DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DEPARTMENT OF THE NAVY ORDNANCE PAMPHLET

DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

TM 5-280

OP 3121, VOL. 1

TO 11A9-1-100-10, VOL. 1

FOREIGN MINE WARFARE EQUIPMENT

DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE

APRIL 1963

TECHNICAL MANUAL
No. 5-280
ORDNANCE PAMPHLET
No. 3121, VOL. I
TECHNICAL ORDER
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THE NAVY, AND THE AIR FORCE

WASHINGTON 25, D. C., *15 April 1963*

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PART ONE
INTRODUCTION
CHAPTER 1
PURPOSE AND SCOPE

1. Purpose

This manual is issued for use in training and in the field as a guide in the identification, use, functioning, installing and arming, and disarming of foreign mines and fuzes. It also provides information necessary for training in the identification, functioning, and operation of related equipment.

2. Scope

a. Content. This manual contains technical information on mine warfare equipment in use during World War II and subsequently by U.S.S.R. and Communist China and their European and Asiatic satellites and by other nations of Europe, Asia, and the Western Hemisphere. It also contains an historical summary of the use of mines and related equipment by the U.S.S.R. Germany, and Japan in World War II. Classified information is found in TM 5–280A, Foreign Mine Warfare Equipment (U).

b. Application. The information in this manual is applicable to both nuclear and nonnuclear warfare.

c. Use of Manual. This manual and TM 5–280A contain information necessary for the instruction of soldiers in disarming (explosive ordnance disposal) and identifying foreign mines and fuzes. Both manuals are issued in looseleaf form to facilitate revision or additions and permit ready disassembly for the organization of instructional material and distribution as handouts. The format and illustrations permit use in projectors.

3. Comments

Users of this manual are encouraged to submit comments or recommendations for changes for improvement. Comments should be keyed to the specific page, paragraph, and line of text in which the change is recommended. Reasons should be provided for each comment to insure understanding and proper evaluation. Comments should be forwarded directly to the Commandant, U.S. Army Engineer School, Fort Belvoir, Va.

CHAPTER 2

HISTORY, TERMINOLOGY AND GENERAL SAFETY REGULATIONS

Section I. TERMINOLOGY

4. Development of Mine Warfare

a. Originally mine warfare was tunneling beneath unpenetrable enemy positions and placing explosives there to destroy them. This was known as sapping and dates far back in military history. Mine warfare did not become prominent, however, until World War I, when late in 1914 on the Ypres front, the Germans placed charges in tunnels dug under the British lines, which they fired at the opening of their attack. This had the effect the Germans expected. When their first assault wave reached the British position, the Germans found the British defenses so badly shocked by the explosions that they were able to pass through without difficulty.

b. Mine warfare as we know it today, however, began when the Germans produced or improvised land mines from artillery shells as a countermeasure against the newly introduced British armored tanks. These were detonated electrically when the tanks reached the mined area. At the same time the Allies also developed an antitank mine of artillery shells that detonated under the weight of a tank. These German and Allied improvisations, though crude, were very effective.

c. During World War II, as mine warfare was carried on widely on both sides, land mines were developed to a very high degree. They came to include a variety of antitank, antivehicle, dual-purpose, and antipersonnel mines with a variety of fuzes. Mine cases, at first made largely of steel, were later made from all sorts of nonmetallic materials. Today, many of the metallic and nonmetallic bodied mines are equipped with improved contact fuzes and influence fuzes that do not require direct contact with the target and are thus difficult if not almost impossible to detect and disarm.

5. Definitions

a. Activator. An activator consists of a plastic body containing a detonator and a plastic cup containing a tetryl booster charge. It has threads for screwing into secondary fuze wells or any standard firing device.

b. Base Coupling. A base coupling contains a percussion primer with a nipple to which a blasting cap or igniter may be attached. The coupling is threaded at one end to screw into the firing device and the other end to screw into a cap well of certain mines and prepared charges.

c. Destructor. A destructor is an explosive adapter for fitting a firing device and nonelectric blasting cap, or a firing device and activator to artillery shells, bombs, rockets, mines, or explosive charges and thus provide a booster in an explosive train. A destructor may also be fitted with an electric blasting cap.

d. Firing Device. A firing device is a mechanism without explosive components designed to initiate a train of fire of detonation in a booby trap or mine. When fitted with a base coupling and a nonelectric blasting cap, it may be used as a mine fuze.

e. Arming. Arming is the removal of all safety devices so that the mine is ready to function.

f. Disarming. Disarming is the replacing of safety devices on fuzes or the removal of fuzes so that a mine cannot be functioned. Some fuzes, however, cannot be disarmed.

g. Trip Flare. This is an illuminating device used as a warning against the approach of foot troops.

h. Fougasse. This is an improvised mine that may consist of 20 to 60 pounds of explosive laid in the bottom of a hole 1½ meters deep, with the opening toward the enemy sloped at 45°. The charge is covered with a board and 10 to 15 centimeters of stones.

i. Daisy Chain. A device consisting of one or more antitank mines, usually wooden, attached to a board that slides or rotates on a pivot. It is pulled in the pathway of a tank by means of a long wire or rope by an operator from a defilade position.

Section II. GENERAL SAFETY REGULATIONS AND REFERENCES

6. General Safety Regulations

a. Handle all mines and fuzes with care at all times.

b. Permit only one man at a time to work on one mine.

c. Examine carefully the ground around a mine before starting to work on it.

d. Be constantly on the lookout of boobytraps.

e. Before lifting a mine, neutralize all fuzes and cut any *slack* tripwires.

f. Never cut or pull a taut wire; never pull a slack one. Look at both ends of a wire before you touch it.

g. The safest way to dispose of a mine is to destroy it in place with explosives. Charges are placed on or near the mines and exploded from a safe distance by means of detonating cord.

h. Take cover before pulling a mine, and do not come out for at least 10 seconds after you have pulled it. There may be a delay fuze. Examine the covered position for boobytraps before occupying it.

i. Never use force on a mine or boobytrap. If a part cannot be removed without applying an undue amount of force, stop removal and destroy in place.

j. If a mine or boobytrap must be left unlifted, mark the location prominently and notify nearby unit headquarters.

k. Neutralize all antipersonnel mines by replacing all safety pins before you lift them.

l. If it is absolutely necessary to walk into a mined area, move slowly looking at the ground carefully to note disturbances in the soil and the presence of any tripwires.

m. Use improvised grapnels to detonate tripwire actuated mines. The grapnels are thrown out over the field and then pulled back, setting off the mines.

n. When cutting the wires of an electrical detonator, cut them one at a time to avoid closing the circuit with the wire cutters. A mine is harmless if the firing chain is broken, **but there may be more than one firing chain.** When pulling a mine from a defilade at a distance of at least 55 meters, always remain in the prone position.

o. Never uncover an antitank mine until the ground on top has been thoroughly checked for antilift devices. It is possible that more than one of these is held depressed on the top of the mine by the thin layer of earth. Probe every square inch cautiously, for even the disturbance of the earth by the probe might release the fuze striker. A nonmagnetic probe is the safer to use, as the mine may have a magnetic fuze.

p. Never remove the pressure plate from a metallic antitank mine, unless the mine can be positively identified as one that is not fitted with an antidisturbance fuze. This involves great risk, even in identifiable mines, as combination pressure and pressure-release (antidisturbance) fuzes are available in almost all Armies. Many countries, Russia for example, may have such fuzes, unknown to foreign intelligence agencies.

q. Be extremely careful in disarming wooden

antitank mines by hand. Frequently, holes are drilled through the bottom of the case through which pull wires connected to auxiliary fuzes are threaded and anchored to a stake underneath. If the stake is driven down deeply enough, it is not easy to locate the wire by probing. A pressure-release fuze or a pull fuze with pull wire may be actuated by raising or removing the pressure piece or lid. Some wooden mines have a special mousetrap type of device that is actuated in this way.

r. Remember that wooden antitank mines with pull fuzes inside the case are frequently fitted with a pull wire anchored to a stake underneath the mine or to a rigging inside that detonates the mine at the disturbance of the lid or pressure plate.

s. Be extremely careful with wooden antitank mines that have remained buried for a comparatively long period. Because of soil conditions, the wood deteriorates so that the slightest inadvertent pressure on the top might initiate the fuze. Wooden box mines with the pressure piece or lid supported on wooden dowels are particularly dangerous in this respect. **Destroy these in place.**

t. Never raise antitank mines from their emplacement by hand unless they can be positively identified, even though the entire outer surface has been carefully explored and all antilift devices have been disarmed. There may be an antilift fuze inside that may be initiated by a very slight jar; also a vibration fuze, wherein a slight tilt of the mine might close a circuit. The safest procedure is to pull the mine out by means of a rope and some sort of grapnel from a defilade position.

u. Be extremely cautious in disarming tilt fuzes by hand, especially if they have been partially initiated. **There must be no movement of the tilt rod** when the fuze is removed from the mine. Some may not have a safety, a safety may not be available, or a safety pin cannot be inserted.

v. Use extreme caution in disarming snap fuzes by hand, as they may be partially initiated by contact or blast and a slight jar or movement will set off the mine. Some may not have a safety, a safety may not be available, or a safety pin cannot be inserted.

w. Be extremely careful in hand disarming antipersonnel mines with tripwire actuation. Before cutting tripwires, trace them from mine to anchor (often the anchor may be another mine). Be on the alert for small antipersonnel mines laid along the side or underneath the tripwire to hinder disarming. Always trace the tripwire from the friendly side—**do not straddle it**—as a safeguard against accidental tripping or stepping on a small antipersonnel mine laid underneath the tripwire. If possible, **insert a safety pin in the fuze before cutting the tripwire.**

x. **Destroy in place all mines charged with picric acid explosive.** Extremely sensitive explosive salts may have formed wherever the explosive contacts the metal, particularly in the threaded areas of the fuze and fuze well.

7. References

Additional information on safety precautions in the handling of mines and mine components may be found in TM 9-1940, FM 5-31, FM 20-32, and AR 385-63.

CHAPTER 3

LAND MINE AND BOOBYTRAP LOCATIONS, USES, AND EFFECTS

Section I. LOCATIONS

8. Land Mine Locations

Land mines may have fixed or permanent locations, depending on the tactical situation and the nature and position of the target.

a. Fixed Location. Mines may be placed as high as six feet above the ground. The Italian B—4 fragmentation antipersonnel mine is a good example, having six spikes in a flattened portion of the outer cylinder for fixing it against a tree or post. Mines may also be laid on the surface of the ground, such as the British ointment-box antipersonnel mine. Antitank mines are usually buried 15 to 20 centimeters below the ground surface. On the other hand, antitank mines have been found buried as deep as 1.2 meters.

b. Movable Location. Mines that move include:

(1) Rocket-propelled mines, such as the Soviet LMG antitank mine.

(2) Bounding or mortar mines, such as the British Mark 3, that bound into the air and explode scattering fragments or shrapnel over a wide area.

(3) Rolling beam mines designed and used by the Soviets with action like a hoe or rake, the handle flying up when the metal end is stepped on.

(4) Tracked mines (German) that consist of a fuzed explosive charge propelled by a miniature tank operated by remote control radio or field wire.

(5) Floating or drifting mines that include the Soviet improvised raft and floating lever mines and the German river mines.

9. Boobytrap Locations

Boobytraps may be found in abandoned areas, abandoned buildings, and all other places of potential enemy occupation. These are usually dirty trick devices produced or improvised to meet special needs or for special locations.

Section II. USES AND EFFECTS

10. Antitank Mines

Antitank mines are used to immobilize or destroy tanks or other vehicles. They are usually emplaced on or slightly below the ground surface. Ordinarily they detonate by the application of 300 to 400 pounds pressure on the pressure fuze; however, the actuation pressure may be modified to produce detonation from lighter pressure, such as running soldiers. Present antitank mines contain 20 to 30 pounds of high explosive, or about twice as much as they had in World War II. Antitank mines have four effects by which they perform their function:

a. Blast. Pressure waves from the detonation of the mine explosive immobilize tanks by

damaging their tracks. These mines usually contain the maximum explosive charge. Smaller charged mines, many of which are still in existence, may be placed double or triple to achieve a stronger blast. Blast type antitank mines may have a fixed location on the surface of the ground or they may be buried ordinarily no deeper than 15 centimeters below.

b. Cavity or Shaped Charge. These mines are the tank destroyers. Gases formed during the detonation of the cavity form a high velocity jet capable of penetrating armor. Cavity or shaped charge mines are fuzed so that the jet strikes the belly of the tank in the vicinity of the fuel compartment or magazine. A good example of such mines is the French offset mine.

c. Miznay-Chardin or Plate Charge. These mines are also tank destroyers. They function by propelling a plate at high velocity in the forward direction of the detonating wave. They require sufficient standoff space for the flat plate to change into a mushroom-shaped slug. If the mines explode underneath the tank tracks and there is no standoff space, they produce no more than a blast effect.

d. Chemical.

(1) *Gas.* Gases having a high persistency are an effective means of stopping tanks through contamination, by which personnel inside and supporting infantry are all affected.

(2) *Incendiary.* Incendiary mines are mostly field improvisations, consisting of some sort of container with a well for an electric or nonelectric blasting cap and filled with thickened fuel. These are usually initiated, however, by controlled methods.

11. Antipersonnel Mines

Antipersonnel mines are used to disable or kill personnel. They may be laid in antitank minefields or in obstacles to delay breaching, or in antipersonnel minefields or isolated locations for nuisance purposes. Antipersonnel mines produce six kinds of effects as follows:

a. Blast. This effect produces casualty by concussion. Blast type antipersonnel mines are generally intended to kill or injure only the persons that actuate them. They may be laid on the ground surface or slightly below. They may be small plastic-cased mines such as the British ointment-box or the German wooden Schü mine. They contain a fraction of an ounce to 4 ounces of explosive and a fuze that functions under as little as 5 pounds pressure.

b. Fragmentation. Fragmentation effects are obtained from mines made of solid metal—cast iron or steel—with a bursting charge that projects fragments in all directions (Soviet POMZ-2). Static fragmentation mines may be placed above the ground or on the surface. Bounding fragmentation mines are placed below the surface.

c. Shrapnel. Shrapnel mines consist of a container with a bursting charge surrounded by preformed missiles, such as ball bearings or small pieces of scrap metal. The detonation of the bursting charge projects the shrapnel at high velocity. The static type may be placed above the ground or on the surface and the bounding type, below the surface (German "S" mine 35).

d. Cavity Charge. Such mines kill or injure the target. They are placed even with the surface of the ground (TM 5-280A).

e. Small Arms. This mine is a firing device with a small arms cartridge. The target pushes the bullet down, camming out the firing pin, which shoots up into the cartridge and fires the bullet into the target and (British ground spike).

f. Chemical.

(1) *Gas.* Gas mines may be of the stationary or bounding type with controlled or contact fuzing. The gas inflicts casualties on personnel and contaminates the area (Soviet KhF).

(2) *Incendiary.* At present, incendiary mines are improvisations with standard devices for initiation. They are used by almost all nations. Incendiary mines include fougasses and Soviet improvised mines.

12. Antivehicular Mines

These are blast type mines used to destroy or

damage land vehicles other than tanks. Many like the German bar mine and the Japanese yardstick mine are easily recognized, but the others are hard to distinguish from antitank mines. They usually contain, however, about 15 pounds of explosive and detonate at about half the pressure of antitank mines.

13. General or Dual Purpose Mines

These blast effect mines are designed to destroy more than one target—a vehicle or a footsoldier—by the variation of the actuating pressure of the fuze or by the use of a trip-wire (Soviet NV-41).

14. Railroad Mines

Special blast type mines are designed for the destruction or damage of railroads, locomotives, and rolling stock (Soviet PMS, and the Italian B-2). Detonation may be controlled or effected by contact. These usually contain more high explosive than antitank mines.

15. Beach Mines

The beach mine (blast-effect mine) has many functions. It may be used to hinder amphibious operations by destroying or damaging landing craft or disabling land vehicles or to injure or kill personnel. They may be found in shallow water, or emplaced below the ground on the beach. The best examples of these are the Japanese single-horn and double-horn beach mines. An exact copy of these latter mines has been standardized by the United States as the Mk 54 model 0 beach mine. The Japanese mines are detonated by chemical fuzes, crushed or tilted. They may be boobytrapped by installing the plunger upside down, and are thus extremely difficult if not impossible to disarm.

16. River Mines

These are floating or drifting blast effect mines used to destroy floating bridges, piers or fixed bridges, and ferry equipment (Russian river mines).

17. Dummy Mines

Such mines may be made of readily available materials and emplaced in dummy minefields. They may also be used to supplement real mines in a live minefield to delay and confuse the enemy.

18. Inert Mines

These are similar in construction to standard mines but contain no explosive charge. They are used for training purposes.

19. Practice (Training) Mines

A practice mine is a replica of a standard mine, with vent holes, that emits a puff of smoke or makes a noise to simulate detonation.

Section III. LOCATION AND REMOVAL METHODS

20. Location Methods

There are three common methods for the location of land mines—visual inspection, probing, and electric detection. Visual detection is one of the best and most effective methods of locating mines embedded in most types of soils. Indications of buried mines are disturbed soil, piles of stones, debris from mine packaging, and often enemy minefield markers. Probing is the detecting of buried mines by penetrating the earth with a sharp instrument—a probe, bayonet, or stiff wire. The probe should be pushed into the ground carefully from about a 40 degree angle to avoid putting pressure directly on top of the mine. Although it is slow and monotonous, probing is the surest, and most effective method of locating mines. On the other hand, electric detectors, though useful in many cases, are not always dependable. They all emit false signals. Metal detectors react to nails and other pieces of metal as well as to mines, while nonmetallic detectors react to a tree root or an air pocket.

21. Removal Methods

Mines are removed by manual, mechanical, and explosive methods. Mine removal, always risky and difficult, may be accomplished relatively safely by the combination of approved

techniques. The instrument or method selected depends on the location of the mines and the orders received. The safest removal is detonation in place, the next safest is remote removal. The least desirable is hand removal. Heavy equipment, such as the tank-mounted roller, plow, and flail, have been used but their effectiveness is limited.

Flexible explosives cables, bangalore torpedoes, and heavy-cased linear charges are adaptable to the removal of mines. Another method is artillery fire.

PART TWO

MINE WARFARE METHODS AND EQUIPMENT OF FOREIGN WORLD POWERS

CHAPTER 4

SOVIET RUSSIA

Section I. SOVIET MINE WARFARE IN WORLD WAR II

22. Equipment

a. Foreword.

(1) The Soviets and the Germans in World War II employed minefields probably more widely and consistently than any of the other combatant nations. Both antitank and antipersonnel mines were laid in patterned fields and at random in defense against infantry and armor and to harass and slowdown enemy pursuit in evacuated areas. Antipersonnel mines were interspersed in antitank minefields to make breaching and clearing difficult. The nuisance value of mines was considered by some to be almost equal to the destructive value.

(2) Improvements in the design and construction of mines came as the war progressed. At the beginning, steel-cased mines were predominant; but later on, the nonmetallic types were used more widely because of their resistance to the new electronic detection methods. Antilifting devices were developed and used effectively as a countermeasure against the skill and efficiency attained by engineer troops on both sides in clearing paths through minefields.

b. Mines. The Soviets produced and used more than 50 models of antitank, antitransport, general purpose, and antipersonnel mines and boobytraps. These were of a wide variety of shapes, sizes, methods of fuzing, complexity or simplicity of design, and construction materials. About 50 percent of the mines were metallic; the remainder had wooden and other nonmetallic cases. The Soviets were not limited in supply to standard factory-made models. Wooden cases were mass-produced in the field as well as the factory according to standard specifications, and were filled with explosive blocks obtained from field demolition stores at the minefield site. Also, mine cases were improvised from empty ration cans, shell cases, and every other available material. Captured enemy mines were used whenever possible.

c. Fuzes. Mechanical, chemical, and electrical internal-action fuzes were produced in large quantities. The MUV pull fuze and the MV-5 mechanical pressure fuze were the most widely used. These activated the mines by the release of a spring-driven striker. There were

also numerous complex types designed for special mine tasks, and at least a dozen delayed action models alone—chemically, electrically, and clockwork operated—that were commonly used in mines and charges laid in areas to be abandoned to the enemy or behind enemy lines by special infiltrating engineer teams. There were also several vibration-induction fuzes, two radio-activated fuzes, several electrically activated and controlled fuzes, and many unextractable fuzes built into special mines for use in areas to be evacuated.

d. Mine-Clearing Devices. For clearing minefields, the Russians had grapnels, drags, and other hand-operated devices, many of which were field improvised. Mine-clearing troops were also equipped with electronic detectors and stethoscopes (clockwork fuze detectors). During the war, the Soviets developed several types of tank-mounted rollers for rapidly breaching lanes through enemy minefields.

e. Mine-Laying Equipment. The Soviets had available a laying cord consisting of a main cord with branch lines of varying lengths attached at varying distances from each other. Markers were provided at the end of each cord to control lateral shifting. Another type was a single line, without branches, having markers throughout its length.

23. Offensive Use of Mines

a. Responsibility for Mine Warfare. The Soviet engineers were responsible for the tactics and techniques of mine warfare—laying, maintaining, detecting, and removing mines and minefields.

b. Mines and Minelaying. Engineer reserves were ordinarily provided with an ample supply of antitank and antipersonnel mines for the protection of flanks of advancing units against counterattacks, jumpoff positions, intermediate objectives on the main avenues of attack, artillery and antitank gun positions, and approaches to bridges. To insure successful minelaying under such circumstances, the Russians attached to each infantry regiment at least one company of engineers.

c. Holding Captured Positions. Mines were employed offensively in holding captured positions against repeated and violent counterattacks. Immediately after the Russian troops reached their objective, they mined as many predetermined vital approaches as possible. The time element was considered so important that mines were laid even under enemy artillery fire and enemy observation. The main thing was to complete the defensive mine belt.

d. Minefield Placement. The Russian forces in the offensive installed minefields immediately at all intermediate halting points for protection when making successive halts to regroup and bring up supplies and reserves, or when enemy resistance prevented the force from advancing further toward the objective without additional support. Also, electrically controlled and detonated mines were often placed across main avenues of approach so that the offensive might be continued without waiting for the removal of minefields. Contact mines were laid to provide adequate protection within the limited time available.

e. Infiltration in Rear Areas. The Soviets were particularly clever in mining German rear areas. Railroads were planted with instantaneous and delayed-action mines. The latter were laid in the roadbed at a maximum density of 5 per kilometer of track. The delay period varied in order to force the enemy constantly to make repairs at different places. Delayed-action mines were frequently laid in pairs to be sure of detonation at a selected point. Activated mines also were laid extensively on railroads behind enemy lines. In deep penetrations made by airborne troops, partisan operations, and infiltration, the Russians mined main supply routes, airfields, and communication centers. Delayed action, pressure, and in some cases radio-controlled mines were planted. Frequently the Soviet engineers crossed the German lines by day or night and mined rear area roads during the half- to one-hour breaks in the stream of heavy traffic. The Soviets also placed extensive antipersonnel minefields near bivouacs and assembly areas. Some of these were laid by partisans; but most of them, by engineer troops.

24. Defensive Use of Mines

a. Mine obstacles. The Soviets coordinated mixed minefields (antitank and antipersonnel mines) with fire power. These were not laid in a continuous belt but in a series of panels, placed as required by the determining factors of terrain, anticipated target, and fields of fire. They were also sited in depth, if necessary. The rear edges of the nearest panels were usually from 70 to 100 meters from the front line emplacements.

b. Minefield Locations.

(1) *Main line of resistance.* Mine obstacles were sited to avoid restriction of friendly movement. All possible tank approaches were closed except for well-guarded lanes. Fragmentation mines and boobytraps were frequently placed in such obstacles as abatis and wire entanglements.

(2) *Points of main effort.* Soviet troops on the move scattered defensive mines around points of main effort to block tank attacks. In the southern Ukraine, following a successful tank thrust, they immediately protected the terrain they had gained with a belt of antitank mines blocking all roads and approaches. On one day alone, 20,000 such mines were laid. The German counterattacks were frequently halted and collapsed by such obstacles. The Soviets often harassed the Germans by placing the dummy mines at crossroads and burying live ones at points that might be used as detours. These at times caused heavy enemy losses. The Soviets often exploded mines at several different points to detract attention from the main point of blasting, thus leading the German troops in the wrong direction. Antitank mines were laid at highway crossings in conjunction with large charges that, when camouflaged, had an annihilating effect (fig. 1). In addition defensive mines were set in terrain and roadblocks, at fords, in the vicinity of blasted bridges, along creeks and shallow watercourses, in log rafts and woodyards, and at combat vehicle relief stations.

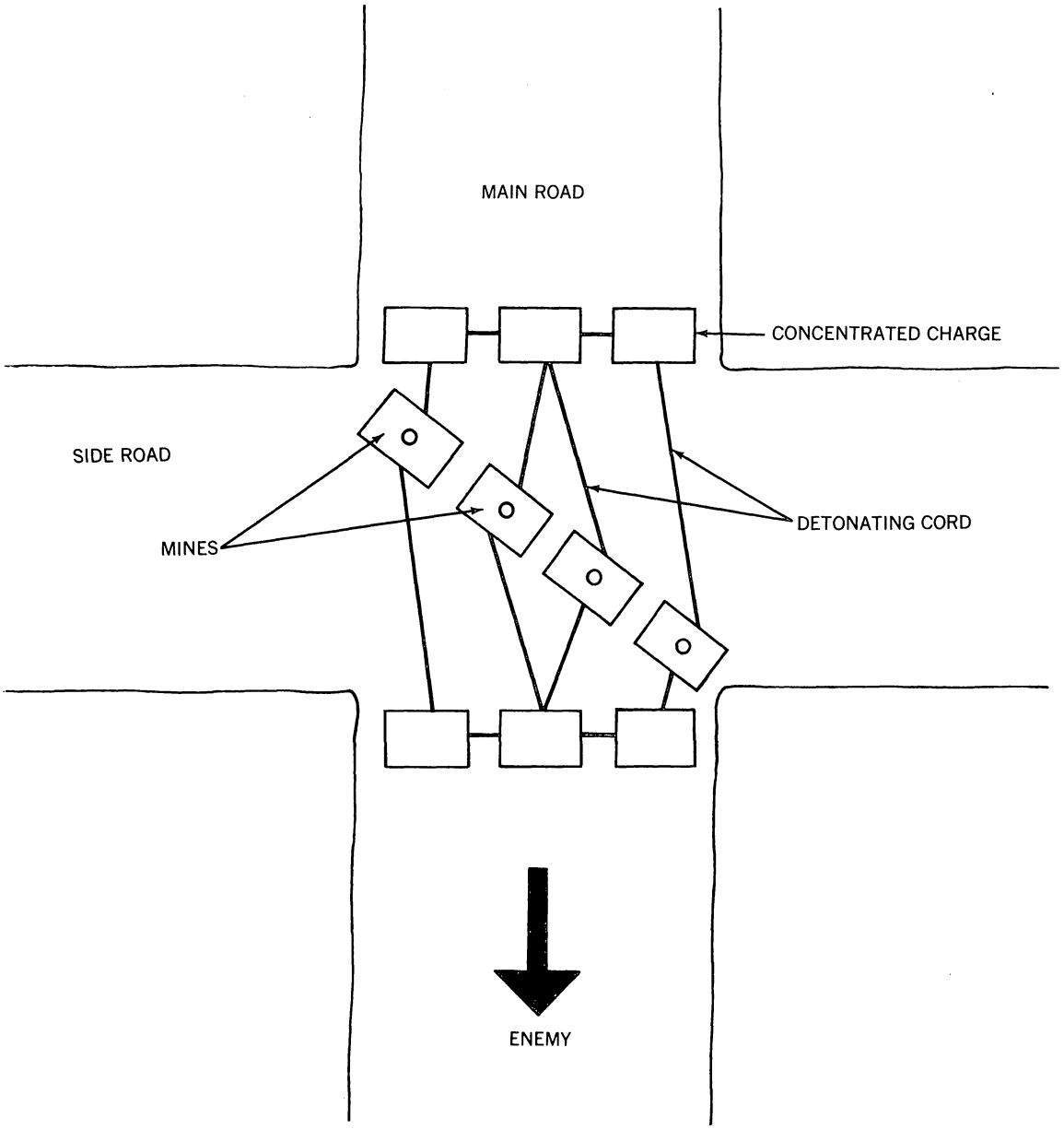


Figure 1. Highway-crossing mine pattern.

c. *Minefield Patterns.*

(1) Mines were often laid against tanks without plan, being simply adapted to the conformation of the terrain.

(2) Three rows were often laid in succession, the individual mines being placed at intervals and at row distances of 1.4 to 5 meters. Against infantry, as many as 10 rows were laid in sequence at row distances up to 100 meters (fig. 2).

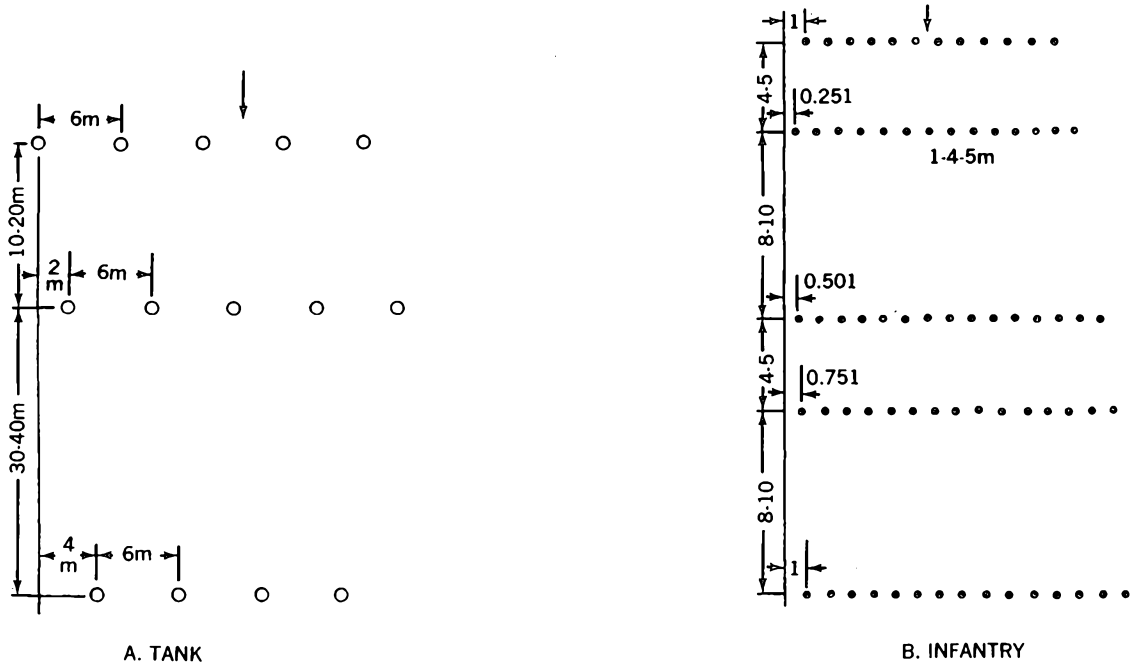


Figure 2. Tank and infantry defense minefield.

(3) Antitank minefields were set up frequently about 200 to 500 meters in front of fortifications for protection. They usually contained antipersonnel mines laid both in the minefield and also 20 to 100 meters ahead of it. Often antitank mines laid at interval greater than 10 meters had in addi tion one or two rows of antipersonne mines between them. Figure 3 show three types of such mixed minefields

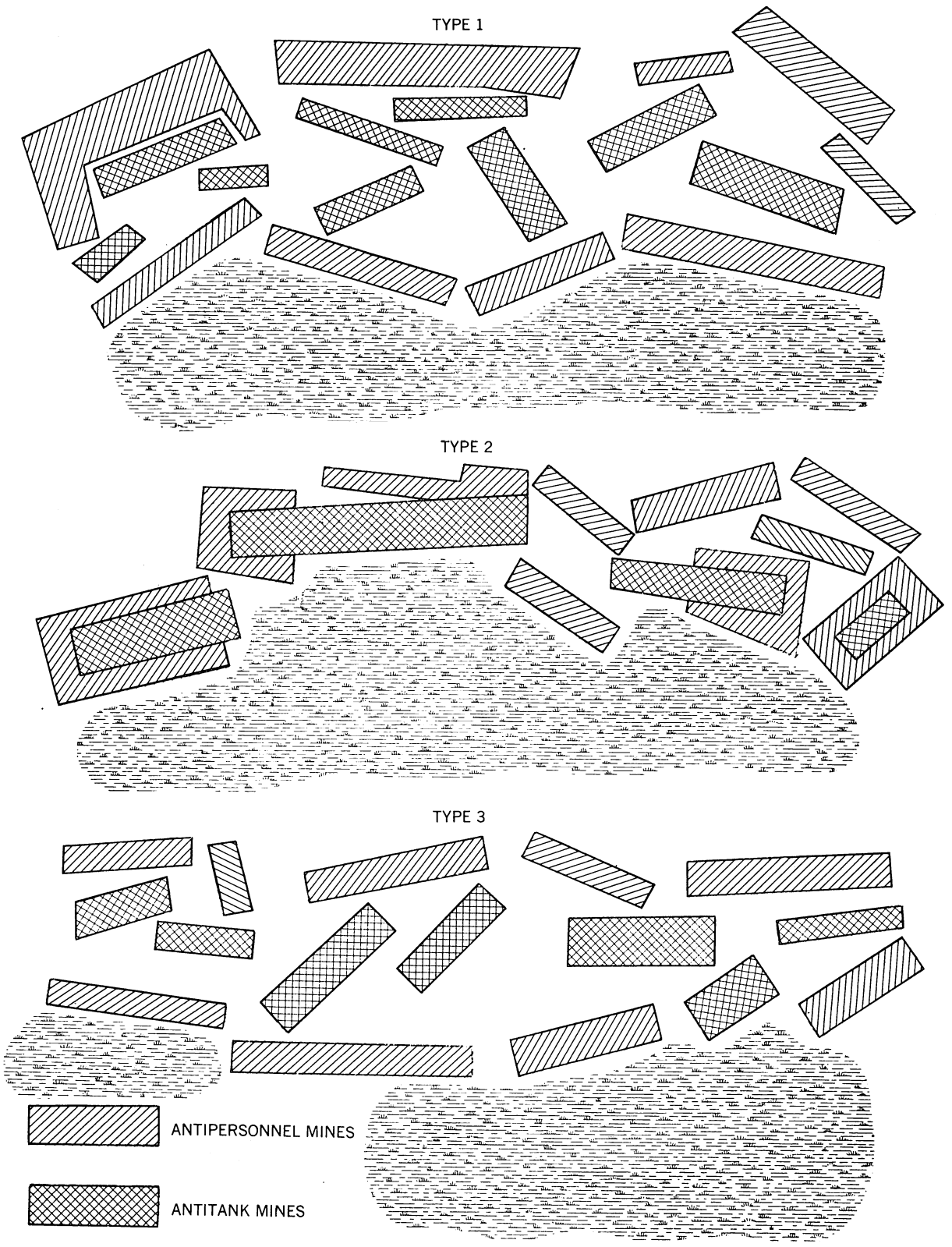


Figure 3. Three types of mixed minefields.

(4) Trip wire antipersonnel mines were used for hasty mining instead of the pressure type, as only a comparatively few were required to cover an area. Bounding shrapnel mines were laid no closer than 152 meters to the friendly side of the field.

d. Minefield Lanes. In mobile defense operations, the Soviets laid mines on all approaches to strengthen the defenses of the central terrain features, particularly against German flank attacks. Here lanes were left for counterattacks with provision for protection and closing. Lanes were frequently protected by controlled mines—"daisy chains"—that could be emplaced very quickly.

e. Activated Mines. Later in the war many antitank mines were provided with antilift fuzes, some of which were reinforced by heavy supplementary charges. Mines were often laid double—above and below each other or side by side—and often secured against removal by pull igniters. Blasting charges placed in bridges usually contained additional percussion igniters connected with wire. Approximately 2 to 5 percent of all mines were unremovable.

f. Railway Mining. Mine warfare against German railway transportation was very effective. Here the mines were exceptionally well camouflaged. The invaders were obliged to send out mine detection squads daily, thus draining their already depleted forces. For protection, the Germans hooked cars loaded with gravel in front of the locomotives to bear the brunt of the explosion. Mines with long cords controlled from wooded or overgrown terrain were detonated when the center section of the train passed above them. Accordingly the Germans cut the woods to a 50-meter depth on the sides of the track; but the enemy, then hidden in the piled-up trunks and branches, continued the destruction.

g. Withdrawal Operations.

(1) *Communications.* Routes of communication and signal facilities were the chief mining objectives. All lateral roads and trails were mined to prevent parallel enemy pursuit and impede movement over the entire zone of withdrawal. Mine obstacles in many cases were prepared in advance on routes along which friendly forces were withdrawing. The Soviets also used mines to deny the enemy the use of roads, railroads, airfields, buildings, and other important elements in abandoned areas.

(2) *Controlled mines.* In withdrawal operations controlled mines were used to block lanes left open to friendly troops and also in strategically important installations. In 1941 and 1942, the Russians used radio-controlled mines for blowing up entire blocks of houses as soon as the enemy entered them. The mines were exploded by a coded radio wave length. At first all German efforts at detection failed; but eventually they succeeded by the use of detectors sensitive to the sound of clockwork.

(3) *Boobytraps.*

(*a*) Mines and boobytraps were installed wherever troops were believed likely to congregate—buildings, command posts and bivouacs, observation posts, artillery positions, radio and communication centers, highways, bridges, factories, and depots.

(*b*) The activation of mines was one of the most common Russian methods of boobytrapping in World War II. Frequently the pressure type mine as provided with supplementary or secondary fuze wells that received a pull fuze attached to a trip wire that was anchored to a wooden stake or metal pin directly underneath. Some mines were boobytrapped with pressure-release type antilifting devices. All these provided actuation when the mine was raised.

(*c*) The Soviets also set a hollow book mined with two explosive charges (one 3.5 ounces, the

other 1.8 ounces), a flashlight battery, a detonator, a wire-loop contact, and connecting wires (fig. 4). When the book was opened, the wire loops of the contact touched, closing the circuit and firing the charge. Neutralization of this device should not be attempted; it should be removed and destroyed in a safe place.

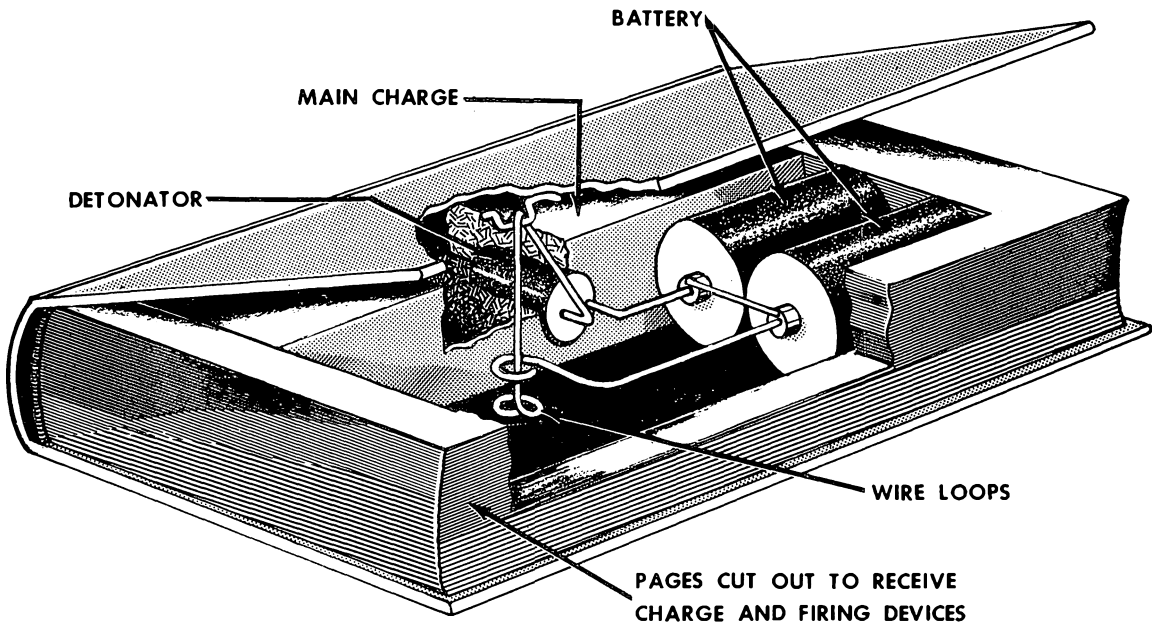


Figure 4. Book boobytrap.

(*d*) The Soviets placed large explosive charges in prominent buildings in towns that had been under artillery fire and bombing. These were connected to electric power lines cut down and ostensibly lying loose. When the power wires were repaired, the flow of power completed the circuit and detonated the explosive charges (fig. 5).

Figure 5. Power system boobytrap.

(*e*) Pistols apparently lying around, when picked up ignited charges buried near by in shallow ground.

The charges were detonated by a pull-fuze trip wire that removed the striker retaining pin (fig. 6).

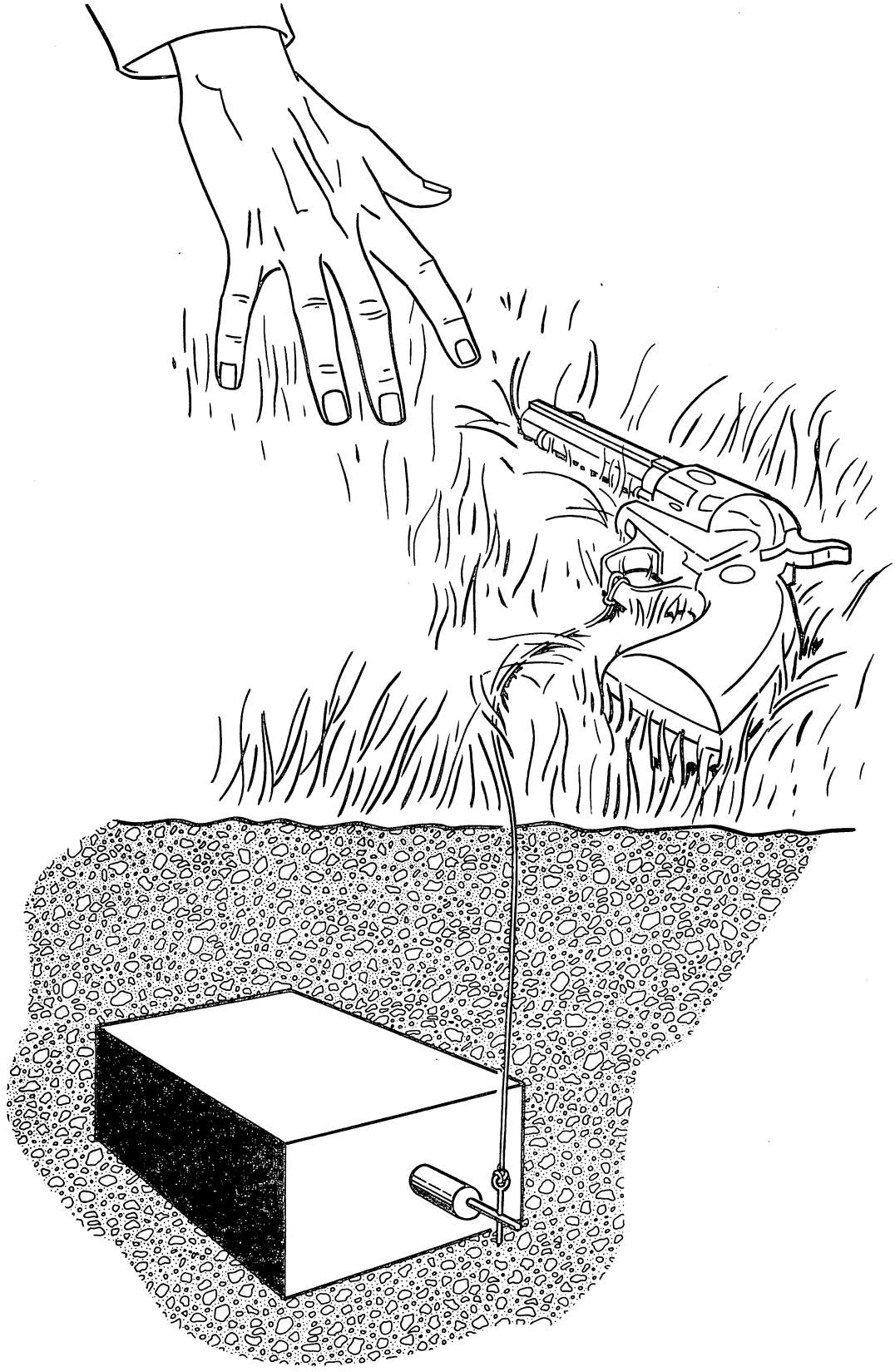


Figure 6. Pistol boobytrap.

(*f*) Door mines were found frequently in abandoned buildings in communities and quarters. An explosive charge was detonated by opening a door attached to a pull fuze by a trip wire (fig. 7).

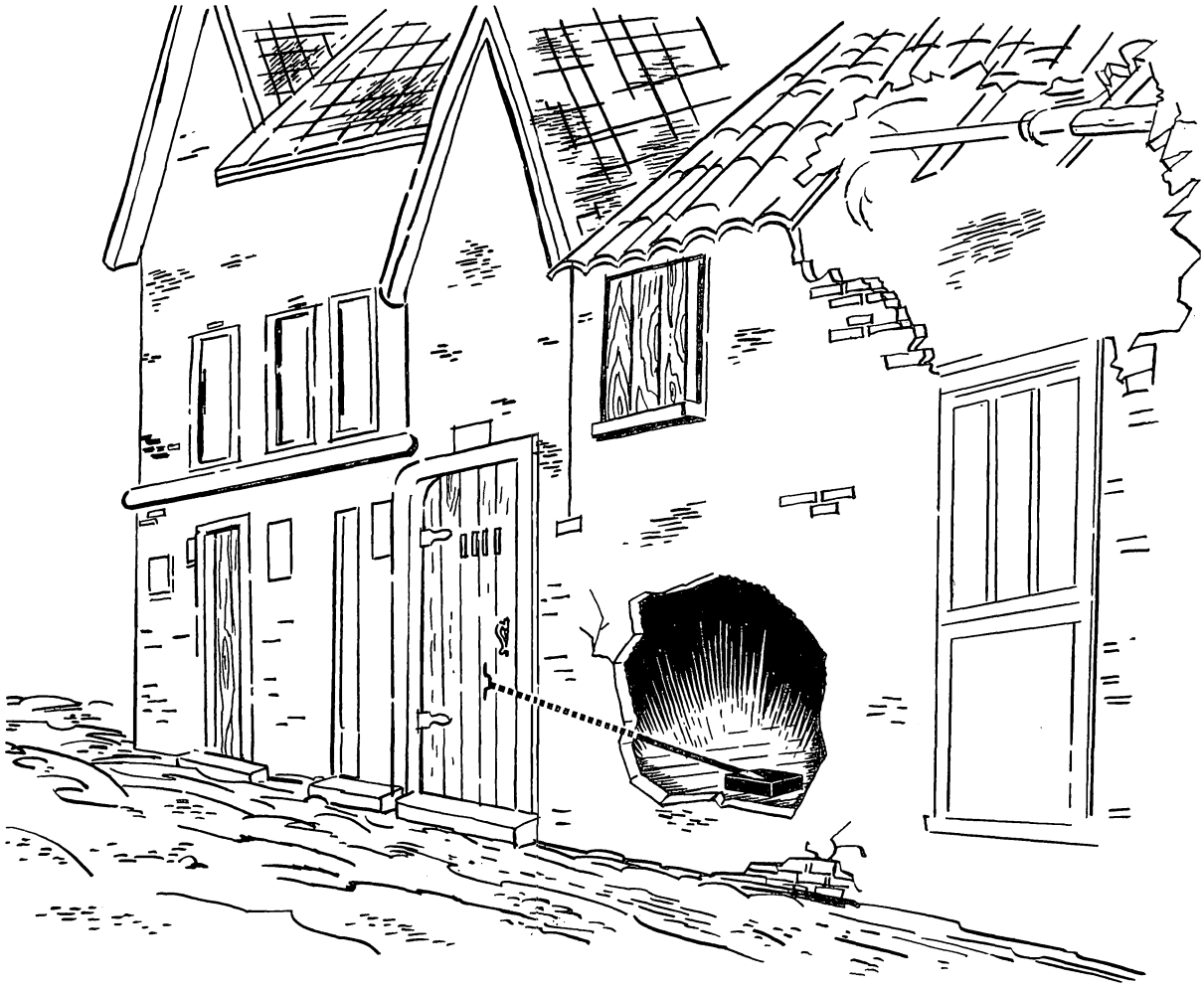


Figure 7. Door boobytrap.

(*g*) The Soviets laid a rail spike boobytrap under a crosstie in the railway roadbed to harass maintenance of way crews or attempts to alter the gage (fig. 8). The trap consisted of an elongated rail spike, a pull cord or wire pin, a slot for holding the igniter assembly, and a 4.5 lb explosive charge. Two types of markings were used—a spike driven into the end of the crosstie and a groove cut into the long spike to which the pull cord was attached.

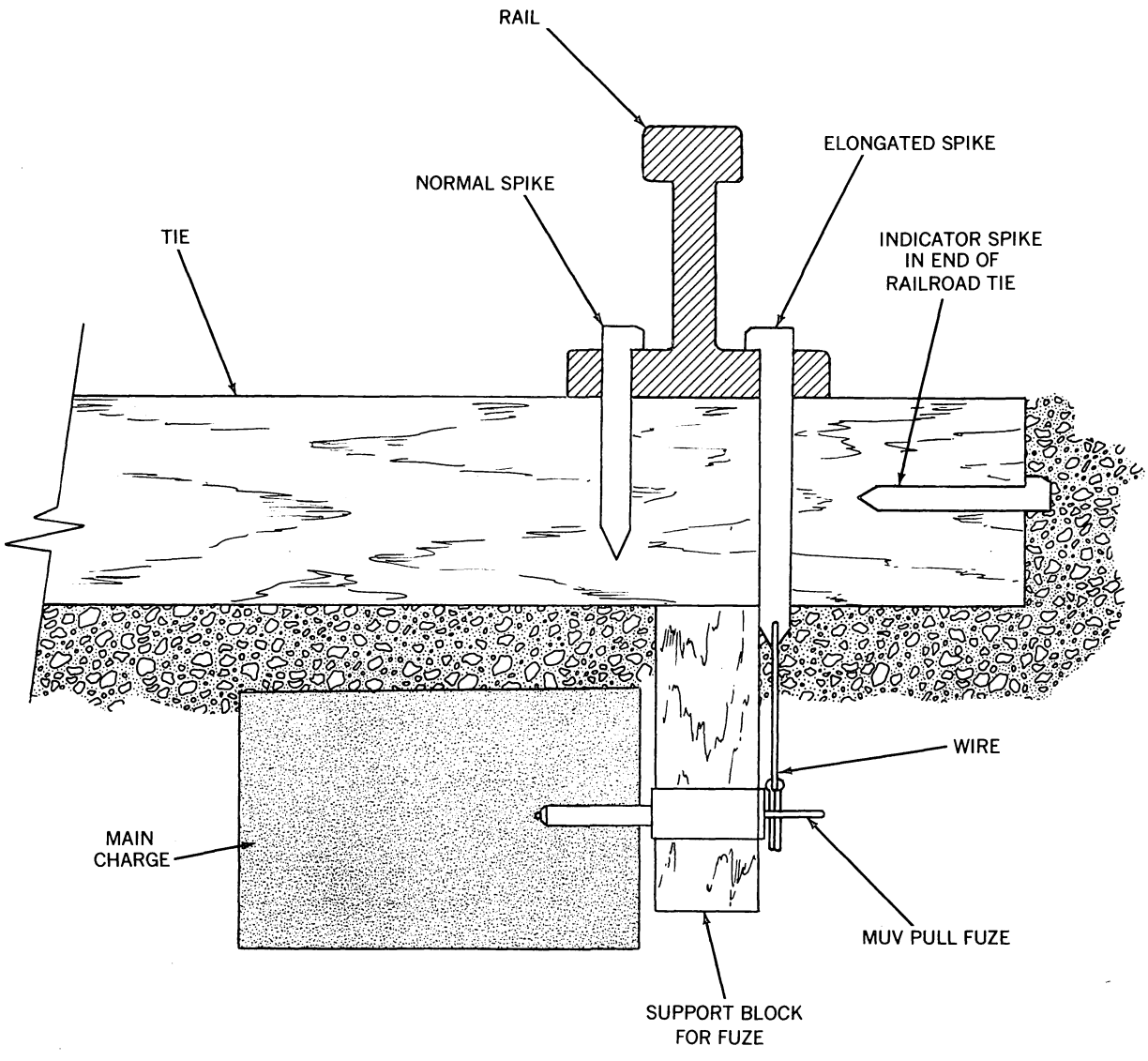


Figure 8. Rail spike boobytrap.

(4) *Miscellaneous boobytraps.* The Germans were harassed by the Soviets in World War II by an additional long list of ingenious boobytraps, as folows:

(*a*) Cartridge boxes apparently filled with German infantry ammunition but with the powder removed and the cartridge charged with a high explosive and a detonator. This ammunition was capable of destroying the weapon that fired it.

(*b*) Bandage packet containing shrapnel, a charge, and a detonator.

(*c*) Bandage cases with Red Cross insignia used as mines.

(*d*) Rubber balls about the size of a fist filled with explosive, used as bombs.

(*e*) Silver-gray, light, metal flasks

that exploded when the lid was raised.

(*f*) Cognac bottles filled with an incendiary liquid.

(*g*) Small red flags marked with an M, normally issued to troops for making individual mines, and connected to a fuze-detonator and an explosive charge that fired at removal.

(*h*) Imitation frogs colored earthy-gray that detonated at the application of pressure.

(*i*) Flashlights containing a high explosive charge, blasting when tampered with.

(*j*) Letter envelopes with explosive filler detonating when opened.

(*k*) Dead soldiers connected to mines or charges.

(*l*) Artificial trenches seemingly containing enemy dead, left in apparent disorder and mined.

(*m*) "Small and tiny" mines packaged in cardboard and sheet metal containers down to the size of a shoe polish can and smaller.

(*n*) Haphazard piles of straw concealing treacherous mines.

(*o*) Pieces of equipment, household utensils, and utilitarian objects boobytrapped with 30 grains of tetryl inclosed in a case that resembled a match box in form, size, and appearance.

(*p*) Charges placed in the wreckage of blown bridges or other structures to delay repairs.

(*q*) Concealed charges and igniters in abandoned munition dumps.

(*r*) Hand grenades placed in asphalt drums.

(*s*) A horse or other animal, with the front legs hobbled, pastured in a minefield to serve as the releasing agent.

(*t*) Concealed charges placed on tombstones.

25. Techniques in the Use of Mines

a. Introduction. Minefields were generally emplaced in pattern; but at times they were merely scattered openly on the ground, especially when the Soviets hastily tried to secure captured objectives. They were laid within clearly defined limits, however, to assure the safe advance of friendly troops. Mines scattered on the surface during advances were usually recovered and used later on. In withdrawal operations, roads, ditches, turnouts, and bridges were saturated with antipersonnel mines, chiefly of the fragmentation type, in addition to antitank mines. Surfaced roads were frequently armed with both activated and dummy mines. Holes to accommodate such mines were often dug into the roadbed and filled with wooden blocks until the enemy approached, when they were replaced by armed mines (fig. 9). Sliding mine barriers (antitank mines tied to long boards at 50-cm intervals), prepared in advance, were used to block roads rapidly in the event of surprise attacks.

The Russian soldiers many times concealed themselves as near as possible to where the German engineers were laying their minefields, noting carefully the gaps or lanes left for the use of patrols. Then at night they sneaked out to the field and filled these gaps with mines they had cleared from other enemy areas. Thus they accomplished a double purpose: they sealed off the gaps provided for German patrols and made others for themselves.

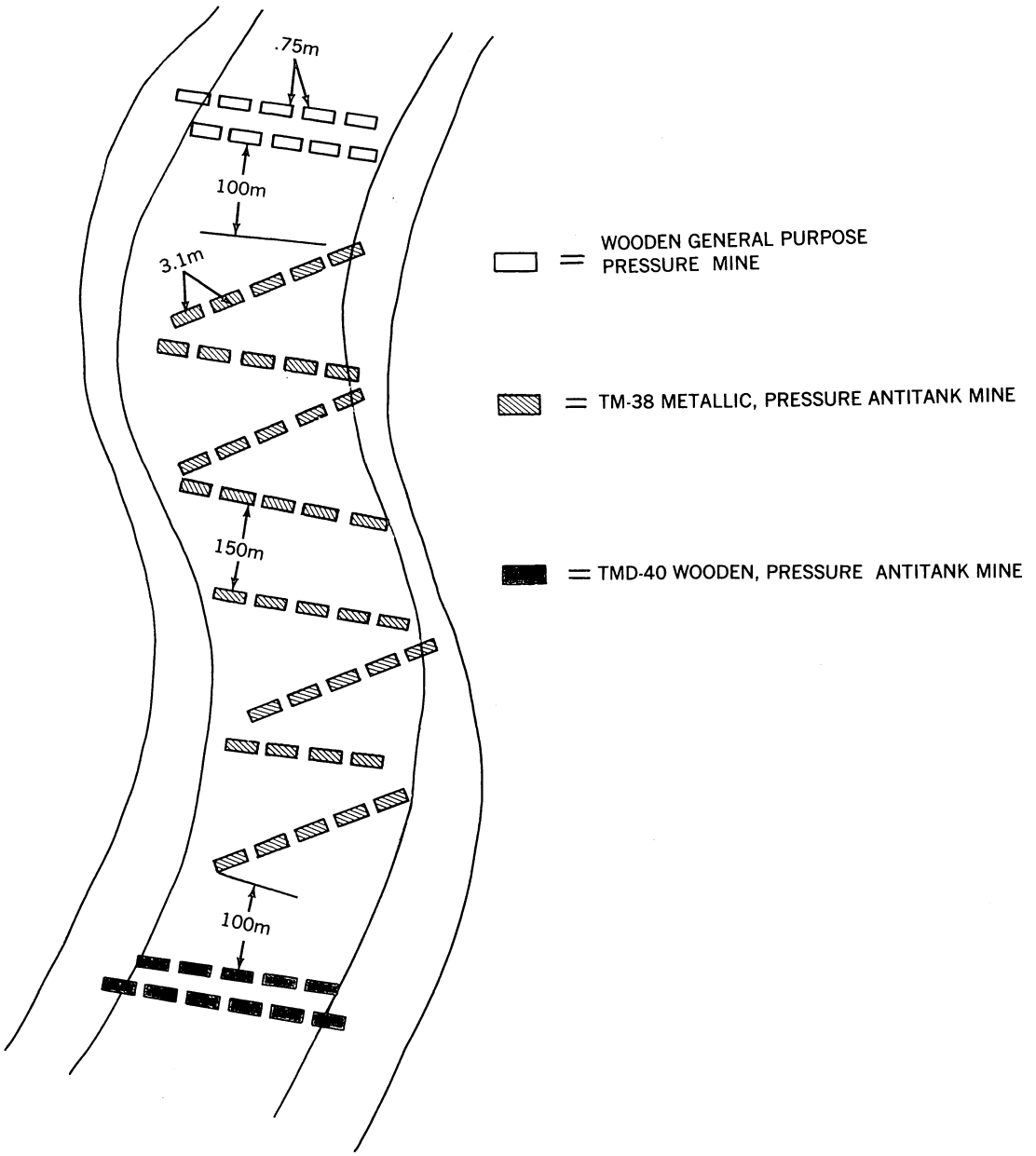


Figure 9. Soviet road mine pattern.

b. Minelaying.

(1) *Basic considerations.*

(*a*) The method and actual installation of mines depended on such considerations as the type required, the time of year and condition of the ground, enemy fire and its effectiveness, the time allotted for laying, and the time of laying—at night or in the daytime. In the autumn mines were laid if possible in dry elevated ground and buried shallowly under a thin layer of camouflage to

assure unaffected functioning when the ground froze. In winter they were usually laid both in areas of snowdrifts or where drifting was unlikely. The snow was compacted to provide a base; in deep snow, however, boards, planks, or other firm supports were put underneath. On roads where the snow was compacted, the top of the mine was often set to protrude from 1.5 to 2.5 centimeters above the surface, and then camouflaged with a layer of snow.

(*b*) In high grass and other forms of natural concealment and at times when enemy action compelled it, antitank mines were planted without special camouflage. In hard ground they were projected about one inch above the surface; in soft ground, they were buried flush. In swampy or very loose soil, boards or other supports were put underneath. The Russians avoided placing pressure type antitank mines in small depressions or other ground hollows because passing tanks might not be able to transmit sufficient detonating pressure upon them.

(*c*) Dummy mines and deceptive indications of minelaying were combined with live mines. All signs of buried mines, such as fuze boxes, paper wrappings, packing crates, and spoil were removed. Particular attention was given to the camouflage of minefield travel lanes.

(2) *Minelaying methods.*

(*a*) *Spacing cord.* Mine laying engineers made wide use of the spacing cord method, which made possible the accurate setting of each mine and its relocation in breaching or clearing the field. The spacing cord was a piece of tracing tape, wire, or cord 30 to 50 meters long, with one metal ring at one end and two at the other. Rings were also spaced at varying distances throughout its length. Short pieces of tape or cord were tied to each ring (fig. 10①). In mine laying, these places were stretched out perpendicular to the main cord, alternately to the left and right. The metal ring tied to the end of each short cord marked the location for a mine. Metal pins were used to fasten the cord to the ground.

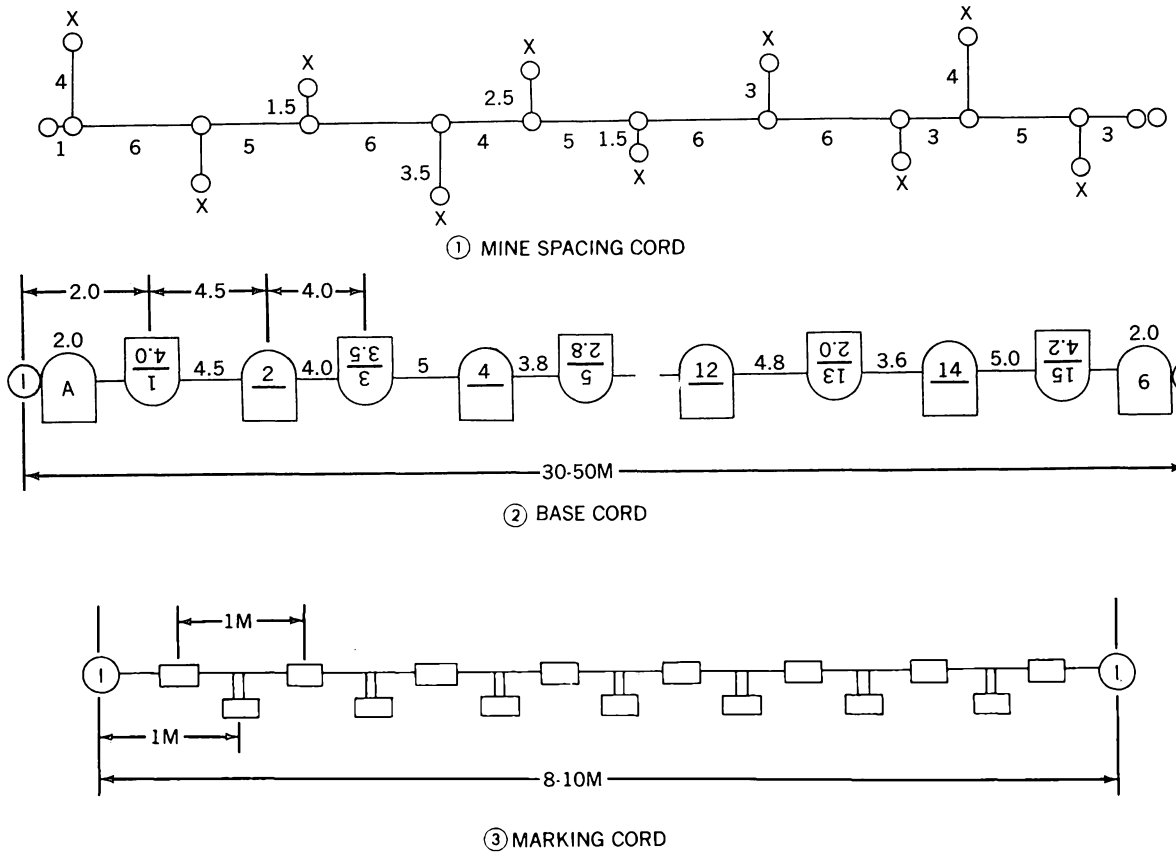


Figure 10. Minelaying cords.

(*b*) *Base cord and marking cord.* The base cord and marking cord method (fig. 10②,③) required a base cord 30.5 to 50 meters long (with 15 numbered tabs tied at various intervals) and a marking cord 7.5 to 10 meters long (with markers tied at each meter and 0.5 meter length). The base cord was staked out in the same way as the spacing cord described above. Two engineers stretched out the marking cord perpendicular to the base cord to the distance indicated on the first tab (fig. 11), which marked the location for a mine. They then moved the cord up to the second tab and stretched it out perpendicular to and in the direction from the base cord indicated by the tab. The consecutively numbered tabs on the base cord were then laid with the even numbers to the left and the odd to the right.

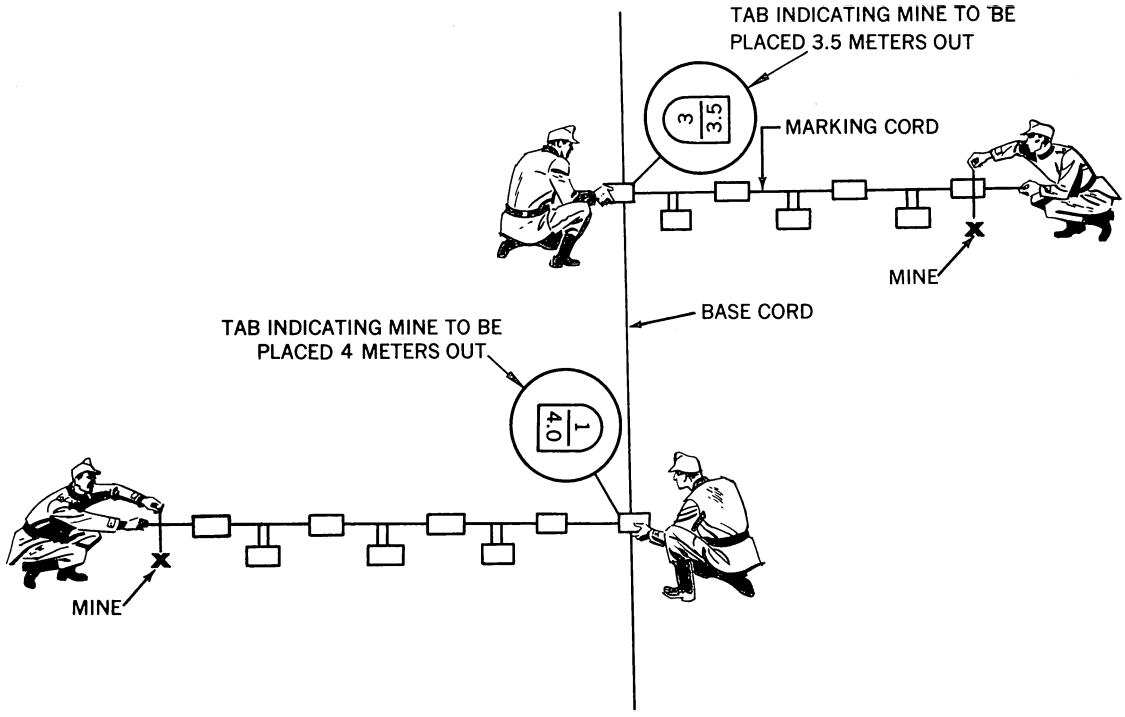


Figure 11. Method of marking the location of mines.

(3) *Minefield densities.*

(*a*) *Antitank minefields.* Pressure type antitank mines were often laid at a density of 1 mine per meter of front, or 1000 mines per kilometer of front. Individual mines were laid at 4- to 10-meter intervals in belts or panels of not less than four rows 15 to 40 meters apart at a minimum depth of 100 meters. Rows were usually zigzagged, the pattern often varying even in different sections of the same minefield.

(*b*) *Antipersonnel minefields.* Antipersonnel mines were usually placed at a density of 2 per meter of front and at a distance of 1 to 5 meters between them. Shrapnel types (POMZ–2) actuated by trip wires were installed on stakes above ground and camouflaged with grass, bushes, or whatever material was available. They were spaced at intervals according to the required length of the trip wire and the casualty radius (fig. 12).

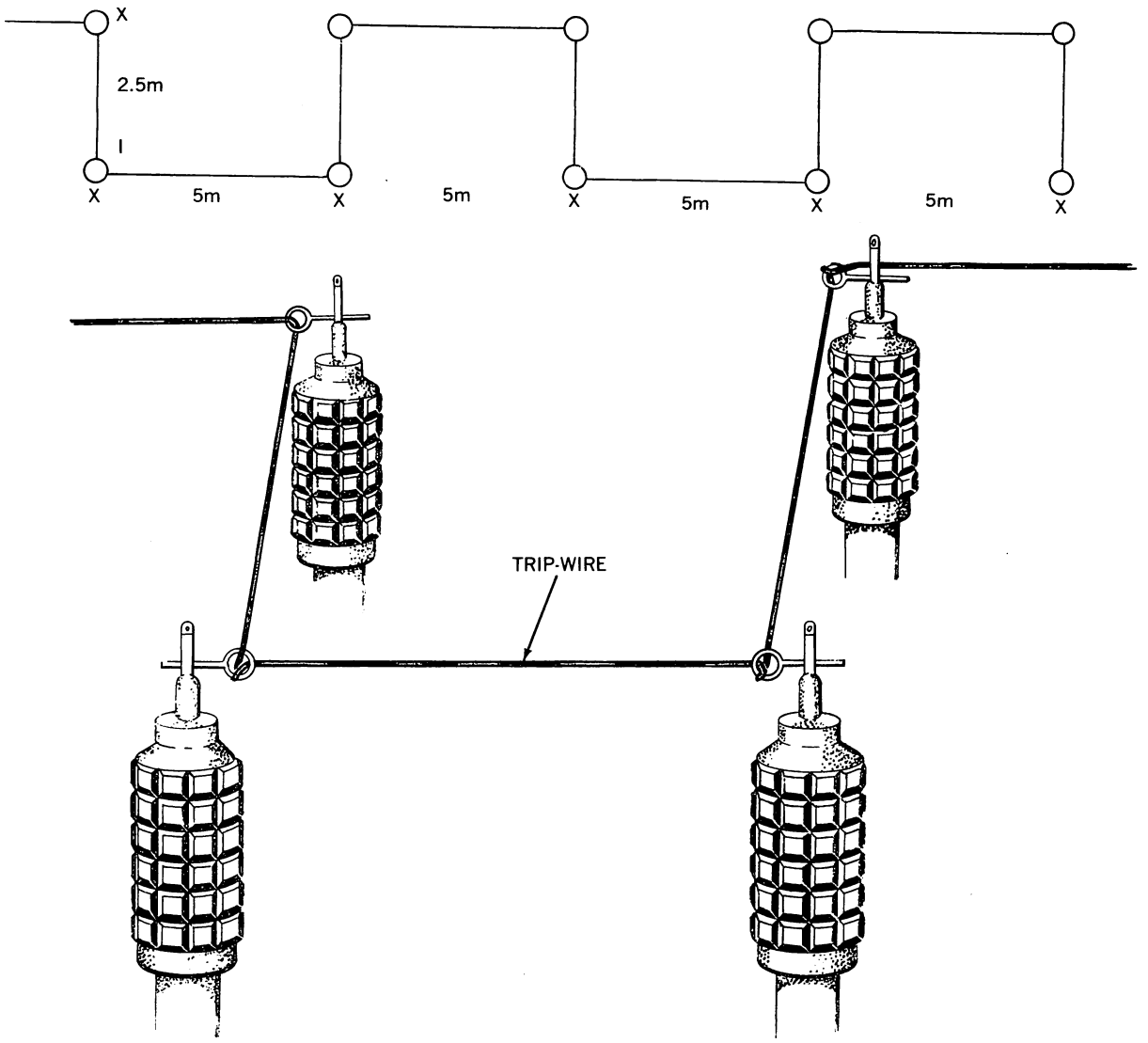


Figure 12. A laying pattern for trip wire mines.

(4) *Minefield marking.* In order to prevent casualties among friendly troops, minefields, after laying, were usually marked by barbed wire and signs. No rigid standard methods were used, however. Blazes and paint marks were made on trees and broken branches were left on bushes. Other devices were heaps or lines of stones, single-stranded barbed wire fence, small shallow ditches 5 to 10 centimeters deep, and small low wire obstacles not over .76 meters high. Most of these markers were located on the friendly side and along the left and right boundaries.

(5) *Minefield recording.*

(*a*) *Locations.* The Soviets kept elaborate records of mine locations, carefully noting datum and reference points, limits, lanes, azimuths, lengths of row centerlines,

and other pertinent traces. They also recorded the location of special boobytrapped mines, the type and number of mines used, a sketch of the minefield, and a diagram of the spacing cord. Locations of mines in front of the main line of resistance were usually surveyed by the eye; but when there was no enemy fire, they were accurately recorded by the use of a compass, transit, or measuring tape. The limits of minefields were tied in with at least two basic reference points (topo markers), which appeared on the map. Also two local reference points (auxiliary markers) were used chiefly to help in laying minefields and in their removal. If topographical markers were absent in the immediate area, a distant one was tied in by means of auxiliary markers, and if there were no auxiliary markers, artificial ones, such as stone piles and shallow ditches, were used.

(*b*) *Boundaries.* The boundaries or limits of each row and lane and the position of each mine were usually recorded. If mine spacing cords were used, individual mines inside the boundary were not indicated; instead an exact sketch with specifications of the spacing cord was included. The Soviets recorded all mines emplaced outside of minefields with the exception of isolated antipersonnel mines and antitank mines put down under enemy fire. The information included the types of mines, their number, their appropriate position in groups or rows, and the exact position of each antipersonnel mine in a mixed minefield. All boobytraps and activated mines of the delayed action type—unremovable, controlled and laid individually—were recorded separately.

(*c*) *Topographical map.* Included also in the record were a 1:50,000 or 1:20,000 scale topographical map on which all minefields were marked and numbered, a 1:25,000 or 1:10,000 scale diagram showing the tie-in of the minefield with reference points, and a 1:10,000 scale detailed plan. There were provided with a legend with data similar to that of United States Army records. Soviet mine-recording symbols are shown in figure 13.

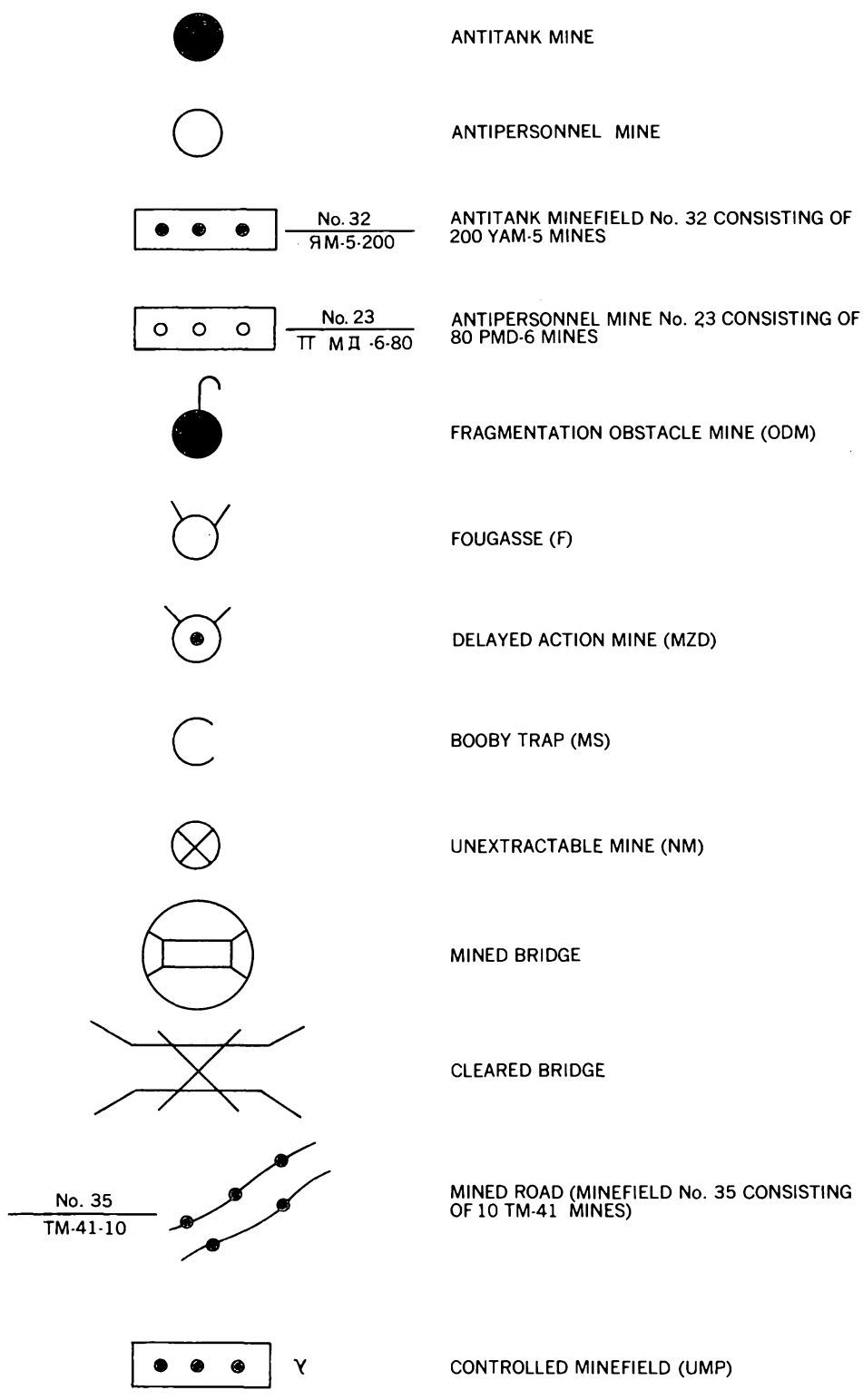


Figure 13. Soviet mine-recording symbols.

(*d*) *Responsibility.* When a unit was relieved of the responsibility of a minefield, all records were transferred to the newly assigned unit and the action was recorded. All minefield records were to be destroyed if capture by the enemy was imminent.

c. Minefield Maintenance.

(1) *Inspection.* Minefields were periodically inspected by regimental engineers for damage by enemy fire, seasonal weather changes, and other deteriorating circumstances. Mines buried for a long period in the ground were frequently damaged by moisture, especially if the waterproof seals were broken. Fuzes became rusted and the explosives deteriorated or were washed away.

(2) *Spot-checks.* Minefields were usually spot-checked after the first spring thaw, before the first autumn frost, and periodically during the year for existence and placement, correctness of pattern and camouflage, lanes, reserve supply of mines, and security of boundaries. Concealment and position of mines, especially during melting snow or after a heavy rain or flood, were noted. Checks were also made to determine whether individual mines or fuzes needed replacement, the minefield should be reinforced, or a new minefield should be laid. The results of the inspection and the restoration or reinforcement action were entered on the record form.

(3) *Mine reconditioning.* Faulty fuzes in antitank mines were replaced on the spot in mines still functionable. On the other hand some mines with unserviceable fuzes were activated by placing two other mines on top. Fuzes of mines run over by vehicles or subjected to motar or artillery fire, but not detonated, were either detonated in place or removed from a covered position by a hook and rope. Damaged minefields were frequently reinforced by laying new rows where needed or entirely new fields.

d. Mine Requirements. The number of mines generally used in planting rugged terrain and cultivated and populated areas is tabulated below.

(1) *Rugged terrain.*

Characteristics	Number per kilo (1000 m) of front	
	Antitank AT	Antipersonnel AP
Main direction of approach of enemy tanks—two roads in open country	1000	1000
Same in wooded swampy areas	500	1000
Steppe country—passable to tanks but not main avenues of approach	500	1000
Same in wooded swampy areas	200	500
Woody swampy areas difficult for tanks to pass through: 1 road	100	500

(2) *Cultivated and populated areas.*

Characteristics	Number per kilo (1000 m) of front	
	Antitank	Antipersonnel
Main direction of enemy tank approaches along highways	2100	2000
Possible approaches passable for tanks, including secondary road net	1000	1000
Open terrain with one secondary road	300	1000

26. Demining

The destruction of minefields or the cutting of lanes in paths through them to prevent

damage to personnel and equipment was a dangerous and formidable operation. It included minefield intelligence, detecting, breaching, and clearing.

a. Reconnaissance.

(1) *Methods.* The Soviets, like the other combatants, used all available resources to locate German minefields, as follows:

(*a*) Combat reconnaissance by combined arms and special engineer reconnaissance groups.

(*b*) Engineer observation from the forward edge of the enemy's defenses prior to and during attack.

(*c*) Interrogation of local inhabitants, partisans, and prisoners of war.

(*d*) Captured enemy documents.

(*e*) Secret agents.

(*f*) Air reconnaissance by observation and aerial photography.

(*g*) Reconnaissance data from all combat arms.

(2) *Reconnaissance troops.* Soviet reconnaissance troops, when possible, were selected from among the most experienced and capable combat engineers. They were supported by other combat engineers that installed markers and performed other nontechnical tasks.

(3) *Reconnaissance functions.* Minefield reconnaissance missions were usually assigned to parties, whose function was to ascertain the:

(*a*) Pattern and extent of mine obstacles.

(*b*) Location of individual mines.

(*c*) Type of mine obstacles found (antitank or antipersonnel, minefield, boobytraps, delayed action or automatic mines, and others).

(*d*) Safe approaches to the minefield.

(*e*) Weak points in obstacles and the location of lanes and bypasses.

(*f*) Fire plan used to cover the minefield.

(*g*) Types of mines used by the enemy.

(*h*) Enemy minelaying techniques.

(4) *Party organization.* The ideal reconnaissance group consisted of 5 to 10 combat engineers commanded by a junior officer. For security they were armed with two or three automatic rifles and one or two light machine guns. The division engineer or the engineer battalion commander usually assigned the mission. Two or three reserve reconnaissance groups were attached to the engineer company commander.

(5) *Reports.* These reconnaissance groups located mine obstacles deep in enemy rear areas. All enemy minefields and mined obstacles discovered were plotted on a map at the time of reconnaissance. Complete reports with sketches were made on return from the mission. The results of the reconnaissance were immediately forwarded to the unit commander and used to determine the organization of mineclearing parties.

(6) *Equipment.* Reconnaissance groups had available such equipment as mine detectors, stethoscopes, probes, markers, safety pins, grapnels, demolition blocks, detonating assemblies, wire cutters, flashlights, measuring tapes, and the like. The type and quantity carried depended on the mission.

b. Minefield Breaching.

(1) *Responsibility.* This task was performed by engineer breaching parties and combat engineer units attached to infantry. The number of lanes cleared and their width depended on the type of unit (infantry or armored) using the lane, the deployment of attacking units, and the battle plan. Safety zones were cleared on both sides of all lanes. For security reasons, breaching activities were usually carried on at night on the eve of the offensive. In each lane

of attack in an infantry regimental sector, an engineer officer from the mine-breaching unit was designated as the commandant. He was subordinate to the regimental commander and directed by instructions from the division engineer. His responsibilities were to clear the lane, to guard, work, and maintain it, to control most of the friendly troops and vehicles that passed through, to plan and execute all widening work, to make available the necessary reserve personnel and close it in the event of enemy counterattack, to mark the limits of the minefield, and to provide security guards until relieved by the unit responsible for the general mine clearing of the area.

(2) *Locating mines.* Mines were located by visual inspection, electronic detection, and probing. Special stethoscopes were required for locating clock mechanisms used in delayed action mines. The electronic detector was carried by the leader of the breaching party and was operated from the prone position if the minefield was under enemy fire or located in front of the main line of resistance. Otherwise it was operated from the standing position. Probes were used to detect nonmetallic mines or mined areas covered with shrapnel or metallic debris where the operation of electronic devices was impractical. The user held the probe at an angle of less than 45° and pierced the ground every 10 to 15 centimeters.

(3) *Explosive methods.* In the hasty breaching of lanes, explosive methods were sometimes employed. One of these consisted of an 11-pound charge fixed on a tripod 0.5 to 4.1 meters above the ground, the blast of which exploded pressure actuated mines within a radius of 4.5 meters. Detonating cord nets were also used to explode pressure actuated mines. Blocks of TNT lashed to boards, forming an elongated charge, were exploded, clearing a lane approximately 0.91 meters wide.

(4) *Breaching by artillery fire.*

(*a*) *First phase.* Artillery breaching consisted of two phases—fire reconnaissance and fire destruction. In the *first phase* a heavy battery, firing high explosive ammunition with quick fuze, combed through the entire suspected area to determine the parameters of the minefield. The battery hurled a parallel sheaf of fire at an elevation jump of one probable error. Two volleys were fired at each sight setting; and careful observation was made for signs of sympathetic detonations.

(*b*) *Second phase.* After the boundaries of the minefield and those of the desired gap had been determined, destruction, or the *second phase,* was begun. Here the Soviets used heavy or very heavy howitzers if they were available. The sheaf or cone of fire was concentrated within a maximum width of 9.1 meters. Ricochet fire was used with the burst no higher than 9.1 meters above the ground. An angle of impact, ranging from 18 to 20 degrees, gave the most satisfactory results. Bombardment was conducted at one sight setting, with the observation of each volley, until there was no evidence of sympathetic mine detonations. Bombardment was repeated at the next site elevation until the gap was cleared. In the absence of medium or heavy howitzers, intermediate howitzers or even light guns were sometimes used with high-explosive ammunition with quick fuze.

(*c*) *Ammunition requirements.* The

Soviet artillery blasting method required 450 to 500 rounds fired from 76-mm guns to give the same results as 60 rounds from a 203-mm howitzer. The time required to detonate a lane 6 to 8.5 meters wide through a 100-meter minefield using various types of artillery was as follows:

Caliber	Number rounds required	Time required	
		1-piece battery	4-piece battery
203-mm howitzer	60	2 hrs 35 min	25 min
152-mm gun-howitzer	120	3 hrs	22 min
152-mm howitzer	120	2 hrs	14 min
122-mm gun	160	2 hrs 50 min	25 min
122-mm howitzer	160	2 hrs	12 min
76-mm gun	450-500	6 hrs	65 min

(5) *Other breaching methods.*

(*a*) The Soviets frequently made pressure type antipersonnel mines safe without removal by covering them with wooden boxes. Lanes through antipersonnel minefields were breached by driven tanks. Tripwire mines, however, were disarmed individually or exploded in place by means of grapnels.

(*b*) Electric fuzed mines were disarmed by their disconnection from the power source. Mines with antidisturbance fuzes or booby-traps, mines of unknown construction, and those that might explode at removal (having frozen fuzes, having been under artillery or mortar fire, or laid in the vicinity of craters) were either detonated in place or taken up by grapnels.

(*c*) Hasty breaching of mined fords was accomplished by blasts of 2- to 11-pound explosive charges which detonated sympathetically all mines within a 4.5-meter radius. Underwater mine clearing work was usually done by specially trained engineers provided with respirators, swim suits, and stream-crossing equipment. Abatis were first partially cleared by demolitions and then pulled apart by grapnels or cables attached to trucks. Once breached, the gap was carefully rechecked for the presence of mines.

(*d*) The Soviets on occasion used breaching methods that were wasteful of both human and animal life. Some forward armored formations were instructed to disregard enemy mines, as casualties were considered negligible in comparison with the advantages to be gained by the discovery of minefields that might then be cleared or breached. Also they were reported to have driven herds of cattle and other animals, civilian refugees, penal battalions, and even regular infantry across minefields to breach gaps for the safe passage of assault forces. The use of penal battalions for this purpose, it is said, was commonplace.

c. Minefield Clearing. After the assault breaching of minefields and obstacles to permit the advance of attacking units, clearing operations were undertaken according to the following priorities:

(1) All main supply roads and cross-country lines of march, with the initial goal of not less than one two-way road for each regiment. All places suspected of having delayed action mines were enclosed, if possible, with a marking system and detours around them were provided until the mines were inspected and removed.

(2) On lateral roads and inhabited areas, prior to clearing, barricades, warning signs, and guards were placed at all access points.

(3) Local Soviet authorities in occupied areas, as a rule, were responsible for notifying the local inhabitants of mined and cleared areas, for guarding marked mine areas, and for training instructor cadres (obtained from the militia, local MVD organizations, and mopping-up battalions) in mine clearing work.

27. Conclusions

a. The Russians showed great skill and mastery in all phases of the art of mine warfare against the invading Germans. The invaders developed a great respect, at times even terror, for the crafty and demon-like use of mines that slowed down their advance—and frequently stopped them completely. This success was due partly to the intricate and unusual minefield patterns as well as the indiscriminate use of improvisations—shells, blocks of explosives, bombs, and other material. They also emplaced all captured mines that were in usable condition. The Soviets repeatedly cleared mines from the front of German obstacles during the night and used them for their own purposes.

b. The Russians also had more supplies than the Germans and their supply lines were rarely disturbed by ground troops. They had available not only the explosives and fuses they needed in large quantities, but were able to produce adequate numbers of wooden mine cases in field shops. Had the Russian mines been crudely constructed and poorly laid and armed, like those of the Japanese in the Pacific, the unlimited supply would have been no more than mildly effective; but because they were equally well constructed as those of the Germans—equally efficient, and usually more effective (the antitank charges were heavier than those in the Tellermines)—this abundant supply greatly increased the odds.

c. The Soviets had an almost unlimited supply of man power which was often ruthlessly expended. No sacrifice in man power or material was too great to achieve victory. Casualties and delays from mines and demolitions during German withdrawal were accepted as a matter of course. Troop losses were considered less important than tank losses.

d. At the beginning of the invasion of Russia the Germans were more skilful in the use of mines than the enemy. But this advantage was short lived. The enemy soon discovered all the German methods and used them along with original innovations of their own. Eventually the German mine casualties became so severe that they were obliged to set up a special remedial training program. Although this appreciably reduced mine casualties and sped up the German advance, it was not enough. Russian mine warfare gradually became more effective.

e. The successes in mine warfare and the German defeat cannot be attributed to Soviet cunning and good equipment alone. The Germans were handicapped by two shortages—mines and manpower. The shortage of mines was caused mainly by the lack of fabrication materials at home and the long and Soviet-harassed supply lines. As the Germans were fighting on more than one front, the national population, much lower than the Russian, could not provide enough adequately-trained soldiers to maintain the sustained advance necessary to conquer the enemy. The defeat of Germany, however, taxed the manpower and material resources of Soviet Russia to the utmost. There was no power to spare. Had the mines and the men required been available, the Germans might have had the strength to bring victory.

f. Mine warfare tactics and techniques, regardless of who won, had on all sides developed a proficiency scarcely warranted by experience. Land mines will probably play a greater and more effective part in offensive and defensive operations in future wars, as the great powers appear unwilling to risk a nuclear war (in which the use of mines might be limited) for fear of total destruction of friend and foe alike.

Section II. SOVIET MINE WARFARE EQUIPMENT

28. Mines

About half of the total standard antitank and antipersonnel mines used in the Soviet Army have metallic bodies; the others are made of wood and other nonmetallic materials. The Army is not limited to the supply of standard metal, wooden or plastic factory-made mines, but is capable of mass-producing wooden types in large quantities in the field according to design specifications. Most of these are armed with explosives obtained from field demolition stores at the site of the minefield. Frequently mine bodies are improvised in the field from available local containers, such as empty ration cases, shell cases, bottles, and cans. The Soviets use a great variety of fuzes. The most widely used, however, are the simple pull and pressure types. They also have numerous complex models for special purposes.

29. Minelaying, Breaching, and Clearing Techniques

Many minefields are laid out and the individual mines placed by means of spacing cords. The Soviets use nonstandard marking devices improvised from available materials, which may vary with the location. They also keep exhaustive records in which all minefields are plotted and numbered and use forms for such data as notations of periodic inspections, maintenance information, guards, and changes in unit responsibility. For mine breaching and clearing, the Soviets use electric detectors, probes, grapnels, drags, and tank-mounted rollers.

CHAPTER 5

CZECHOSLOVAKIA, HUNGARY, BULGARIA, POLAND, COMMUNIST CHINA, AND NORTH KOREA

Section I. CZECHOSLOVAKIAN MINE WARFARE EQUIPMENT

30. Mine Warfare Equipment

Czechoslovakia has much mine warfare equipment of her own design and production. The wooden PT–Mi–D antitank mine, and the PP–Mi–D and the metallic PP–Mi–St antipersonnel mines resemble Soviet models; while the Ro–1 pull and the RO–8 pressure fuzes resemble World War II German models.

31. Exports

In addition to producing equipment for her own use, Czechoslovakia has exported some plastic antitank and antipersonnel mines to Egypt and some antipersonnel mines to Syria. Thus she has an excellent potential for the supply of mine warfare equipment to Soviet Russia and her satellites in the event of need.

Section II. HUNGARIAN MINE WARFARE EQUIPMENT

32. Mines

During World War II Hungary produced and used a limited amount of mine warfare equipment and produced some also for the German Army. The chief items were a plate-charge type antitank mine, a plate or disk-shaped metallic general purpose mine, and a 3-pound metallic antipersonnel mine.

33. Related Equipment

The Hungarians, in addition to their own mines, produced several fuzes, several mine detectors, and a vehicular-mounted mine distributor. As the Soviets have complete control over the Hungarian Army, it is possible that their mine warfare doctrine is the same as or similar to that of the Soviets. In the future, then, Hungarian mine warfare equipment may include many Soviet items.

Section III. BULGARIAN AND POLISH MINE WARFARE EQUIPMENT

34. Bulgarian Mines and Detectors

In World War II Bulgaria relied mostly on German and few domestic mine warfare items. She has of her own design and production one metallic antitank mine and two antipersonnel mines, one of glass and one of wood-all of very simple construction. Like the other Soviet satellites, her mine warfare doctrine and equipment are probably similar and in many cases identical with that of the Soviets. The mine detectors now in use in the Bulgarian Army are copies of World War II German and Soviet models.

35. Polish Mine Warfare Equipment

The Germans defeated Poland so early in World War II that she had little opportunity to develop mine warfare equipment of her own. She did, however, design and produce one item—an antivehicular mine, which is now obsolete. Being a satellite nation, Poland has access to Soviet mine warfare equipment and training in Soviet doctrine. Although she has developed some equipment since World War II, only one item—a vehicular-mounted distributor—is described in this publication.

Section IV. COMMUNIST CHINESE AND NORTH KOREAN MINE WARFARE EQUIPMENT

36. Communist Chinese Mine Warfare Equipment

In the Korean War, Communist China used Japanese and United States mine warfare equipment captured previously from the Chinese Nationalists. As the War continued, she used much material captured from the United Nations forces. She also improvised mines of many types from local materials and available explosives. A modified version of the Soviet wooden TMD-B antitank mine, constructed in field shops, was widely employed. She has also designed and manufactured at least two models of dual purpose mines, No. 4 and No. 8.

37. North Korean Mine Warfare Equipment

In the Korean War the North Koreans used Soviet and improvised models and captured United States and Japanese models. The fuzes are chiefly of the Soviet MUV pull and MV-5 pressure types. They also used some Communist Chinese and captured South Korean dual purpose mines and fuzes. The North Korean Army is equipped with Soviet mine detectors and mine probes.

CHAPTER 6

UNITED KINGDOM, FINLAND, FRANCE, ITALY, AND SWITZERLAND

Section I. UNITED KINGDOM

38. British Mine Warfare Equipment

In World War II, British and United States mine warfare equipment was similar in quality and manner of employment. At present, the British possess many standard items of all types and are capable of producing all they may need to meet military demands.

39. Research and Development

Since World War II, the British have maintained a program for the development of mine warfare equipment. This includes mines, fuzes, minelaying and marking devices, and detectors. There is still much obsolete or limited service equipment on hand and appreciable quantities are held for use in other countries.

Section II. FINLAND, FRANCE, ITALY, AND SWITZERLAND

40. Finnish Land Mines

The army of Finland is equipped with a variety of mine warfare items of original design. Finland has developed a wooden-cased antitank mine, a number of plastic, wooden, and tubular cased antipersonnel mines, and a dual purpose ice mine.

41. Finnish Fuzes

Finland has produced for her army a pull fuze similar to the Soviet Model MUV, a special bakelite pull fuze, a boobytrap pull fuze, and an impact fuze designed especially for use in the ice mine. She has also a special fuze integral with the model 44 antitank mine, which is a copy of the World War II German Model T.Mi.Z.42.

42. French Mines

From 1952 on the French Army has been equipped with mines of original design and production. These include metallic and nonmetallic antitank and antipersonnel mines and plate-charge and shaped-charge antitank mines for penetrating and "killing" armored vehicles.

43. French Fuzes

French fuzes, generally, are simple in construction and functioning and easy to install and arm. These include pressure, pressure-chemical, pressure-friction, pull, pull-friction, antidisturbance, and tilt-rod types. The French forces also have available an offset firing device to actuate plate-charge and shaped-charge antitank mines, and a nonmetallic offset fuzing device to activate groups of undetectable shaped charge antitank mines.

44. Italian Mines

Many Italian antitank mines have wooden or plastic cases. One model, a wooden undetectable type with a shaped-charge explosive, is laid in pairs to break the tracks of medium tanks. A small undetectable plastic mine has

only two metallic parts—the striker point and the detonator case. The Italian Army also has two wooden antipersonnel mines with metal shrapnel plates and one trip-wire cast-iron-cased fragmentation antipersonnel mine.

45. Italian Fuzes

Italian fuzes, generally, are simple in construction and easily armed and installed. Some plastic fuzes operate on the shear principle; the metal fuzes operate on the pull principle.

46. Swiss Mines and Fuzes

Because of her well-developed industrial facilities with their numerous skilled technicians, Switzerland can produce mine warfare equipment adequate for her military needs in time of war. Although she took no part in World War II, she has access to an abundance of basic information on tactics and equipment whereby she may develop modern designs. She has several types of mines including a light antitank mine, a heavy 114-millimeter shell mine M–G, and a wooden box antipersonnel mine, which are described and discussed in this publication.

CHAPTER 7

GERMANY

Section I. GERMAN MINE WARFARE IN WORLD WAR II

47. Equipment

In World War II the German Army had available more than 40 types of antitank, antipersonnel, special purpose, and improvised mines. For the most part the antitank mines had metal cases; while those of the antipersonnel mines were largely of wood, plastic, or some other nonmetallic substance.

a. Antitank Mines. The most widely used antitank mine, the Tellermine, was laid in minefields in great numbers. It had the disadvantage, however, of a small explosive charge, which made large numbers necessary to obtain a satisfactory effect thereby increasing storage and transportation requirements. Usually several were laid close together—often two at the same point, one on top of the other—when a more substantial explosive force was demanded. Unless Tellermines were boobytrapped with a supplementary pull, pressure, pressure-release, or antidisturbance fuze, they ordinarily exploded only when run over by a tank or other relatively heavy vehicle. Later in the ware the Germans developed the bar mine and the nonmetallic Top mine.

b. Antipersonnel Mines. These were used against infantry and other living targets. Most of them were fired by means of trip wire or pressure actuated fuzes. One type, the S mine (about the size of a tomato can), bounded into the air, exploded at .91 to 1.54 meters above the ground, and scattered widely 350 shrapnel balls or small pieces of metal that were dangerous at distances up to 183 meters. One of the most common antipersonnel mines was the wooden Schü mine, actuated by a trip wire or a pressure fuze and armed with approximately 7 ounces of TNT. It was difficult to detect because of the very small amount of metal used in fabrication. Later models had cases made of a composition much like cardboard, only considerably harder. The Germans had a stake-mounted antipersonnel mine with a case made of concrete and shrapnel aggregate, and also a concrete ball mine that was adaptable to rolling down hillsides or emplacement in the ground.

c. Special Mines. German troops were equipped with a variety of special mines, among which were the sliding antitank mine, the snow or ski mine, the ice mine, and more than 26 types of boobytraps. The sliding antitank mine was a 3- to 6-kilogram explosive charge built into a two-sided skid and secured against premature detonation from falling or overturning. Two to four of these were linked together into a group, at each end of which a 20-meter rope or cable was attached. The operators hid in two foxholes about 20 meters apart. At the approach of a tank or vehicle, the mines were slid under their wheels or tracks. Several pairs of soldiers operating in this fashion, were often effective in protecting key-points of resistance. The ski or snow mine consisted of about one kilogram of explosive and a cylindrical metal container pointed at one end. It had a rip igniter actuated by a

wire noose. The mine was intended for planting in snow in trails taken by enemy patrols. There was also another winter type unit, the ice mine, that consisted of a bottle shaped container loaded with a powerful charge of gunpowder or an explosive similar to RDX and fitted with a special high sensitivity pressure igniter (a concussion fuze was also used). The igniter was actuated by a diaphragm that served as the bottle-stopper. The mine was used singly and in groups to clear navigational passages over ice-covered waters.

d. Boobytraps.

(1) *Small-charge type.* Boobytraps, cunningly devised were planted in profusion, especially during troop withdrawals. There were more than 26 types. Some had small concealed explosive charges; others had larger ones. Many of the small-charge type were laid in minefields to explode at removal. Some of these were S-mines rigged with pull igniters, mined charged waterbottles, hand grenades fixed in tin cups, pull wire charges laid across entrances to buildings, pressure igniter mines laid under loose boards and steps, and charges in earphones. Others were charged whistles, charged tubes the size and appearance of a shaving stick, charged cakes of soap, hand grenades concealed in cakes of Peters chocolate, egg grenades with the delay element removed, loose pieces of shrub attached to trip wires, piles of hay concealing explosives with detonators, steel helmets lying around and covering charges with pull fuzes, and many more.

(2) *Large-charge type.* There were numerous boobytraps with large explosive charges frequently planted on airfields, in roads, bridges, and houses, and in many other strategically advantageous locations.. These included:

(*a*) Tellermines with antilifting devices.

(*b*) Tellermines connected by primacord to two or more other mines and fitted with antilifting devices.

(*c*) Mortar bombs with fuze sockets fitted with antennae type pressure igniters (used in the S-mine).

(*d*) Boxes of French mines exploded by a pull igniter and a small prepared charge.

(*e*) Tellermines and heavy charges laid in wells and cisterns with a pull igniter connected to the manhole cover.

(*f*) Antitank mines connected by pull wires to movable parts of an abandoned vehicle or to the material forming part of a road barrier.

(*g*) Improvised wooden mines rigged with pull igniters that detonated the charge at the lifting of the pressure lid.

(*h*) Tellermines left in their original packing-cases fitted with fuzes and charges that detonated when the case was moved.

(*i*) Tellermines balanced in tree branches by means of a long stick to the ground and actuated by a pull fuze. At the removal of the stick, the falling mine exploded in the air.

(*j*) Twenty one- or two-hole heavy charges, each attached to a post so that its removal or disturbance by a vehicle caused the explosive to detonate under the wheel or track. These were frequently located between trees.

(*k*) Dummy minefields completely wired in, with an occasional interspersed live mine. The gaps invariably contained live mines.

(*l*) Trip wires strung to look like minefields with gaps. The gaps, however, were mined.

(*m*) Mines lying on the surface of the ground, supposedly unarmed, with antilifting devices under-

neath.

(*n*) Barrels with heavy charges placed on culverts. They were destroyed when the barrels were moved.

(*o*) Trucks abandoned on roads, with an obvious wire connected to a mine and a carefully concealed wire to a second mine.

e. Improvised Mines. Toward the end of the war, the shortage of standard mines led the Germans to make many improvisations which they used along with captured French, Belgian, Dutch, Italian, Soviet, and British mines.

(1) *River mines.* For river or underwater mining they used waterproofed Tellermines; artillery shells attached to wooden posts with firing devices replacing their fuzes; tetrahedra for concrete encased Tellermines; and concrete block snagline mines. All these were fired either by direct contact, by tension on a line, or electrically by remote control from the shore.

(2) *Concrete block and artillery shell mines.* An improvised mine, "Katie," was a reinforced concrete block 1.17 meters square and .55 meters deep, filled with a 175-pound explosive charge. On the upper face was fastened a steel tripod, the apex of which was fitted with a single lead horn connected electrically to the detonator. Large quantities of improvised mines made from artillery shells of all calibers were laid in beaches, woods, tracks, airfields, and approaches to bridges.

48. The Tactical Use of Mines

a. The African Campaign.

(1) *El Alamein.* At El Alamein, in Northern Africa, the Germans used many mines of Italian, French, and British origin. Antipersonnel mines were placed in single rows in front of the outer minefield working wire and spaced from 6.5 to 9.5 meters apart. Some antitank minefields were laid 183 to 275 meters in front of the main line of resistance and covered by fire and listening posts. Others were laid as far as 915 meters in front, with listening posts 90 to 137 meters behind them. Dummy mines were often used to lead tanks into desirable locations for destruction. Tanks following the gaps were led directly to the antitank guns.

(2) *Libyia.* In the Libyian area, the British Eighth Army had difficulty in penetrating the German antitank minefields. Mines were laid in complete belts and additional ones were strewn at random both in front and behind the regular minefields. As these areas were well covered by fire, disarming and removal had to be undertaken during the night. The Germans used antitank mines with great success in the desert where flat terrain and hard soil made difficult the construction of artificial obstacles. Fields were often laid in a complicated pattern that made location and removal of mines very tedious. The uncovering of a small portion of a field gave no key to the location of the individual mines in the remainder. The hazard was increased by a liberal interspersion of antipersonnel mines.

(3) *Mining of roadways.*

(*a*) Tellermines were frequently placed in roads in potholes 5.1 to 10.1 centimeters deep and covered with sand. In some cases they were placed half on the shoulder and half on the road where the surface had broken away. The antitank mines were rigged with two types of antilifting devices. One was a small made-up charge complete with pull fuze and wire buried under the Tellermines; the wire was attached to a handle on the case. The other was a fuze screwed into the base of the mine with a length of wire anchored to

a peg underneath. In many cases Tellermines were buried below the range of electronic detectors in potholes squared-out for refilling with road surfacing. French mines were laid at roadsides and in cuts through sand dunes and were covered to look like an ordinary bank or drift of sand. They were patterned in nests of eight, laid 45.72 centimeters deep and not interconnected or activated.

(*b*) On one occasion, the Germans mined a road leading through a pass with unarmed wooden box mines that were connected by a detonating cord to armed mines laid about 4.5 meters away (fig. 14). A stick of gelatine was placed under the loose cover of the unarmed mine. Tellermines also were interconnected to similar unarmed mines by a detonating cord, so that at the firing of one, a whole row would follow.

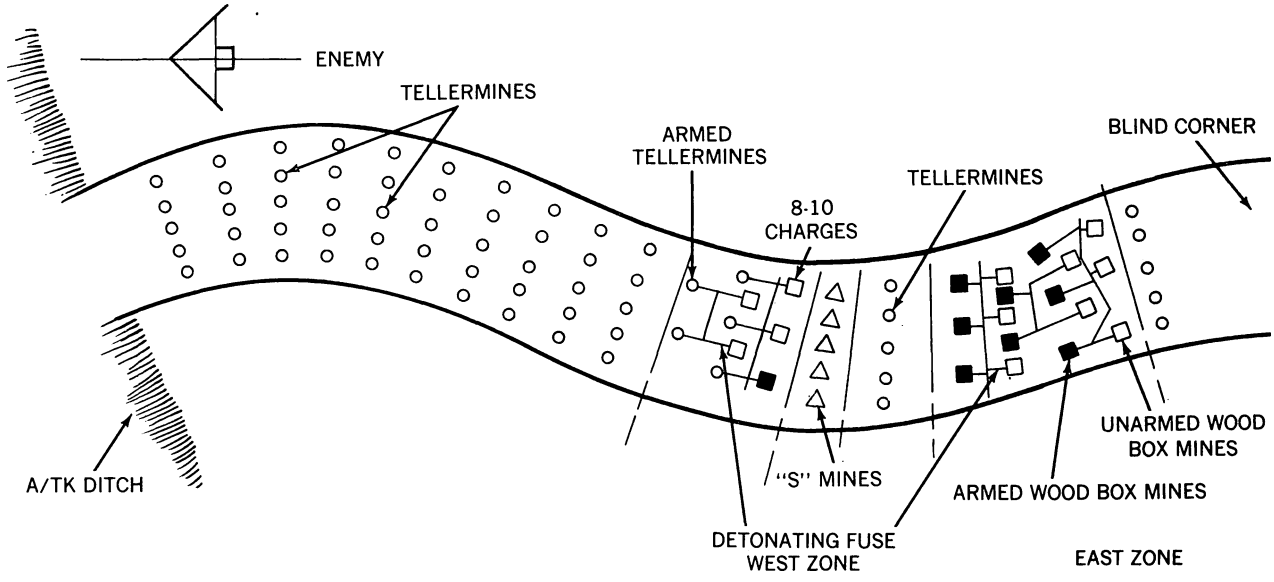


Figure 14. German road minefield.

(*c*) The Germans delayed Allied advances by the demolition of bridges and culverts, and the systematic cratering of causeways and roads wherever defiles occurred through sand dunes, steep rock, or *sabakha* (a smooth, flat, often saline plain sometimes covered after a rain by a shallow lake). All physical objects were potential boobytraps of heavy charges of antipersonnel mines. Barbed wire on stakes connected to a pull fuze and charge was dragged across the roads; heavily-charged bombs were placed on culverts; and craters were sown with S type antipersonnel mines concurrently with antitank mines on either side. These all extended the time needed for clearing a passage. Mine-laying gave every evidence of free improvisation; the extent of the delay it imposed depended on the effectiveness of its concealment.

(4) *Minefield protection.* The Germans consistently covered all main mine-

fields during the day with small arms fire from close range, and at night they maintained antilifting patrols as well as listening posts that were often located within the minefield itself.

b. The Invasion of U.S.S.R.

(1) *Antitank defenses.* In the Soviet campaign, the Germans were obliged to use mines as defensive weapons. In 1941 they used the "march obstacle," which consisted of 3-kilogram charges laid in a number of places and connected to each other by a wire loop. These were particularly effective against surprise attack by enemy tanks. Controlled mines also proved useful as "march obstacles." As a rule, antitank mines were used along with armor-piercing guns. Broad distances covered by the front in Russia could not be protected by antitank mines alone, as the number required was too high for available production facilities. They were generally laid where enemy attack was expected, to hold up or canalize it. Mines were extremely useful when planted on regular routes of enemy patrols and raiders as well as in terrain where the enemy might infiltrate or noiselessly steal up to the German positions. Dummy minefields were used against the Soviets with good results, especially when they were mixed with live mines. Toward the rear, mines were laid as far as the antitank and artillery defense positions, which proved very useful in sealing off breakthroughs.

(2) *Controlled mines.* Individual electrically controlled mines were irregularly laid 200 to 300 meters in front of the most advanced defense outposts. The Soviets, however, became so familiar with this practice that they no longer considered such minefields an obstacle but broke through them in broad formations, especially in attacks against prepared positions.

(3) *Position warfare.* In position warfare during the early stages of the campaign, it was customary to plant Tellermines only by detailed plan. The survey procedure was extremely difficult because the mines as a rule had to be laid during darkness. In the early days of the War, the planting of mines in front of wire entanglements became useless, as the Russians cleared them almost every night. The mines were then emplaced between the obstacles and the main line of resistance, or even farther back. As the War continued, the mines laid deep in the battle position as frontal or flank protection for heavy weapons, especially artillery and antitank guns, became more and more effective.

(4) *Road blocks and mine reserves.* The Germans also secured positions taken deep into enemy territory by blocking all avenues and roads with antitank mines. Whenever an armored attack anticipated, one or more motorized engineer battalions equipped with a large supply of Tellermines were held in reserve. When the probable direction of enemy attack was ascertained, the engineers guarded against breakthrough by reinforcing existing minefields with mines scattered after a quick survey, or by hasty planting behind their own lines. Mine barriers were placed perpendicular or parallel to the probable direction of attack.

(5) *Minefields on long fronts.*

(*a*) *An aid to weak forces.* The Germans, according to reports, laid 40,000 antitank and 25,000 antipersonnel mines per month in day-to-day combat activity. Minefields repeatedly proved a valuable aid to their weak forces on relatively long fronts by halting or forcing the Russians back and frequently preventing breakthroughs. Armored attacks were often halted and forced to with-

draw with heavy casualties. These attacks usually bogged down in the mine belt, often for as long as seven hours, which gave the Germans time to prepare their defenses. But in 1944, as there were no longer any continuous defensive fronts, the protection of the German flanks became difficult. Too, the German forces were insufficient to meet requirements. Troops in which all men were completely fit for combat were no longer available.

(*b*) *A substitute for guns.* The gaps in the front became so large that it was necessary to assign emergency units to guard the rear areas. Here again, mines were used to make up for the lack of guns. It was said that they gave the troops, among other things, a strong feeling of security and bolstered their will to resist. Because of the shortage of engineers, other troops after a two-week training course were authorized to lay mines in stray positions. This experiment proved very costly. On one occasion a troop organization, in joining with others in the offensive, was trapped by its own stray pattern minefields, suffering heavy losses.

c. Resistance in France.

(1) In the first six months of 1944, General Rommel laid some 5 or 6 million mines in the European costal defense zone, and estimated that he needed 50 million more to complete the continuous defense belts. Ten million were needed for the 352d Division Sector alone to cover a 56.3-kilometer front to a depth of 4.8 kilometers. He received only about 10,000 antipersonnel mines and no Tellermines at all.

(2) Because of the supply shortage, the Germans used great numbers of British and French antitank mines. Naval projectiles were also used in combination with antipersonnel mines. These, rigged with pressure fuzes, were laid at 51-meter intervals in seven rows 51 meters apart and were positioned opposite each other in the 1st, 3d, and last two rows. Those in the 4th and 5th rows were placed opposite each other but covered gaps in the other rows.

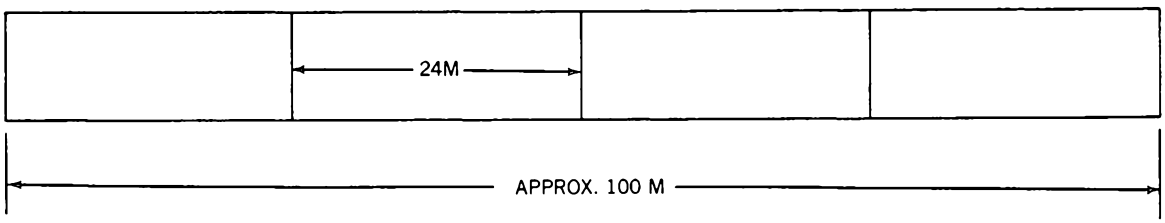
(3) Many antitank mines were fitted with antilifting devices. Some French light antitank mines and S mines were laid in a similar pattern. The field, however, was patterned in a single row of mines, then a 27.5-meter clear space, and then seven rows. Because of the shortage of antitank weapons, the Germans laid land mines by the thousands as tank defenses. An American tank force attempting to go through a heavily-mined woods had to change its route. The Germans, in one instance, used mines so carelessly that they hemmed themselves in and were virtually frozen in position. Much of this was the result of hasty defensive minelaying, which was often defective; for once the enemy had broken through, as in the case of the Allied landing on D-day, hastily laid minefields frequently caused as many casualties to friendly as to enemy troops.

49. Minelaying

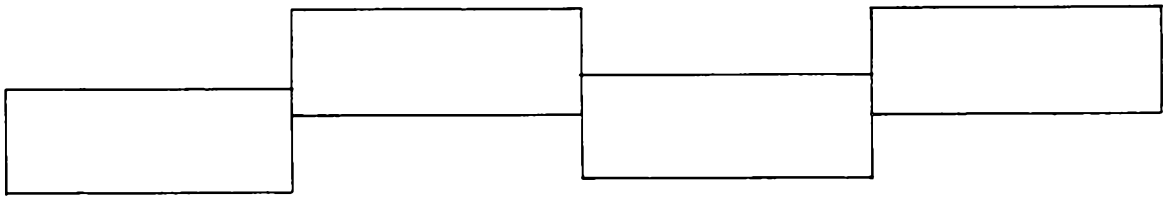
a. Antitank Mines.

(1) *Minefield plans.* Generally, antitank minefields were laid according to plan in sections. Some, however, were laid unpatterned. Mine sections as a rule consisted of four *basic* sections (occasionally two or three), each 24 meters wide. They usually had a frontal width of about 100 meters, but sometimes only about 48 meters and again as much as 72 meters. The mines were laid according to specific plan (on the premise that in wars conducted by mass armies, only the

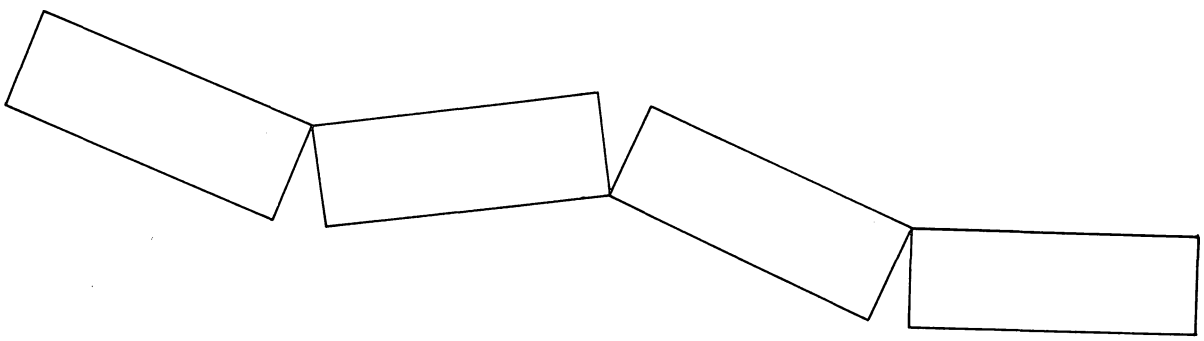
simplest measures promised success). The purpose was to obtain the greatest possible speed and security (against accidents) and also highly accurate data for the record to be used in removing them quickly and safely later on. This was accomplished by the use of the *basic* mine section, which made possible the preparation of a limited section simply and speedily, even with poorly-trained men, with the help of a 24-meter measuring wire. It was also possible to arrange the *basic* sections in different ways side by side according to the terrain (fig. 15).



A. BASIC MINE SECTIONS LAID CONTINUOUSLY SIDE BY SIDE



B. BASIC MINE SECTIONS LAID IRREGULARLY SIDE BY SIDE



C. BASIC MINE SECTIONS LAID IRREGULARLY SIDE BY SIDE

Figure 15. Basic mine sections.

(2) *Density.* In mine sections (and also in *basic* sections), mines were laid in small rows. The distance between rows and individual mines was determined by their sensitivity to blast (or the possibility of one mine's being actuated by the detonation of another). For Tellermines and irregular types, this distance was about 2 meters if they were laid under cover, and 4 meters, if laid openly. The defense value or density of a mine section was considered dependent on the average number laid in proportion to each meter of minefield front (fig. 15). Tellermines in antitank minefields were usually placed at the rate of two per meter of front, and three to five where the tactical situation demanded. According to the width of the front that required blocking, a corresponding number of mine sections was laid side by side, generally staggered, so that various patterns might be formed by taking advantage of the terrain. Several mine sections constituted a minefield, the extent of which was determined by its tactical purpose and the supply of mines available. Densities were increased by laying several minefields at intervals behind each other (fig. 16). Pains were taken to avoid overconcentration in small areas in order to make breaching by artillery bombardment difficult.

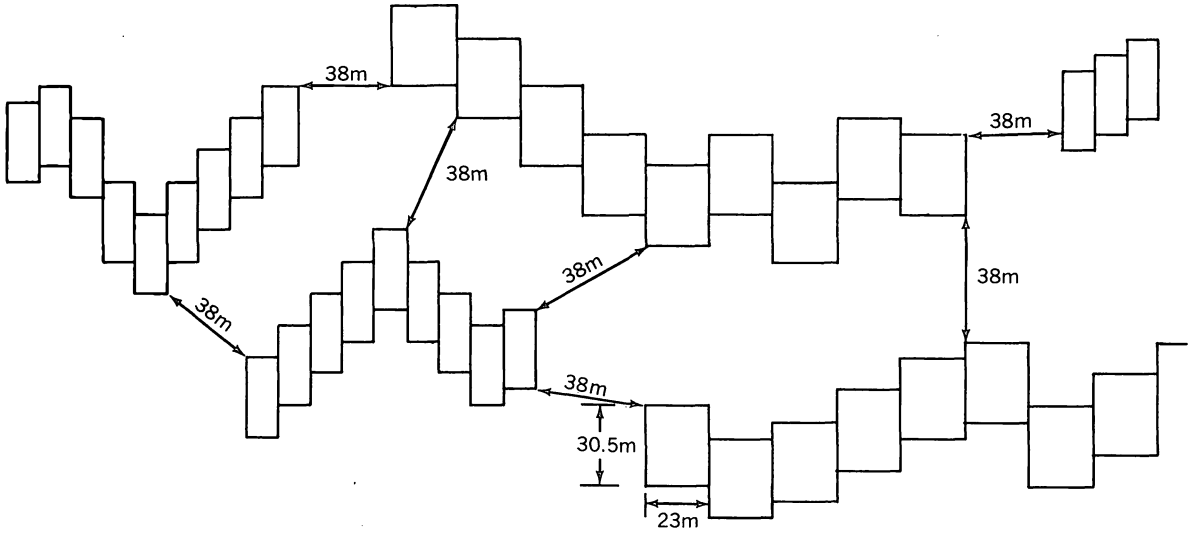


Figure 16. Minefields laid at intervals behind each other to increase density.

b. Large Protective Minefield. In the African campaign the Germans showed great versatility in minelaying. Minefields were built up gradually but concurrently to protect the entire front of their major position. They placed them so that they gave the maximum initial protection and also became an integral part of the final installation. These minefields, accordingly, were laid in three phases.

(1) *Phase one.* In phase one a single continuous belt was placed along the entire front. It was marked and protected on both sides by concertina or barbed wire at a spacing of about 183 meters between rows of wire, (fig. 17), and often as much as 732 meters.

During the laying of the initial belt, incomplete points in the line were held or supported by armor. After this a second belt was laid in front of the forward wire marking the initial belt to increase the density of the field. The front edge of the second belt was usually not marked during this phase of preparation. During the laying, the area was covered by short range small arms and antitank fire—listening posts and machine gun posts being interspersed throughout the field. In this phase the Germans constructed battalion defense areas behind the mine belt, spaced about 1.6 to 3.2 kilometers from center to center. As the defenses and mined areas neared completion, the armor was moved to the rear for a counter attack role (fig. 17).

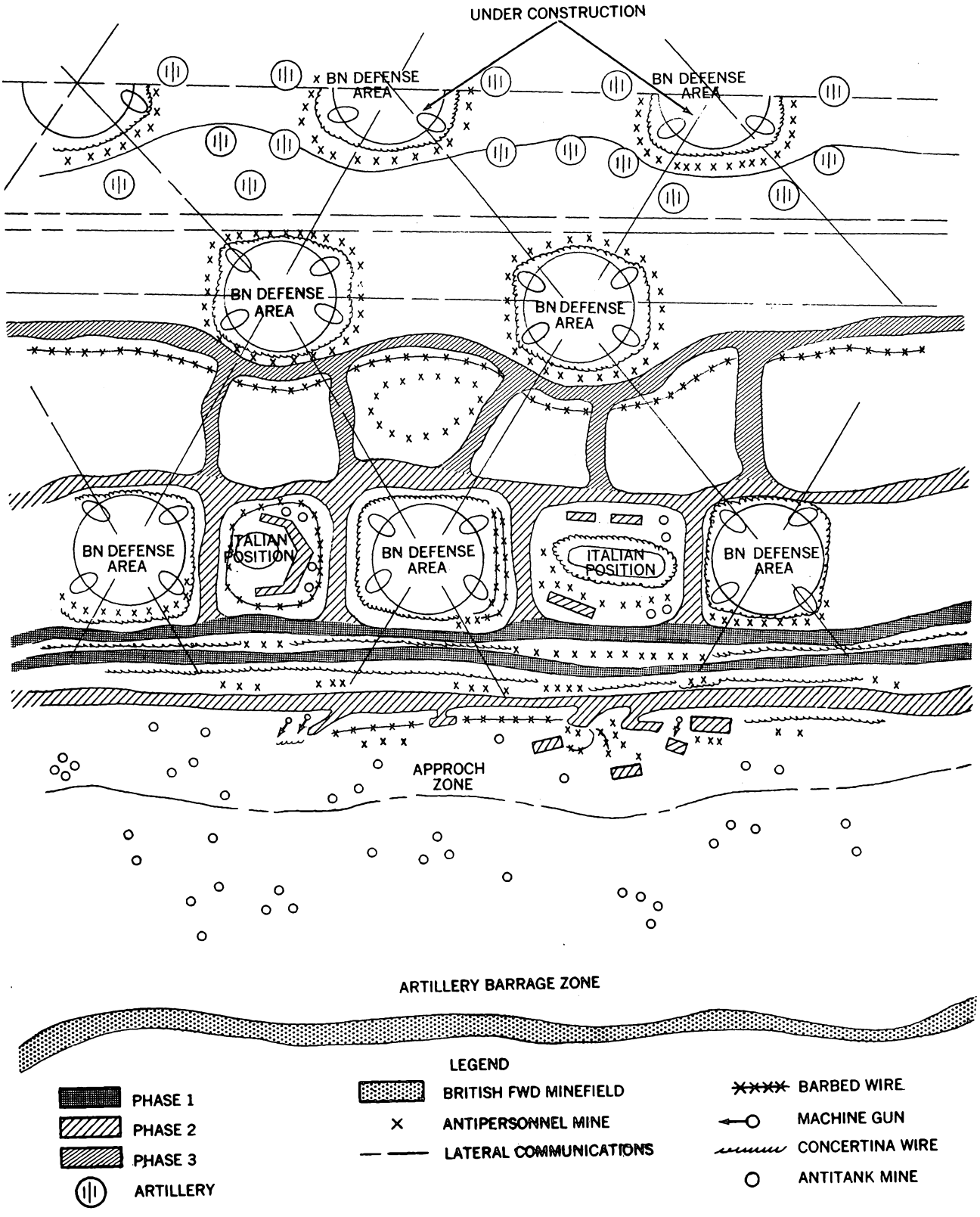


Figure 17. Large protective minefield.

(2) *Phase two.* In phase two the marking and protecting of the second belt of mines laid in the first phase was accomplished along with the thickening of the field by the planting of an irregular belt in front of the new forward wire. This belt was complicated by the addition of numerous unmarked tactical spurs and small scattered minefields laid further out, of scattered wire obstacles, and of false gaps. The forward zone was usually strewn with antipersonnel mines and automatic trip wires, which in many instances extended as much as 732 meters in front of the original front wire (fig. 17). The Germans then laid a belt of mines to protect the second line of defense-areas under construction during the second phase. This field was from 91.5 to 182.5 meters deep and sometimes not as clearly marked as the front fields. The defense-areas were echeloned back from the original defensive line and tactically sited to support it. The second line of defense-areas was patterned to form triangles on 1.6- to 3.2-kilometer centers with the forward defense-areas (fig. 17). In certain instances the original and the rear mine belts were interconnected, which by hindering lateral movement served to canalize and disorganize all penetration through the front line belt. This practice compartmented every local success of the enemy.

(3) *Phase three.* In the third phase, the Germans laid a third line of well marked minefields to give additional protection to the front and flanks of the second line of defense area. These, when connected with the second belt, served further to canalize the field and disrupt enemy lateral movement in the event of local successes. This third line was usually about 182.5 meters deep. During this phase, there was often a further thickening of previously-laid belts by the installation of boobytraps, antipersonnel mines, small minefields, and scattered mines, usually unmarked. In the rear areas, tactical and protective fields were often laid at this stage. The troops holding the front main defense areas were frequently thinned-out gradually and a third line of defense-areas was constructed in the rear (fig. 17).

c. Antipersonnel Minefields. Antipersonnel minefields were laid in much the same way as the antitank type. One variation, however, was the wire minefield, in which three or four antipersonnel mines were connected to a 30-meter pull wire to increase their effectiveness. Although pull wires were not placed according to any specific plan but were adapted to the terrain, wire minefields were measured in the same way as others. Antipersonnel minefields were usually placed in front of the main line of resistance, and less often in the main defensive area, as they restricted too greatly the combat zone during counter attacks. Antitank mines were often interspersed in antipersonnel minefields to protect them from traversion by tanks and to make breaching or clearing difficult.

d. Minelaying Devices.

(1) *For antitank minebelts.* For laying mine belts, the Germans used a measuring wire 21 meters long with a number of metal rings and varishaped wooden markers—crosses, bars, and cubes—attached to indicate space intervals. At one end of the wire was a single ring, and at the other were four rings—one at the end, another at a distance of 34 centimeters, the next at a distance of 66 centimeters, and the fourth at 34 centimeters. A wooden cross fastened 2 meters from the end to which the four rings were attached served as the zero mark for all the markings below:

Crosses, at 0, 4, 8, 12, 16, 20 meters
Bars at 2, 6, 10, 14, 18, 22 meters
Cubes at 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23 meters

The end ring was used to stretch the wire taut for laying. Each basic mine belt and four rows of mines, each 24 meters long, were laid at right angles to the datum line, which formed the right-hand edge of the belt. One mine was laid under any one or more types of wooden marks along the mine-spacing wire. To stagger the rows of mines, any one of the four rings could be put on the datum line. By varying the sequence of the rings and marks used, a great variety of staggered rows could be laid. The distance between Tellermines was 4 meters, between S mines, 2 meters, and between Schu-mines, only 0.5 meter; that is, all wooden marks were used and one mine was laid at each interval.

(2) *For antipersonnel minefields.* The Germans also used an antipersonnel mine-laying device that consisted of 10 rings, each 40-mm in diameter, connected together with cords to form an equilateral triangle, each side of which was 13.2 meters long. In the construction of a minefield, one side of the triangle was laid on a chosen baseline and the net stretched taut on the ground. Small flags were pushed into the ground at the center of each of the rings. The whole net was then turned through 60° about the ring at the apex of the triangle (the one remotest from the baseline), and fresh flags were placed in the centers of the new positions of the rings. This process was then repeated as often as required. The mines were subsequently laid in the flagged positions.

e. Minefield Plans. In the German army it was basic procedure to make plans for all minefields, in order that the mines might be removed or cleared without casualty. Careful measurements were made and recorded, and if possible, the same troops that laid the mines cleared them. More casualties usually occurred in clearing friendly than enemy minefields, however, as the soldier believed that less caution was needed. A copy of each mine plan was filed in a central office in Germany so that it could be obtained any time in case of need. The practice of filing minefield plans only in front line offices was considered unsatisfactory, as they could be destroyed easily by enemy action.

50. Minefield Marking

a. Friendly Minefields.

(1) The German soldiers suffered many accidents because of inadequate minefield fencing. Later on, the higher echelons directed that strong wire fences one meter high or stone walls at least 40 centimeters high be used. Minefields then were frequently marked also with a variety of substitute materials, such as barrels, concertina wire, tin cans, and derelict vehicles. At times they were marked with two rows of warning boards—the outer painted black with white lettering and the inner, white with black lettering. The British found German minefields marked by barbed wire wound around wooden boundary fence posts. Antipersonnel mines were indicated by a length of wire projecting about 7.62 centimeters from the top of the post and antitank mines by several hoops on top forming a dome (fig. 18).

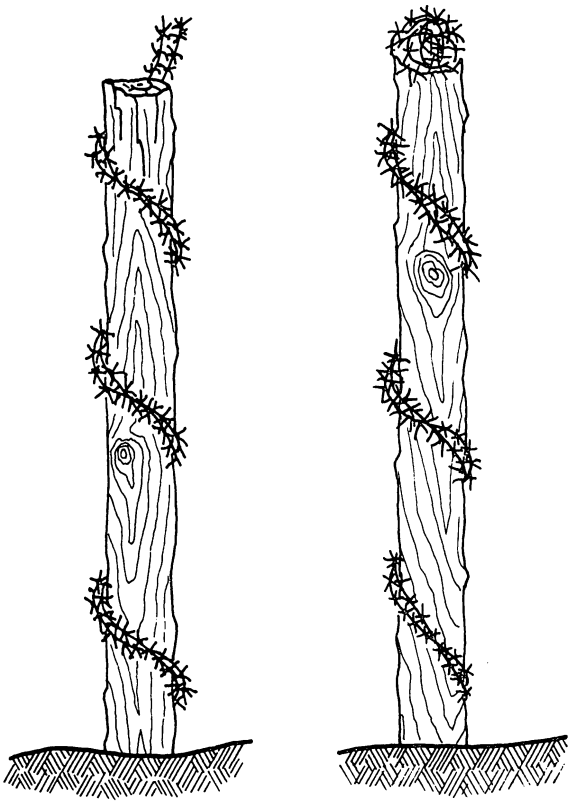


Figure 18. Minefield markers.

(2) In the Russian campaign, the Germans, in marking minefields, assumed that the Russians would carry out very conscientious combat reconnaissance, particularly with regard to the location of minefields. The use of wire fences made enemy identification easy. The practice at the beginning, in addition to planting dummy minefields, was to surround the minefields with double apron fences of the customary kind. The Germans erected signs marked "Beware of Mines" on the friendly side. Lanes were marked by stakes protruding as high as a man's hip every 10 to 20 meters, with a smooth wire stretched over the top. Guards and patrols could guide themselves along this wire, even at night. Signs were put up on both sides of the entrance on the friendly side. The enemy side of the lane was enlarged to make it easier for reconnaissance groups to find their way back.

(3) At El Alamein the front edge of the forward minefields was often unmarked; but the rear edge was usually marked with a trip wire supported on short stakes. Cattle fence, concertina wire, and stone cairns also served the purpose. Occasionally the near edges were unmarked. Commonly the markings were a single row of concertina wire running along the center of the field parallel to the rows of mines. In large minefields at times the Germans laid several rows of concertina wire, more mines, then concertina wire and so on, and finally a row of concertina wire at the near edge.

(4) Gaps made in minefields ranged from 6.5 to 9.5 meters in width. These were closed by two or three rows of Tellermines with boards placed on all the rows to insure detonation by a vehicle passing over. These boards were generally concealed by a shallow covering of soil. Two types of gap markers were found. Painted signs were placed on either side of the gap (fig. 19); sometimes 2.54-centimeter-long luminous tubes, visible about 2.9 meters away, were placed on top of the mines to mark partial routes. Occasionally these gaps were covered by groups of unmarked scattered mines laid as far as 183 meters in front of them.

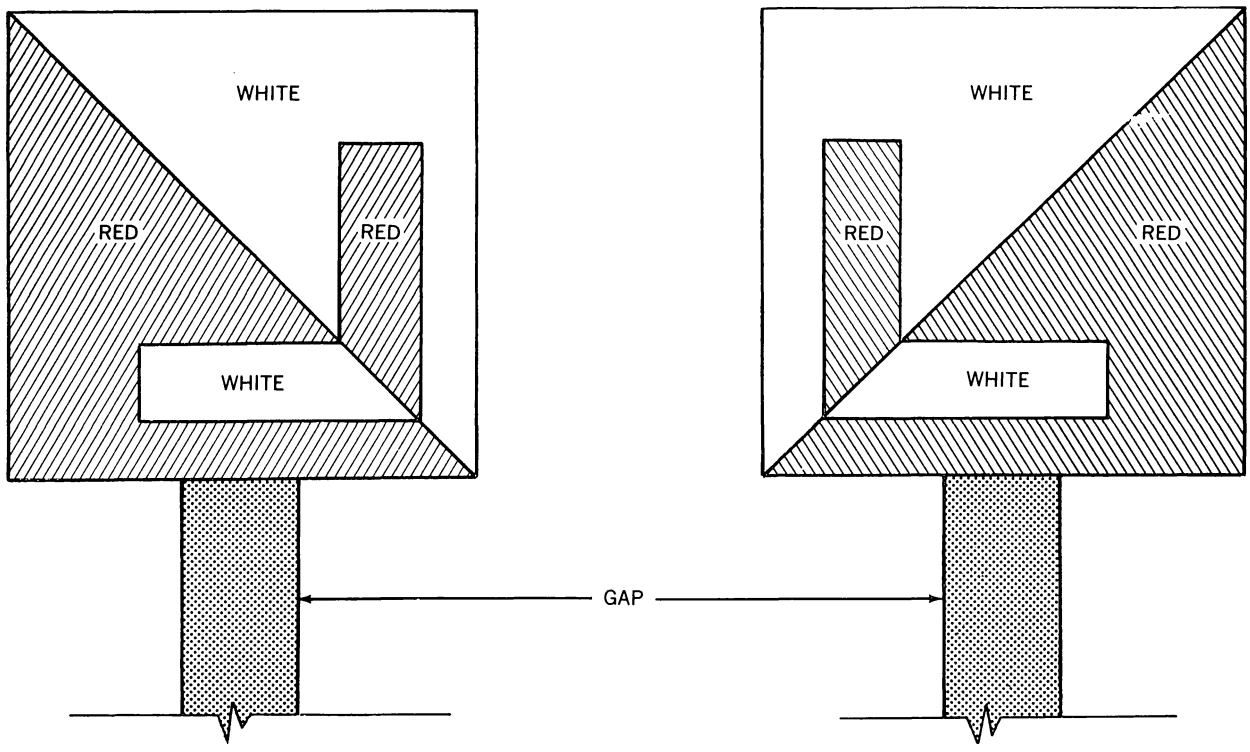
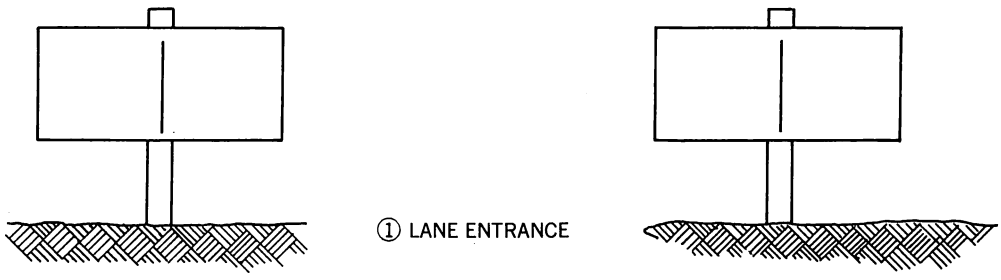
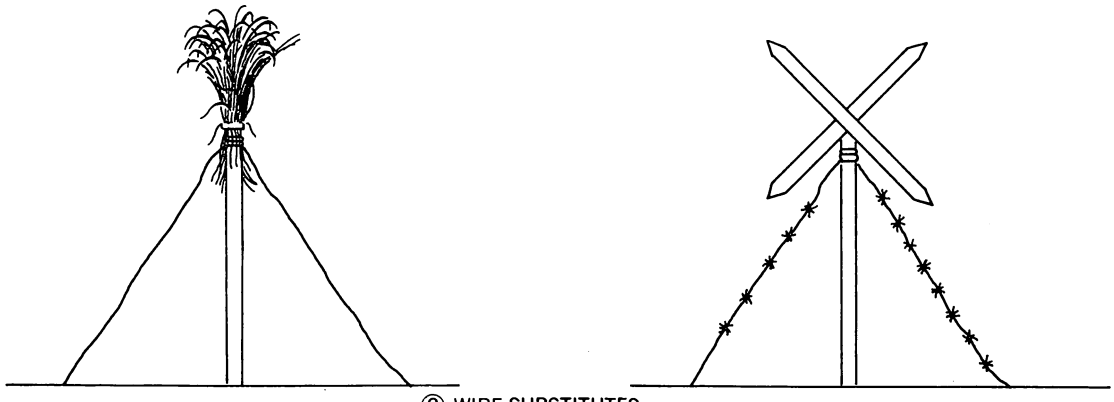


Figure 19. Painted gap-marking signs.

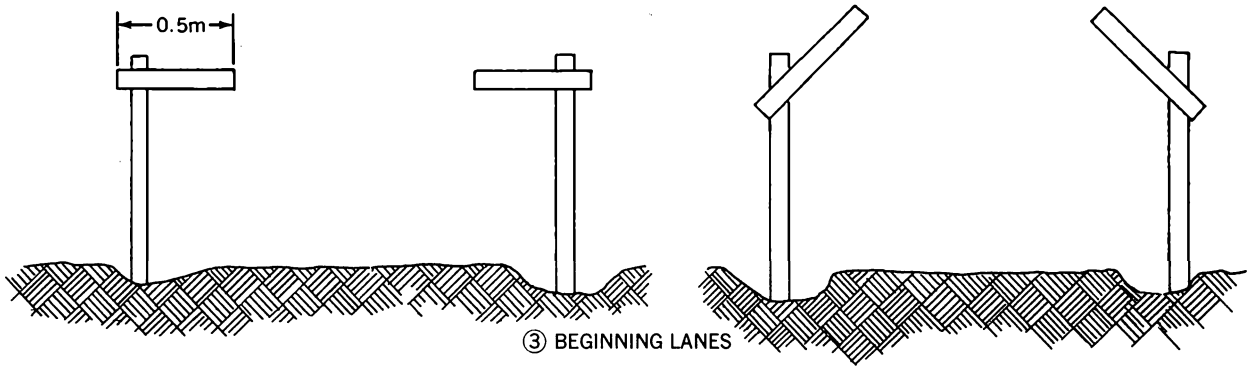
b. Enemy Minefields. After long experience the Germans developed an effective method of marking enemy minefields. Detected mines were immediately surrounded with a fence of at least one wire at knee height, or with two wires, one above the other. Signs with the inscription "Mines" were set up in a clearly visible spot. If wire was not available, stakes about 1.5 meters high were placed every 20 meters with a scrap of local vegetation tied at the top and tracing tape hanging down to the ground on both sides. Another method was to erect a cross similar to that placed on railroad crossing signs (fig. 20 ① and ②). Cleared lanes in enemy minefields were marked with vertical stakes about 1.5 meters high provided with a crosspiece about 0.5 meter long on top placed on both sides of the cleared lane—about every 50 meters. At the beginning of the lane, wings were erected similar to those in the sketch in figure 20 ③. For safety reasons, signs for marking lanes were erected at a distance of half a meter from the mine nearest the lane. The width of the lane was 2 meters for infantry and 5 meters for vehicles. Where signs were not available, the cleared lanes were temporarily fenced in and provided with warning signs (fig. 20 ④).



① LANE ENTRANCE



② WIRE SUBSTITUTES



③ BEGINNING LANES

④ WARNING SIGNS

Figure 20. Four types of enemy minefield markers.

51. Demining

a. Minefield Breaching.

(1) *Reconnaissance.* Minefield reconnaissance was generally performed by engineers, who moved forward in small parties 275 to 457 meters apart. Mines laid a long time in sand were easily spotted by the depression that developed from disturbing the soil. Mines in grassy areas were located by the light color of the grass disturbed during laying; in wet earth, by dark patches; in frosty ground, by cracks; and in a thin covering of snow, by a slight rise, if they were laid during a snowfall.

(2) *Breaching methods.*

(*a*) *Demolition nets.* In the spring of 1940 the Germans first used antitank mine demolition nets made of detonating cord fashioned in a 15.24-centimeter mesh pattern, which they carried rolled up in units 15.24 meters long and 2.43 meters wide. These nets were laid over the minefields and detonated, setting off the mines. Later on when blast-resistant mines were laid in large quantities, they were less effective.

(*b*) *Breaching parties.* Another method of breaching was accomplished by parties or groups of three to four men with spades sent out during the night into minefields, each party closely covered by a tank or armored car. As the party moved forward, the vehicle followed close behind.

(*c*) *Breaching by tanks.* The Germans, at times, deliberately drove tanks into minefields as far as they would go until the tracks were damaged and then pulled them out. This procedure continued, tank after tank, until the breach was completed. They considered this economical, as only a few hours of labor were required to repair the damaged tracks and the delay period was thus relatively short. In daylight, tanks proceded into minefields about 46 meters apart, while footsoldiers protected by tank fire moved about 2.74 meters apart in front of the tanks and in the gaps between to disarm and pick up the mines they located. Another procedure was the advance to the edge of a minefield of a detachment of tanks that engaged all the defending weapons visible. Meanwhile soldiers dismounted from the tanks and cleared the mines in front. Tanks that were hit were pulled out by others and replaced.

(*d*) *Use of Bangalore torpedoes.* The Germans breached minefields by Bangalore torpedoes mounted on a series of wheels and axles spaced about 4.57 meters apart. The pipe of the torpedo was made fast to the axles, and as a supplementary explosive, three 1-kilogram charges were set on top of the pipe—two spaced between each axle. The wheeled torpedo, usually about 22.86 meters long, cleared a gap 3.65 to 5.5 meters wide. It was towed as far as possible and then pushed out into the minefield.

(*e*) *Artillery barrage.* Another method was the artillery barrage. This, however, was very expensive. A 92-meter gap, 18 to 23 meters wide, required 120 rounds of 21-cm heavy howitzer, percussion fuze ammunition, 400 rounds of 15-cm heavy howitzer, percussion fuze (short delay) ammunition, and 600 rounds of 10.5-cm gun howitzer percussion fuze ammunition. The latter, however, was not used except in an emergency. Air bombardment with 50-

kg bombs fuzed without delay was found effective; lighter bombs were unsatisfactory, and heavier ones made the gaps impassable for armored vehicles. About nine hundred 50-kg bombs were required to clear a gap 46 to 92 meters wide and 183 meters long. Neither shelling nor bombs, however, guaranteed the neutralization of all mines; engineer parties were required to complete the clearance.

b. Minefield Clearing.

(1) *Probes and plows.* Probes were used extensively by engineer parties to locate and remove mines. Each party member cleared a lane .91 meter wide. Three types of probes were in general use. Two of them were about .91 meter long, one resembling a rapier, the other having no special handle. The third was about 1.5 meters long with an end having points like a pitchfork. A bayonet was also frequently used for mine probing. In rear areas, mines were frequently removed by a plow towed from a safe distance by a tractor and winch. S-mines were cleared by a tank towing a harrow.

(2) *Electronic detectors.* The Germans located many mines by the use of electronic detectors. In reconnaissance soldiers worked in pairs—a detector operator and a neutralizer clearing a lane 1.5 meters wide. To clear a gap 4.6 meters wide, five such pairs were used. Boundaries of gaps were marked with tape laid 0.45 meter outside the guide lines. The location of mines by electronic means, however, had several limitations. It was difficult to distinguish between metallic mines and odd bits of metal, such as tin cans, shell splinters, and short pieces of scrap iron buried shallowly or lying on top of the ground. Bakelite and wooden-cased mines with nonmetallic igniters often defeated the instrument.

52. Conclusions

a. Throughout World War II, the Germans continued mine warfare operations with equipment of high quality and men carefully and efficiently trained in methods and laying techniques. Every possible advantage was taken of terrain features and seasons and of enemy activities, installations, and equipment in order to achieve the best possible mine placement. As equipment was produced in factories in Germany under rigid standards and tactical and technical methods were rigidly followed, German mine warfare became less and less effective as the war progressed. Had the Germans been more versatile and more flexible in adaptation to new needs, they might have been more successful.

b. In the African campaign both the Germans and the Allies used minefields on a very large scale. The Germans at first had the advantage; but the enemy soon found adequate countermeasures. With the exception of the Tellermines, which had light charges, the German and Allied equipment, some of which was hastily devised expedients, were almost equally effective. Here the Germans had ample supplies of mines, which contributed substantially to whatever military success they enjoyed.

c. At the start of the invasion of the U.S.S.R., German mines caused relatively heavy Soviet engineer casualties—in fact, so many lane-clearing teams had 100 percent casualties that they were nicknamed the "suicide squad." Later on, however, the Soviet engineers became very adept in the invention and use of mine removing expedients. Frequently creeping patrols located the mines at night, unscrewed the fuzes, including the dangerous antipersonnel types, and cleverly replaced the camouflage they had disturbed. They also cut through the trip wires of antipersonnel mines and removed them entirely. The Russians also developed great skill and caution in identifying mines with pull igniters. Pressure igniters, on the other hand, were merely unscrewed. German minefields were then clearly marked in order to avoid them during attack.

d. After the winter of 1942, the Soviets re-

duced considerably the effectiveness of German mines, particularly those laid in front of the main line of resistance, by preceding their planned attacks with a special drum-fire barrage against the outpost area or the advance of the infantry position. Actually after the drum-fire, only small mine sections in front of the support and switch positions remained effective.

e. As the U.S.S.R. campaign continued, German mine warfare developed serious limitations. Engineers in adequate numbers properly equipped with Tellermines were never available. For an average 20-kilometer front, 10,000 to 15,000 mines were needed per month, whereas only a maximum of 3,000 to 4,000 were received. Also shipment was difficult because of the shortage of transportation facilities, even for the small quantity in supply at ammunition dumps or engineer depots. Days and sometimes weeks passed before mines could be placed in the front lines. Despite the innumerable minefields laid on the Eastern front, they were of little effect in preventing or delaying the Soviet breakthrough late in the summer of 1944. German minefield locations and patterns were known, and the versatility and imagination necessary to the immediate adjustment of tactics and laying methods to outwit the Soviets were lacking.

f. The German mine warfare effort in the defense of France was comparatively weak. As the point of invasion was not anticipated by the Germans, the enemy got off to a good start. Not only was there no time for the laying of extensive minefields over a wide front, but the supply of mines was greatly limited. The number of mines that General Rommel received for the defense of France was hardly a token of what he requested.

g. It is possible that in many instances mines were not used in number or in location that they might have been because, throughout the war, many German officers were critical of their tactical value. They believed that the cost of mines greatly outweighed their effectiveness. They also claimed that minefields frequently restricted the combat zone, causing casualties to friendly troops. On the other hand, certain officers believed that the results from the use of mines were excellent, and their presence had a good psychological effect on the German troops by giving them a feeling of security.

h. In the latter part of 1942, the German leaders investigated the possibility of reducing the use of mines and mine obstacles and curtailing their production in favor of artillery ammunition. Although the report they made called for an increase in mine production, which was then officially authorized, most officers believed that because they were expensive and their design and fuzing were rather complicated, they could not be used to good advantage in a long war with a marked decline in training standards.

i. The German official concept of the use of mines was correct. They proved valuable in operations because they were laid according to a plan intended to produce uniform results; but their methods required much time and material and many men. Because of their excessive weight and complexity of design and operation, they demanded specially trained units for their handling and emplacement. Nevertheless they were very effective when used along with fire power and were helpful in saving but not in replacing troops.

j. German victories were consistently short lived. Although the Germans made great advances and won great victories in World War I and II, their successes were not sufficient to bring them ultimate victory. German strategic methods were well-worked-out but too rigid in application to admit the change necessary to meet new conditions. The Allies, soon aware of the German strategy and methods outwitted them and eventually defeated them. The same was true of mine warfare. Although the Germans had superb equipment and the best of operational plans, they eventually became almost useless and no improved methods were devised to take their place. The Allies, therefore, with fewer men and in some cases inferior equipment overcame the German superiority by employing effective delaying and supply-consuming tactics. Thus the idea of many German leaders that mines could not be used to good advantage in a long war was correct only in re-

gard to German mine warfare and not to that of the Allies, whose methods were mainly expedients that were frequently adjusted to meet tactical needs.

Section II. GERMAN MINE WARFARE EQUIPMENT

53. Mines and Fuzes

The Germans produced and used more mines in World War II than any other combatant nation, probably with the exception of Soviet Russia. Also their mines and fuzes were copied or modified by almost all of the nations of the World. Many nations still have large stocks of German mines and fuzes on hand, which will probably appear on the battlefields of future European wars. Conversely, in World War II the Germans improved upon and adopted equipment used by other armies. The Germans copied from the Russians the MUV pull fuze (Z.Z. 42), the EKHV chemical-mechanical time delay fuze (41 W), and the frequency induction fuze (SM-12). German copies of Soviet mines included the antipersonnel concrete stake mine (POM.Z-2) and the wooden Schümines (PMD). The Germans also used features of the Soviet Ovtsinnikov mine and the British ointment box mine in the development of the 400-grain Schümine, and they adopted intact the Finnish ice mine.

54. Auxiliary Mine Warfare Equipment

The Germans developed superior mine-laying and spacing cords, minefield patterns, and recording methods. They also developed mine clearing devices and methods, including the Wien 41 mine detector, mine probes, and the artillery blasting methods of breaching.

CHAPTER 8

JAPAN

Section I. JAPANESE MINE WARFARE IN WORLD WAR II

55. Equipment

Neither the Japanese nor the Allied armies in the Pacific in World War II used mines and their related equipment in the quantity and in the varied operations that the Axis and Allied armies did in Africa and Europe. In fact, the Japanese used them negligibly, as they seemed to prefer other means of offense and defense.

56. Tactical Use of Mines

a. Introduction. Minefields were used at times by the Japanese on beaches to delay and cause confusion among the initial assault units. They were also emplaced in deliberate patterns inland to stop the advance of armored units, in patterns or indiscriminately as road blocks, and hastily without any tactical consideration during retreat. Mines, especially those laid inland, were often found unarmed or lacking fuzes.

b. Beach Minefields. These were often erratically patterned and generally ineffective. Sometimes beach minefields consisted mostly of single- or double-horn beach mines spaced approximately 5.5 meters apart with a 3.6- to 5.5-meter space between rows. The forward row was generally placed at or just within the high tide line. Often mines were partially covered and hidden by brush. The Japanese lashed 6-meter lengths of 1.27-centimeter steel reinforcing bar to the mine horns to provide a greater contact area. Reinforcing bars were also used to connect one mine to another to give a continuous interconnected line.

(1) On one beach model 93 "tapemeasure" antitank mines were buried haphazardly and generally unpatterned. They were set in depth in single-horn and double-horn minefields, to be detonated only by the continuous passage of vehicles. They were laid at 3-meter intervals with the pressure fuze down and attached to 1- by 8-inch boards. One row was laid along the hightide mark and another along the line of brush growth. These were generally visible and easily disarmed and removed. The "yardstick" mine was also used at the point where the beach road turning inland caused a gap in the trenches (fig. 21). Double-horn beach mines were laid at 4.5-meter intervals partially within the high water mark. Wide sections of the beach contained an additional line of single-horn mines placed in depth and staggered (fig. 21). Steel bars were lashed to the mine horns to improve vehicle contact. Only two of the possible areas of egress were mined, and those with the "yardstick" and "tape measure" types.

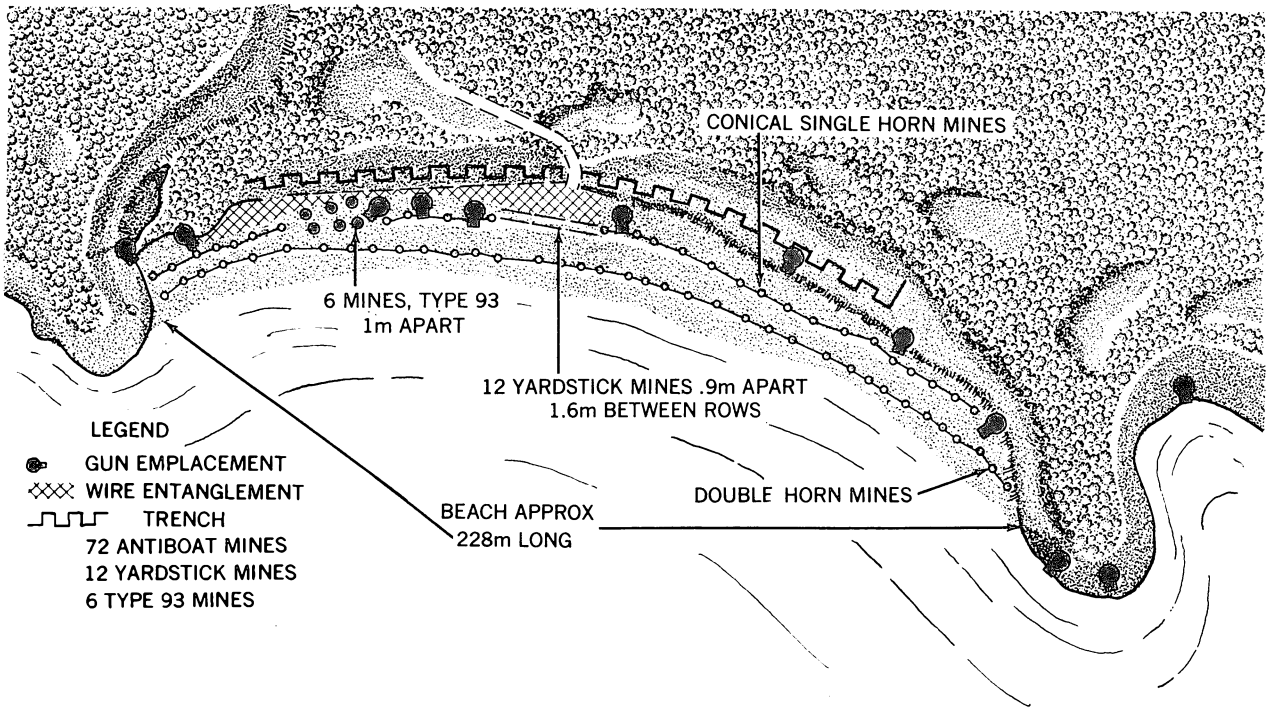


Figure 21. Japanese beach minefield (1).

(2) A second beach (fig. 22) was mined for 572 meters with 128 beach mines spaced 5.5 meters apart. The first line, composed of interconnected double-horned mines, was placed within the high water mark; and the second line, of both double- and single-horn mines, was placed inland and staggered. An occasional unfuzed mine was set close beside a fuzed one of sympathetic detonation. The area on the high ground above the beach was laid across the road with poorly-set single horn mines that were easily circumvented. Thus the beach minefields, crudely designed and emplaced, were rather ineffective against the Allied forces.

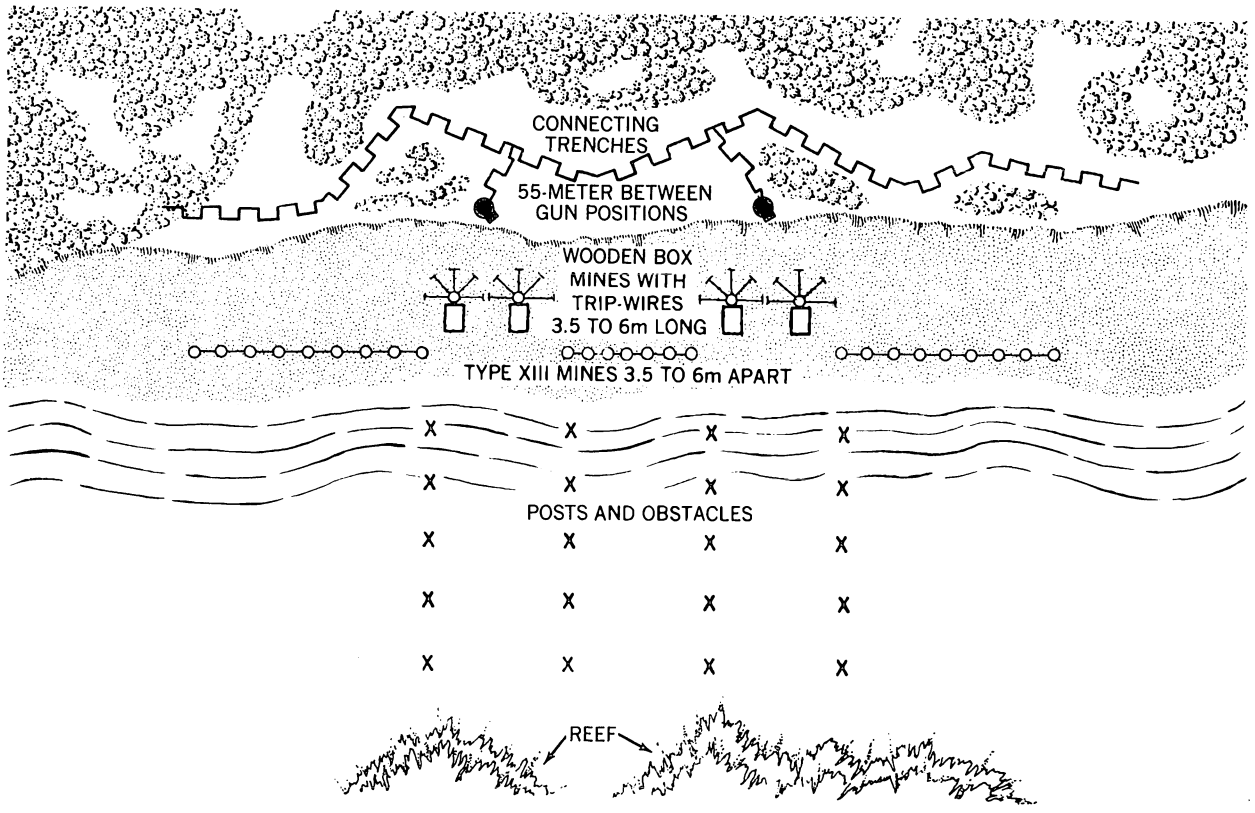


Figure 22. Japanese beach minefield (2).

(3) Magacienne Bay was one of the best protected of all beaches, as that was where the Japanese expected the Allied landing. The defense included trenches, wire entanglements, gun positions, a blockhouse, and mines (fig. 23). The well camouflaged blockhouse covered a 10-meter row of 22 partially covered double-horn beach mines, set about 6 meters apart in a line 9 meters in from the water's edge. The minefield was bordered by a fire trench, thick vegetation, and rough terrain. The 228.6-meter minefield at the right contained 52 partially camouflaged double-horn mines laid at 35-meter intervals behind high wire and 18.3 meters in from the water line. Fire trenches were dug out in front of the field whose extremities reached natural barriers of high ground. Gun positions, on the high ground inland end in the caves in the cliff above the beach, covered all approaches. The road adjacent to the beach was mined at odd intervals for 91.5 meters with double-horn mines set in groups of four, partially buried on the shoulders and in ruts.

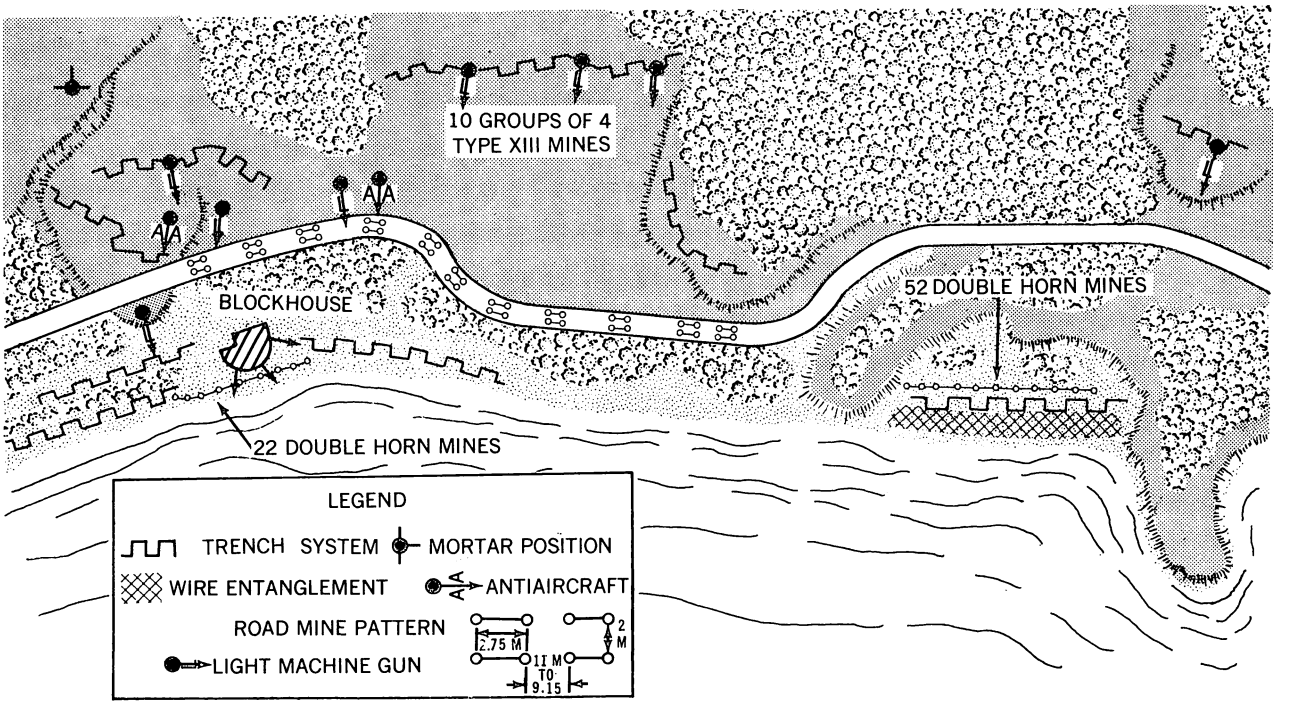


Figure 23. Mines laid in Magacienne Bay defenses.

c. *Inland Minefields.*

(1) In the northern part of Saipan, the Japanese laid inland minefields to cover their retreat and to stop, delay, and harrass the advance of the United States armored units. One field consisted of 133-pound general purpose aerial bombs buried tail down with the impact nose fuze extending 5 to 10.1 centimeters above the ground, which made detection easy. In some instances bombs were buried at an angle of approximately 45°, pointing in the probable direction of enemy troop advances.

(2) The best situated of all the Japanese Saipan inland minefields is shown in figure 24. A road and railroad were mined for a distance of 366 meters by 164 133-pound general purpose aerial bombs laid in staggered parallel lines in the form of an elongated S-curve. The upper end of the field was bordered by high ground; and the lower and left end had a 54.86-meter gap, presumably for the passage of friendly vehicles.

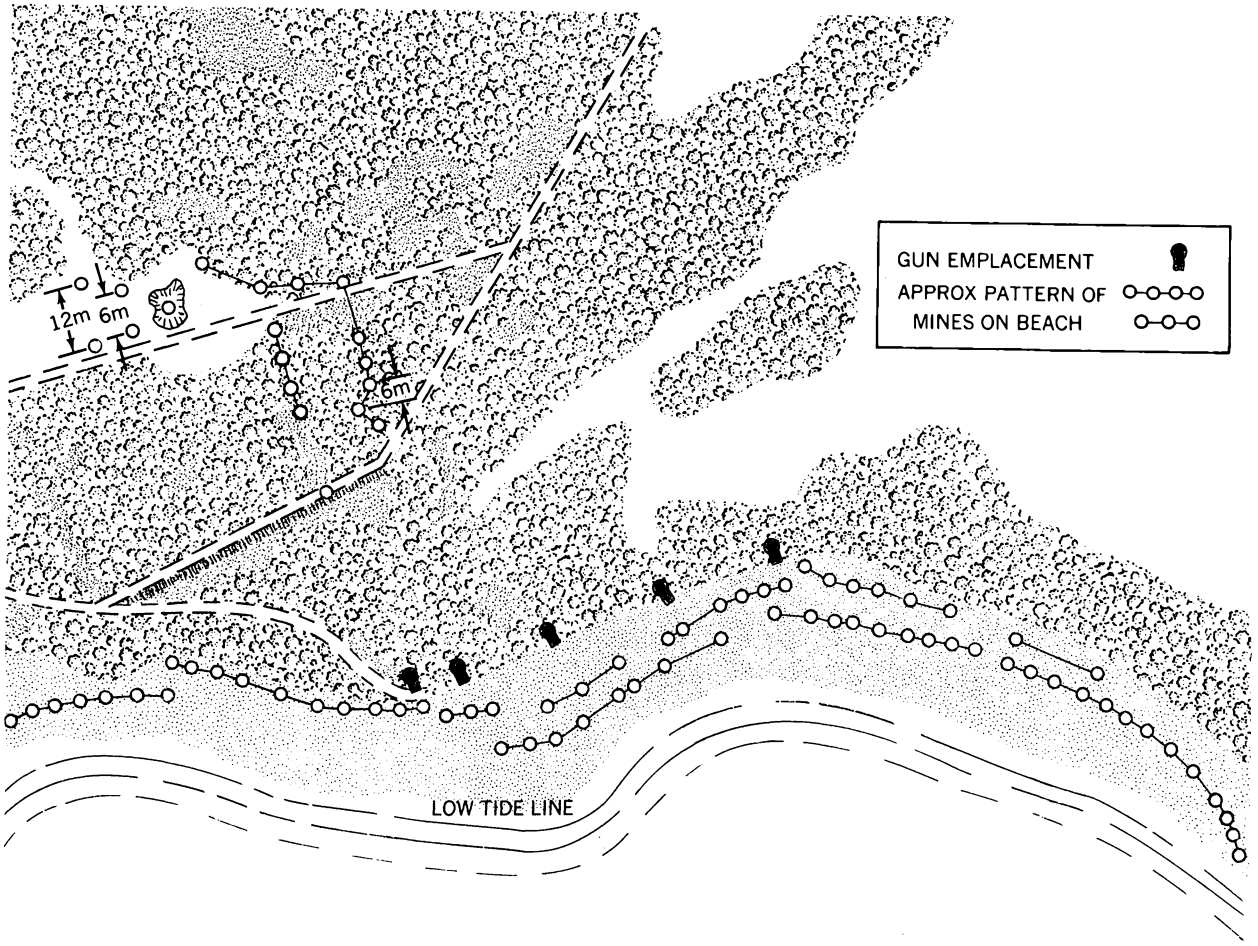


Figure 24. Inland Japanese minefield.

(3) The inland minefield at Marpi Mountain was armed with fifty-three 133-pound general purpose aerial bombs laid at 3- to 4-meter intervals in two staggered parallel lines 3 meters apart. A gap, probably for the passage of friendly troops, was left at the dispersion strip (fig. 25). This 137-meter long minefield crossed a road, a railroad, and a wire entanglement, covering the entire distance between two cliffs. At another place on Saipan, there were 150 bombs spaced 18.28 to 36.57 meters apart, and at another there were 200 bombs. The safety pin was left lying near each of the latter. In the streets of Garapan, 124 bombs were buried. Inland minefields on Saipan, like the beach mines previously described, were crude and obviously emplaced, having little retarding influence on the enemy advance.

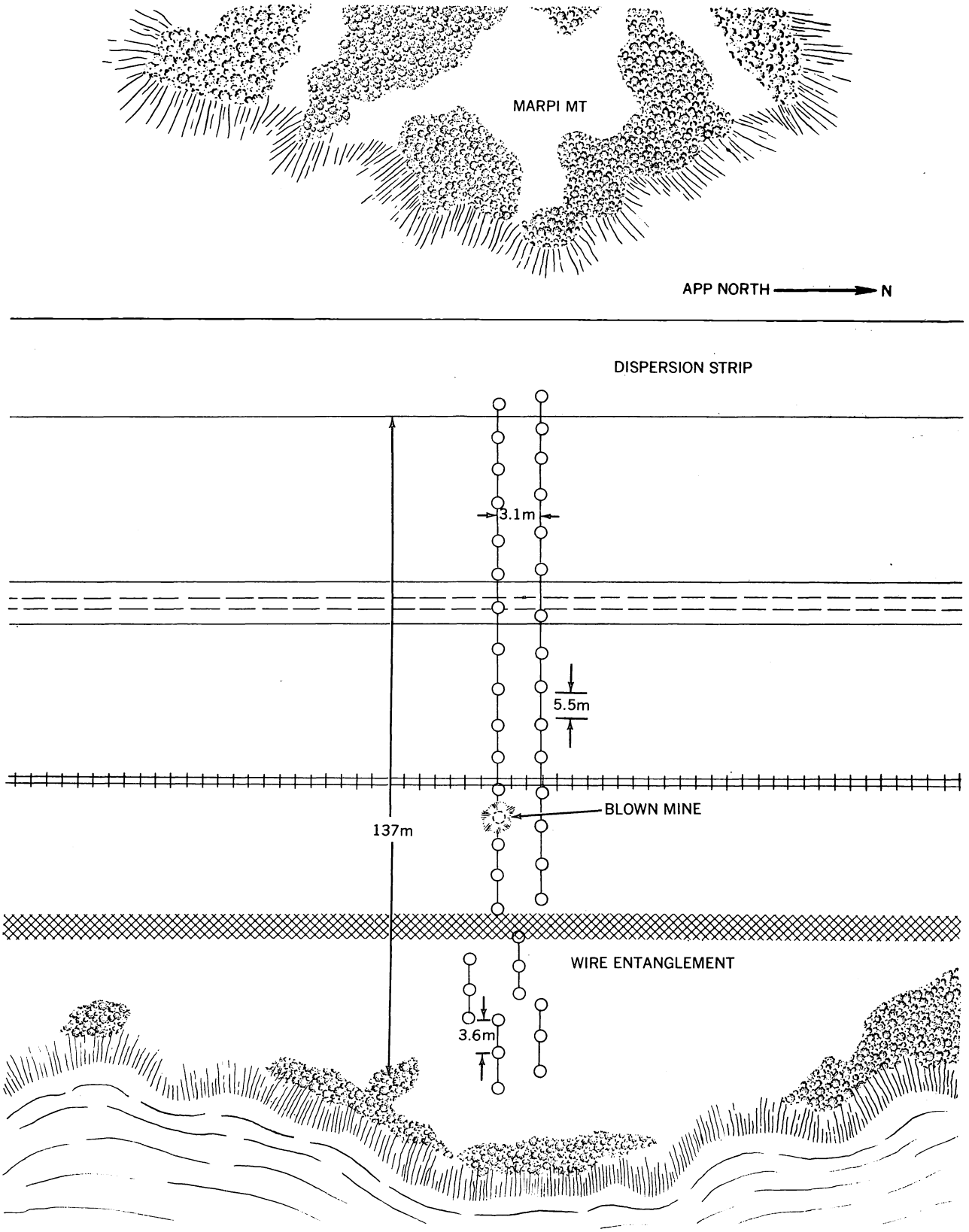


Figure 25. Minefield at Marpi Mountain

d. Road Blocks. Both general purpose aerial bombs and antitank mines were used in laying road blocks. Figures 26 and 27 show mine placements. In many instances the Japanese failed to remove the safety pin or to arm the bomb nose fuze. "Yardstick" antitank mines were located partly buried in groups of 4 or 5 along a road in the vicinity of an ammunition dump.

Some "yardstick" antitank mines were also found partly buried in a definite plan integral with a large horn minefield. Here was evidence of careless and almost useless minelaying.

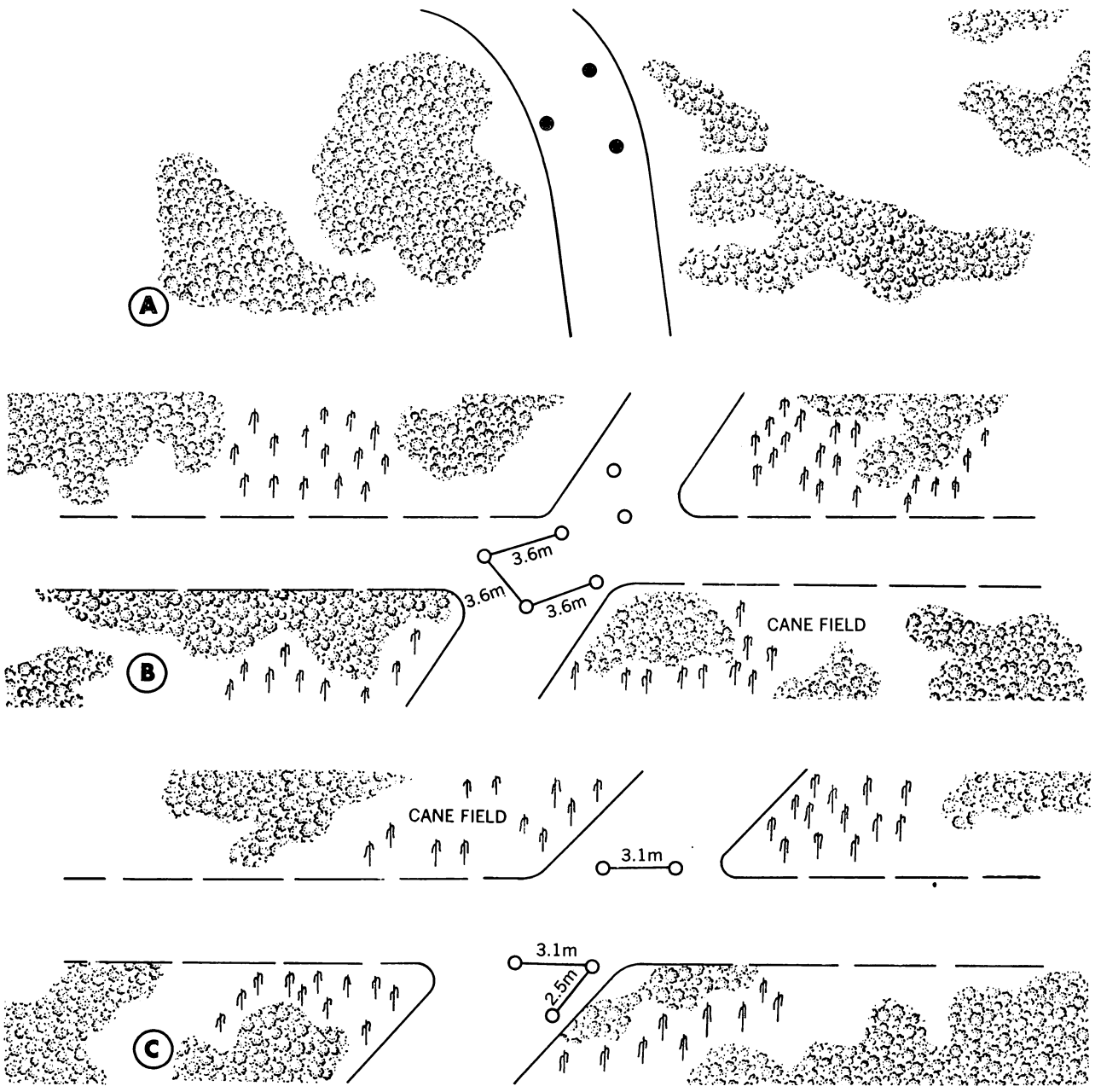


Figure 26. Typical road blocks.

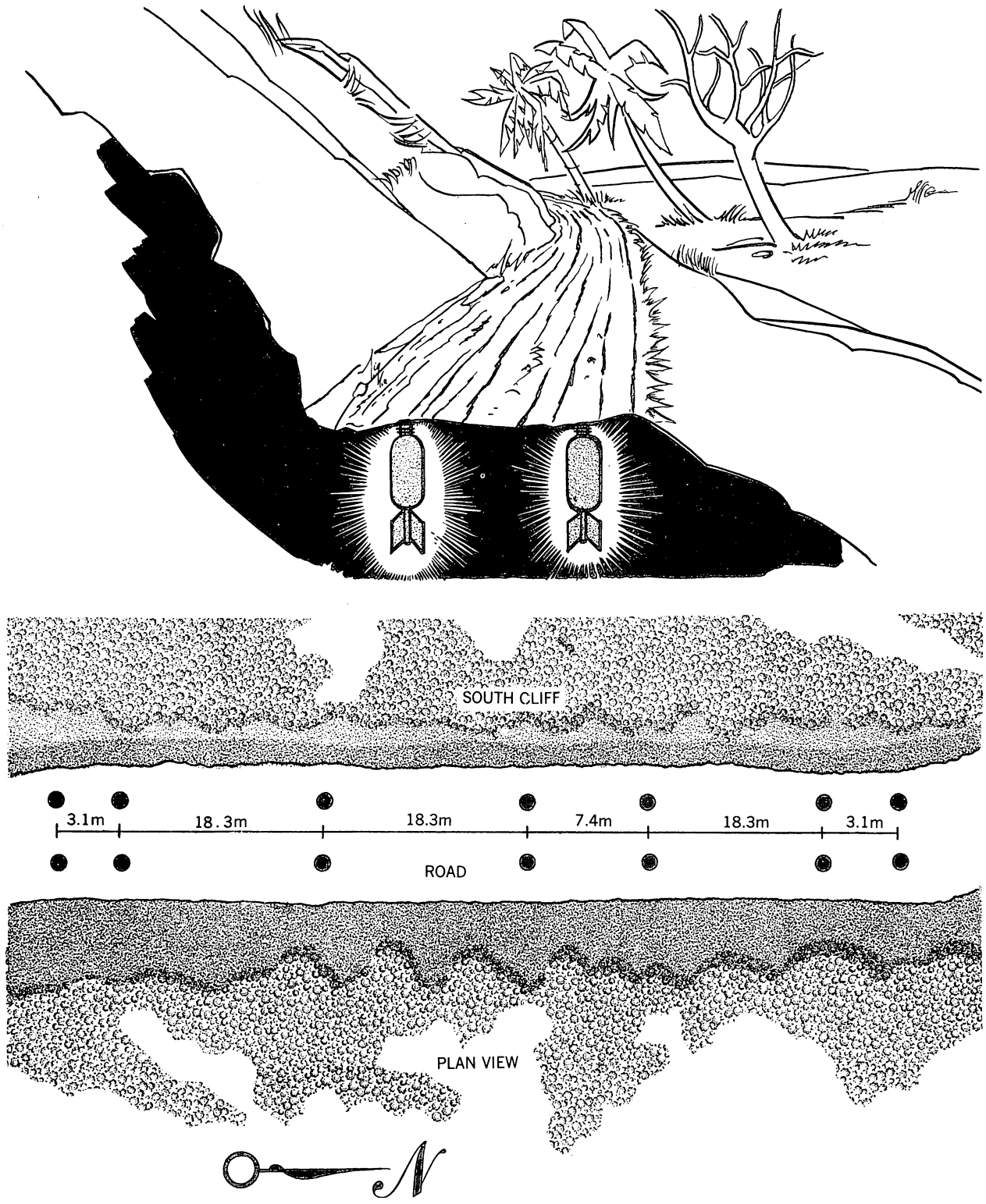


Figure 27. Blocks laid on a cliffside road.

e. Dummy Mines. Frequently the Japanese emplaced dummy mines in horn minefields and along unprotected beaches. There were primarily pieces of wood resembling horns stuck into the ground with bamboo stakes put nearby to attract attention. Dummy mines were also used along with false barbed wire entanglements made by twining vine around bamboo poles, with dummy tanks. Photographs failed to reveal the inoffensive character of the barbed wire. Even from the water's edge 22 meters away, the entanglements appeared genuine.

f. Boobytraps.

(1) The Japanese on the whole used only a comparatively few boobytraps. One of these was an American 81-mm mortar shell lashed to a plank or pole and laid on top of a British hand grenade so as to maintain pressure on it. Such devices were usually found across entrances to dugouts or buildings that enemy troops were expected to enter. As the motar shell lashed to the plank was visible, it aroused suspicion. Also, the grenade explosion was too light to detonate the motar shell.

(2) Another method of boobytrapping was to bury a mortar shell just below ground level with the fuze down and the pin removed, making actuation instantaneous and detection difficult. The Japs sometimes used a hand grenade as a boobytrap, buried with the striker up, the pin was out, and the top of the striker protruding about one inch above the ground. This was limitedly effective because of the conventional grenade time lag between initiation and detonation.

(3) At several ammunition dumps the Japanese boobytrapped their own dead by rigging grenades in the arm pits or under the body. Also they boobytrapped an air-ground radio command post, that consisted of an air-ground radio and transmitter housed in a tent. Seven charges were found, each consisting of ten ½-pound blocks of picric acid and a firing device. Five charges were connected in series with the transmitter to be detonated when energized by some hapless soldier. The sixth was connected to a trip wire covering the entrance to the tent and the seventh, to a rifle in the immediate vicinity. All were amateurishly prepared, easily discovered, and readily deactivated.

(4) Many times boobytraps made of explosives and pull type fuzes were found at the entrances to caves used as ammunition dumps. During the Second Battle of Milestone 52 in Burma, about 200 boobytraps were laid. They were British No. 36 grenades set on the ground and in trees and activated by trip wires loosely strung along the ground or fastened to creepers and vines.

(5) Another type of boobytrap was the cloth bag, containing explosive, colored white and various shades of pastel blue and pink, which the Japanese used to charge abandoned aircraft. A short delay fuze was fixed in the mouth of the bag by wrapping twine. On Peleliu, the majority of the captured Japanese aircraft were boobytrapped with either antipersonnel mines or hand grenades. Here they also boobytrapped bodies of their own and United States soldiers, and buildings. Fuzes although rather extensive, were generally quite obvious and crude.

57. Demining

a. Reconnaissance. Japanese technical troops were instructed in locating enemy mines and minefields. They were trained to make detailed searches at probable indications of their presence.

b. Probing. Engineer troops were also instructed to use a probe and a spade if other means and methods were lacking. Usually the

Japanese preferred to remove discovered mines; occasionally, however, they marked located minefields or destroyed the mines by firing them.

c. Electric Detection. In Burma, the Allies captured a detector set Model 100 (1940) that located mines by visual indication on a meter. It weighed about 53 pounds, including the carrying case. The set had a 5-pound loop for use by the operator in standing position and a 2-pound loop for the prone position. Both loops were 38 centimeters in diameter.

58. Conclusions

a. Japanese mine warfare methods and equipment employed in World War II were negligible in comparison with those of other major combatants. On many occasions a well planned, well executed minefield would have proved extremely advantageous to Japanese defense operations. This apparent indifference to the employment of mines, however, is easily explained. Mine warfare, generally, was not emphasized in the Armies of most of the World Powers in training or by the procurement of equipment prior to World War II because land mines and their techniques had not been developed to any great extent other than by the Germans.

b. Because of her isolation from her European Allies, there was little opportunity for Japan to obtain German equipment and train soldiers in mine warfare techniques. Accordingly, minefield patterns were crude and ill-conceived. Mines were poorly constructed and inefficient, and those responsible for laying them had neither the material nor the skill to arm and conceal them properly. As the Japanese generally have been imitators and not innovators, they were badly-off indeed in mine warfare. Mines laid along trails or pathways and on beaches were readily detected; boobytraps, for the most part, were crudely devised and also readily detected. Thus the enemy suffered little loss of time or manpower from Japanese mine warfare.

c. The defensive position at Myitkyina, where a small but extremely well dug-in garrison held out against superior Chinese and American forces for nearly two months, was an operation in which the Japanese might have used extensive minefields to advantage. Japanese defense actions in the North Burma Campaign were characterized by the virtual absence of mines, even though in earlier operations at Warazup, where the Allies used tanks, they used a small number of the Model 99 (1939) magnetic armor-piercing type. All told, the use of mines and boobytraps in the Burma theater was haphazard and sparse. The same was true on Saipan, partially because the Japanese had not prepared defenses there; for they had not anticipated an early attack. No mines of any consequence were found on any of the beaches where the Allies landed. Inland mines were small, feeble, ill-concealed, and relatively ineffective; and they reflected little deliberate planning. The Japanese laid small minefields of the 133-pound bomb type in the northern part of Saipan to cover their retreat and harrass the advance of Allied armored units; but they lacked depth and density and were easily breached. The Japanese also laid mines in an unpatterned fashion-often singly along trails and unimproved roads in the valleys and defiles in locations apparently selected by individual soldiers at their own discretion.

d. The Japanese were indifferent to mine warfare also because it was not inherent in their method of fighting. In the offensive they counted heavily on surprise, endeavoring to strike suddenly where the enemy did not expect it and hit when he was not ready. They depended on a small striking force that moved rapidly under cover of a stratagem or ruse, such as holding attacks, deceptive displays of force, confusion of the enemy caused by deception, or suicidal attacks by small units that caused premature deployment in the wrong direction or the erroneous commitment of reserves. The Japanese, if possible, avoided the slugging match in which numbers and firepower counted and depended on surprise and mobility.

e. The Japanese defense operations, based on maneuver, stressed to the limit the necessity of striking back when the attackers were

disorganized, even to the extent of hitting them while they were concentrating on deploying for the attack. The Japanese followed the principle that the way to cope with the greater Allied fire power was to increase the size of the reserves, were at the expense of the frontline defenses. Japanese counter attacks were not intended merely to drive the enemy out of the areas he had taken, but rather to strike in such a manner as to gain the initiative. This usually brought decisive results. The Japanese did not wish to whittle down the attackers by a strong defense until the advance bogged down, but planned on giving with the blow and hitting back suddenly and decisively when the attackers became disorganized by their own penetration. Thus as military tactics to the Japanese were an art with battle decisions gained by skill and rapid movement and not by power, it was probably logical that they did not employ mine warfare on a large scale.

Section II. JAPANESE MINE WARFARE EQUIPMENT

59. Mines and Fuzes

In World War II, standard Japanese mine warfare equipment was very limited in type and quantity. The Japanese had only about four antivehicular mines, and two antiamphibious (beach) mines. Each of the four antivehicular mines had a different fuze and a special fuze (lead covered chemical fuze) was devised for the two antiamphibious mines. One antipersonnel and two antiamphibious mines were developed late in the war but were not issued to troops. There were some improvisations: four antivehicular mines and three antipersonnel mines. The Japanese also developed three mine detectors, but they were seldom seen in the field. As the supply of metals gradually dwindled in Japan, subsitute materials for mine cases were used, such as ceramics. They also had no mine laying, working, recording, or clearing equipment.

60. Mine Warfare Developments

The Japanese Ground Self-defense Force has only a limited number of home-produced mines and some United States SCR-625 mine detectors. Techniques and tactical applications of mine warfare have improved greatly over those of World War II. Research and development is carried on in nonmetallic mine detectors and a new type of acoustic mine.

PART THREE

LAND MINES AND FUZES OF FOREIGN WORLD POWERS

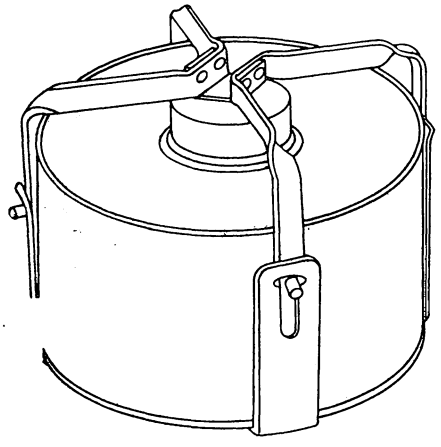
CHAPTER 9

ANTITANK MINES

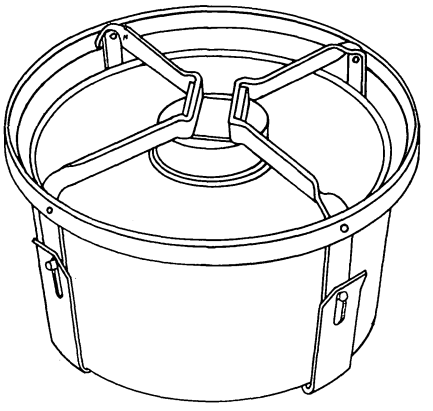
Section I. METALLIC ANTITANK MINES

61. Antitank Mine, Mark 5 Models G.S. and H.C. (United Kingdom)

This steel land mine may be found in two different models, the Mark 5, G.S. (general service) and the Mark 5, H.C. (higher content). The two models are identical in appearance and size (20.3 cm in dia and 10.1 cm high). The only difference is that the Model H.C. has explosive on both sides of the inner wall of the case. The fuze well, located at the top center of the case, is covered with a metal cap seated on a rubber gasket. Both models may be found fitted with either the Mark I or the Mark II pressure spider which is held in place by four slotted metal straps.



MINE WITH MARK I PRESSURE SPIDER



MINE WITH MARK II PRESSURE SPIDER

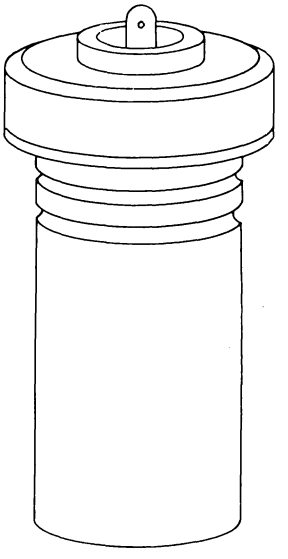


Figure 28

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Mark charge	Booster
Cylinderical	No. 3, Mark I	350 to 400 pounds pressure.	4.5 lb. TNT (GS) 8.3 lb. TNT (HC)	TNT/CE (HC) (CE is Tetryl)

Fuze hazards	Markings	Remarks
Percussion cap, detonator, and booster.	Contractors' mark and date of assembly are stenciled on the side. 1.2 cm green band near the top of the mine case. 1.2 cm red band near the bottom of the mine case.	1. The fuze cannot be separated from the integral percussion cap detonator and booster. 2. Both models are obsolete, but as stocks still exist they may turn up anywhere.

b. Use. As antitank mines, these models are capable of stopping most medium tanks, but against heavy tanks they must be laid double.

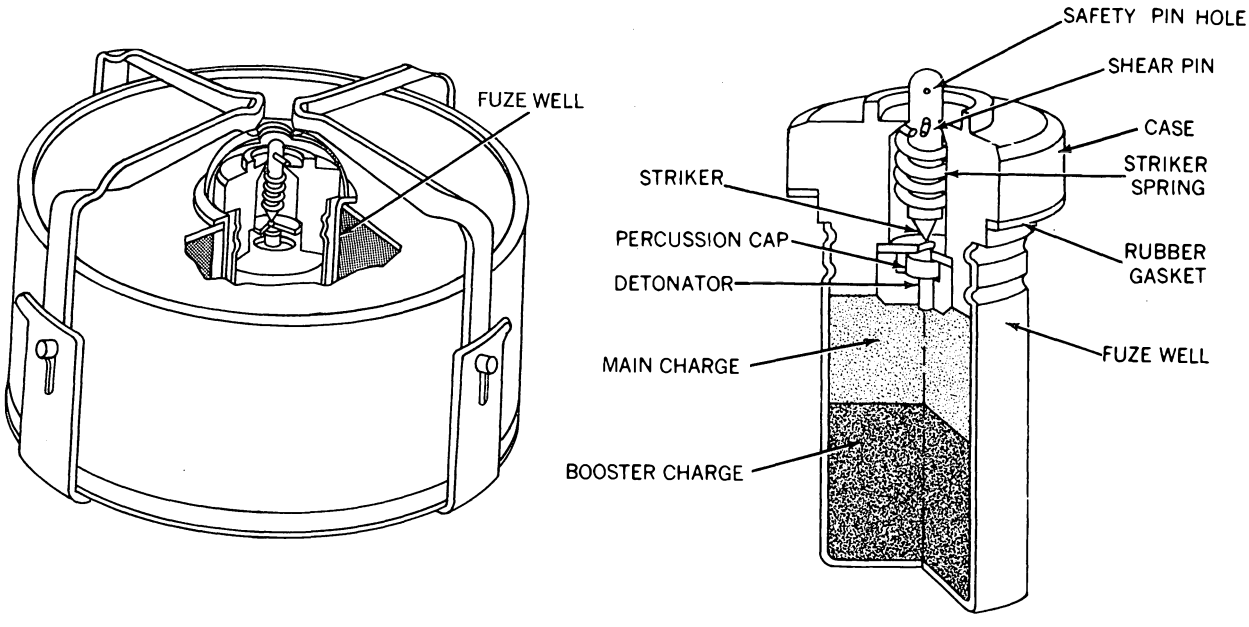


Figure 29

c. Functioning. Pressure on the spider crushes the protective cap over the fuze and severs the shear pin, releasing the spring loaded striker against the percussion cap and firing the mine.

d. Installing and Arming.

(1) Remove the pressure spider and the protective cap.
(2) Place the mine in a hole, so that the top of the pressure spider, when replaced, will be less than 1 inch below the surface of the ground.
(3) Remove the paper sealing the fuze well.
(4) Inspect the fuze to see that the shear pin is in position and has not been entirely or partially sheared.
(5) Withdraw the safety pin.
(6) Insert the fuze in the fuze well (do not use force).
(7) Replace the pressure cap so that it rests on the rubber washer.
(8) Replace the pressure spider, making sure that the spider-locking pins engage in the slots in the spider. Be careful not to put any pressure on the fuze.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Carefully remove the pressure spider and the protective cap.
(3) Insert a safety wire into the safety pin hole of the fuze.
(4) Lift the fuze out of the mine.
(5) Transport the mine and the fuze to a safe storage or disposal area.

f. Additional Precautions. Handle the fuze carefully, even when the safety pin is in place because of the integral percussion cap, detonator, and booster. Keep the fuzes separated from the mines at all times except when the mines are being placed in the ground.

62. Dual-Purpose Mine, No. 8 (Communist China)

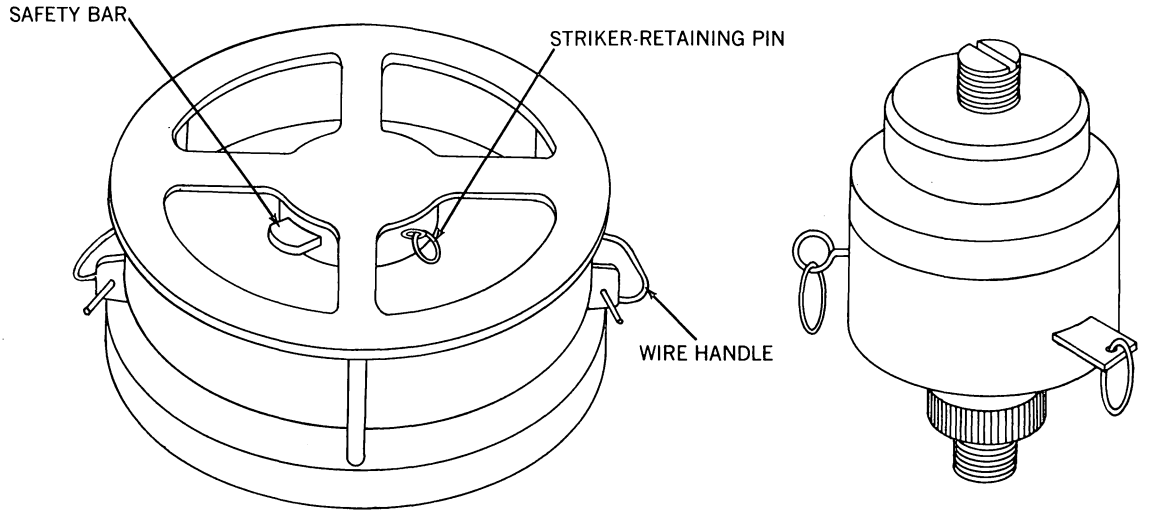


Figure 30

This cast-iron mine is 22.8 centimeters in diameter and 10.1 centimeters high. A threaded fuze well is located in the top-center of the mine. The mine has a pressure spider and is similar in appearance to the obsolete United States antitank mine M–1.

a. Characteristics.

Shape	Fuze or fuzes	Operating force	Explosive
Circular...	Combination pressure or pull.	330 to 500 lb. pressur 10 to 50 lb. pull.	5 lb. (approx)

b. Use. This mine may be used for an antivehicular or antipersonnel purposes.

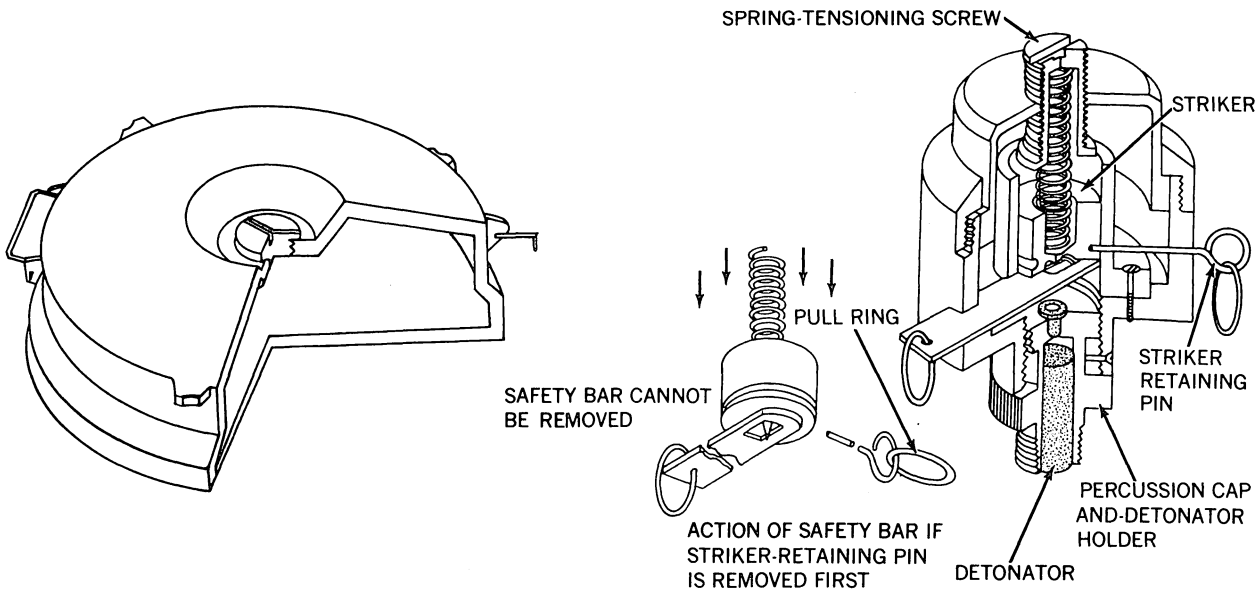


Figure 31

c. Functioning.

(1) *Pressure.* Pressure on the spider is transferred to the top of the fuze. It shears the striker retaining pin and releases the spring loaded striker against the percussion cap, firing it, the detonator, and the main charge.

(2) *Pull.* Pull on the pull ring of the striker retaining pin pulls it from the fuze, releasing the spring loaded striker against the percussion cap, firing it and in turn the detonator and main charge.

d. Installing and Arming.

(1) Unscrew the fuze well plug.

(2) Test the fuze by attempting to remove the safety bar. If the fuze has been fired, it cannot be removed.

(3) Insert the detonator in the fuze and screw the fuze (detonator end) into the fuze well.

(4) Adjust the spring tensioning screw on the top of the fuze for the pull desired. The screw should be turned at least four full turns.

(5) Place the spider on the mine. Turn the spider in a clockwise direction until the spider arms engage the locking lugs on the side of the mine.

(6) Attach a trip wire to the striker retaining pin of the fuze, if pull operation is required.

(7) Carefully remove the safety bar from the side of the fuze.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Cut any slack trip wires found attached to the mine fuze.

(3) Carefully remove the pressure spider.

(4) If the safety-bar is still in the fuze, push it on in. DO NOT DISTURB THE STRIKER RETAINING PIN WHEN PERFORMING THIS OPERATION. If the safety bar cannot be pushed in, the fuze has probably been fired.

(5) Carefully remove the fuze from the mine.

(6) Separate the percussion cap and detonator from the fuze.

(7) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. If the fuze appears to have been fired, do not attempt to separate the precussion cap and detonator from the fuze, as the striker may be impinged in the percussion cap. Destroy the fuze immediately.

63. Tellermine 29 (T-5 Mine) (Germany)

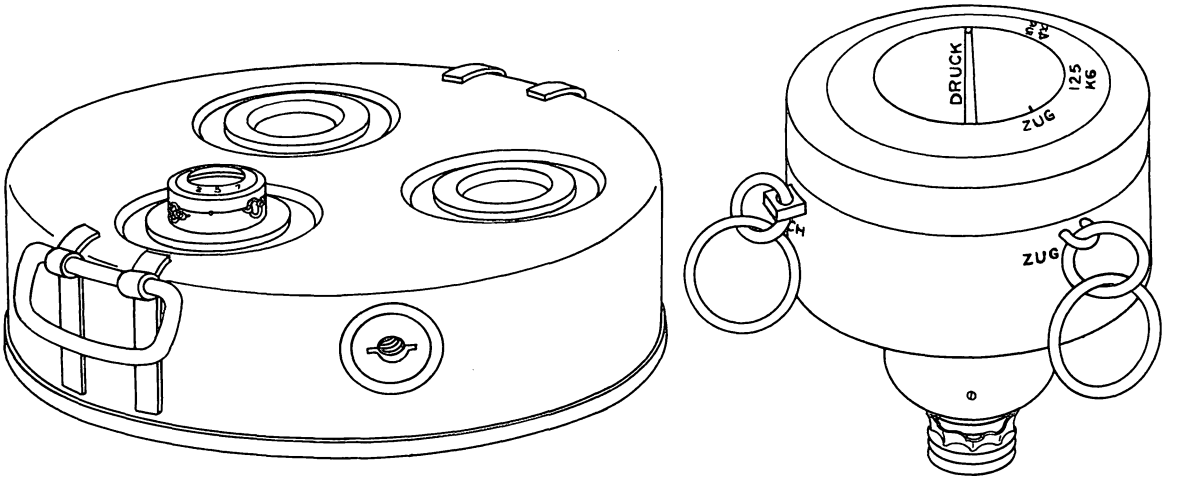


Figure 32

This steel mine is 25.4 centimeters in diameter and 6.77 centimeters high. It has three main fuze wells located in a triangular pattern in the top and two secondary fuze wells in the side. In addition there is one centrally located fuze well in the bottom. Two carrying handles are attached to the mine case.

a. Characteristics.

Shape	Fuze	Operating force	Explosives
Circular.....	29	99 to 276 lb. pressure*.	10 pounds TNT

*When the indicator mark on the slotted disk (marked DRUCK) is opposite the 45 KG mark, the fuze is set for antipersonnel use. When the ndicator mark is opposite the 125 KG mark, it is set for antitank use.

b. Use. This mine may be employed as an antitank or antipersonnel mine.

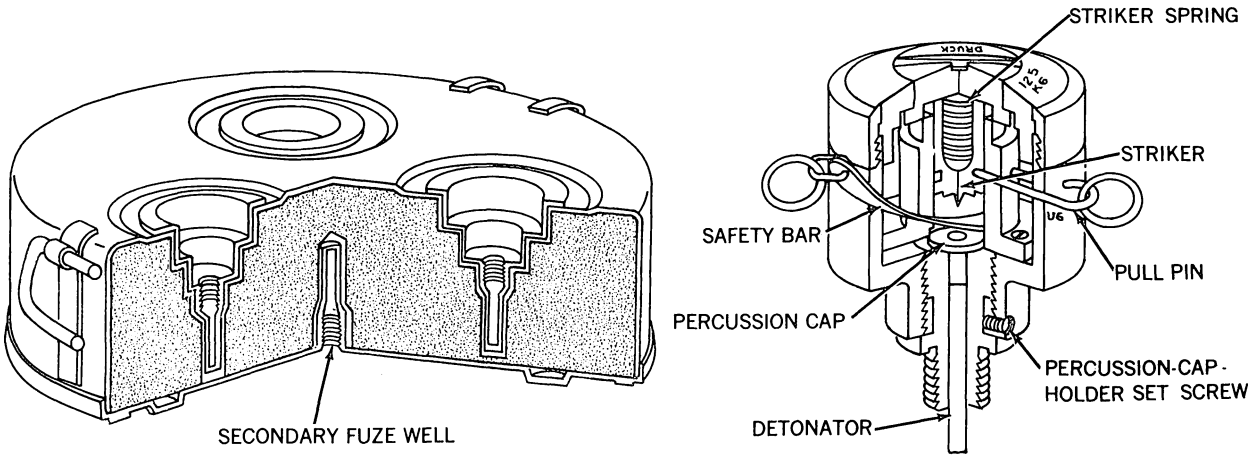


Figure 33

c. Functioning.

(1) *Pressure.* Pressure on the top of any one of the three main fuzes shears the shear pin and releases the striker to fire the percussion cap, detonator, and the main charge.

(2) *Pull.* A pull on the pull wire removes the pull pin, which allows the striker, driven by the compressed striker spring, to fire the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Place the mine in a hole with its top flush with the surface of the ground.

(2) Remove the shipping caps from three pressure-pull fuzes 29, and insert a detonator in the base of each.

(3) Turn the slotted disks of the pressure-pull fuzes to the desired setting.

(4) Screw the fuzes into the fuze wells. If a secondary fuze is used, screw any pull fuze with standard threads into the secondary fuze well.

(5) Attach wires or cords to the rings on the safety base of the pressure-pull fuzes 29 and remove the safety bars from a safe distance. (If the pull pin is removed by accident, the safety bar cannot be pulled out.)

e. Disarming Procedure.

(1) Check for and remove any secondary fuzes or antilift devices.

(2) Carefully unscrew each of the main fuzes from the mine. (Do not attempt to insert an improvised safety-bar into the slot marked SICH because it may come into contact with the percussion cap and fire the mine.)

(3) Cut any slack wires attached to the pull pin.

(4) Separate the percussion cap and detonator from the fuze by unscrewing the percussion-cap-holder set screw.

(5) Remove the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. If both the safety-bar and the pull pin are missing from the fuze, do not attempt to separate the percussion cap and the detonator from the fuze. This indicates that the striker is probably impinged in the percussion cap and the fuze should be destroyed immediately.

64. Barrier Mine (Sperrmine) (Austria)

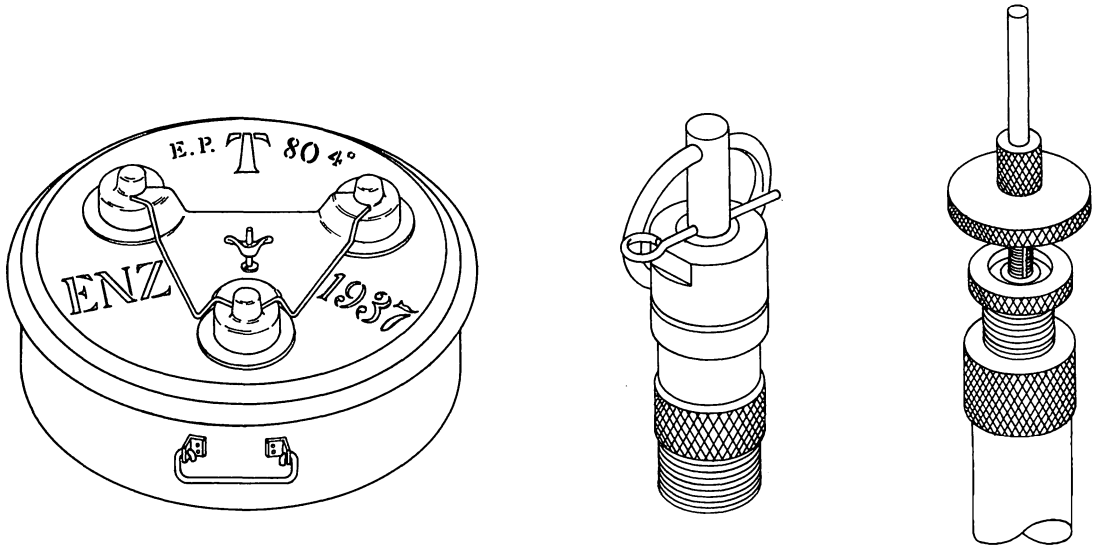


Figure 34

This steel mine is 27.9 centimeters in diameter and 7.6 centimeters high. It has three main fuze wells located in a triangular pattern in the top. A pressure cover fits into each fuze well. The fuzes are held in place by a triangular metal plate that is belted to the mine case.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Combination	400 lb. pressure 5 to 10 lb. pull.	10 lb.
	Tilt-rod.....	20 pounds lateral pressure.	

Remarks

This fuze could also be used as a tension release fuse by attaching a taut trip wire to the arming ring and removing the shear or pull pin.

b. Use. This mine is usually laid in antitank mine fields. Tilt-rod fuzing will be found when the mine is laid in tall grass or snow.

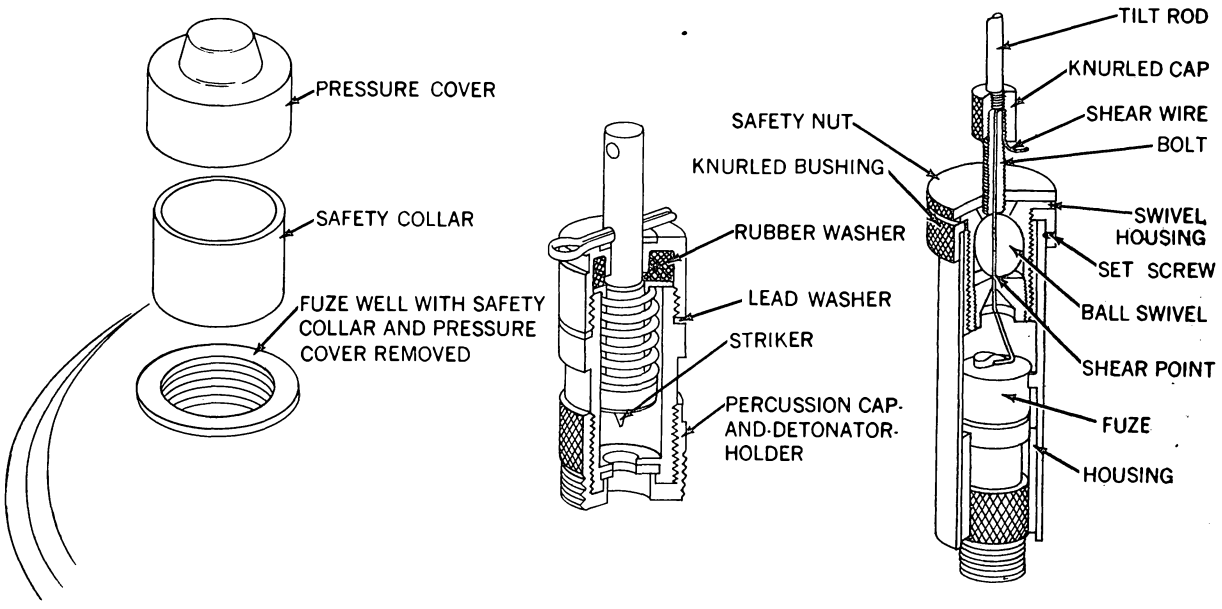


Figure 85

c. Functioning.

(1) *Pressure.* Pressure on one or more of the fuze pressure covers forces the striker shaft down, shears the shear pin, and releases the striker. The striker fires the percussion cap, detonator, booster, and main charge.

(2) *Pull.* Pull on the trip wire attached to the pull pins pulls out the pin and releases the striker. The striker fires the percussion cap, detonator, booster, and main charge.

(3) *Tilt-rod.* Lateral pressure in any direction against the tilt-rod causes the ball-swivel to rotate and shear off the shear wire. This releases the striker to fire the percussion cap, detonator, booster, and main charge.

d. Installing and Arming.

(1) *Pressure fuze.*

(*a*) Unscrew the wing nut and remove the triangular metal plate.

(*b*) Remove the metal pressure covers and the metal safety collars.

(*c*) Install the fuzes.

(2) *With tilt adapter.*

(*a*) Unscrew the wing nut and remove the triangular metal plate.

(*b*) Remove the pull ring and the shear or pull pin from the fuze.

(*c*) Push the long shear wire through the top hole of the striker until it is stopped by the metal knob attached to the end of the shear wire.

(*d*) Push the loose end of the shear wire straight up through the hole in the ball swivel and through the hole in the bolt of the tilt adapter. As the end of the shear wire emerges from the top of the bolt, pull it until the fuze is drawn into the base of the adapter. Bend the end of the shear wire down so that it fits into the longitudinal groove in the bolt.

(*e*) Screw the knurled cap onto the bolt and screw the tilt rod into the end of the cap.

(*f*) Screw a percussion cap and detonator into the base of the fuze.

(*f*) Rotate the knurled brushing at the top of the tilt adapter, so that it raises the ball swivel housing and at the same time pulls the

striker bolt up, compressing the striker spring.

(*g*) Turn the knurled safety nut until it moves up against the knurled cap.

e. Disarming Procedure.

(1) *Pressure fuze.*

(*a*) Check for and remove any antilift devices.

(*b*) Cut all slack trip wires.

(*c*) Remove the wing nut and the triangular metal plate.

(*d*) Remove the pressure covers from the fuzes.

(*e*) Carefully unscrew the fuzes from the mine.

(*f*) Unscrew the percussion-cap-and detonator assembly from the mine.

(*g*) Transport the mine and fuzes to a safe storage or disposal area.

(2) *For tilt rod.*

(*a*) Rotate the safety nut until it moves down flush with the top of the swivel housing.

(*b*) Rotate the knurled bushing until the swivel housing moves down flush with the knurled bushing. This releases the tension on the striker.

(*c*) Continue with steps in (1) (*e*) through (*g*) above.

65. Antitank Mine, Type 2 (T-39 or T-40) (Netherlands)

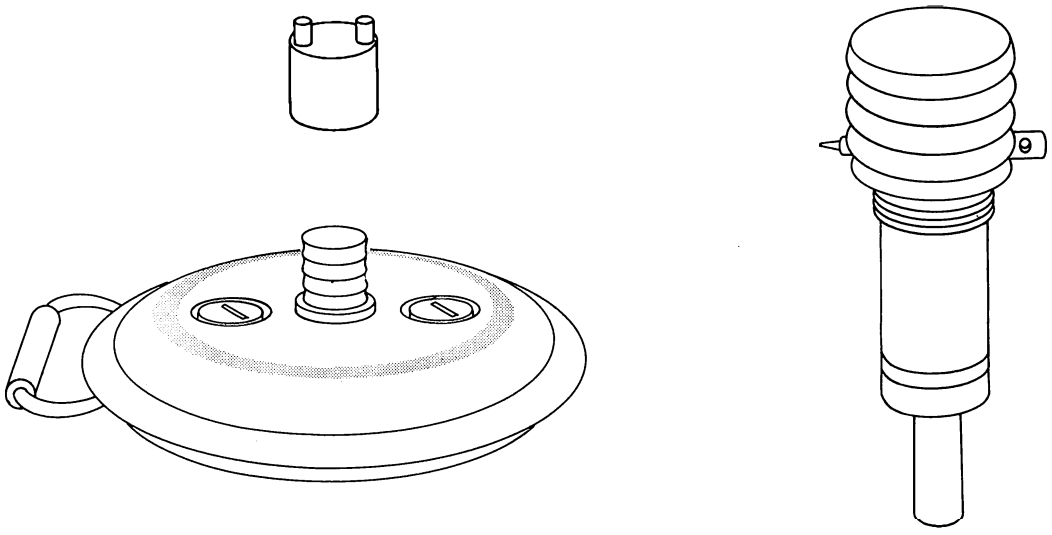


Figure 86

This steel mine is approximately 26.0 centimeters in diameter and 8.8 centimeters high. There are two filler plugs in the top of the mine case, 180° apart. The fuze in this mine has a copper water-proofing sheath that cannot be removed. The design of this mine makes it satisfactory for use in extremely wet areas.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	44NM	165 lb. pressure.....	9 lb.

Fuze hazards	Markings
Percussion cap.....	White ring completely encircling the top of the mine case.

b. Use. This is an antitank mine that may also be used for other purposes.

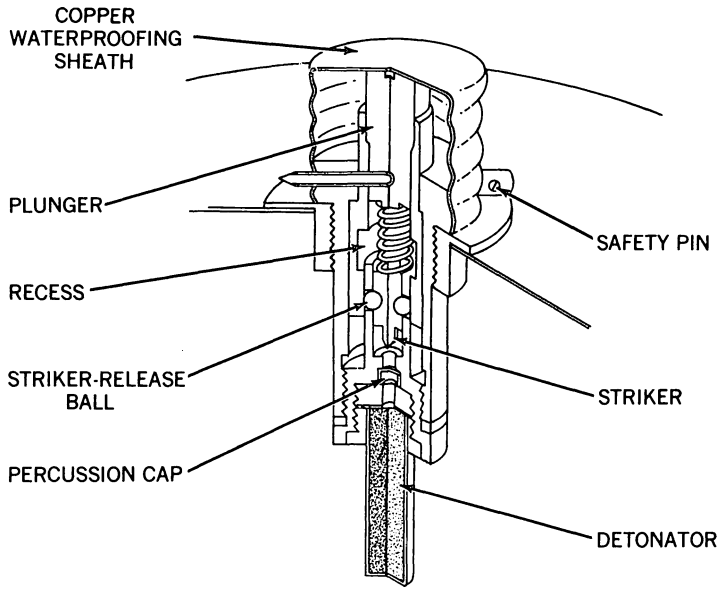


Figure 37

c. Functioning. Pressure exerted on the waterproofing fuze cover crushes it, depresses the plunger and plunger housing, and compresses the striker spring. When the recess in the plunger housing is opposite the striker-release balls, the balls escape into the recess, releasing the spring-loaded striker to fire the percussion cap, detonator, booster, and main charge.

d. Installing and Arming.

(1) Remove the protective cap.
(2) Screw the detonator into the base of the fuze.
(3) Screw the fuze into the mine.
(4) Pull the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Insert a safety-wire into the safety pin hole in the mine fuze.
(3) Carefully unscrew the fuze from the mine.
(4) Carefully unscrew the detonator from the fuze.
(5) Transport the mine and fuze to a safe storage or disposal area.

66. Tellermine 35 (Germany)

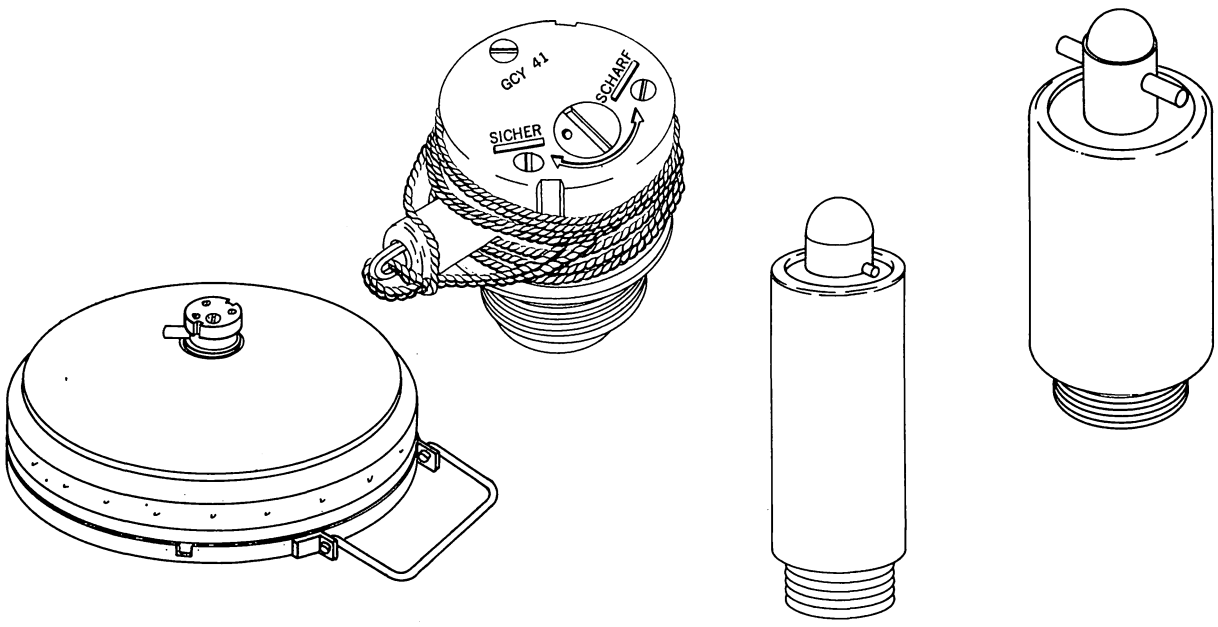


Figure 38

This steel mine is 31.7 centimeters in diameter and 8.2 centimeters high. The large, circular, steel pressure plate has a spring between it and the mine body. This spring is placed in the centrally located main fuze well. It has two secondary fuze wells. One is located in the side directly across from the carrying handle and the other is located in the bottom in the center.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Circular..	35	200 to 400 lb. pressure.	11 lb. TNT or 65/35 amatol or 50/50 tetrytol.	9 oz. Penthrite. (PETN/TNT 50/50).

Fuze hazards	Remarks
Percussion cap.....	A pressure bar to interconnect mines may be used.

b. Use. The Tellermine 35 is used as an antitank mine. This mine may be found encased in a waterproof jacket.

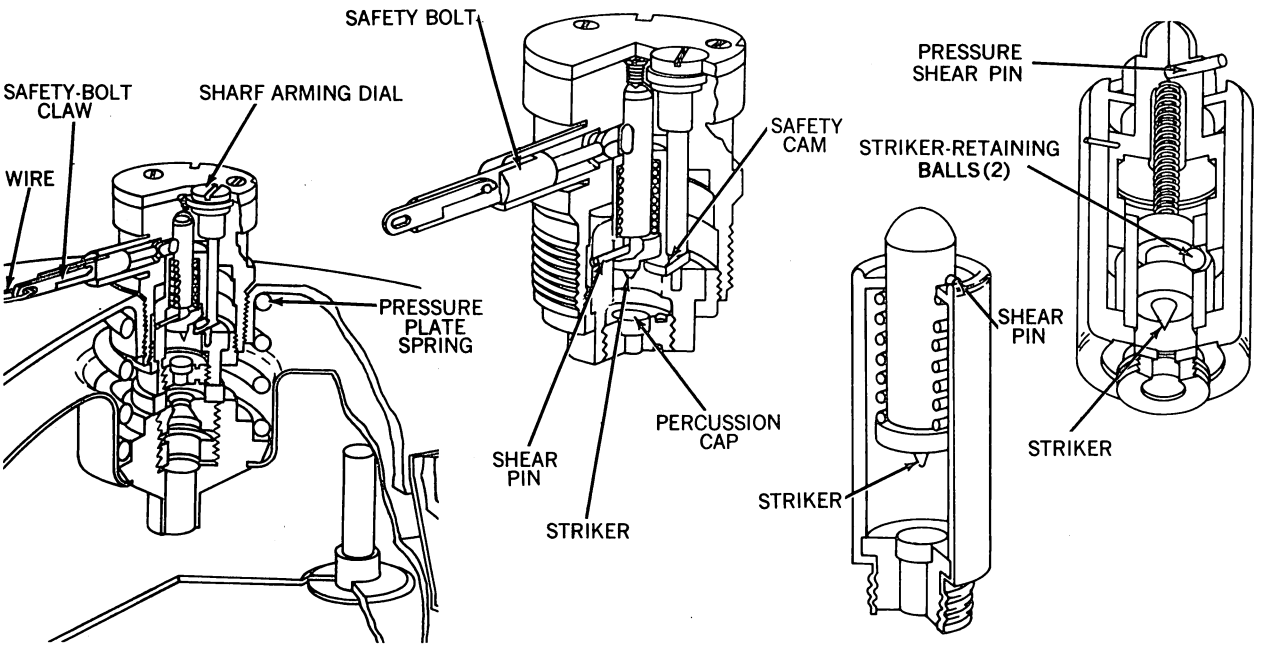


Figure 39

c. Functioning. Pressure on the pressure plate is transferred to the top of the fuze. This pressure forces the striker-shaft down, shears on the shear pin, and fires the percussion cap. The percussion cap in turn fires the detonator, booster, and mine.

d. Installing and Arming.

(1) Place the mine in a hole with the carrying handle in the horizontal or down position.

(2) Unscrew the wooden shipping plug from the main fuze well and insert a detonator in the fuze well.

(3) Screw in the threaded washer to hold the detonator in place and then screw in the adjusting collar (a special wrench is provided for this and the threaded washer).

(4) Place the rubber or leather washer in the groove of the adjusting collar.

(5) Screw the Tellermine fuze 35 into the main fuze well until it bears on the rubber or leather washer.

(6) If a secondary fuze is used, screw any pull fuze with standard threads into the secondary fuze well.

(7) Turn the screw head arming dial in the top of the Tellerfuze 35 so that the red dot points to *scharf* (armed).

(8) Pull out the safety bolt by the wire attached to the safety bolt claw.

e. Disarming Procedure.

(1) Check for and remove any secondary fuzes or antilift devices.

(2) Carefully press in the safety bolt. If it does not move easily, do not force it.

(3) Carefully unscrew the fuze from the mine.

(4) Separate the detonator from the fuze. Turn the arming dial to sicher (safe).

(5) Transport the mine and fuze to a safe storage or disposal area.

67. Training Tellermine 35 (Germany)

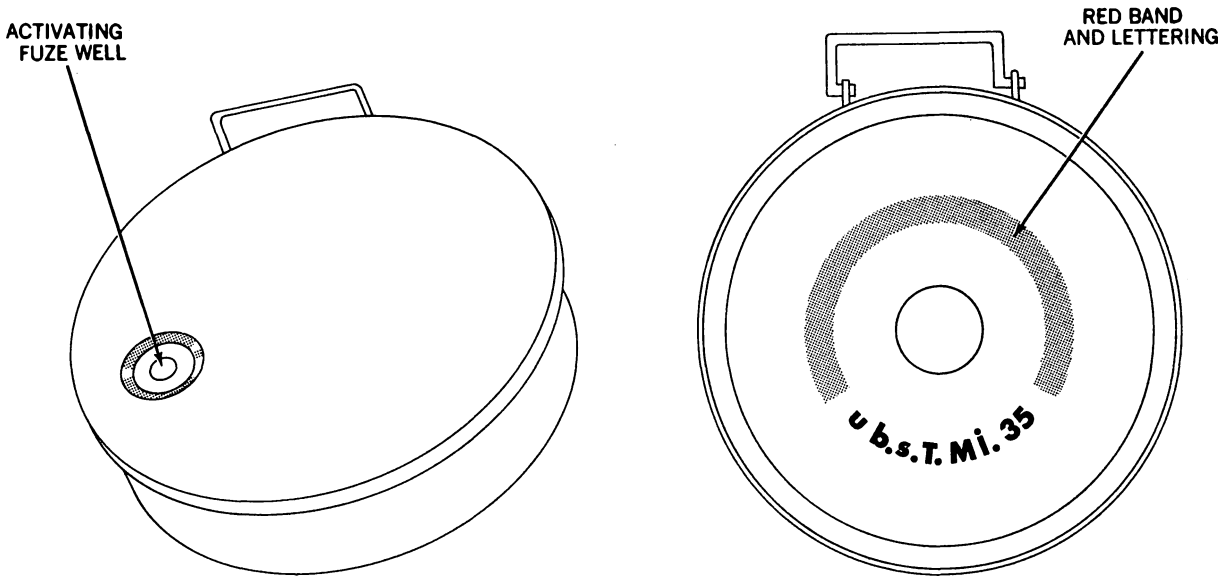


Figure 40

The training model Tellermine 35 is similar in appearance to the standard Tellermine 35 except that it has a red band and the letters Ub.S.T.Mi. 35 painted on the top. The construction of this mine is also heavier than that of its counterpart. The usual filling of smoke powder is provided instead of high explosive.

68. Light Antitank Mine (L.P.Z.) (Germany)

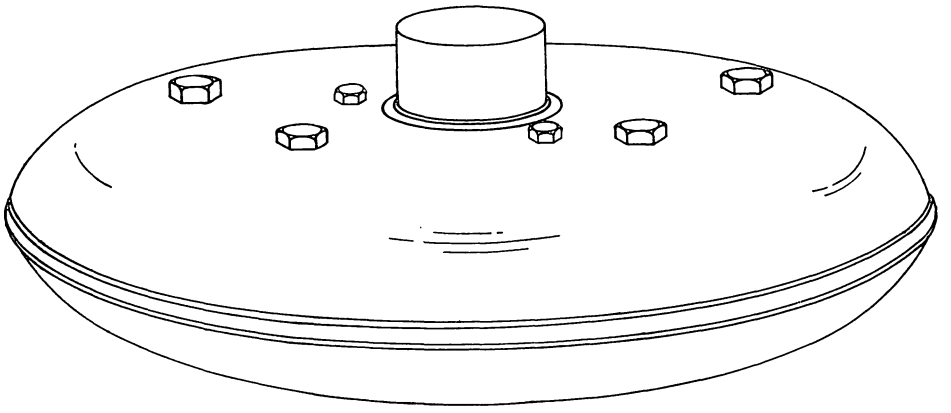


Figure 41

This steel mine is 26.6 centimeters in diameter and 6.2 centimeters high. It contains five built-in, ball-release type, pressure fuzes. There is also a centrally located detonator that is connected to each fuze by a flash tube. On the top is a protective cap covering a safety screw. The safety screw, when screwed down, closes the openings from the flash tubes to the detonators. On the top cover of the mine case are five hexagonal fuze plugs that cover the fuze wells. On the bottom of the mine case are five hexagonal nuts which are removed when the mine is employed as an antipersonnel mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Pressure	250-lb. minimum pressure for antitank use.	5 lb. TNT

b. Use. This mine may be used for antitank or antipersonnel purposes.

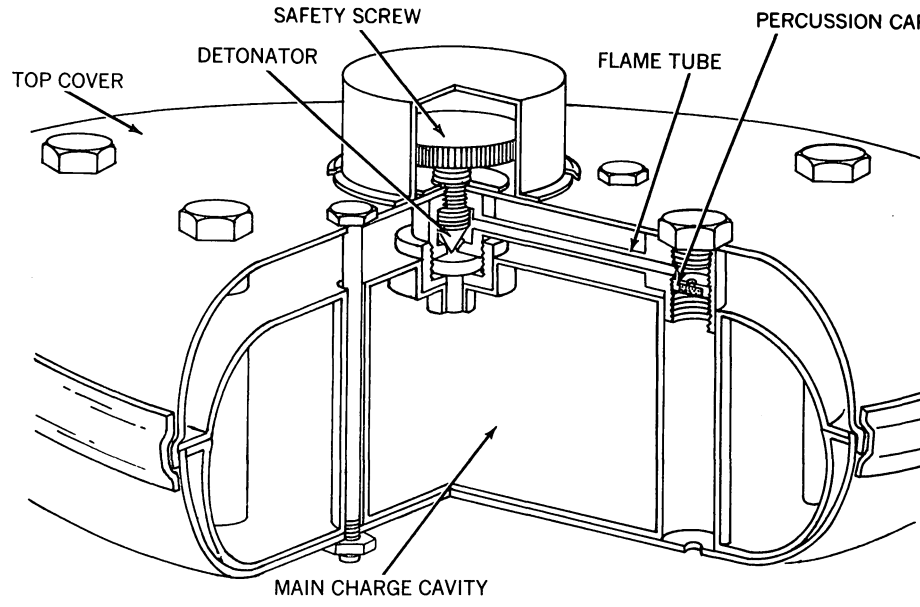


Figure 42

c. *Functioning.*
   (1) *Antitank.* Pressure crushes the top of the mine case and depresses the actuating sleeve of one or more of the fuzes until the actuating sleeve clears the striker-retaining balls, releasing the spring-loaded striker against the percussion cap. The percussion cap produces a flame that travels through the flash tube to the flash chamber, firing the detonator and the main charge.
   (2) *Antipersonnel.* With the fuze nuts on the bottom of the mine case removed, light pressure on the top of the mine depresses the entire mine, except the plunger-and-striker assembly of each fuze, until the actuating sleeve of one or more of the fuzes clears the striker-retaining balls, releasing the spring-loaded striker against the percussion cap. The percussion cap produces a flame that travels through the flash tube and fires the mine.

d. *Installing and Arming.*
   (1) Bury the mine so that the safety screw cap is flush with the surface of the ground.
   (2) Attach a percussion cap to each of the five fuzes.
   (3) Remove the five fuze well caps and insert the five fuzes and tighten the fuze nuts (if set for antipersonnel use, the bottom nuts are not used and the mine rests on the threaded ends of the plungers and on a flat hard surface).
   (4) Replace the five fuze well caps.
   (5) Cover the mine.

e. *Disarming Procedure.*
   (1) Check for and remove any antilift devices.
   (2) Remove the protective cap and turn the safety screw clockwise, screwing it all the way in until the white line marked *safe* on the screw head lines up with the white indicator on the mine case.
   (3) Carefully lift the mine from the hole without applying any pressure on the top and check to see if the bottom fuze plugs are in place. The mine is very sensitive if they are not in place.
   (4) Stand the mine on edge and remove the five top fuze plugs, the percussion cap holders, and the percussion caps.

(5) Remove the three hexagonal nuts from the top cover and pry it loose.
(6) Unscrew the detonator holder and remove the detonator.
(7) Transport the mine and fuzes to a safe storage or disposal area.

69. Antivehicular Mine, Type 93 (Japan)

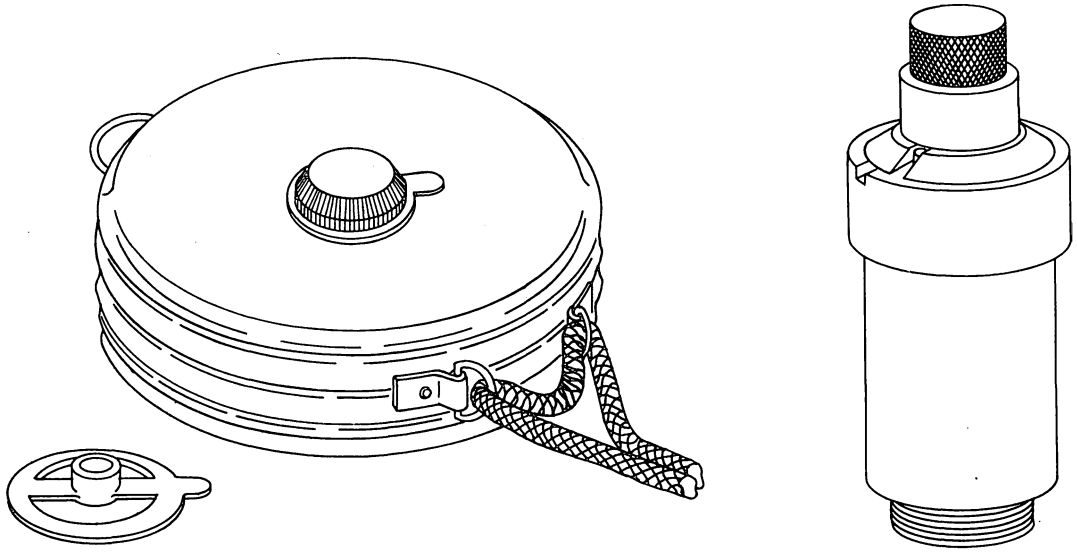


Figure 43

This copper or tin cased mine is 17.1 centimeters in diameter and 4.4 centimeters high. The top portion of the mine has a centrally located pressure plug over the fuze well. Pressure is transferred to the fuze by a pressure plate.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	93	250 lb. or more.	2 lb. picric acid.

Remarks

Picric-acid explosives in close contact with metal produce very sensitive explosive crystals. If there is any indication of any deterioration, no attempt should be made to disarm this mine. It should be destroyed in place.

b. Use. This is an antivehicular mine usually laid in pairs because of the light explosive charge.

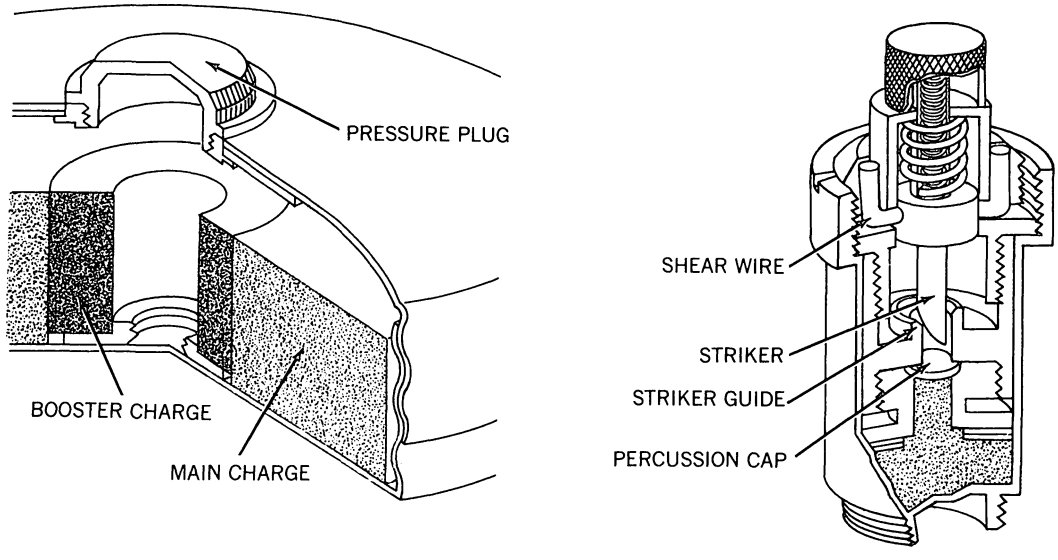


Figure 44

c. Functioning. Pressure on the pressure plate or the pressure plug shears the shear wire in the fuze. This releases the cocked striker against the percussion cap, firing it, the detonators, the booster, and the main charge.

d. Installing and Arming.

(1) Unscrew the pressure plug and remove the safety collar.
(2) Unscrew the safety cap from the fuze.
(3) Screw the fuze into the mine.
(4) Screw on the pressure plug.
(5) Bury the mine with the pressure plug at ground level.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Carefully unscrew the pressure plug from the mine.
(3) Carefully unscrew the fuze from the mine.
(4) Unscrew the outer case of the fuze and remove the main detonator.
(5) Unscrew the percussion cap and the primary detonator assembly.
(6) Transport the mine and fuze to a safe storage or disposal area.

70. Dual-Purpose Mushroom-Top Mine (Netherlands)

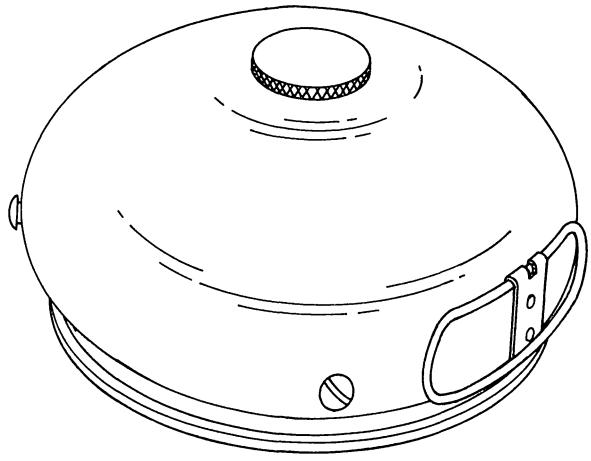


Figure 45

This mine has a centrally located main fuze well covered by a brass cover plug and a large pressure cover to transfer the pressure to the fuze. There are two models. One, marked on the top with the letters "A2", was manufactured in the United States. The other, marked with the letters "P.W.2", was manufactured in Holland and Java. The model "P.W.2" has a low operating pressure, no safety pin, and a booster charge as an integral part of the fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Pressure.	A2: 180 to 240 lb. pressure.	A2: 5.25 lb. TNT
	Pressure.	P.W.2: 50 lb. pressure.	P.W.2: 5.25 lb. TNT

b. Use. This mine may be used as an antitank or antipersonnel mine.

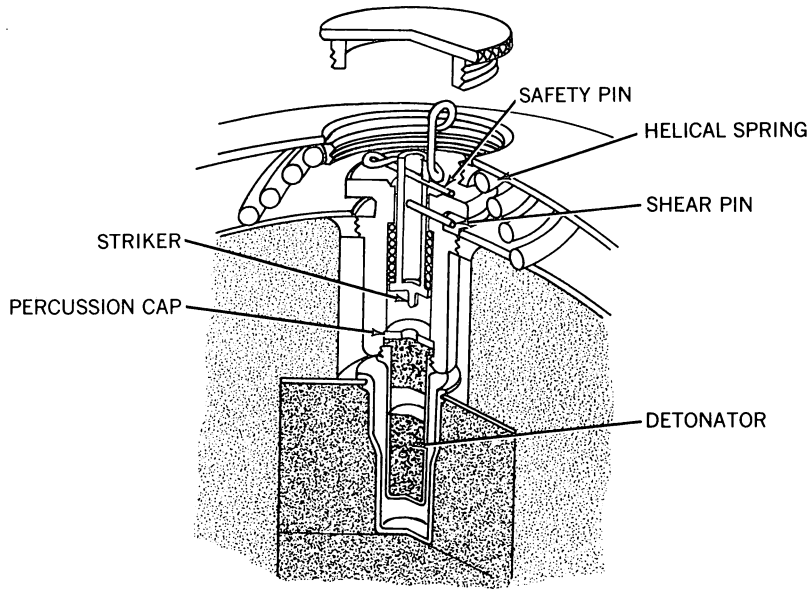


Figure 46

c. Functioning. Pressure on the pressure cover shears the copper shear pin and releases the striker. The striker, driven by the compressed spring, fires the percussion cap and the mine.

d. Installing and Arming.

(1) Remove the brass covered plug and the wax cork from the fuze well.
(2) Check to see that the helical spring is in place.
(3) Screw in the fuze.
(4) Remove the striker protector cover from the pressure lid.
(5) Looking through the viewing slots, place the pressure lid on the mine so that the striker is just over the percussion cap.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Unscrew the brass cover plug.
(3) Insert a safety-wire in the safety pin hole of the fuze if one is there.
(4) Carefully unscrew the fuze from the mine.
(5) Separate the percussion cap, detonator and booster from the fuze if possible.
(6) Transport the mine and fuze to a safe storage or disposal area.

71. Variable-Pressure, General Purpose Mine, CVP—1 (Hungary)

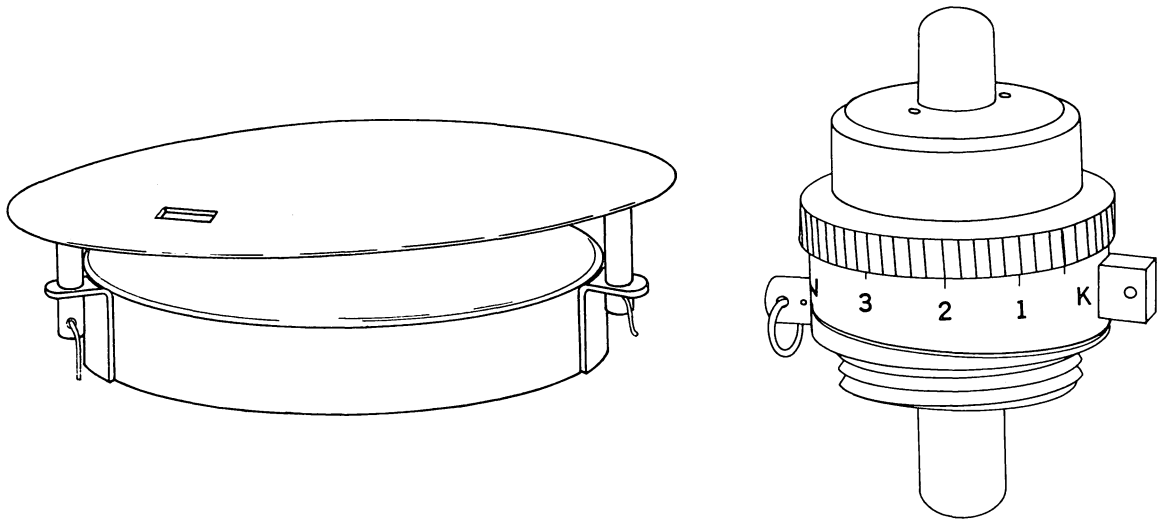


Figure 47

This steel mine is 20.3 centimeters in diameter and approximately 7.6 centimeters high. It has a centrally located main fuze well in the top of the mine case and a large pressure plate supported by three steel lugs. There is a small rectangular slot in the pressure plate that is used for attaching a carrying strap. This mine employs a variable-pressure pull fuze. The amount of pressure required is varied by rotating the knurled setting ring, which causes the shear blade to move in or out. The settings run from K (77 lb.) through N (770 lb.). H is the setting for pull.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Variable pressure and/or pull.	77 to 770 lb. pressure.	3.5 lb. TNT

b. Use. This mine is used as an antivehicular or antipersonnel mine.

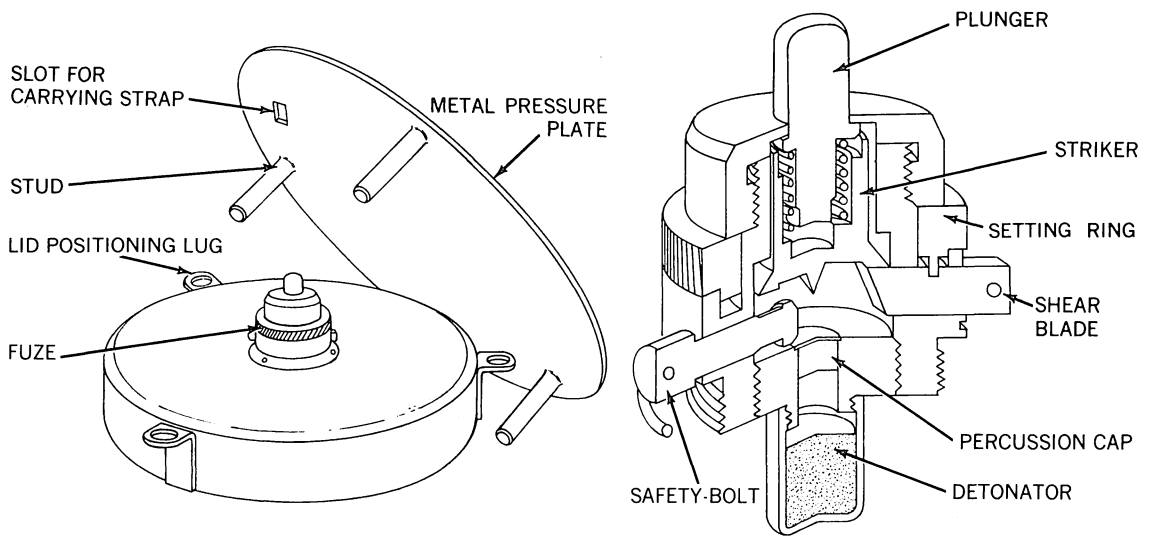


Figure 48

c. Functioning.

(1) *Pressure.* Pressure exerted on the pressure plate is transmitted to the top of the fuze plunger. The plunger compresses the striker-spring and forces the striker down on the shear blade. The blade shears off a part of the flanged striker head, releasing the striker against the percussion cap, which fires the detonator and in turn the mine.

(2) *Pull.* A pull on the tripwire, which is attached to the shear blade, pulls the blade out of the fuze, allowing the striker to fall on the percussion cap, firing it. This fires the detonator and in turn the mine.

d. Installing and Arming.

(1) Turn the setting ring for the proper pressure.

(2) Screw the detonator into the fuze.

(3) Screw the fuze into the mine, and plant the mine so that the pressure plate is flush with the surface of the ground.

(4) Attach a trip wire if the setting H is used.

(5) Place the pressure plate on the mine with the studs in the holes provided in the brackets. Insert a piece of wire in the hole provided in each of the studs.

(6) Withdraw the safety pin by a string attached to the ring.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Cut any slack trip mine attached to the fuze.

(3) Remove the pressure plate.

(4) Insert a safety wire into the safety bolt hole of the fuze.

(5) Press in on the shear blade and carefully unscrew the fuze from the mine.

(6) Unscrew the detonator assembly from the fuze.

(7) Transport the mine and fuze to a safe storage or disposal area.

72. Antitank Mine (Poland)

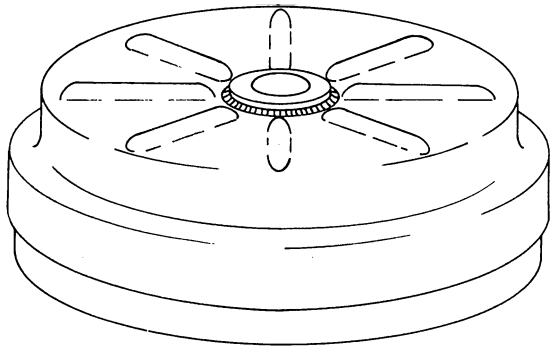


Figure 49

This steel antitank mine is 19.7 centimeters in diameter and 6.2 centimeters high. It has one centrally located main fuze well. The entire top section of the mine acts as a pressure plate. The bottom section contains the explosive consisting of four blocks held in place by metal clips.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Pressure mechanical.	88 lb. pressure.	2 lb. TNT

b. Use. Although classified as an antitank mine this mine seems more suitable as an antipersonnel mine due to its light charge and pressure requirements.

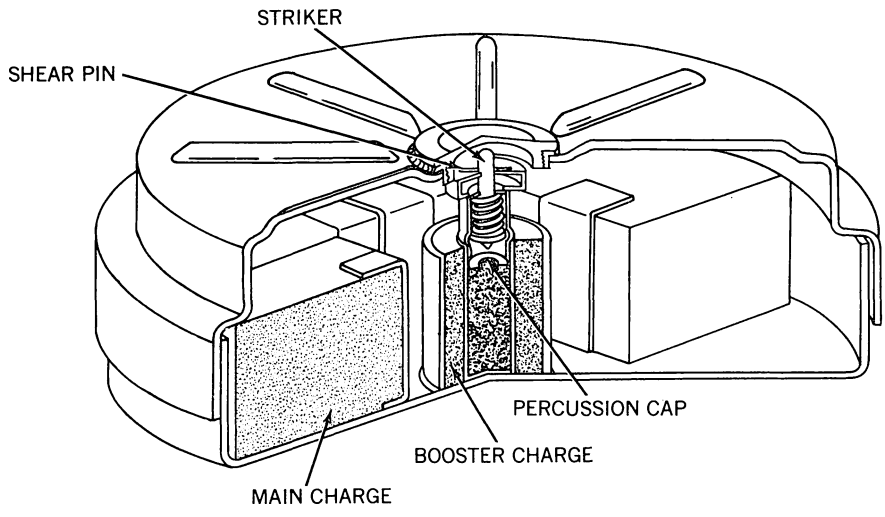


Figure 50

c. Functioning. Pressure on the top of the mine case crushes the lid, depresses the striker, shears the shear pin, and allows the striker to be driven into the percussion cap. This in turn fires the detonator, booster, and main charge.

d. Installing and Arming.

(1) Unscrew the plug from the center of the lid.

(2) Examine the fuze closely to make certain that the shear pin is not damaged in any way.

(3) Replace the plug in the center of the lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the plug from the center of the lid.

(3) Carefully remove the fuze by lifting it out of the fuze well.

(4) Separate the fuze and booster assembly.

(5) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. This fuze has no safety device.

73. Tellermine 35 (Steel) (Germany)

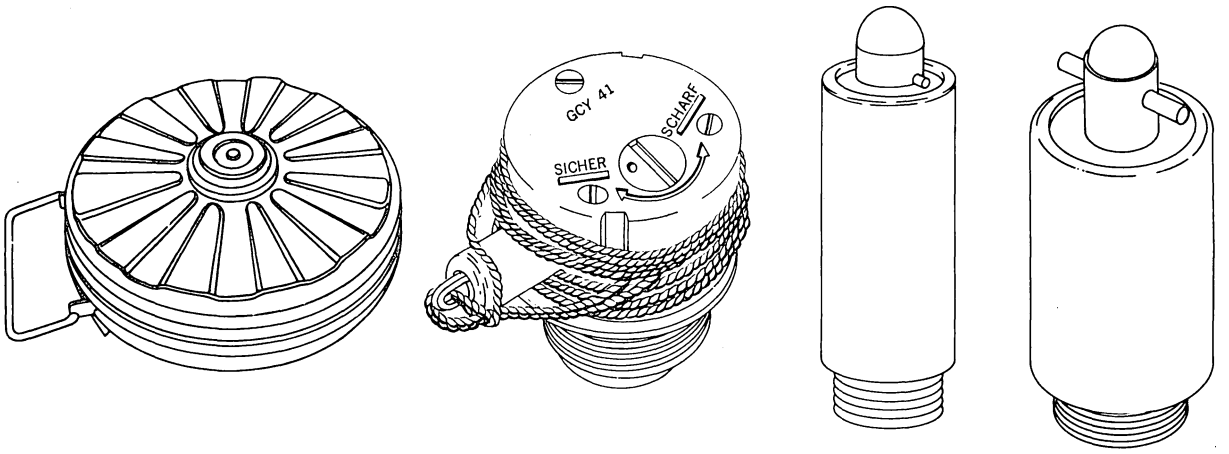


Figure 51

This steel mine is 31.7 centimeters in diameter and 8.8 centimeters high. It differs from the Tellermine 35 by having a fluted pressure plate to keep the sand from blowing off in desert areas. It has one centrally located main fuze well that is hidden by a pressure plug when either the Tellermine 42 or 43 fuze is used, but is not used with the Tellermine 35 fuze. One secondary fuze well is located in the bottom of the mine case directly in line with the carrying handle, and another in the side of the mine case in the vicinity of the carrying handle.

a. Characteristics.

Shape	Fuze	Operating force	Explosive		Secondary fuze wells
			Main charge	Booster	
Circular..	T.Mi 35 T.Mi 42 T.Mi 43	200 lb. pressure.	12 lb. TNT	9 oz. penthrite (penthrite is PETN/TNT 50/50).	2

Fuze hazards	Markings	Remarks
Percussion cap.	"T.Mi.35/T.Mi. Z." 42" in white.	Lugs are added to late models for attaching trip-wires.

b. Use. This mine used as an antitank mine in desert areas. It may also be encased in an earthenware waterproof jacket.

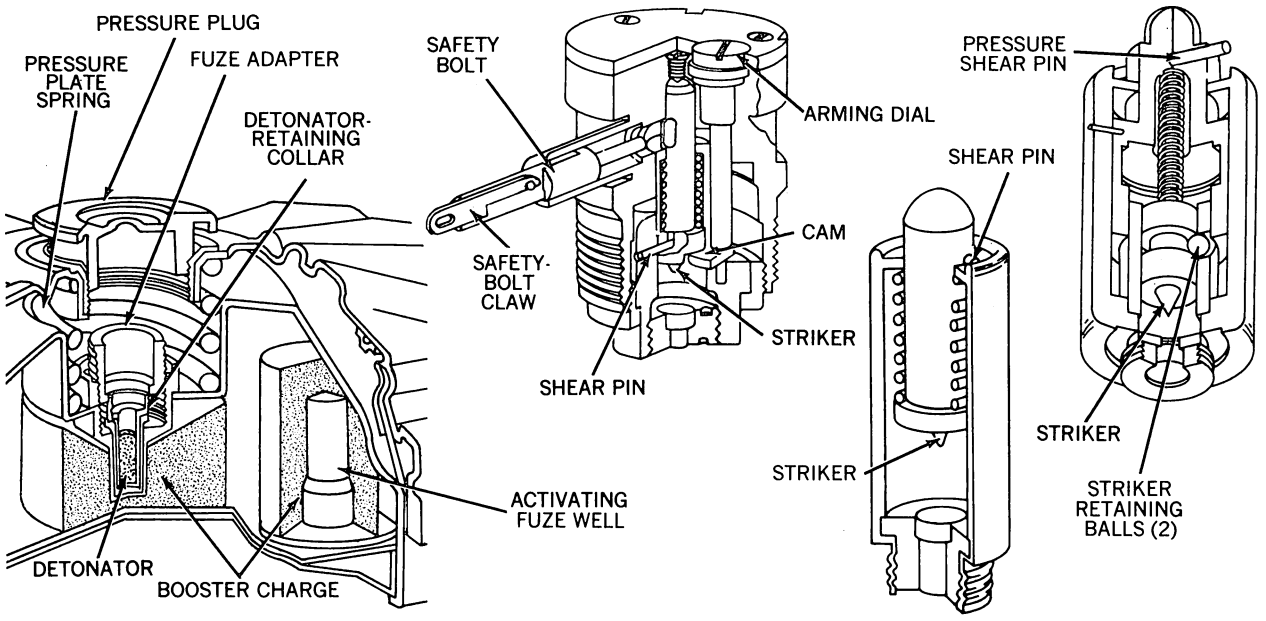


Figure 52

c. Functioning. Pressure on the pressure plug or the pressure plate is transmitted to the top of the fuze. This forces the striker shaft down, shears the shear pin, and fires the percussion cap, detonator booster, and the mine.

d. Installing and Arming.

(1) *Tellermine fuze 35.*

(*a*) Place the mine in the ground.

(*b*) Unscrew the pressure plug from the main fuze well and insert a detonator. The pressure plug is not used.

(*c*) Screw in the threaded washer to hold the detonator in place and then screw in the adjusting collar. A special wrench is provided in the fuze packing box for screwing in the threaded washer and the adjusting collar.

(*d*) Place the rubber or leather washer in the groove of the adjusting collar.

(*e*) Screw the Tellermine fuze 35 into the main fuze well until it bears on the rubber or leather washer.

(*f*) If a secondary fuze is used, screw any pull fuze with standard threads into a secondary fuze well and arm as specified.

(*g*) Turn the screw head arming dial in the top of the Tellermine fuze 35 so that the red dot points to *scharf* (armed).

(*h*) Pull the safety bolt out by the wire attached to the safety bolt claw.

(2) *Tellermine fuze 42.*

(*a*) Place the mine in the ground.

(*b*) Unscrew the pressure plug from the main fuze well and screw a fuze adapter into the fuze well.

(*c*) Screw a detonator retaining collar with the detonator to the base of a Tellermine fuze 43.

(*d*) Insert the Tellermine fuze 42 with detonator into the fuze adapter.

(*e*) Screw on the pressure plug.

(*f*) If a secondary fuze is used, screw pull fuze with standard threads into a secondary fuze well and arm as specified.

(3) *Tellermine fuze 43.*

(*a*) Place the mine in the ground.

(*b*) Unscrew the pressure plug from the main fuze well and screw a fuze adapter into the fuze well.

(*c*) Screw a detonator retaining collar with the detonator to the base of a Tellermine fuze 43.

(*d*) Insert the Tellermine fuze 43 with detonator into the fuze adapter.

(*e*) Screw the pressure plug down until a click is heard. This indicates that the arming shear pins have sheared and the fuze is now armed.

(*f*) If activating is required, screw any pull fuze with standard threads into an activating fuze well and arm as specified.

e. Disarming Procedure.

(1) *Tellermine 35.*

(*a*) Check for and remove any secondary fuzes or antilift devices.

(*b*) Carefully press in the safety bolt. If it does not move easily, do not force it.

(*c*) Carefully unscrew the fuze from the mine.

(*d*) Separate the detonator from the mine. Turn the arming dial to safe (*sicher*).

(*e*) Transport the mine and fuze to a safe storage or disposal area.

(2) *Tellermine 42 or 43 fuze.*

DO NOT ATTEMPT TO DISARM THE MINE WHEN THESE FUZES ARE USED. As the pressure plug cannot be removed to identify the fuze, consider the mine as armed with 43 fuze (par. 328). The mine should be blown in place by laying a 1-pound charge of TNT on top of the pressure plate next to the fuze.

f. Additional Precautions. If for any reason the mine cannot be blown in place, check for and remove any secondary fuzes or antilift devices, and carefully pick up the mine and carry it to the closest safe disposal area.

74. Tellermine 42 (Germany)

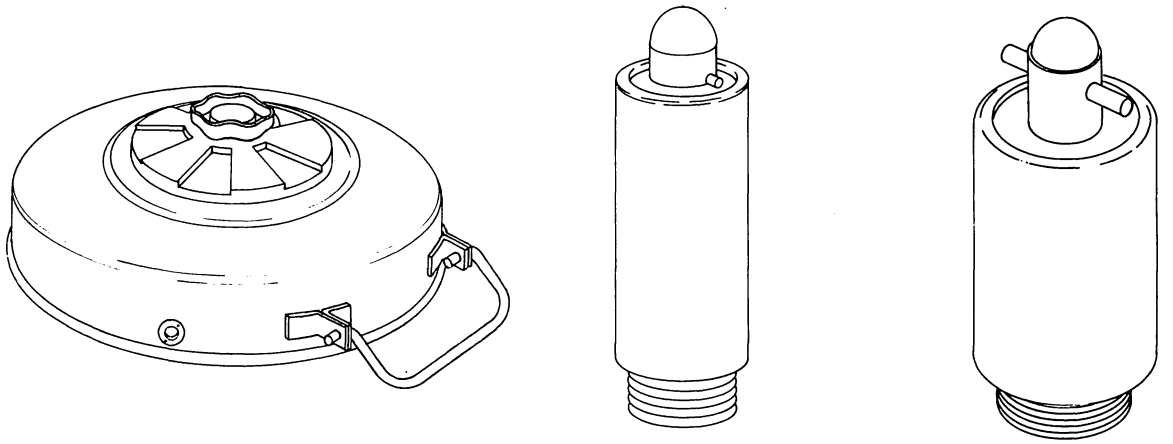


Figure 53

This steel mine is 32.2 centimeters in diameter and 10.1 centimeters high. It has a circular steel pressure plate 15.2 centimeters in diameter. A scalloped pressure plug in the center of the pressure plate covers the main fuze well. There are two secondary fuze wells—one in the side of the mine case close to the carrying handle, the other in the bottom of the mine case slightly off-center in the direction of the carrying handle.

a. Characteristics.

Shape	Fuze	Operating force	Explosive		Secondary fuze wells
			Main charge	Booster	
Circular..	T.Mi 42 or T.Mi 43	250 to 400 lb. pressure.	12 lb. TNT	12 oz. PETN/ Wax 91/9 (approx).	2

Fuze hazards	Markings
Percussion cap, and two secondary fuze wells.	Manufacturer's date and number in white on the top.

b. Use. This antitank mine is laid in roads and minefields.

c. Functioning.

(1) *Tellermine fuze 43.* Pressure applied on the pressure plate forces the pressure sleeve down, shearing the main shear pin, then permitting the retaining balls to escape and releasing the striker against the percussion cap. Pressure release action is initiated by the unscrewing of the hexagonal pressure plug, which releases the striker against the percussion cap.

(2) *Tellermine fuze 42.* Pressure on the pressure plate shears the shear pin, releasing the striker against the percussion cap.

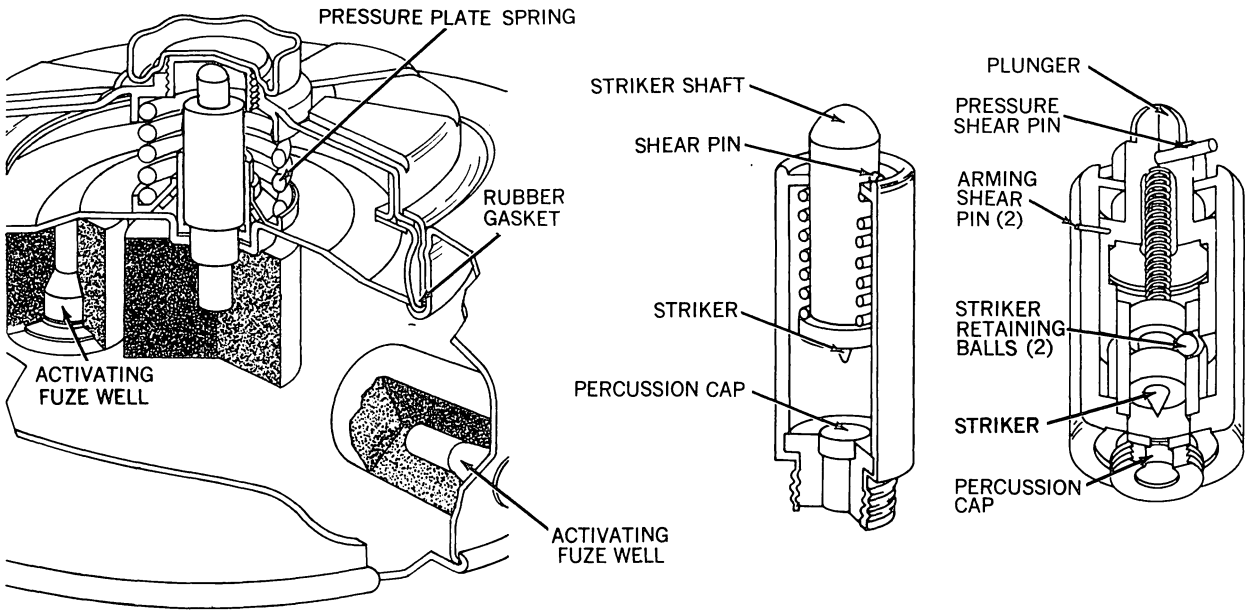


Figure 54

d. Installing and Arming.

(1) Place the mine in the ground with the carrying handle horizontal or down.
(2) Unscrew the hexagonal pressure plug from the main fuze well.
(3) Screw detonator retaining collar with detonator to the fuze.
(4) Insert the fuze with detonator into the main fuze well.
(5) Screw in the hexagonal pressure plug. If the Tellermine fuze 43 is used, screw the hexagonal pressure plug down until a click is heard. This assures that the fuze is armed.

e. Disarming Procedure. **Do not attempt to disarm this mine,** as the pressure plug cannot be removed in order to identify the fuze. **Blow the mine in place.**

f. Additional Precautions. If for any reason the mine cannot be blown in place, check for and remove any secondary fuzes or antilift devices and carefully pick up the mine and carry it to the closest safe disposal area.

75. Tellermine 43 (Germany)

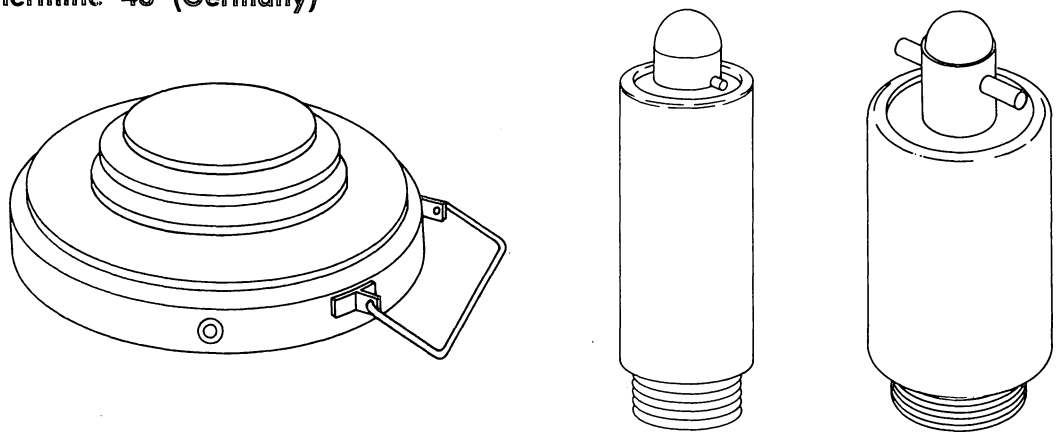


Figure 55

This steel mine is 30.7 centimeters in diameter and 10.1 centimeters high. It has a mushroom shaped pressure plate, 19.0 centimeters in diameter, but no pressure plug. The entire pressure plate unscrews to reveal the centrally located main fuze well. There are two secondary fuze wells. One is located in the side of the mine case near the carrying handle, the other, in the bottom of the mine case slightly off-center and directly in line with the secondary fuze well in the side. This mine may be found encased in an earthenware waterproof jacket.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Circular...	Teller-mine.	570 lb. pressure.	12 lb. TNT	12 oz. PETN/Wax-91/9 (approx).

Fuze hazards	Markings
Percussion cap, and two secondary fuze wells.	"T.Mi-Pilz 43/T-Mi.Z.42 13A" in white.

b. Use. The Tellermine 43 is used as an antitank mine.

c. Functioning.

(1) *Tellermine fuze 43.* Pressure on the pressure plate forces the pressure sleeve down, shearing the main shear pin, then moving downward, to release the retaining balls and free the striker to fire the percussion cap. Pressure-release action occurs when the pressure plate is unscrewed, permitting the pressure sleeve to move upward and release the retaining balls, which free the striker against the percussion cap.

(2) *Tellermine fuze 42.* Pressure on the pressure plate shears the shear pin and releases the striker to fire the percussion cap.

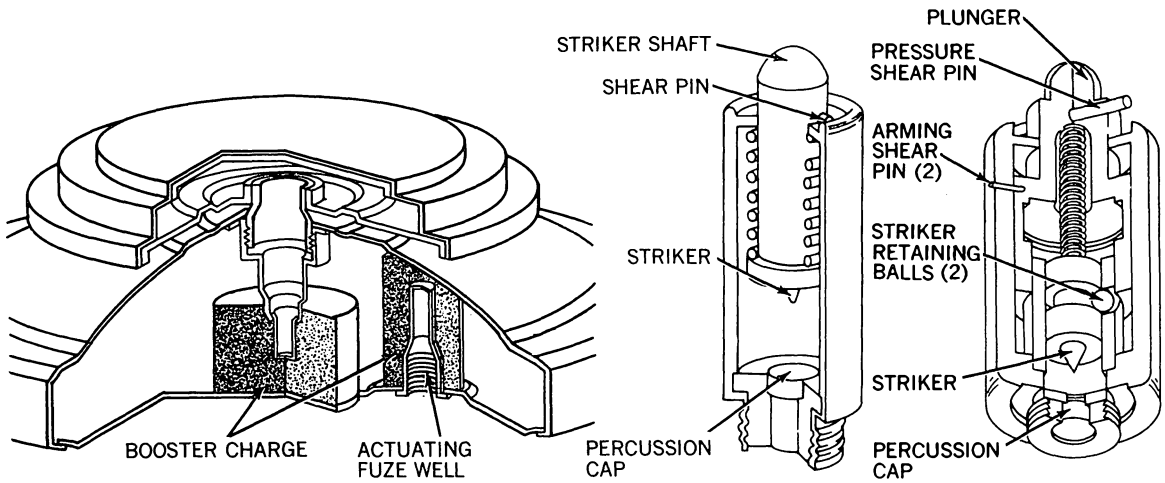


Figure 56

d. Installing and Arming.

(1) Place the mine in the ground with the carrying handle horizontal or down.
(2) Unscrew the pressure plate.
(3) Screw a detonator retaining collar and detonator to the base of the fuze.
(4) Insert the fuze and detonator into the fuze well, and screw down the pressure plate until a click is heard. This indicates that the fuze is armed.

e. Disarming Procedure. **Do not attempt to disarm this mine,** as the pressure plate cannot be removed in order to identify the fuze. **Blow the mine in place.**

f. Additional Procedure. If for any reason the mine cannot be blown in place, check for and remove any secondary fuzes or antilift devices, and carefully pick up the mine and carry it to the closest safe disposal area.

76. Antitank Mine, Model 1948 (France)

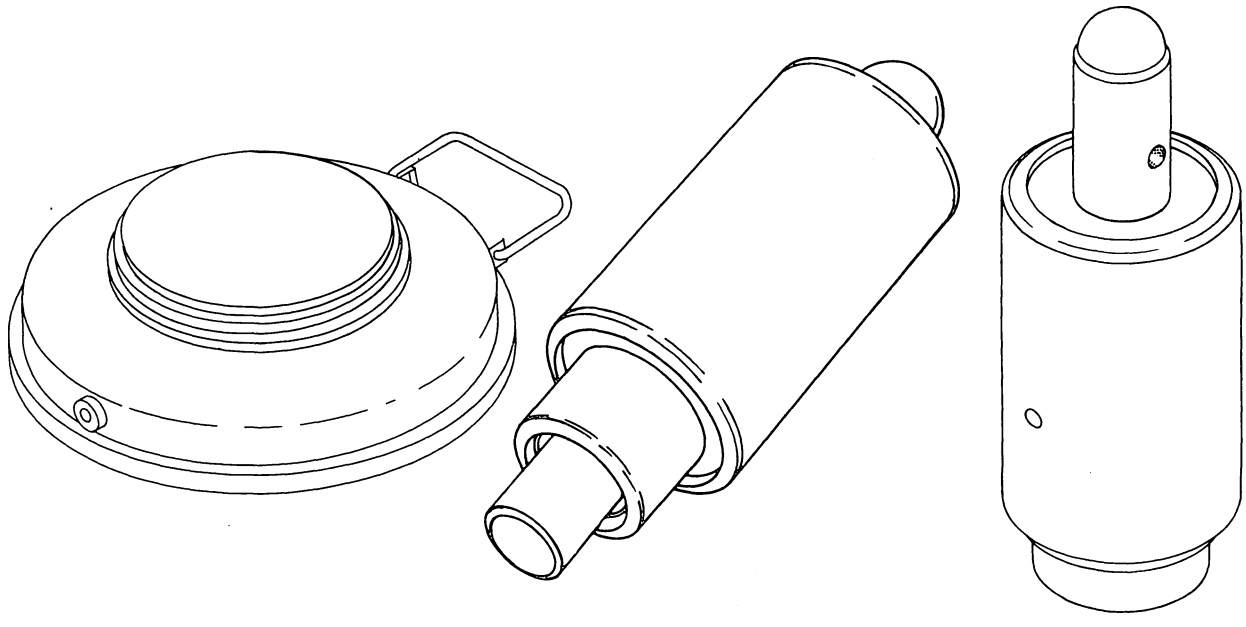


Figure 57

This steel mine is 32.0 centimeters in diameter and 8.8 centimeters high. It is the French version of the German Tellermine Model 43. It has a large circular pressure plate that completely covers the centrally located main fuze well. There are two secondary fuze wells—one located in the side directly across from the carrying handle, the other in the bottom of the mine case. This mine is a standard item of French mine-warfare equipment.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
1948 circular.	Press, Model 1948. or Antidisturbance Model 1952.	330 lb. pressure.	11.5 lb. TNT or MD (20% dinitronapthalene, 80 per cent picric acid).

Fuze hazards	Markings	Remarks
Percussion cap.	Manufacturers' symbol and lot number on the upper surface.	As the antidisturbance fuze, Model 1952 (a copy of the German T.M1. 43 fuze) can be used, all mines of this type should be considered so armed.

b. Use. This mine is usually laid in antitank mine fields or roads.

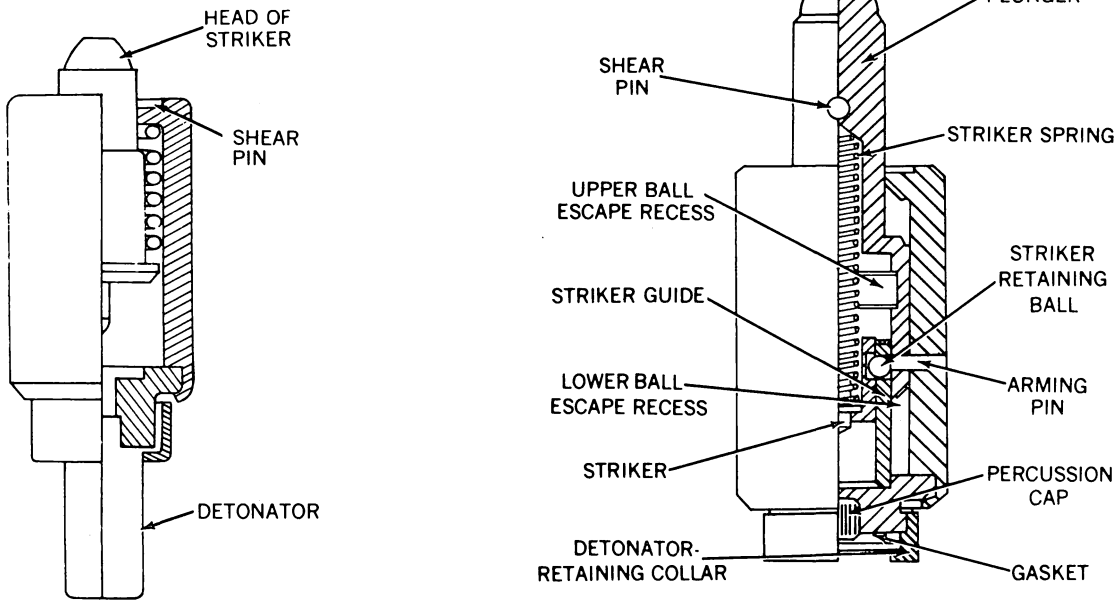


Figure 58

c. Functioning. Pressure on the pressure plate breaks the fuze shear pin (pressure, Model 1948), thus releasing the spring-loaded striker to drive into the detonator. If the Model 1952 antidisturbance fuze is used, the arming pin is sheared when the pressure plate is put in place, after which the fuze functions under pressure or by pressure release on the removal of the pressure plate.

d. Installing and Arming.

(1) Remove the pressure plate.

(2) Attach a detonator to the Model 1948 pressure fuze or the Model 1952 antidisturbance fuze.

(3) Insert the fuze in the well.

(4) Replace the pressure plate (When the Model 1952 antidisturbance fuze is used, turn the pressure plate down until the sound of the snapping of **the arming pin is heard.**)

e. Disarming Procedure. **Never attempt to disarm this mine,** as it is impossible to determine by inspection the type of fuze that is used. **It should be destroyed where it is laid.**

77. Antitank Mine, Type D (Italy)

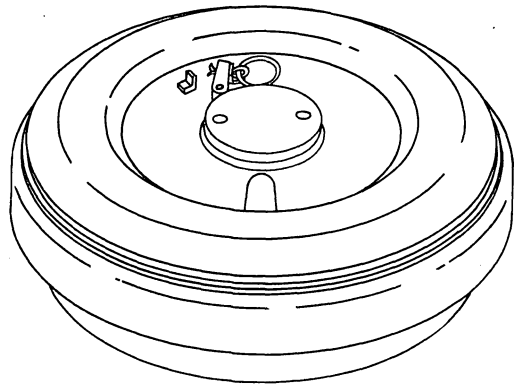


Figure 59

This steel mine is 30.4 centimeters in diameter and 9.3 centimeters high. A steel band completely encircles the mine to form a waterproof seal. The centrally located main fuze well is covered by a pressure plug. A threaded plug in the bottom of the mine case provides access to the detonator well. An arming lever on the top of the mine case is held in the safe position by a safety pin fastened through it and the safe stop. Moving the arming lever to the armed stop arms the mine, after which the arming lever cannot be returned to the safe position.

a. Characteristics.

Shape	Fuze	Operating force
Circular.....	Pressure type D, integral.	150 lb. pressure (approx).

b. Use. This is an antitank or antivehicular mine.

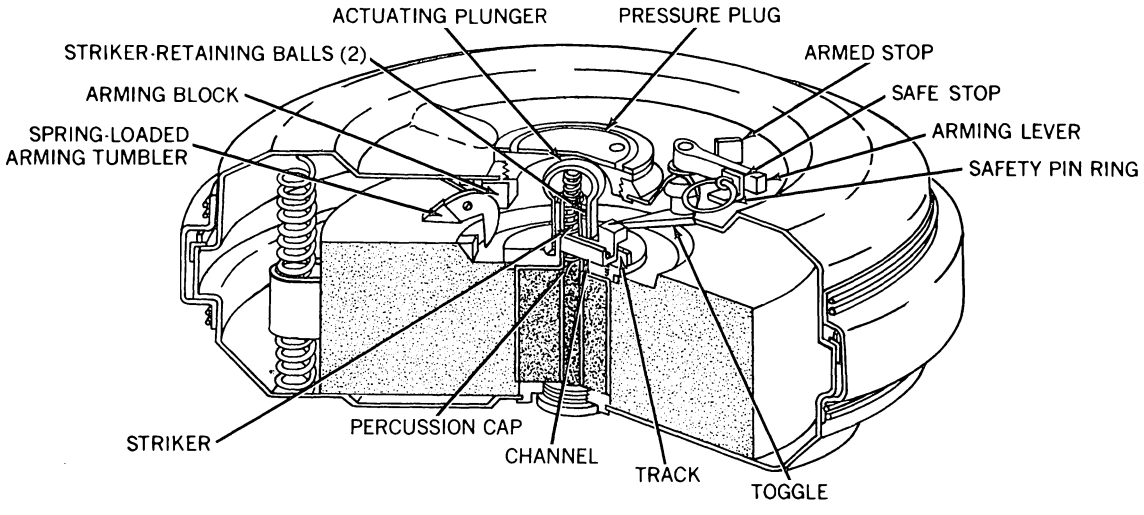


Figure 60

c. Functioning. Pressure exerted on the top cover compresses the two pressure springs and depresses the actuating plunger until the two striker-retaining balls escape into the spherical head of the plunger, releasing the spring-loaded striker against the percussion cap, firing the detonator, the booster, and the mine.

d. Installing and Arming.

(1) Unscrew the plug in the bottom of the mine and insert the percussion cap. Replace the plug.

(2) Place the mine in a hole with the top flush with the surface.

(3) Remove the safety pin holding the arming lever to the *safe* stop and move the lever to the *armed* stop.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the plug in the bottom of the mine and remove the detonator assembly.

(3) Transport the mine and fuze to a safe storage or disposal area.

78. Railway Mine, Type I (Italy)

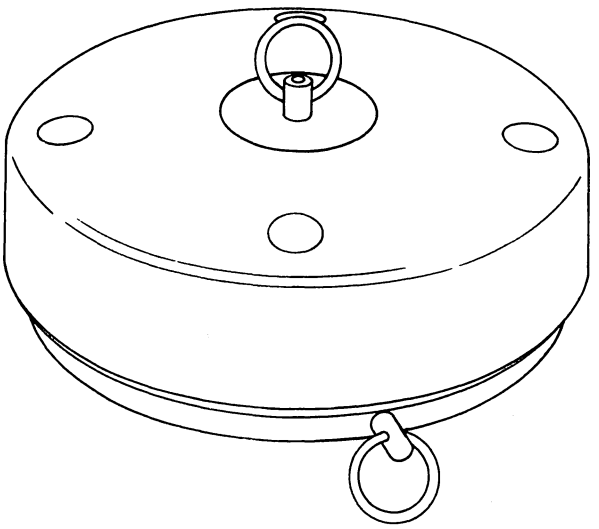


Figure 61

This metallic mine is 30.4 centimeters in diameter and 10.1 centimeters high. The top section, which serves as a pressure cover, overlaps the bottom section and is attached to it by four bolts. Each bolt is surrounded by a spring that acts as a pressure spring for the top section. A percussion cap and detonator assembly is screwed into a detonator holder in the bottom center. The striker is located in the center of the top section and consists of a pointed steel rod screwed through the top section to protrude inside of the top cover. The striker shaft has a carrying ring on its outer end.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Integral pressure.	30 to 40 lb. pressure.	8 to 9 lb. gelignite.

b. Use. This mine is laid under a railroad rail or tie; but because of its light operating pressure, it may be used as an antipersonnel mine.

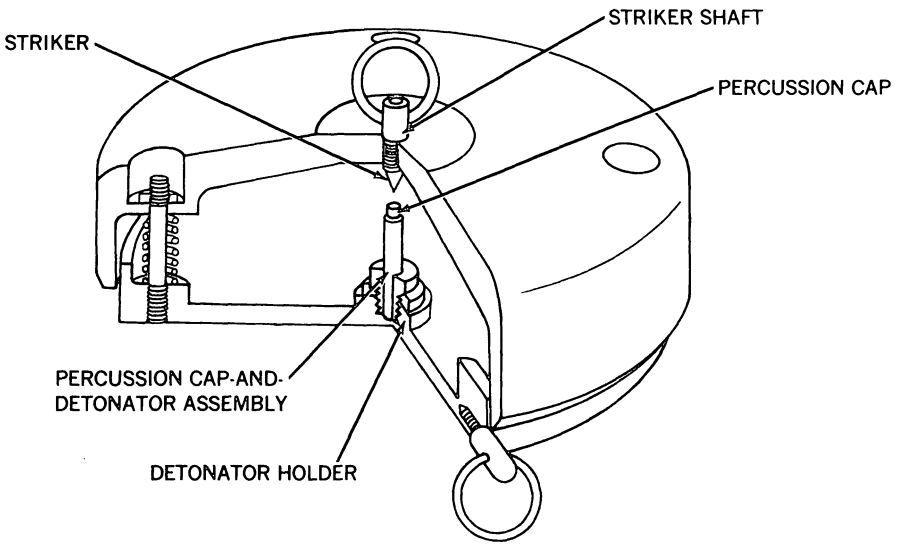


Figure 62

c. Functioning. Pressure on the top section of the mine case forces it down. This downward movement of the top section releases the striker to fire the percussion cap and in turn the detonator, booster, and the mine.

d. Installing and Arming.

(1) Remove the top section by unscrewing the four stud bolts.
(2) Screw the percussion cap and detonator assembly into the detonator holder in the bottom section.
(3) Place half of a cartridge of explosive around the percussion cap and detonator assembly as a booster charge.
(4) Replace the top section.
(5) Remove the striker shaft from the carrying position and screw it into the top of the top section.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Unscrew the four nuts from the top section of the mine and lift it up off of the bottom section.
(3) Remove the half cartidge of explosive from its location over the percussion cap and detonator assembly.
(4) Carefully remove the percussion cap and detonator assembly from the detonator holder.
(5) Remove the mine and fuze to a safe storage or disposal area.

79. Antitank Mine, Aluminum (Germany)

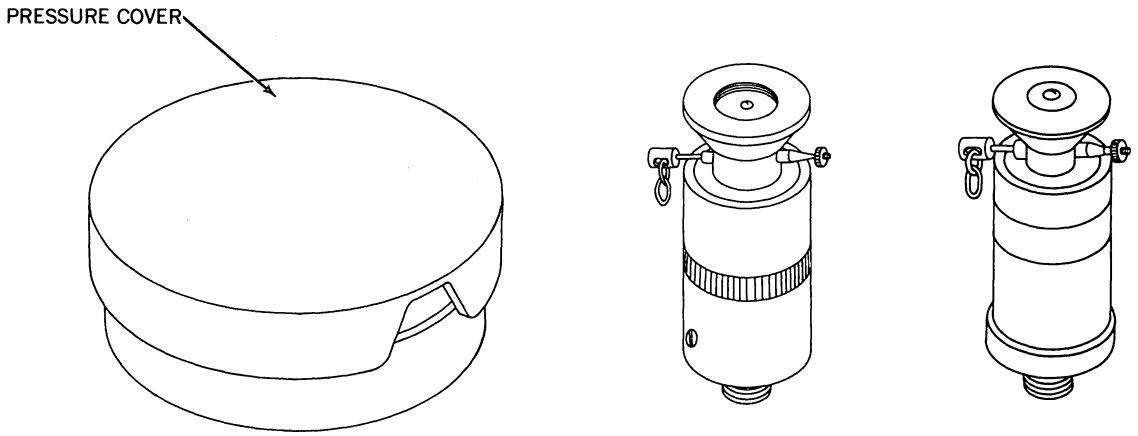


Figure 68

This aluminum antitank mine is 31.7 centimeters in diameter and 12.0 centimeters high. It has a flat, circular pressure cover that rests directly on the top of the three main fuzes. There are three deep V-notches cut in the side of the pressure cover for removing the fuze safety pins.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Circular...	D.Z. 35 or T.M1. 42	130 to 390 lb. pressure.	8 to 9 lb. cheddite.	Tolite

Fuze hazard	
Percussion cap.	

b. Use. This was used as an antitank mine.

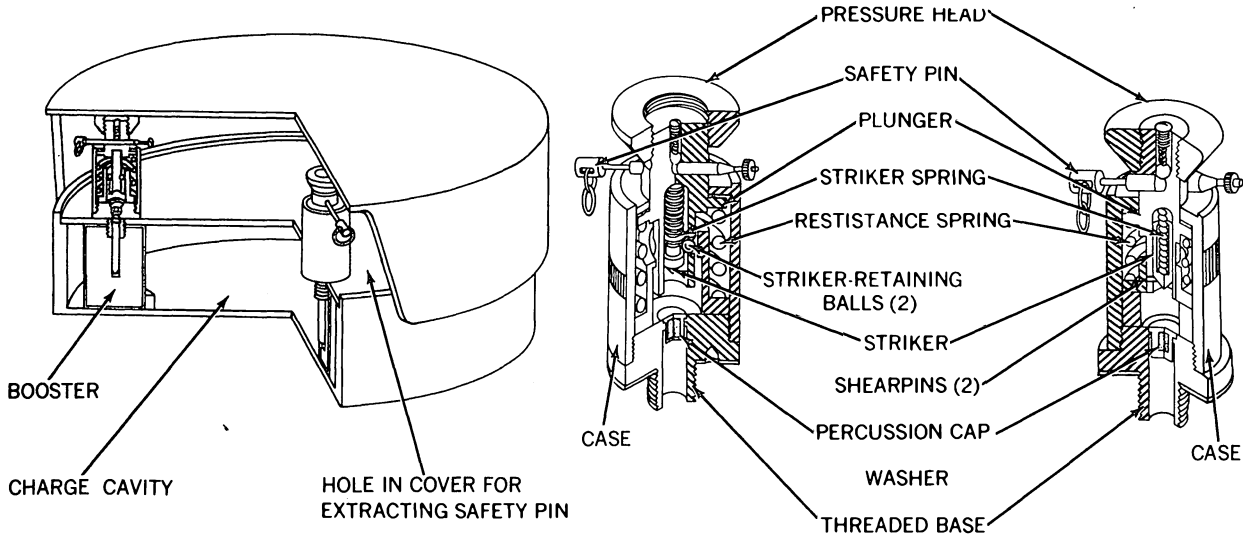


Figure 64

c. Functioning. Pressure on the top of the pressure cover depresses it and at the same time depresses the top of one or all the fuzes, causing the striker-retaining balls to be cammed out, and releasing the spring-loaded striker. The striker falls against the percussion cap, firing it and in turn the detonator, booster, and the mine.

d. Installing and Arming.

(1) Remove the aluminum pressure lid.

(2) Screw three D.Z. 35 fuzes with detonators into the main fuze wells in the aluminum disk. The booster charges should be directly underneath the fuze wells. Make sure that the pressure caps of the fuzes are adjusted to the same height.

(3) Replace the pressure lid and place the mine in a hole so that the pressure lid is level with the ground surface.

(4) Remove the safety pins from the fuzes by pulling on the attached cords through the slots in the pressure lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices that may be found.

(2) Remove the pressure cover.

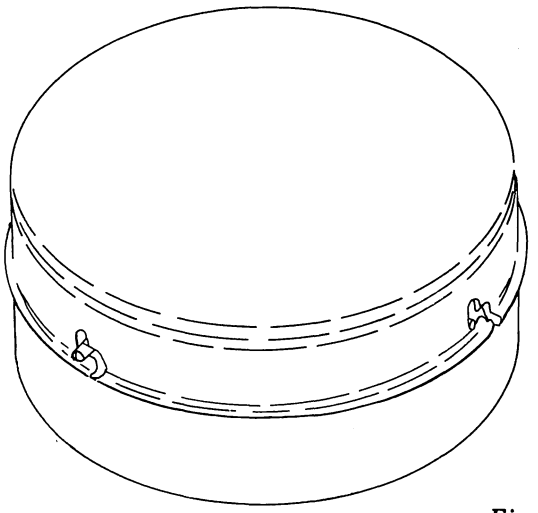
(3) If the D.Z. 35 fuzes are in the mine insert a safety-wire in the safety pin hole of the fuze.

(4) Carefully lift the three fuzes from the mine.

(5) Separate the detonator assembly from the fuzes.

(6) Transport the mine and fuzes to a safe storage or disposal area.

80. Antitank Mine, Mark 2, G. S. (United Kingdom)



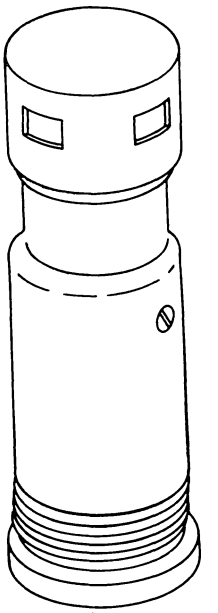


Figure 65

This steel mine is 19.0 centimeters in diameter and 8.1 centimeters high. The pressure plate has four notches around its lower edge that engage four lugs spaced around the side walls of the case. A springlike plate riveted to the underside of the pressure plate exerts a light pressure on the case to hold the pressure plate in firm contact with the lugs. This pressure plate is usually not removed. One centrally located main fuze well is in the bottom of the mine case.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Circular...	No. 1, Mark 1 pressure.	350 lb.	4 lb. TNT or Baratol (Barium nitrate TNT-20/80 or 10/90)	CE pellets (tetryl).

Fuze hazard	Markings
Detonator assembly.	Stamped on the pressure plate are nomenclature, contactor's mark, and month and year of manufacture.

b. Use. This mine is employed as an antivehicular mine or against light tracked vehicles.

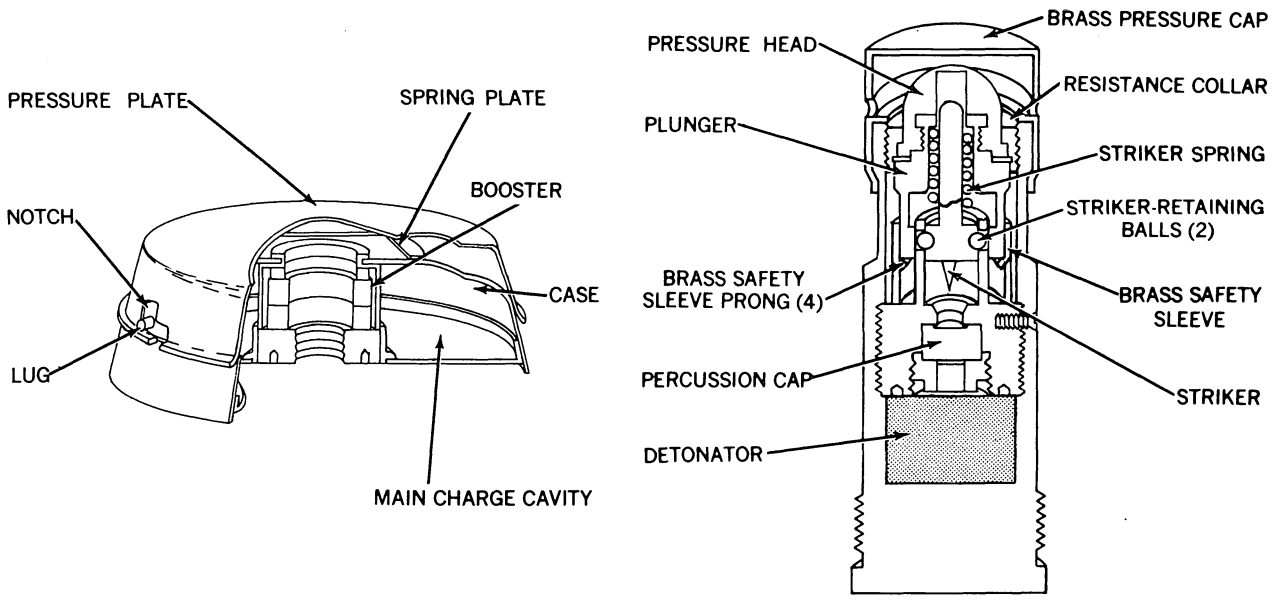


Figure 66

c. Functioning. Pressure exerted on the pressure plate is transmitted to the top of the fuze. This crushes the pressure cap forcing the plunger down, compressing the striker-spring, releasing the striker retaining balls, and freeing the striker. The striker falls against the percussion cap, firing it and the detonator, booster, and mine.

d. Installing and Arming.

(1) Unscrew the shipping plug from the fuze well in the bottom of the mine.
(2) Insert the fuze in the fuze well and screw it in finger tight.
(3) Place the mine in a hole so that the cover is flush with the surface of the ground.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Unscrew the fuze from the bottom of the mine.
(3) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. Do not attempt to separate the detonator assembly from the fuze. Use caution whenever handling or transporting the fuze, as it has no safety devices.

81. Antitank Mine, Mark 4, G.S. (United Kingdom)

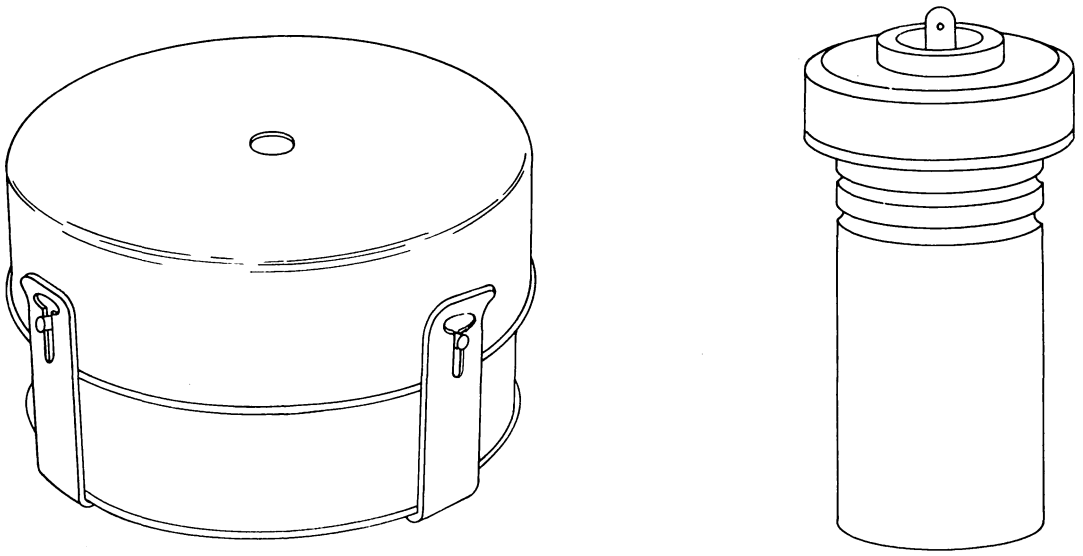


Figure 67

The British G.S. Mark 4 is fitted with the Mark 4 pressure cover and the pressure fuze No. 3, Mark 1. The steel mine case and the Mark 5 case are identical, except that the former locks the circular inner wall. The mine with its steel pressure cover is 20.3 centimeters in diameter and 12.7 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical.....	Pressure..	350 to 450 lb.	8.25 lb.

b. Use. The British laid this mine in large tactical minefields and in hasty road blocks against vehicles and light tanks.

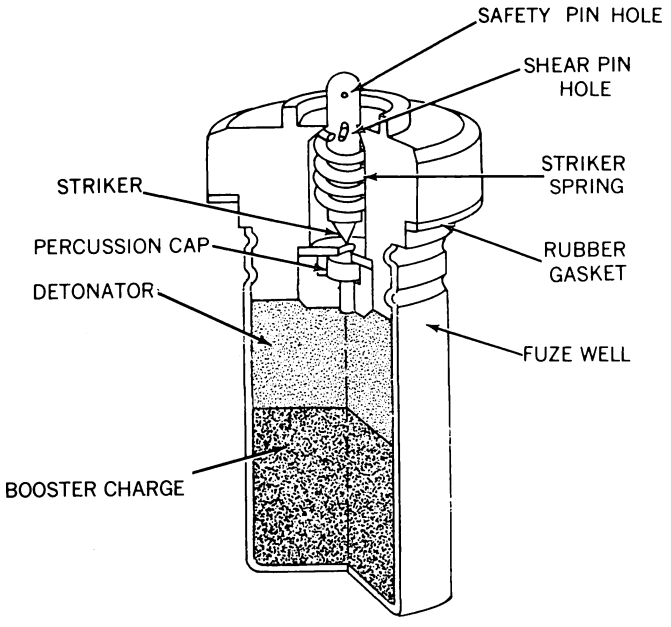


Figure 68

c. Functioning. Pressure on the pressure cover crushes the protective cap over the fuze, shears the shear pin, and thus frees the spring-driven striker to fire the percussion cap and explode the mine.

d. Installing and Arming.

(1) Remove the pressure cover and the fuze protection cap.

(2) Place the mine in a hole so that the top of the pressure cover, when replaced, will be less than 2.5 centimeters below the ground surface.

(3) Inspect the fuze to see that the shear pin is in position.

(4) Withdraw the safety pin from the fuze.

(5) Insert the fuze into the fuze well. Do not use force; it should fit easily.

(6) Replace the fuze protective cap and the pressure cover, making sure that the locking pins engage properly in the slots in the holding straps. Be very careful to put no pressure on the top of the fuze or the pressure cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the pressure cover and fuze protector cap without putting any pressure on the fuze.

(3) Insert a safety pin or a substitute in the safety pin hole.

(4) Remove the mine and fuze to a safe storage or disposal area.

82. Practice Antitank Mine, No. 3 E.P. (United Kingdom)

(No illustration available.)

This steel mine is 20.3 centimeters in diameter and 6.2 centimeters high. It has a circular, flat-surfaced pressure cover which is supported in place by three lugs which are engaged in the slotted straps fastened to the lower mine body. The fuze is very similar to the E.P., Mark II, except that it has a "Thunderflash" in place of the booster assembly. This is a container filled with 120 grains of G–20 gunpowder connected to the exploder by 15.4 centimeters of red instantaneous fuze. A hole is drilled in the side of the fuze well to allow for passage of this fuze; and three holes are drilled in the top of the mine case to allow the gas to escape.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Practice, E.P. No. 1.	250 lb. pressure.	120 grains gunpowder.

Remarks

There is also a practice mine E.P. No. 2 which is very similar except that a 0.9-meter length of red instananeous fuse is substituted for the "Thunderflash."

b. Use. This mine is used in training.

(No drawing available.)

c. Functioning. Pressure on the mine cover forces the plunger through the shear pin and down onto the ampoule cartidge, firing the instantaneous red fuze, which then fires the "Thunderflash."

d. Installing and Arming.

(1) Lay the mine on the ground and remove the cover.

(2) Inspect the plunger to assure that the shear wire is in position.

(3) Insert the plunger in the hole provided on the top of the exploder.

(4) Replace the mine cover.

e. Disarming Procedure.

(1) Remove the cover of the mine.

(2) Remove the plunger.

(3) Remove the fuze and mine to a safe storage or disposal area.

83. Antitank Mine PT-Mi-K (Czechoslovakia)

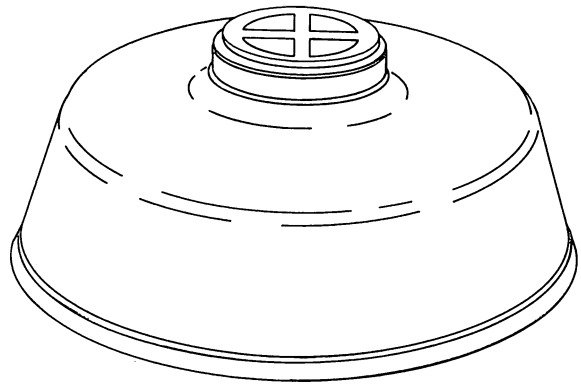


Figure 69

This metallic Teller-shaped mine has an open type pressure plate fashioned like a wheel with four spokes and held in place by shear pins passing through the collar on the case. These specially designed pressure plate and shear pin supports provide resistance to actuation by over-pressure from nuclear weapons explosions. The mine measures 30.0 centimeters in diameter and 10.0 centimeters in height.

a. Characteristics.

Shape	Fuze	Operating force	
Circular...	RO-5 or RO-9, pressure with shear pin release.	600 to 800 lb.	11-lb. TNT main charge 3.5 oz. toul (like tetryl) booster.

b. Use. This antitank mine is designed for mechanical laying.

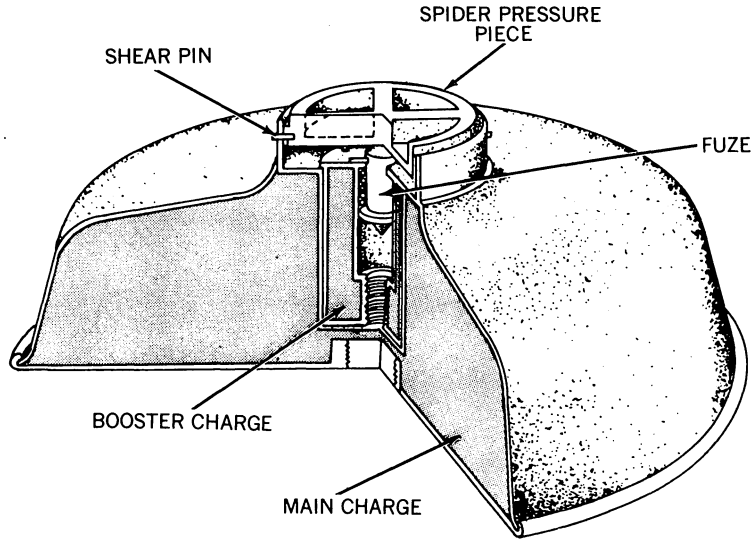


Figure 70

c. Functioning. Force on top of the pressure plate ruptures the shear pin and releases the fuze striker to fire the mine.

d. Installing and Arming.

(1) Remove the pressure piece.
(2) Place an RO–9 fuze with integral detonator and booster charge in the mine.
(3) Replace the pressure piece.

e. Disarming Procedure.

(1) Check for and remove any secondary fuzes or antilift devices.
(2) Carefully remove the shear pins from the collar on the mine case.
(3) Carefully lift the fuze from the mine.
(4) Separate the percussion cap, detonator, and booster from the fuze, if possible.
(5) Transport the mine and fuze to a safe storage or disposal area.

84. Antitank Mine, Mark 6 E.P. (Egyptian and Mark 5c (United Kingdom)

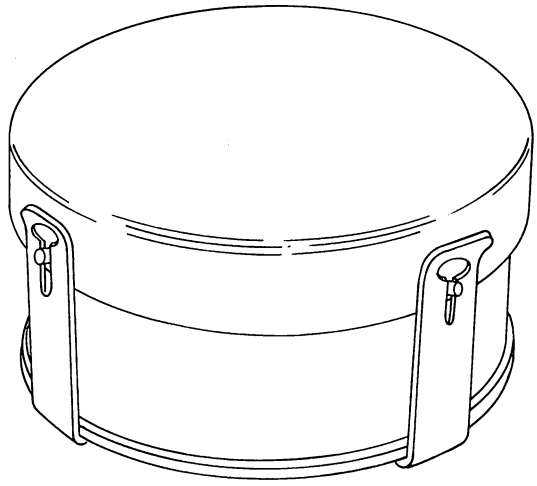


Figure 71

This steel mine is 20.3 centimeters in diameter and 8.2 centimeters high. The flat surface pressure cover is held in place by three pins that engage the three slotted straps fastened to the bottom of the mine case. It has one centrally located fuze well. This is an obsolescent item of British mine warfare equipment.

a. Characteristics.

Shape	Fuze	Operating force	Explosives	
			Main charge	Booster
Circular...	No. 3, Mark 1, pressure.	350 lb. pressure.	4.5 lb. TNT	CE pellets (CE is Tetryl).
Fuze hazard				
Detonator assembly.				

b. Use. This mine is employed as an antivehicular mine.

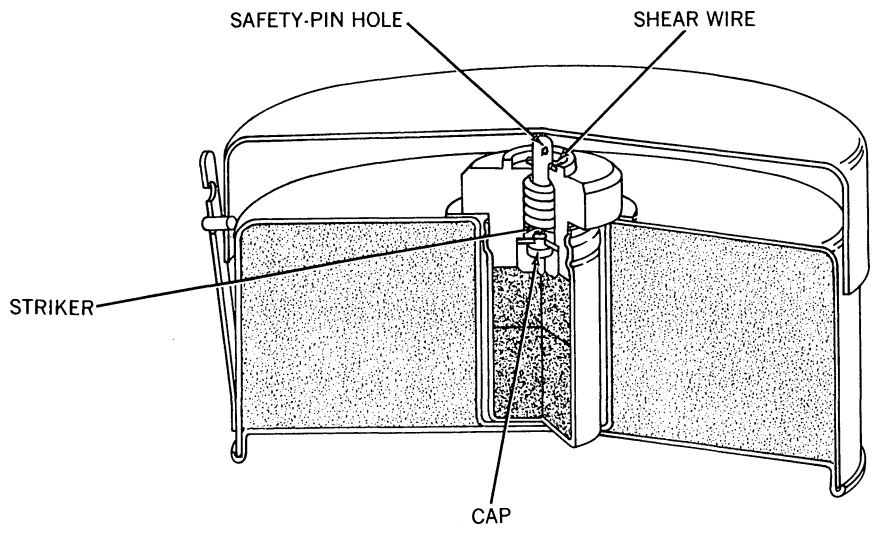


Figure 72

c. Functioning. Pressure on the mine cover forces the striker through the shear wire, releasing the striker against the percussion cap to fire the mine.

d. Installing and Arming.

(1) Remove the mine cover by unfasting the three slotted metal holding strap from the holding pins.
(2) Inspect the fuze to assure that the shear wire is in position.
(3) Place the fuze in the mine and withdraw the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the mine cover.
(3) Insert a safety pin in the safety pin hole in the striker.
(4) Remove the fuze from the fuze well.
(5) Lift the mine from the ground and replace the cover.
(6) Remove the mine to a safe storage or disposal area.

85. Antitank Mine, Mark 3 G.S. (United Kingdom)

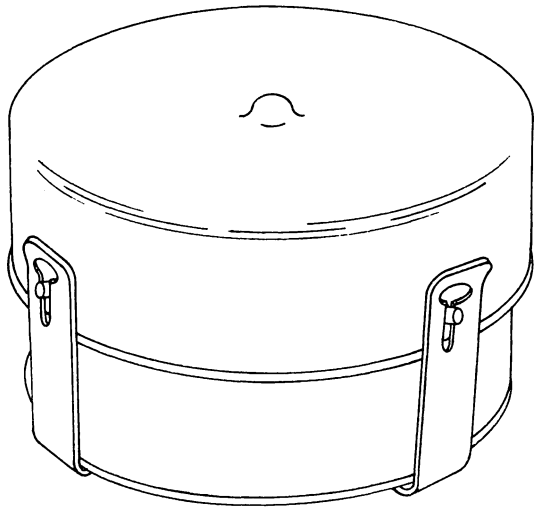


Figure 73

This steel mine is 15.2 centimeters in diameter and 12.8 centimeters high. It has a flat-surfaced circular steel pressure cover that fits loosely over the top of the mine case and is raised slightly in the center to form a pocket for the plunger of the fuze. The Germans manufactured a pressure igniter, the Mi.Z. 530 (e) to be used in this mine, which was an almost exact copy of the No. 2 Mark 1.

a. Characteristics.

Shape	Fuze	Operating force	Explosives	
			Main charge	Booster
Circular...	Contact No. 2, Mark 1.	350 lb. pressure.	4.5 lb. TNT (approx).	CE pellet (CE is Tetryl).
Fuze hazard				
Detonator assembly.				

b. Use. The Mark 3 G.S. was used as an antivehicular mine.

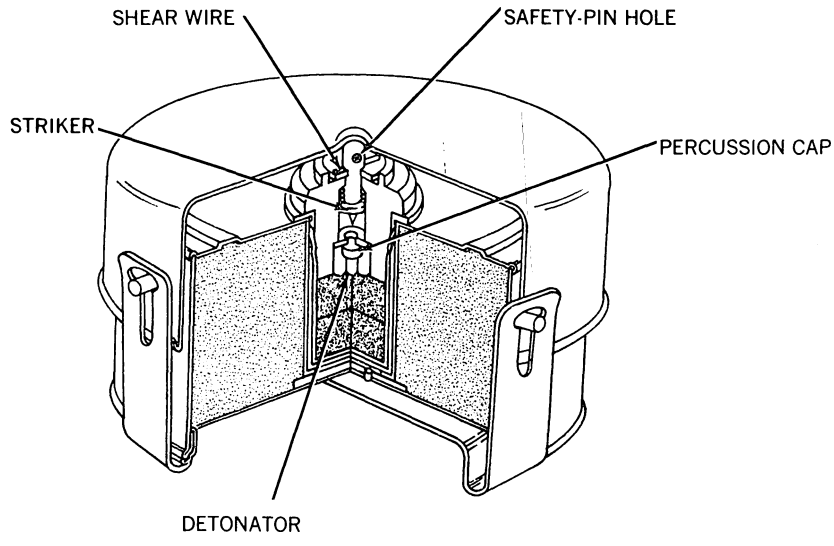


Figure 74

c. Functioning. Pressure on top of the mine cover forces it down on the striker, shearing the shear wire and releasing the striker against the percussion cap, and initiating the explosive train.

d. Installing and Arming.

(1) Place the mine in the ground.
(2) Remove the mine cover.
(3) Insert the fuze in the fuze well.
(4) Withdraw the safety pin from the fuze.
(5) Replace the mine cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the cover from the mine.
(3) Pull out the fuze from the fuze well.
(4) Remove the mine and fuze to a safe storage or disposal area.

86. Antitank Mines, Models Mark 5 G.S. and Mark 5c (United Kingdom)

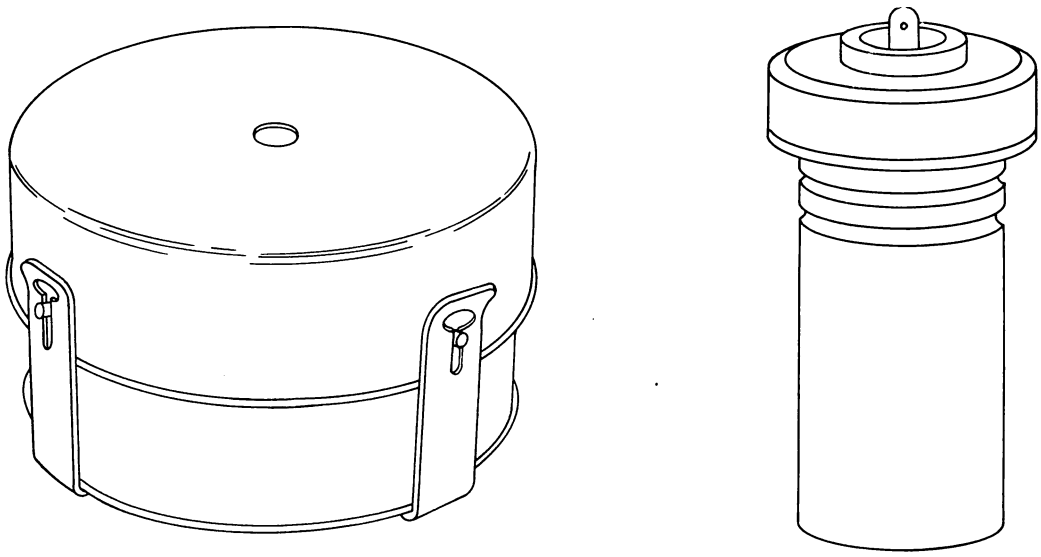


Figure 75

These steel mines are approximately 20.3 centimeters in diameter and 12.7 centimeters high. Both mines use the Mark 4 circular, steel, flat surfaced pressure cover held in place by four lugs that engage four slotted straps attached to the mine case.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Circular...	No. 3, Mk 1.	350 lb. pressure.	Mk4 GS: 8.3 lb. TNT Mk 5c: 4.5 lb. TNT or baratol.	Mk4 GS: CE/ TNT (CE is tetryl).

Fuze hazard	Remarks
Booster assembly....	The Mark 5c is identical to the Mark 5 except that it is fitted with a Mark 4 pressure cover instead of a pressure spider.

b. Use. These are generally used as antivehicular mines.

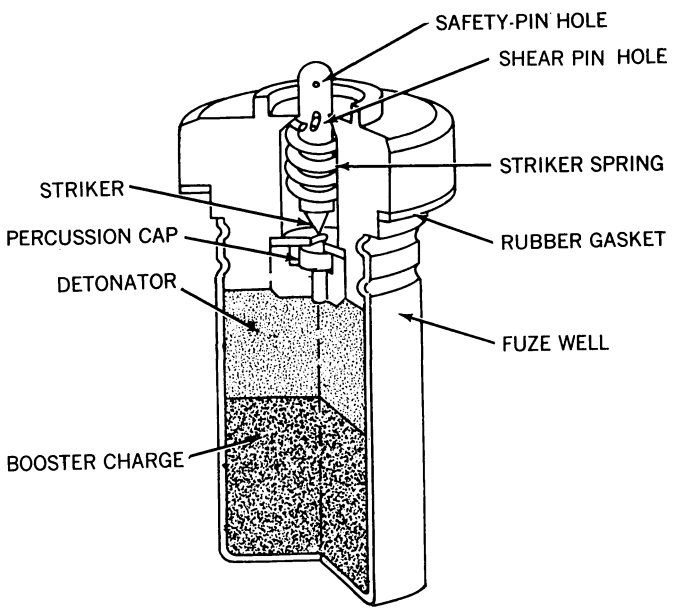


Figure 76

c. Functioning. Pressure on the pressure cover crushes the protective cap over the fuze and severs the shear pin, releasing the spring-loaded striker against the percussion cap, firing it, and in turn the detonator, booster, and the mine.

d. Installing and Arming.

(1) Remove the adhesive tap binding the pressure plate to the mine and remove the pressure plate.

(2) Place the mine in the ground and remove the paper seal from the fuze well.

(3) Inspect the fuze to be sure that the shear pin is in position, and then insert the fuze and remove the safety pin. If it does not come away easily discard the fuze.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the pressure cover.

(3) Insert a safety wire into the safety pin hole of the fuze.

(4) Lift the fuze out of the mine.

(5) Transport the mine and the fuze to a safe storage or disposal area.

f. Additional Precautions. Handle the fuze carefully even when the safety pin is present because of the integral percussion cap, detonator, and booster. Keep the fuzes separated from the mines at all times except during emplacement in the ground.

87. Antitank Mine, E.P. Mark 2 (United Kingdom)

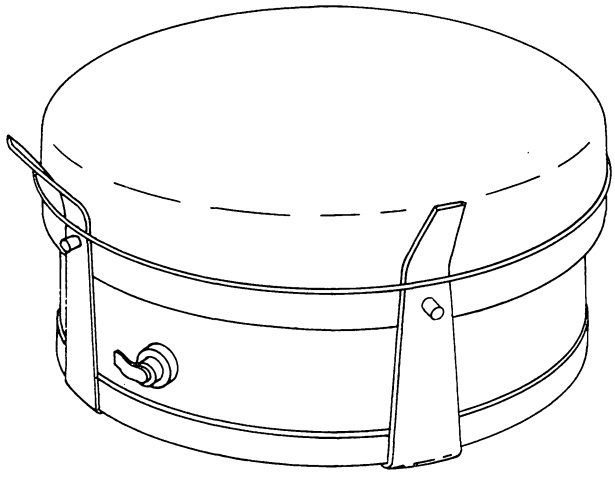


Figure 77

This antitank mine consists of the steel mine body, mine cover, and mine fuzing arrangement. The mushroom-shaped mine cover is attached by four hooked straps. The mine has a central fuze well. On the side near the base is a channel that leads to the central well, which is closed by a small metal tab during shipment and storage. The fuze (E.P. Mark 2) consists of a plunger inserted into the central well and retained by a shear pin, and a detonator and ampoule cartridge inserted in the side channel. The mine is 25.4 centimeters in diameter and 10.1 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	Remarks
Mushroom..	Integral, percussion type.	200 lb. (approx).	4 ½ lb.	Once laid, these mines should not be used again, even if disarmed.

b. Use. This mine is used in defense against armored cars, tanks, and other vehicles.

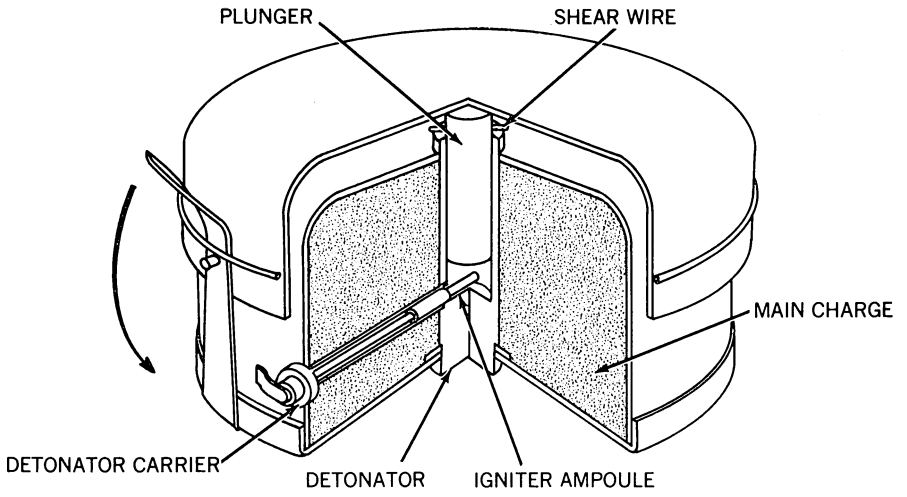


Figure 78

c. Functioning. Pressure on the mushroom-shaped top forces the plunger through the shear pin and down against the ampoule cartridge, crushing it and causing a chemical reaction that fires the detonator.

d. Installing and Arming.

(1) Insert the ampoule cartridge, red end first into the open end of a detonator No. 8 and seal with luting.

(2) When ready to lay the mine, remove the steel rod from the hole in the mine body and insert the detonator assembly, ampoule end first, without using force.

(3) Bend the tab over the end of the assembly and place the mine in the ground.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the wire holding the mine cover in place and remove the mine cover.

(3) Remove the plunger from the mine.

(4) Loosen the metal tab which covers the detonator assembly on the side of the mine case and carefully remove the detonator assembly.

(5) Destroy the detonator assembly.

(6) Transport the mine to a safe storage or disposal area.

f. Additional Precautions. If the detonator assembly does not come out easily, destroy the mine in place.

88. Antitank Mine, E.P. Mark 5 (United Kingdom)

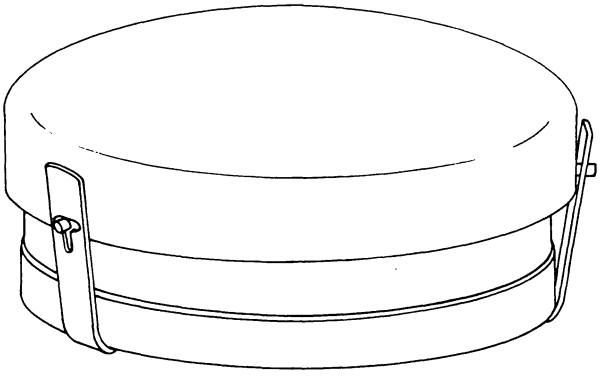


Figure 79

This metallic mine consists of a body, exploder mechanism, and cover. The cover is fastened down by three pins that engage in slots in three retaining straps attached to the mine body. The mine has a centered well for the special fuzes, exploders No. 1 and No. 2, which operate on the shear wire principle. In the side of the exploder body, near the base, is a channel for the inserting of the ampoule cartridge and detonator assembly. The mine is 20.3 centimeters in diameter and 6.2 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Mushroom.	Integral percussion exploder.	250 to 350 lb. pressure.	4½ lb. TNT

b. Use. The mine will break the tracks of light or medium tanks and disable vehicles.

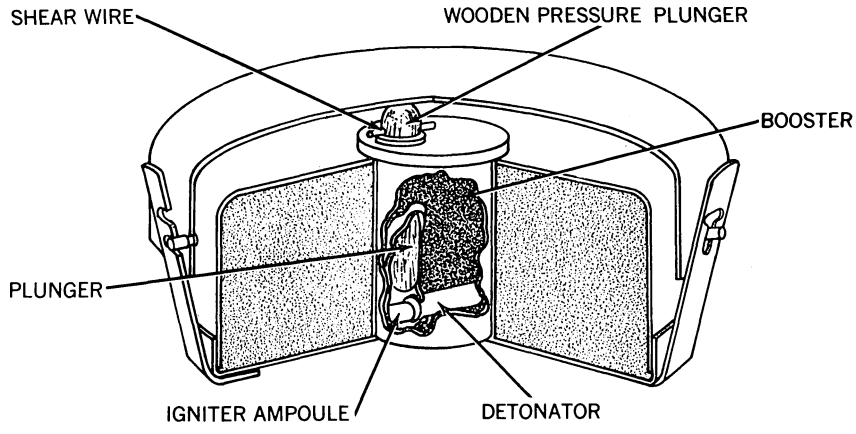


Figure 80

c. Functioning. Pressure on the top of the mine forces the plunger through the shear wire and down onto the ampoule cartridge, crushing it and firing the detonator, booster, and main charge.

d. Installing and Arming.

(1) Lay the mine in the ground and remove the cover.
(2) Place an exploder in the inverted cover and insert an ampoule, red end first, into a detonator No. 8.
(3) Fill the open end of the detonator flush with luting.
(4) Insert this end with luting into the hole in the side of the exploder body.
(5) Slide the assembly home and seal in place with more luting.
(6) Grease the exploder and insert it into the fuze well.
(7) Refit the cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the pressure cover.
(3) Remove the wooden pressure plunger from the fuze.
(4) Carefully remove the fuze from the mine.
(5) Pull out the detonator assembly by the tape ends projecting out of the horizontal fuze well at the bottom of the fuze case.
(6) Transport the mine and fuze to a safe storage or disposal area.

89. Antitank Mine, M/39 (Finland)

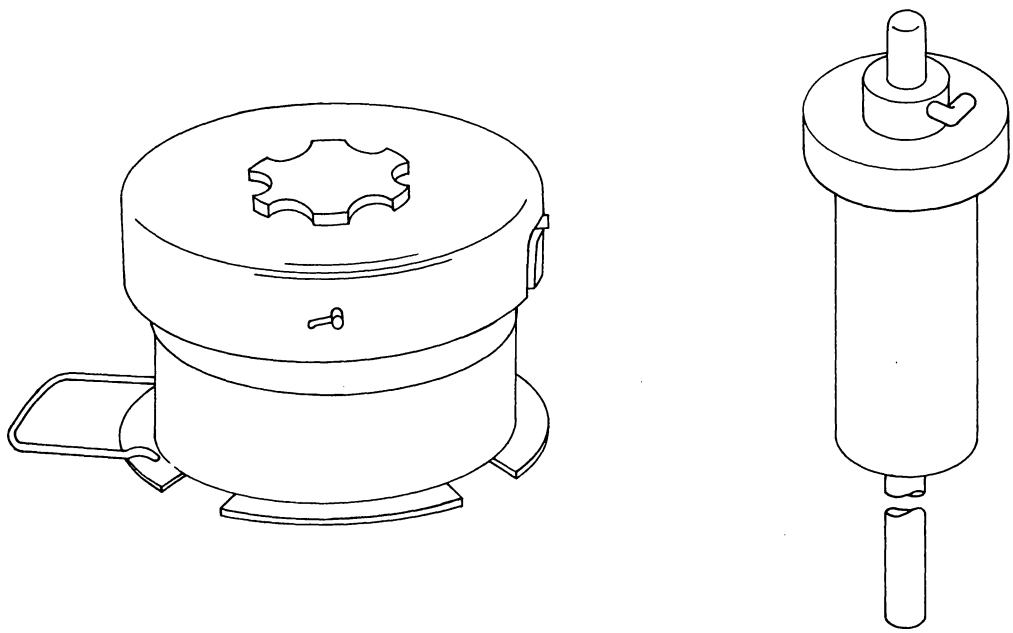


Figure 81

This mine except for its outward appearance, is identical to the M/36. It has a cast-iron case about 23.0 centimeters in diameter and 10.5 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Pressure	220 lb. on at least ¼ of the area of the pressure lid.	8.8 lb. TNT

b. Use. This mine is used against tanks.

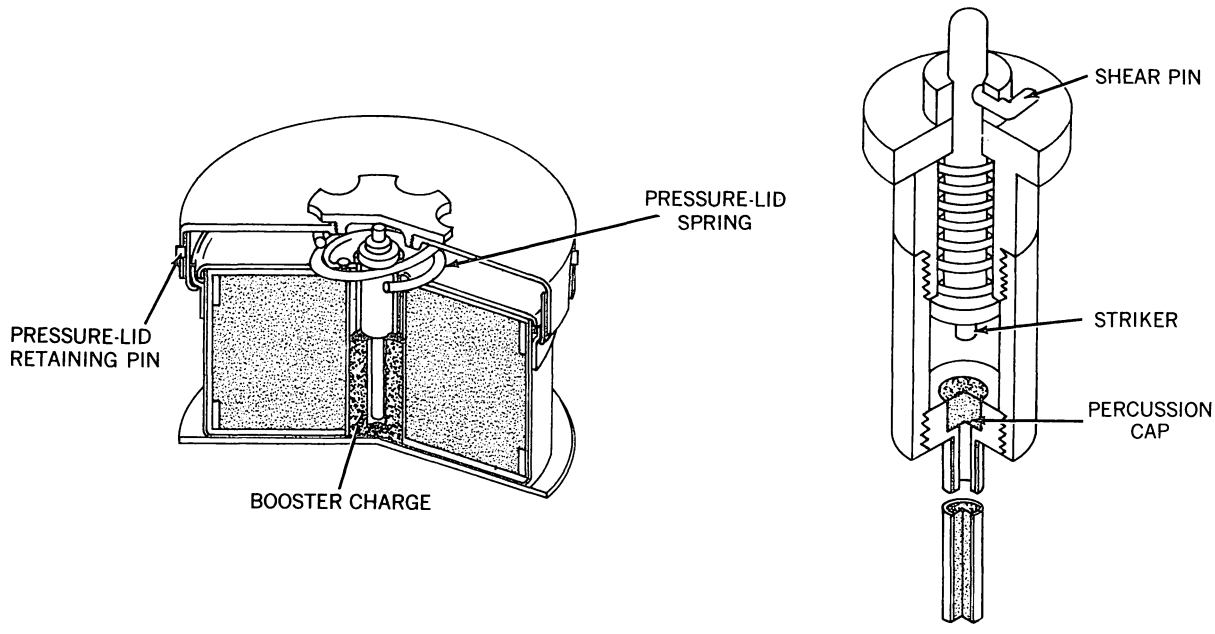


Figure 82

c. Functioning. Pressure on the pressure lid forces the pressure plug down on the top of the fuze, shearing the shear pin and releasing the striker to fire the percussion cap, detonator, booster, and main charge.

d. Installing and Arming.

(1) Unscrew the pressure plug.
(2) Insert the fuze into the fuze well.
(3) Screw the pressure plug back on.
(4) Turn the pressure lid so that the pressure lid retaining pins are over the vertical slots in the pressure lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Rotate the pressure lid until the lid-retaining pins are in the horizontal slots (this precludes the possibility of applying any pressure to the top of the fuze).
(3) Unscrew the pressure plug and remove the fuze.
(4) Carefully unscrew the detonator assembly from the fuze.
(5) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. This fuze has no safety device.

90. Antitank Mine, Heavy (South Korea)

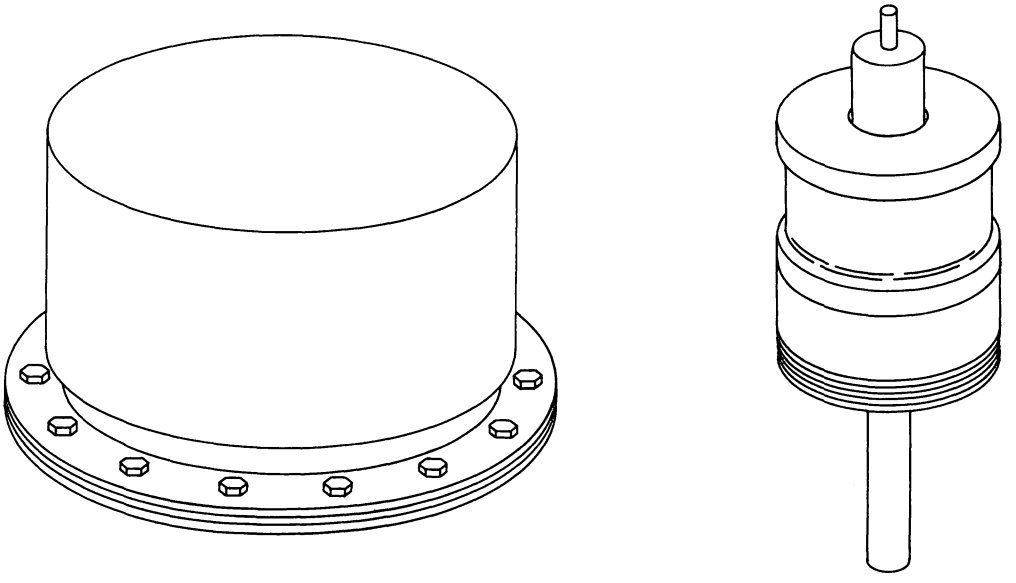


Figure 83

This metallic antitank mine is 38.1 centimeters in diameter, and when assembled, 20.3 centimeters high. Three fuze wells are spaced in line on 8.8-centimeter centers for the use of modified pressure-pull fuzes.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Modified, pressure pull.	Pressure-300 lb. AT Pressure-20 lb. AP Pull-10 lb. AT.	22 lb.

b. Use. This mine is used primarily against tanks.

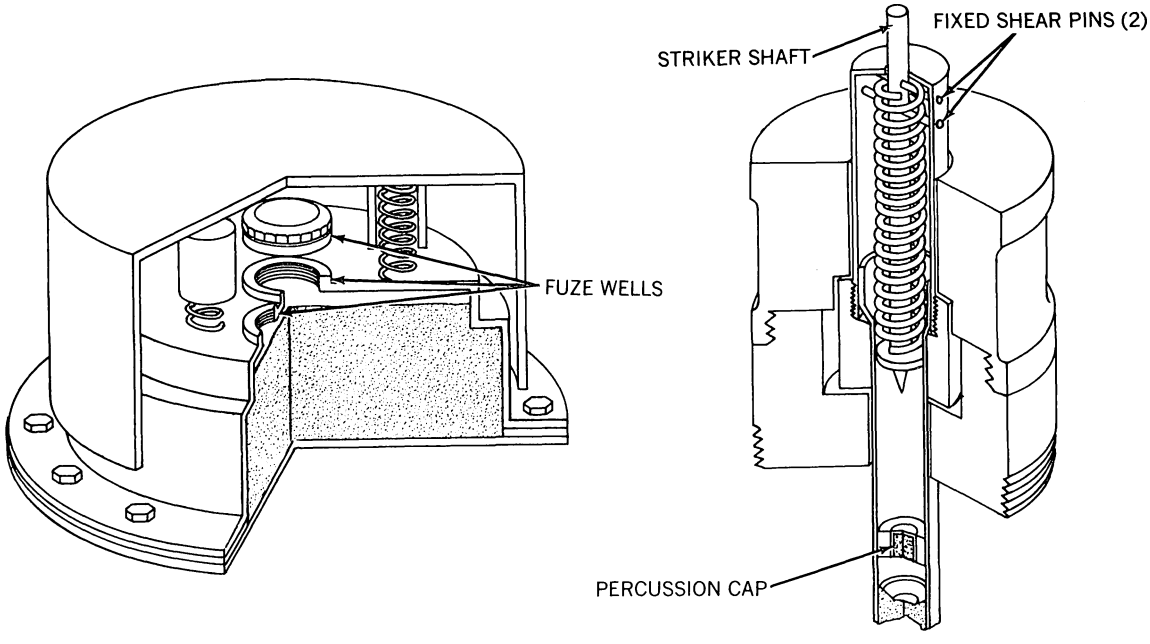


Figure 84

c. Functioning. Pressure on the pressure lid overcomes the resistance offered by the three coil springs and the two shear pins, or a pull on the trip wire removes the pull pin. In either case, the striker is freed to strike the percussion cap, initiating the firing train.

d. Installing and Arming.

(1) Remove the pressure lid.
(2) Unscrew the fuze well plugs.
(3) Screw a modified pressure-pull fuze in each of the fuze wells.
(4) Replace the pressure lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Lift the pressure cover straight up and off the mine.
(3) Unscrew the three main fuzes from the mine.
(4) Unscrew the detonator assembly from the fuze.
(5) Transport the mine and fuzes to a safe storage or disposal area.

91. Dual-Purpose Mine, Type 1 (South Korea)

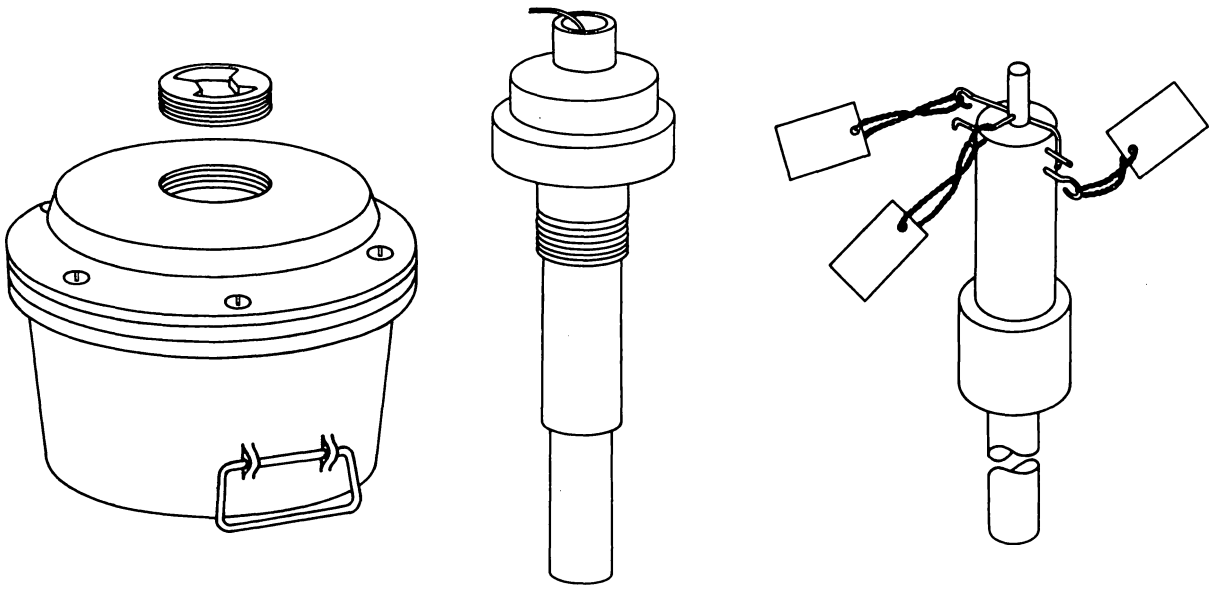


Figure 85

This mine has a unpainted cast-iron case 25.4 centimeters in diameter by 13.6 centimeters high. It contains a pressure spring housing, a pressure lid, and a flat collar. The pressure-pull fuze is inserted into the main fuze well in the center of the pressure spring housing, and the friction-pull fuze, into the secondary fuze well.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical	Pressure-pull, Pull-friction	300 lb. pressure, 15 lb. pull.	5.7 lb. flaked TNT.

b. Use. This mine is used against vehicles and personnel.

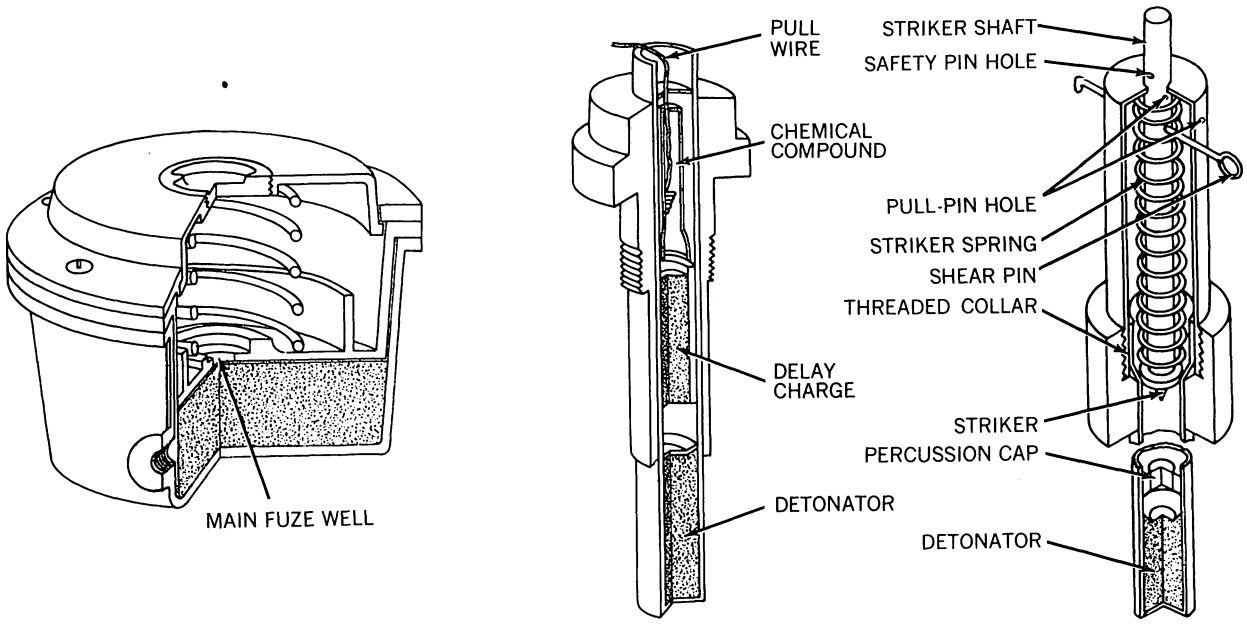


Figure 86

c. Functioning. Pressure on the pressure lid depresses the pressure spring, shearing the shear pin and releasing the striker. Also a pull on the trip wire attached to the friction pull fuze actuates it and explodes the mine.

d. Installing and Arming.

(1) Lay the mine.
(2) Remove the fuze well plug.
(3) With a wooden stick, make a hole in the main charge under each fuze well to insert the detonators.
(4) Insert a pressure fuze with detonator into the fuze well in the top of the mine and replace the pressure fuze well plug.
(5) Insert a friction pull fuze with detonator into the side fuze well.

e. Disarming Procedure.

(1) Check for and remove any secondary fuzes or antilift devices.
(2) Cut the slack trip wire attached to the fuze, if wire is present.
(3) Unscrew the pressure plug in the pressure plate.
(4) Carefully remove the fuze from the mine case.
(5) Insert a safety wire in the safety pin hole if the combination pressure-pull fuze is found.
(6) Separate the detonator assembly from the fuze, if the combination pressure-pull fuze is found, by unscrewing the upper portion of the fuze and lifting out the detonator assembly.
(7) Transport the mine and fuze to a safe storage or disposal area.

92. Dual Purpose Mine, Type II (South Korea)

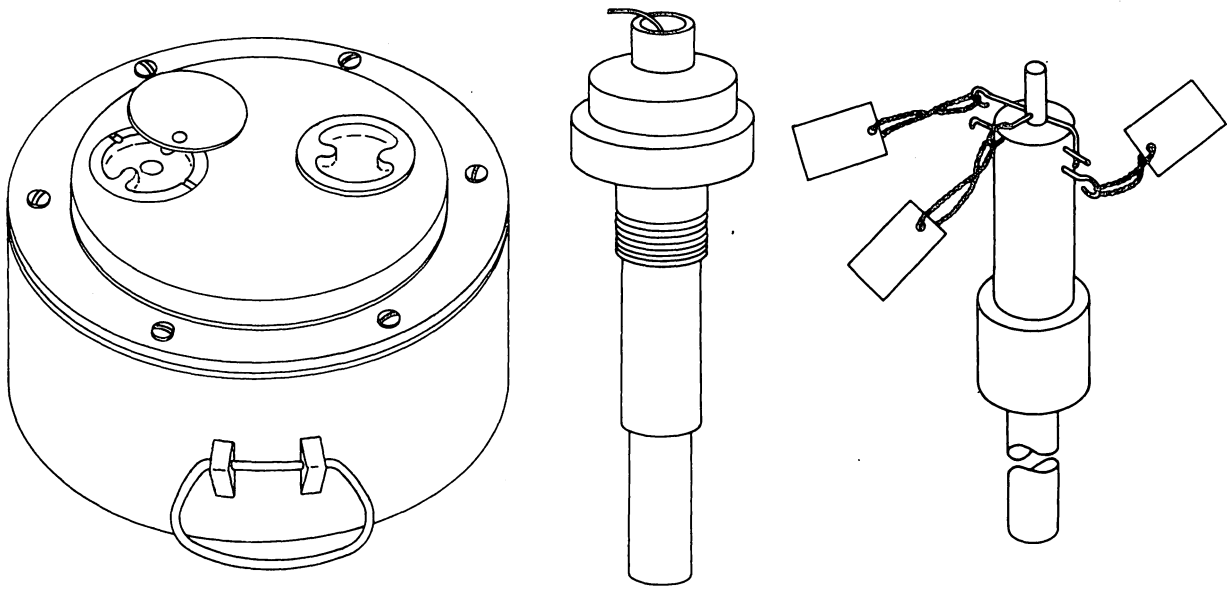


Figure 87

This metallic mine is about 25.4 centimeters in diameter and 21.2 centimeters high. It lacks the flange around the top that is present in type I, and it does not have a secondary fuze well. The pressure lid has two fuze wells, one for a pressure pull fuze and the other for a pull-friction fuze. The pressure-spring housing is like that of the type I, but has two fuze wells instead of one.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Pressure-pull Pull-friction.	350 lb. pressure, 15-lb. pull.	4.5 lb. TNT

b. Use. The mine is usually fitted with a pressure-pull fuze for antitank use and a pull-friction fuze for antipersonnel use.

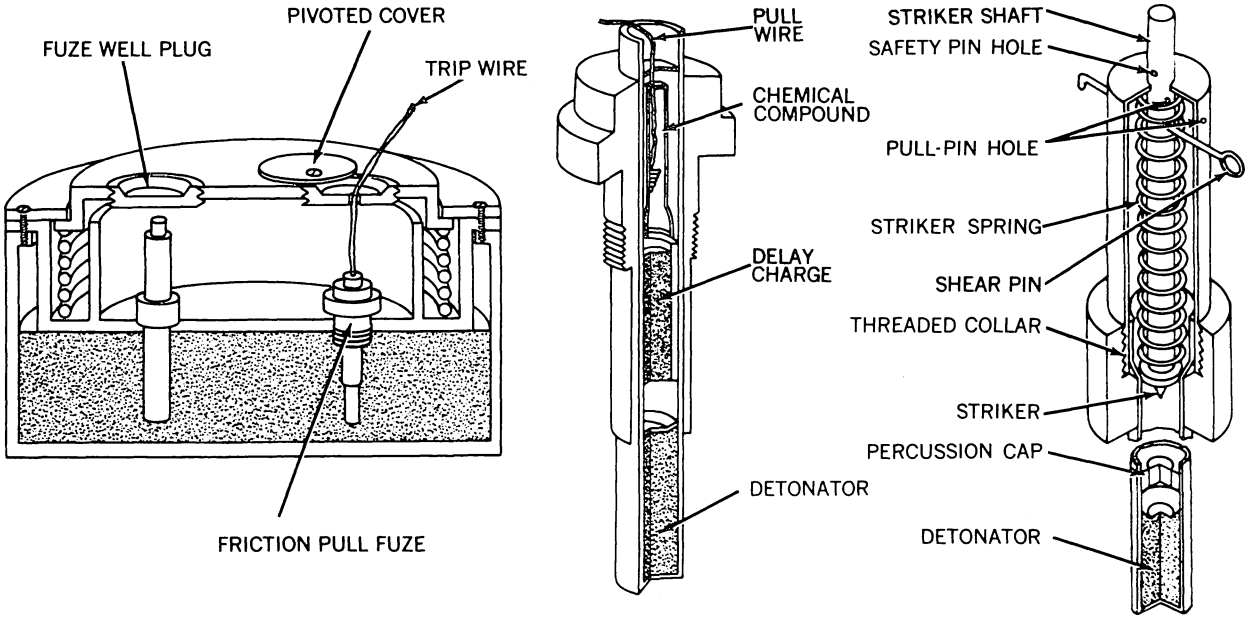


Figure 88

c. Functioning. For antitank mines, pressure overcomes the resistance of the pressure spring and the shear and pull pins in the fuze. The pins shear releasing the striker to fire the mine. For antipersonnel mines, a slight pressure shears the pull pin, freeing the striker to fire the mine, or a pull on the friction pull fuze ignites the chemical compound the 3- to 5-second delay pellet, and then the detonator, which sets off the main charge.

d. Installing and Arming. In **antitank mines,** insert the pressure-pull fuze with the safety pin removed into the unthreaded fuze well. In **antipersonnel mines,** remove the shear pin and safety pin from the pressure-pull fuze and install the fuze in the mine, or screw the friction-pull fuze into the pull-fuze well, leading the trip wire up through the hole in the fuze well plug. Screw on the fuze well plugs and anchor the trip wire.

e. Disarming Procedure.

(1) Check for and remove an antilift devices.
(2) Slide open the pivoted cover of the pressure plate plug which has the slack trip wire leading from it.
(3) Cut the slack trip wire as close to the pressure plug as possible and allow the remainder of the wire to fall back inside the mine case.
(4) Remove the pressure plug with the pivoting cover.
(5) Unscrew the pull-friction fuze from the mine.
(6) Unscrew the other pressure plug.
(7) Remove the combination pressure-pull fuze.
(8) Insert a safety wire in the safety pin hole of the fuze.
(9) Separate the detonator assembly from the fuze by unscrewing the upper part of the fuze housing and lift out the detonator assembly.
(10) Transport the mine and fuzes to a safe storage or disposal area.

93. Obstacle Mine, PMZ–40 (U.S.S.R.)

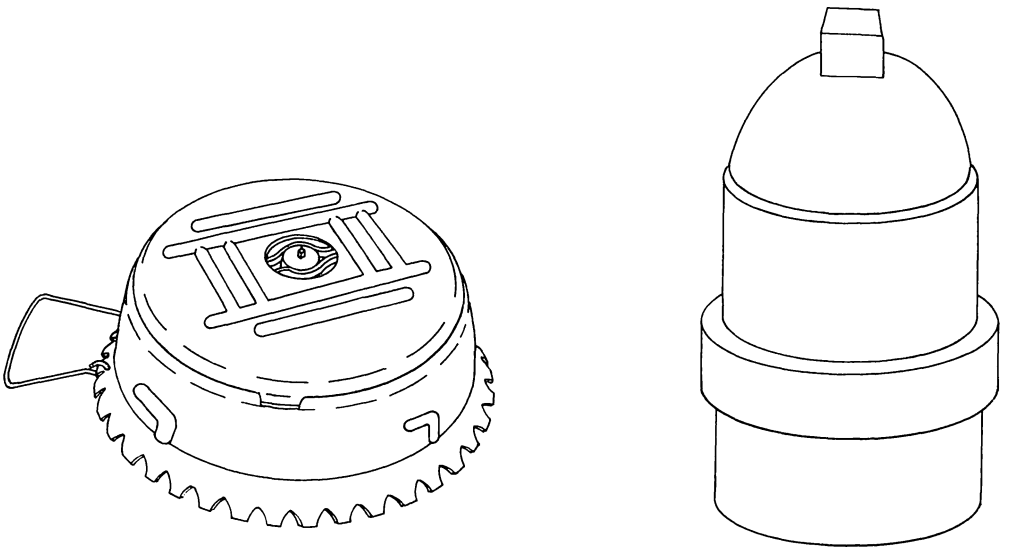


Figure 89

This is a dual purpose mine made of pressed steele, 27.9 centimeters in diameter and 10.1 centimeters high when set for antipersonnel use and 11.8 centimeters high when set for antitank use. The mine has a charge container with a flanged base, a central fuze well, a charge filling hole in the bottom closed by a steel plug, and a pressure plate grooved to add rigidity with 4 shear studs equally spaced around its edge. In Korea, this mine was issued with the MV–5 instead of the MV–3 fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	MV–3 MV–5	500 lb., MV–5 150 lb., MV–3	8 lb.

b. Use. As an antitank mine, the PMZ–40 is used in road blocks. In antitank mine fields, these mines rigged for antipersonnel use, harass mine clearing and breaching parties.

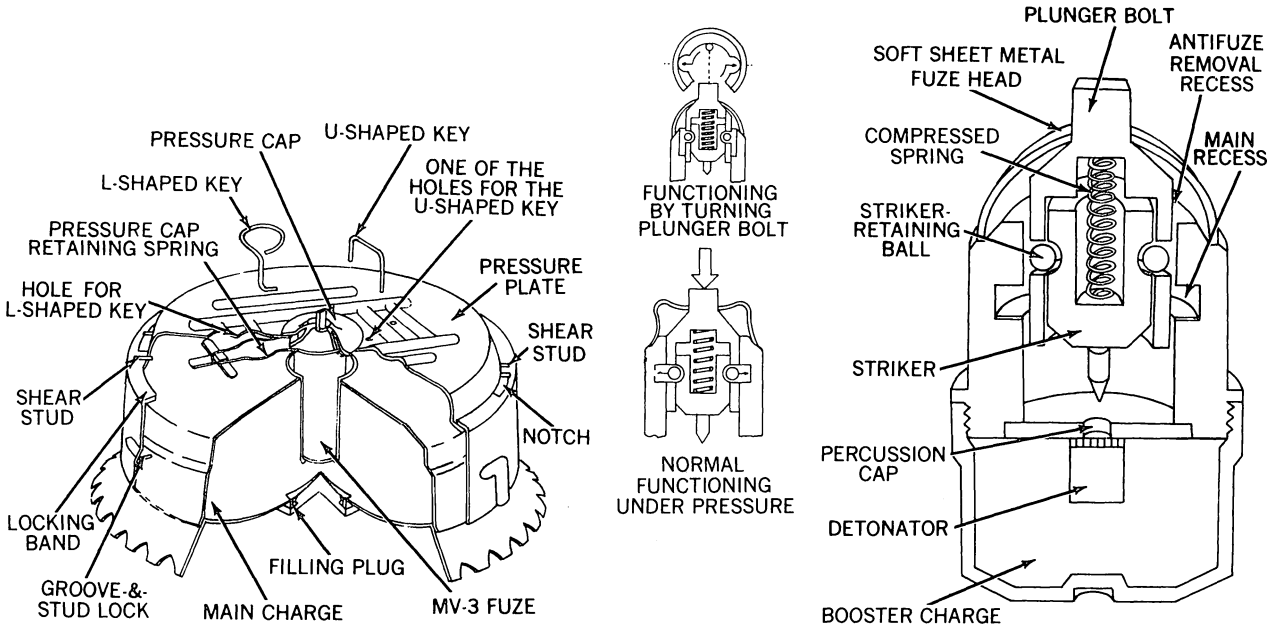


Figure 90

c. Functioning. As an antitank mine, pressure shears the four shear studs, depressing the fuze until the retaining balls slip to the side, freeing the strider to initiate the firing chain. As an antipersonnel mine, the pressure plate is rotated so that it clears the shear studs, eliminating shearing action, and transmitting pressure of a man's foot directly on the head of the fuse.

d. Installing and Arming (MV-3 fuze).

(1) Set the pressure plate for antitank use.

(2) Remove the pressure cap and separate the two arms of the pressure cap retaining spring by inserting a U-shaped key into the two small holes in the pressure plate.

(3) Install the fuze.

(4) Replace the pressure cap so that the square plunger bolt which projects above the fuze fits through the square hole in the pressure cap.

(5) Remove the U-shaped key. This allows the two arms of the pressure cap retaining spring to close, holding the pressure cap in place.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert the L-shaped key in the larger hole in the top of the mine case and carefully turn the key until one side of the pressure cap retaining spring passes by one of the two smaller holes in the top of the mine case. Hold the L-shaped key in position and insert the longer end of the U-shaped key into the smaller hole that the pressure cap retaining spring has passed. Maintain pressure on the U-shaped key and carefully rotate the L-shaped key in the opposite direction until the other side of the pressure cap retaining spring has passed under the other small hole. Hold the L-shaped key in position and insert the short end of the U-shaped key into the remaining small hole. A slight pressure should be felt against both sides of the U-shaped key.

(3) Carefully remove the pressure cap without rotating it in either direction. Do not force the pressure cap. If the

U-shaped key is in the proper position the cap should come out easily.

f. Additional Precautions.

(1) Do not attempt to rotate any part of this mine if the fuze is still in it.

(2) Do not attempt to turn the square plunger of the fuze at any time.

(3) Do not attempt to transport or reuse the fuzes for any reason.

94. Antitank Mine, M/36 (Finland)

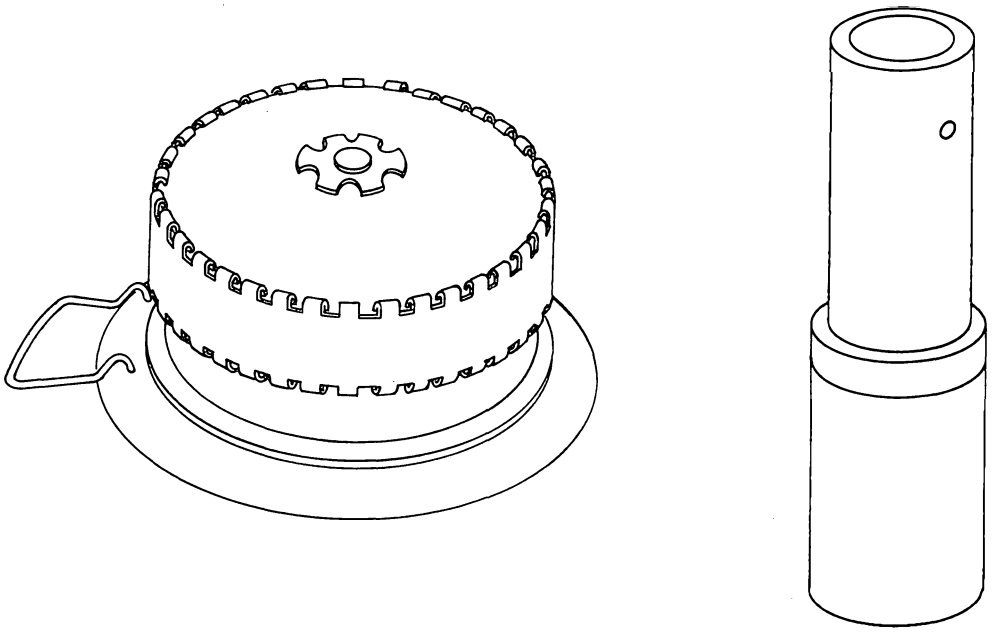


Figure 91

This early Finnish antitank mine was called the "round loaf" mine or H.V.M. M/36, and the "F–1". It has a steel case 30.4 centimeters in diameter by 12.7 centimeters high. The plate-shaped pressure lid is held off the explosive case by a strong spring and locked to the case by a metal locking ring. The fuze is inserted through the spring in the central fuze well. The mine has one wire carrying handle.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Pressure.....	400 lb.	8 lb. TNT

b. Use. The M/36 is used as an antitank mine.

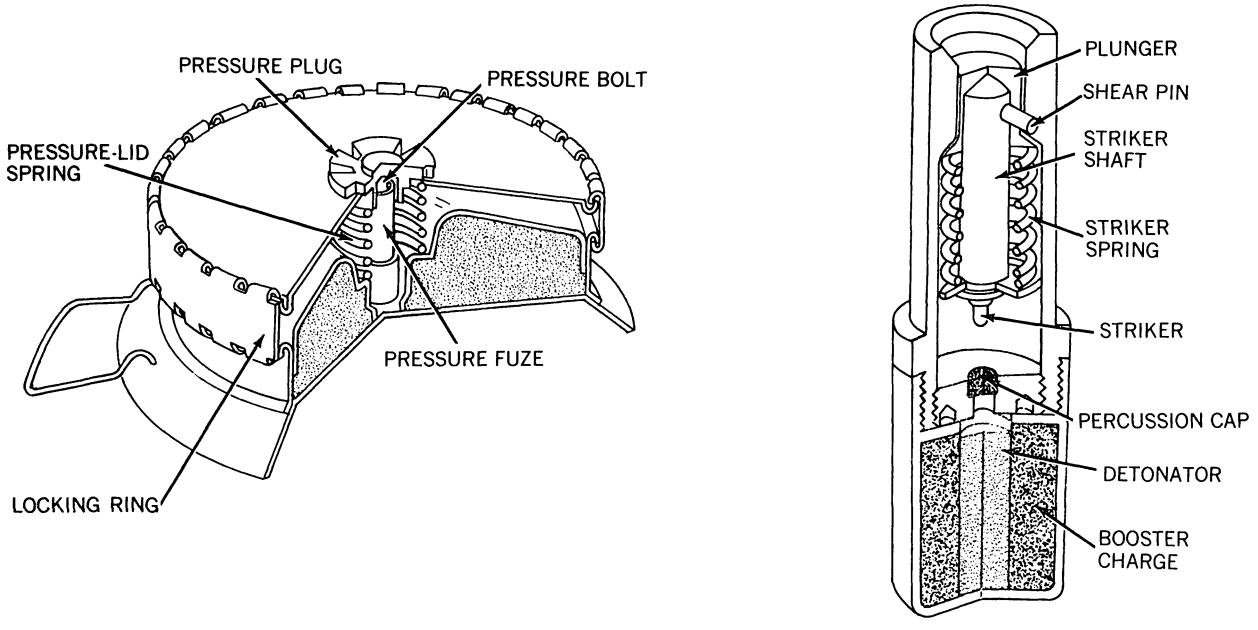


Figure 92

c. Functioning. Pressure on at least 1/5 of the mine surface overcomes the resistance of the pressure-lid spring. The pressure bolt depresses the plunger on the percussion cap, initiating the firing chain.

d. Installing and Arming.

(1) Unscrew the pressure plug and insert the fuze.

(2) Screw the pressure plug back onto the pressure lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the pressure cap.

(3) Carefully lift the fuze out of the mine.

(4) Unscrew the detonator assembly from the fuze.

(5) Transport the mine and fuze to a safe storage or disposal area.

95. Metallic Antitank Mine, TM-41 (U.S.S.R.)

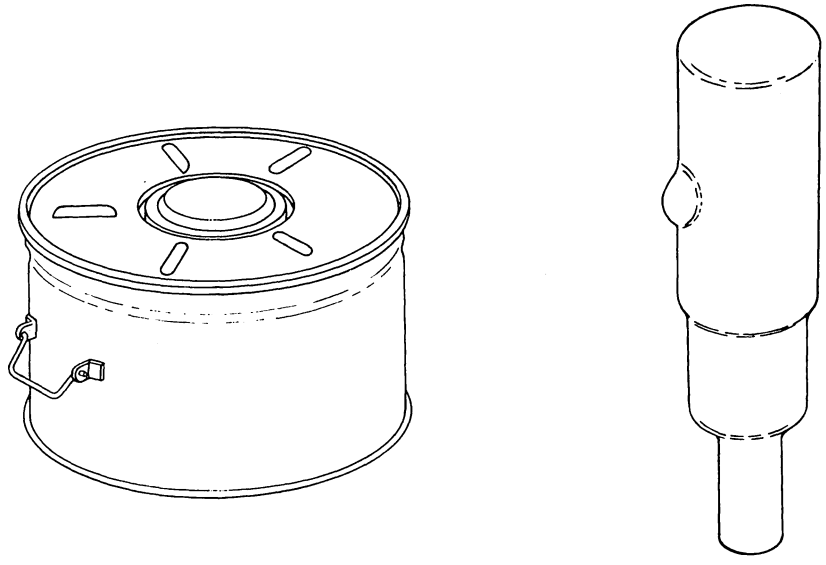


Figure 93

This is a metal-cased mine fitted with an MV-5 pressure fuze. Some modifications of the original design have appeared, such as changes in the number of radial ribs on the lid, the size and location of the filling plug, and the number of corrugations around the top side.

a. Characteristics.

Shape	Fuze	Operating pressure	Explosives	
			Main charge	Booster
Circular...	MV-5 (pressure)	400 lb. (approx).	8.6 lb. amatol 80/20 or flaked TNT.	2.6 oz. picric acid (par. 6*x*).
Markings				

"TM-41 THT" (TM-41 TNT) and the manufacturer's symbols are stenciled black on the side. Additional symbols and dates are stenciled on the top.

b. Use. This mine is usually emplaced in pattern in minefields to immobilize tanks and other vehicles, to protect troops, positions, and equipment, and to halt and delay enemy movement.

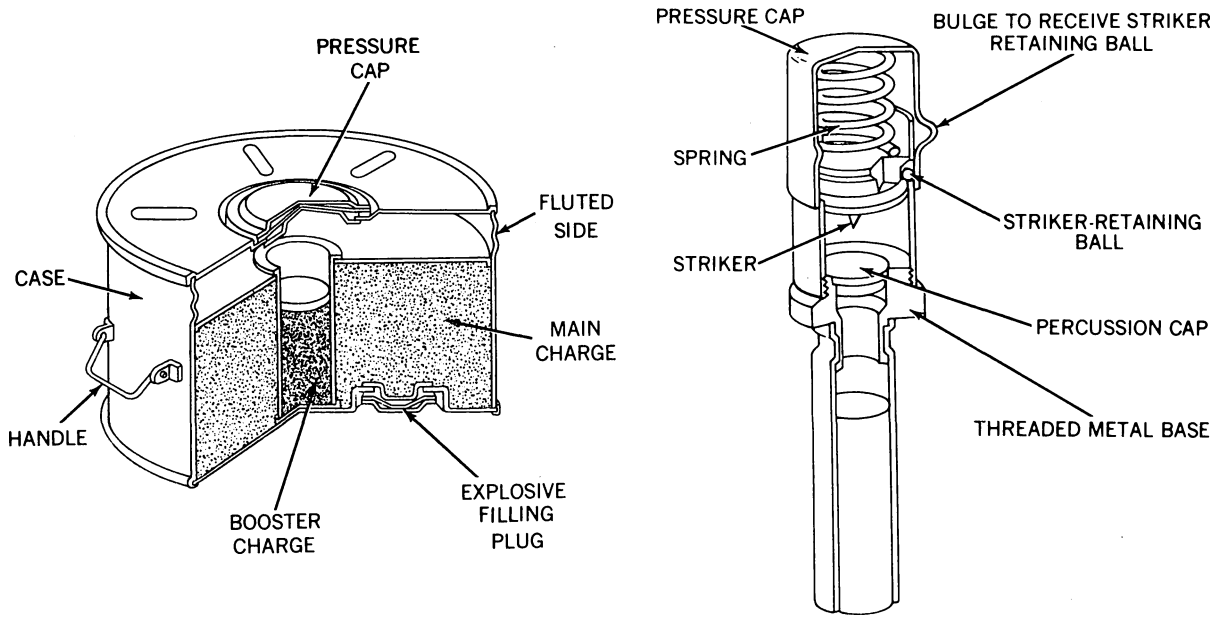


Figure 94

c. Functioning. Pressure on the top crushes the corrugated sides of the lid, depressing the sliding head of the fuze until it functions and detonates the mine.

d. Installing and Arming.

(1) Unscrew the pressure cap from the cover of the mine.

(2) Insert an M–5 fuze and MD–2 detonator assembly into the hole in the booster charge.

(3) Replace the pressure cap.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the pressure plug.

(3) Lift the fuze out of the mine case.

(4) Unscrew the detonator assembly from the fuze.

(5) Transport the mine and fuze to a safe storage or disposal area.

96. Dual-Purpose Mine, No. 4 (Communist China)

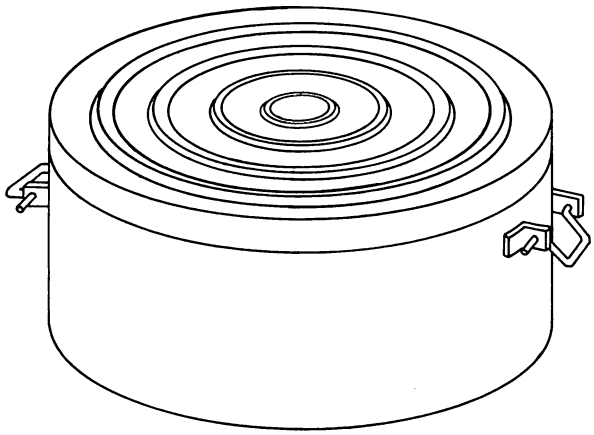


Figure 95

This model has a cast iron case with a flat top and bottom. The fuze well is centrally located on the top and closed by a threaded waterproof cap. As an antipersonnel mine, it may have steel fragments or shrapnel glued to the outside of the top.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular . . .	Pressure-pull.	300 to 500 lb. 10 to 50 lb.	12 lb.

b. Use. This model may be used as an antivehicular or antipersonnel mine.

(No drawing available.)

c. Functioning. Functioning, installing and arming, and disarming procedures are unknown.

97. Sheet Metal Antitank Mine (North Korea)

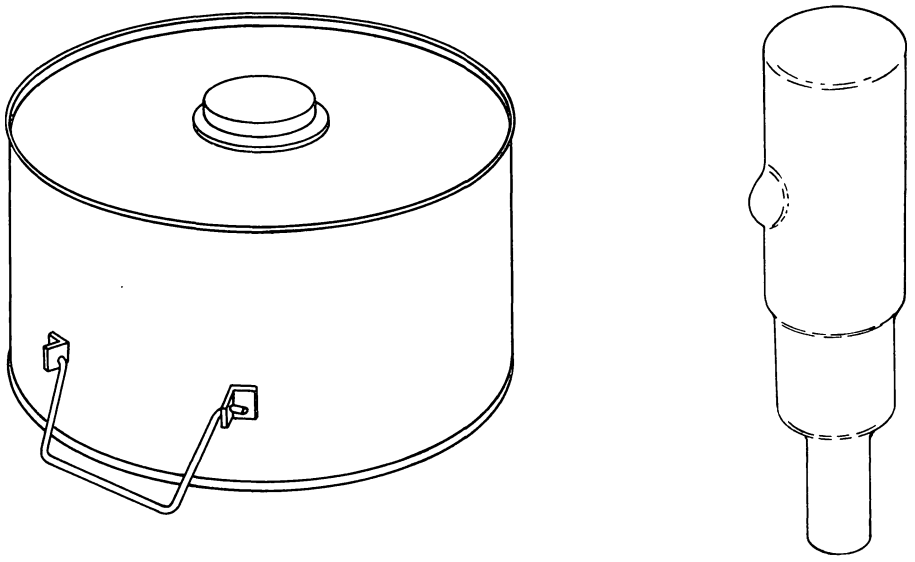


Figure 96

This sheet metal mine resembles the Soviet TM–41, but is of simpler construction. It has no raised ridges on top for rigidity and no corrugations on the lid to aid crushing under pressure. The fuze well is located in the center of the top and the filler hole is off center in the bottom. The filler hole may be used for booby-trapping. The mine is 25.4 centimeters in diameter and 12.7 centimeters high.

a. Characteristics.

Shape	Fuze	Operating pressure	Explosives	
			Main charge	Booster
Circular...	MV–5 pressure.	350 lb.	Unknown	75-gram cylindrical charge.

b. Employment. This antivehicular mine is laid in minefields and roadblocks.

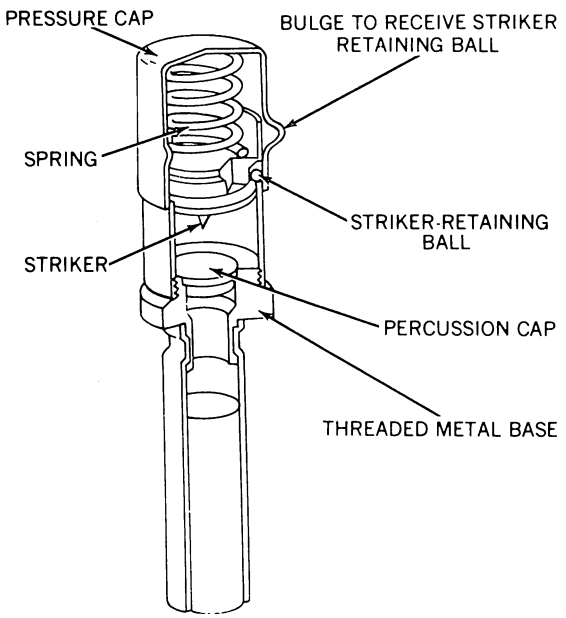


Figure 97

c. Functioning. Pressure on the lid crushes it, depressing the fuze pressure cap, actuating the fuze, and exploding the mine.

d. Installing and Arming.

(1) Rotate the pressure cap on the lid until it can be lifted.
(2) Insert a 75-gram cylindrical booster charge in the fuze well.
(3) Insert an MV–5 fuze with detonator into the fuze well.
(4) Replace the pressure cap.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Unscrew the pressure cap from the mine case.
(3) Lift the fuze out of the mine case.
(4) Unscrew the detonator assembly from the fuze.
(5) Transport the mine and fuze to a safe storage or disposal area.

98. Antivehicular Mine (Estonia)

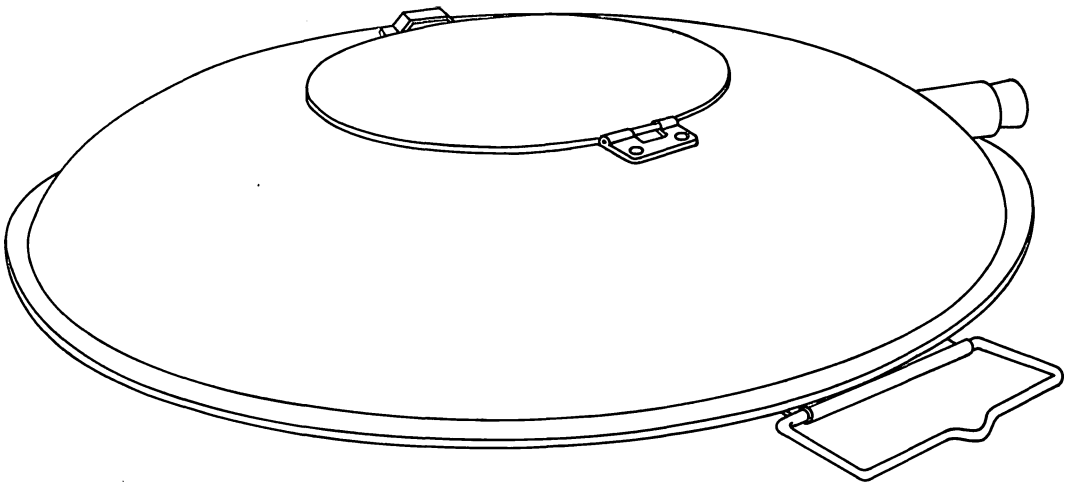


Figure 98

This land mine has a metal case 19.0 centimeters in diameter and 5.6 centimeters high, with a fixed wire handle on the side. A horizontal percussion cap holder and detonator tube projects out of the side. A hinged rounded metal pressure lid on the top covers the central fuze well and the circular pressure disk. The spring loaded striker is built into the mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Integral pressure.	200 lb.	2 lb.

b. Use. This is an antivehicular mine.

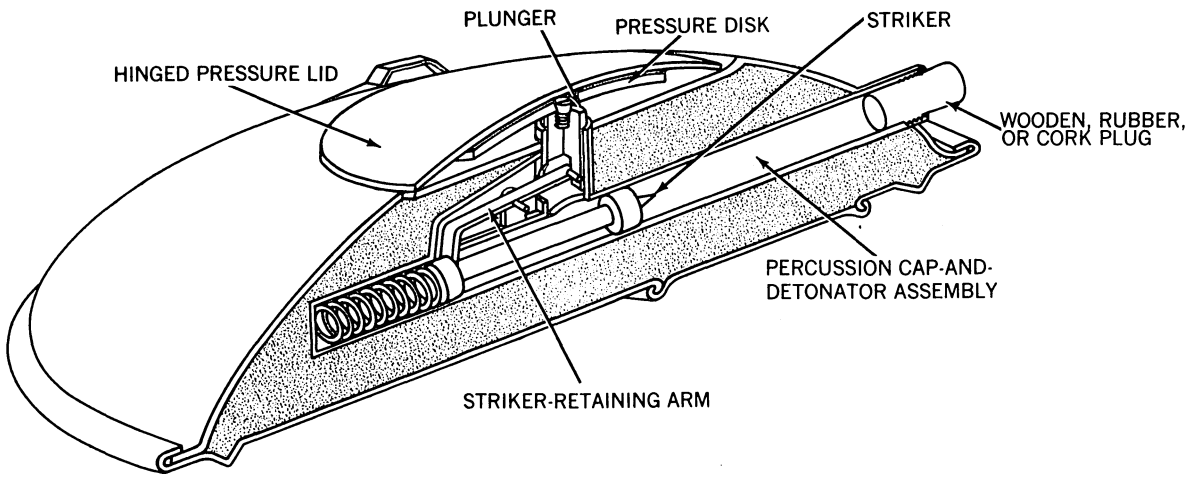


Figure 99

c. Functioning. Pressure on the pressure lid, transmitted to the pressure disk, depresses the plunger, pushing down on one end of the striker retaining arm until the other end releases the striker to slam against the percussion cap.

d. Installing and Arming.

(1) Remove the plug and slide the percussion cap and detonator assembly, cap first, into the detonator tube.

(2) Close the tube with the plug.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the plug in the end of the percussion cap and detonator tube.

(3) Carefully tilt the mine and slide out the detonator assembly.

(4) Transport the mine to a safe storage or disposal area.

99. Antivehicular Mine (Latvia)

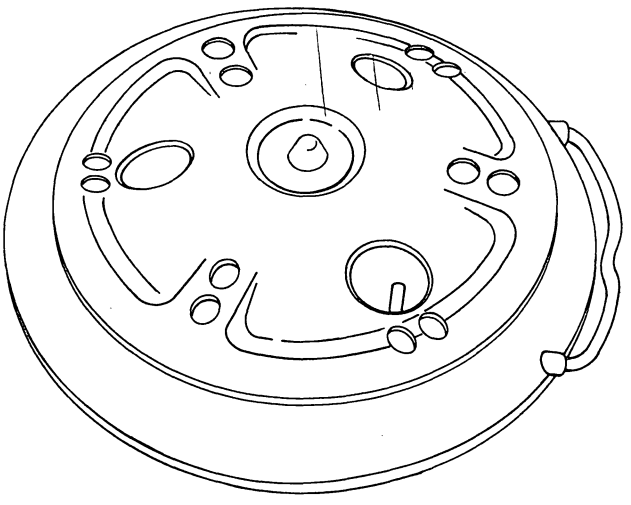


Figure 100

This mine has a metal case 19.0 centimeters in diameter and 5.6 centimeters high, with a hole in the bottom closed by a metal plug for access to the charge cavity. The centrally located fuze well is on top of the case. The thin metal pressure plate fits inside the charge case. It may be locked in place by turning it one-half inch in a counterclockwise direction. The mine has a wire handle and a doughnut shaped booster charge.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Flat, circular.	Integral	650 lb. pressure.	1.5 lb.

b. Employment. This is an antivehicular mine.

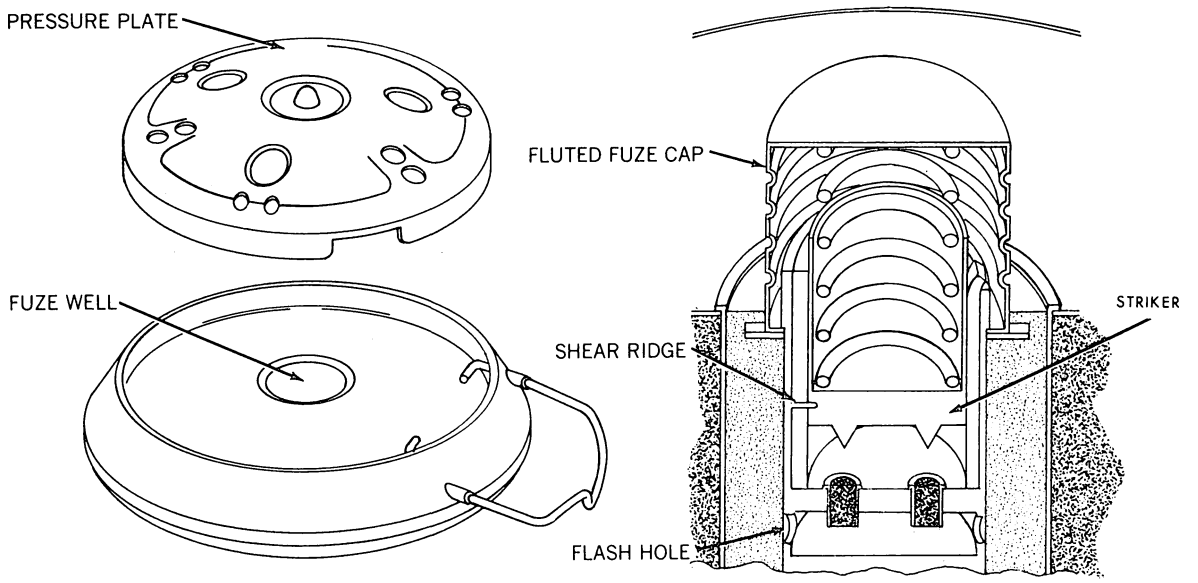


Figure 101

c. Functioning. Pressure on the center of the pressure plate crushes it and the fluted fuze cap. This compresses the main spring of the fuze until the pressure shears the ridge that retains the striker, releasing it and setting off the two percussion caps, the booster, and the main charge.

d. Installing and Arming.

(1) Rotate the pressure plate in a clockwise direction and lift it off.

(2) Insert the fuze and the booster charge into the fuze well.

(3) Replace the pressure plate and lock it in place by turning it in a counterclockwise direction.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the pressure plate by rotating it in a clockwise direction.

(3) Lift the fuze from the fuze well.

(4) Separate the booster charge from the fuze.

(5) Transport the mine and fuze to a safe storage or disposal area.

100. Antitank Mine (Yugoslavia)

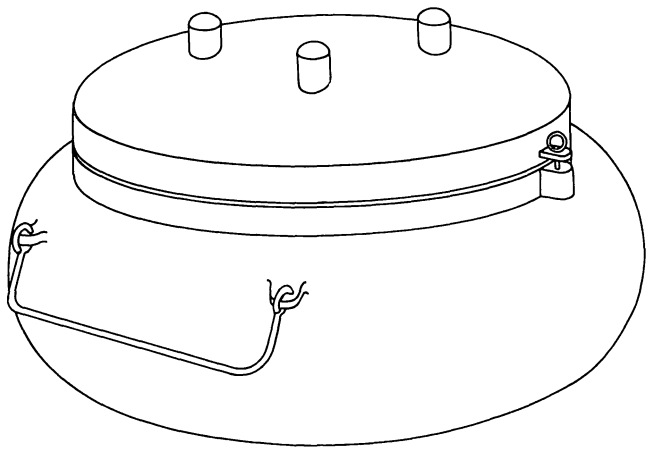


Figure 102

This antitank mine has a cast metal case with curved walls and a pressure plate, held off the fuze by a safety band, with three stud-like projections on the top to permit the use of a thin camouflage layer of earth and still provide positive detonation. The fuze has a spring-loaded striker.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Round, flat.	Pressure	220 lb. or more	5.5 lb.

b. Employment. This mine is used in antitank mine fields against light and medium tanks and in hasty road blocks.

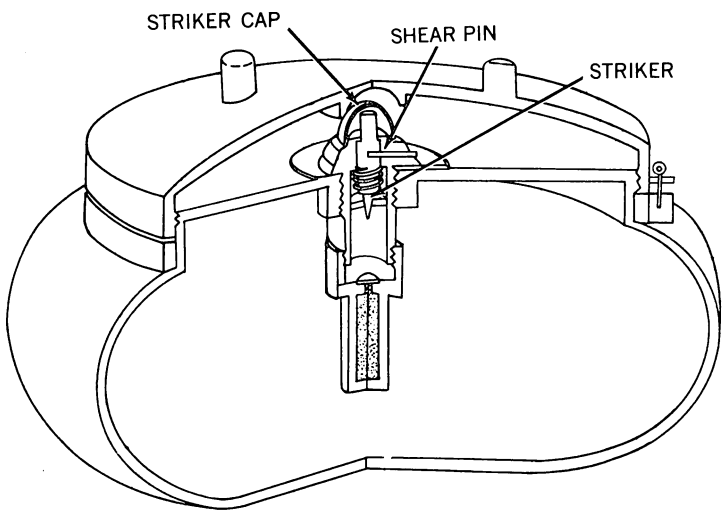


Figure 103

c. Functioning. Pressure on the pressure plate depresses the striker, shearing the shear pin and releasing the striker to fire the percussion cap and detonate the mine.

d. Installing and Arming.

(1) Remove the safety band.
(2) Screw down the pressure plate until it rests on the striker cap.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Unscrew the pressure plate from the mine case.
(3) Carefully unscrew the fuze from the mine.
(4) Unscrew the detonator assembly from the fuze.
(5) Transport the mine and the fuze to a safe storage or disposal area.

101. Dual-Purpose Mine, M/39 (Sweden)

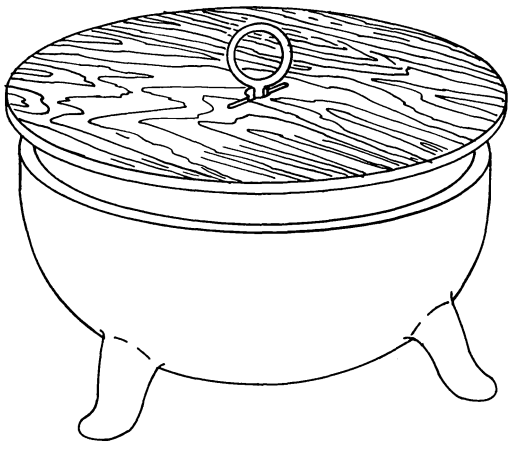


Figure 104

This mine is in an iron case. It has a fuze with a spring-loaded striker, a wooden lid, and 3 short legs welded to the bottom. The mine measures about 30.4 centimeters in diameter and 15.2 centimeters in height.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Pot-shaped....	Pressure.....	200 to 300 lb.	6.84 lb.

b. Employment. This mine is used as an antitank and antivehicular mine.

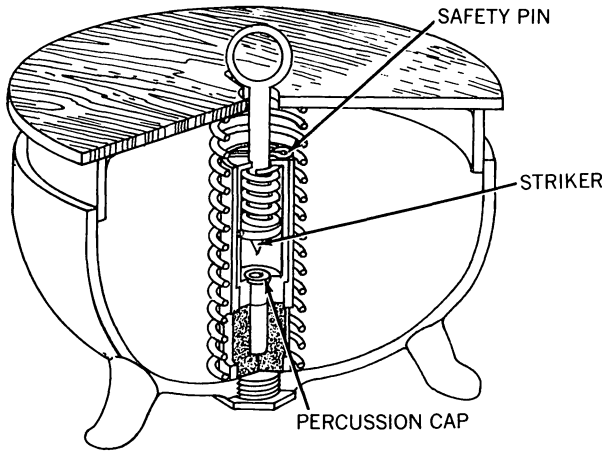


Figure 105

c. Functioning. Pressure on the striker ring and wooden lid breaks the lid, releasing the striker, which driven by its spring fires the percussion cap, detonator, booster, and main charge.

d. Installing and Arming.

(1) Insert the striker ring through the slit in the wooden lid and turn the ring 90°, so that it is at right angles to the slit.

(2) Remove the safety pin.

(3) Place the lid assembly (fuze, detonator, and lid) in the mine.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Check to be sure that the striker ring is at right angles to the slit in the wooden mine cover.

(3) Carefully lift off the wooden cover with the fuze attached.

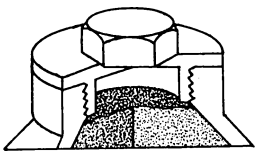
(4) Insert a safety wire in the safety pin hole of the fuze.

(5) Turn the striker ring parallel to the slit and remove the fuze from the cover.

(6) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. If the mine cover shows any sign of deterioration, do not attempt to disarm the mine. Destroy the mine by placing a ½-pound block of TNT on the mine cover and detonating it.

102. Antitank Mine VI (Bottle Mine) (Belgium)



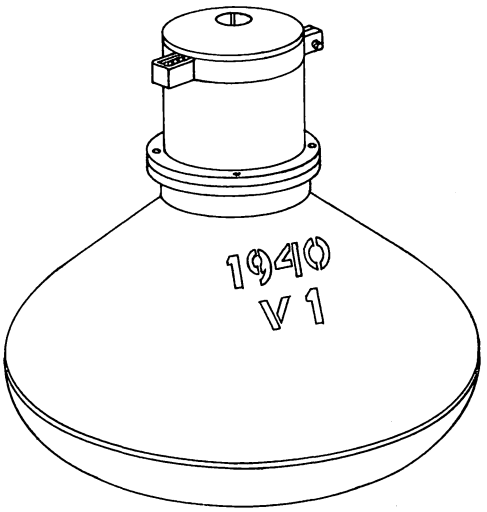


Figure 106

This mine has a cast iron body 20.3 centimeters in diameter and 11.8 centimeters high. It has a cylindrical fuze model 800–B with a spring loaded plunger, safety collar, pressure cap, and a spring loaded striker.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	Markings
Cone-shaped.	800–B, pressure.	400 lb. or more.	6 lb.	Letters "VI" stenciled in white.

b. Employment. This model is laid in large tactical antitank minefields.

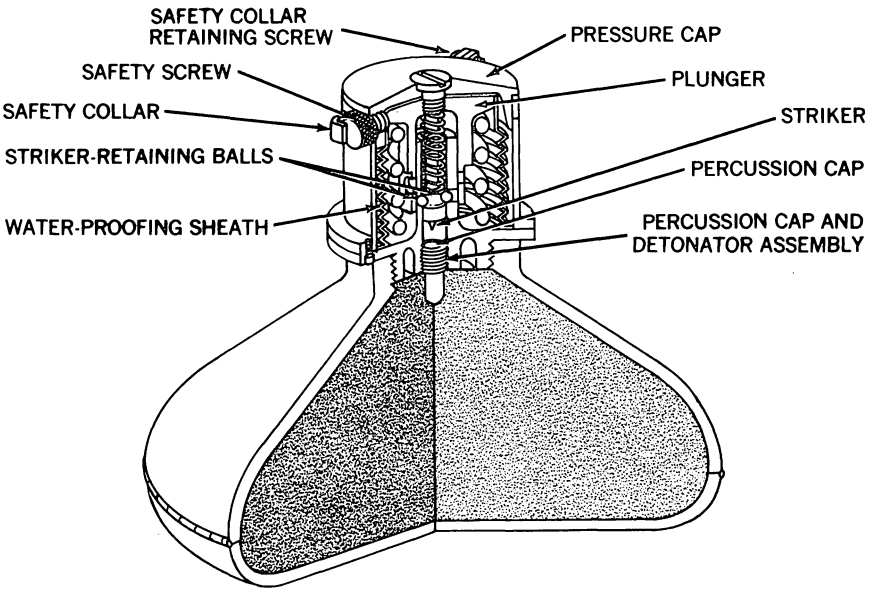


Figure 107

c. Functioning. Pressure on the pressure cap depresses the plunger, allowing the retaining balls to escape into their recesses releasing the striker and firing the mine.

d. Installing and Arming.

(1) Unscrew the shipping plug from the fuze well.
(2) Screw the percussion cap and detonator assembly into the fuze.
(3) Screw the fuze into the mine.
(4) Unscrew the safety collar retaining screw and remove the collar.
(5) Unscrew the safety screw.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Screw in the safety screw, if present.
(3) Unscrew the fuze from the mine.
(4) Unscrew the detonator assembly from the fuze.
(5) Transport the mine and the fuze to a safe storage or disposal area.

103. Light Antitank Mine (Gliding Mine) (Switzerland)

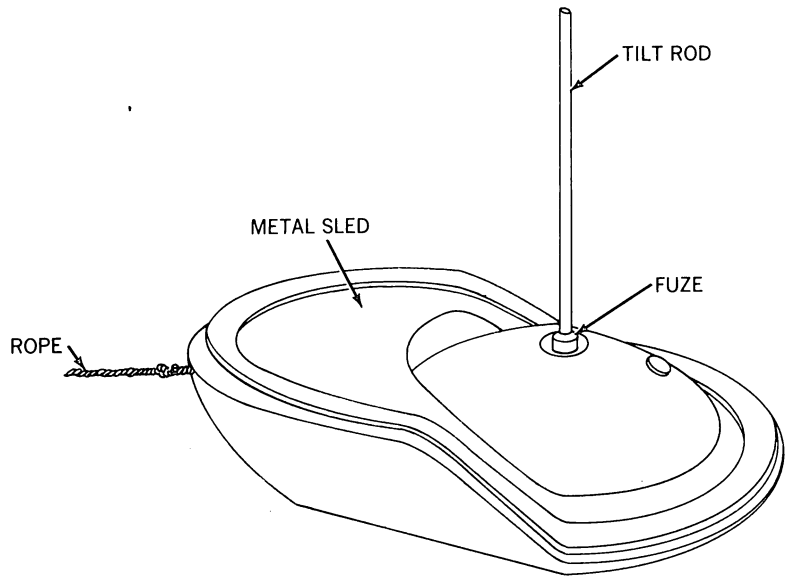


Figure 108

This metal cased mine has a centrally located fuze well and a pressure fuze with a pressure disk that fits over it. This mine resembles the Belgian bottle antitank mine more closely than any other. It is called a gliding mine as it may be provided with a metal sled for pulling out onto a roadway in front of a tank.

a. Characteristics.

Shape	Color	Fuze	Operating pressure	Explosive
Flat bottom and cone-shaped top.	Camouflage pattern.	Pressure fuze with tilt rod release or pressure fuze.	25 lb. or more	6.5 lb. TNT

b. Employment. This mine is useful against light and medium tanks and vehicles.

(No drawing available.)

c. Functioning. Pressure on the top of the mine or a sideward movement of the tilt rod releases the striker to fire the percussion cap and detonate the mine.

d. Disarming Procedure.

(1) Carefully check for and remove any antilift devices.

(2) Carefully unscrew the fuze from the mine.

(3) Transport the mine and fuze to a safe storage or disposal area.

104. Antitank Mine TM–35 (U.S.S.R.)

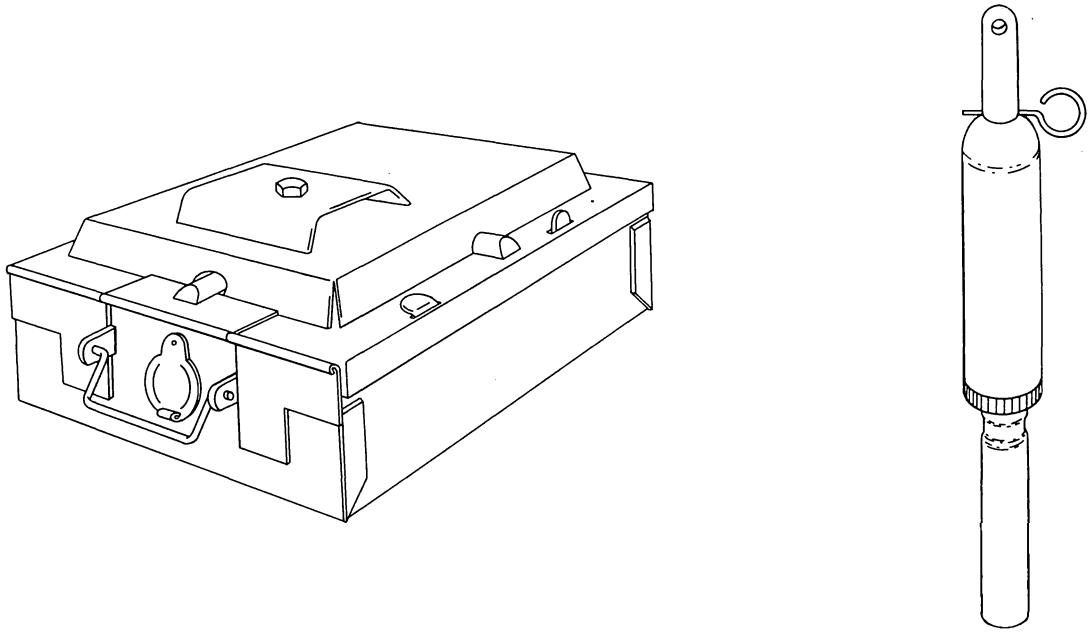


Figure 109

The TM–35 is one of the earliest Soviet metallic land mines. It consists of a sheet metal case, 2.28 by 21.8 by 8.3 centimeters with a hinged sheet-metal lid, and on top of this, a pressure lid. A pressure bolt extends from the top of the shield plate through the pressure lid and the hinged lid and is positioned just above the fuze actuating lever. Projecting upward from each side of the mine body is a pair of metal locking lugs, which, projecting through the lid, are bent over to keep it closed.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	MUV pull	500 lb.	6.2 lb.

b. Use. This mine is laid on the ground and camouflaged or in the ground with just the metal shield extending above the surface.

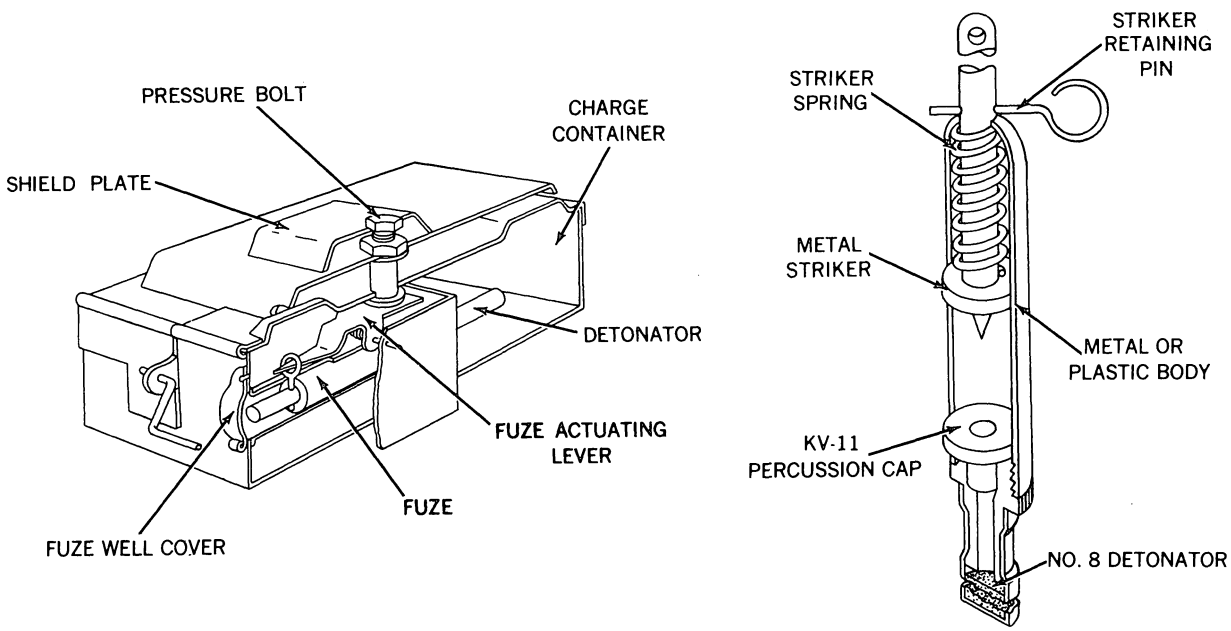


Figure 110

c. Functioning. Pressure on the metal shield crushes the pressure lid forcing the pressure bolt down on the fuze actuating lever. This pulls out the retaining pin and frees the striker to fire the mine.

d. Installing and Arming.

(1) Screw an MD-2 detonator assembly to the base of an MUV pull fuze.

(2) Install the fuze by sliding it into the hollow fuze well through the opening under the handle. Keep the top of the striker retaining pin upward so that it engages in the narrow end of the fuze actuating lever.

(3) Close the pivoted fuze well cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Carefully lift up the lid locking lugs.

(3) Carefully lift the mine cover.

(4) Check for any antilift devices inside the mine case.

(5) Open the fuze-well cover and remove the fuze.

(6) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. As these mines are easily booby-trapped, it is recommended that they be destroyed in place by countercharging them on the top close to the fuze.

105. Antitank Mine, TM-38 (U.S.S.R.)

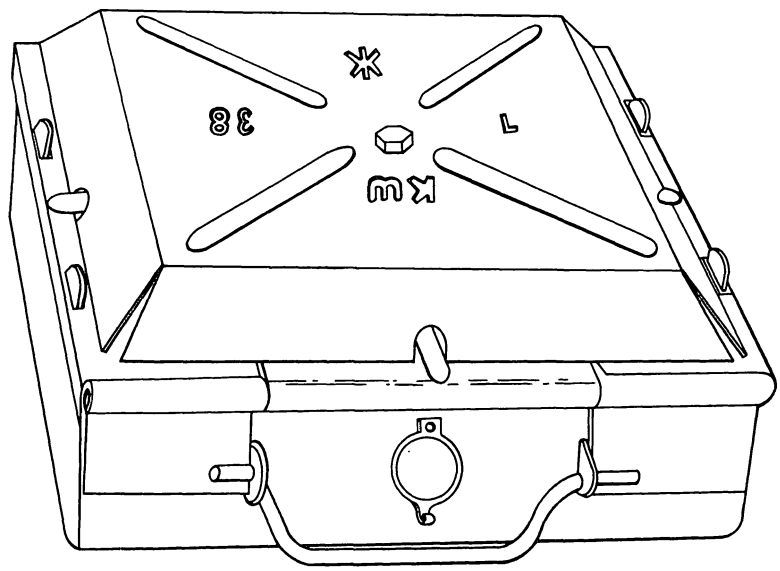


Figure 111

The TM-38 is a later model of the TM 35, and looks much like it. It is 21.8 by 21.8 by 7.8 centimeters. The pressure lid has four raised ridges to add rigidity and does not have a shield plate. A pressure bolt extends through the pressure lid and mine cover and is positioned just above the fuze actuating lever.

a. Characteristics.

Shape	Fuze	Operating pressure	Explosive
Rectangular....	MUV pull	500 lb.	6.5 lb.

Markings

Manufacturing plant symbols, month and year of manufacture, and the Russian symbol.

b. Use. This mine is employed in minefields and roads for antitank and antitransport purposes. Occasionally the Germans found this mine laid on a supplementary charge containing an MUV pull fuze with a cord running from the retaining pin to the handle of the mine.

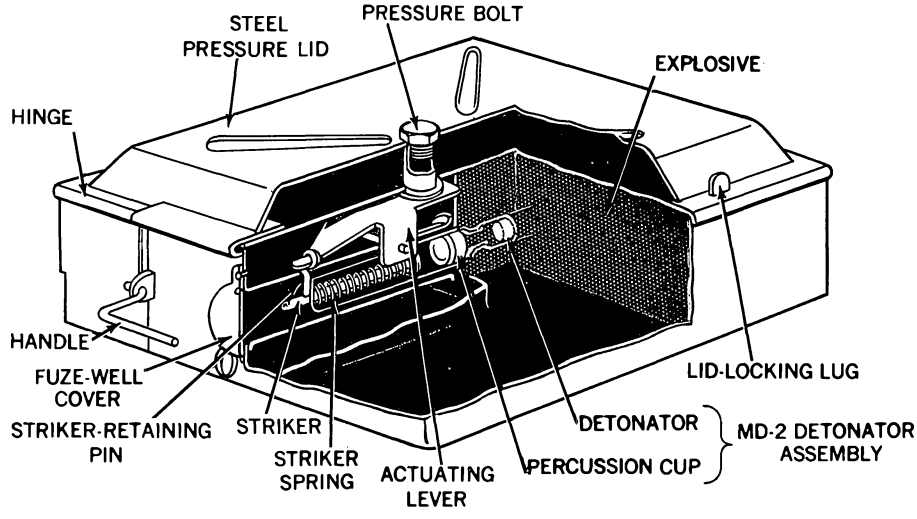


Figure 112

c. Functioning. Pressure on the steel pressure lid forces the pressure bolt down on the fuze actuating lever, pulling out the retaining pin. This forces the spring-driven striker to fire the percussion cap and detonate the mine.

d. Installing and Arming.

(1) Screw an MD–2 detonator assembly to the base of an MUV pull fuze.

(2) Install the fuze by sliding it into the hollow fuze well through the opening under the handle. Keep the loop of the striker retaining pin upward so that it engages in the narrow end of the actuating lever.

(3) Close the pivoted fuze well cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices outside of the mine.

(2) Carefully lift up the lid-locking lugs.

(3) Carefully lift the mine cover.

(4) Check for any antilift devices inside the mine.

(5) Open the fuze well cover and remove the fuze.

(6) Remove the mine to a safe storage or disposal area.

f. Additional Precautions. As these mines are easily boobytrapped, it is recommended that they be destroyed in place by countercharging them on the top close to the fuze.

106. Antitank Mines TM-35(M) and TM-39 (U.S.S.R.)

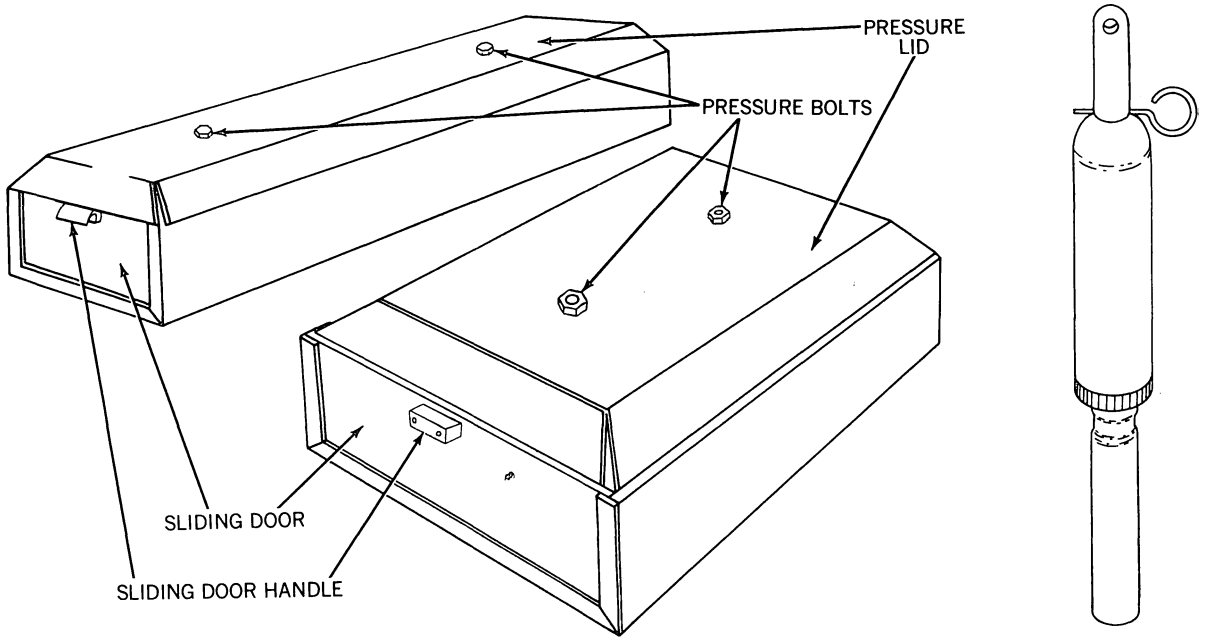


Figure 113

The TM-35 (M) is a modification of the TM-35 and resembles and elongated TM-38. It measures about 22.8 by 21.8 by 11.4 centimeters. The pressure lid contains two pressure bolts, one at each end of the lid, each positioned over a fuze actuating lever. A sliding door at each end gives access to the fuze wells. The TM-39, is similar to the TM-38 but much longer and narrower. The case measures 59.6 by 13.9 by 10.1 centimeters. Access to the fuze wells is provided by a sliding door at each end.

a. Characteristics.

Shape	Fuze	Operating pressure	Explosive
Rectangular....	MUV pull, with lever release.	TM-35(M)-500 lb. TM-39-600 lb.	TM-35(M)-8.8 lb. TM-39-7.1 lb.

b. Use. These mines are laid in minefields and road blocks against tanks and transport vehicles.

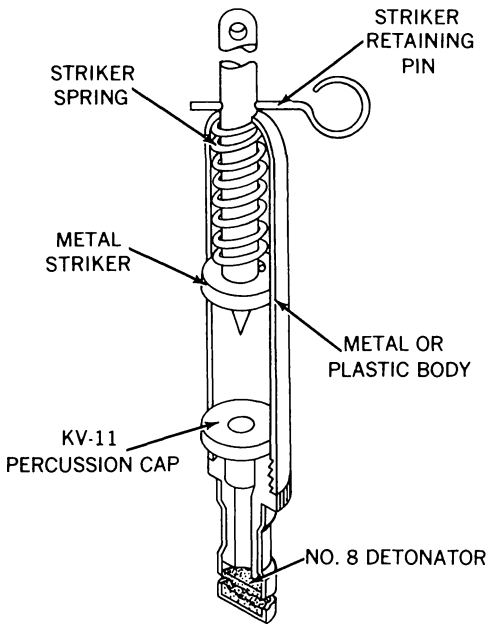


Figure 114

c. Functioning. Pressure on either or both pressure bolts in both mines presses them down upon the actuating lever, which pulls the retaining pin out of the striker and releases it to fire the mine.

d. Installing and Arming.

(1) Screw an MD-2 detonator to each of the two fuzes and insert them into the fuze wells, with the eye of the retaining pin upwards so that it engages the narrow end of the actuating lever.

(2) Close the fuze well cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices on the outside of the mine case.

(2) Lift the mine cover.

(3) Check for antilift devices on the inside of the mine case.

(4) Open the sliding door or doors and remove the fuze or fuzes.

(5) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. As this mine is easily boobytrapped, it is recommended that it be destroyed in place by countercharging on the top close to the fuze.

107. Antitank Mine, T-IV (U.S.S.R.)

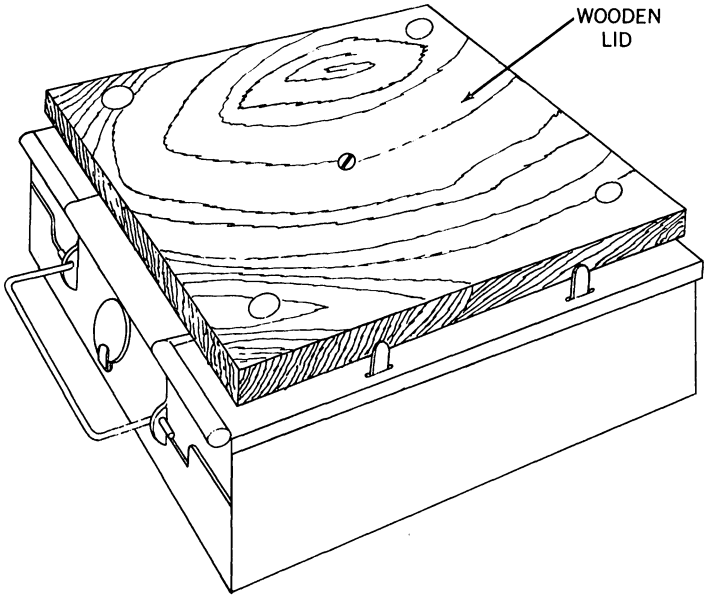


Figure 115

The T-IV is merely another modification of the TM-35 and TM-38 antitank mines. The T-IV differs only in the lid and pressure piece which is a flat, wooden board secured to the steel hinged lid by four bolts, one at each corner. The round wooden pressure piece, fastened to the bottom of the wooden board, projects through the metal lid and is positioned above the fuze actuating lever. (Some models have a round wooden shear pin projecting through the pressure piece flush with the top of the metal lid.) The mine measures 21.8 by 21.8 by 9.6 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	MUV pull	500 lb.	6.2 lb.

b. Use. This mine is used in minefields and road blocks against tanks and vehicles.

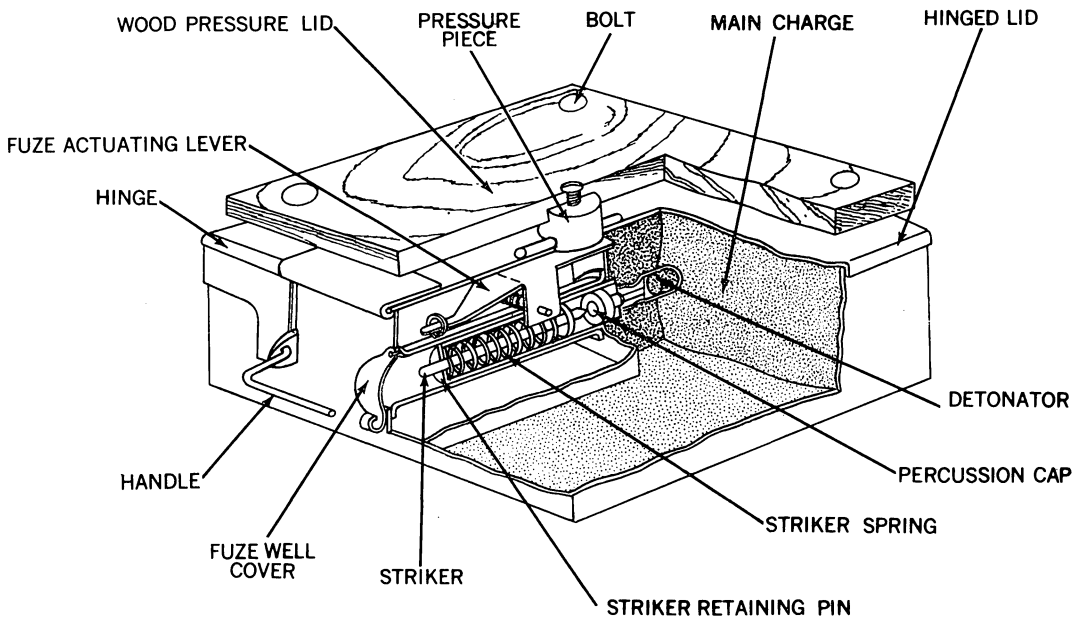


Figure 116

c. Functioning. Pressure on the wooden pressure lid crushes it, forcing the wooden pressure piece down on the actuating lever, pulling out the retaining pin, freeing the striker, and exploding the mine.

d. Installing and Arming.

(1) Screw an MD–2 detonator assembly to the base of an MUV pull fuze.

(2) Install the fuze by sliding it into the hollow fuze well through the opening under the handle. Keep the loop of the retaining pin up so that it engages in the narrow end of the actuating lever.

(3) Close the fuze well cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices outside of the mine case.

(2) Remove the wooden pressure plate.

(3) Lift the metal mine cover.

(4) Check for any antilift devices that may be inside of the mine.

(5) Open the fuze-well cover and remove the fuze.

(6) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. As this type of mine is easily boobytrapped, it is recommended that it be destroyed in place by countercharging it on the top closest to the fuze.

108. Tilt Rod General Purpose Mine, AKS (U.S.S.R.)

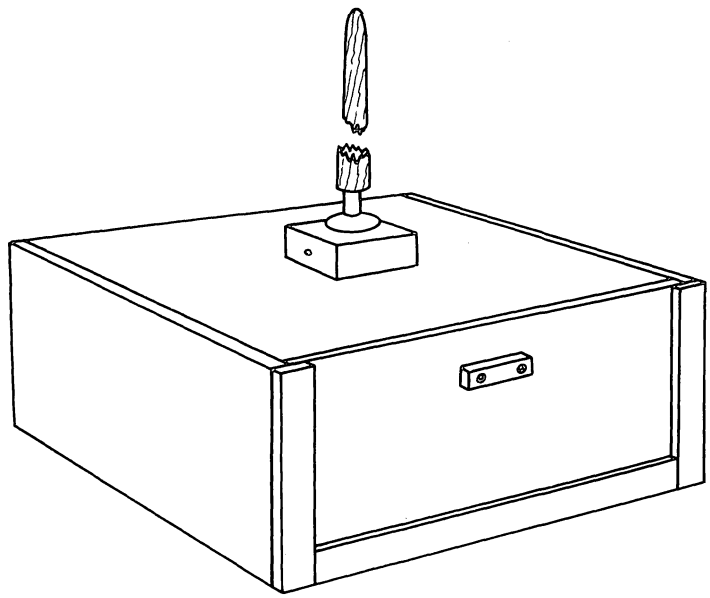


Figure 117

The interior of this mine is similar to that of the TM-38. The metal case is 21.5 by 21.5 by 11.4 centimeters. The tilt rod is about 63.5 centimeters high. One side of the case has a sliding door to give access to the fuze. A safety pin is provided on the base of the tilt rod to prevent movement.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Tilt rod on top to actuate a pull fuze.	11 to 44 lb. pull	13.2 lb. TNT

b. Use. The tilt rod mine was designed for use in deep snow where other types of mines were not always dependable. The tilt rod is often camouflaged to resemble a small seedling or bush.

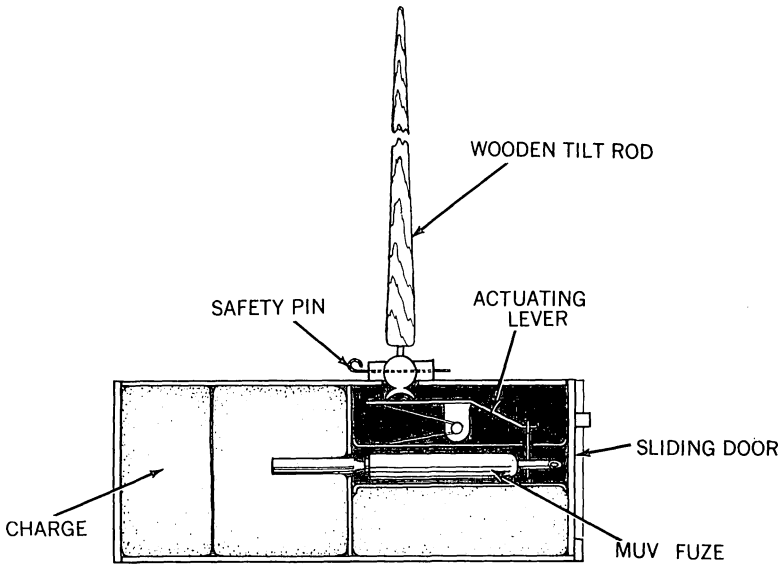


Figure 118

c. Functioning. Rotation of the lever rotates a hinged disk which depresses the actuating lever, lifting the pin from the striker, and firing the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Slide off the removable side.

(2) Screw an MD-2 detonator assembly to the base of an MVV pull fuze.

(3) Slide the fuze into the charge.

(4) Attach the loop of the striker retaining pin to the actuating lever.

(5) Remove the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Carefully raise up the sliding door and remove the fuze.

(3) Transport the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. The recommended disposal procedure for this mine is to destroy it in place because of the ease with which it can be boobytrapped. **Do not allow any movement of the tilt-rod when removing the mine fuze.**

109. Antitank Mine, BSB (Belgium)

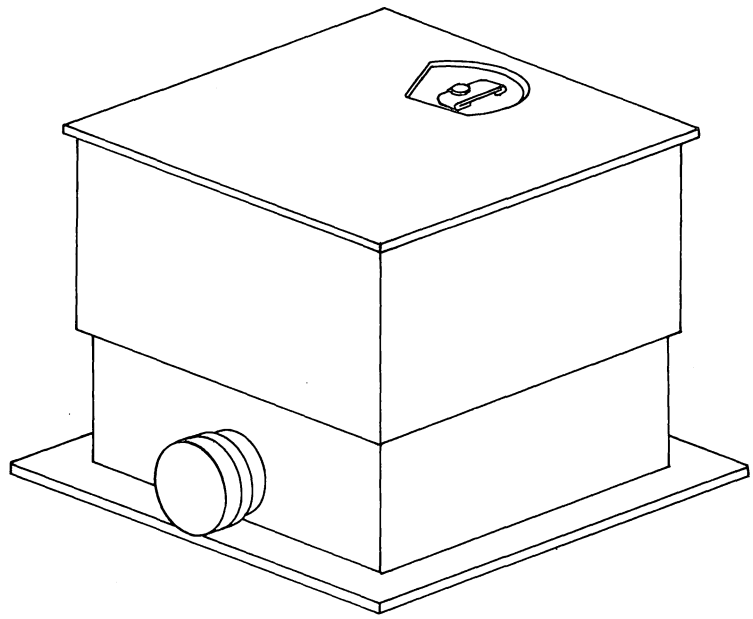


Figure 119

This antitank mine consists of a metal case 24.1 by 24.1 by 16.5 centimeters and a lid. It resembles the type H antitank mine but has a different fuze. The integral pressure fuze has a spring-loaded striker and a release plunger. A safety catch in the lid of the mine prevents the striker-release plunger from releasing the striker.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular.....	Integral pressure.	400 lb. or more	7.75 lb. pressed TNT.

b. Use. This mine was designed for employment in large tactical minefields and border-defense barrier systems.

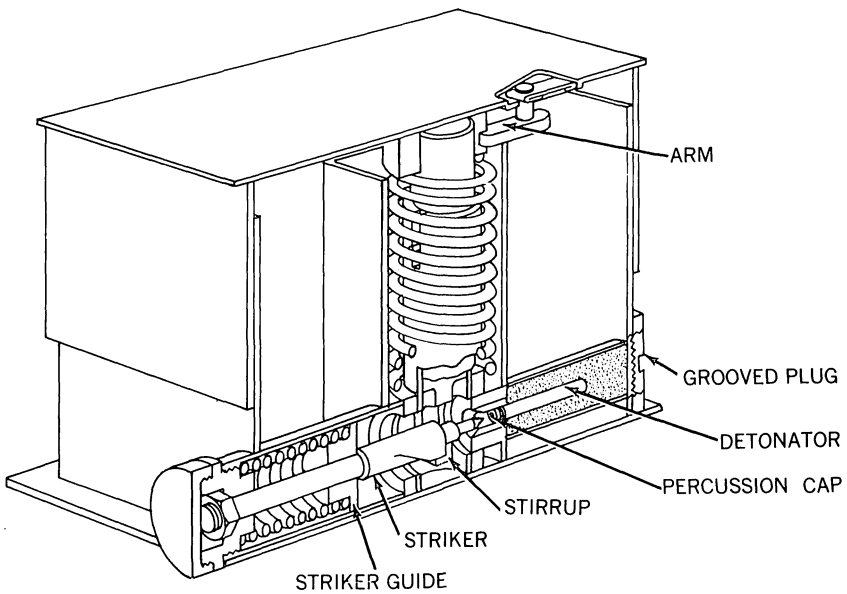


Figure 120

c. Functioning. Pressure on the lid depresses the plunger until it releases the striker and fires the mine.

d. Installing and Arming.

(1) Turn the safety catch so that the arm disengages from the plunger collar and remove the lid.

(2) Unscrew the grooved plug from the striker tube and insert the percussion cap, detonator, and charge into the tube.

(3) Install the TNT blocks and replace the lid.

(4) Turn the safety catch so that the arm engages in the groove in the plunger collar.

(5) Unscrew the threaded cap from the striker tube, unscrew the safety nut, and replace the cap.

(6) Turn the safety catch in the lid so that the arm is freed from the plunger collar.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the grooved plug from the booster end of the striker tube.

(3) Carefully remove the booster, detonator, and percussion cap from the striker tube.

(4) Transport the mine and fuze to a safe storage or disposal area.

110. Antitank Mine, Type H (Belgium)

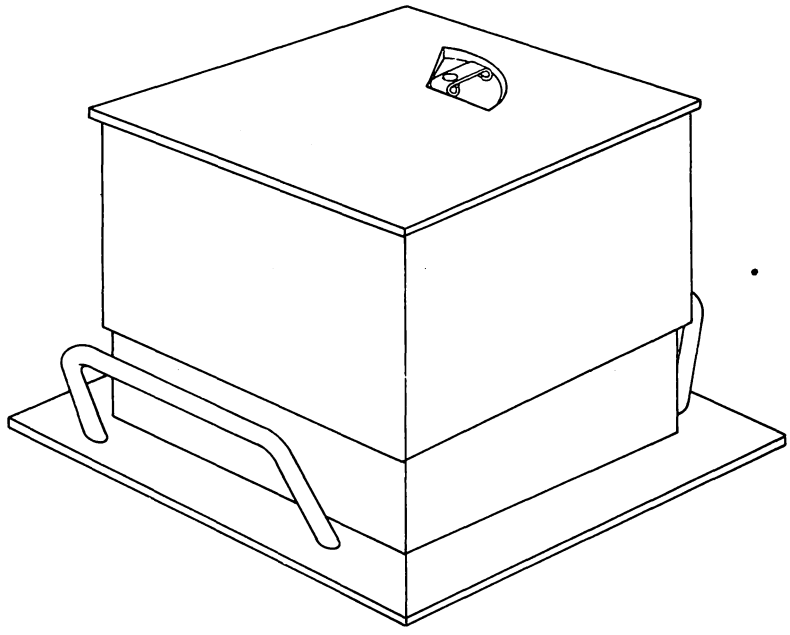


Figure 121

This sheet steel antitank mine has a case 26.6 by 26.6 by 17.7 centimeters and a lid. A safety catch located at the top of the lid has an arm that engages in the safety cap of the fuze. The fuze, though removable, is designed especially for this mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular.....	Pressure....	400 lb. or more.	12.75 lb. TNT.

b. Use. This mine was designed for employment as an antitank mine in large minefields and in border-defense barrier systems.

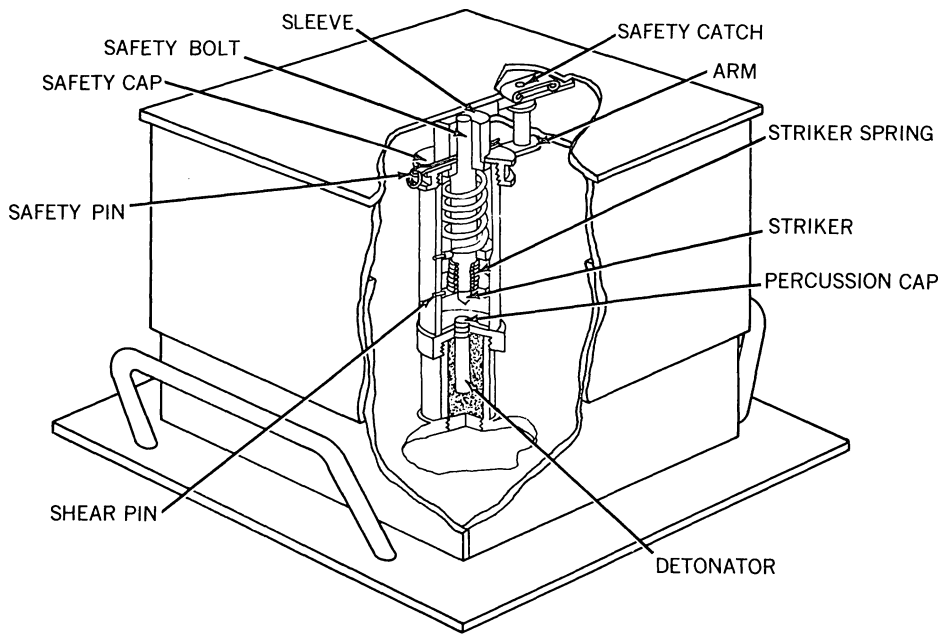


Figure 122

c. Functioning. Pressure on the lid depresses the fuze sleeve and shears the shear pin, releasing the striker to fire the percussion cap, detonator, booster, and main charge.

d. Installing and Arming.

(1) Remove the lid and insert the percussion cap, detonator, and booster charge into the booster case.

(2) Screw on the fuze assembly and place the TNT blocks into the mine.

(3) Withdraw the safety pin, remove the shipping cap from the top of the fuze, and unscrew the safety bolt.

(4) Replace the lid and turn the safety catch so that its arm engages in the groove of the safety catch, freeing the arm from the safety cap.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Carefully free the safety catch if it is engaged in the groove of the safety cap and lift off the mine cover.

(3) Insert a safety-wire into the safety pin hole of the fuze.

(4) Unscrew the fuze assembly from the mine.

(5) Separate the detonator assembly from the fuze.

(6) Transport the mine and fuze to a safe storage or disposal area.

111. Antitank Mine, Type HA (Belgium)

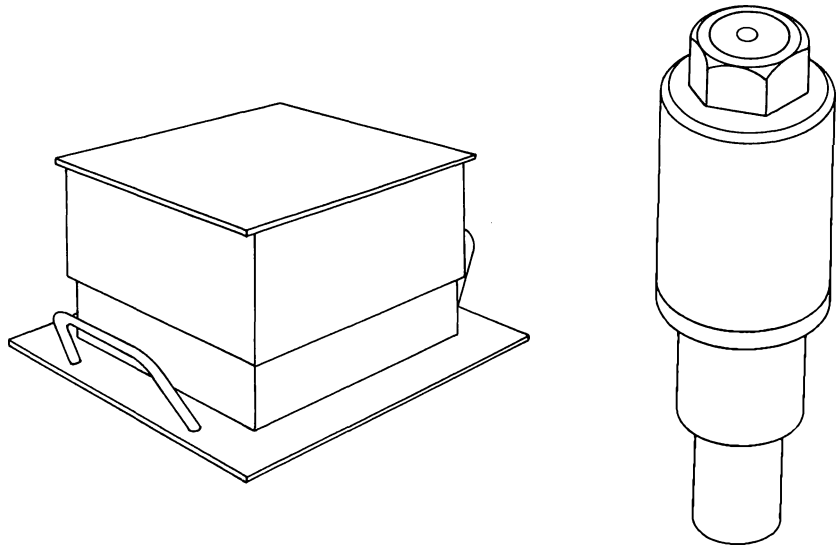


Figure 123

Although this antitank mine is identical to the type H, it is much simpler in many respects. The lid has no safety catch, and the integral fuze is different. The fuze has a plunger, plunger spring, percussion cap, a spring-loaded striker located in a central hole in the plunger, and a safety nut. The mine measures 26.6 by 26.6 by 17.7 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular.....	Integral pressure.	400 lb.	12.75 lb. TNT.

b. Use. This mine was designed for emplacement in large minefields and border-defense barrier systems.

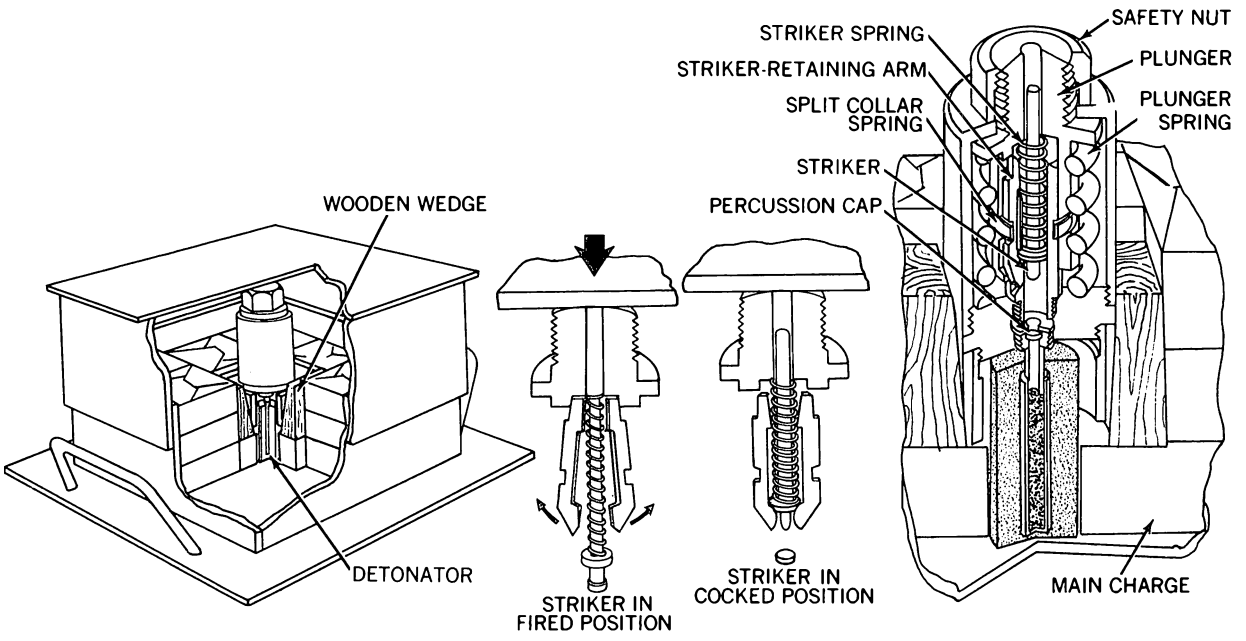


Figure 124

c. Functioning. Pressure on the lid depresses the plunger, forcing it downward on the tops of the two retaining arms, the uppermost ends of which are forced into recesses in the base of the plunger. This continues until the retaining arms are forced far enough outward to release the striker to fire the mine.

d. Installing and Arming.

(1) Fill the mine with TNT blocks leaving a space in the center for the fuze and the booster charge.

(2) Insert a detonator into the booster charge; place the charge in the mine; and insert the fuze.

(3) Force the wooden wedges around the fuze to hold it in place.

(4) Unscrew the safety nut from the fuze.

(5) Replace the lid of the mine.

e. Disarming Procedure.

(1) Check for and remove any antilift devices that may be found.

(2) *Carefully* lift off the mine cover and lift out the fuze assembly.

(3) Lift out the detonator assembly from the mine case.

(4) Separate the percussion cap from the fuze.

(5) Transport the mine and fuze to a safe storage or disposal area.

112. Light Antitank Mine, M–1936 (France)

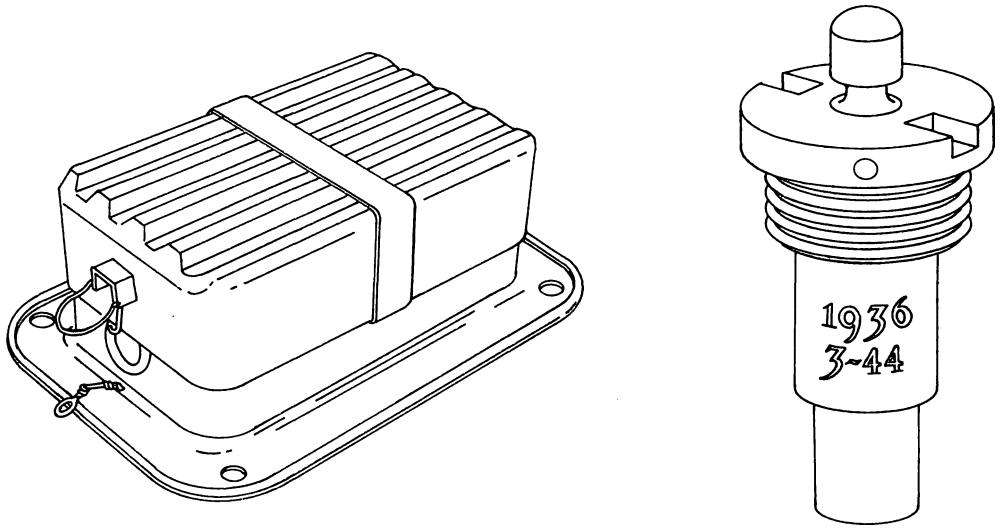


Figure 125

This mine has a steel case 24.1 by 13.9 by 11.4 centimeters. The two fuze wells are located in the top of the charge container. The flanged base plate has a hole in each corner for holddown bolts when the mine is laid in permanent defense positions. Two metal pressure bars welded to the underside of the pressure cover are positioned above the fuzes. A channel shaped aluminum safety bar passes longitudinally through the pressure cover and rests over the fuzes, preventing actuation.

a. Characteristics.

Shape	Fuze	Operating pressure	Explosive
Rectangular.....	Pressure....	300 to 500 lb.	5.75 lb.

b. Use. This mine was laid in antitank minefields and in permanent defensive positions.

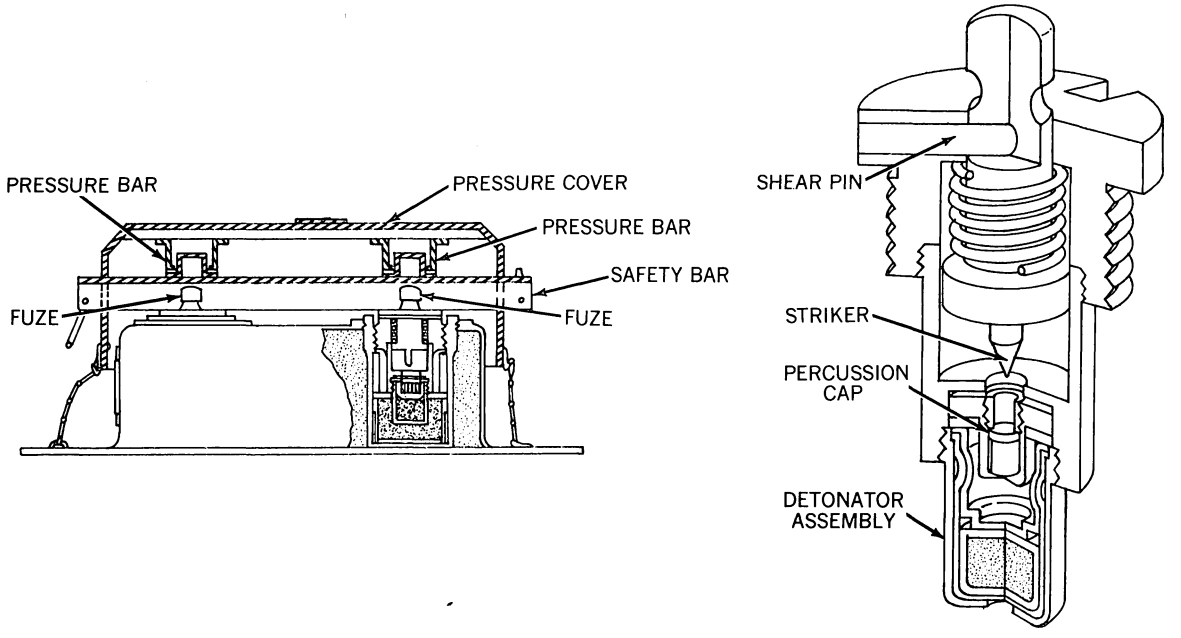


Figure 126

c. Functioning. Pressure on the pressure cover moves the pressure bars downward against the striker shaft of one or both fuzes (M–1935 and 1936), rupturing the shear pin. This releases the striker to fire the mine.

d. Installing and Arming.

(1) Place the mine in the ground with the top flush with or a little below the surface.

(2) Remove the pressure cover and screw two M1935 and 1936 fuzes, percussion caps, and detonator assemblies into the fuze wells.

(3) Insert the safety bar through the holes in the ends of the pressure cover.

(4) Replace the pressure cover and put the wire or chain over the hook to hold it in place.

(5) Withdraw the safety bar.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Carefully lift off the mine pressure cover.

(3) Unscrew both fuzes from the mine.

(4) Unscrew the percussion cap and detonator assembly from the fuze.

(5) Transport the mine and fuze to a safe storage or disposal area.

113. Heavy Antitank Mine, M-1935 (France)

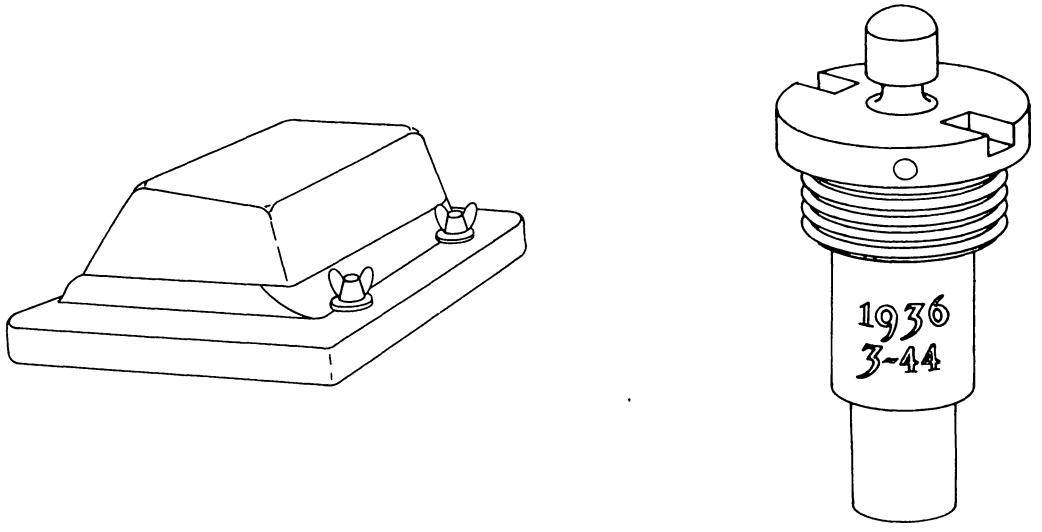


Figure 127

This mine has a steel case—the charge container being welded to a steel base. A hinged, steel pressure cover fits over the charge container and is held in place by two wingnuts. The fuze well is in the top of the charge container. The mine is 41.1 centimeters long, 25.4 centimeters wide, and 11.9 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular.....	M-1935 and 1936 pressure.	800 lb.	3.25 lb.

b. Use. This mine is used in permanent defensive installations.

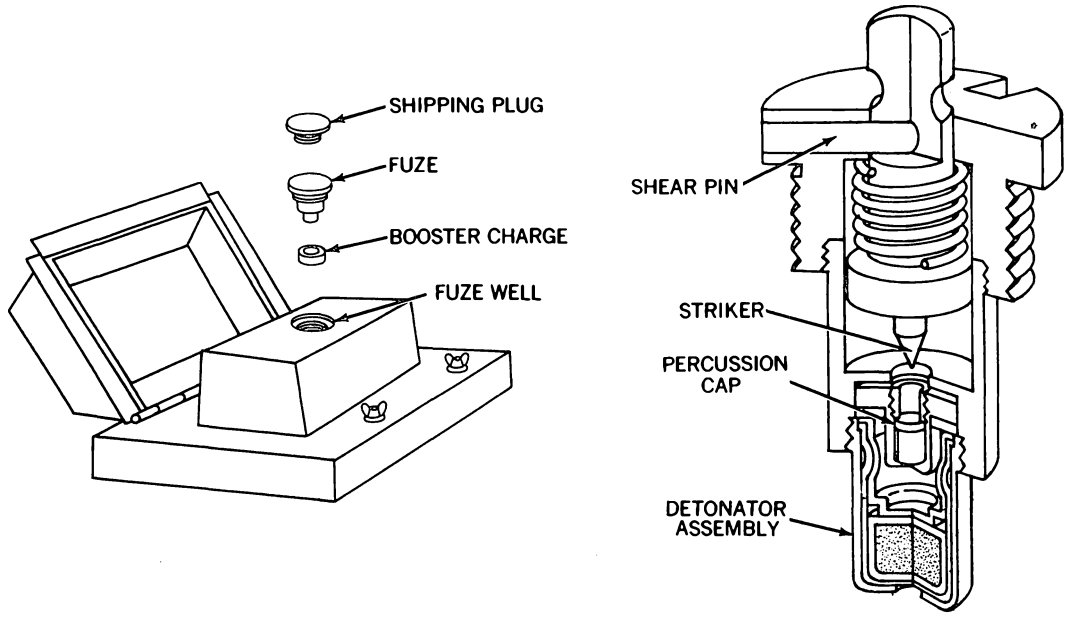


Figure 128

c. Functioning. Pressure on the pressure cover crushes it until it bears against the striker shaft of the fuze, shearing the shear pin. This releases the striker to fire the mine.

d. Installing and Arming.

(1) Place the mine in a hole with the top flush with or a little below the surface of the ground.

(2) Lift the pressure cover and unscrew the shipping plug from the fuze well, or remove the safety collar from around the fuze if the mine is shipped with the fuze in place.

(3) Insert the booster charge in the fuze well and screw in a pressure fuze M–1935 and 1936, with the percussion cap and detonator assembly.

(4) Lower the pressure cover and fasten it with the wing nuts.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the two wing nuts and carefully lift the pressure cover.

(3) Unscrew the fuze assembly from the mine.

(4) Unscrew the percussion cap and detonator assembly from the fuze.

(5) Transport the mine and fuze to a safe storage or disposal area.

114. Ratchet Railway Mine (Italy)

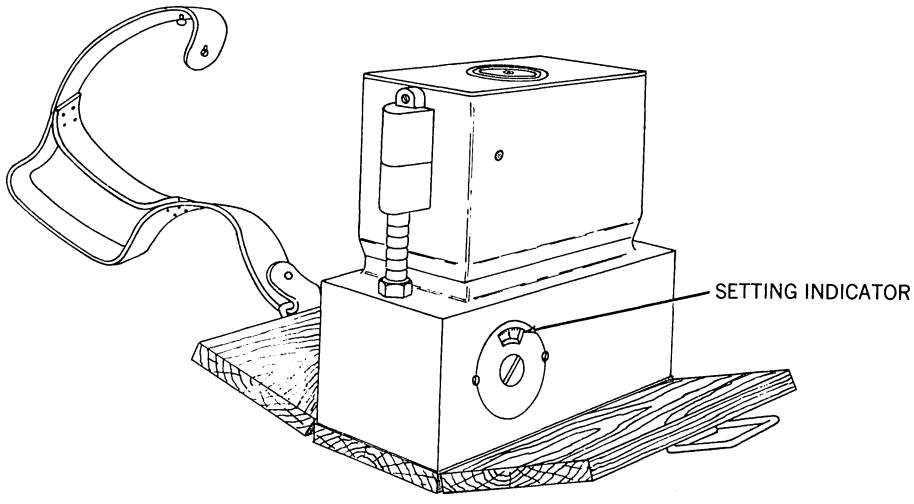


Figure 129

This air valve operated railway mine is a rectangular aluminum case containing the main charge placed on top of another aluminum case containing the ratchet firing mechanism. The two cases are fastened together by spring tension stud bolts, one at each end. The mine measures 30.4 by 22.8 by 15.2 centimeters. The ratchet firing mechanism consists of a pivoted brass lever arm, an air valve governor, and a cog wheel. Applications of pressure on the mine case are transmitted to the lever arm by a spring-loaded plunger.

a. Characteristics.

Shape	Fuze	Explosive	Secondary fuze wells
Rectangular.....	Pressure fuze.	5.1 lb.	One at side of case.

b. Use. The ratchet mine was designed for laying under railroad ties and rails; but it may also be laid on main roads and bridge sites where there is heavy traffic.

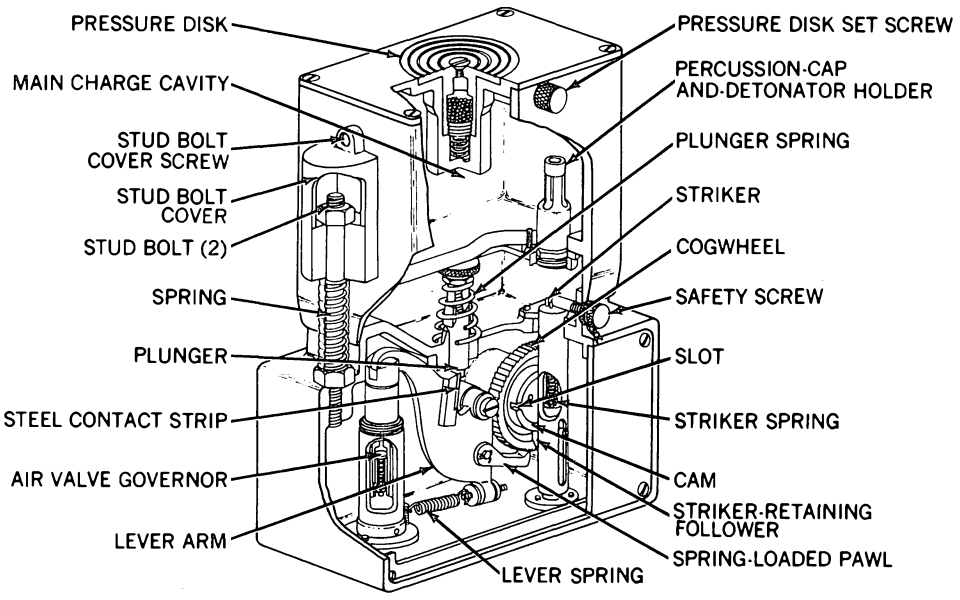


Figure 130

c. Functioning. Pressure on the top of the mine moves the top case down, depressing the plunger, which depresses the lever arm. The lever arm actuates the spring-loaded pawl which moves the cogwheel one cog. (The setting on the setting indicator corresponds with the number of cogs remaining on the cog wheel before the spring-loaded striker is released. When the setting reaches zero, the striker retaining follower is opposite the slot in the cam on the cogwheel.) When the striker-retainer follower is opposite the slot in the cam, the spring-loaded striker is released against the percussion cap, firing the mine.

Note. As 5 seconds is required to fully depress the lever arm and move the cog wheel one cog, vehicles passing over the mine at 30 mph would have to be 75 yards apart, and trains have to be traveling at 15 mph or less to move the cog wheel more than one cog.

d. Installing and Arming.

(1) Remove the covers and nuts from the stud bolts.
(2) Lift off the top case of the mine and check to see if the safety screw is in place.
(3) Insert a detonator and percussion cap into the holder.
(4) Set the indicator for the desired cogwheel setting (1 to 59).
(5) Replace the top case and lay the mine in position.
(6) Adjust the height of the pressure disk on top of the mine by loosening the set screw, removing the pressure disk, and placing lead shot in the cavity at the base of the pressure disk well.
(7) Replace the pressure disk. It should rest flush with the bottom of the tie or rail.
(8) Remove the safety screw.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Insert a 20 D nail into the safety screw hole.
(3) Remove the mine from its position.
(4) Remove the stud-bolt covers and the stud-nut bolts.
(5) Lift off the top of the mine case.
(6) Remove the percussion cap and detonator.
(7) Transport the mine and fuze to a safe storage or disposal area.

115. Magnetic Antivehicular Mine, MDM (U.S.S.R.)

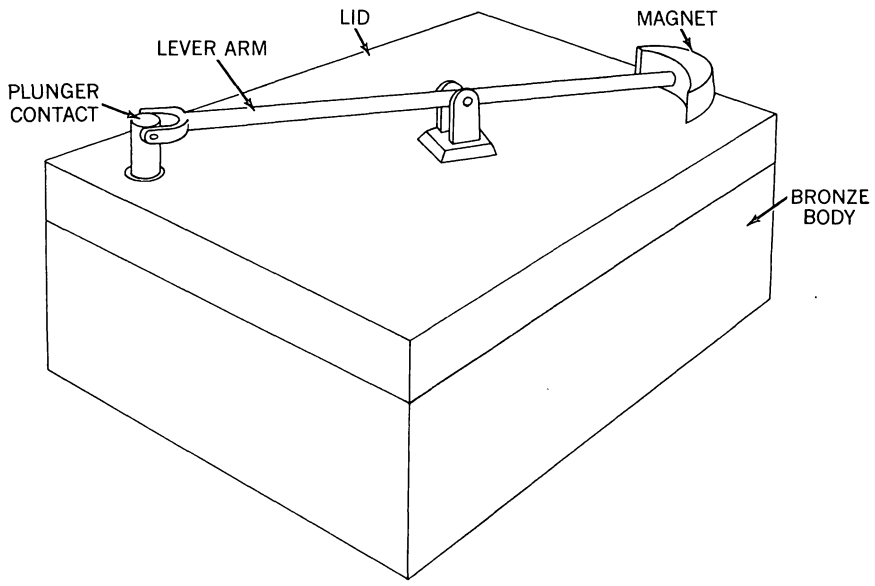


Figure 131

This mine consists of a bronze box 30.4 by 20.3 by 10.1 centimeters, containing the explosive, two 3-volt dry cell batteries, three induction coils, and a relay. A contact is attached to the inner end of a plunger which projects through one corner of the lid. The outer end of the plunger is attached to a lever arm pivoted in the center of the box. A magnet is attached to the other end of the lever arm.

a. Use. This model is used for antitransport purposes in roads or railroad beds on a supplementary charge.

(No drawing available.)

b. Functioning. When a large metal object passes over the mine, the magnet on the end of the lever rises, pivoting and depressing the plunger at its other end. This closes the contact and fires the mine.

c. Installing and Arming.

(1) When laying the mine, hold the magnet end of the lever arm down firmly so that the contacts are open.
(2) Bury the mine flush with the ground or lay it on the ground so that the lever arm is exposed.
(3) Keep it in a perfectly horizontal position.

d. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Hold the magnetic end of the lever arm down and remove the lid.
(3) Cut the fuze connecting the mine to the supplementary charge.
(4) Disconnect the batteries from the contact.
(5) Remove the detonator assembly from the mine and the charge.
(6) Transport the mine and fuze to a safe storage or disposal.

116. Bar Mine 43 (Riegel Mine 43) (Germany)

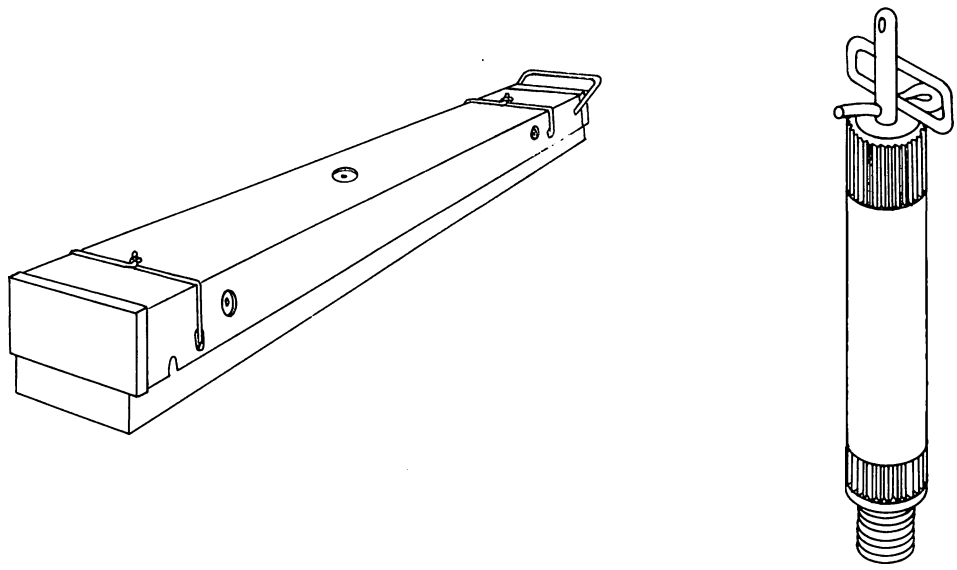


Figure 132

This metal antitank mine is 80.0 centimeters long, 8.5 centimeters high, and 9.4 centimeters wide. It has these parts: a steel tray, a metal-encased main charge, and a steel lid which fits over the tray and acts as a pressure plate. Two fuzes with pin releases are placed in the top.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Pull fuze 42.	400 lb. on ends, 800 lb. on center.	8.8 lb.

Secondary fuze wells	Remarks
	By reversing one pull fuze 42 so that its wings are below the slotted shoulder, the mine will function when the main charge is lifted from the tray.

b. Use. Because of its length, this mine is employed in road blocks and in junctions and terminals. Fewer of these are required than conventional round mines.

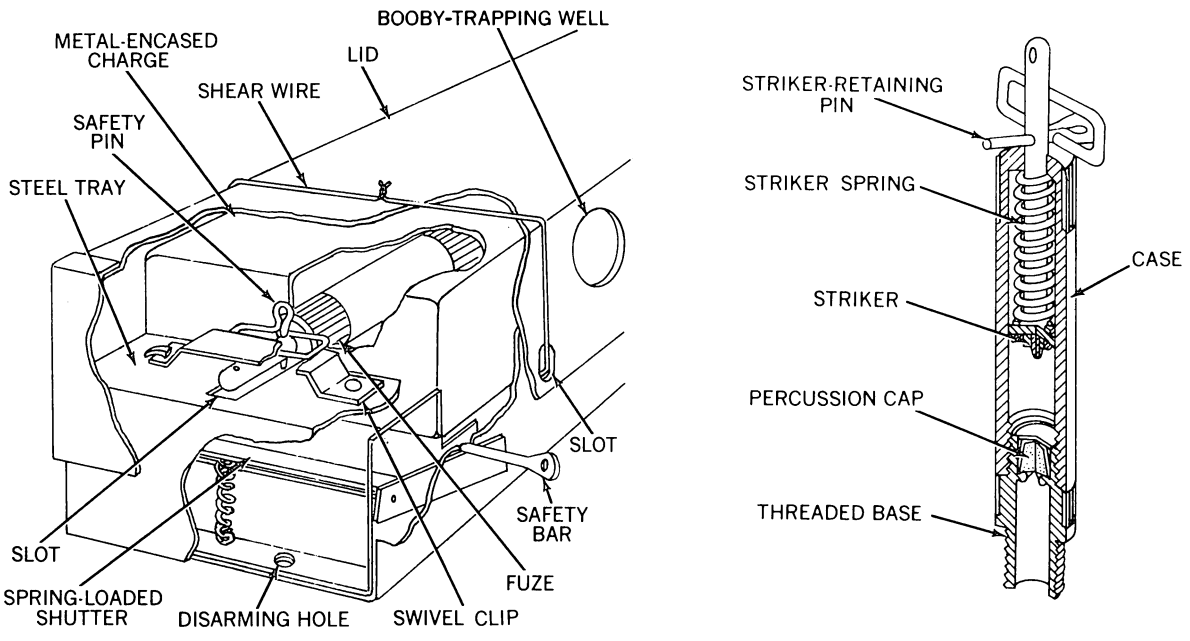


Figure 133

c. Functioning. Pressure on either end of the lid or on the center, shears one or both of the shear wires and forces the striker retaining pin out, releasing the striker to fire the percussion cap and the mine.

d. Installing and Arming.

(1) Press down the spring-loaded shutters and insert the safety bars.

(2) Screw a pull fuze 42 into the main fuze well in each end of the metal-enclosed main charge.

(3) Open the swivel clips toward the ends of the mine and insert the main charge so that it is resting on the safety bars with the wings of the fuze-striker retaining pins above the slotted shoulders at the end of the tray. Close the swivel clips.

(4) Place the lid over the main charge and thread the shear wires through the holes in the side of the lid. Pull the ends of the shear wire up and over the lid and fasten them as shown in illustrations.

(5) Withdraw the safety bars.

(6) For activation, screw any pull fuze with standard threads into an activating fuze well and attach and anchor the pull wire.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert a 6-inch nail in the disarming hole in the bottom of the mine case; press up on the safety bar shutter to clear the safety bar hole in the side of the mine case.

(3) Push a 6-inch nail through the safety bar hole and on out the far side.

(4) Repeat steps (2) and (3) on the other end of the mine case.

(5) Carefully cut the shear wires and lift the lid.

(6) Inspect both fuzes to be certain the wings of the safety are free.

(7) If both wings of the safety pins are free, lift out the charge.

(8) If one wing is underneath, raise the opposite end of the charge and slide it out along the long axis of the mine.

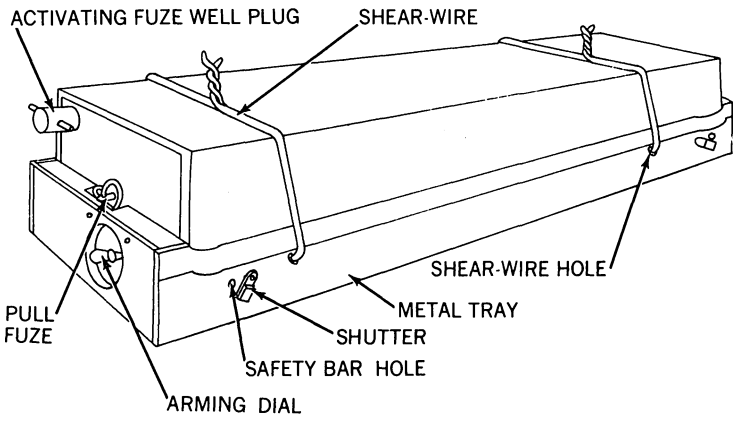
(9) Unscrew the two fuzes from the main charge.

(10) Transport the mine and fuzes to a safe storage or disposal area.

Note. If the snap fuze 43 is used, eliminate steps 6 through 8.

e. Additional Precautions. It is recommended that these mines be destroyed in place whenever possible.

117. Bar Mine (17.6—Pound) (Germany)



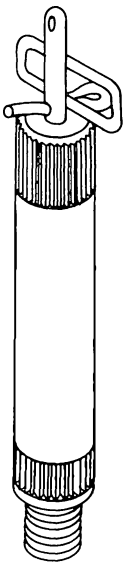


Figure 134

This mine is similar to the Riegel 43, except that it has no steel lid and has a different arming device. The case is 83.0 by 10.1 by 9.4 centimeters. The main charge rests on two shear wires inside the metal tray. The fuzes are modified by cutting off the end of the striker shaft and its outer hole.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Pull fuze 42, modified.	400 lb. at ends, 800 lb. at center.	18 lb. (approx).

Secondary fuze well	Remarks
1.....	One or both of the striker retaining pins may be placed with the wings down instead of up which will cause detonation if the main charge is lifted.

b. Use. This mine is employed in the support of road blocks and antitank minefields. Because of its length, fewer mines are needed to block a road or construct a minefield.

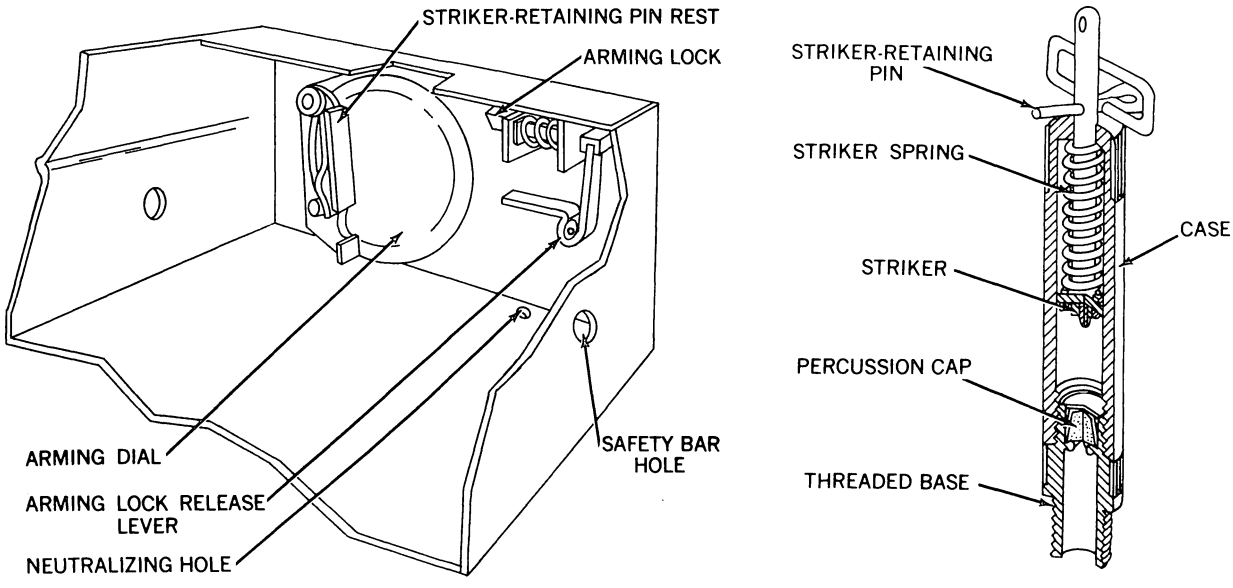


Figure 135

c. Functioning. Pressure on the mine at the ends or in the center, shears one or both of the shear wires, permitting the charge to fall into the tray. As the charge falls, it pushes out one or more of the igniter detent pins, firing the mine.

d. Installing and Arming.

(1) With a nail or stiff mine inserted through the neutralizing hole in the bottom of the tray, press up the arming lock release lever which pulls back the arming lock and releases the striker retaining pin rest.

(2) Turn the arming dial, at each end, so that the arrow points to *unscharf* (unarmed).

(3) Insert the shear wires and the safety bars through their respective holes in the tray.

(4) Insert a pull fuze 42 into the fuze well at each end of the main charge and turn them so that the wings of the retaining pins are up.

(5) Slide one end of the main charge into the solid end of the tray and lower the charge so that it rests on the safety bars and the shear wires.

(6) Twist the shear wires together over the main charge to secure it in the tray.

(7) Turn the arming dials from *unscharf* (unarmed) to *scharf* (armed).

(8) Remove the safety bars.

e. Disarming Procedure.

(1) Check for and remove any secondary fuzes or antilift devices.

(2) Insert a 15.2-centimeter nail in the safety-bar hole and push it through the hole and on out the other side.

(3) Repeat step (2) at the opposite end of the mine.

(4) Carefully cut the two shear wires.

(5) Inspect the striker-retaining pins to see if the wings are ON TOP of the recesses of the striker-retaining pin rests. If both are ON TOP of the rests, then insert a 15.2-centimeter nail through the neutralizing holes in the bottom of the tray and press up the arming-lock release levers, which pull back the arming locks, releasing the striker retaining pin rests; and turn the arming dials to *unscharf* (unarmed). If one pin is below the

recess, do not turn that particular dial to *unscharf*. Instead, carefully lift the opposite end of the main charge and gently slide it out until the reverse fuze is clear of the recessed striker retaining pin rest.

(6) Lift out the main charge and unscrew the two fuzes and detonators.

(7) Transport the mine and fuzes to a safe storage or disposal area.

118. Antitank Mine, V–3 or N5 (Italy)

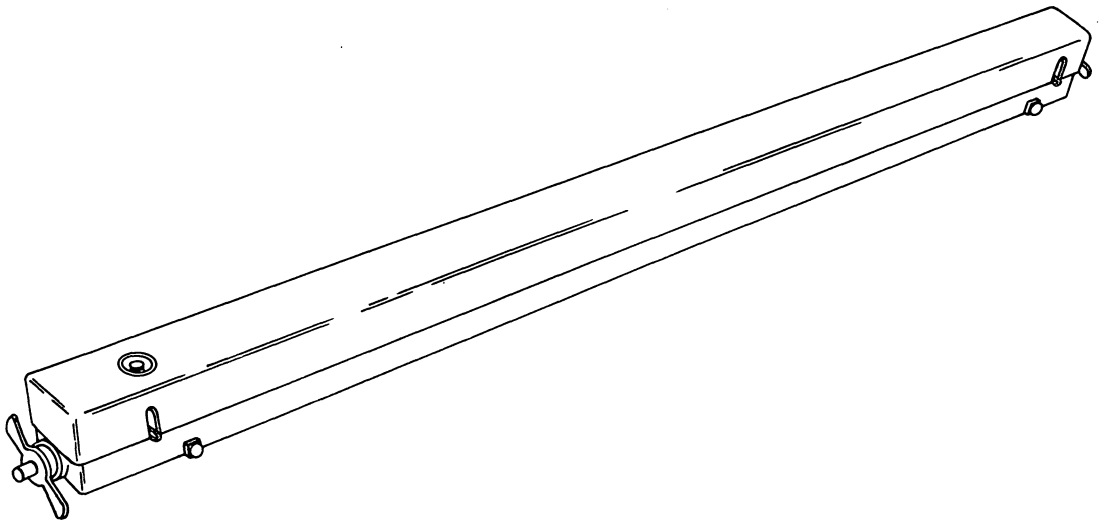


Figure 136

This Italian bar mine consists of a sheet-metal case with a removable pressure cover. It has a built-in fuze with a spring-loaded striker and plunger at each end. The mine is 114.3 centimeters long, 6.2 centimeters wide, and 6.8 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Integral....	264 lb. antitank 22 lb. antipersonnel.	6 lb.

Remarks

If the copper pin is left out and the pressure adjustment nut is not used, it becomes an antipersonnel mine.

b. Use. This mine is usually laid in road blocks and at road junctions because of its large-area coverage.

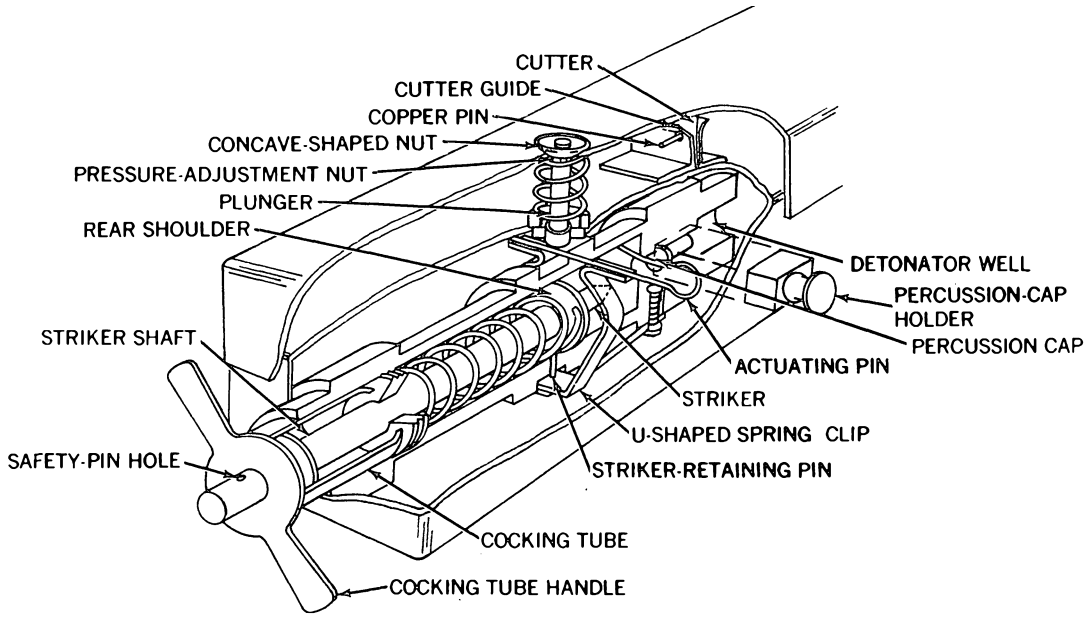


Figure 137

c. Functioning.

(1) Pressure on the pressure cover forces the cover downward causing the cutter to cut the copper pin in the cutter guide.

(2) The plunger in one or both fuzes is depressed against the resistance of the coil spring onto the actuating pin, which in turn depresses the U-shaped spring clip.

(3) The U-shaped spring clip then depresses the striker retaining pin end of the flat retaining spring, releasing the striker to fire the percussion cap and the mine.

d. Installing and Arming.

(1) Withdraw the percussion cap holders.

(2) Remove the pressure cover.

(3) Cock the striker of each fuze by pulling outward on the cocking tube while depressing the plunger enough for the striker retaining pin to clear the striker spring and the front shoulder on the striker shaft. When the shoulder is drawn past the striker retaining pin, release the pressure on the plunger.

(4) Push each cocking tube all the way in and insert a safety pin in the safety pin hole in the end of each striker shaft.

(5) Withdraw the actuating pins.

(6) Place the mine in a hole so that the pressure cover will be flush with the surface of the ground.

(7) Insert the detonators, closed ends first, in the two end explosive blocks.

(8) Place the two explosive blocks with the detonators in the mine so that the protruding ends of the detonators fit into the detonator wells in the ends of the fuzes.

(9) Adjust the actuating pressure by means of the pressure-adjustment nuts. Increasing the compression of the coil springs increases the actuating pressure.

(10) Insert the copper pins in the cutter guides.

(11) Place the pressure cover on the mine

and tighten the concave-shaped nuts finger tight.

(12) Insert the percussion cap holders, with percussion caps, in the openings provided in the side of the mine.

(13) Insert the actuating pins.

(14) Withdraw the safety pins.

Note. This mine may be modified for antipersonnel use by omitting the copper pins in the cutter guides.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert nails in the safety-pin holes in the ends of both striker shafts.

(3) Withdraw the actuating pins and the percussion cap holders from the side of the mine.

(4) Carefully unscrew the pressure adjustment nut and remove the pressure cover.

(5) Remove the block of explosive at each end and remove the detonators from the blocks.

(6) Replace the actuating pins and apply pressure to the plungers to fire both fuzes.

(7) Transport the mine and fuzes to a safe storage or disposal area.

119. Antitank Mine, B–2 (Italian and Spanish) (Italy and Spain)

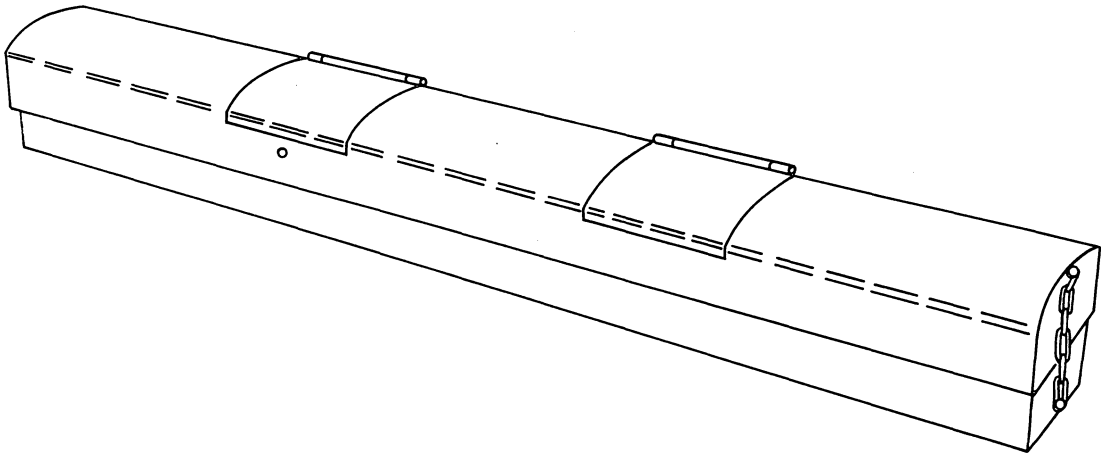


Figure 138

The Italian B–2 and Spanish B–2 antitank mines are almost identical. They consist of a metal case, 106, 66 by 12.7 by 12.7 centimeters, with a detachable lid or pressure cover supported on two coil springs. The two fuzes are retained cocked by a retaining wire that is sheared by a cutter fastened to the under side of the pressure cover. The two explosive charges are placed one at each end.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Integral, pull.	300 lb. or more.	6 lb.

b. Use. This mine is used against tanks. It must be emplaced at a distance of at least 2 meters between mines, to avoid sympathetic detonation.

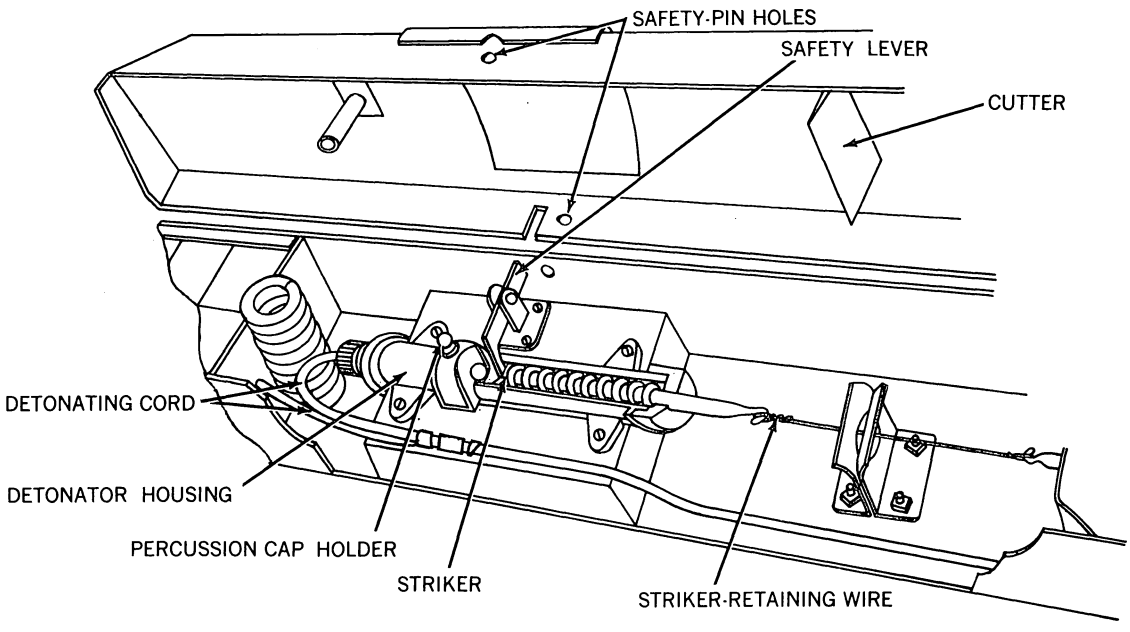


Figure 139

c. Functioning. Pressure on the pressure cover moves it downward against the compression springs, clearing the safety levers from the strikers and cutting the retaining wire. This releases the strikers to fire the mine.

d. Installing and Arming.

(1) Remove the cover.
(2) Cock the striker by turning the wire tensioning nut in a clockwise direction until the safety lever falls into the notch in the striker.
(3) Insert the safety pin into the hole through the side of the mine and into the fuze case.
(4) Screw on the detonator and attach the detonating cord.
(5) Insert the percussion cap holder into the hole in the housing in front of the detonator.
(6) Replace the detachable cover, cover the mine with earth, and from a safe distance, withdraw the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Carefully lift the mine cover.
(3) Insert a safety wire through the safety-pin hole in the side of the mine case.
(4) Cut the detonating cord at the fuze end and unscrew the percussion cap holder.
(5) Unscrew the detonator from the fuze.
(6) Allow the striker to go forward.
(7) Transport the mine and fuze to a safe storage or disposal area.

120. Antivehicular ("Yardstick") Mine (Japan)

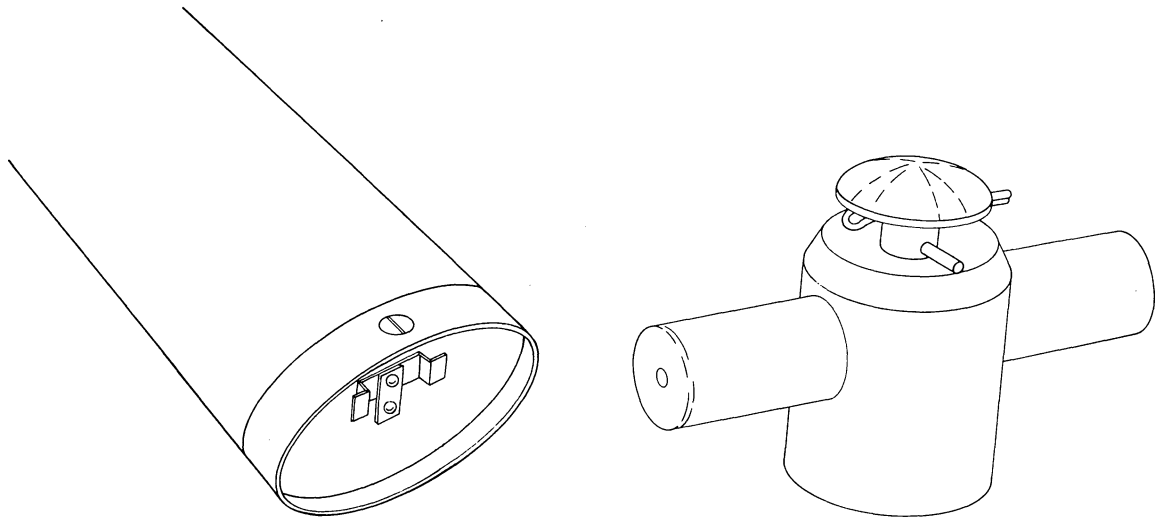


Figure 140

This mine is in a steel case 91.4 by 8.3 by 4.4 centimeters, containing an explosive charge and four fuze wells, and a safety wire that passes through all fuzes. No more than three fuzes are used at one time, however.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Tubular...	Integral pressure.	300 lb. antivehicular.	6 lb. picric acid (par. *6x*).

b. Use. This mine was designed for emplacement at road junctions, in road blocks, and on landing fields because of its large area of coverage.

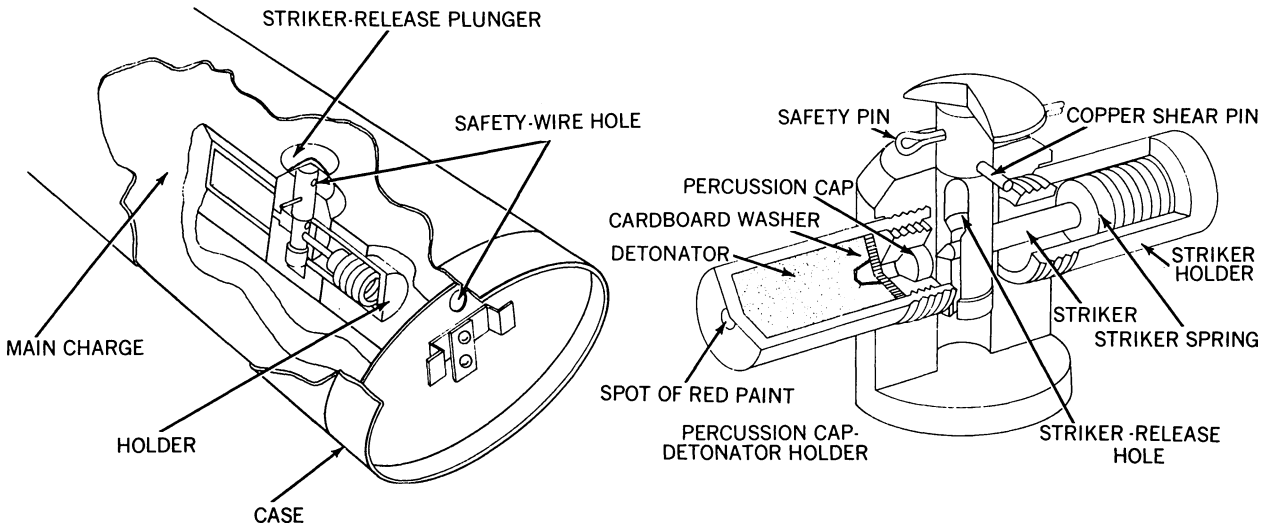


Figure 141

c. Functioning. Pressure on the mine case forces it against the head of the striker release plunger of one or more fuzes, shears the shear pin and forces the release plunger down to free the striker and fire the mine.

d. Installing and Arming.

(1) Bury the mine.

(2) To arm the mine, remove the safety wire.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the screws and cover from one end.

(3) Insert a safety wire in all the fuzes.

(4) Remove the blocks of explosive and the fuzes from the mine.

(5) Unscrew the percussion cap and detonator assembly from all the fuzes.

(6) Transport the mine and fuzes to a safe storage or disposal area.

121. Magnetic Mine 158 (U.S.S.R.)

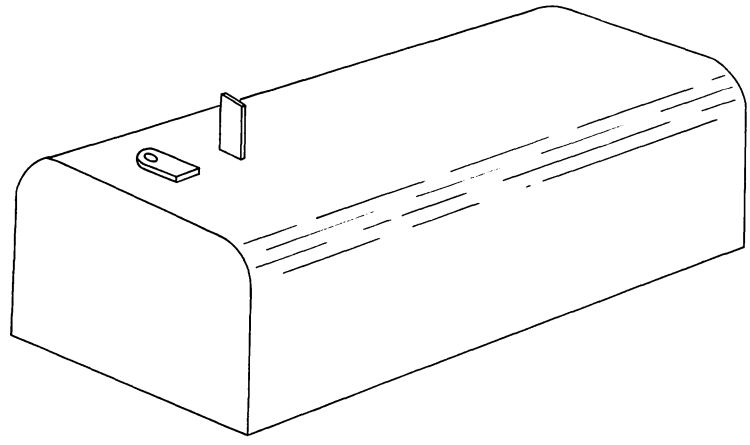


Figure 142

This mine consists of a 14.6 by 6.9 by 3.7 centimeter case, and explosive charge, and two bar magnets, one at each end, for attaching it to an object.

a. Characteristics.

Shape	Fuze	Explosive
Rectangular....	Tension with lead rod releases.	1 lb.

b. Employment. This mine was designed to cut railroad tracks and sabotage tanks and vehicles.

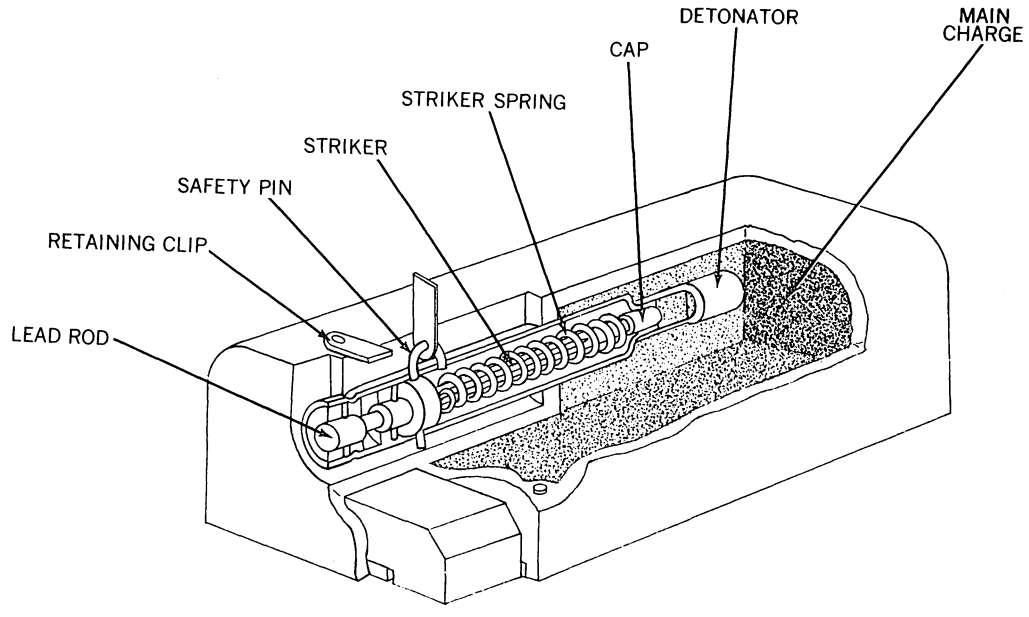


Figure 143

c. Functioning. When the safety pin is removed, the striker is restrained by a lead rod, which breaks after a short delay to free the striker and fire the mine.

d. Installing and Arming.

(1) Insert the detonator and fuze in the hole in the mine and tape them in place.

(2) Place the mine against the object to be destroyed.

(3) Remove the safety pin.

e. Disarming Procedure.

(1) If possible, destroy this mine in place.

(2) If the mine cannot be destroyed in place, remove it from the object to which it is attached and immediately withdraw the fuze and detonator assembly.

(3) Destroy the fuze assembly immediately.

(4) Transport the mine to a safe storage or disposal area.

122. Magnetic Mine, BMZ-1 (U.S.S.R.)

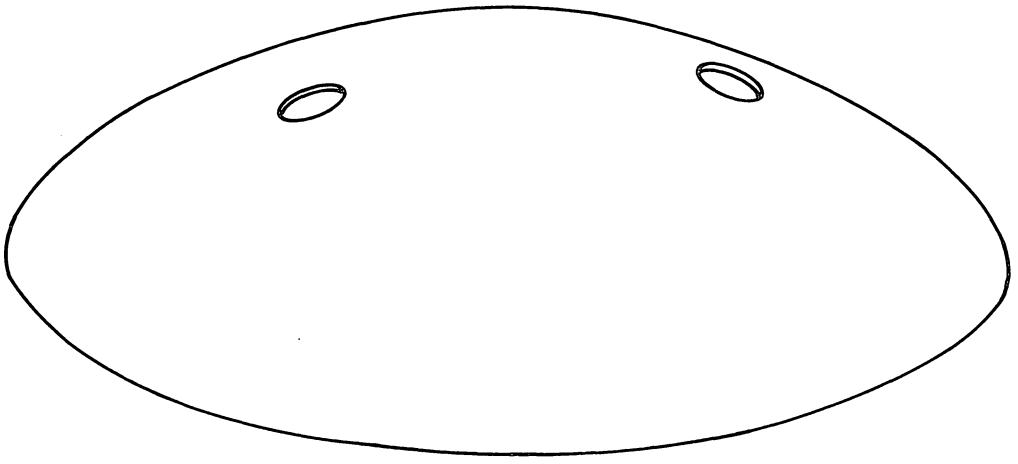


Figure 144

This mine is similar in functioning to the model 158. It has a domeshaped case 24.7 centimeters in diameter and about 6.5 centimeters high. A doughnut shaped magnet is located in the bottom of the mine. Two fuze wells are located in the top. The lead-break type delay fuze is used.

a. Characteristics.

Shape	Fuze	Explosive
Circular.....	Lead fatigue delay.	Unknown

b. Employment. The BMZ-1 was used by guerrillas to sabotage vehicles and tanks behind German lines.

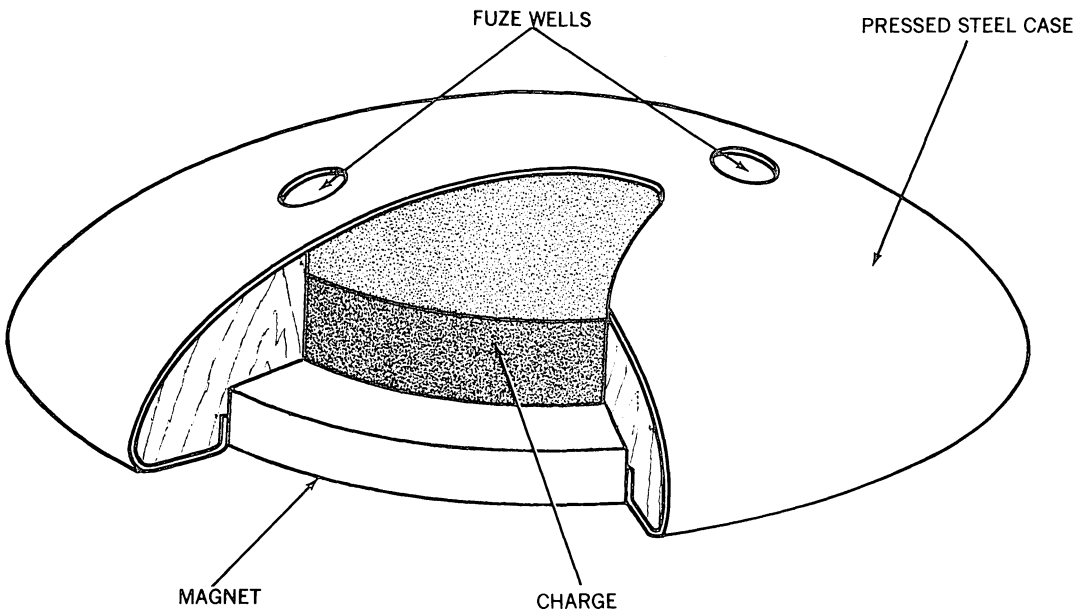


Figure 145

c. Functioning. After the safety pin has been removed the force of the striker spring on the lead retaining strip, causes it to break after a short delay, releasing the striker to fire the mine.

d. Installing and Arming.

(1) Place the lead break delay fuzes in the fuze wells.
(2) Place the mine on the selected object.
(3) Remove the safety pin.

e. Disarming Procedure.

(1) If possible destroy this mine in place.
(2) If it is not possible to destroy this mine in place, remove it from the object to which it is attached and immediately remove the two fuze and detonator assemblies.
(3) Destroy the fuze and detonator assemblies immediately.
(4) Transport the mine to a safe storage or disposal area.

123. Plate-Charge Antitank Mine, Model 1948 (France)

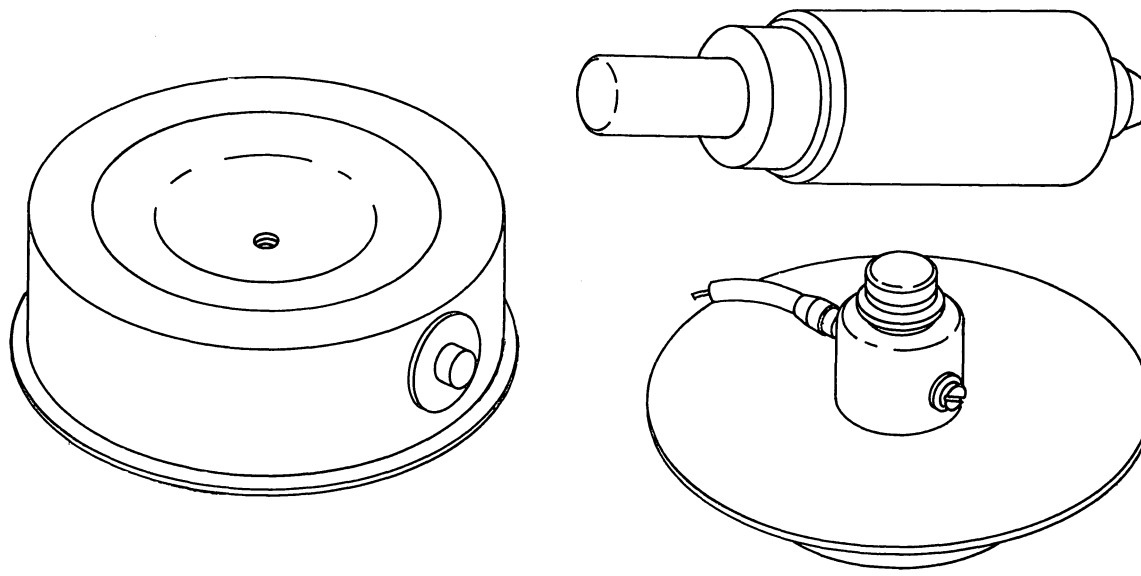


Figure 146

This sheet metal unit with its 10-pound metal plate is designed to "kill" and not merely to stop or disable a tank. The device will make a hole about 20.3 centimeters in diameter through 4.7 centimeters of armor plate when detonated about 50.8 centimeter inches away. The mine is usually emplaced in pairs, connected to a common metallic offset fuzing device or a Model 1948 metallic antitank mine so that one of them will likely explode underneath the tank. When used singly, the plate-charge mine is fitted with a tilt-rod fuze. The mine is 27.9 centimeters in diameter and 13.7 centimeters high. (Another version of this mine, Model 1951, has no case, the explosive being reinforced by glass wool. The same charge plate is used, however.)

a. Physical Features.

Shape	Fuze	Operating force
Circular, with concave top and convex bottom.	Mechanical, offset, or tilt-rod.	330 lb. for offset fuze or metallic antitank mine, Model 1948.
Explosive main charge	**Booster**	**Markings**
16.0 lb. TNT or picric acid (approx). (par. 6r.)	.5 lb. pentolite.	Each mine and offset fuzing device marked with code number, abbreviated nomenclature, type of explosive, manufacturer's symbol, and year of fabrication.

b. Employment. This plate-charge mine is used as a "tank killer" or for the penetration of tank belly armor.

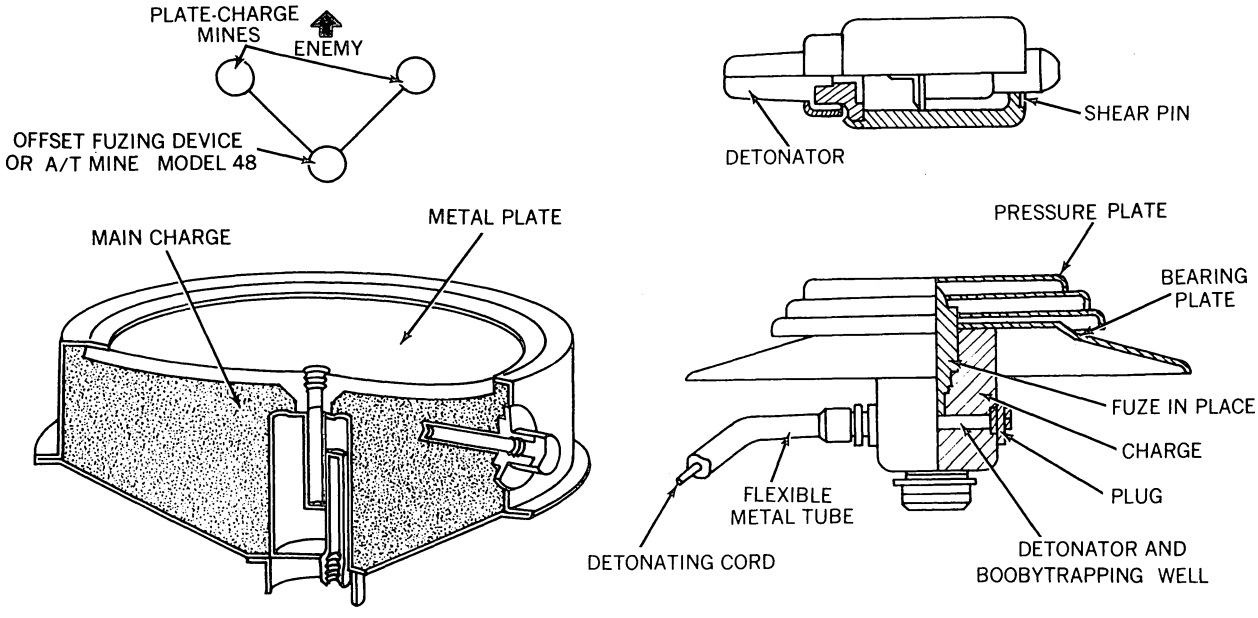


Figure 147

c. *Functioning.*

(1) *Offset fuzing.* Pressure transmitted to the fuze through the pressure plate of the offset device or control mine causes the striker retaining pin to fall and the spring-actuated striker to fire the detonator. The detonator fires the charge of the offset device or mine and the firing chain is carried through the detonating cord to the plate-charge mines, which throw the metal plates to penetrate the belly armor of the tank.

(2) *Tilt-rod fuzing.* Lateral pressure on the rod cams down a sleeve with holes in it to allow the striker holding-balls to escape, freeing the striker and initiating the firing chain.

d. *Installing and Arming.*

(1) *Offset fuzing.*

(*a*) Place the two mines and the offset fuzing device (or Model 1948 metallic antitank mine) to form a V with the open side toward the enemy and the plate charge mines at the ends.

(*b*) Attach the metallic hoses containing the detonating cord to the offset device or the central mine.

(*c*) Remove the pressure plate of the offset device or central mine.

(*d*) Place a Model 1948 mechanical fuze or a Model 1952 antidisturbance fuze fitted with a detonator into the well of the offset device or the central mine.

(*e*) Replace the pressure plate.

(*f*) Attach the detonating cords to the plate-charge mines after having placed No. 8 blasting caps in the wells to be used.

(*g*) Boobytrap the mines, if desired.

(2) *Tilt-rod fuzing.*

(*a*) Place a Model 35 grenade detonator in the central fuze well.

(*b*) Screw a tilt-rod fuze into the well.

(*c*) Activate the mine if desired.

(*d*) Remove the safeties from the fuzes.

e. *Disarming Procedure.*

(1) *Offset device.*

(*a*) Check for and remove any antilift devices.

(*b*) Cut the detonating cord at the mine.

(*c*) Destroy the fuzing device in place.

(2) *Concussion-type fuzing.*

(*a*) Check for and remove any antilift devices.

(*b*) Cut the detonating cord leads between the mines.

(*c*) Identify and disarm the firing mine according to disarming instructions.

(*d*) Remove the blasting caps from the fuze wells.

(*e*) Transport the mine and fuzes to a safe storage or disposal area.

(3) *Tilt-rod.*

(*a*) Check for and remove any antilift devices.

(*b*) Insert a safety wire in the safety pin hole of the fuze if one is present. If no hole is present, screw down the safety cap which will usually be found directly below the base of the rod.

(*c*) Remove the fuze and detonator assembly

(*d*) Transport the mine and fuze to a safe storage or disposal area.

124. Shaped-Charge Antitank Mines, Model 1951 (France)

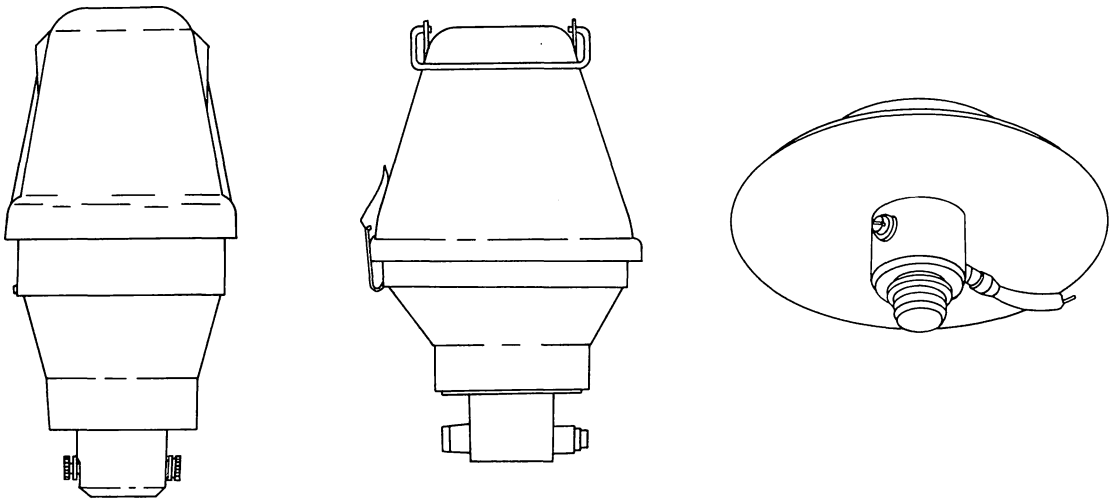


Figure 148

There are two Model 1951 shaped charge mines, metallic and nonmetallic or bakelite. They are similar except that one has a metallic case and cone, and the other, a plastic case and a glass cone. Each mine is supposedly capable of penetrating 14.7 centimeters of armor plate. Standoffs that snap on the rim of the mine are provided. The metallic mine is 35.0 centimeters high and 20.0 centimeters in diameter; the bakelite mine is 39.1 centimeters high and 17.0 centimeters in diameter.

a. Physical Features.

Shape	Fuze	Operating force
Assembled: two truncated cones, base to base. For transport: nested, truncated cones.	Metallic: pressure, offset. Nonmetallic: pressure, offset.	Metallic: 660 to 990 lb. Nonmetallic: 606 to 990 lb.

Explosive	Markings
Metallic: 4.0 lb. hexolite. Nonmetallic: 5.5 lb. hexolite.	Code number, abbreviated nomenclature, manufacturer's symbol, and year of fabrication.

b. Employment. These mines, laid only by engineer troops, are employed to destroy tanks by penetration of the belly armor. The model used depends on whether undetectability is desired. The mine is ordinarily laid in pairs, each connected by detonating cord to a common pressure-plate or to a concussion type antitank mine. In both arrangements, one shaped-charge mine probably will detonate under the tank's belly, while the other will damage the tracks.

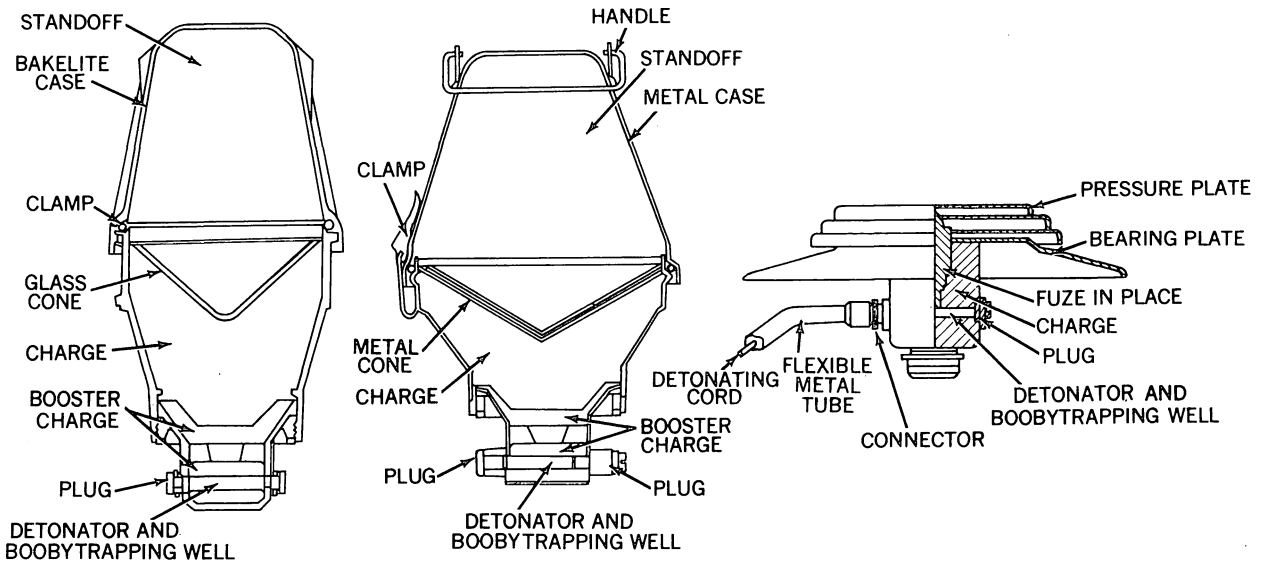


Figure 149

c. Functioning. Proper pressure on the common offset fuze, or the central concussion mine, detonates and explodes the two lengths of detonating cord connected to the shaped-charge mines which in turn are detonated.

d. Installing and Arming.

(1) *With offset device.*

(*a*) *Metallic model.*

1. Emplace the two shaped charge mines with a metallic offset device between and behind them to form a 90°-angled V, with the open end directed toward the enemy.

2. Remove the pressure-plate from the metallic offset device.

3. Place the detonator in the fuze (metallic pressure fuze model 1948 or 1952).

4. Place the fuze in the well.

5. Replace the pressure plate.

6. Remove the two detonator well plugs from the offset device and one from each mine.

7. Connect the offset device to the mines by the detonating cords.

(*b*) *Undetectable model.* The arming procedure is the same as for the metallic model, except that in *a1* and *2* above the undetectable offset device is used, and in *a3* above the Model 1952 undetectable pressure fuze or Model 1950 pressure-chemical fuze is used.

(2) *With the concussion type antitank mine.* For the undetectable units, either the Model 1947 or 1951 undetectable antitank mine is used. For the metallic units, the Model 1948 metallic antitank mine is used. These concussion units are fuzed in the usual manner and connected to the shaped-charge mines with detonating cords as in (*a*) above.

e. Disarming Procedure.

(1) *Offset device.*

(*a*) Check for and remove any antilift devices.

(*b*) Cut the detonating cord leads between the fuzing device and the mines.

(*c*) Destroy the firing device in place.

(2) *Concussion type fuze.*

(*a*) Check for and remove any antilift devices.

(*b*) Cut the detonating cord leads between the mines.

(*c*) Identify the type of antitank mine used as a fuze and disarm it according to the disarming procedure given for that particular type of mine.

(*d*) Remove the detonator plugs from the shaped charge A/T mines.

(*e*) Transport all the mines to a safe storage or disposal area.

125. Antitank Hollow Charge Mine (Germany)

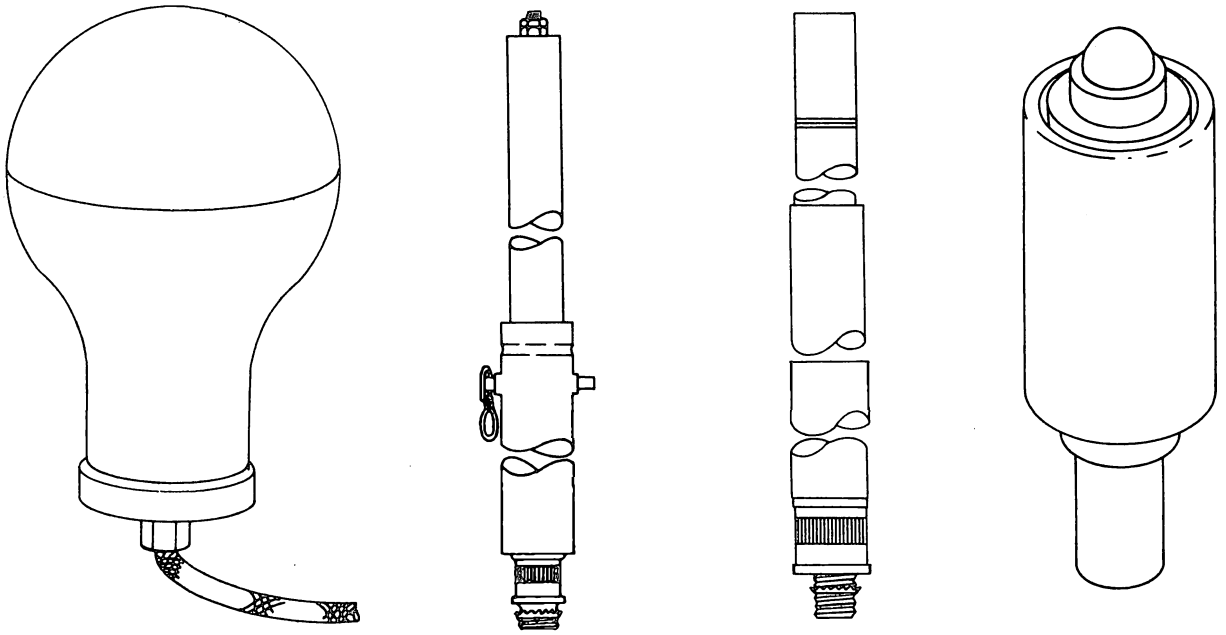


Figure 150

This mine consists of a hollow mine charge encased in sheet metal, and a propelling charge, capable of lifting the mine 1 meter into the air, connected to the fuze by 0.6 to 1 meter of detonating cord. The fuze may be a snap fuze 43/I or 43/II, or a Tellermine fuze 42.

a. Characteristics.

Shape	Fuze	Operating force
Tubular, with a spherical enlargement at the top.	Snap fuze with snap strip or snap rod release or Tellermine fuze 42, with shear pin release.	Tellermine fuze 42, 570 lb. pressure.

b. Use. This mine was employed against tanks and laid with one or two to a fuze.

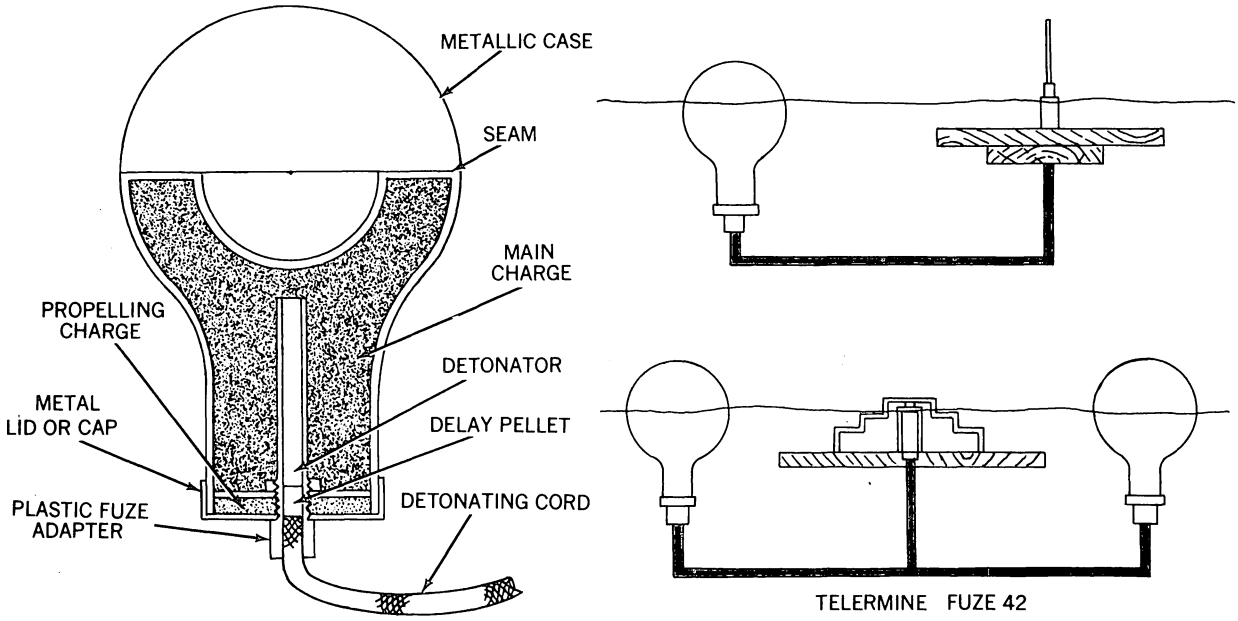


Figure 151

c. Functioning.

(1) *Snap fuze 43/I.* A sideward pressure on the extension bends the fuze and causes the pull chain to rupture the retaining strip, which releases the striker to fire, the percussion cap and the detonating cord. This fires the propelling charge which lifts the mine about 1 meter into the air or until it strikes the underside of a tank or vehicle. The delay pellet fires the main charge.

(2) *Snap fuze 43/II.* A sideward pressure on the extension rod breaks the fuze at the breaking groove and snaps the plastic retaining rod, releasing the striker to fire the percussion cap and the detonating cord. This fires the propelling charge and the delay pellet and raises the mine into the air about 1 meter or against the under side of a tank or vehicle. The delay pellet fires the detonator and main charge.

(3) *Tellermine fuze 42.* Pressure on the pressure plate crushes it and shears the shear pin of the fuze, firing the percussion cap. The ignition of the firing chain and the projection of the mine are the same as for fuzes 43/I and 43/II.

d. Installing and Arming.

(1) *Snap fuze 43/I.*

(*a*) Install the fuze in a board or improvised device on the surface of the ground so that it will break instead of giving way or tilting to sideward pressure on the extension rod.

(*b*) Insert a detonator and a delay pellet into the mine.

(*c*) Connect the mine to the fuze with 0.6 to 1 meter of detonating cord, using fuze adapters.

(*d*) Dig a hole and install the individual mines upright with the seam on the metal case at ground level. Make a groove in the ground and bury the detonating cord.

(*e*) Remove the safety pin retaining wire from the fuze and the safety pin by means of the attached removal wire.

(2) *Snap fuze 43/II.*

(*a*) Follow procedure in (1) (*a*) through (*d*) above.

(*b*) Remove the safety collar from the fuze by sliding it upward and off the extension rod.

(3) *Tellermine fuze 42.*

(*a*) Install the fuze in a board or improvised device on the surface of the ground.

(*b*) Insert a detonator and a delay pellet into the mine.

(*c*) Connect the mine to the fuze with 0.6 to 1.0 meters of detonating cord, using fuze adapters.

(*d*) Dig a hole and install the individual mines upright as stated in (1) (*d*) above.

(*e*) Place a mushroom shaped pressure plate from a Tellermine 43 over the fuze so that the pressure plate is flush with the surface of the ground.

Note. In each of the procedures above, the detonating cords should be at right angles to the line of probable approach of tanks.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Cut the detonating cord leads at each mine.

(3) Pick up the mines and remove the detonator assembly from each mine.

(4) Destroy the fuze in place.

(5) Transport the mines to a safe storage or disposal area.

126. Dual-Purpose, Bounding, Hollow-Charge Mine 4672 (Germany)

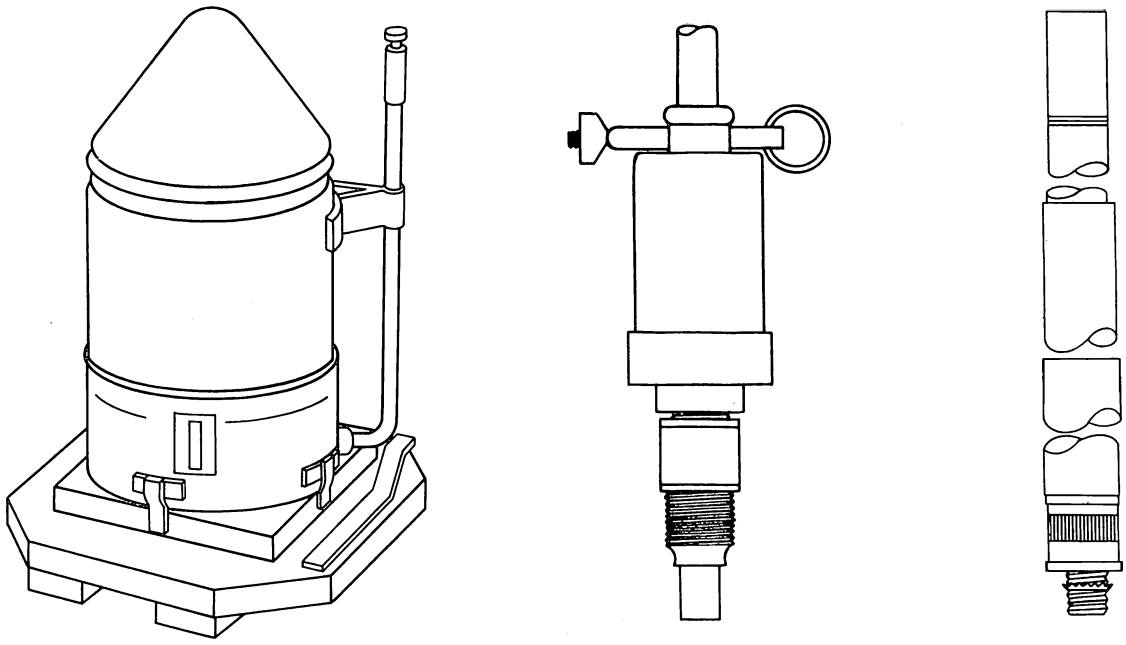


Figure 152

The bounding, hollow-charge mine has an outer case, inner case, a cone-shaped spacer head, an exposed flash tube, a concrete fragmentation collar, a propelling charge, two primer charges, and the hollow main charge. The mine is 15.8 centimeters in diameter and 28.5 centimeters long. It may be ignited by either a snap fuze 43/I or 43/II, or a tilt fuze 43A or 43B.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical, with bluntly-pointed cone-shaped top.	Snap fuze 43/I or 43/II. Tilt fuze 43A or 43B.	10 to 20 lb.	3.5 lb.

b. Employment. This mine is effective against vehicles and personnel. It was designed to penetrate 10.1 centimeters of armor and for use in all types of terrain and in deep snow.

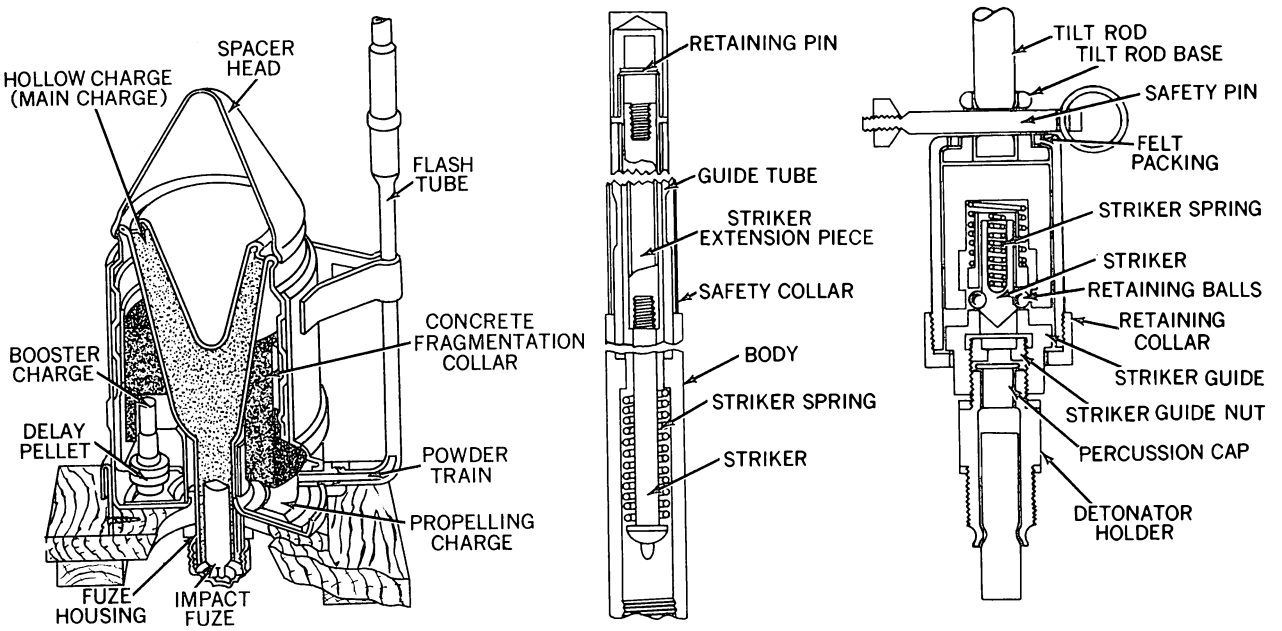


Figure 153

c. Functioning. The actuation of the main fuze releases the striker against the special percussion cap assembly, which produces a flash that fires the powder train and the propelling charge. This propels the inner case into the air and at the same time ignites the delay pellets. When the spacer head strikes a solid object, such as a tank, the inertia overcomes the light resistance of the creep spring of the striker and fires the percussion cap, detonator, and main charge. If the delay pellets burn through before the mine strikes a solid object, they fire the percussion caps, detonator, booster charges, and main charge.

d. Installing and Arming.

(1) Unscrew the metal cap from the fuze well in the bottom of the main charge; insert an impact fuze, closed end first into the fuze well; and replace the cap.

(2) Place the mine in a hole so that the tip of the spacer head is flush with the surface of the ground.

(3) Attach a special percussion cap assembly to the flash tube.

(4) Screw a snap fuze 43/I or 43/II or a tilt fuze 43A or 43B into the main fuze well.

(5) Arm the main fuze as described in paragraphs 372–373 and 366–367.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert a safety-wire, if armed with the snap fuze 43/I or the tilt fuze 43A. If armed with the snap fuze 43/II, very carefully unscrew it from the mine. If armed with the tilt fuze 43B, insert a nail through the hole marked SCHARF, and screw the safety cap down tight.

(3) Carefully remove the main fuze from the mine.

(4) Remove the special percussion cap assembly from the flash tube.

(5) Unscrew the metal cap from the bottom fuze well and remove the impact fuze.

(6) Destroy all fuzes and transport the mine to a safe storage or disposal area.

f. Additional Precautions. The recommended procedure for disarming this mine is destruction in place, if armed with a snap fuze 43/II.

127. Antitank Stake Mine 43 (Germany)

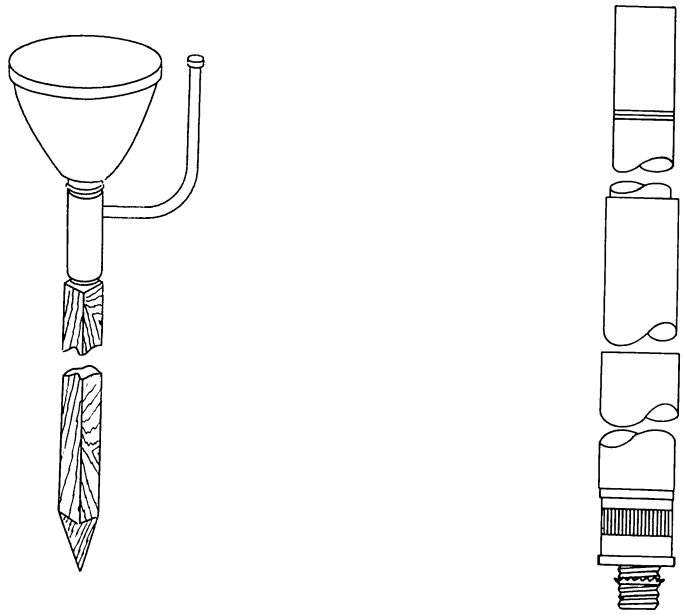


Figure 154

This stake mine has a parabolic, hollow shaped charge with zinc lining in a metal container that is screwed onto a metal cylinder. In this metal cylinder are two compartments—a flash chamber and a receptacle for the wooden stake. A flash tube with a fuze well is welded to the metal cylinder at the flash chamber. A square wooden stake 38.6 centimeters long, rounded at the top, fits into the lower part of the metal cylinder. A thin metal cover 10.7 centimeters in diameter is crimped over the top of the mine.

a. Characteristics.

Shape	Fuze	Operating force
Conical.....	Snap fuze 43/I or 43/II.	10–25 lb. sideward pressure.

b. Employment. The stake mine 43 was designed to punch a hole in the under side of a tank. It is laid in snow, brush, or tall grass in likely areas of approach.

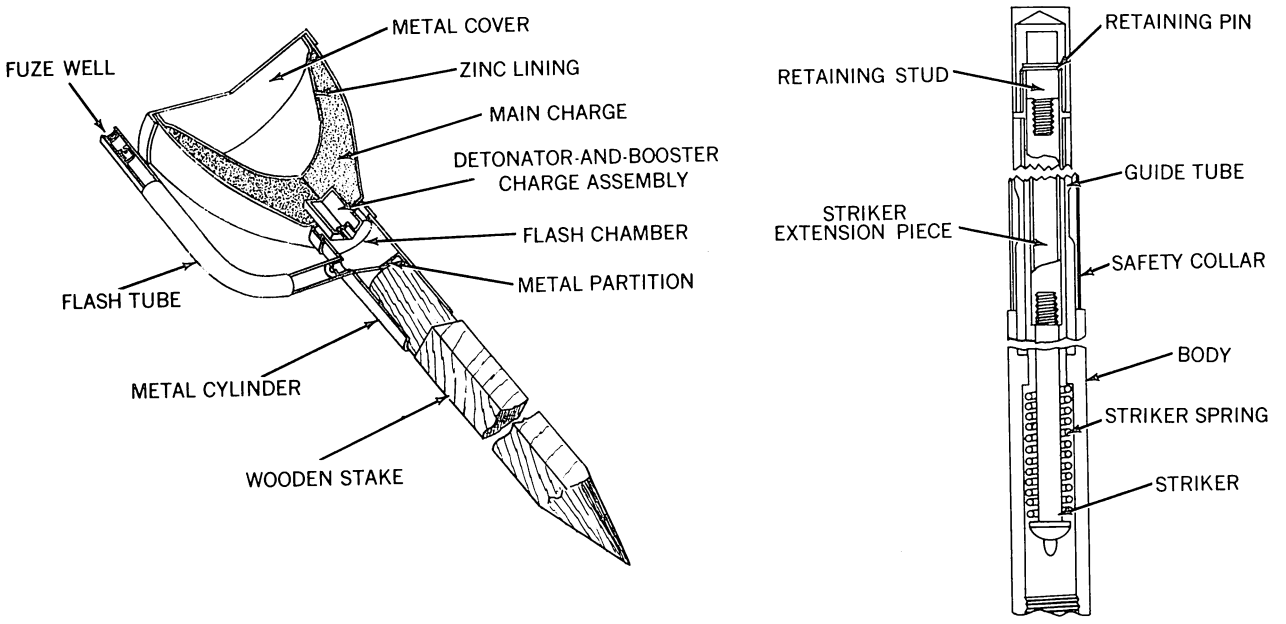


Figure 155

c. Functioning. A sideward pressure on the fuze extension rod actuates the fuze, creating a flash that fires the detonator and booster charge assembly and the main charge.

d. Installing and Arming.

(1) Dig a hole in the ground so that the top of the mine will be flush with the surface of the ground when mounted on the stake.

(2) Drive the stake into the ground until only the rounded portion remains above the bottom of the hole.

(3) Install snap fuze 43/I by removing the safety pin retaining wire, and removing the safety pin from the fuze by means of the attached safety pin removal wire.

(4) Install snap fuze 43/II by removing the safety collar, sliding it upward and off the extension rod.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert a safety wire in the safety-pin hole if the mine is armed with the snap fuze 43/I.

(3) Very carefully unscrew the fuze from the mine if armed with either snap fuze.

(4) Destroy the fuzes immediately.

(5) Disassemble the mine and remove the detonator assembly.

(6) Transport the mine to a safe storage or disposal area.

f. Additional Precautions. If the mine is armed with the snap fuze, 43/II destroy it in place.

128. Beach Mine, Doublehorn, Model 1 (Japan)

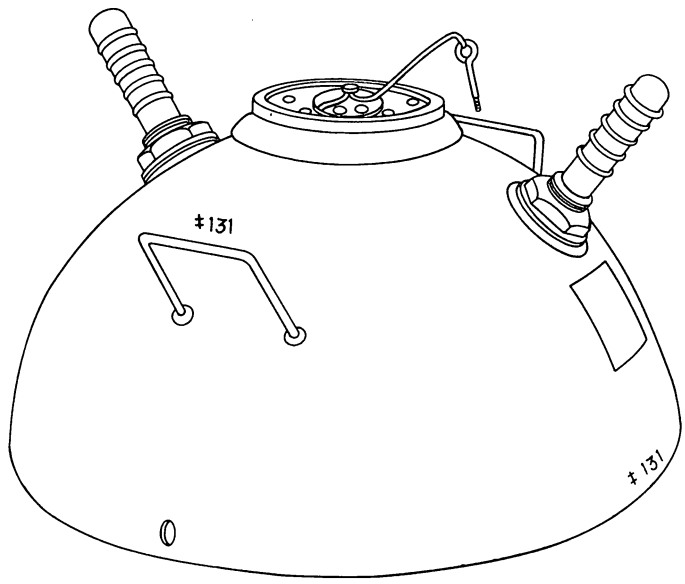


Figure 156

This doublehorn beach mine is a 4.5-millimeter steel case containing an explosive charge and two chemical fuzes enclosed in a lead body. Eight thousand of these were manufactured in 1943, the only year they were produced.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Conical....	2 chemical pressure, or chemical-pull.	200 to 430 lb..	40.6 lb. trinitroanisol.

b. Employment. The doublehorn mine is useful on beaches against landing craft or debarking vehicles, and inland against vehicles.

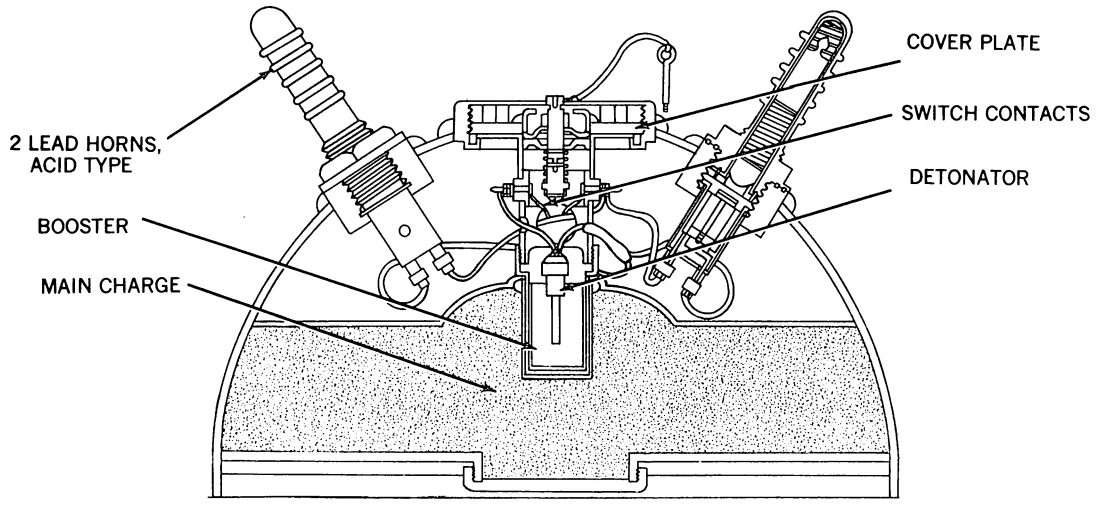


Figure 157

c. Functioning. Once armed, direct pressure or either or both of the fuzes or a pull on a trip wire bends or crushes the fuzes, breaking the glass vial and releasing the acid to contact the battery plates. This generates enough electricity to fire the detonator, booster, and main charge.

d. Installing and Arming.

(1) If tripwires are used, attach heavy gage tripwires first to the anchors and then to the fuzes.
(2) Remove the safety fork.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Screw the retractor pin into the head of the plunger.
(3) Pull up the plunger and replace the safety fork.
(4) Use a spanner wrench to remove the keep-ring over the arming mechanism.
(5) Pull the arming mechanism far enough to expose the wires.
(6) Cut the white or the yellow leads to the detonator and tape the ends of the wires.
(7) Unscrew the fuzes by turning them clockwise.
(8) Cut the wires leading from the fuzes into the bottom of the mine.
(9) Remove the main detonator assembly.
(10) Transport the mine and fuzes to a safe storage or disposal area.

129. Beach Mine, Single Horn Model 2 (Japan)

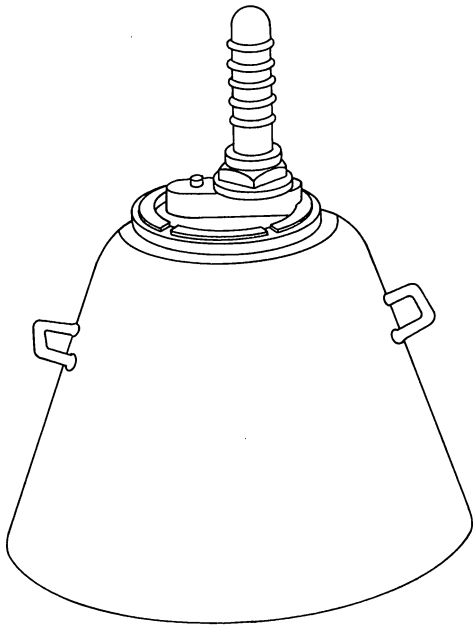


Figure 158

The Japanese single horn beach mine consists of a 4.5-millimeter steel case containing a heavy explosive. With fuze, the mine measures 36.0 centimeters in diameter and 44.3 centimeters high. It uses the same fuze as the double horn beach mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Conical....	Pressure or pull chemical.	200 lb. pressure; 200, 275, and 430 lb. pull.	22 lb.

b. Use. This mine has several advantages over the double horn beach mine. It can be buried deeper in the sand without decreasing the chances of firing and thus better withstand surf action. It was used on beaches, in buildings, on roads, bridges, and airstrips, and in large minefields. The mine was sometimes emplaced with wires, wire cables, or steel bars connecting the fuzes to give a larger area of coverage.

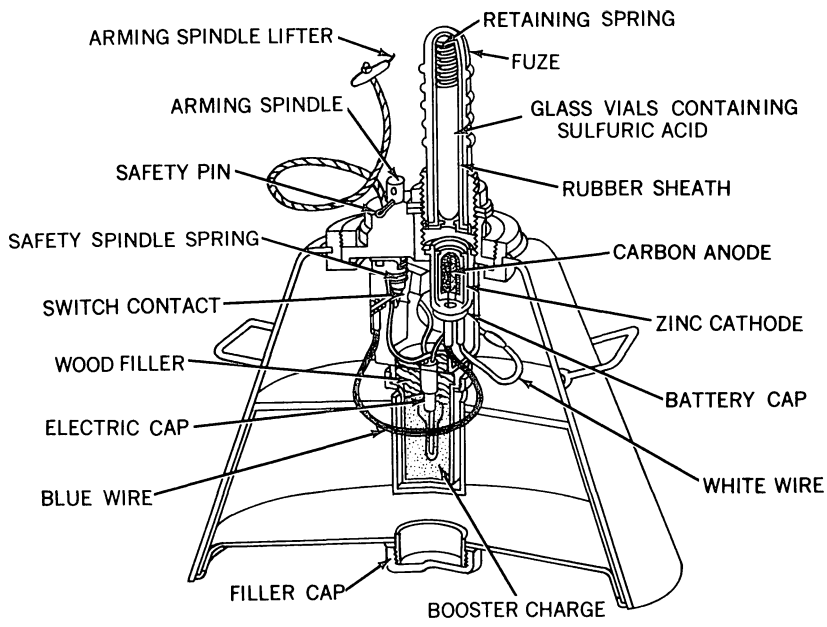


Figure 159

c. Functioning.

(1) Arming the mine by removing the safety pin allows the arming spindle to be forced down by the spindle spring, closing the safety switch.

(2) Direct pressure on the fuze or a pull on the wire fastened to the fuze bends or crushes the fuze, breaking the glass vial. The horizontal pull required to bend the fuze and break the vial is 200 pounds at the outermost ring; 275 pounds at the third ring down; and 430 pounds at the bottom ring.

(3) Acid from the vial comes in contact with the battery plates, generating electricity to fire the detonator, the booster, and the main charge.

Note. This mine can be fired electrically and in this case the fuse is omitted. Also, several mines can be connected to form an electrically controlled mine field.

d. Installing and Arming.

(1) Remove the wooden shipping plugs from the fuze well.

(2) Install the detonator, the electric cap, the battery, and the wiring circuit in the firing-mechanism assembly.

(3) Connect the blue wire from the battery to one terminal on the side of the safety switch. Connect one electric-cap lead to the other terminal on the side of the safety switch. Connect the white wire from the battery to the other electric-cap lead and tape.

(4) Place the firing mechanism in the mine and secure it by screwing in the keep ring.

(5) Screw the fuze into place.

(6) Install the mine in position.

(7) Remove the safety pin, allowing the arming spindle to make contact with the safety-switch contacts.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Screw the retractor pin into the head of the plunger.

(3) Pull up the plunger and replace the safety fork.

(4) With a spanner wrench or a drift pin and a hammer, remove the keep ring over the arming mechanism.
(5) Pull out the arming mechanism far enough to expose the wires.
(6) Cut the white or yellow leads to the detonator and tape the ends of the wires.
(7) The alternate method is:
(*a*) Unscrew the fuzes by turning them clockwise.
(*b*) Cut the wires leading from the fuzes into the body of the mine.
(*c*) Remove the arming mechanism and disconnect the leads to the detonator and the safety switch.

f. Additional Precautions. Removing the fuze under water will permit salt water to get into the battery cap and perhaps create enough current to detonate the mine. Thus when neutralizing the mine under water, remove the entire arming mechanism, including the battery cap, as a unit.

Section II. WOODEN ANTITANK MINES

130. Antitank Mine, Model 1951

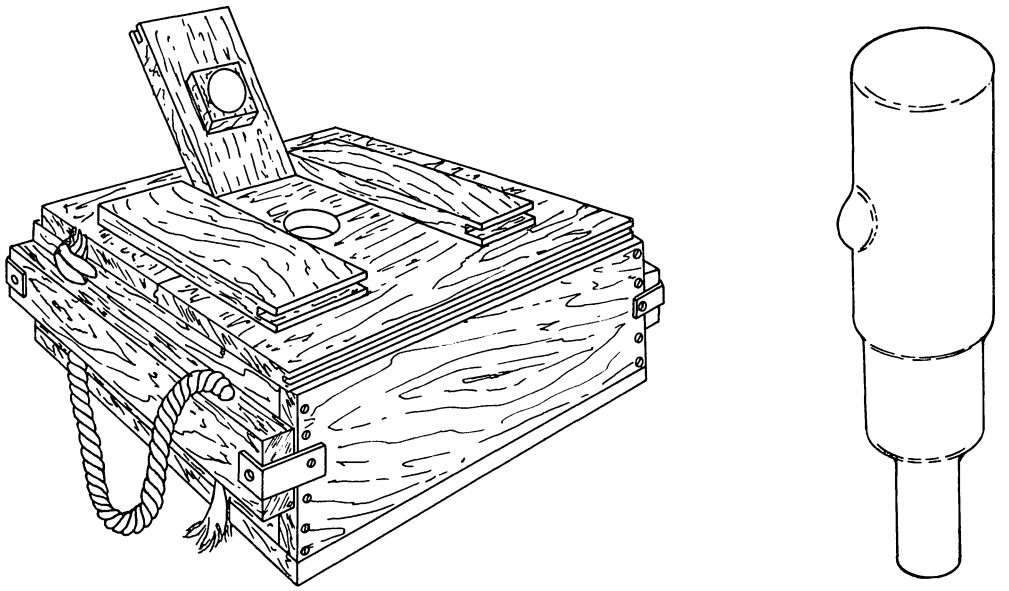


Figure 160

This Communist Chinese wooden model 1951 replica appeared in the Korean War late in 1952. It is more sturdily built than its Soviet parent, is slightly longer and wider, and has a carrying handle made of rope instead of leather or rubber. The mine measures 33.9 by 29.2 by 12.7 centimeters.

a. Characteristics.

Shape	Fuze	Operating force
Reotangular.....	Pressure, Soviet MV-5 pattern.	440 lb. or more.

Explosive

Main charge	Booster
13.8 lb. TNT.....	7 oz. TNT.

Markings

Chinese characters and numbers indicating 51 Model antitank mine, TNT for explosive, factory code number, year, and month of manufacture are stenciled in black on long side of mine. Other factory numbers and inspector marks are stenciled on the opposite long side and handle end.

b. Use. The Chinese Communist Model 1951 land mine is used for antitank and antivehicular purposes.

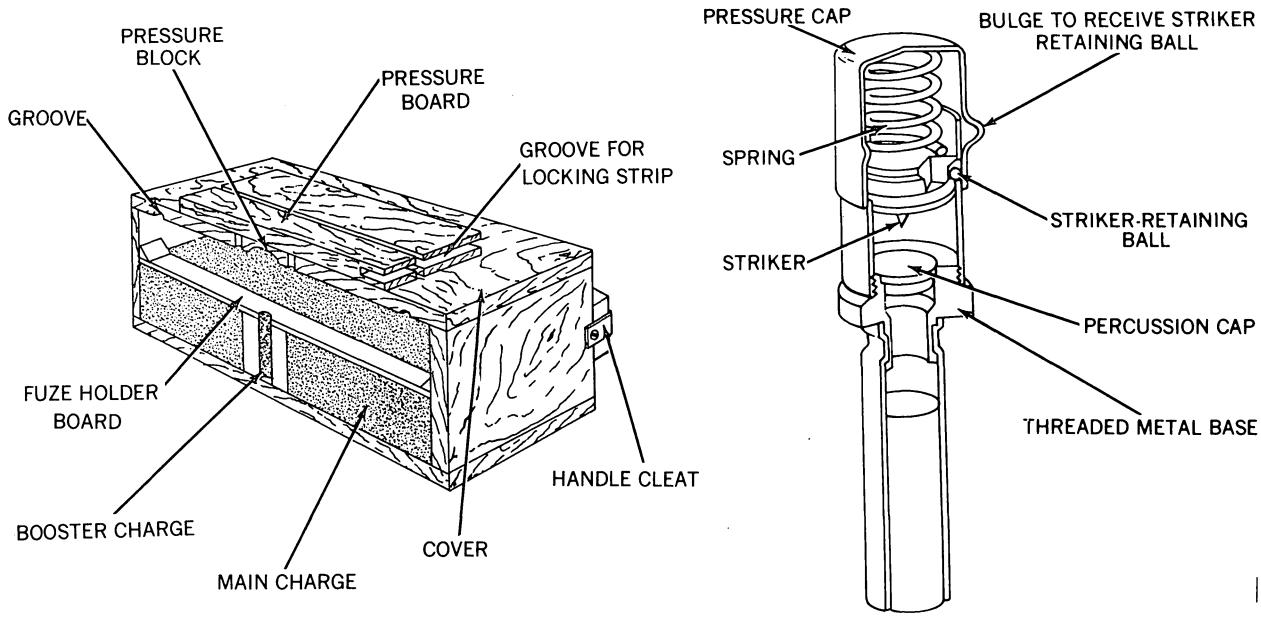


Figure 161

c. Functioning. The imposition of force on the cover breaks it along the sawed grooves, transmitting pressure to the pressure block and actuating the fuze.

d. Installing and Arming.

(1) Swing out the locking strip and lift the hinged pressure board.

(2) Place an MV–5 pressure fuze with an MD–2 detonator into the booster charge and insert the assembly into the mine.

(3) Close the hinged pressure board and lock it in place with the locking strip. For antipersonnel use, put a small wooden block under the booster so that the fuze is raised 1.2 to 2.5 centimeters. This causes the hinged pressure board to rest directly on the fuze in a slightly raised position, at which a pressure of about 25 pounds will actuate it.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Open the locking strip and raise the hinged pressure board.

(3) Lift out the fuze and detonator and unscrew the detonator. (As the mine may be boobytrapped, it is recomcended that the hinged pressure board be raised from a safe distance by a hook and rope.)

(4) Remove the fuze and mine to a safe disposal or storage area.

131. Wooden Antitank Mine, TMD–B (U.S.S.R.)

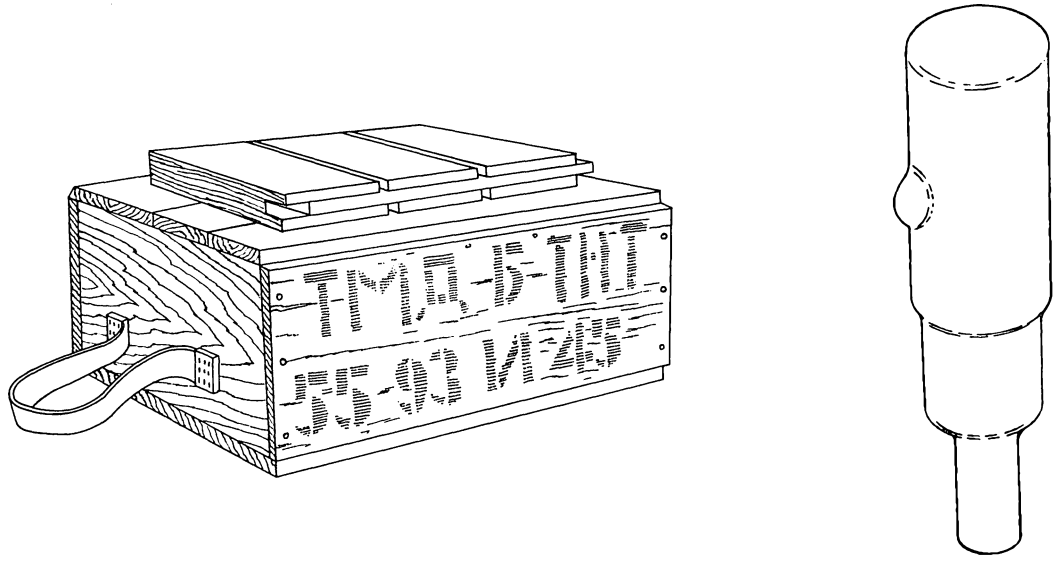


Figure 162

This is a standard wooden-cased antitank mine, the sides and bottom of which are nailed together or joined by tongue and groove. It is one of the Soviet mines used by the North Korean Army. The wooden cases may be produced either in the factory or in Ordnance field shops according to standard specifications. The hinged pressure board is fastened by a wooden locking-bar placed in grooves made for that purpose. The mine measures 31.7 by 27.9 by 13.9 centimeters.

a. Characteristics.

Shape	Fuze	Operating force
Rectangular.....	MV–5 pressure type.	440 lb. (approx) depending on condition of case.

Explosive

Main charge	Booster charge	Markings
11–15 lb. pressed amatol; dynammonite in two 5.5 lb. blocks; cast TNT; or powered picric acid.	7 oz. TNT	(1) Model No., type of explosive factory code No., lot No., date of manufacture; (2) on underside of hinged pressure board: factory code No., lot No., and inspector's ink; and (3) other factory and inspector's stamps rubber-stamped or painted in various other locations.

b. Use. This mine is usually emplaced in pattern in various types of minefields to immobilize tanks and other vehicles, to protect troops, positions and equipment, and to delay or halt enemy advance. It is usually laid with a space of 6 to 9 meters between individual mines and at a density of one mine per meter of front. Two or three mines (or one and a supplementary charge) may be buried in the same emplacement. The TMD–B antitank mine is sometimes converted to antipersonnel use.

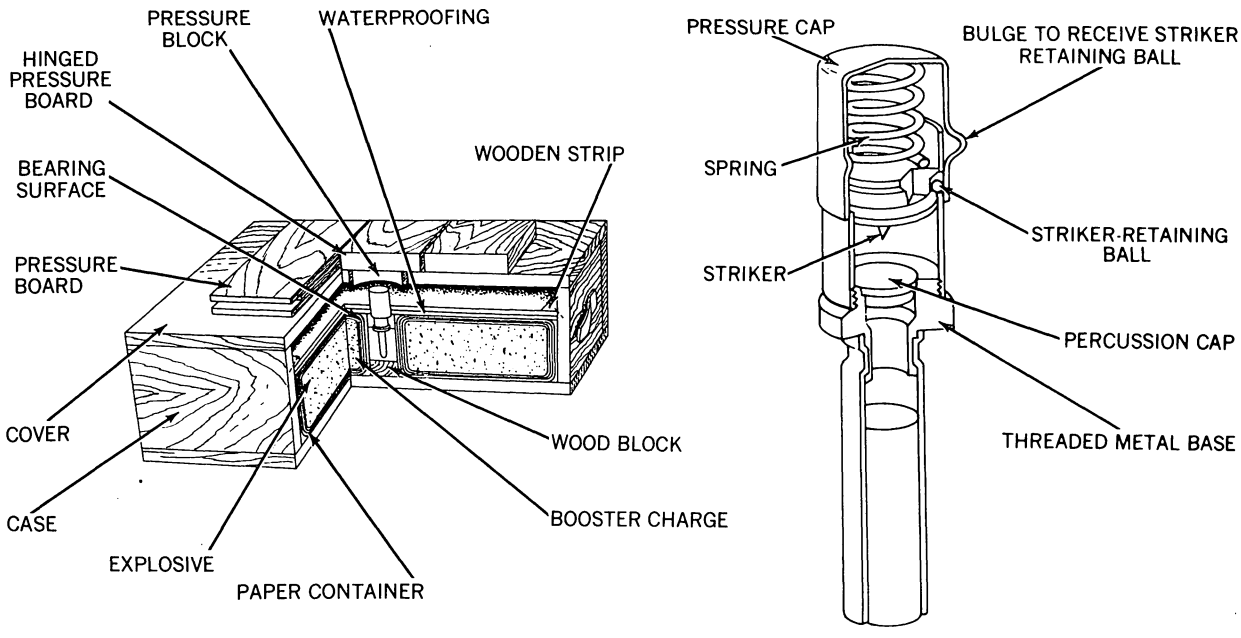


Figure 163

c. Functioning. Weight applied on top breaks down the cover at the sawed grooves, transmitting pressure to the pressure block, actuating the fuze, and setting off the mine.

d. Installing and Arming.

(1) Swing the locking strip out from the groove and lift the hinged pressure board.

(2) Place an MV–5 fuze with an MD–2 detonator assembly attached into a 200-gram TNT block and insert into the mine.

(3) Close the hinged pressure board and secure it with the locking strip. For conversion to an antipersonnel mine, place a small wooden block under the booster block, raising the fuze 1.2 to 2.5 centimeters. This causes the hinged pressure board to rest directly on the fuze in a slightly raised position, so that a pressure of about 25 pounds is sufficient for actuation.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Open the locking strip.

(3) Raise the hinged pressure board.

(4) Remove the fuze assembly.

(5) Unscrew the detonator.

(6) Remove the mine and fuzes to a safe storage or disposal area.

f. Additional Precautions. Although disarming methods are presented here, their use is not recommended, as the mine is often booby-trapped.

132. Wooden Antitank Mine, TMD–44 (U.S.S.R.)

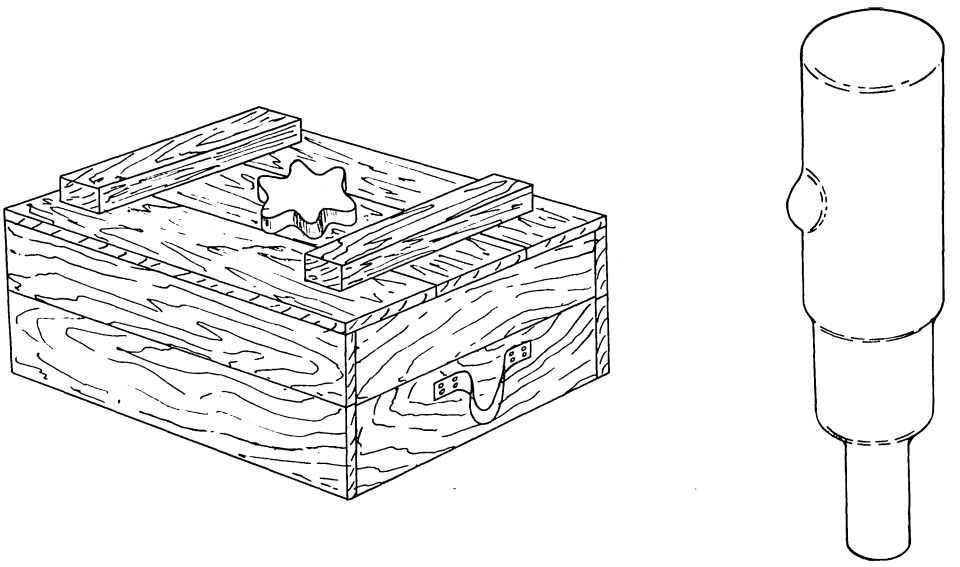


Figure 164

The TMD–44 wooden antitank mine is provided with two pressure boards and a centrally located plastic fuze well cover. Shear grooves are sawed on the under side of the cover to aid crushing when pressure is applied.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Rectangular...	MV–5 pressure.	440 lb. (approx).	11.0 to 15.4 lb. amatol dynammon, ammonite, or TNT.	7 oz. TNT

b. Use. This mine is laid in minefields to demobilize tanks and other vehicles.

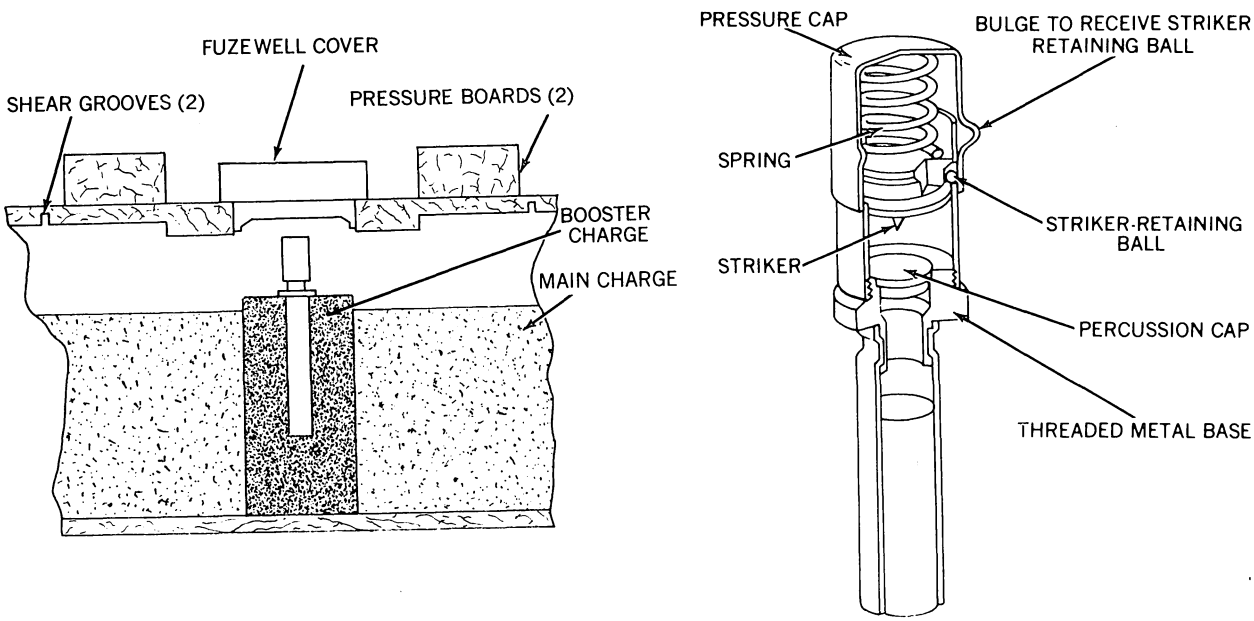


Figure 165

c. Functioning. The application of pressure crushes the top of the case, releasing the fuze striker pin and detonating the mine.

d. Installing and Arming.

(1) Remove the fuze well cover.
(2) Insert an MV–5 fuze with an MD–2 detonator attached.
(3) Replace the fuze well cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the fuze well cover.
(3) Remove the fuze and detonator assembly.
(4) Unscrew the detonator from the fuze.
(5) Remove the mine and fuze to a safe disposal area.

133. Wooden Pressure and Traction Land Mine (Japan)

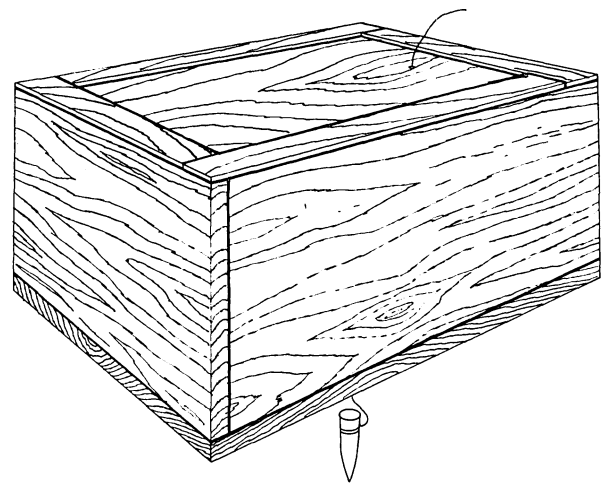


Figure 166

This antitank-antipersonnel mine is a wooden box with a lid held in place against the internal flanges on the top by four stout springs, one in each corner. To the underside of the lid a wooden pressure block is fixed by two bolts. This block operates the pull igniter from pressure exerted on the cover. The dimensions of the mine are 31.7 by 24.1 by 17.7 centimeters. The fuze contains an ignition composition and a pellet of powdered glass in red cement. A pull wire extends from the fuze to a wire rod directly under the wooden pressure block. A trip wire is also attached to the rod and fastened to an anchor outside the mine. An activating wire, fastened to the wire rod, is threaded through a hole in the bottom of the case and anchored to a stake driven into the ground underneath the mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Pull-friction.	5 to 10 lb.	2 lb. TNT or picric acid (par. 6x.)

b. Employment. This pressure-traction mine is used against tanks and personnel.

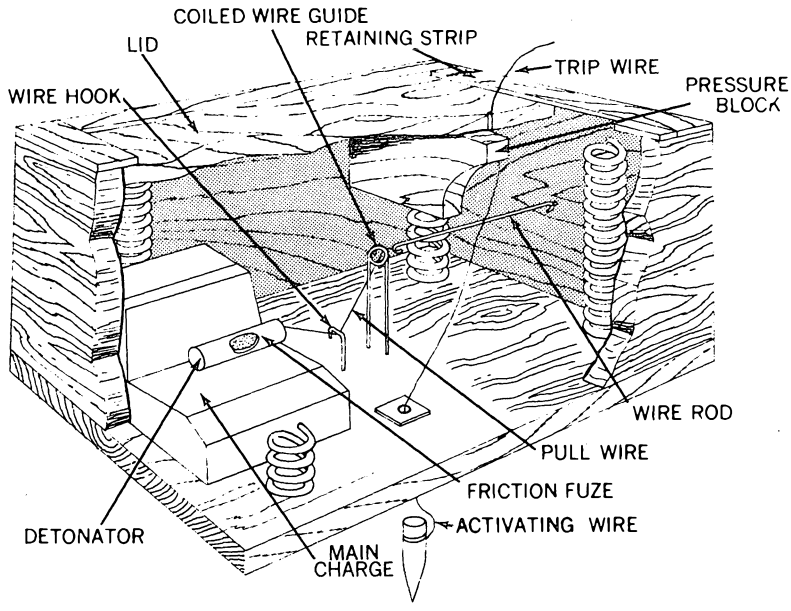


Figure 167

c. Functioning. This mine functions by three methods, pressure on the lid, tension placed on the trip wire, or lifting the mine and actuating the antilift device. In all instances the wire rod is moved, which pulls the wire leading to the igniter.

d. Installing and Arming.

(1) Dig a hole and drive a stake into the bottom.

(2) Place a pull-friction fuze and detonator in the charge.

(3) Attach a pull wire to the fuze and to the wire rod hooked into the staple in the opposite end of the mine case.

(4) Attach a trip wire to the stake in the bottom of the placement hole. Thread the trip wire through the hole in the bottom of the case, tie it to the wire rod, and extend it through the hole in the top of the case.

(5) Place the lid on the coil springs in the corners of the case and fasten on the retaining strips.

(6) Anchor the trip wire to a stake or some other suitable object.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the retaining strips and life off the lid.

(3) Remove the fuze and detonator from the mine.

(4) Separate the fuze and detonator, if possible.

(5) Remove the mine and fuze to a safe storage or disposal area.

134. Wooden Antitank Mine, CS 42/3 (Italy)

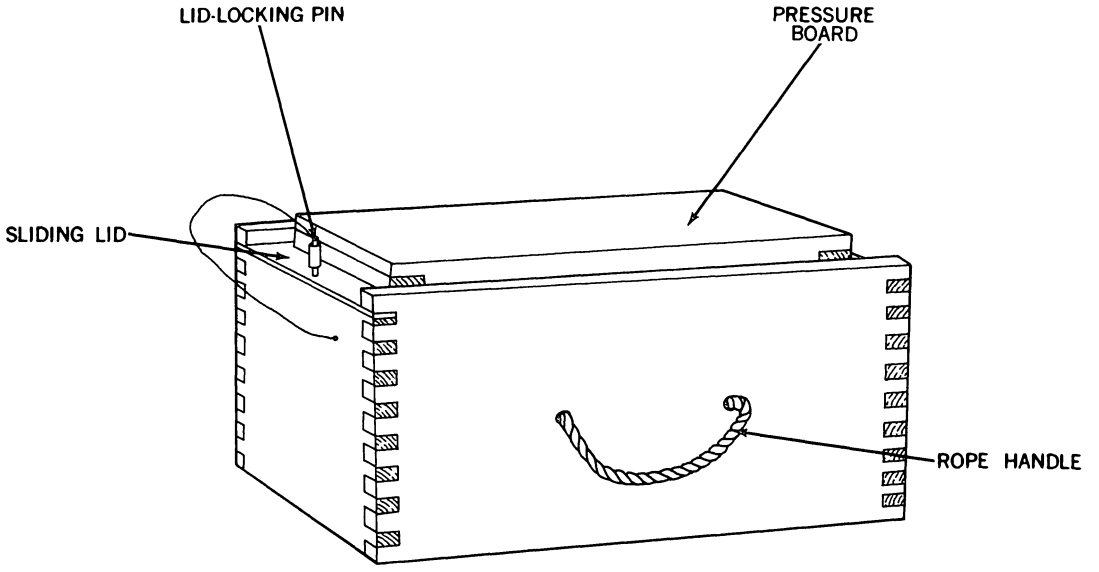


Figure 168

This is essentially a modified wooden CS 42/2 antitank mine with four pressure fuzes. It has no metallic parts and is thus nondetectable by electronic detectors. The lid is held in place by thin tongues sliding in grooves in the wooden case. The mine is 28.4 centimeters long, 23.6 centimeters wide, and 14.4 centimeters high .

a. Characteristics.

Shape	Fuze	Operating force
Rectangular box. .	Pressure.....	220 lb. (approx).

Explosive

11.0 TNT or similar explosive in cartridge form.

b. Use. This concussion mine is used to damage tank tracks.

(No drawing available.)

c. Functioning. The thin edges of the lid fail under pressure and force the pressure board onto the fuzes, which, thus actuated, detonate the mine.

d. Installing and Arming.

(1) Remove the lid locking-pin and slide the lid back.
(2) Remove the four wooden cylinders (false fuzes) from the fuze wells.
(3) Remove the fuzes from their transport recesses.
(4) Attach OTO detonators to the fuzes and place them in the fuze wells.
(5) Replace the lid, being careful not to place any pressure on the pressure-board.
(6) Replace the lid locking-pin.

e. Disarming Procedure.

(1) Inspect for and remove any antilift devices.
(2) Remove the lid locking-pin and slide the lid back.
(3) Remove the fuzes from the mine and separate them from the detonators.
(4) Take the mine and fuzes to a safe storage or disposal area.

135. Antitank Mine, CC 48 (Italy)

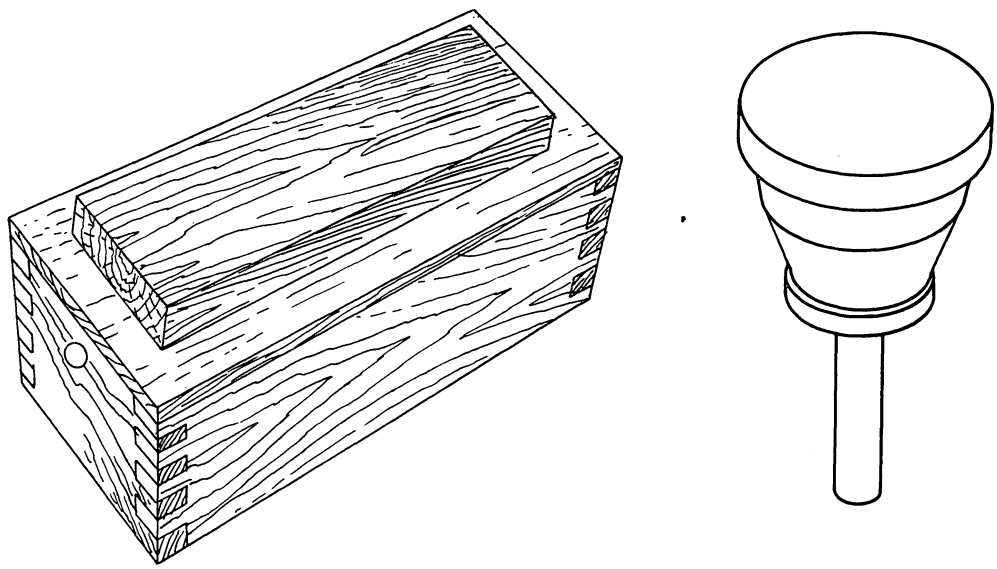


Figure 169

This is a wooden undetectable mine loaded with a shaped charge that concentrates its force along a line rather than at a point. Although no longer produced, this mine will remain in service as long as present stocks last. The mine is 28.4 by 12.9 by 13.9 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Rectangular box.	Pressure..	220 lb. (approx).	4.0 lb. cast TNT (approx).	Pressed TNT.

b. Use. This mine is laid singly or in pairs (usually about 3.5 meters and never less than 1.8 meters apart) to cut the tracks of medium tanks. The long axes are set perpendicular to the expected line of attack. This mine may be used for antipersonnel purposed by substituting PMC/43 fuzes for the 42/2 pressure fuzes and weakening the lid so that the weight of a man will crush it.

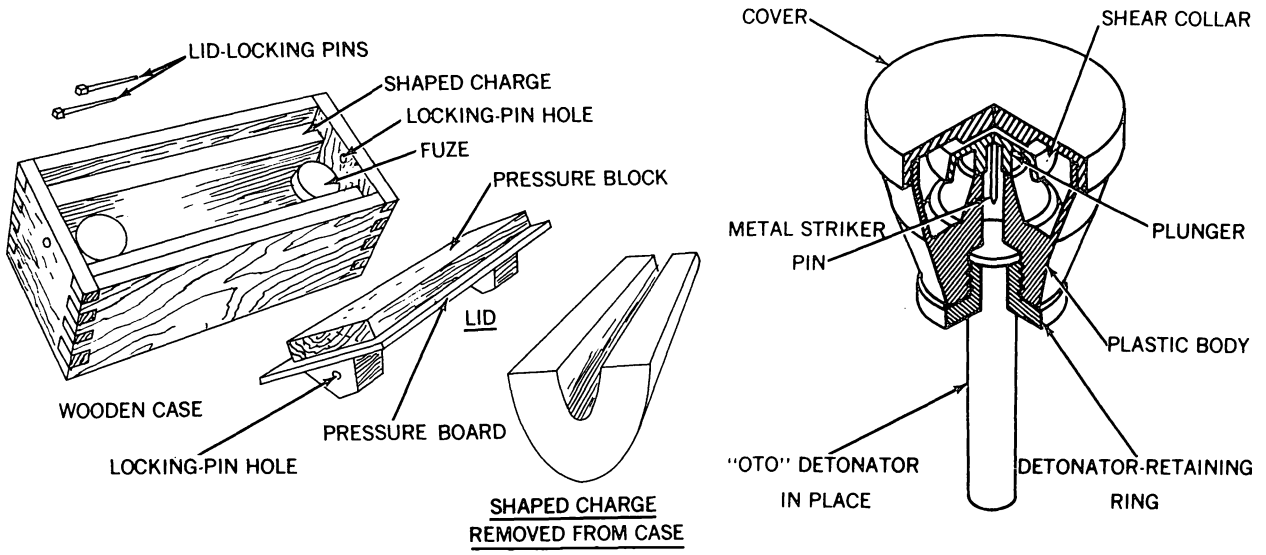


Figure 170

c. Functioning. Pressure exerted on the top breaks the lid and forces the pressure board down. The two wooden blocks on the underside of the pressure board transmit pressure to the fuzes and fire them; and in turn, they detonate the main charge.

d. Installing and Arming.

(1) Remove the cover and emplace the mine.

(2) Attach OTO detonators to the two fuzes (42/2) and place these assemblies in the wells.

(3) Replace the cover carefully without putting pressure on it.

e. Disarming Procedures.

(1) Check for and remove any antilift devices.

(2) Remove the cover.

(3) Remove the fuzes.

(4) Take the mine and fuzes to a safe storage or disposal area.

136. Wooden Antitank Mine, PT-Mi-D (Czechoslovakia)

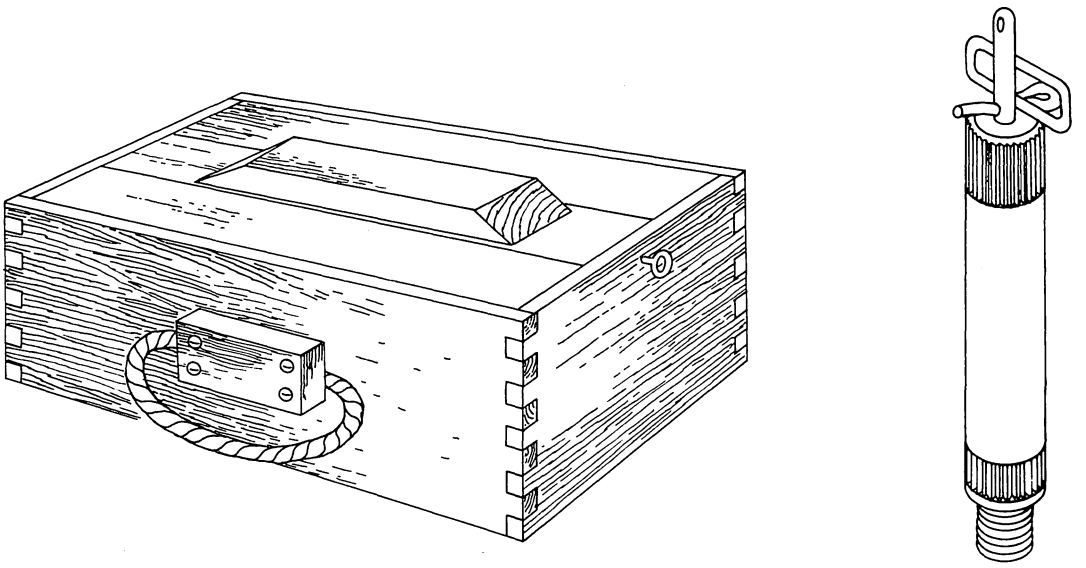


Figure 171

This wooden mine was standardized in the Czechoslovakian Army in 1947 or 1948. It shows Soviet influence in design and method of operation. It is complicated, having wooden shear dowels at each end for adjustment to increase or decrease activation pressure, booby-trap holes in the bottom, and two RO-1 pull fuzes—one at each end. The mine measures 32.9 by 21.5 by 13.9 centimeters.

a. Characteristics.

Shape	Fuze	Operating force
Rectangular.....	2 RO-1 pull type.	330 lb.

Explosive

Main charge	Booster
6.0 lb. TNT (approx).	14 oz. TNT.

b. Use. This mine is used for antivehicle and antitank purposes. It is generally buried with the top of the pressure block flush with the ground surface and lightly covered with soil.

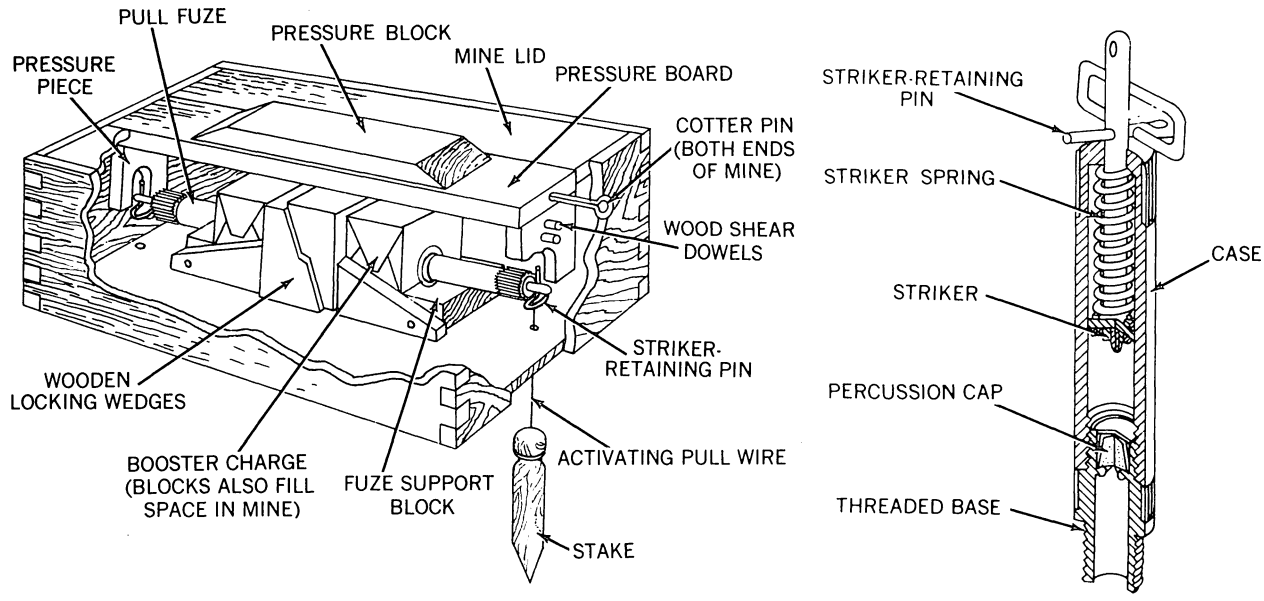


Figure 172

c. Functioning. Pressure on the pressure-block shears the wooden dowels holding one or both of the shear blocks at the ends of the mine. The fuze slot in the shear block goes down over the end of the striker, forcing out the striker retaining pin and releasing the striker against the percussion cap.

d. Installing and Arming.

(1) Remove the cotter pin holding the pressure board in place.

(2) Lift out the pressure block and place the two booster charges so that the detonator holes are opposite the grooves in the fuze support blocks.

(3) Insert two RO-1 fuze-detonator assemblies into the booster charges so that the winged striker retaining pins fit under the fuze slot in both of the shear blocks. The wings of the pins must be below the striker bolts.

(4) Plug the space between the booster charges with the two wooden locking wedges.

(5) Replace the pressure board.

e. Neutralizing.

(1) Check for and remove any antilift devices.

(2) Lift off the pressure board.

(3) Take out the wooden locking wedges.

(4) Carefully disengage a booster charge from one fuze and remove it; then carefully disengage the other booster charge and remove the second fuze.

(5) Take the mine and fuzes to a safe storage or disposal area.

137. Antitank Mine, Model 44 (Finland)

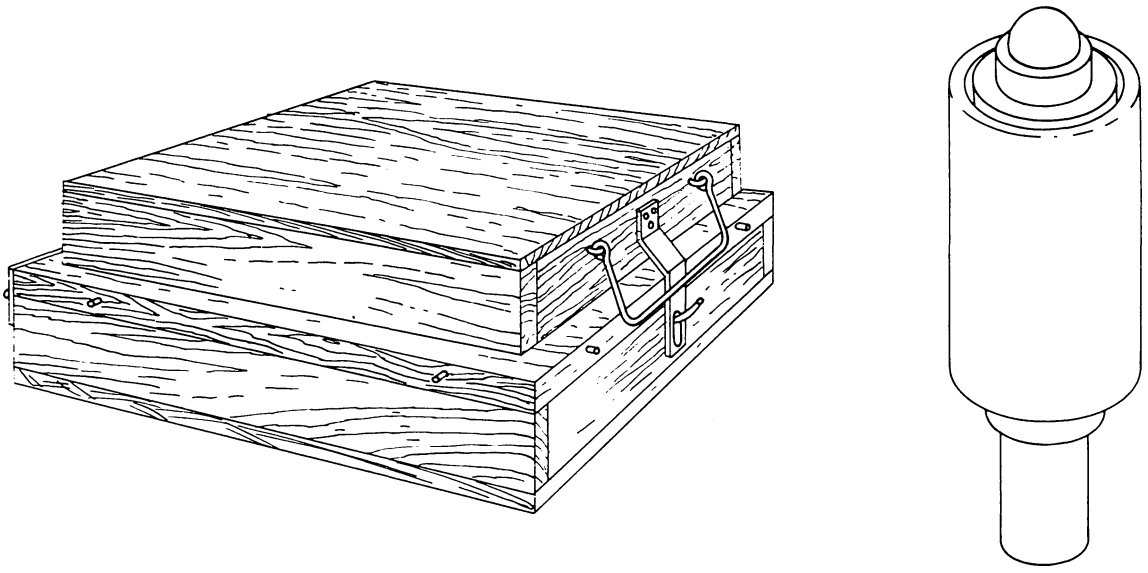


Figure 173

This wooden unit consists of a two-part case, main charge, and a booster. The smaller upper part of the case, which contains the charge, is hinged and latched to the larger lower part. Both parts are held together by eight wooden shear dowels that mainly perform the duty of shear pins. The booster charge, embedded in the main charge, contains a cylindrical detonator well. A metal bearing plate for the head of the fuze is fitted to the floor of the mine directly beneath the detonator well. The mine measures 30.7 by 30.7 by 11.4 centimeters.

a. Physical Features.

Shape	Fuze	Operating force	Explosive		Markings
			Main charge	Booster	
Rectangular box.	Pressure	770 lb. (approx).	11.0 lb. cast TNT (approx).	.5 lb. TNT	"This side down" written in Finnish on bottom of case.

b. Use. The Model 44 is used in minefields primarily to damage tracks and suspension systems of armored vehicles.

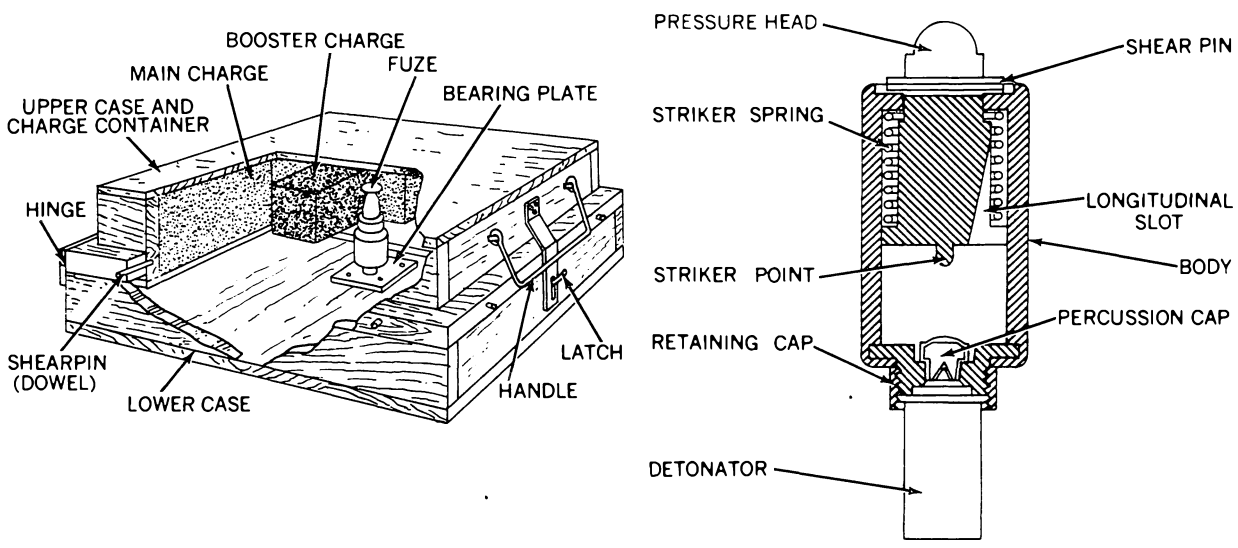


Figure 174

c. Functioning. Pressure on the top shears the wooden dowels, which transmits the pressure to the fuze. This actuates the spring-driven striker against the percussion cap and carries the firing chain through to the main charge.

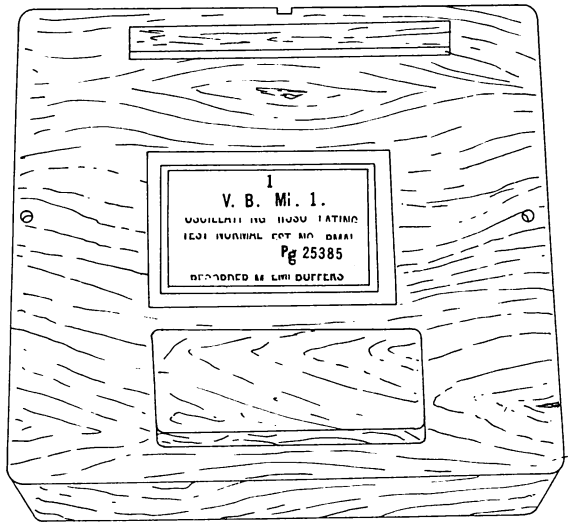
d. Installing and Arming.

(1) Unlatch and open the case.
(2) Remove the transit plug from the detonator well.
(3) Attach a detonator to the fuze.
(4) Insert fuze and detonator into the well.
(5) Close the case and latch.

e. Disarming Procedures.

(1) Check for and remove any antilift devices.
(2) Open the case and pull out the fuze.
(3) Separate the detonator from the fuze.
(4) Remove the mine and fuze to a safe storage or disposal area.

138. Wooden Box Mine V. B. (Holzmine V. B. Mi. 1) (Germany)



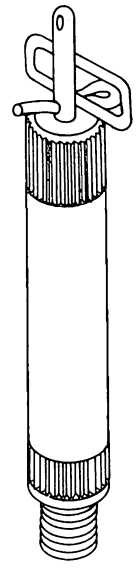


Figure 175

This wooden box antitank mine is similar to the wooden box mine 42, with these exceptions—the main charge space is larger, the cover is held down with two screws and is positioned by two wooden cleats instead of wooden pegs, the explosive charge is larger, and the markings are different. The wooden case is divided into three compartments—two for the main and booster charges, and the other for the fuze mechanism.

a. Characteristics.

Shape	Fuze	Operating force	Explosive		Markings
			Main charge	Booster	
Rectangular.	Pull fuze 42 with winged pin release removed by pressure.	200 lb. or more.	10 lb. cast explosive.	1.5 lb. cast explosive.	V.B.Mi. 1 on a label with description of the contents pasted on the top.

b. Use. This mine is laid in minefields during retrograde movements. It is not used during periods of wet weather because it is not waterproof.

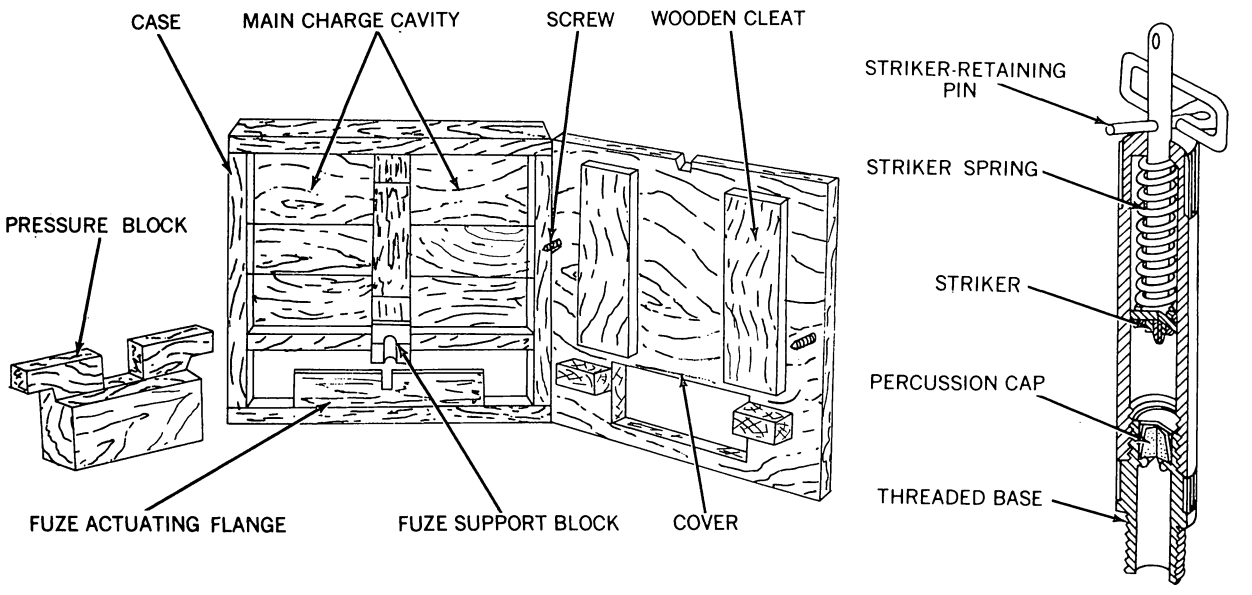


Figure 176

c. Functioning. Pressure on the pressure plate shears the two wooden dowels, which permits the depression of the fuze actuating flange. The fuze actuating flange, thus forced down, pushes the retaining pin from the pull fuze 42, releasing the spring-loaded striker against the percussion cap and firing the mine.

d. Installing and Arming.

(1) Remove the cover, pressure block and booster charge, and insert a pull fuze 42, with detonator, into the booster charge.

(2) Replace the booster charge so that the fuze rests on the U-shaped block with the striker retaining pin below the striker shaft and under the slot in the fuze actuating flange.

(3) Place the pressure block in the armed position and replace the cover.

(4) Lay the mine in the ground so that the pressure block is level with the ground surface.

Caution. **This mine may be laid with the two wooden dowels removed or cut to make it function under foot pressure. It may also have a hole drilled under the fuze for a pull wire to be tied to the loop of the retaining pin. Too, the mine functions under less pressure if it has been buried long long enough for the wood to rot.**

e. Disarming Procedure.

(1) Check for and remove any antilifting devices present.

(2) Remove the cover avoiding all pressure on the pressure block and lift the pressure block clear of the fuze actuating flange.

(3) Remove one of the explosive blocks of the booster charge but not the one into which the fuze is screwed.

(4) Slide the explosive block with the fuze in it back until the striker retaining pin is clear of the fuze actuating flange, and left out the explosive block and fuze.

(5) Unscrew the fuze and remove the detonator.

(6) Take the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. Such mines should not be disarmed except in extreme emergencies, as they may have an antilift device that detonates the charge at the raising of the lid.

139. Wooden Antitank Mine, M/S-39 (Finland)

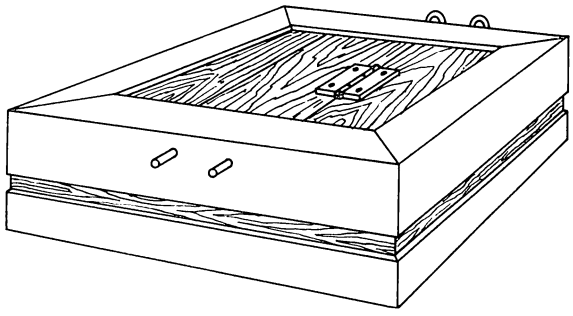


Figure 177

This wooden mine consists of a wooden internal explosive container on a flat wooden base, a wooden pressure cover with metal positioning plates fastened along the edges, and two metal safety bars inserted through the pressure cover. The center board of the pressure cover is hinged to give access to the fuze. The fuze has a percussion type striker consisting of a shear pin and a leaf spring with a striker point held up by a pivoted trigger.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Rectangular...	Mechanical with percussion-type striker.	200 lb. (approx).	Unknown	Unknown

Remarks

This mine may have pull wire or pressure release fuzes under the lid that may make it impossible to remove the fuze. Also there may be antilift devices at the sides, under the mine or on the top, held cocked by the weight of the thin ground layer.

b. Use. This mine was used against tanks.

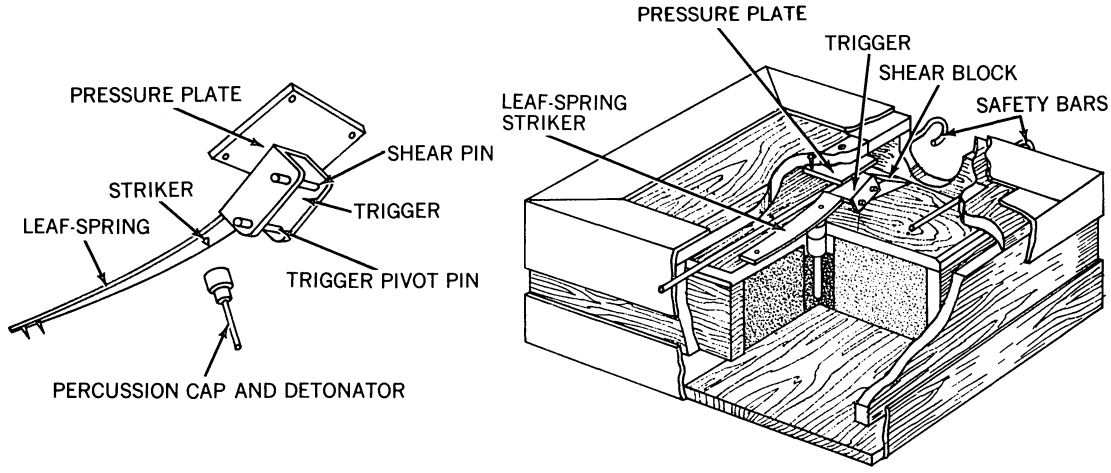


Figure 178

c. Functioning. Pressure on the pressure cover is transmitted through the pressure plate to the trigger. It also shears the shear pin. This permits further depression that releases the leaf spring to force the striker against the percussion cap, setting off the detonator and the main charge.

d. Installing and Arming.

(1) Open the fuze access door and raise the leaf spring.
(2) Insert a detonator and percussion cap.
(3) Close the fuze access door and remove the safety bars.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Replace the safety bars, if they are available.
(3) Open the fuze access door and carefully lift up the leaf spring.
(4) Remove the percussion cap and detonator.
(5) Transport the mine to a safe storage or disposal area.

140. Wooden Box Mine 42 (Holzmine 42) (Germany)

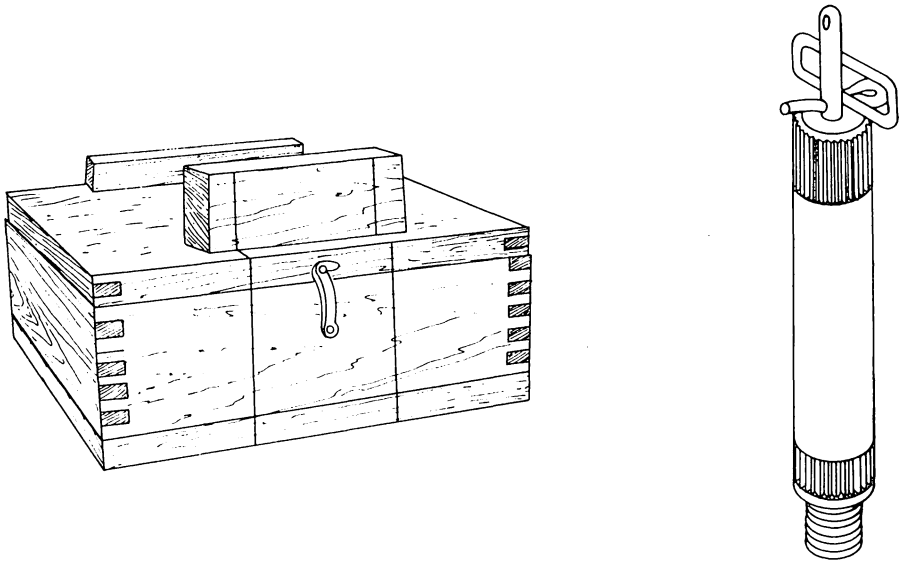


Figure 179

This wooden antitank mine consists of a case 32.9 by 30.4 by 11.4 centimeters divided into four compartments. One is for the fuze, two for the main charge, and one for the booster. The fuze actuating mechanism is in three parts—a wooden fuze support block with a U-shaped slot, a wooden fuze actuating flange secured to the outside wall of the mine case by two wooden dowels, and a wooden pressure block that fits into a hole in the top of the mine. The cover of the mine case is positioned by wooden pegs and secured to the front and back by metal hooks. One side of the pressure block is painted red, and when it is in the armed position a continuous red band about 10.1 centimeters wide shows down the front of the mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Rectangular.	Pull fuze 42, with winged striker removed by pressure.	200 lb.	11.5 lb. amatol 50/50.	1.5 lb. amatol 50/50.

b. Use. This mine was designed for use in antitank minefields.

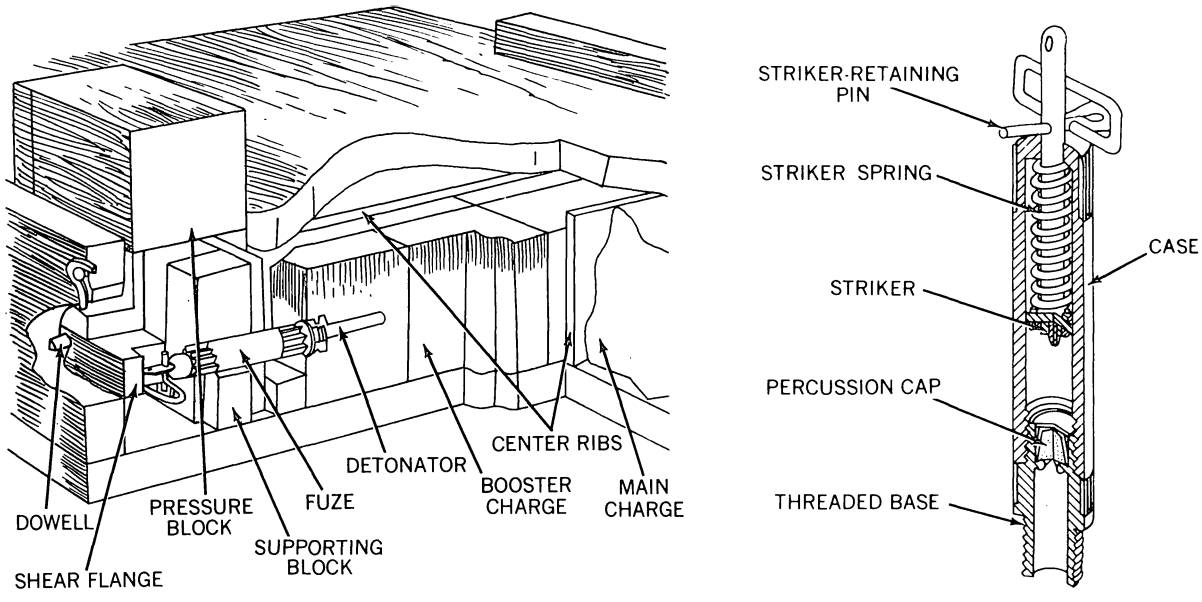


Figure 180

c. Functioning. Pressure on the pressure block shears the wooden dowels, releasing the actuating flange and forcing it downward to remove the striker retaining pin. This action releases the striker to fire the percussion cap and detonate the mine.

d. Installing and Arming.

(1) Remove the cover, pressure block, and booster charge and insert a pull fuze 42 with detonator into the well of the booster charge.

(2) Replace the booster charge so that the fuze rests in the U-shaped slot of the support block with the wings of the retaining pin below the striker shaft and under the slot in the fuze actuating flange.

(3) Place the pressure block in the armed position with the red band toward the fuze side of the mine, and replace the cover.

(4) Lay the mine in the ground so that the pressure block is level with the ground surface and the red band is away from the enemy.

Caution. **This mine may be laid with the wooden dowels removed or cut to make it function under foot pressure. It may also have a hole drilled through the bottom under the fuze for tying a pull wire to the loop of the striker retaining pin. The mine also functions under less pressure if it has been buried long enough for the wood to rot.**

e. Disarming Procedure.

(1) Search for and remove any antilift devices.

(2) Remove the cover avoiding all pressure on the pressure block.

(3) Lift the pressure block clear of the actuating flange.

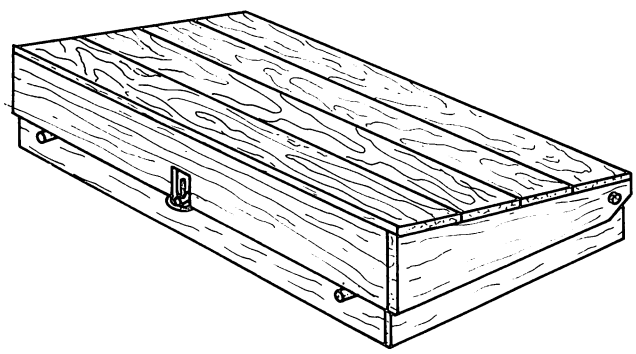
(4) Remove one block of booster charge, but *not* the one with the fuze screwed into it.

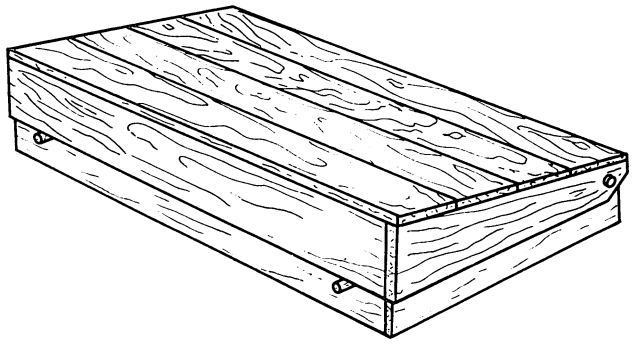
(5) Slide back the booster explosive block with the fuze screwed in it until the striker retaining pin is clear of the fuze actuating flange and lift out the explosive block and fuze.

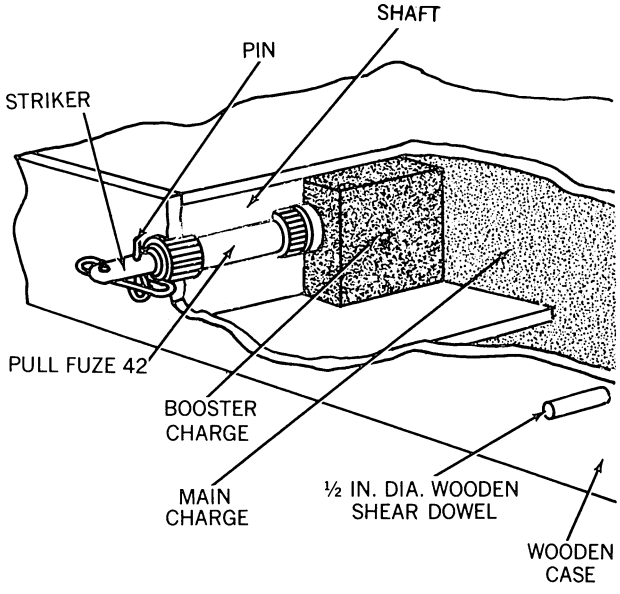
(6) Unscrew the fuze and separate the detonator from it.

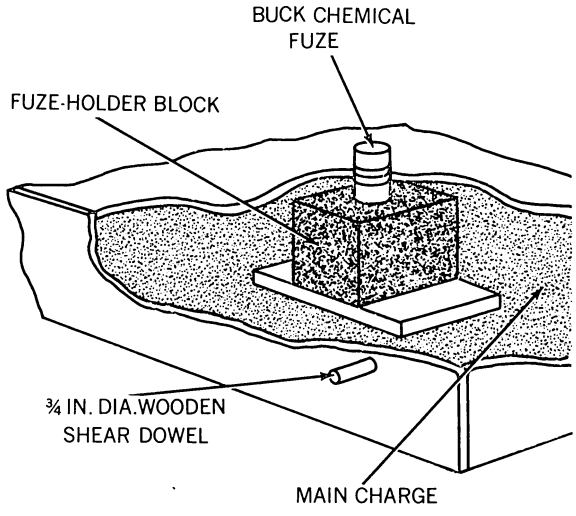
(7) Remove the mine and fuze to a safe storage or disposal area.

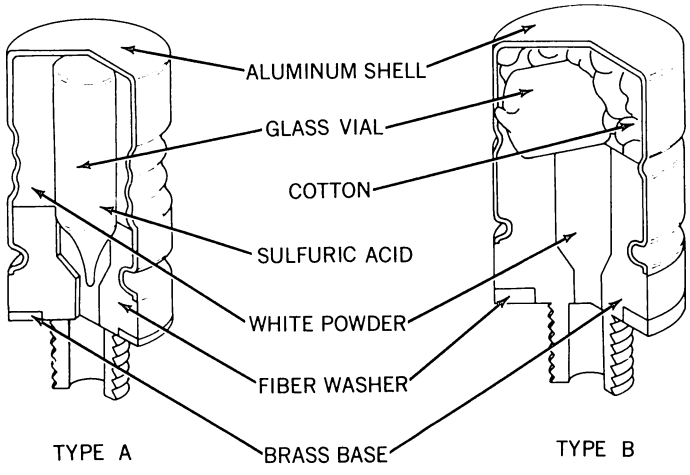
141. Antitank Schnellmine, Types A and B (Germany)











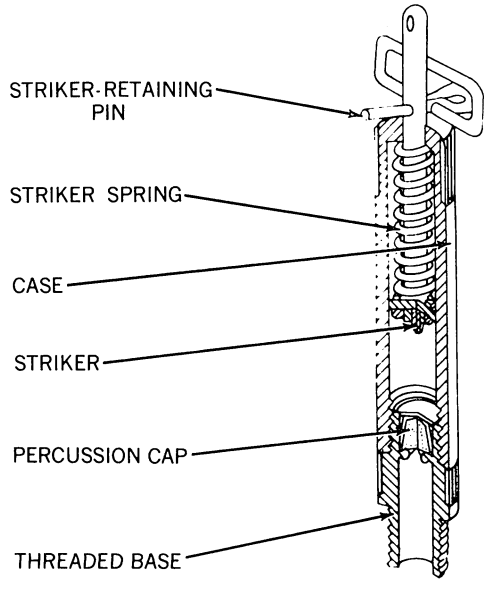


Figure 181

These two models resemble a large Schu mine in appearance and functioning. The wooden cases measure 52.7 by 31.0 by 15.9 centimeters. Both have a main charge and a booster charge. Type A is detonated by a pull fuze 42 with winged retaining pin; type B has two buck chemical fuzes. In type A, the hinged pressure lid rests on 1.2-centimeter wooden shear dowels; in type B, on two 1.9-centimeter wooden shear dowels.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Rectangular...	Type A-pull fuze 42; type B-two buck chemical igniters.	Type A-100 lb.; type B-200 lb.	13 lb. cast explosive.	.44 lb. cast explosive.

b. Use. Both models are laid in antitank minefields.

(No drawing available.)

c. Functioning. Pressure on the lid in both types shears the two wooden shear dowels, lowering the lid. On type A this descends on the wings of the striker retaining pin and removes it, releasing the striker and firing the percussion cap, detonator, booster, and main charge. In type B the lowered lid crushes the aluminum shell on top of the fuze, breaking the glass vial and permitting the chemical to react with the white powder and cause a flame. This flame sets off the detonator, booster, and main charge.

d. Installing and Arming.

(1) *Type A.*

(*a*) Raise the pressure lid off of the mine and place the two wooden shear dowels in the holes provided.

(*b*) Remove the wooden shipping plug from the booster charge and screw in a pull fuze 42 with detonator.

(*c*) Lower the pressure lid carefully on the wooden shear dowels and place the mine in the hole so that the pressure lid is level with the ground surface.

Caution. **(Type A and B) Keep 4-meter intervals between the mines to insure against sympathetic detonation.**

(2) *Type B.*

(*a*) Raise the pressure lid of the mine and place the two wooden shear dowels in the holes provided.

(*b*) Remove the wooden plugs from the fuze wells.

(*c*) Screw two Buck chemical fuzes with detonators through the top of the wooden case into the booster charges. (Be careful not to crush the fragile aluminum shell.)

(*d*) Lower the pressure lid carefully on the wooden shear dowels and place the mine in the hole so that the pressure lid is level with the ground surface.

Caution. **Deterioration of the wood over a period of time (both types) makes these mines unsafe to handle. The wooden shear dowels must be intact and in place; otherwise the mine will explode when the pressure lid is dropped.**

e. Disarming Procedure.

(1) *Type A.*

(*a*) Check for and remove any antilifting devices present.

(*b*) Make sure that the mine is not damaged by blast or deterioration. The wooden shear pins *must* be inplace and intact. If not, make no attempt to disarm.

(*c*) Lift the pressure lid.

(*d*) Unscrew the fuze and detonator from the booster charge.

(*e*) Separate the detonator from the fuze.

(*f*) Transport both mine and fuze to a safe storage or disposal area.

(2) *Type B.*

(*a*) check for and remove any antilifting devices present.

(*b*) Make sure that the mine is not damaged by blast or deterioration. The wooden shear pins *must* be inplace and intact, if not, make no attempt to disarm.

(*c*) Unscrew the Buck chemical fuzes and detonators from the booster charges.

(*d*) Separate the fuzes and detonators.

(*e*) Remove both fuzes and mines to a safe storage or disposal area.

f. Additional Precautions. As many wooden mines have antidisturbance devices underneath the lid, disarming should be undertaken **only when unavoidable.**

142. AMS Starinov Mine (U.S.S.R.)

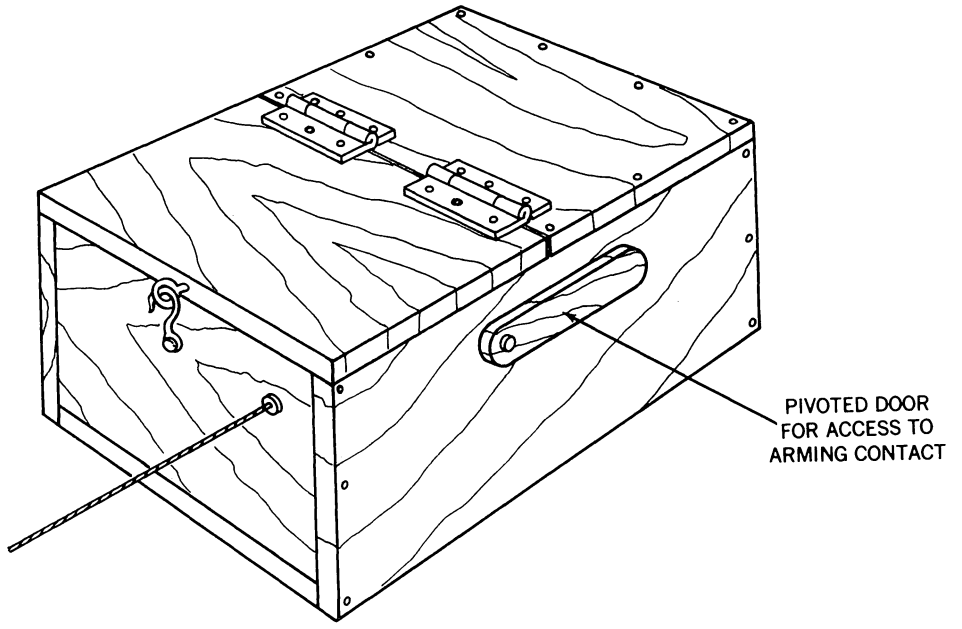


Figure 182

This is an antitransport antiautomobile mine. It consists of a wooden box 17.1 by 12.0 by 7.6 centimeters. The ignition assembly consists of a small battery, an electric detonator, an arming contact, and a detonating contact. For assembling purposes, a hinged lid is provided in the top of the mine. The arming cord extends from a hole in the side.

a. Characteristics.

Shape	Fuze	Explosive	Remarks
Rectangular....	Electric, with pull wire or cord.	15-oz. explosive block.	This mine may function by pull or tension release.

b. Use. This mine is used against vehicles in the surface of paved or unpaved roads on a supplementary charge.

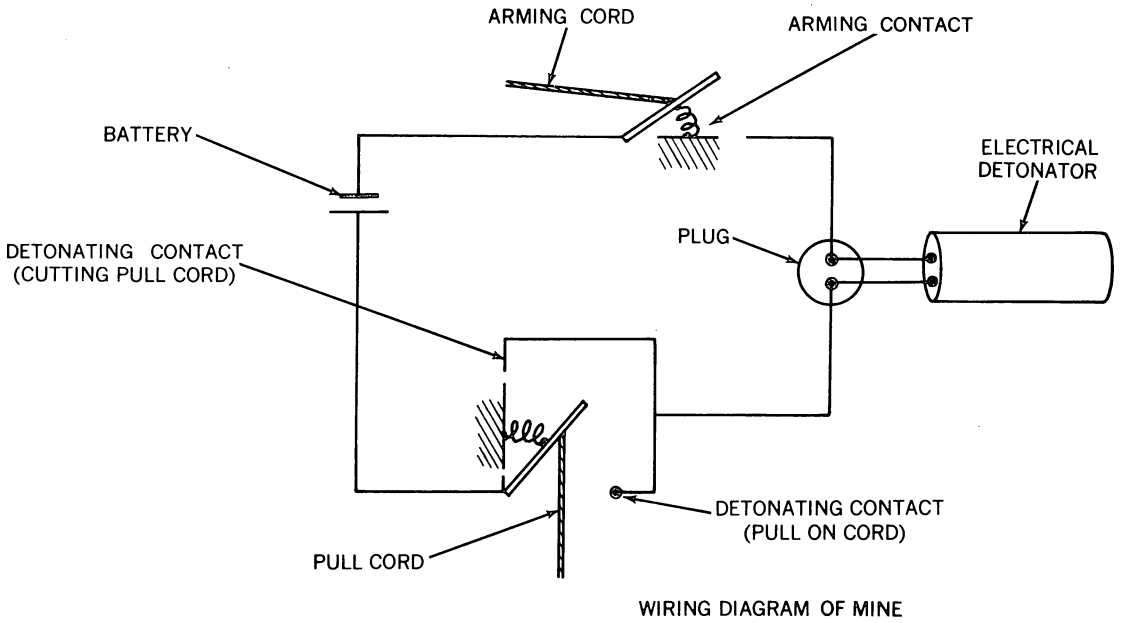


Figure 183

c. Functioning. Pulling or breaking the pull wire closes the circuit and explodes the mine.

d. Installing and Arming.

(1) Test the battery and contacts by inserting a bulb in the plug socket for the leads of the electric detonator.

(2) Place the mine on an additional charge so that the top is flush with the surface of the road.

(3) Stretch the cord or wire attached to the detonating contact over the road at a height of about 10.1 centimeters and tie it fast to a tree, post, or other anchor so that the detonating contact lever is midway between the contacts.

(4) Open the arming contact by leading the arming cord through the hole in the side of the mine closed by the pivoted door and tie it fast to an anchor so that the contact remains open.

(5) Insert an electric detonator into the charge and plug the electric leads into the terminal socket.

(6) Release the arming contact by cutting the arming cord.

e. Disarming Procedure. **The hand disarming of this mine should not be attempted.** It should be pulled out with a grapnel or blown in place.

143. Railroad Mine, PMS (U.S.S.R.)

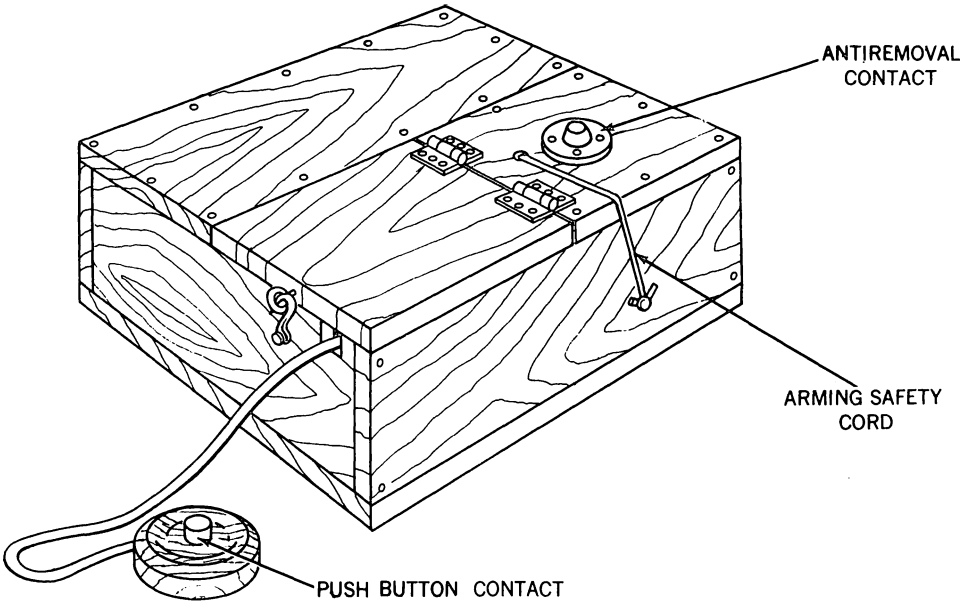


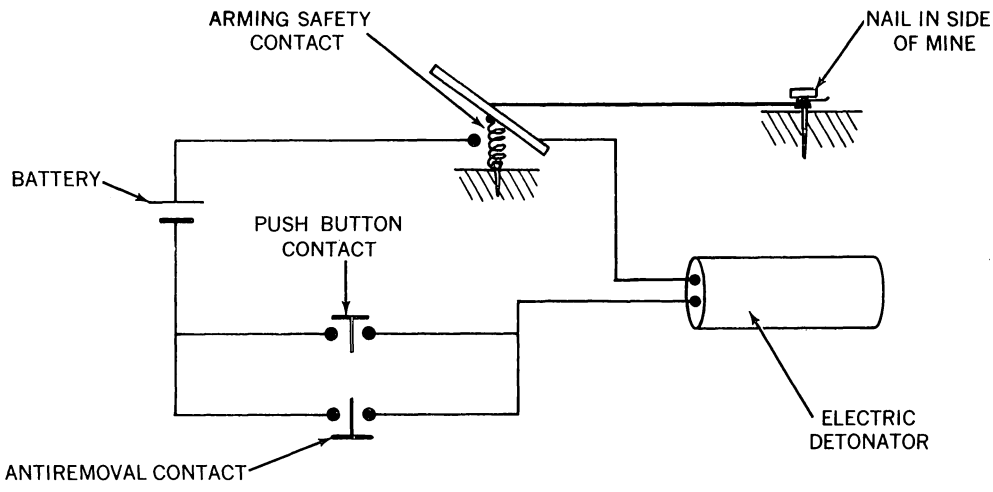
Figure 184

This is an electric antiremoval mine in a wooden case with a visible knob on top. In the knob is a springloaded antiremoval contact held open by a weight, such as a rock, when the mine is laid. The box is about 16.5 by 13.9 by 6.2 centimeters in dimension. A safety arming contact is also provided. It is held open by a cord led through a hole in the top of the mine and tied to a nail in the side.

a. Characteristics.

Shape	Fuze	Explosive charge	Fuze hazard
Rectangular....	Pressure-electric with pressure release antilift device on the top.	1 lb.	This mine cannot be uncovered without care.

b. Use. This is an antitransport mine laid in roads or railroad beds for the explosion of large charges and as a boobytrap.



WIRING DIAGRAM OF MINE

Figure 185

c. Functioning. In addition to functioning as an electric pressure mine, it is activated by a pressure release device in a knob on the top of the case. The lifting of the weight on the mine permits the rising of the spring-loaded contact to close the circuit and fire the mine. The push button contact under the rail functions when the weight of the train completes the contact.

d. Installing and Arming.

(1) Bury the mine under a railroad bed at a level that permits the depression of the antiremoval device by the weight of a rock or other object.

(2) Lift the lid and connect the electric detonator into the detonating circuit.

(3) Close the lid and place the push-button contact on a support just under the rail or tie.

(4) From the nail in the side of the mine, untie the cord holding the arming safety contact open.

e. Disarming Procedure. This mine cannot be hand disarmed; it must be pulled out from defilade or blown in place.

144. VMG Seesaw Winter Mine (U.S.S.R.)

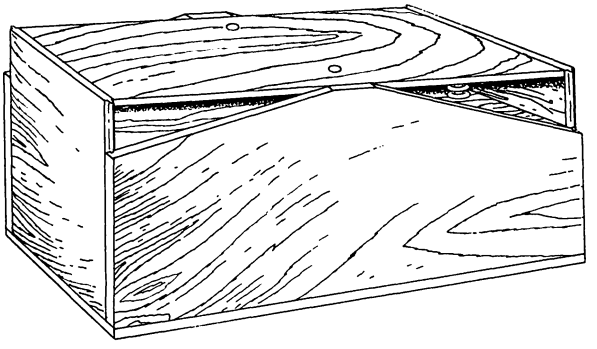


Figure 186

This plywood mine measures 47.5 by 11.8 by 22.8 centimeters. It has two actuating assemblies, access to which is obtained by means of two sliding doors, one at each end of the mine. Each actuating assembly consists of a plunger, plunger spring, and a lever arm that is hinged at the bottom to a striker. The plunger is held in place by a safety pin. The mine has a removable cover through which two plungers project so that they rest flush with the under side of the revolving lid. The revolving lid—also the pressure plate—rotates on a wooden axle seated on the top of the mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.....	Integral, pressure	40 to 50 lb.	22 lb. TNT, for antitank use 6 to 8 lb. TNT, for antipersonnel use.

b. Use. The lever mine was designed for use as a winter antitank mine; but because of its design, it is very effective against personnel. When used for the latter purpose, the space left by the removal of over half of the explosive may be filled with shrapnel.

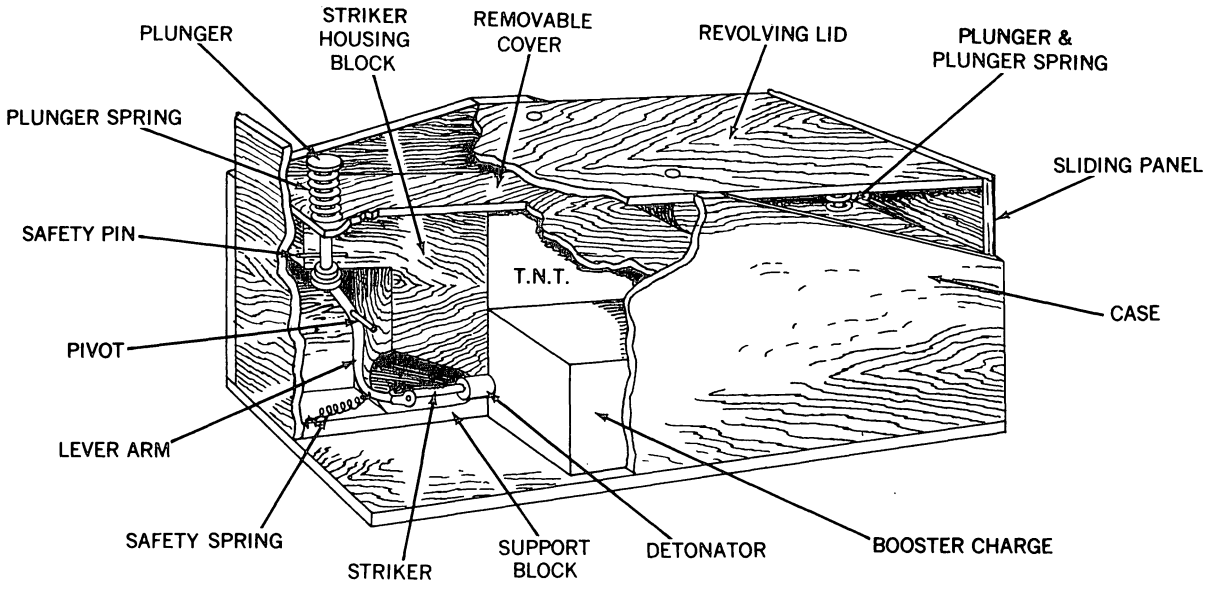


Figure 187

c. Functioning. Pressure on either end of the revolving lid forces it down on a plunger. This compresses the plunger spring, rotates the hinged lever arm, extends the safety spring, and slams the striker against the percussion cap inside the detonator.

d. Installing and Arming.

(1) Slide the end panels of the mine upward and remove the safety pin, revolving lid cover, and the housing blocks containing the striker mechanism.

(2) Insert the detonators into the hole in each explosive block.

(3) Carefully replace the striker housing block in the mine and also the cover and the lid.

e. Disarming Procedure.

(1) Check for and remove any antidisturbance or antilift devices.

(2) Uncover the mine and remove the sliding end panels. If they stick, blow the mine in place.

(3) Remove the revolving lid and the cover.

(4) Pull out the striker housing blocks and remove the detonators.

(5) Remove the mine and detonators to a safe storage or disposal area.

145. Lever Mine

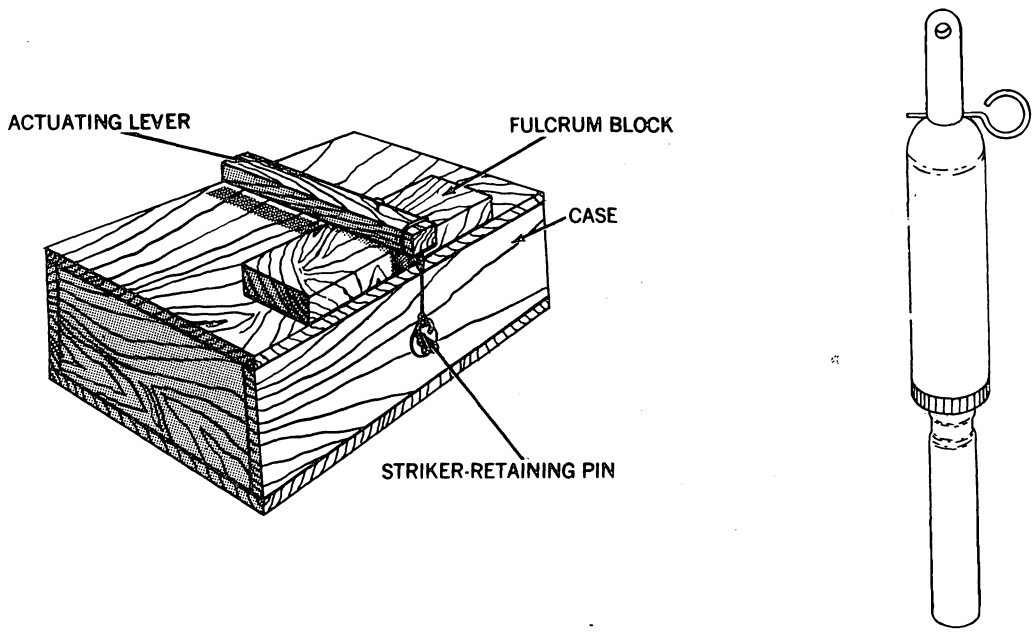


Figure 188

The lever mine is a wooden box 49.5 by 19.7 by 12 centimeters. The fuze rests in a hole in the wooden block nailed inside the mine and projects into the booster charge. A block of wood, 14 by 3 by 1 inch, is nailed to the lid over the side in which the fuze is inserted. This acts as a fulcrum for the wooden actuating lever, which is nailed with one nail to the block. One end of the lever is tied to the loop in the striker retaining pin of the fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.....	MUV pull, with pin release.	25 lb. (approx).	10 lb. TNT

b. Use. The lever mine was designed as an antitank mine; but because it is easy to actuate, it is very effective against personnel.

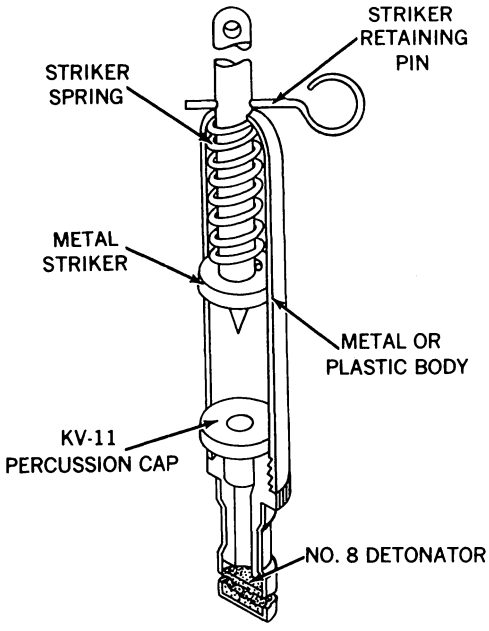


Figure 189

c. Functioning. Pressure by a tank, vehicle, or soldier on the long arm of the actuating lever removes the retaining pin, freeing the striker to fire the mine.

d. Installing and Arming.

(1) Emplace the mine in a hole in the ground so that the top is flush with the surface.

(2) Tie a wire to the short end of the actuating lever and to the loop of the striker retaining pin.

e. Disarming Procedure.

(1) Check for and remove any antilift or antidisturbance devices.

(2) **Use great caution in uncovering the lever,** being sure to put no pressure on it.

(3) Carefully cut the wire attached to the fuze.

(4) Pull out the fuze and detach the MD–2 detonator assembly.

(5) Remove the mine and fuze to a safe storage or disposal area.

146. Wooden Vibration Antitank Mine, DM (U.S.S.R.)

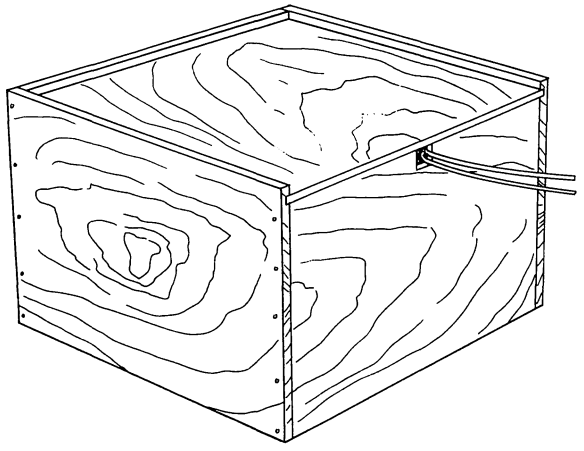


Figure 190

Vibration mines are generally a wooden box divided into an upper and lower compartment, the upper containing the vibration-contact type fuze wired to an electric detonator, and the lower, the main explosive charge. These mines are generally recognized by the lack of pull wires or protruding pressure pieces on the mine body. The model DM is such a mine, with an additional fuze—the ChVZ vibration delay. (In addition to this model, the Germans described two others—DM–3 and DM–4. These were 15.5 by 15.5 by 13.0 centimeters. Both use the VZl vibration fuze, the latter having two. Both use either the ChMV–10 or ChZ–10 delay clock fuzes.) The model DM has one hole in the partition for the short electric leads to connect with the electric detonator and another hole in the top for the long arming wire leads from the fuze.

a. Characteristics.

Shape	Fuze	Explosive	Fuze hazard
Rectangular....	VZ–1 vibration CHV vibration delay.	2.7 lb. explosive blocks.	VZ–1 vibration delay fuzes cannot be disarmed.

Remarks

As these mines give no exterior evidence of the fuzing and any jar or tilt will likely close the electric circuit, there is no alternative but to destroy them in place from a safe position.

b. Use. This mine is employed mainly in truck routes and railroad and highway bridges. It is usually buried about 50.8 centimeters under railroad beds or 25.4 centimeters under roads. It is frequently reinforced with a supplementary charge.

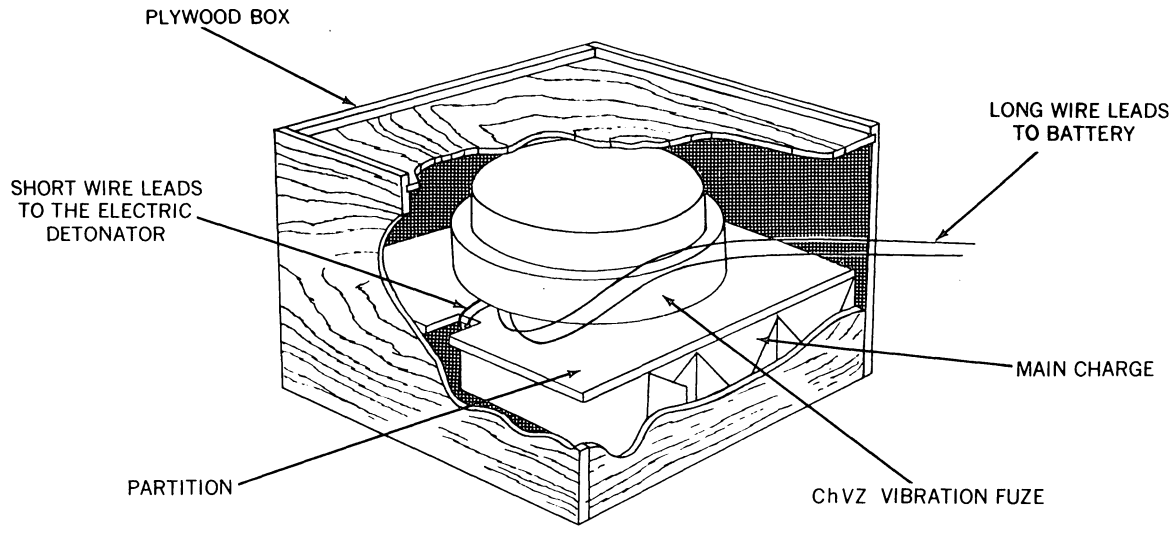


Figure 191

c. Functioning. Vibrations in the ground or structure where the mine is laid causes the vibration of the spiral-spring contacts in the fuze until one touches its metal housing, completing the circuit and exploding the mine.

d. Installing and Arming.

(1) Lift the cover off the wooden box.

(2) Lift the fuze from the box. Make sure that it is still usable according to the date specified thereon.

(3) With the small standard OK pocket ohmmeter, test the lead wires projecting from the fuze. The reading should be *infinity* for the short leads and *zero* for the longer leads.

(4) Lay the charge on the bottom of the box. Install the detonator in the charge, and pack the empty space between the charge and the wall of the box with paper or some other suitable material.

(5) Join the wires from the electric detonator and the fuze and carefully insulate the joints.

(6) Lay the wooden partition on the charge and insert the lead wires connecting the fuze with the electric detonator in the cutout of the partition.

(7) Set the fuze on the partition with the fuze lid downward. Lead the long wire leads out of the top of the box.

(8) Close the mine cover.

(9) Bury the mine in a previously prepared hole, not deeper than 20 inches.

(10) To activate the mine, connect the clean ends of the long wire leads to the poles of a 16-volt battery for 5 to 10 seconds. This melts a small wire that has restrained the wound-up clockwork in the fuze. The released clockwork runs down (approx. 4 min.) until a metal pointer strikes against the contact screw. The circuit is then interrupted only by the two spiral-spring vibrator contacts.

e. Disarming Procedure. Once laid, this mine cannot be disarmed or removed. **It must be destroyed in place.**

147. Wooden Antitank Mine, MZD-1 (U.S.S.R.)

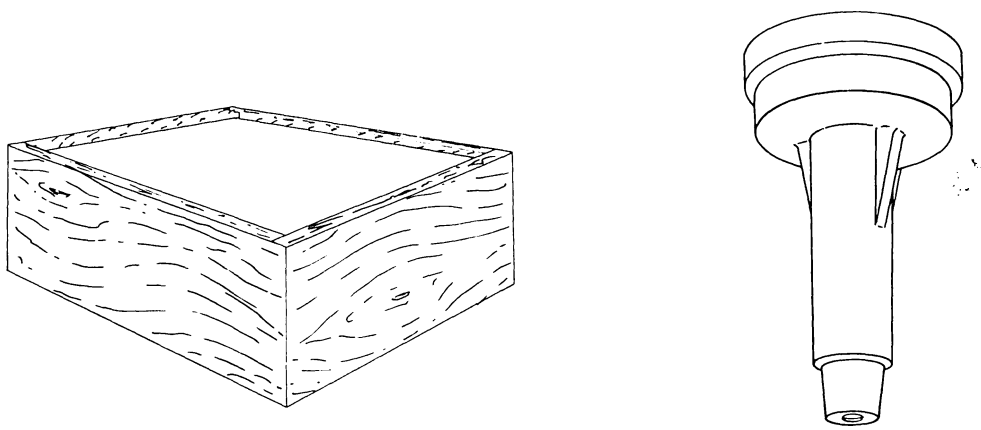


Figure 192

This wooden antitransport delayed-action mine is 24.1 by 19.0 centimeters. It has an EKhV fuze, with an MD-2 detonator assembly. The fuze is adjusted to the proper delay period at the place of use only. The resistance tube is inserted in the fuze and the fuze into the mine.

a. Characteristics.

Shape	Fuze	Explosive	Fuze hazard
Rectangular....	EKhV electrical delay.	Up to 10 lb.	This fuze has no safety.

b. Use. This mine is primarily used for the delayed uncontrolled detonation of large charges concealed in important buildings and installations. It is also used in roadbeds and other places where vehicles may travel. In winter, it is laid below the frost line. In wet earth, it is waterproofed with tar or paraffin.

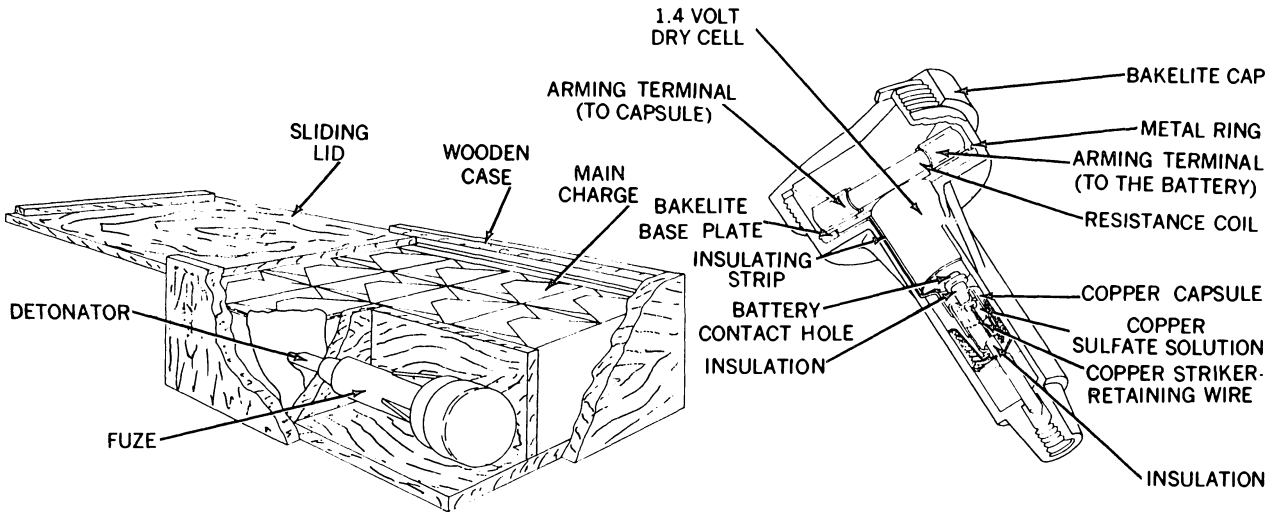


Figure 193

c. Functioning. The time of the explosion depends on the electrical resistance in the resistance tube of the fuze.

d. Installing and Arming.

(1) Test the voltage between the terminals; it should be a minimum of 1.25 volts. Test the voltage between one terminal and the striker; it should be at least 1.4 volts.

(2) Insert the fuze into the explosive charge (or into the electric detonating circuit).

(3) Insert a resistance coil between the two arming contacts. One of the 10 different resistances may be used, depending upon the length of delay required.

e. Disarming Procedure. As the fuze has no safety device, hand disarming is not recommended. If handled carefully, however, the detonator assembly (or electric contact base) may be unscrewed from the fuze.

148. Wooden Antitank Mine, MZD-2 (U.S.S.R.)

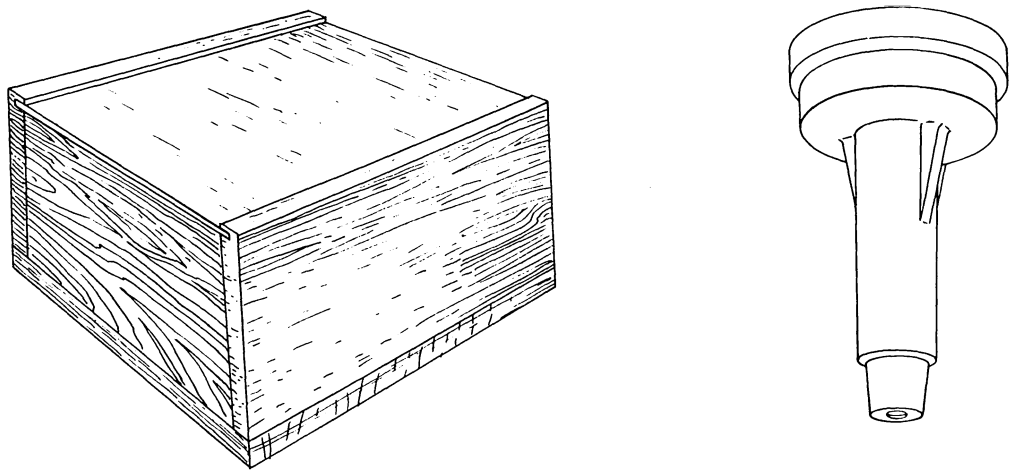


Figure 194

This antitank mine is a two-compartmented wooden box 21.5 by 21.4 by 11.4 centimeters. It contains an explosive charge in one compartment and an electrical detonating circuit in the other. The latter consists of an EKhV fuze, three batteries, a vibration contact fuze, and an electric detonator. The EKhV fuze is used to provide a delay period before the mine is armed.

a. Characteristics.

Shape	Fuze	Explosive	Fuze hazard
Rectangular....	Double-fuzing: EKhV chemical, electrical, and vibration contact.	1.75 lb.	The vibration contact is too sensitive to permit disarming the mine. A jar, disturbance, or tilt of the mine might close the contact. Raising or revolving the lid of the mine has the same effect.

b. Use. In addition to antitank minefields, this mine was used in road beds and also to detonate large charges in railroad beds. For the latter purpose it was generally buried 0.6 to 1 meter under ground, but in freezing weather, only 38 to 50 centimeters.

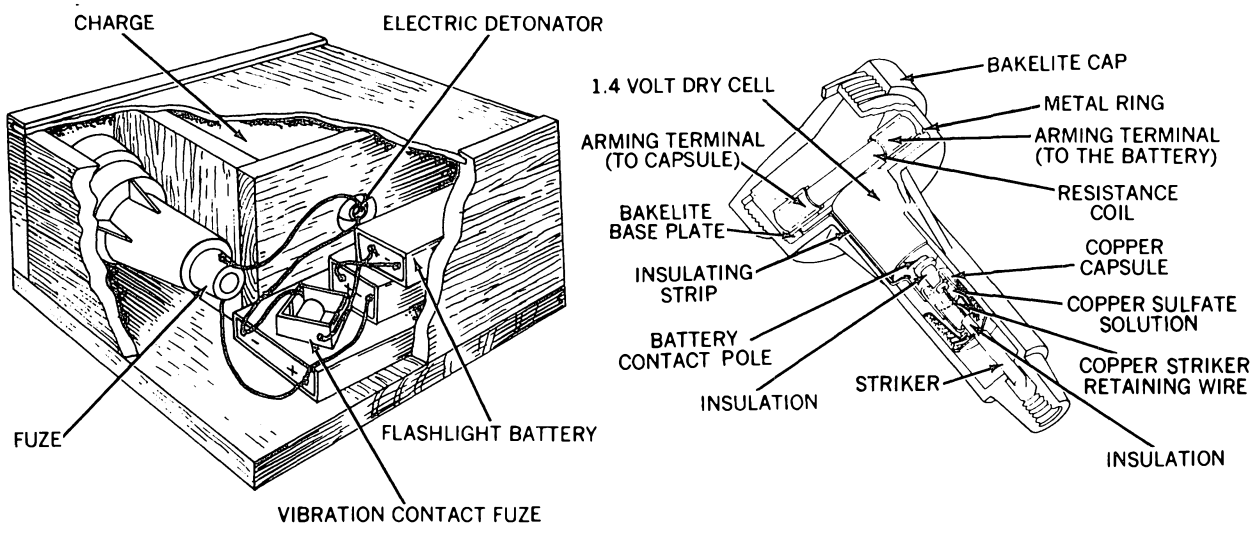


Figure 195

c. Functioning. The EKhV fuze, connected into the electrical circuit, functions, closing the circuit except for the vibration contact fuze. Any subsequent vibration or movement of the mine causes the vibration contact fuze to function, closing the circuit and firing the detonator.

d. Installing and Arming.

(1) Connect the batteries in series and connect the EKhV fuze in series with them. Test the circuit with a galvanometer. If there is any deflection of the pointer, the EKhV fuze is not good.

(2) After the test shows the fuze to be good, connect a vibration contact fuze in series with the batteries and the EKhV fuze.

(3) Connect the leads to an electric detonator.

e. Disarming Procedure. **This mine should not be hand disarmed.**

149. Wooden Antitank Mine, MZD-3 (U.S.S.R.)

(No drawing available.)

This model is like the MZD-2 (par. 148) except that the vibration contact fuze is separated from the mine (about 3.77 cm away). The EKhV fuze and other elements are contained in the mine case.

a. Characteristics. See paragraph 148 for data.

b. Use. This mine is used primarily to detonate large charges under highways and railroad beds. Under highways, it is buried about 1 meter and the vibration contact fuze 20 centimeters. Under railroad beds, it is buried from 1 to 1.5 meters and the vibration contact fuze about .6 meters. On hard-surfaced roads, only medium and heavy tanks cause enough vibration to explode the mine.

c. Functioning. See paragraph 148 for details.

d. Installing and Arming. See paragraph 148 for details.

e. Disarming Procedure. **Hand disarming should not be attempted.**

150. Wooden Antitank Mine, MZD–4 (U.S.S.R.)

(No drawing available.)

This wooden-cased antitransport mine is about 17.78 centimeters long, 13.9 centimeters wide, and 10.1 centimeters high. It is partitioned—one side for the explosive charge, a 400-gram block of TNT; the other side for an electric detonating circuit with a flashlight battery, an EKhP electro-chemical safety-delay fuze, and a VZ–1 vibration contact fuze wired to an electric detonator. The VZ–1 fuze is fastened under the end of the mine. In employment, functioning, and arming and installing, this mine is similar to the MDZ–2 (par. 148). **The hand disarming of this mine should not be attempted.**

151. Wooden Antitank Mine, MZD-5 (U.S.S.R.)

(No drawing available.)

This wooden antitransport mine is similar to the MZD-4 (par. 150) in all respects except that it has an EKhV electro-chemical fuze instead of the EKhP safety delay fuze. It is buried about 50.8 centimeters under railroad beds and 25.4 centimeters under roads. It is also similar in employment, functioning, and installing and arming to the MDZ-2 mine (par. 148). **Hand disarming should not be attempted.**

152. Wooden Antitank Mine, MZD–10 (U.S.S.R.)

(No drawing available.)

This wooden antitransport mine measures 18.4 by 20.9 by 11.4 centimeters. It contains a 400-gram explosive block fitted with an electric detonator wired to a battery, a VZ–1 vibration contact fuze, and a ChZ 10 electrical delay fuze, all in one compartment. The mine is used with large charges under railroad beds or roads. **This mine, because of the VZ–1 vibration fuze, cannot be disarmed by hand.**

153. Wooden Antitank Mine, MZD-35 (U.S.S.R.)

(No drawing available.)

This model is basically the same as the MZD-10, but larger, measuring 26.1 by 6.9 by 12.0 centimeters. It has a ChZ-35 electrical delay fuze, instead of the ChZ-10, wired into the circuit. **This mine cannot be disarmed by hand.**

154. Wooden Antitank Mine, NV-41 (U.S.S.R.)

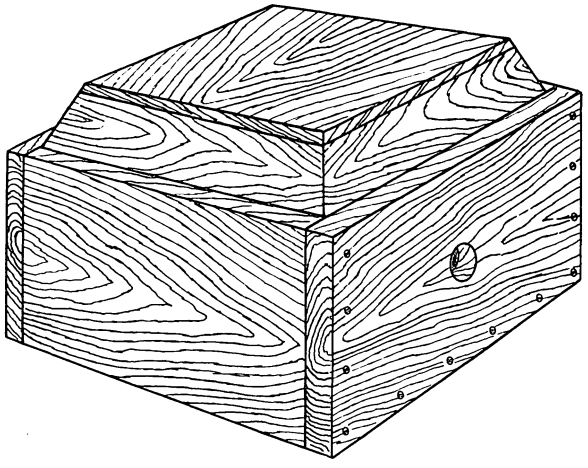


Figure 196

This is a wooden box-shaped dual-purpose mine with a flat-topped lid with sloping sides. The mine body, 24.7 by 19.5 by 18.2 centimeters in dimension, contains the main charge, a built-in pressure plunger, a release lever and spring, a spring-loaded striker, and a booster charge. A vertical hollow tube in the bottom, which leads into the chamber between the striker and detonator, is used for the insertion of an electric blasting cap for electrical firing. If an antilift is used, the tube permits a wire or string to be tied to the end of the plunger and anchored underneath the mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Integral pressure.	200 lb. or more.	13 lb. TNT (approx).

b. Use. This mine may be laid for antitransport or antipersonnel use, or both.

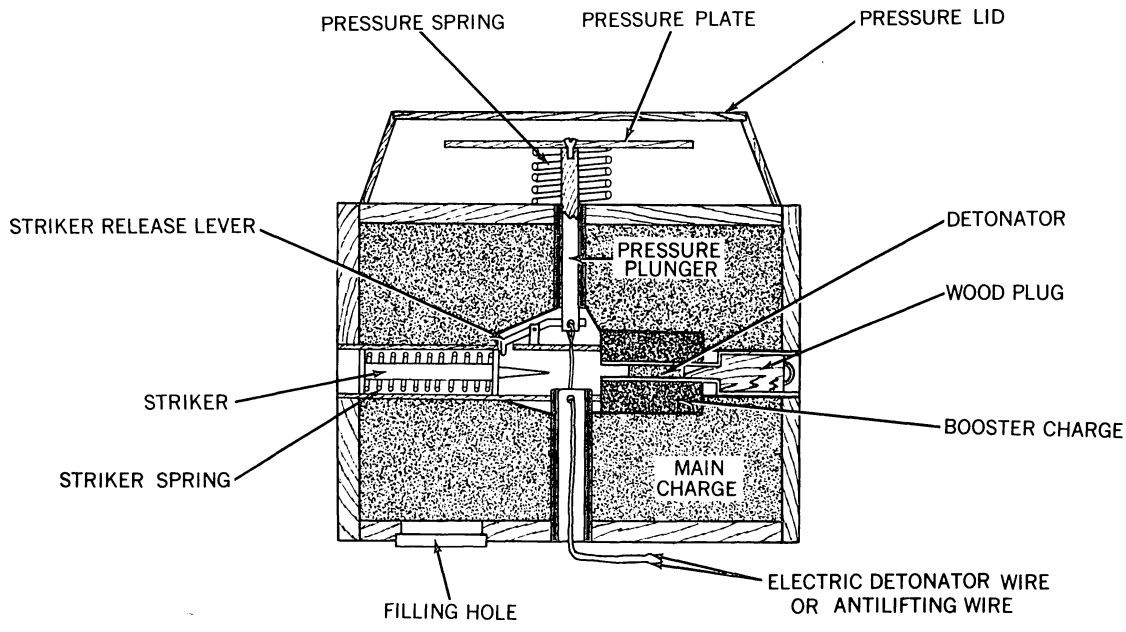


Figure 197

c. Functioning. Pressure on the lid crushes it and depresses the plunger and spring. The plunger moving downward rotates the striker release level, freeing the striker; or any attempt to lift the mine draws taut the pull wire fastened to the hole in the lower end of the plunger, drawing down the plunger, rotating the striker release lever, and firing the striker. The freed striker, in both cases, slams against the percussion cap, firing the mine. The mine may also be detonated by the firing of an electric blasting cap inserted in the charge from a remote-control post.

d. Installing and Arming.

(1) Dig a hole deep enough to keep the sloping lid above the ground.

(2) Insert the percussion cap and detonator assembly in the horizontal tube and close the tube with a wooden plug.

(3) Arm the mine for pressure, antilift, or electrical functioning.

e. Disarming Procedure.

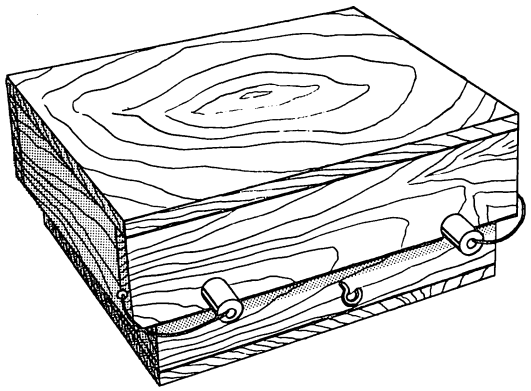
(1) Check for and remove any antilift devices.

(2) Carefully remove the wooden plug.

(3) Tip the mine gently so that the cap and detonator assembly slides out.

(4) Take the mine to a safe storage or disposal area.

155. Ovtsinnikov Mine (U.S.S.R.)



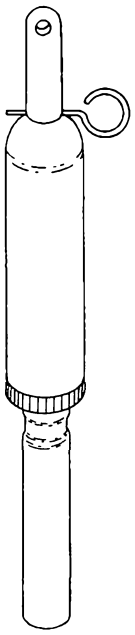


Figure 198

This wooden dual-purpose mine is 24.1 by 20.9 by 12.3 centimeters in dimension. The lid, which fits down over the charge container, is supported on 4 wooden shear pegs. A wooden pressure block nailed to the underside of the lid is positioned over a metal actuating rod that projects through one side of the container. The inner end of the actuating rod engages the loop of the striker retaining pin. A block of wood fastened to the bottom of the container is recessed to hold the fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	MUV pull.	Unknown.	4.4 lb. block explosive.

b. Use. This mine is laid as an antitank and antipersonnel obstacle. In antipersonnel use, only one or two blocks of explosive are used; the remaining space is filled with nails or shrapnel.

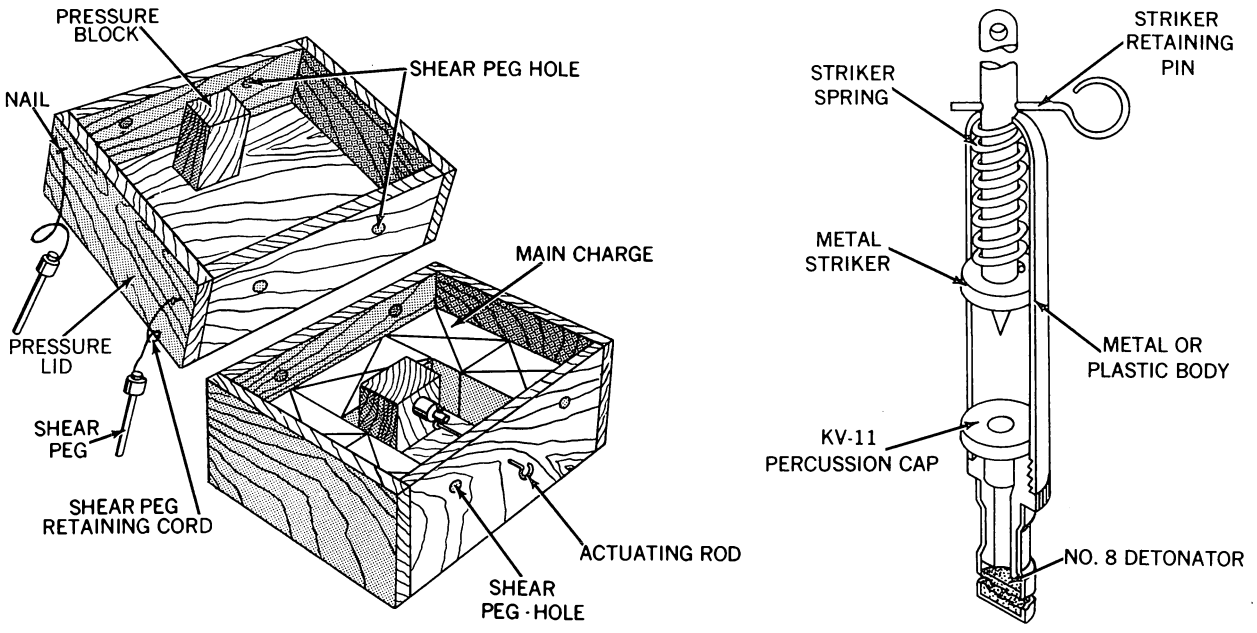


Figure 199

c. Functioning. Pressure on the lid shears the wooden pegs, forcing down the lid and the pressure block onto the metal actuating rod. This forces out the retaining pin and releases the striker to fire the percussion cap, detonator, and main charge.

Note. This mine may also be fitted with a wooden or metal pressure bolt placed directly over a pivoted lever that engages the loop of the striker retaining pin. Pressure on the pressure bolt removes the retaining pin.

d. Installing and Arming.

(1) Dig a hole for the mine.

(2) Remove the lid and place an MUV pull fuze fitted with an Md-2 detonator assembly through the hole in the fuze support block and into the explosive block.

(3) Carefully engage the metal actuating rod in the loop of the retaining pin.

(4) Carefully replace the lid and cover the mine.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Withdraw the metal actuating rod from the mine.

(3) Remove the shear pegs and lift the lid.

(4) Slide out the fuze and unscrew the detonator from it.

(5) Remove the mine and fuze to a safe storage or disposal area.

156. Wooden Antitank Mine, 9-pound (Italy)

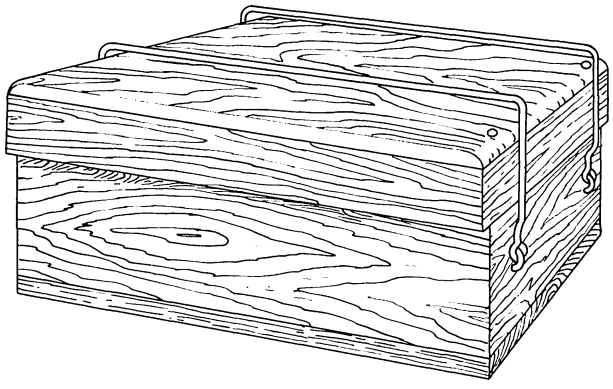


Figure 200

The 9-pound antitank mine is a wooden case 24.1 by 20.3 by 13.3 centimeters with a wooden cover board, an explosive charge, two fuze wells and fuzes with aluminum alloy bodies, and a detonator. The pressure head, which rests on the top of the fuzes, is held in place by two wire handles.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Two pressure fuzes with shear pin release.	185 to 300 lb. on either or both fuzes.	5.5 lb.

Remarks

Antilift or antiremoval devices may be found with this mine.

b. Use. Road blocks and antitank minefields are the common sites for the emplacement of the 9-pound mine.

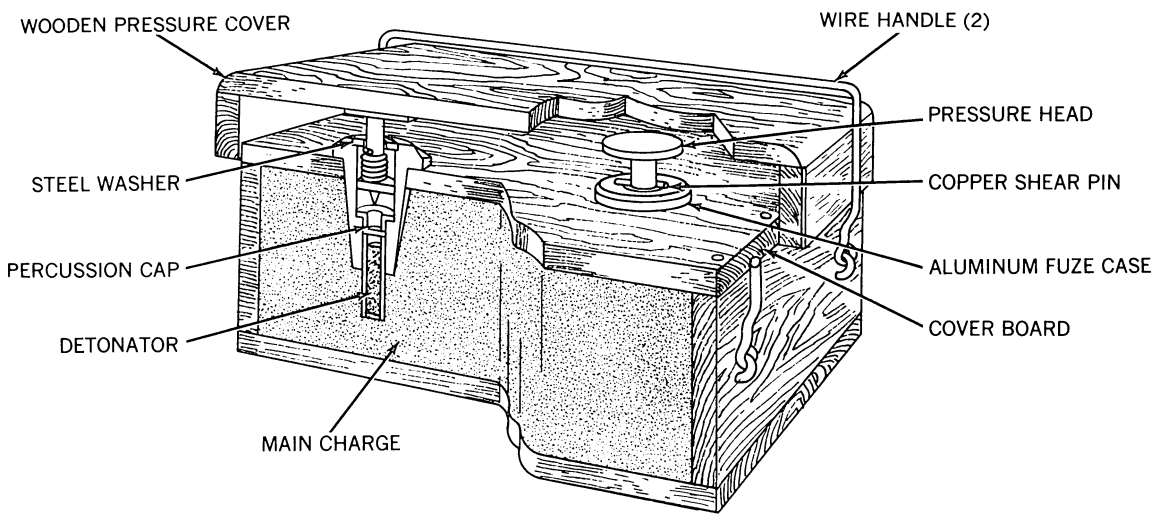


Figure 201

c. Functioning. Pressure on the top of the pressure head shears the copper shear pin in one or both fuzes, releasing the striker in either case to fire the percussion cap and then the mine.

d. Installing and Arming.

(1) Remove the pressure cover.
(2) Place the mine in a hole so that the cover, when replaced, will be from 5 to 8 centimeters below the surface of the ground.
(3) Remove the fuzes and insert a detonator in the base of each.
(4) Insert the fuzes in the fuze wells.
(5) Replace the pressure cover and position the two wire handles over it.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the pressure cover.
(3) Remove the two fuzes and detonators.
(4) Remove the detonators from the fuzes.
(5) Take mine and fuzes to a safe storage or disposal area.

157. Wooden Antitank Mine, Type N (Italy)

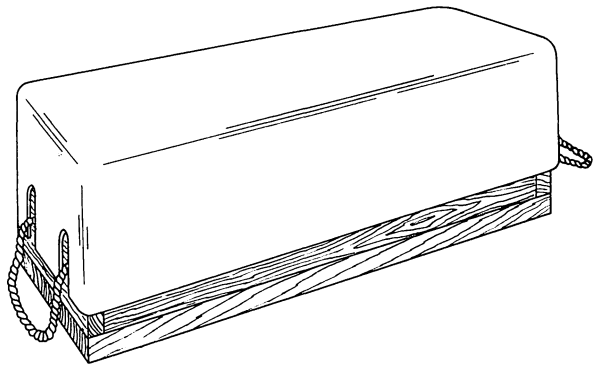


Figure 202

This mine consists of a wooden case bound by steel straps and a sheet metal pressure cover. It has two metal tubes containing percussion cap and detonator assemblies. Two steel pressure plates are attached to the wooden liner on the underside of the metal pressure cover. These pressure plates rest on the heads of two striker shafts supported by two U-shaped springs, each bound by a strand of piano wire. Rope handles are provided on the ends of the wooden case. The ends of the pressure cover are slotted to clear the handles. The mine measures 40 by 13.9 by 12.7 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Percussion-type fuze striker on spring-supported pressure plate with snap wire release.	150 to 200 lb.	5 lb.

b. Use. This mine is usually employed in hasty minefields for unit security.

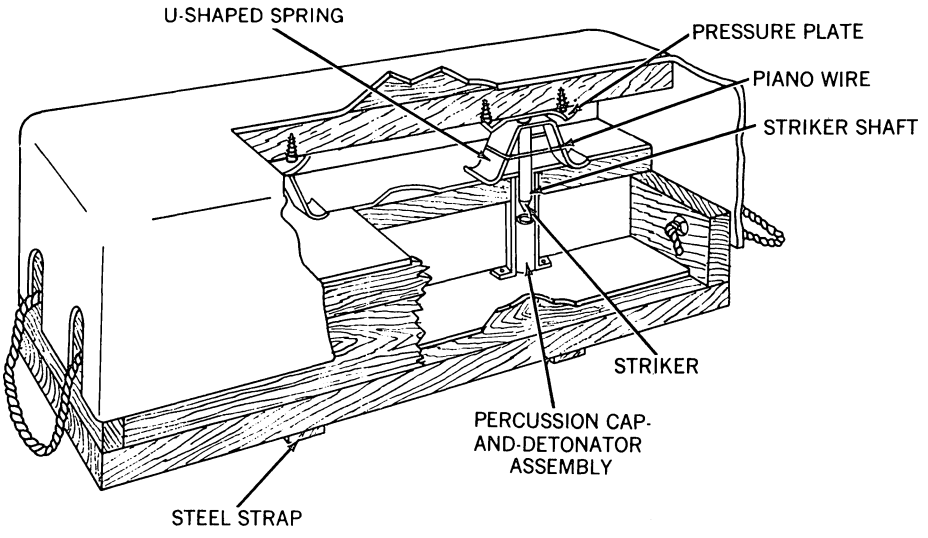


Figure 203

c. Functioning. Pressure on the pressure cover snaps the piano wire around the U-shaped springs, flattens them, and forces the strikers into the percussion caps, firing the detonators and the main charge.

d. Installing and Arming.

(1) Remove the pressure cover.
(2) Remove the metal plate covering the top of the mine case and insert the percussion cap and detonator assemblies in the metal tubes.
(3) Replace the metal plate.
(4) Position the U-shaped springs over the holes in the metal plate so that the striker shafts extend down into the two metal tubes. See that the U-shaped springs are bound with piano wire.
(5) Place the mine in a hole so that the pressure cover, when replaced will be flush with the surface of the ground.
(6) Replace the pressure cover.

e. Disarming Procedure.

(1) Check carefully for and remove any antilift devices present.
(2) Remove the pressure cover.
(3) Remove the U-shaped springs and strikers.
(4) Remove the metal plate covering the top of the mine case and remove the percussion cap and detonator assemblies.
(5) Take the disassembled mine to a safe storage or disposal area.

158. Wooden Antitank Mine, CS 42/2 (Italy)

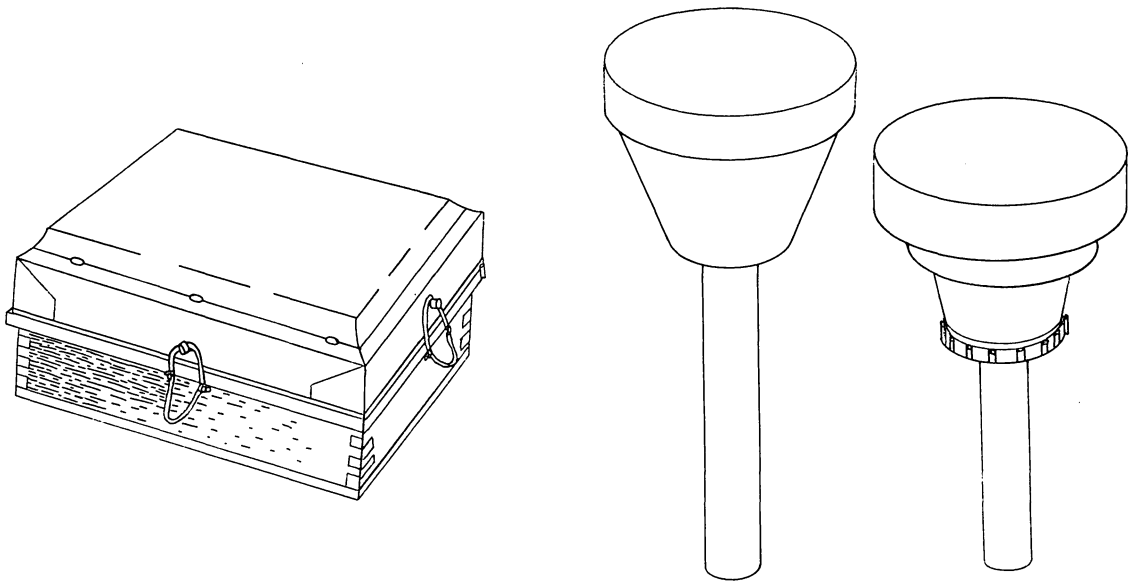


Figure 204

This is a wooden box-type unit with four plastic fuzes, but with enough metal to make it detectable. It has three parts—a box for the explosive, a frame to support the pressure board, and the pressure board. The top is covered with cloth painted or dyed in a camouflage pattern. This mine is no longer produced, but will remain in service until present stocks are consumed. The mine measures 34.0 by 28.9 by 16.0 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	Pressure..	220 lb. (approx).	11.0 lb. TNT in cartridge form —25 7 oz. cartridges.

b. Use. It is laid in pattern in minefields to damage tracks of armored vehicles by concussion. By the substitution of the Model PMC 43 button type fuze for the Model 42/2 pressure fuze and by weakening the pressure board supports so that they fail under a man's weight, it may be converted to an antipersonnel mine.

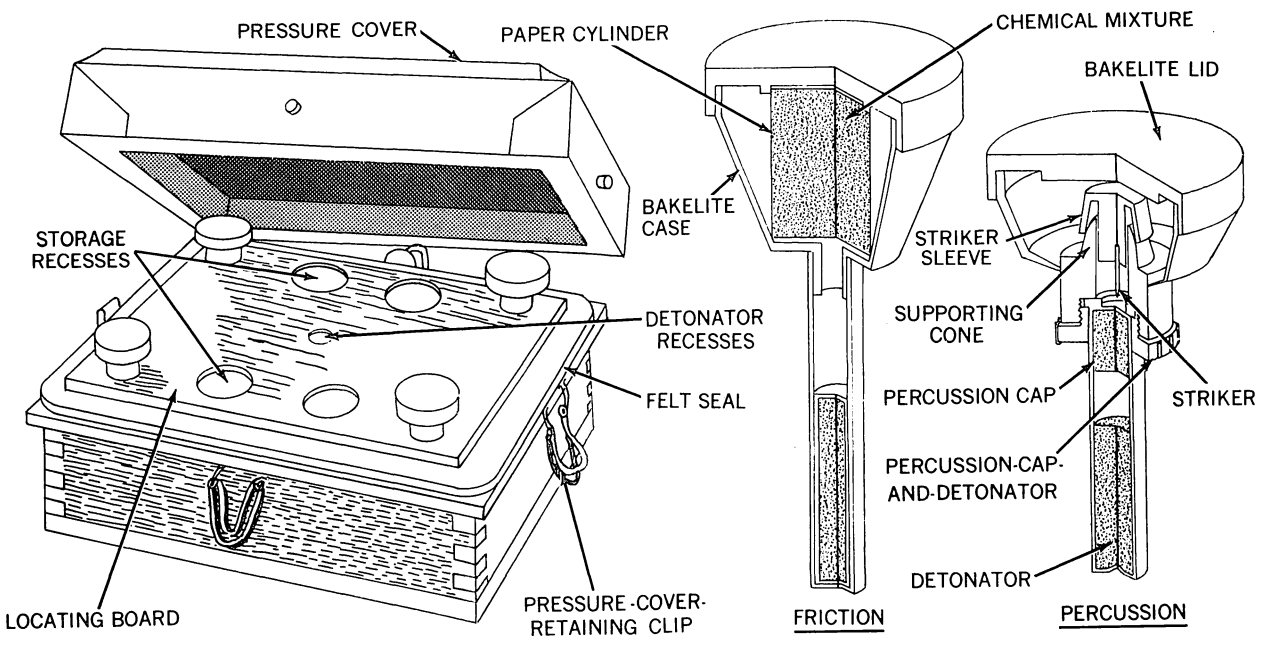


Figure 205

c. Functioning. Pressure on the top breaks the fragile supports of the pressure board and forces it down on the fuzes, actuating them and detonating the mine.

d. Installing and Arming.

(1) Remove the lid.
(2) Remove the four wooden cylinders (false fuzes) from the fuze wells.
(3) Remove the fuzes from their transport recesses.
(4) Attach OTO detonators to the fuzes (42/2) and place the fuzes in the wells.
(5) Replace and lock the lid on all four sides.

e. Disarming Procedures.

(1) Check for and remove any antilift devices.
(2) Remove the lid and the fuzes from the fuze wells.
(3) Separate the detonators from the fuzes.
(4) Remove the mine and fuzes to a safe storage or disposal area.

159. Electrical Dual Purpose Mine (U.S.S.R.)

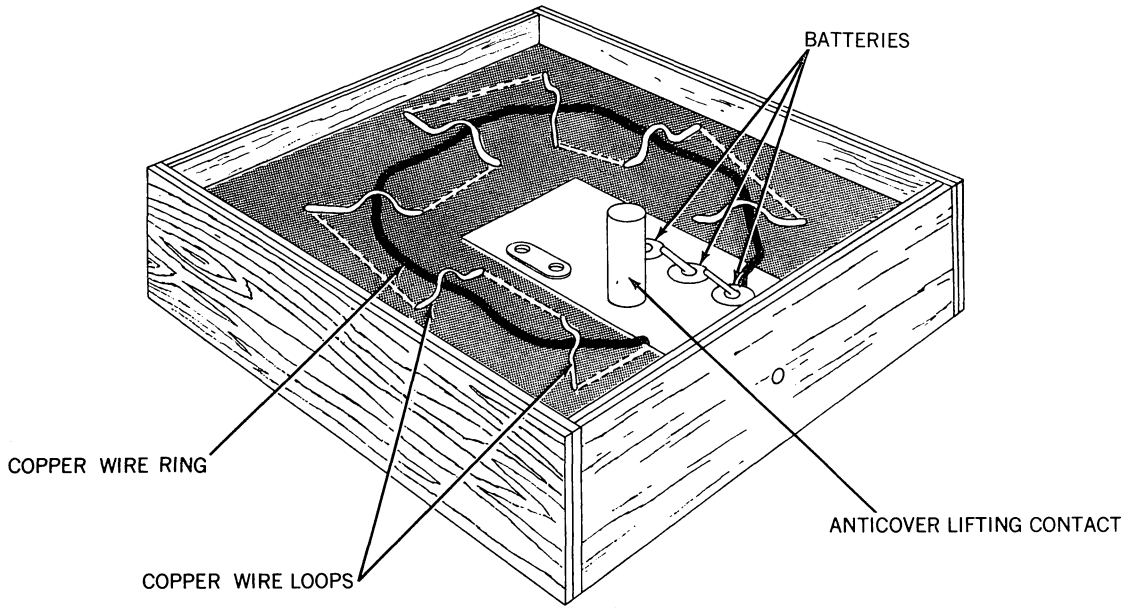


Figure 206

This dual purpose mine consists of a plywood box 20.3 by 20.3 by 7.6 centimeters resembling a Soviet first aid kit; an electrical ignition system wired to 3 dry cell batteries with 3 different contacts, either of which may complete the circuit and fire the mine; an electric detonator; and an explosive charge. Wired to the plywood lid is an octagonal copper wire ring connected to the batteries. Two arming contacts are connected to the wiring systems, one closing the circuit if the mine is lifted, and the other, if the cover is raised.

a. Characteristics.

Shape	Fuze	Color	Operating force
Rectangular....	Electric pressure, electric pressure-release, and electric drop contact.	White	20 to 100 lb.

Explosive	Fuze hazard
3.5 lb.	This mine should not be lifted because of the deep contact, held open by resistance of the soil and boards under the mine (The pressure release contact inside the case will not prevent the lifting of the mine from the hole).

b. Use. This is used as an antitransport and antipersonnel mine. When camouflaged as a first aid kit, it is dispersed in former friendly bivouac areas.

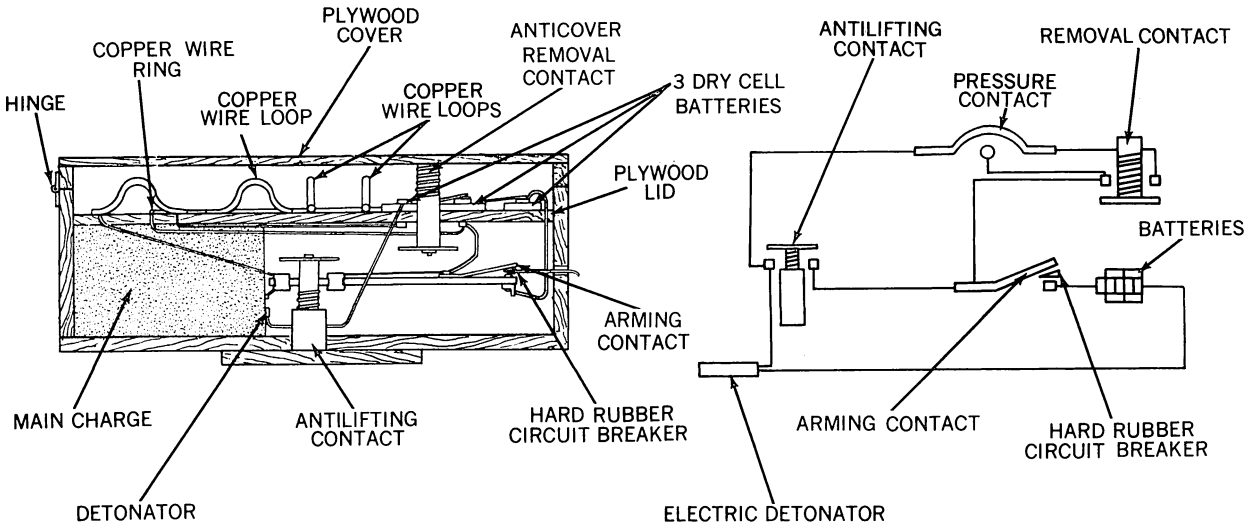


Figure 207

c. Functioning. Pressure on the top of the mine crushes it, closing the circuit; or lifting the cover permits the contact post to slide up, closing the electric circuit; or lifting the mine permits the contact post in the bottom to slide down until it closes the electric circuit. In all cases, the closing of the electric circuit fires the mine.

d. Installing and Arming.

(1) Insert a hard rubber circuit breaker between the poles of the arming contact to assure safe arming.

(2) Insert the antilifting contact post in the hole in the bottom of the mine, and lay a board in the bottom of the placement hole to keep the post from sinking into the soft ground and actuating the mine prematurely.

(3) Lay the mine and remove the hard rubber circuit breaker by pulling on the attached cord running through the hole in the end of the mine.

e. Disarming Procedure. After the mine has been armed, it is very hazardous to disarm by hand. If detonation in place is not possible, secure an additional board in place on the bottom of the mine with tape.

160. Wooden Electro-Chemical Antitank Mine (U.S.S.R.)

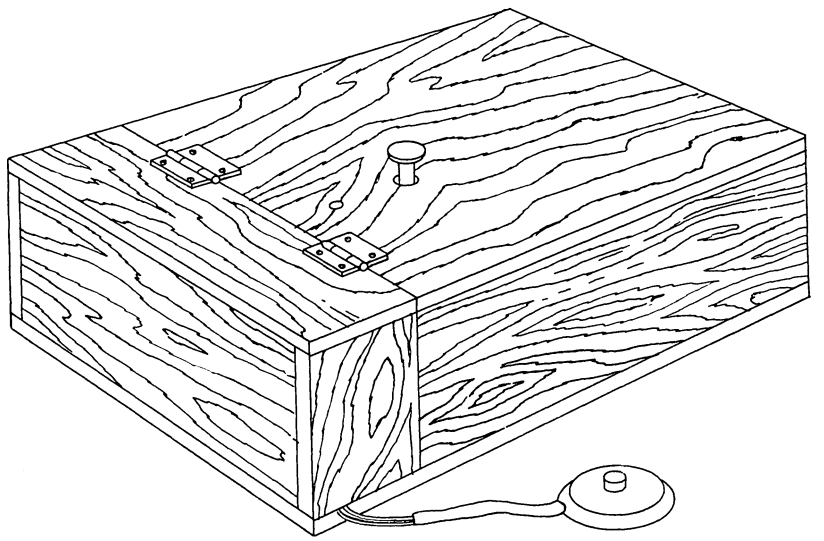


Figure 208

This dual-purpose mine is contained in a plywood box 12.7 by 10.1 by 5.7 centimeters. It consists of an explosive, and an electrical circuit consisting of a dry cell battery, two electrical contacts, and a chemical contact. The hinged lid, which forms the pressure piece, rests on the ampoule of acid, which acts as the chemical ignition device. Attached to the under side of the fixed lid is a spring-loaded antilift activator, held down (open), when the mine is laid, by a rock or other weight. A push button contact is also wired into the circuit.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	Fuze hazard
Rectangular...	Pressure-chemical, electric.	20 to 25 lb.	½ lb.	The main fuze is not difficult to disarm, but the antilift contact makes disarming extremely hazardous.

b. Use. Because of its low explosive content, this mine is used as an antitransport and antipersonnel mine.

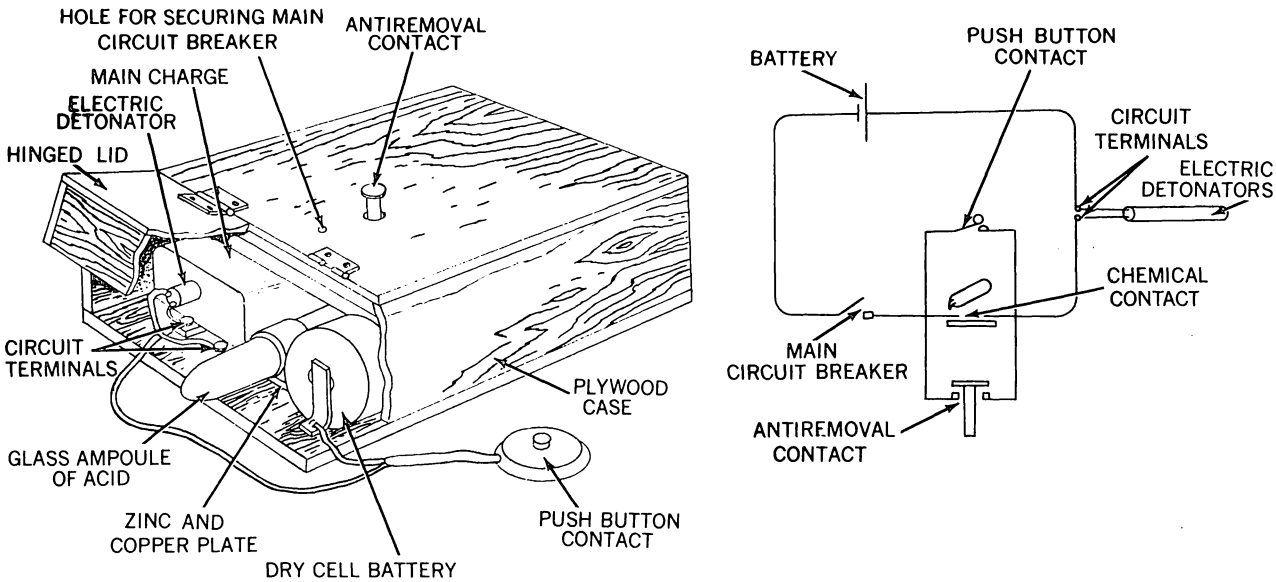


Figure 209

c. Functioning. Pressure on the hinged lid breaks the vial of acid which seeps onto the copper and zinc plate, creating an electrical impulse that completes the electrical circuit and fires the mine; or pressure on the pushbutton contact completes the circuit and fires the mine; or releasing the weight from the antiremoval contact permits the pressure release mechanism to close the circuit and fire the mine.

d. Installing and Arming.

(1) Lay the mine.

(2) Pull the main circuit breaker open with a wire or cord passing through the hole in the lid and secure it.

(3) Raise the hinged lid and insert the glass vial in its holder on the copper and zinc plate.

(4) Insert an electric detonator into the charge and convert the wire leads from the detonator to the two circuit terminals.

(5) Place the pushbutton contact under a pressure board but in such a manner that the board does not rest on the pushbutton.

(6) Place a rock or weight on the antiremoval contact post projecting through the lid to keep it open.

(7) Lower the hinged lid gently so that it rests on the pointed end of the glass vial.

(8) Gently release the safety cord attached to the circuit breaker.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Because jarring or tipping the mine may remove the weight from the antiremoval contact in the fixed lid, gently lift the hinged lid and disconnect the wire leads from the electric detonator to the circuit terminals.

(3) Remove the detonator.

(4) Remove the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. If the hinged lid does not open easily or the detonator cannot be removed, the mine must be destroyed in place.

161. Incendiary Mine (U.S.S.R.)

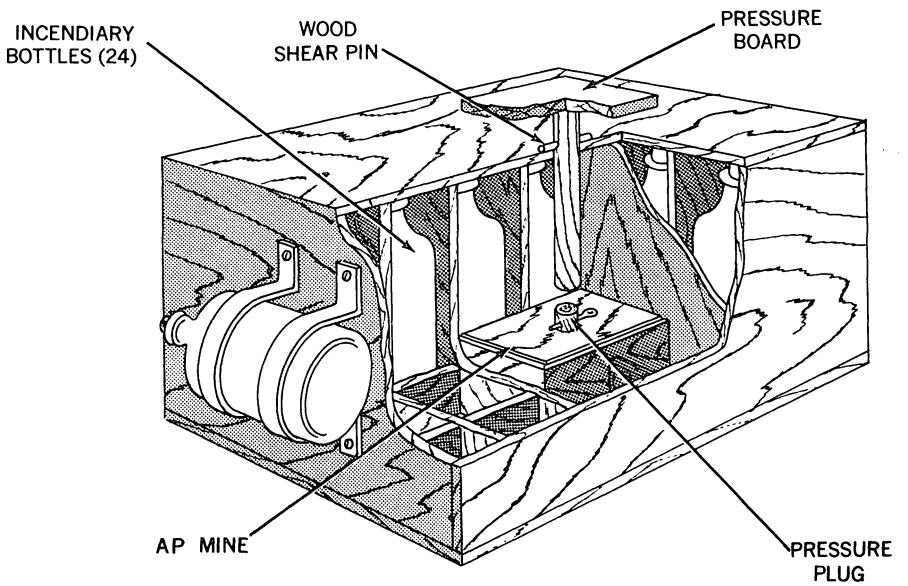


Figure 210

This type of incendiary mine is a wooden box containing 24 bottles of incendiary liquid and a wooden antipersonnel mine charged with 3 pounds of TNT to fire it. Incendiary mines may vary in size and number of bottles of liquid. They inflict casualties on infantry accompanying tanks and will temporarily blind tanks.

a. Use. Incendiary mines are laid in a checkerboard pattern (with approx 1 meter of space between them) in front of unit positions to retard armor support attacks.

(No drawing available.)

b. Functioning. Pressure on the pressure board shears the wooden shear pin and depresses the wooden pressure plug of the antipersonnel mine, which detonates, destroys the case, and breaks the bottles. The phosphorus, released from the bottles ignites on contact with the air.

c. Installing and Arming.

(1) Lift the lid of the mine and remove two bottles from the section of the case directly beneath the pressure-board opening.

(2) Place the two bottles in the brackets on the side of the case.

(3) Install the antipersonnel mine and the pressure board.

(4) Bury the mine with only the pressure board above the ground.

d. Disarming Procedure.

(1) Check for and remove any antilift devices.

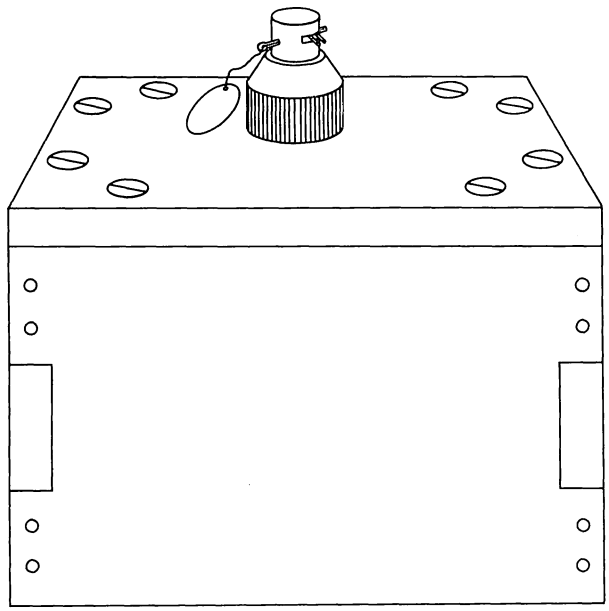
(2) Raise the lid.

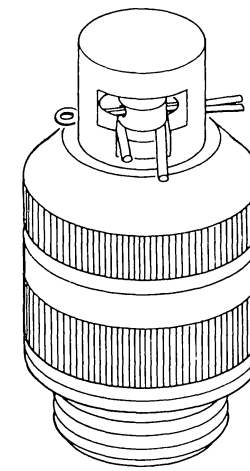
(3) Remove and disarm the antipersonnel mine.

(4) Remove the disassembled mine to a safe storage or disposal area.

e. Additional Precautions. Be careful not to break any of the bottles as their contents will ignite on contact with the air.

162. Wooden Land Mine, Type 3 (Japan)





TYPE A

Figure 211

This antivehicular-antipersonnel mine is merely a wooden box with dovetailed sides to which the bottom has been fastened by nails and the top, by screws. It contains an explosive charge in a rubber container and a threaded rubber fuze seat nailed to the bottom side of the top closing piece directly underneath the hole provided for the insertion of the fuze. The mine measures 18.0 by 19.0 by 12.7 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Bakelite, pressure.	20 to 25 lb. pressure.	4½ lb. TNT, 50%; 4½ lb. ammonium nitrate, 50%; or 4½ lb. ammonium nitrate 90%; dinitronapthalene, 10%.

b. Use. This model may be used either against vehicles or personnel.

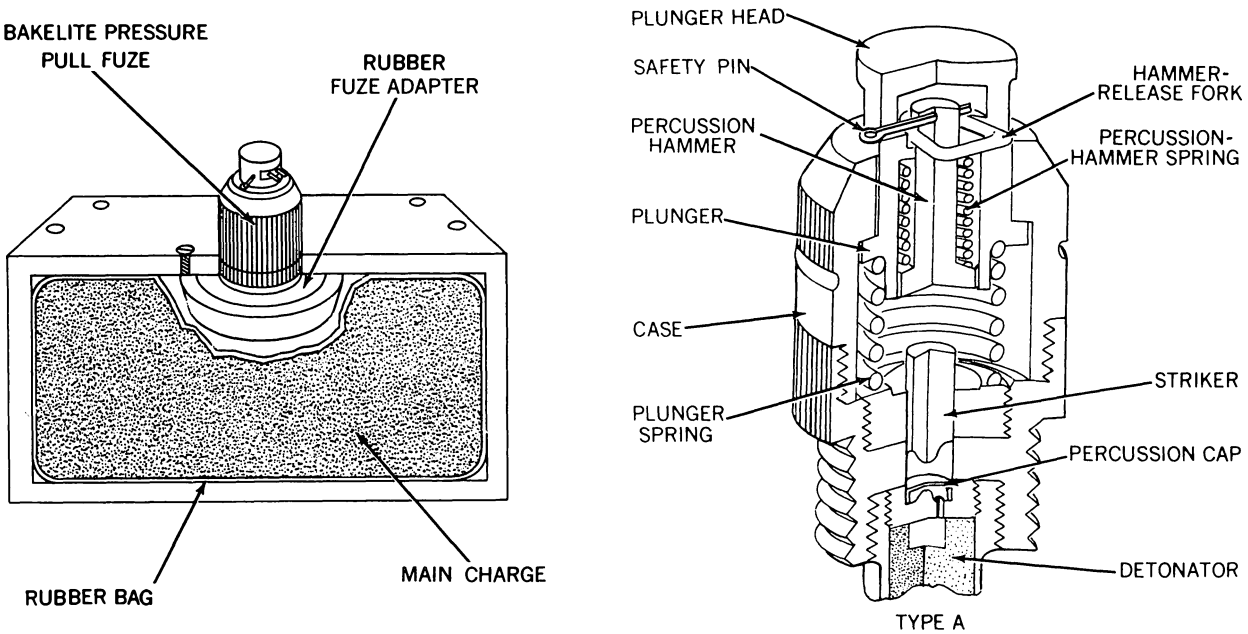


Figure 212

c. Functioning. Pressure on the top of the plunger head forces the hammer-release fork from its position, releasing the spring driven striker, or a pull on the hammer-release fork removes it from its position, releasing the striker. In either case, the released striker fires the percussion cap, which sets off the detonator and then the main charge.

d. Installing and Arming.

(1) Screw the detonator in the fuze.

(2) Screw the fuze into the mine.

(3) Remove the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the fuze from the mine.

(3) Remove the percussion cap and detonator from the fuze.

(4) Take the mine and fuze to a safe storage or disposal area.

163. Wooden Mine PDM-1 (U.S.S.R.)

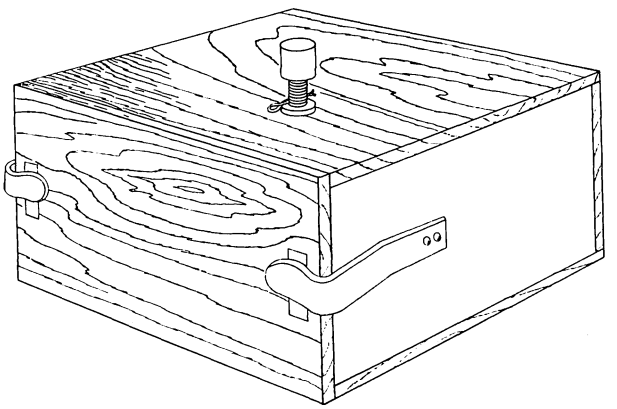


Figure 213

This wooden partisan railroad mine is approximately 12.7 centimeters square and 7.6 centimeters high. The partitioned case contains the explosive on one side and the detonator and electric firing assembly on the other. The latter consists of a mousetrap type striker held open in a vertical position by a cup on the lower end of the pressure plunger (the top of which projects through the lid) and a restraining wire looped around a lead strap fixed to the partition. A striker needle is fixed to the U-shaped arm of the striker so that when the striker is released, the needle strikes the percussion cap of the MD-2 detonator assembly. The striker retaining wire is held by a lead shear release.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Built-in integral pressure.	10-20 lb.	15 oz. TNT.

b. Use. This mine is usually laid on top of a heavy charge with the pressure plunger just under a rail or tie.

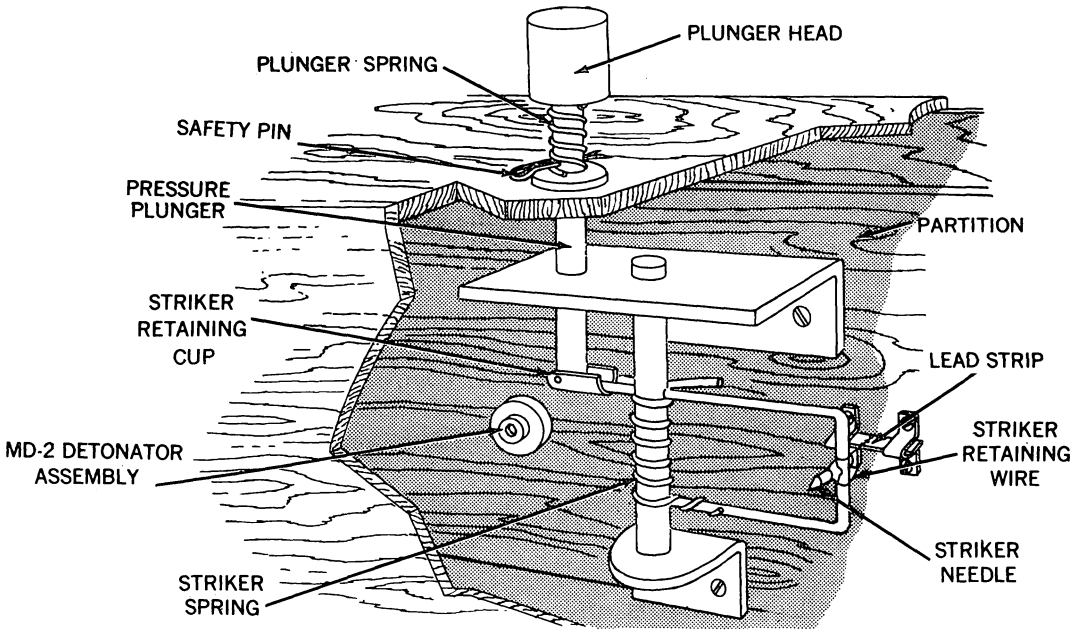


Figure 214

c. Functioning. Passage of the first train depresses the plunger, after which the striker is held only by the thin wire and the lead shear strip. If the train passes before the lead is cut (3 to 5 min.), the plunger goes back into the original position and recocks the striker. Several trains may pass over, before the mines explodes, each repeating the process until the 3 to 5 minutes cutting time has elapsed when the lead cuts through, freeing the striker to ignite the percussion cap, detonator, and charge.

d. Installing and Arming.

(1) Dig a hole under a tie or rail and place in it an explosive charge.

(2) Lay the mine on the charge so that the projecting plunger rests flush with the underside of the rail or tie.

(3) Remove the end of the mine and insert an Md–2 detonator assembly in the hole in the partition leading into the charge.

(4) Cover the mine and charge and remove the safety pin from the plunger.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Replace the safety pin (otherwise, the mine must be removed by wire or rope from a safe position).

(3) Remove the mine to a safe storage or disposal area.

164. Chemical Fuze (Ampoule) Mine (U.S.S.R.)

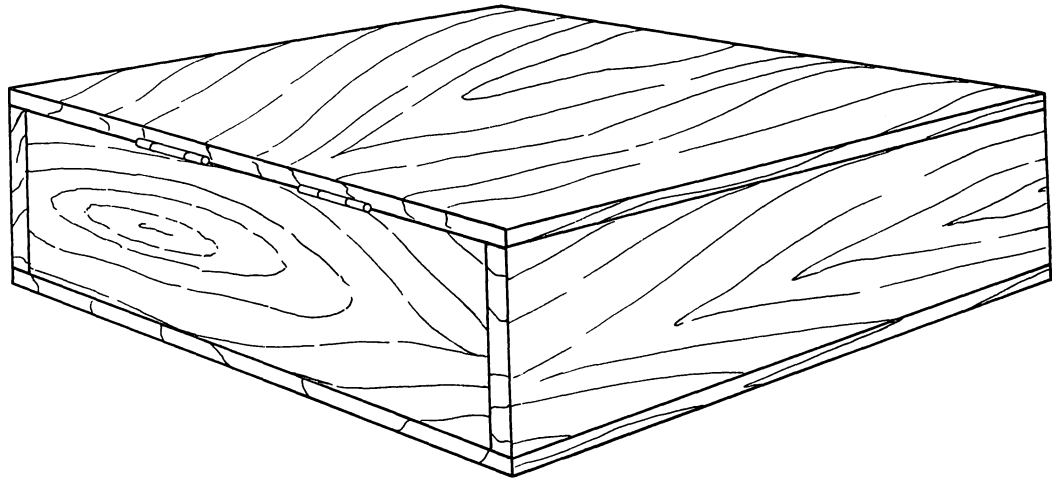


Figure 215

This rectangular wooden box antitransport mine, 17.7 by 11.4 by 6.2 centimeters, has a chemical fuze, a hinged lid, and a wire handle at one end. A hole is provided in the center of the lid for the insertion of the ampoule of acid. On the bottom of the ignition chamber is a wooden block with a brass disk on top. On the top of this disk is a glass disk containing a black and white powder separated by a glass partition. The disks are held in the recess of the wooden block by two spring-clamps. Two detonators are provided.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Pressure chemical.	50 lb. or more.	2-lb. explosive block.

b. Use. This is an initiating mine designed to detonate large charges laid in railroad beds or roads and highways. Alone, it may be used as an antipersonnel mine.

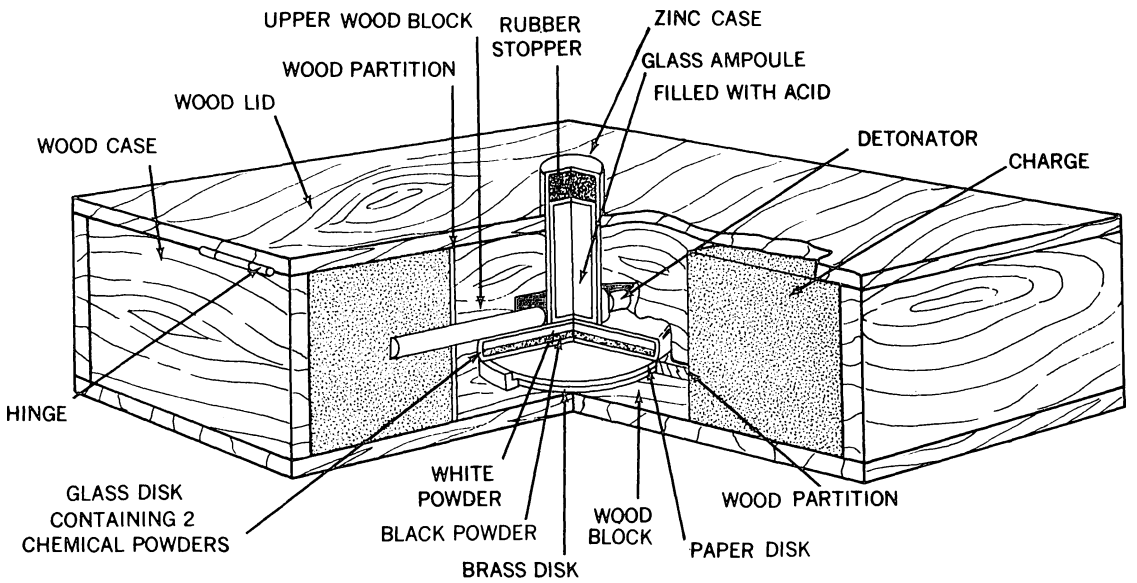


Figure 216

c. Functioning. Pressure on the zinc case surrounding the acid ampoule presses down and crushes both the ampoule and the glass disk containing the powdered chemicals. The resulting chemical reaction produces a flame which sets off the two detonators and explodes the charge.

d. Installing and Arming.

(1) Lift the lid and remove the upper wood block.
(2) Place a brass and paper disk in the recess in the lower wood block.
(3) Insert a glass disk containing chemicals on top of the paper disk.
(4) Insert two detonators into the charge through the holes provided in the walls of the ignition chamber.
(5) Install the upper wood block so that the two grooves in its base fit over the two detonators.
(6) Close the lid.
(7) Insert the glass ampoule in its zinc case into the hole in the lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Pull out the acid ampoule. If this is stuck, destroy the mine in place; or
(3) Take the mine to a safe storage or disposal area.

165. Electrical Pressure Wooden Mine (U.S.S.R.)

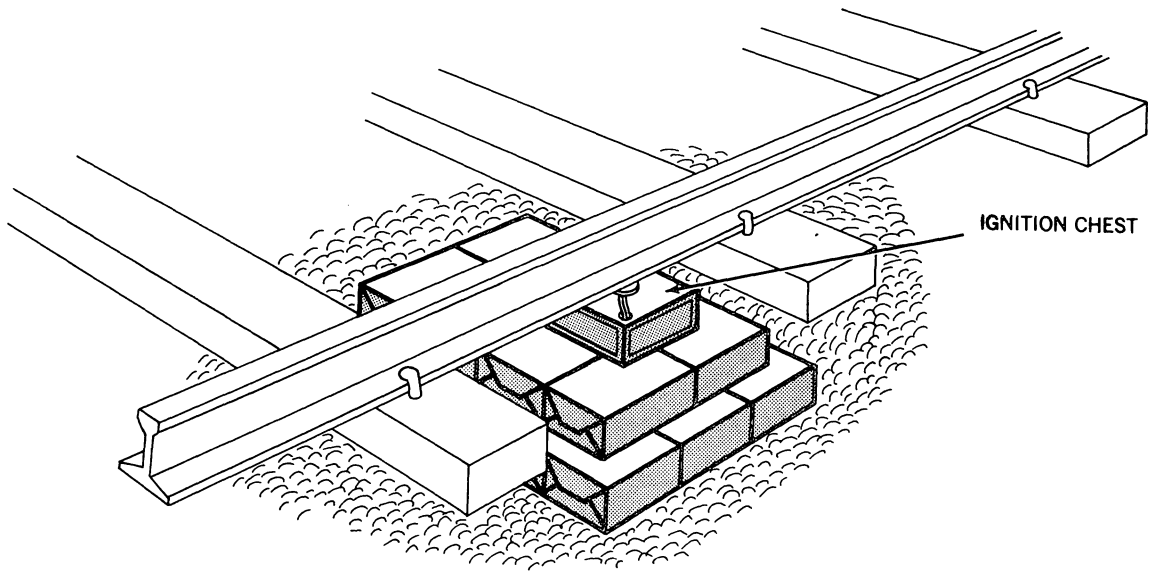


Figure 217

This type of antitransport mine has a built-in electrical detonating circuit consisting of one or more flashlight batteries, an electric detonator inserted into the charge, and a pressure-type contact fixed to the top of the mine, or separate from, but wired to the mine. The plywood case measures 13.9 to 15.2 centimeters long, 11.4 by 12.7 centimeters wide, and 5.0 to 7.6 centimeters high.

a. Characteristics.

Shape	Fuze	Explosive charge	Remarks
Rectangular....	Electric pressure.	.66-to 1.1-lb. explosive block.	The pushbutton contact on top of the case makes identification easy. However, for road uses, as is the case with wooden box mines, booby-traps, cunningly devised, may often be found inside the lid or underneath, which make lifting virtually impossible.

b. Use. When used as a railroad mine, it is laid on a large charge and detonated by pressure from the rail, and as an antivehicular mine, it is laid where vehicles are expected to travel.

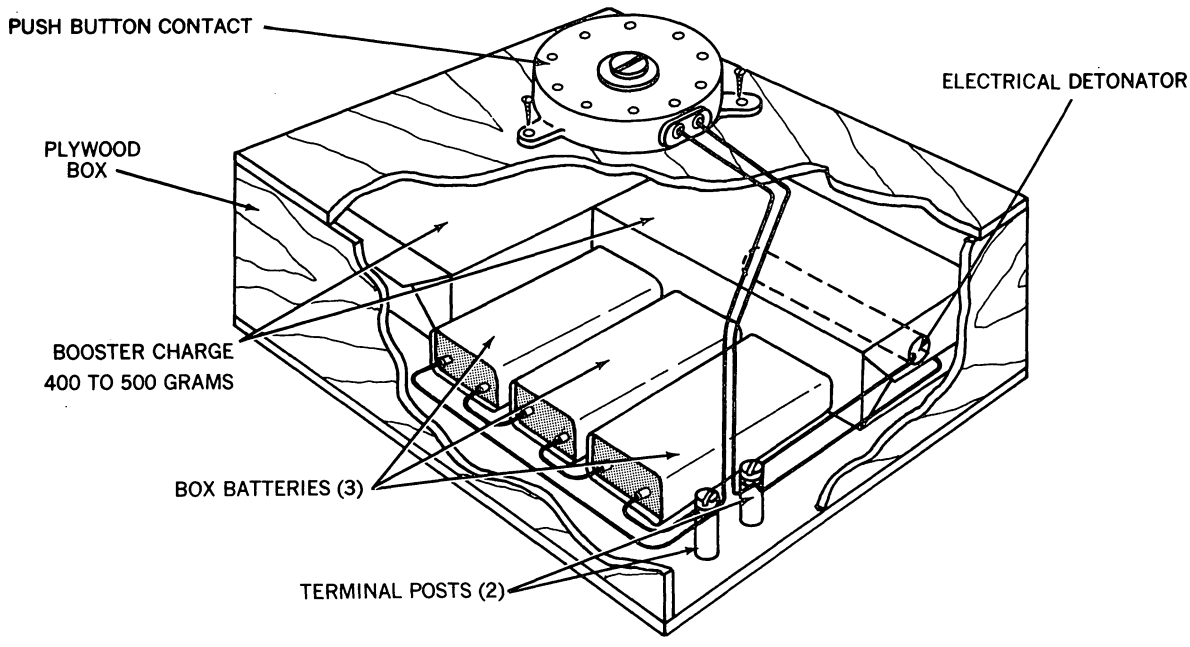


Figure 218

c. Functioning. This type of mine functions only by pressure on the pushbutton circuit closer.

d. Installing and Arming.

(1) Place the electric detonator in the charge only after the mine has been laid.

(2) Place the pushbutton contact just under the rail or tie or close to the surface of the road, so that a passing train depresses the rail and presses the top of the contact button or the wheel of a vehicle presses the top of the contact button to close it and fire the mine.

e. Disarming Procedure. As this mine is similar in appearance to those having built-in antiremoval contacts, **it is best** to pull the mine from place for a safe distance by a rope or wire or blow it in place.

166. Electric Railway Mine (Germany)

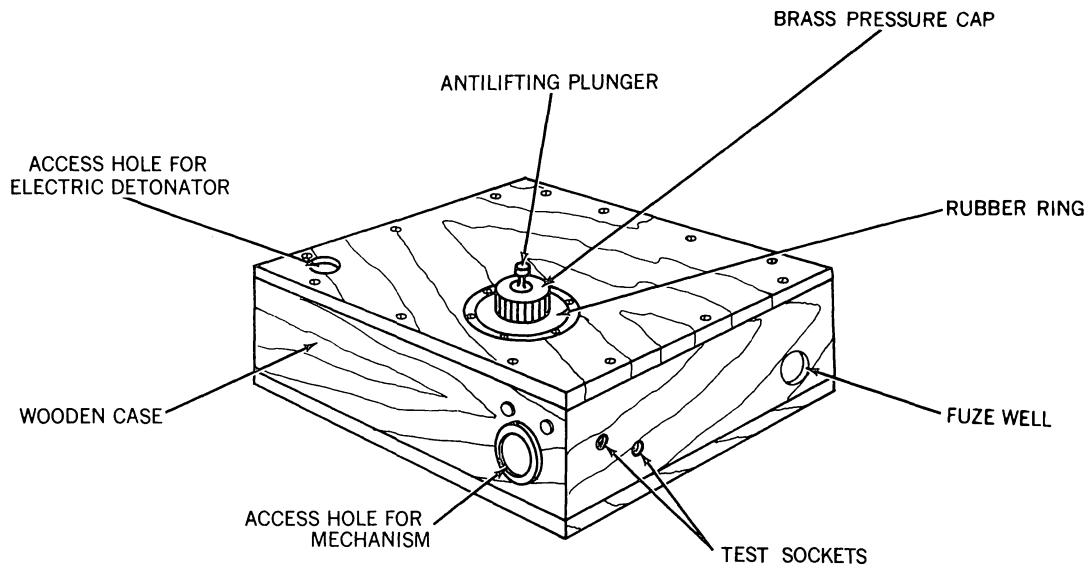


Figure 219

This mine consists of a wooden case 22.8 by 22.8 by 11.3 centimeters with an explosive charge, an electric railway mine fuze and an antilifting plunger, a 4½-volt battery, and a clockwork delay mechanism.

a. Characteristics.

Shape	Fuze	Explosive	Secondary fuze wells
Rectangular....	Electric, with pressure contact and time delay circuit closing.	8.5 lb.	One or more.

b. Use. This mine is placed under railroad ties. If laid under a hollow steel tie, a nonmetallic pressure piece is provided between the top of the brass pressure cap and the tie.

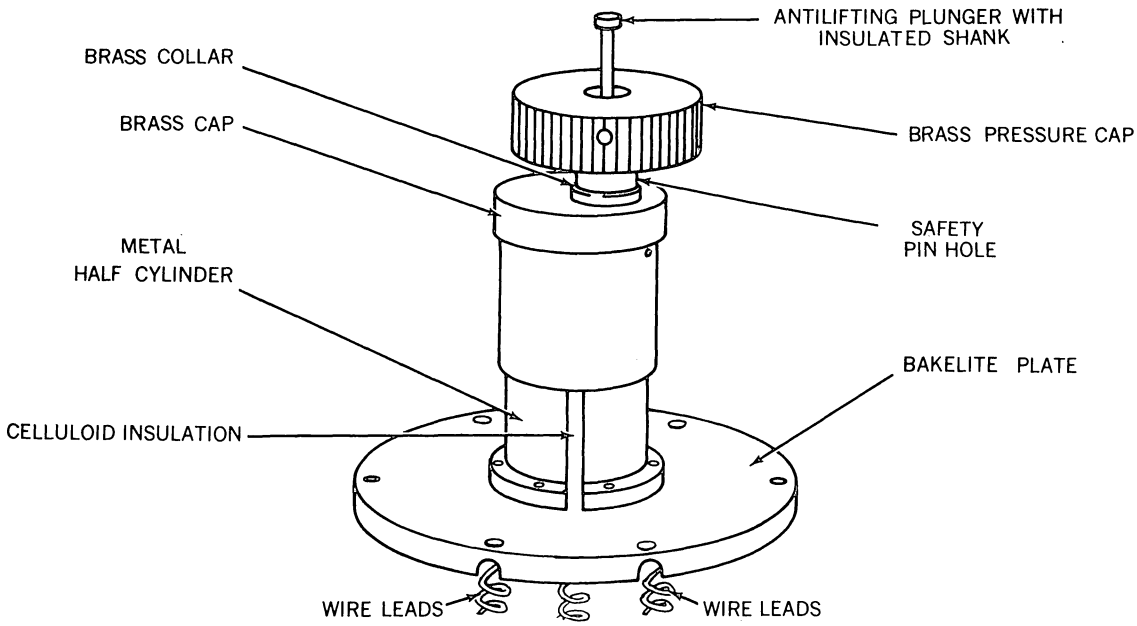


Figure 220

c. Functioning. The mine may be set for delayed action in three ways:

(1) The main circuit is closed when the brass pressure cap is depressed so that the contact strip makes contact with the spring-loaded plunger. A contact in the clockwork delay mechanism is closed at the expiration of the setting time, firing the mine. However, if the brass pressure cap is screwed up sufficiently against the underside of the tie, contact between the spring-loaded plunger and the contact strip will be made and the mine will automatically detonate at the expiration of the delay period.

(2) If the circuit between the spring-loaded plunger and the contact strip is not closed at the time the mine is laid, the mine cannot function until the end of the delay period, and then only by the action of a passing train which depresses the pressure cap and closes the contact below it.

(3) The antilifting spring-loaded plunger contact, if free to rise, will close the circuit and fire the mine. Also if a metal pin is inserted in the safety pin hole, it will make contact with the metal base of the antilifting plunger, completing the auxiliary circuit and firing the mine.

d. Installing and Arming.

(1) Remove the lid and examine the contents to be sure that the batteries and main charge are present.

(2) Compare the wiring with the illustration to see whether or not the correct connections have been made.

(3) Test the circuit through the two test holes in the side of the case.

(4) Replace the lid.

(5) Test the clockwork delay mechanism by setting it for a short delay period.

(6) Dig a hole underneath the railroad tie the adequate to permit vertical movement when the train passes over the mine.

(7) Place the mine in the hole so that the brass pressure cap may be screwed up to bear firmly against the underside of the tie.

(8) Set the delay clock for the desired period and place it in the mine

through the access hole in the side of the case.

(9) Close the wooden sliding plate.

(10) Remove the nonmetallic safety pin from the fuze. Be sure that the mine is installed on firm footing.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the special electric detonator, prying it out of its recess with a screw driver if necessary.

(3) Slide out the cover plate covering the clockwork delay mechanism, and withdraw the clockwork delay mechanism and main detonator together. To do this, the wires should be cut, one at a time.

(4) Remove the fuze and mine to a safe storage or disposal area.

f. Additional Precautions.

(1) Do not remove the mine until the detonators have been withdrawn.

(2) Do not insert a metallic pin in the safety pin hole.

(3) Do not allow the antilifting plunger to rise while the detonators are in the mine.

(4) Do not put pressure on the brass pressure cap.

167. Improvised Friction-Fuzed Mine (Japan)

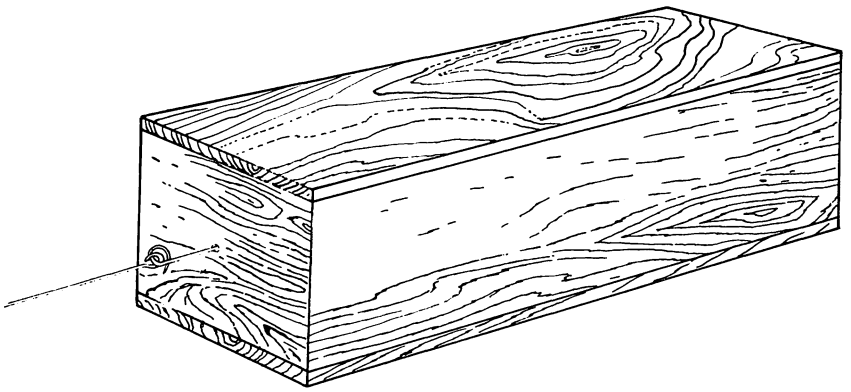


Figure 221

This antivehicular mine consists of a wooden box, an explosive charge, and a pull type friction fuze. The mine measures 33.0 by 7.6 by 6.2 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular	Pull-friction with main pull wire and activating wire.	10 to 14 lb.	3.5 lb. TNT or picric acid (par. 6x).

b. Use. This mine is laid primarily in road blocks and on road shoulders. It is also used for unit security.

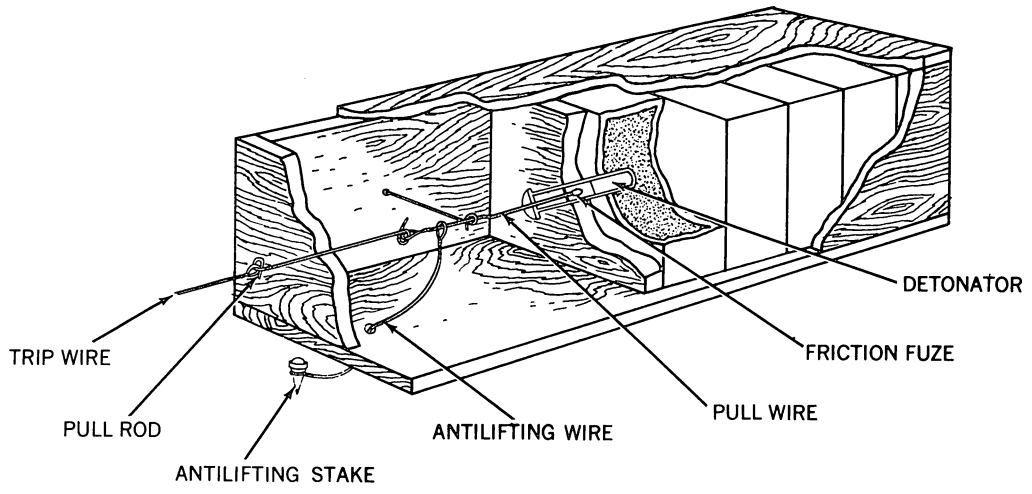


Figure 222

c. Functioning. A pull on the main pull wire or the actuating wire, which extends from the side of the mine, causes the friction fuze to function, exploding the percussion cap and completing the firing chain.

d. Installing and Arming.

(1) Drive a stake into a prepared hole and tie the activating wire to it.
(2) Lay the mine in place in the hole and open the lid.
(3) Thread the activating wire into the box.
(4) Attach one end of the main pull wire to the pull rod and the other end to a tree or other object.
(5) Insert the fuze through the hole in the partition.
(6) Thread the pull wire through the loop of the supporting wire and tie it to the loop of the pull rod.
(7) Fasten the activating wire to the pull wire and close the lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Cut the main trip wire.
(3) Wedge the pull rod firmly in place where it emerges from the mine.
(4) Uncover the fuze end of the mine and carefully feel for an activating wire and cut it if present.
(5) Remove the lid and cut the pull wire.
(6) Withdraw the fuze.
(7) Remove the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. As this mine may have an activating device within that is initiated by the lifting of the lid, hand disarming is extremely hazardous. The mine should be blown in place unless silent removal is mandatory.

168. Wooden Antitank Mine, Type 9 (Italy)

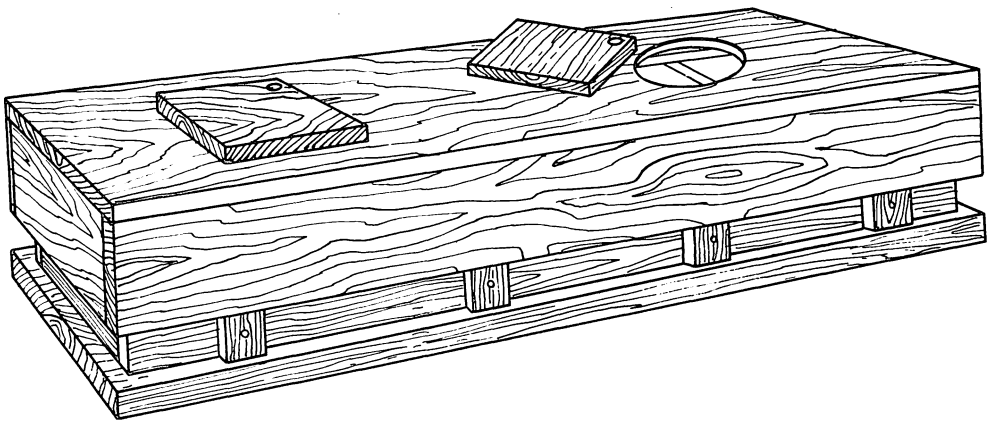


Figure 223

This antitank mine is of the wooden bar type. It has a case 99.0 by 22.8 by 13.3 centimeters, two pressure fuzes, and a main charge. The fuze consists of two cylindrical cases locked together by a cam. The fuzes have spring-loaded strikers, the end of each threaded to take an adjusting nut. One end of an actuating lever bears against the adjusting nut, retaining the striker. The midpoint of the actuating lever is pivoted on a bracket, while the other end bears on a metal plate on the underside of the pressure cover. The mine contains also a cartridge holder with a blank cartridge, having a detonator inserted in its open end. For antitank use, eight thin wooden blocks are fastened to the sides of the mine case between the overlapping sides of the pressure cover and the bottom of the case.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Integral with lever release.	500 lb. or more, but 20 to 40 lb. without the wooden blocks.	12 lb.

b. Use. Road blocks and road junctions are the usual places for the laying of this mine because of its large area of coverage.

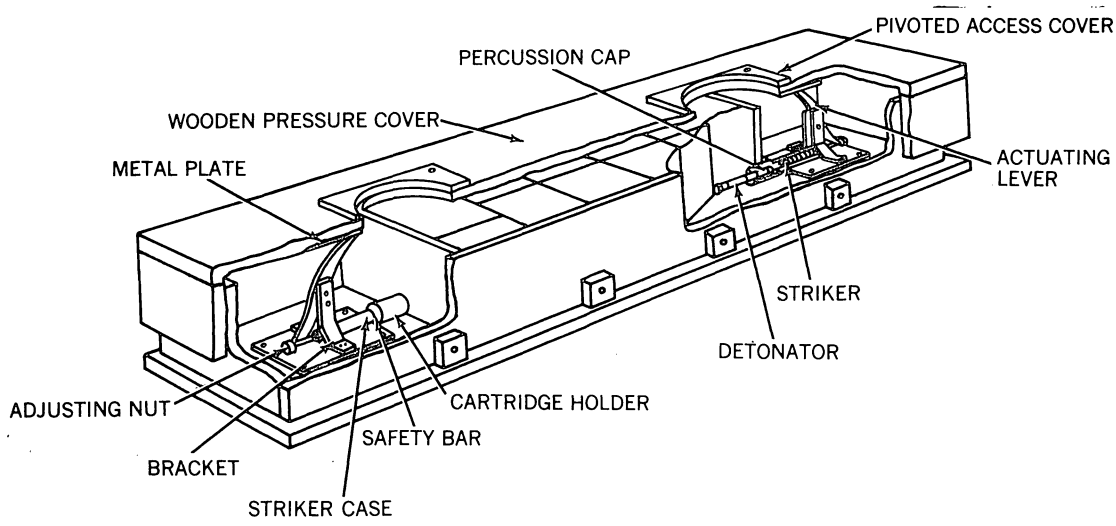


Figure 224

c. Functioning. Pressure on the pressure cover crushes the wooden blocks and rotates one or both of the actuating levers about its pivot, further compressing the striker spring until the lower end of the actuating lever trips the adjusting nut on the end of the striker shaft. This releases the striker against the blank cartridge, firing it, the detonator, and the main charge.

d. Installing and Arming.

(1) Remove the pressure cover and the blocks of explosive and prepare holes in the two end blocks to receive detonators.
(2) Insert the open end of a detonator into the blank cartridge of each fuze.
(3) Replace the blocks of explosive, the end blocks first.
(4) Place the mine in a hole so that the pressure cover, when replaced, will be flush with the surface of the ground or slightly below it.
(5) Replace the pressure cover; open the two access covers and withdraw the two safety bars; then close the access covers.

e. Disarming Procedure.

(1) Check for and remove any antilifting devices present.
(2) **Place wooden blocks, if none are present, between the bottom of the case and the overlapping sides of the cover to prevent it from being depressed.**
(3) Open the access covers and insert a small knife blade or similar strip of metal in the safety-bar slot of each fuze.
(4) Remove the pressure cover.
(5) Remove the blocks of explosive, end blocks last.
(6) Remove the detonators from the blank cartridges.
(7) Unlock the striker case from the cartridge holder by disengaging the cam on the end of the striker case from the internal groove in the end of the cartridge holder.
(8) Remove the mine and fuze assemblies to a safe storage or disposal area.

169. Wooden Antitank Mine, B–2 (Italy)

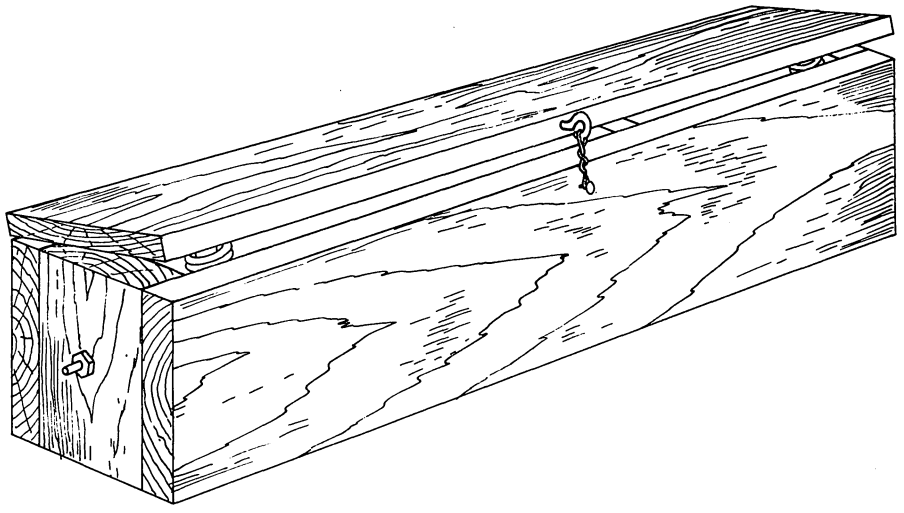


Figure 225

The B–2 wooden mine is a bar type, 87.6 centimeters long by 19.0 centimeters wide by 21.5 centimeters high. The integral spring-loaded striker is supported on an E-shaped bracket. A striker retaining wire passing over a wooden block connects the top of the striker shaft to an adjusting bolt running through one end of the wooden case. Fastened on the underside of the pressure lid and positioned directly over the wooden block is a cutter for cutting the striker retaining wire. At the other end of the box is a compartment for the maincharge. Two coiled springs hold the lid partly open so that the cutter does not rest on the retaining wire.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Integral pressure.	220 lb. on each spring.	7 lb. TNT.

b. Use. The B–2 is laid in road blocks and at road junctions because of its large coverage area. It should be installed at least at 2-meter intervals to prevent sympathetic detonation.

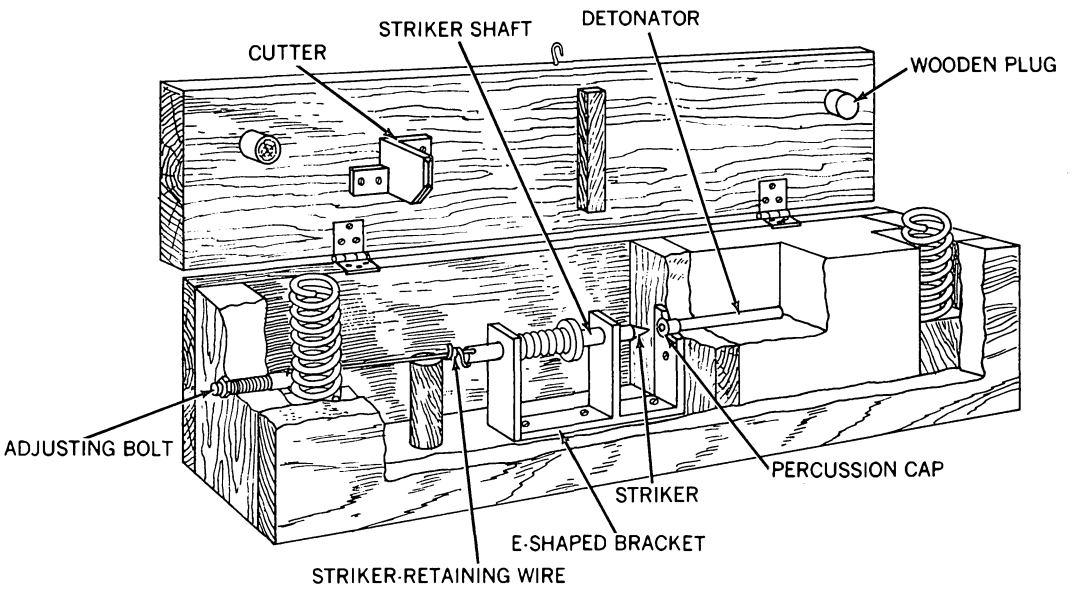


Figure 226

c. Functioning. Pressure on the lid causes it to close against the resistance of the two coil springs, forcing the cutter to cut the retaining wire and release the striker to fire the percussion cap and the mine.

d. Installing and Arming.

(1) Place the mine in a hole with the pressure lid flush with the surface of the ground.

(2) Insert the detonator and percussion cap in the charge through the leg of the E-shaped bracket and the wooden partition. The percussion cap will rest in the leg of the bracket.

(3) Draw the striker in the cocked position by means of the adjusting nut on the outside of the case. For safety during arming, place a flat piece of metal between the striker point and percussion cap.

(4) Lower the pressure lid on the coil springs. It should not close all the way.

(5) Wire the lid to the case as shown in the illustration.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Open the pressure lid. **Do not force it.**

(3) Place a heavy strip of metal between the striker and percussion cap.

(4) Remove the percussion cap and detonator from the mine.

(5) Turn the adjusting nut until the tension in the striker retaining wire is removed.

(6) Transport the mine and detonator to a safe storage or disposal area.

170. Wooden Ramp Mine (Germany)

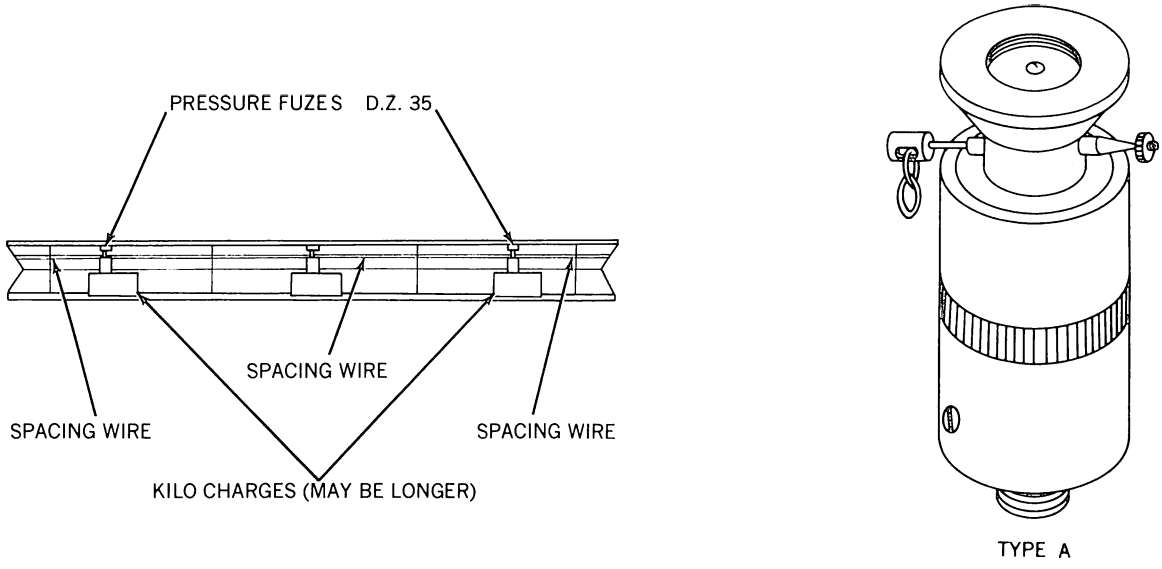


Figure 227

This improvised mine was constructed in various ways. It consisted of charges fitted with pressure fuzes placed in wooden boxes with a sloping or ramp-hole lid, or on a bottom board with a sloping or ramp pressure board on the top of the fuzes.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Pressure fuze 35 with shear pin release.	500 lb. (approx).	TNT or some other explosive block.

b. Use. The ramp mine was used at railroad crossings, bridge approaches, and similar sites.

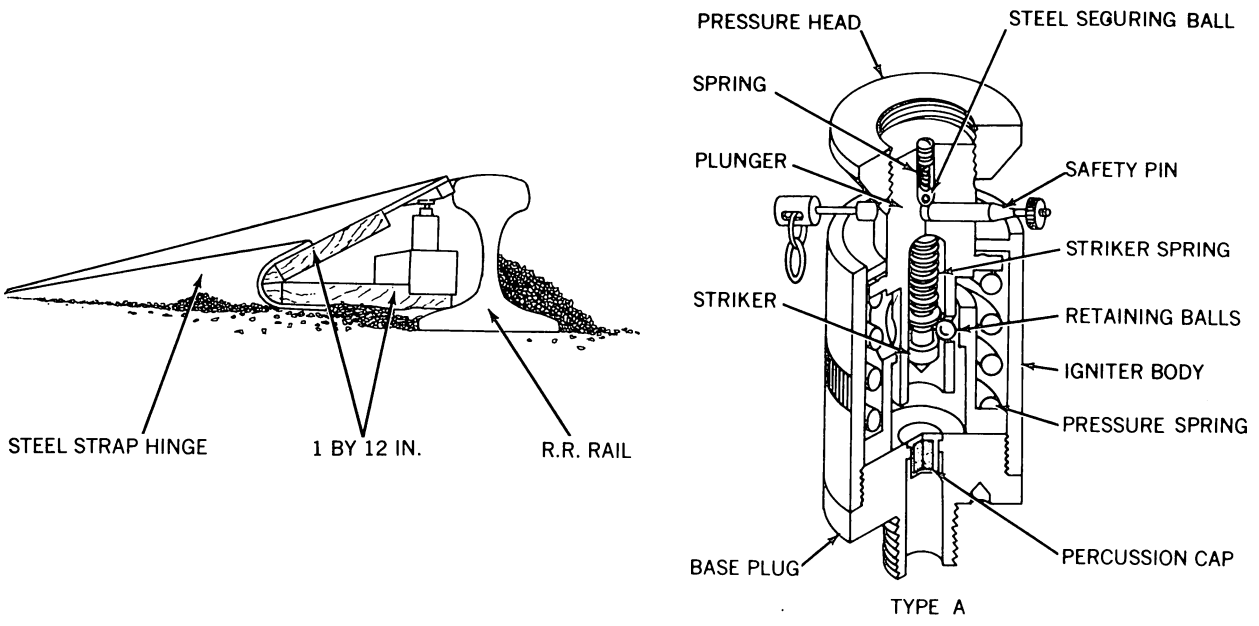


Figure 228

c. Functioning. Pressure on the sloping board or ramp actuates the pressure fuzes, releasing the striker against the percussion caps and firing the charges.

d. Installing and Arming.

(1) Hinge together two boards at least 15 centimeters wide and 2 meters long and lay them with the hinged side toward the enemy.

(2) Install the charges with pressure fuzes one about every meter, on the lower board, along the open edge of the ramp.

(3) Remove the safety pins from the fuzes and carefully lower the top board onto the fuzes.

e. Disarming Procedure.

(1) Check for and remove any antilift or antidisturbance devices.

(2) Lift the top board.

(3) Insert safety pins or rails in the pressure fuzes.

(4) Unscrew the fuzes with detonators from the charges.

(5) Separate the fuzes and detonators.

(6) Remove the charges and fuzes to a safe storage or disposal area.

171. Wooden Antitank Mine, TMD–40 (U.S.S.R.)

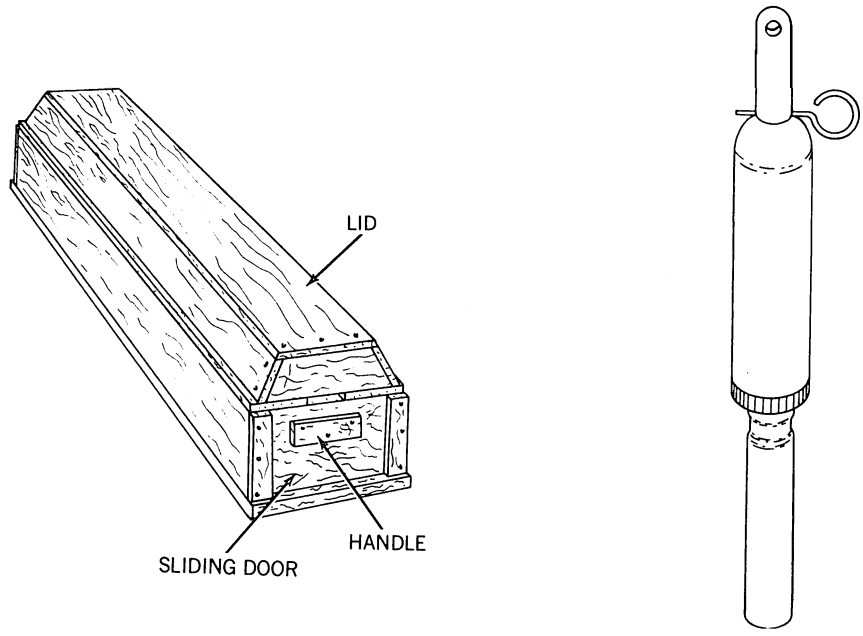


Figure 229

The TMD–40 is a wooden bar mine 59.6 by 13.9 by 10.1 centimeters. The lid contains two pressure pieces that rest on two fuze actuating levers, one at each end, that remove the striker retaining pins. A wooden handle is fastened to the sliding door at each end.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	Markings
Rectangular.	Two MUV pull fuzes.	550 lb.	7.1 lb. TNT.	TMD–40 in Russian letters stenciled in black on top of lid.

b. Use. These mines are laid 7 meters apart in rows in minefields. They are designed to injure or disable vehicles and light and medium tanks.

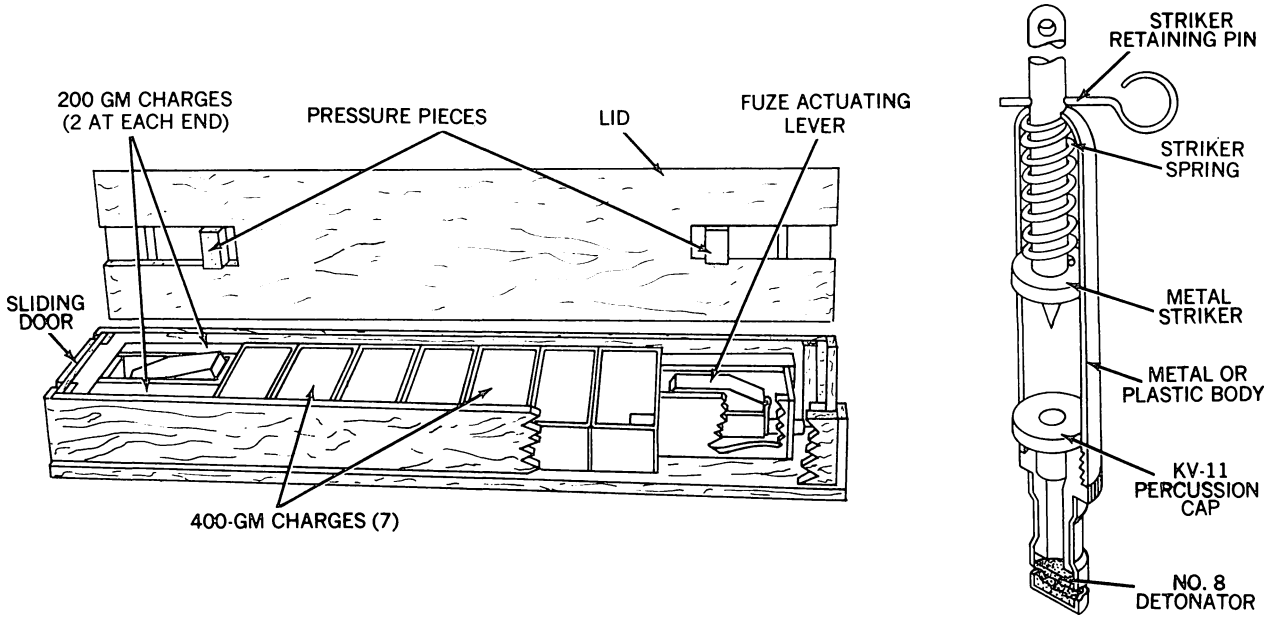


Figure 230

c. Functioning. Pressure on the lid crushes it forcing one or both of the wooden pressure pieces down on the actuating levers. This pulls out the retaining pins and releases the strikers to fire the percussion caps, detonators, and main charge.

d. Installing and Arming.

(1) Lift the lid and insert the MUV pull fuzes with detonator assemblies attached into their respective holes.

(2) Carefully insert a nail in the end of the fuze actuating lever through the loop of the striker retaining pin.

(3) Replace the lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Lift the sliding doors at each end of the mine and remove the fuzes.

(3) Unscrew the detonator assemblies from the fuzes.

(4) Remove the fuzes and mine to a safe storage or disposal area.

172. Wooden Antitank Mine, YaM Series (U.S.S.R.)

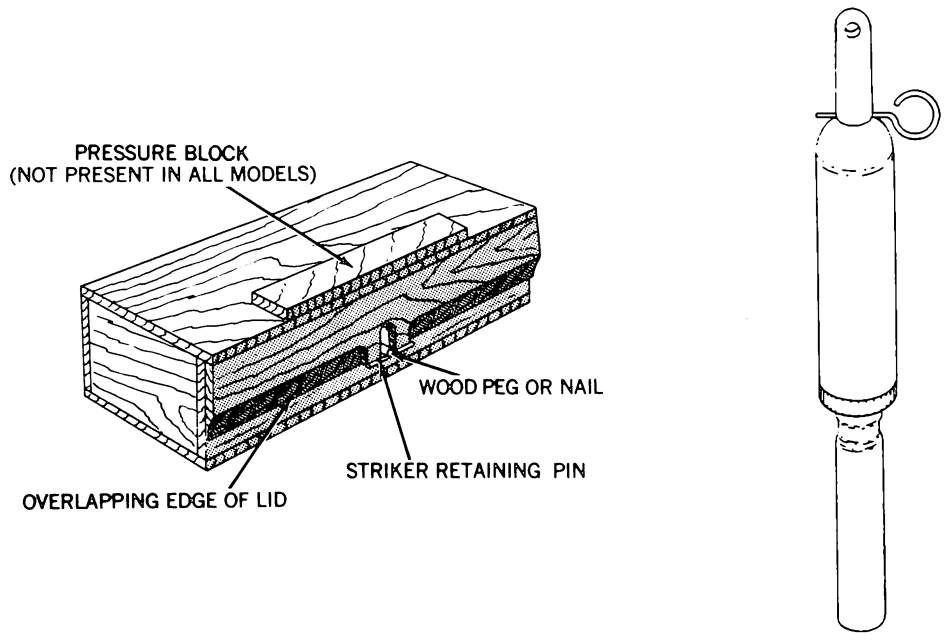


Figure 231

These antitank mines appeared early in World War II and became the most widely used of all the nonmetallic types. Five models are produced, four of which are basically similar but differing slightly in weight and dimensions. The main feature is the hinged lid lip which overlaps the box and is recessed in the center to fit over the protruding end of the pull fuze striker. Two staples are provided, one placed on each side of the recess, to accommodate a pin that passes through the eye of the striker retaining pin. In this case the pull fuze is actuated by pressure.

a. Characteristics.

Model	Shape	Fuze	Operating pressure (approx)	Measurements		
				L	W	Ht
YaM 5	Rectangular	MUV pull	300 lb.	49.9 cm	12.9 cm	12.4 cm
YaM 5K	Rectangular	MUV pull	300 lb.	60.0 cm	17.5 cm	16.0 cm
YaM 5M	Rectangular	MUV pull	300 lb.	49.9 cm	18.7 cm	16.0 cm
YaM 5U	Rectangular	MUV pull	300 lb.	49.9 cm	20.0 cm	11.8 cm
YaM 10	Rectangular	MUV pull	300 lb.	62.2 cm	21.5 cm	19.0 cm

Explosive			Markings
Main charge	Model	Booster	
11 lb. amatol 80/20 (approx).	YaM 5	7 oz. trotyl (approx).	Black lettering on the lid.
11 lb. amatol 80/20 (approx).	YaM 5K	7 oz. trotyl (approx).	Black lettering on the lid.
11 lb. amatol 80/20 (approx).	YaM 5M	7 oz. trotyl (approx).	Black lettering on the lid.
11 lb. amatol 80/20 (approx).	YaM 5U	7 oz. trotyl (approx).	Black lettering on the lid.
22 lb. amatol 80/20 (approx).	YaM 10	7 oz. trotyl (approx).	Black lettering on the lid.

b. Use. These mines are generally emplaced in pattern to immobilize tanks and other vehicles, to protect various troops, positions, and equipment, and to halt and delay enemy advance.

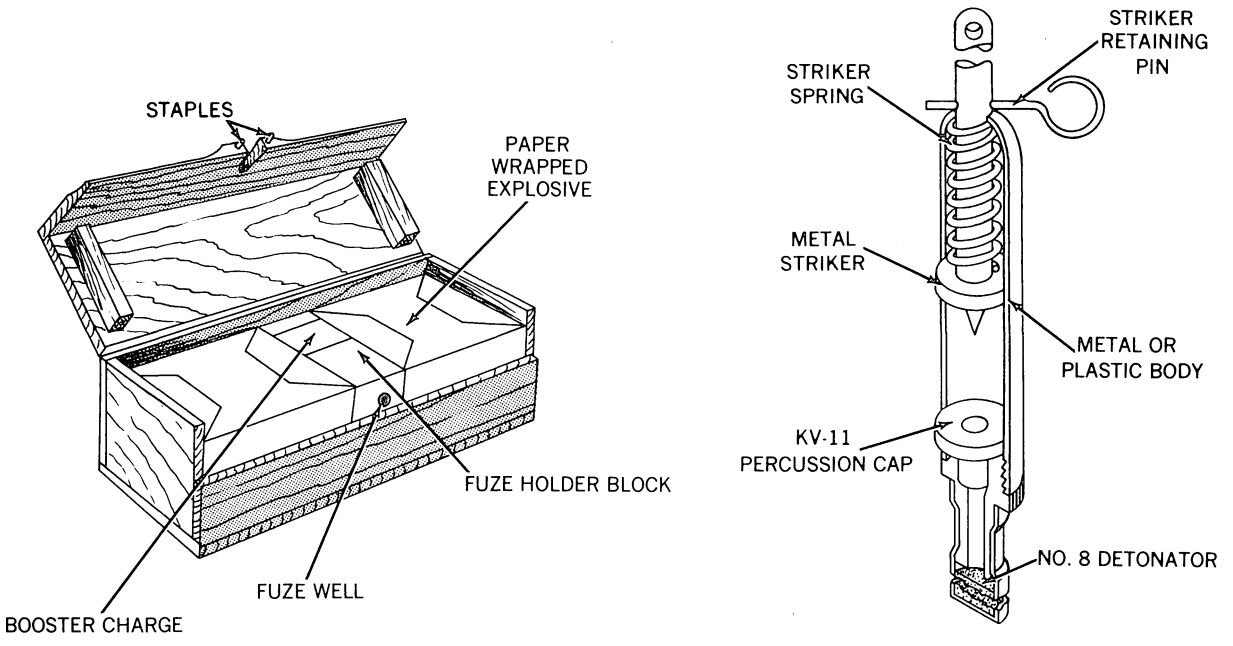


Figure 232

c. Functioning. Generally an application of approximately 300 pounds pressure on the lid collapses it, forcing the overlapping edge down. The wooden peg (or nail or wire) passed through the eye of the striker retaining pin is also pushed down, removing the striker retaining pin and actuating the fuze. Some of these mines may have sawed grooves on the underside of the lid, which reduce the required operating pressure to much less than 300 pounds.

d. Installing and Arming.

(1) Lift the lid and insert the booster charge.

(2) Insert an MUV pull fuze, with detonator attached, through the wooden fuze-holder block, so that the detonator projects into the hole in the booster charge and the eye of the striker retaining pin is down.

(3) Close the lid.

(4) Slide a wooden peg, nail, or piece of wire through the staples and the eye of the striker retaining pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove peg, nail, or wire from the staples and eye of the striker retaining pin.

(3) Lift the lid, pull out the fuze, and unscrew the detonator.

(4) Remove the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. As improvised boobytrapping of this mine is easy, it should be blown in place, except when silent lifting is required.

173. Grenade-Fuzed Land Mine (Japan)

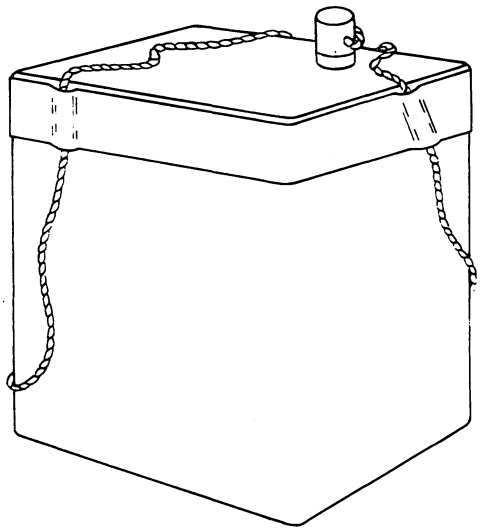


Figure 233

This improvised antivehicular mine is a rectangular metal, wood, or plastic case with a cover fastened with friction tape. If a carrying cord is used, it passes through the safety pin hole of the grenade, if it is not used, the safety pin is in the grenade. A type 91 or 97 hand grenade acts as the fuze and booster charge.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical.....	Type 91 or 97 hand grenade, with pull pin or shear cord release.	Sharp blow or pressure on pressure cap. Heavier pressure if carrying cord is used.	3 lb. of block explosive.

b. Use. This mine was used to disable vehicles, and as an antipersonnel mine or a boobytrap.

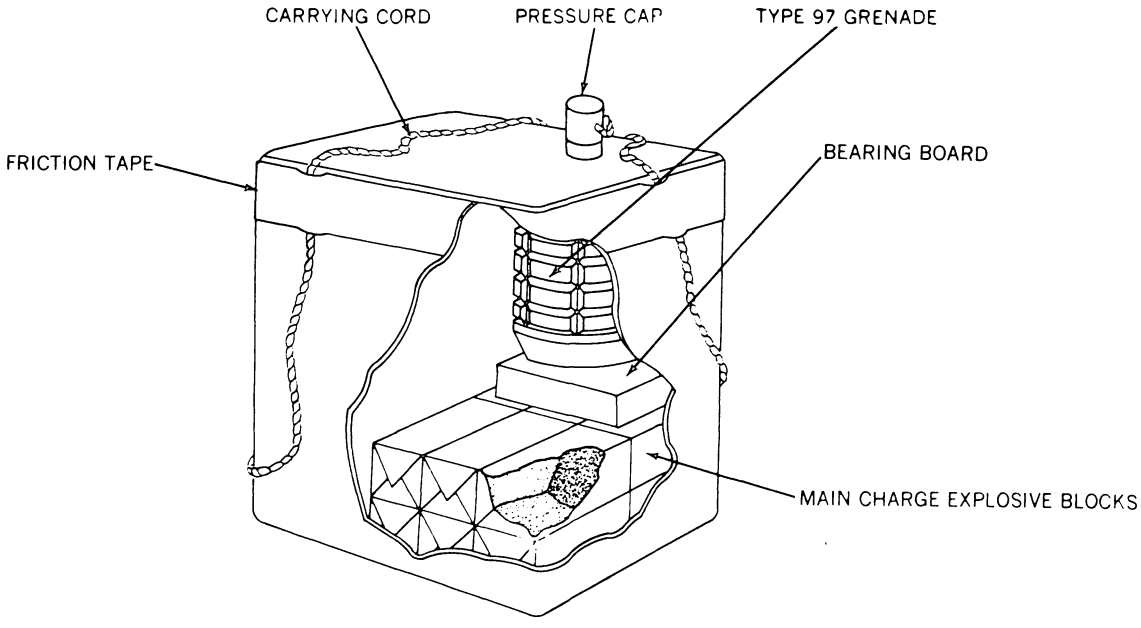


Figure 234

c. Functioning. A sharp blow or pressure on the pressure cap drives the striker into the percussion cap, setting off the grenade. Heavier pressure is required if the carrying cord is used. The exploding grenade detonates the main charge.

d. Installing and Arming.

(1) Place the mine in a hole deep enough for the top of the grenade to extend just a fraction of an inch above ground level.
(2) Remove the safety pin, if it is used.
(3) Remove the carrying cord, if the mine is set for antipersonnel use.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Place a safety pin in the safety pin hole in the top of the grenade if the carrying cord is not passed through it.
(3) Remove the black tape around the top of the mine and lift off the cover and the grenade.
(4) Remove the grenade from the cover.
(5) Take the grenade and the mine to a safe storage or disposal area.

Section III. MISCELLANEOUS NONMETALIC ANTITANK MINES

174. Antitank Mine, Model 1947 (France)

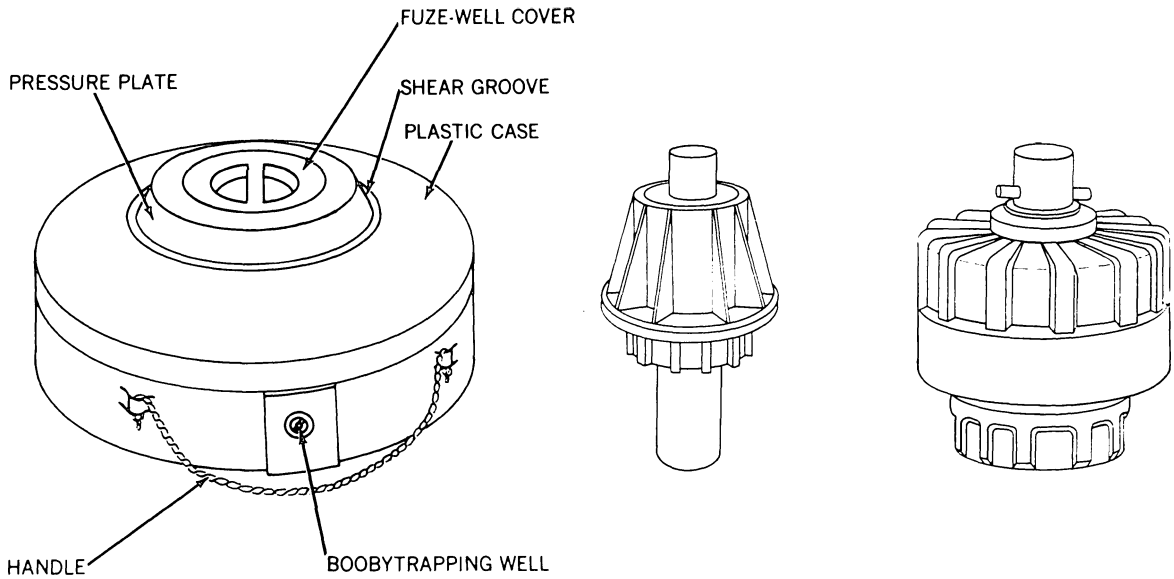


Figure 235

This is a conventional undetectable concussion type mine fitted with a pressure-chemical or pressure-friction fuze. It is inclosed in a plastic case. The fuze well and its screwed-in cover are located in the center of the mine. It is easily armed, boobytrapped, and powerful enough to cut or damage the tracks of heavy tanks. The mine is 34.0 centimeters in diameter and approximately 10.8 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Circular, plate.	Pressure-friction, or pressure-chemical.	550 lb. (approx).	12.1 lb. TNT (approx).	2.42 oz. lead azide (approx).

Secondary fuze wells	Markings
2.....	Manufacturer's symbol and lot number on upper surface.

b. Use. This is used as a concussion type antitank mine for cutting or damaging the tracks of armored vehicles.

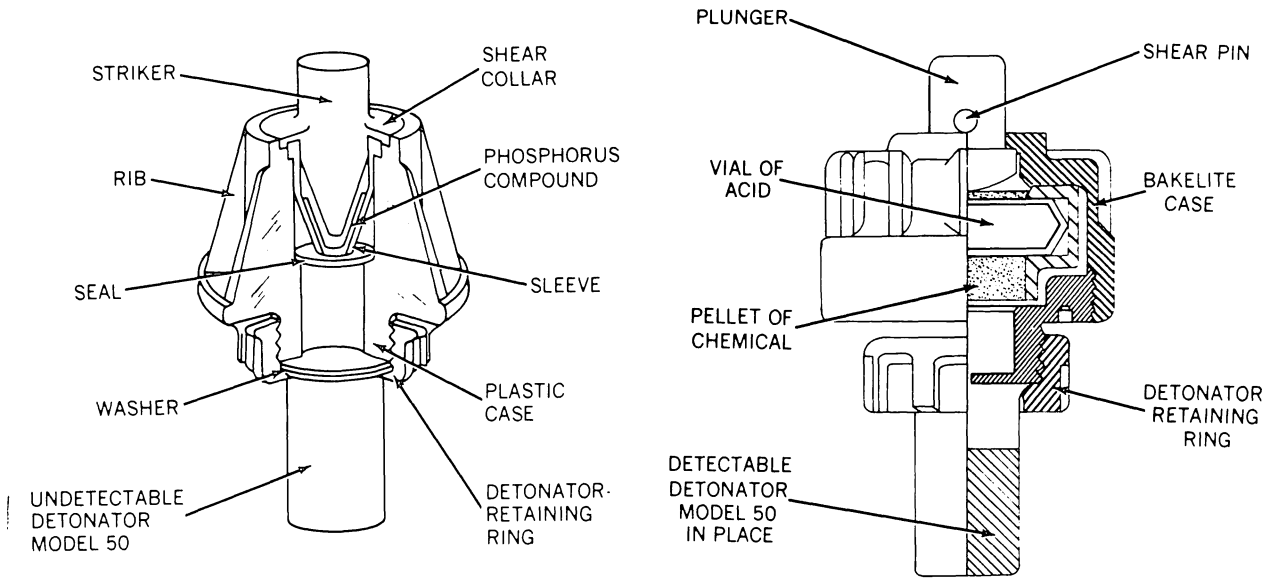


Figure 236

c. Functioning. The pressure plate shears away from the case at the application of about 550 pounds or more pressure and transmits it to the fuze, which then actuates the detonator and fires the mine.

d. Installing and Arming.

(1) Emplace the mine in a hole about 12.7 centimeters so that it will have about 2.5 centimeters.
(2) Unscrew the fuze-well cover.
(3) Fix the detonator to the fuze (pressure-friction model 1952, or pressure-chemical model 1950).
(4) Place the fuze in the fuze well.
(5) Replace the fuze-well cover.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Unscrew the fuze-well cover.
(3) Remove the fuze and detach the detonator.
(4) Take the mine and fuze to a safe storage or disposal area.

175. Nonmetallic Antitank Mine (Egypt)

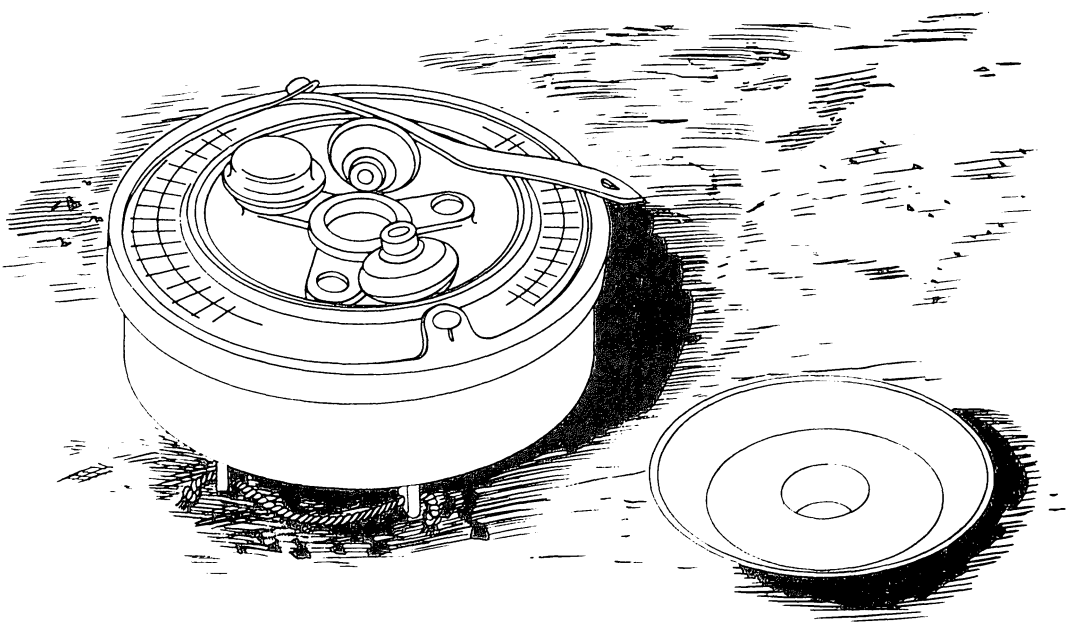


Figure 237

The Egyptian nonmetallic mine is a copy of the Italian Model SACI. It is completely nonmetallic except for the fuze striker points and the detonators. The mine has three fuzes. The pressure plate has a 3-armed section positioned so that one arm rests above each fuze. The mine is 27.9 centimeters high and 16.0 centimeters in diameter.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	Supplementary fuze wells
Cylindrical...	Pressure with shear type release.	200 lb. (approx).	19.8 lb. TNT.	Two, one in side and one in bottom of case.

b. Use. This mine was designed for laying in antitank minefields and barriers.

(No drawing available.)

c. Functioning. Pressure on the top of the mine crushes the pressure plate, rupturing the shear mechanism and exploding the mine.

d. Installing and Arming.

(1) Remove the pressure plate from the mine.
(2) Place three fuzes and detonators into the three fuze wells.
(3) Replace the pressure plate.

e. Disarming Procedure.

(1) Search for and remove any antilift devices.
(2) Remove the pressure plate.
(3) Remove the three fuzes from the mine.
(4) Separate the detonators from the fuzes.
(5) Remove the mines, fuzes, and detonators to a safe storage or disposal area.

176. Bakelite Antitank Mine, PT-Mi-Ba, 53 (Czechoslovakia)

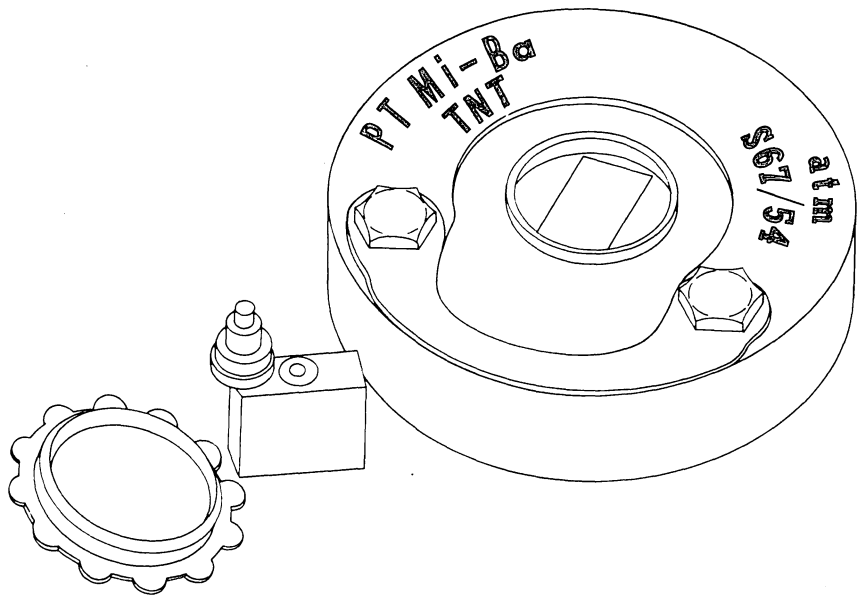


Figure 238

This mine consists of a case made of two bakelite mouldings cemented together. The fuze well is closed by a threaded cover plate; and the two filler holes in the bottom of the case, by two lugs. It is detonated by a plastic-bodied RO 7-11 mechanical pull fuze. The mine is 32.5 centimeters in diameter and 10.1 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Circular...	RO 7-11..	300 lb. or more.	15 lb. cast TNT.	7 oz. TNT.

Markings

"PT-Mi-Ba, TNT," and manufacturer's and inspector's markings.

b. Use. This model is used in minefields and obstacles and will probably break 63.5 centimeters and smaller tank tracks.

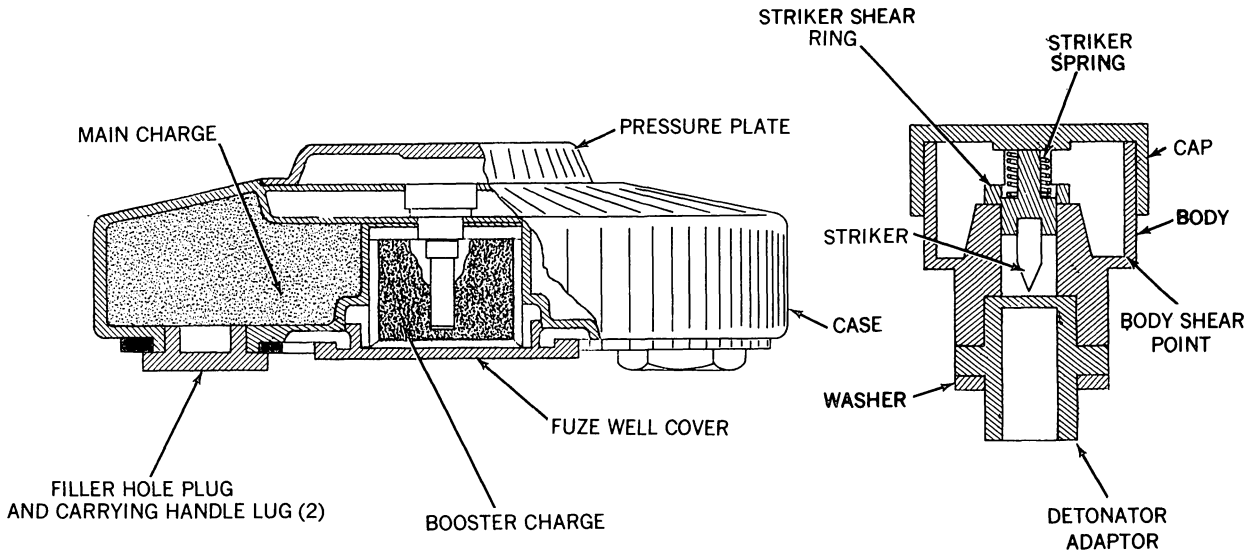


Figure 239

c. Functioning. Force on the pressure plate ruptures the shear groove, puts pressure on the fuze, and thus activates the detonator and starts the firing chain.

d. Installing and Arming.

(1) Turn the mine upside down and remove the fuze well cover.
(2) Remove the base of an RO 7–11 fuze and insert the detonator.
(3) Replace the base of the fuze with the detonator attached.
(4) Screw the fuze and detonator assembly into the threaded plastic well in the booster charge.
(5) Place the assembled fuze, detonator, and booster, fuze first, into the fuze well (with the mine inverted for arming, the fuze should be down).
(6) Replace fuze well cover.
(7) Turn the mine over, top side up.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the fuze well cover and pull out the fuze and booster.
(3) Unscrew the fuze from the booster and the detonator from the fuze.
(4) Remove the mine and fuze to a safe storage or disposal area.

177. Bakelite Antitank Mine Type I (Italy)

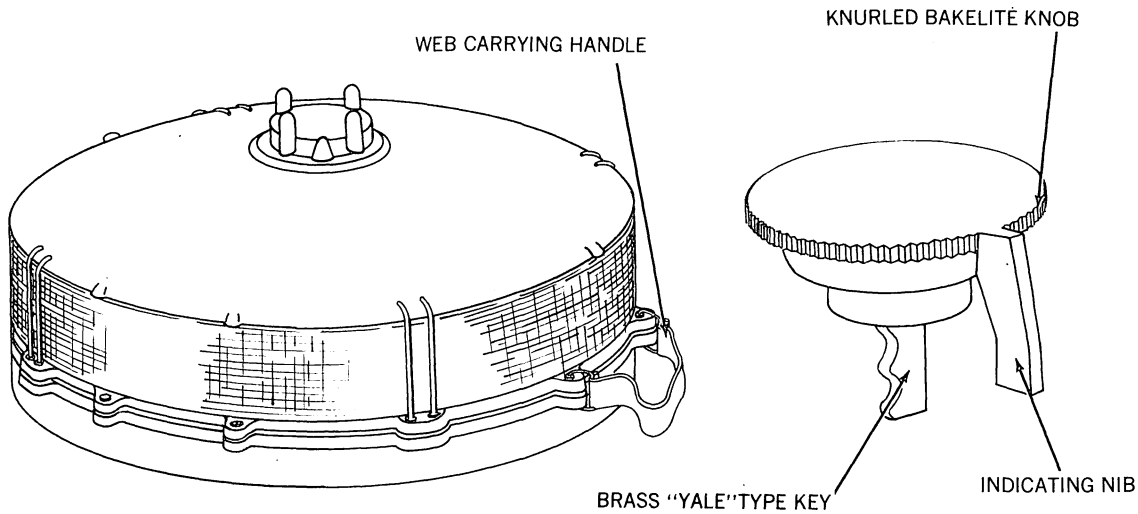


Figure 240

This is a bakelite mine 29.5 centimeters in diameter and 13.0 centimeters high with a pressure plate that covers the entire case. The pressure plate, which bears on the fuze assembly, is held in place by four steel wires looped through lugs. The space between the pressure plate and the top of the mine case is closed around the circumference by a strip of impregnated canvas. The moulded base and the moulded pressure cap of the fuze assembly are held apart by 9 coil springs. The mine is armed by means of a "Yale" type key.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Integral pressure, with ball and shear-pin release.	110 lb.	8-lb. main charge.

b. Use. This mine is laid in areas abandoned to opposing forces, as it is difficult to detect and disarm.

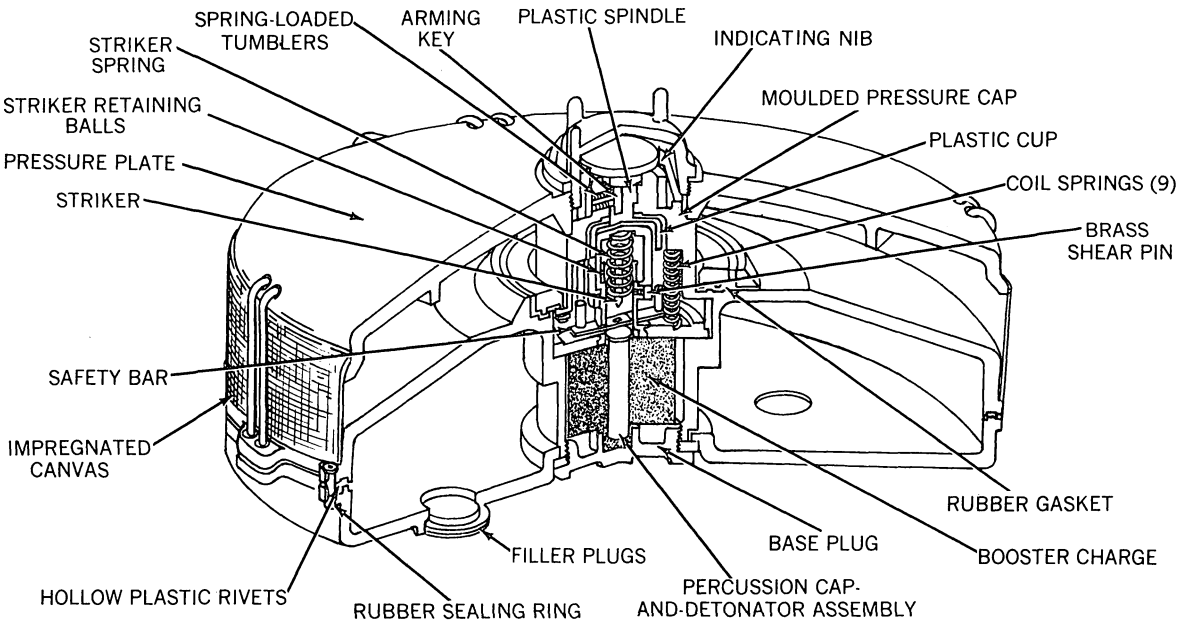


Figure 241

c. Functioning. Pressure on the pressure plate forces the upper part of the fuze assembly downward, compressing the coil springs and shearing the two brass shear pins. Further downward movement permits the two retaining balls to free the striker to fire the percussion cap.

d. Installing and Arming.

(1) Unscrew the base plug, insert a percussion cap and detonator assembly into the booster charge, insert the booster charge into the mine, and replace the base plug.

(2) Place the mine into a hole in the ground so that the pressure plate is flush with or slightly below the surface.

(3) Unscrew the pressure plug.

(4) Turn the arming key from S (*sicure*—safe) to A (*armato*—armed) and remove the key.

(5) Replace the pressure plug.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the mine from the hole.

(3) Unscrew the base plug and remove the booster charge.

(4) Remove the percussion cap and detonator assembly from the booster charge. (The fuze assembly is in *armed* position and cannot be turned to the *safe* position without the arming key.)

(5) Remove the disassembled mine to a safe storage or disposal area.

178. Bakelite Antitank Mine Type II (Italy)

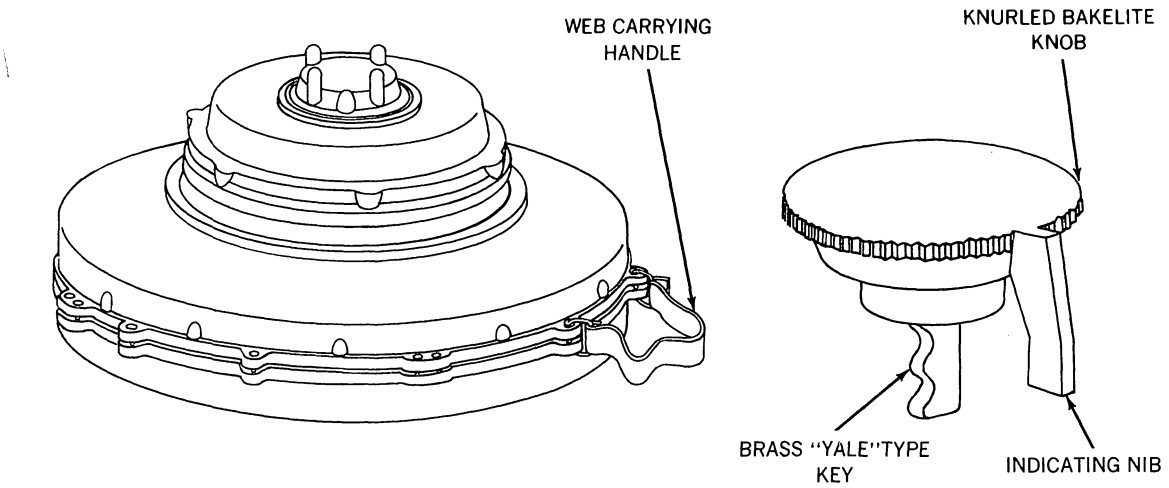


Figure 242

This mine consists of a bakelite case with a 13.9-centimeter pressure plate bearing on top of the fuze assembly and held in place by a locking collar that screws into the top of the mine case. The case is in two sections held together by lugs and plastic rivets and sealed by a rubber gasket. The mine is 29.9 centimeters in diameter and 13.9 centimeters high. The fuze is almost identical to that of Type I (par. 177), having a moulded base and pressure cap held apart by coil springs. The mine is armed by means of a "Yale" type key.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Integral pressure, with shear pins and ball release.	300 lb. (approx).	8 lb. main charge.

b. Use. This mine is laid in evacuated areas because it is difficult to detect and disarm.

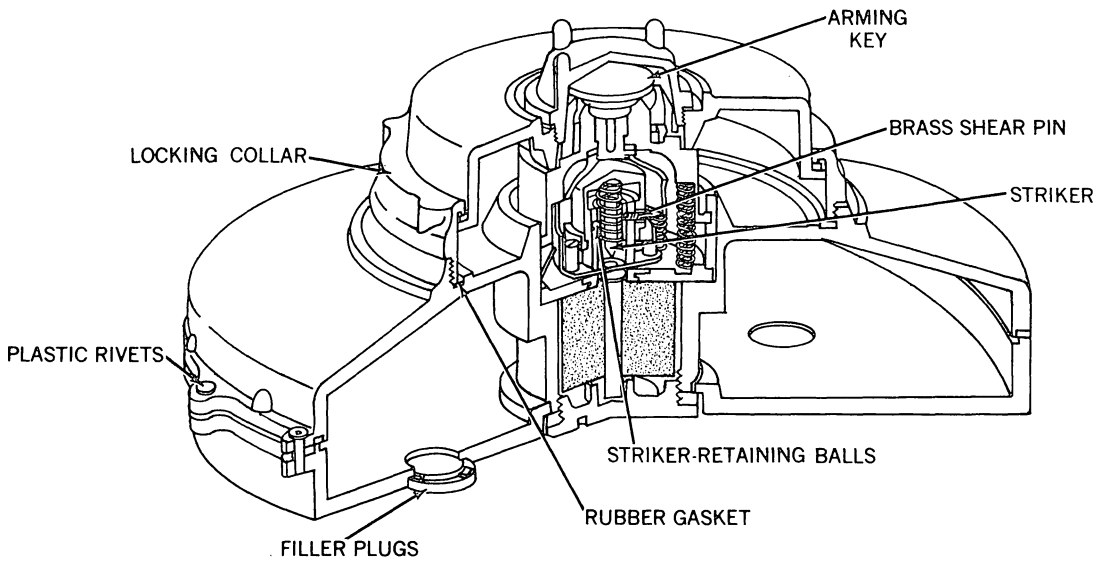


Figure 243

c. Functioning. Pressure on the pressure plate forces the upper part of the fuze assembly downward, shearing the shear pins and moving on downward to permit the retaining balls to release the striker against the percussion cap.

d. Installing and Arming.

(1) Unscrew the base plug, insert a percussion cap and detonator assembly into the booster charge, insert the booster charge into the mine, and replace the base plug.

(2) Emplace the mine so that the pressure plate is flush with or slightly below the surface of the ground.

(3) Unscrew the pressure plug, and with the arming key turn from S (*sicure*—safe) to A (*armato*—armed), and remove the key.

(4) Replace the pressure plug.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the mine from the hole.

(3) Unscrew the base plug and remove the booster charge.

(4) Take the percussion cap and detonator assembly out of the booster charge. (As the fuze assembly is in a locked position, it cannot be disarmed without the arming key.)

(5) Remove the disassembled mine to a safe storage or disposal area.

179. Antitank Mine, SH-55 (Italy)

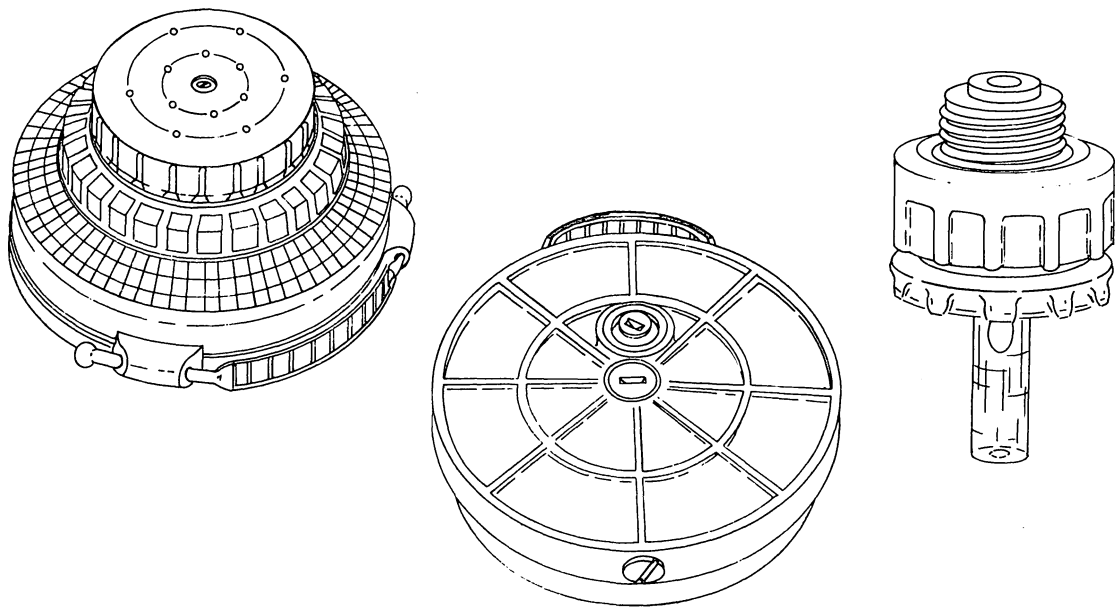


Figure 244

This is a small nondetectable plastic mine that has only two metallic components—the striker point and the detonator case. Its pneumatic fuze resists deterioration, shock, and malfunction from mechanical failure. The mine is 26.9 centimeters in diameter and 12.9 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical.....	Integral pneumatic.	440 lb....	12.1 lb. composition B (sometimes TNT).

Secondary fuze wells	Markings
2.....	"SH-55" and a star plate on top of pressure plate.

b. Use. This mine is used against tanks and other vehicles.

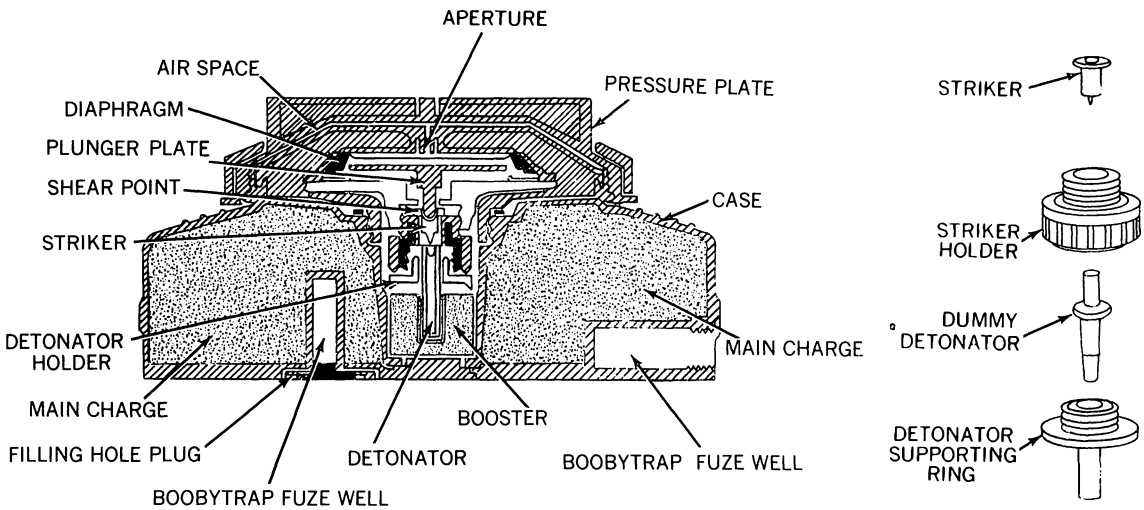


Figure 245

c. Functioning. A constant pressure on the top forces down the pressure plate, compressing the air chamber. The air, exhausted downward through a small aperture, depresses a plastic diaphragm, which pushes down the plunger plate and puts pressure on the striker. The striker retaining-collar fails, which then permits the striker to be forced onto the detonator and initiate the firing chain.

d. Installing and Arming.

(1) Unscrew and remove the pressure plate and its attached detonator retaining-collar.

(2) Remove the detonator retaining-collar and replace the dummy detonator with a live detonator.

(3) Replace the detonator retaining-collar.

(4) Replace the pressure plate.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew and remove the pressure plate.

(3) Unscrew the detonator retaining-collar.

(4) Remove the detonator.

(5) Take the mine to a safe storage or disposal area.

180. Pignone Antitank Mines, P–1 and P–2 (Italy)

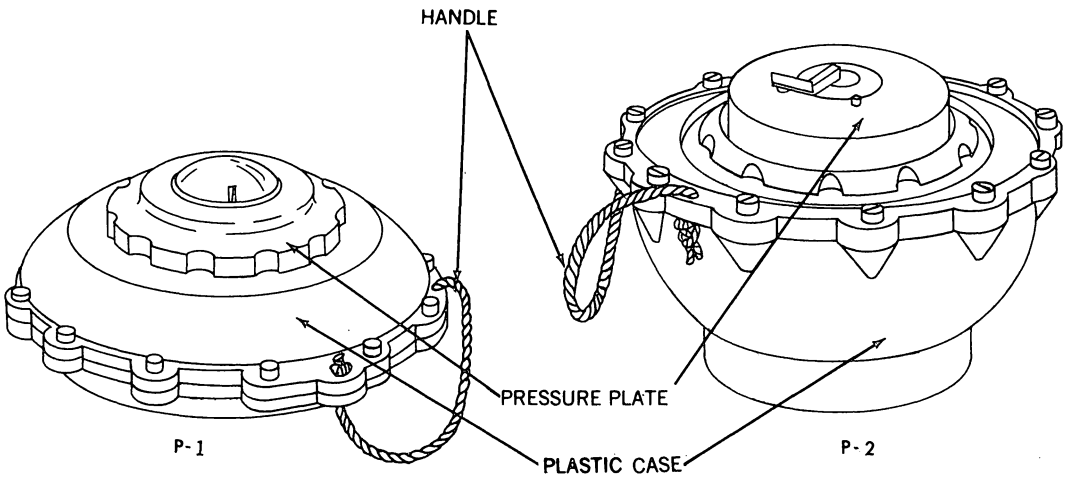


Figure 246

The present Pignone mines are modified and improved World War II models (see types I and II, pars. 177 and 178). The earlier models had plastic cases and metal springs and fastenings, thus being detectable by electric devices. The present models, however, have plastic fasteners and rubber collars or cylinders acting as springs and are thus undetectable. Model P–1 is 33.5 centimeters in diameter and 14.0 centimeters high; P–2 is 33.0 centimeters in diameter and 12.7 centimeters high.

a. Characteristics.

Shape	Type fuze	Operating pressure	Explosive
P–1: circular plate. . . . . P–2: circular bowl.	Pressure, integral, with shear pin and ball release.	242–330 lb.	P–1: 15.4-lb. TNT. P–2: 11.0-lb. TNT.

b. Use. This mine is laid in minefields to damage tank tracks and suspension systems.

(No drawing available.)

c. Functioning. The passage of a tank over the top of the mine forces the pressure plate downward, compresses the rubber collar, pushes down the fuze head, and ruptures the shear pins. The head of the fuze, thus freed, moves downward, compressing the rubber cylinder between the striker head and striker until the two retaining balls fall into the side recesses. This releases the striker to fire the percussion cap, booster, and main charge.

Note. Details of the installing and arming and disarming procedures are unknown.

181. Antitank Mine, "CETME" (Spain)

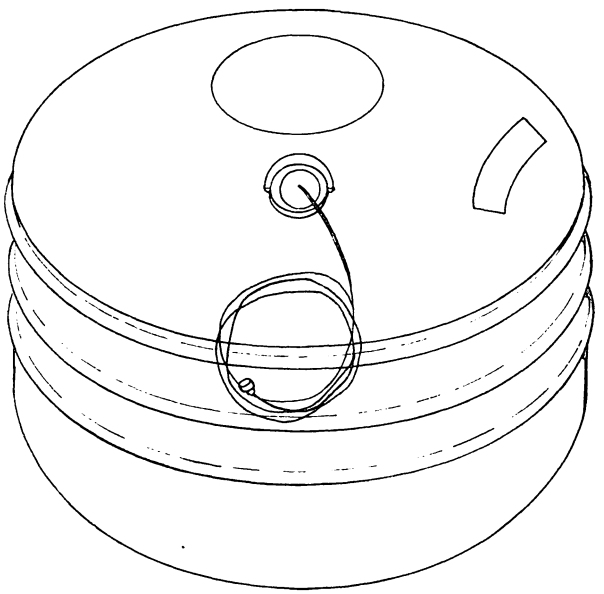


Figure 247

This is a completely nonmetallic device actuated by either a chemical or mechanical fuze. A hydraulic-damped time response principle is applied. The downward movement of the pressure plate is retarded by three hydraulic cylinders, which make the mine resistant to mechanical and explosive mine clearing devices.

a. Characteristics.

Case	Fuze	Operating force	Explosive	Secondary fuze wells
Bakelite...	Pressure, chemical or mechanical.	220 to 330 lb.	15.4 lb. TNT.	1

b. Use. This mine is emplaced in antitank minefields.

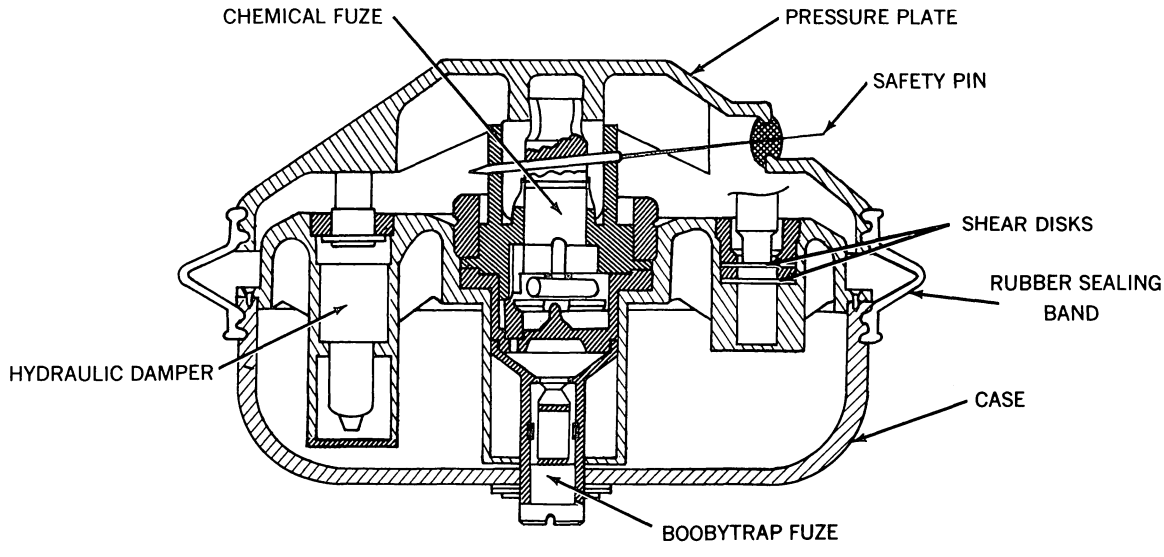


Figure 248

c. Installing and Arming.

(1) Remove the safety disk from the fuze and insert the fuze into the mine.

(2) Emplace the mine.

(3) Remove the safety pin from the fuze.

d. Disarming Procedure. Detonate the mine in place; do not attempt to disarm it.

182. Asbestos Antitank Mine (U.S.S.R.)

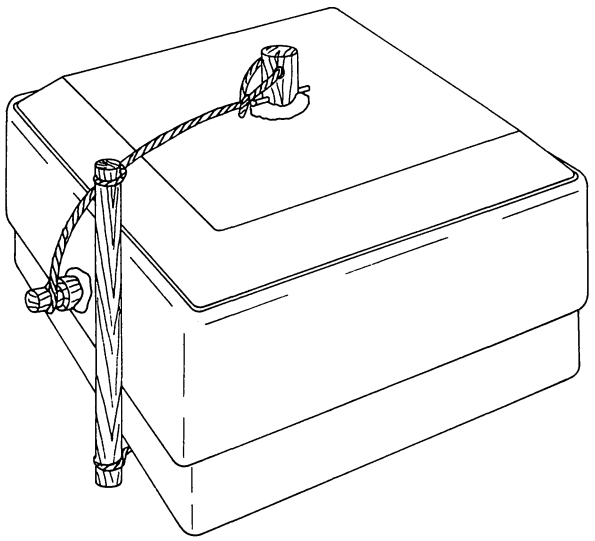


Figure 249

This mine has a waterproof asbestos case, a wood pressure piece, and an actuating lever that functions the MUV pull fuze. The case measures 24.7 by 24.7 by 12.0 centimeters. The joints and openings are closed with sealing wax. The wooden handle is tied to the pressure piece and fuze supporting plug by a rope.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Square....	MUV pull, with lever and pull pin release.	200 lb. (approx).	7-lb. powdered ammonium nitrate main charge 7.05-oz. TNT booster.

b. Use. This mine is used in minefields and road blocks. It may also be actuated by a running man.

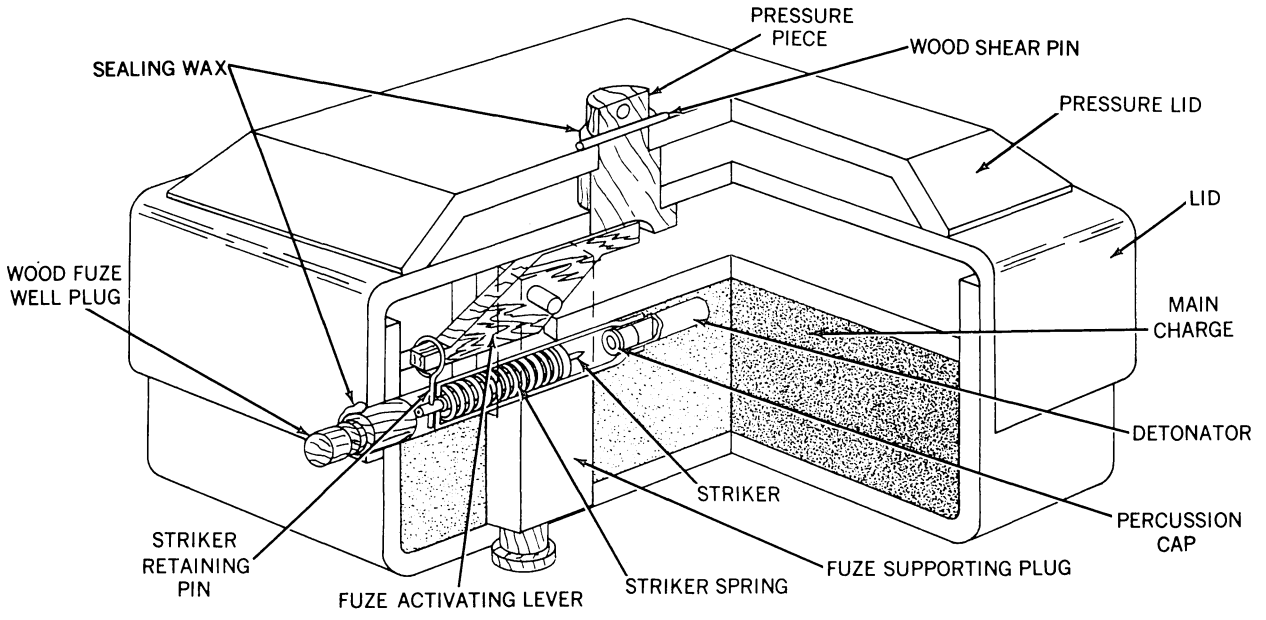


Figure 250

c. Functioning. Pressure on the pressure piece or the lid depresses the cover, rotates the fuze actuating lever, and pulls the retaining pin from the striker, firing the mine.

d. Installing and Arming.

(1) Remove the wooden fuze well plug from the side of the mine.

(2) Screw an MD–2 detonator assembly to the base of the MUV fuze.

(3) Place the fuze in the mine so that the loop of the striker-retaining pin slides over the end of the fuze actuating lever.

(4) Replace the fuze well plug.

e. Disarming Procedure.

(1) Check for and remove any antilift or antidisturbance devices.

(2) Remove the wooden fuze well plug.

(3) Remove the fuze.

(4) Separate the fuze and detonator assembly.

(5) Remove the mine and fuze to a safe storage or disposal area.

183. Antitank Mines: Paper, TMB–2, and Tarpaper, TMSB (U.S.S.R.)

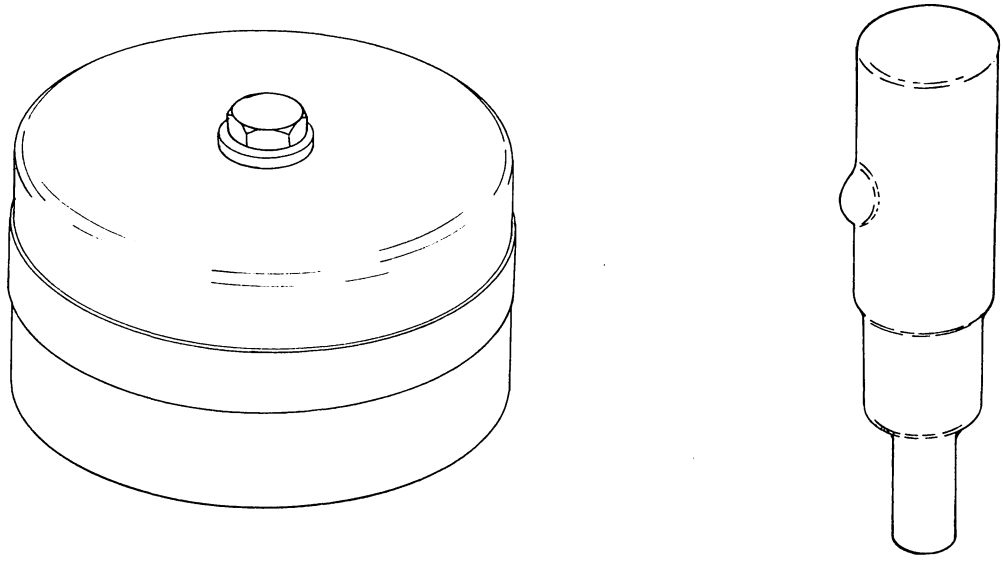


Figure 251

The TMB–2 antitank mine is encased in tar-impregnated cardboard, sealed with tape and a coating of asphalt. Model TMSB, a post-war modification of the TMB–2 and larger contains the most explosive. These mines are designed to make electronic detection difficult, if not impossible. All are similar in functioning, employment, installing and arming, and neutralizing.

a. Characteristics.

Shape	Fuze	Operating force	Measurements	
			Diam	Ht
Circular...	MV–5 pressure.	26 lb. or more.	TMB–2, 10.8 in. TMSB, 11.3 in.	TMB–2, 6.1 in. TMSB, 6.6 in.

Explosive	
Main charge	Booster
TMB–2, 11 lb. (approx) powdered amatol 80/20.	TMB–2, paper-wrapped, cylindrical TNT.
TMSB, 13 lb. (approx) powdered amatol 80/20.	TMSB, paper-wrapped cylindrical TNT.

b. Use. These three nonmetallic models are frequently used along with metal or wooden mines to remain armed and undetected in a supposedly cleared minefield.

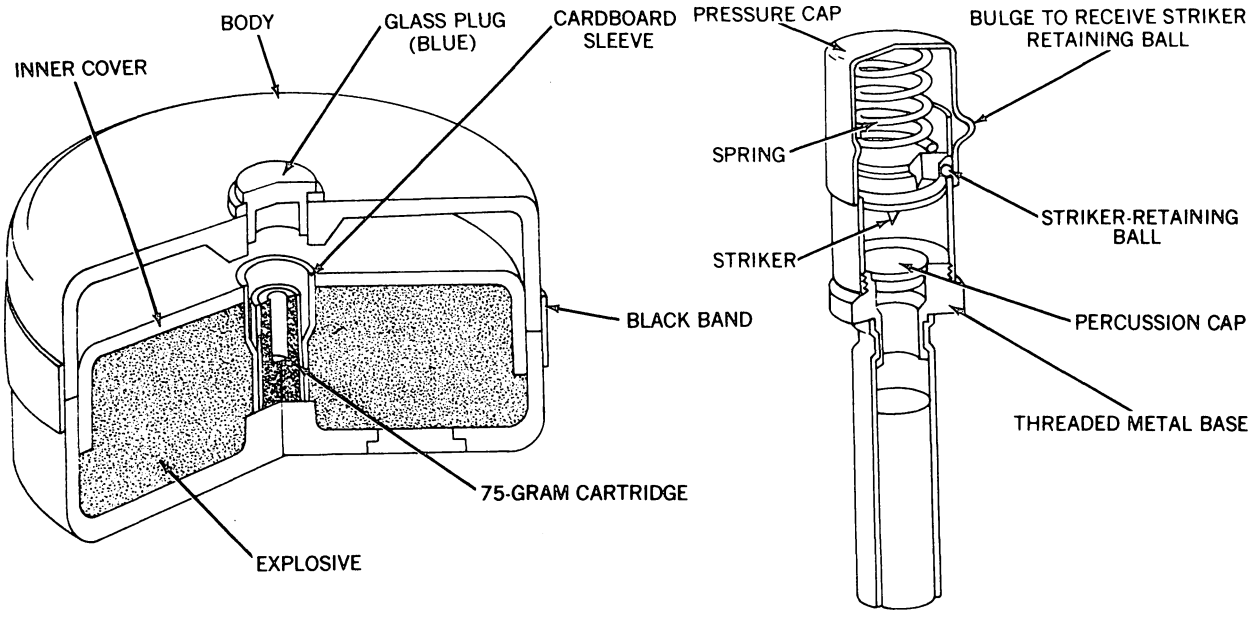


Figure 252

c. Functioning. The application of force on the glass pressure plug on top of the case actuates the fuze and detonates the mine.

d. Installing and Arming.

(1) Unscrew the glass fuze-well cap.
(2) Insert the booster charge, hole end up, into the fuze well.
(3) Screw an MD–2 detonator to the base of an MV–5 fuze and insert, detonator end first, into the booster charge.
(4) Replace the glass fuze-well cap.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Unscrew the glass fuze-well cap.
(3) Pull out the fuze and detonator assembly.
(4) Unscrew the fuze from the detonator.
(5) Remove the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. **The safest procedure is the destruction of the mine in place.**

184. Armor Penetration Land Mine, Type 99 (Japan)

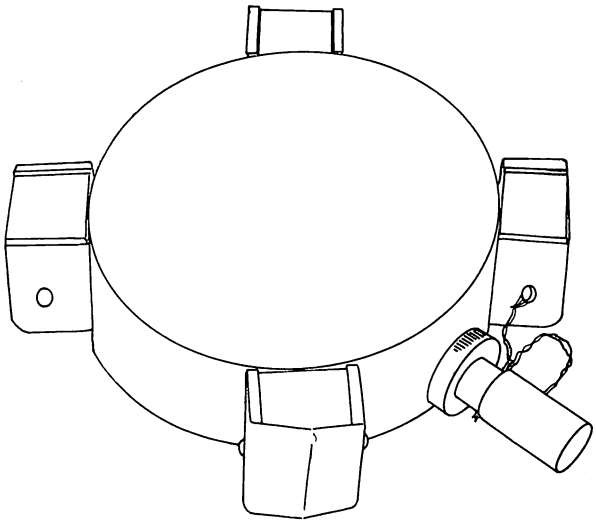


Figure 253

This armor penetration magnetic mine consists of a disc-shaped canvas bag with a snap-fastened flap on the outer edge for inserting the 8-block explosive charge. The mine has an externally threaded metal adapter for the fuze. Four equally-spaced permanent magnets are attached to the outer edge of the bag. The mine over-all is 12.0 centimeters (circular) in diameter and 3.7 centimeters high. The fuze has a compression spring and a firing pin spring, the latter contained in a firing pin sleeve. The powder delay train threads into the base of the fuze body.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	Markings
Circular...	8- to 10-second delay pressure, with ball release.	10 lb. (approx).	8 blocks 50—50 cast. RDX—TNT (1.5 lb.).	121 A— on body and on opposite side.

b. Use. This mine is used as an antitank or antivehicular mine or against armored fortifications.

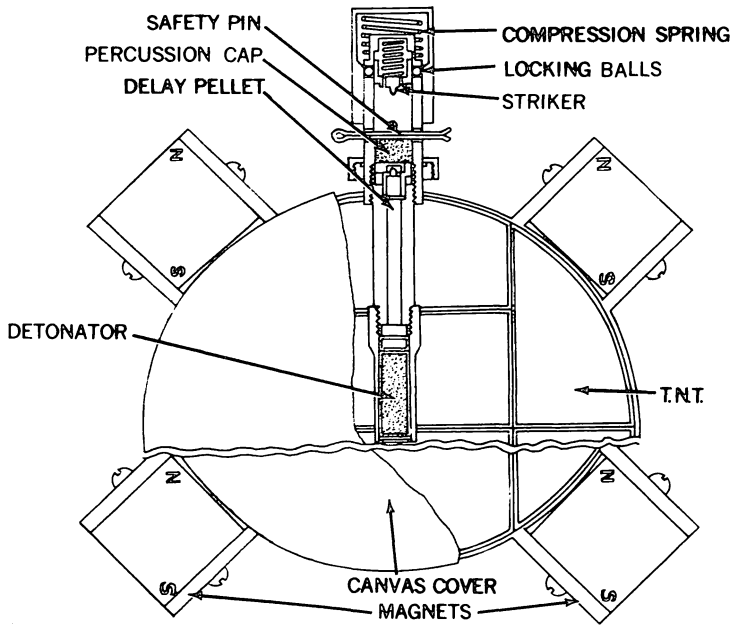


Figure 254

c. Functioning. Hand pressure on the top of the sliding pressure cap depresses it, permitting the striker retaining balls to release the striker, which, driven by its spring, fires the percussion cap, delay pellet, and main charge.

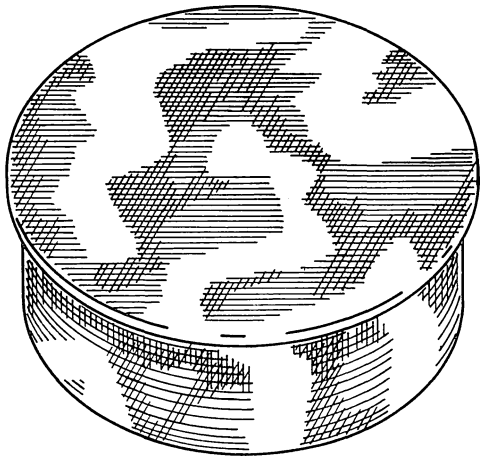
d. Installing and Arming. This mine is frequently used in pairs. In use the safety pin is pulled, the fuze cap is given a sharp rap, and the mine is placed on or tossed on armor plate within a range of 3 meters.

e. Disarming Procedure. As the mine explodes 4 or 5 seconds after the sliding pressure cap is depressed, the safest procedure is to take cover for several minutes after discovering it. If it does not explode, disarm as follows:

(1) Check for and remove any antilift devices.

(2) Unscrew the fuze from the mine.

185. Nonmetallic Shaped-Charge Antitank Mine (Hungary)



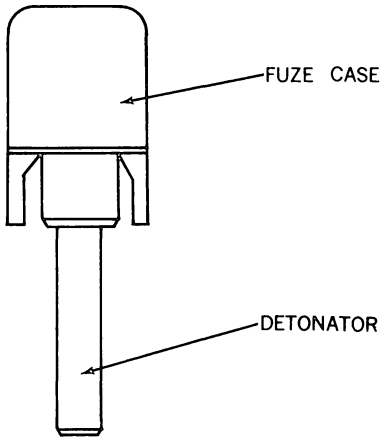


Figure 255

The charge is placed in a cardboard case with a plywood top and bottom. The mechanism is adjustable to function at the application of varying amounts of pressure. Sometimes an L-shaped metal angle iron is used as an accessory. When the tank runs over the upright leg of the L, the mine, attached to the other leg, is slammed up, detonating when it strikes the belly of the tank. The mine is 30.2 centimeters in diameter and 14.2 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Circular...	Pressure....	1,000 lb.	TNT.	PETN.

b. Use. This nonmetallic mine is used against heavy and medium combat vehicles. In snow, the fuze is adjustable to function under less than standard pressure by the omission of the pressure cap.

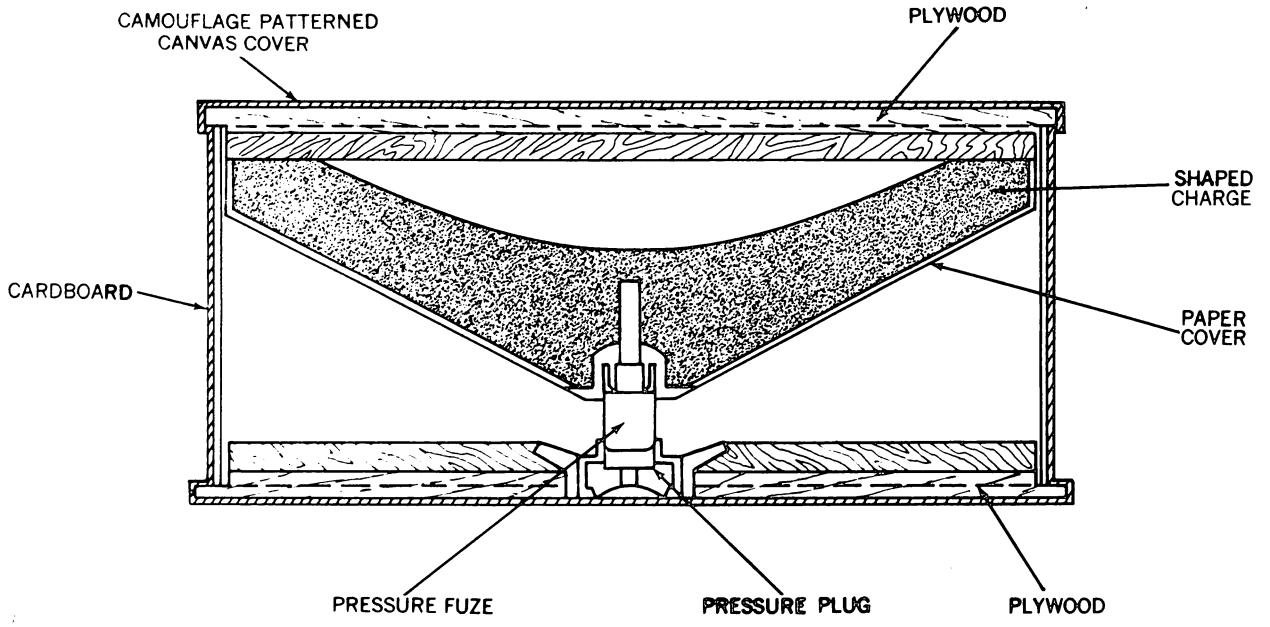


Figure 256

c. Functioning. Pressure on the top of the mine crushes the case and actuates the pressure fuze in the bottom. It may also function by impact by use of the L-shaped angle iron described above.

Note. Details on installing and arming, and disarming procedure are unknown.

186. Antitank Topfmines, A, B, and C (To. Mi.) (Germany)

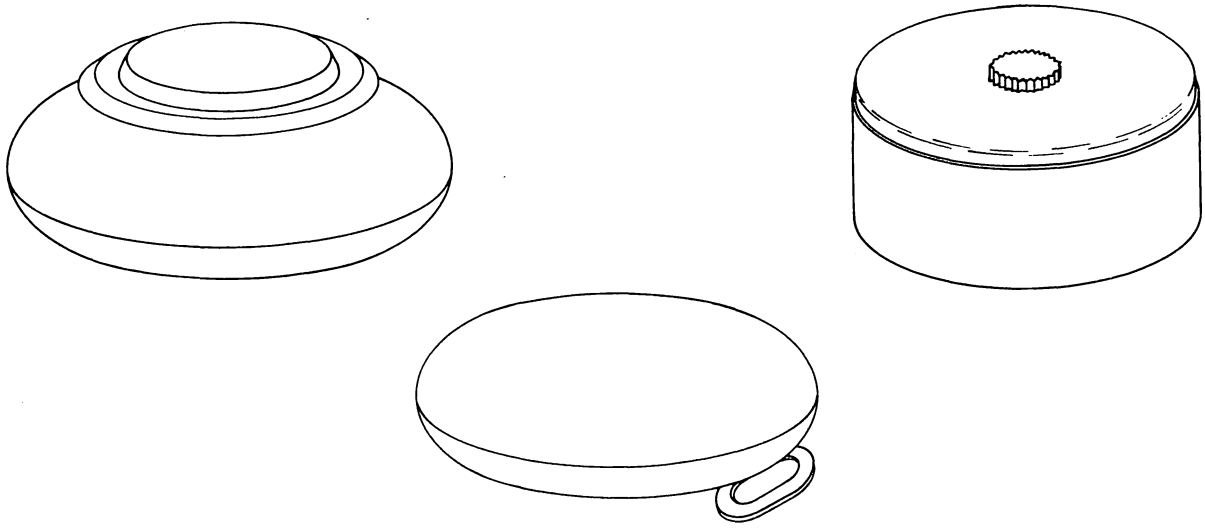


Figure 257

These nonmetallic "pot" mines were produced to prevent their location by electronic detectors. Type A, 30.4 centimeters in diameter and 12.7 centimeters high, has a case made of pressed wood pulp, cardboard, and tar. Some mine cases are made of pressed bituminous coal waste 2.5 centimeters thick. Type B differs from Type A only in the curved shape of the top and in the pressure plate shear groove, which is located inside the mine to prevent the accumulation of water in the shear groove. Topfmine C, or paper mine, has a flat top and bottom, and a glass pressure plug that screws into the fuze well opening.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Topfmine fuze SF1, pressure-chemical, or snap or tilt fuze.	SF1—370 lb., snap or tilt-strong sideward pressure.	13 lb.

Secondary fuze wells	Markings
1-in. bottom in all three models.	A—To.Mi. A 4531, waterproofed B—To.Mi. 4531 C—To.Mi. 4531

b. Use. These mines were laid in holes with a black metallic sandy substance called tarn-sand sprinkled on the top, after which they were covered with no more than 5 centimeters of dirt or soil.

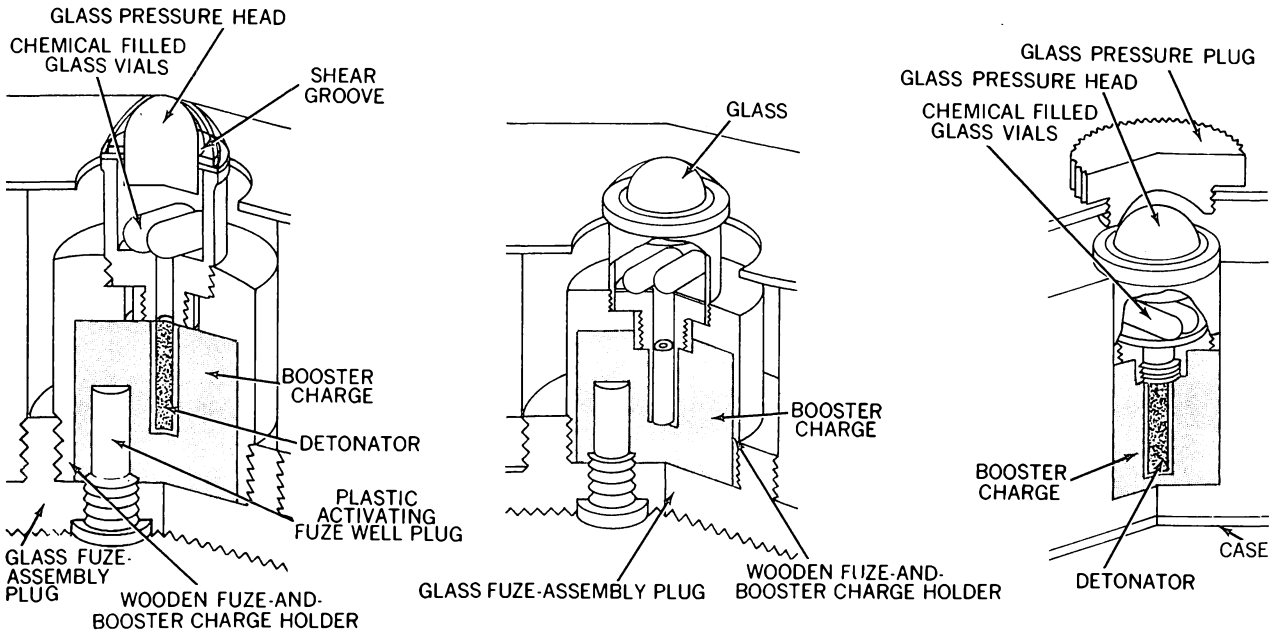


Figure 258

c. Functioning.

(1) *Topfmine fuze SF1.* Pressure on the pressure plate shears it off at the shear groove, transmitting this pressure on the fuze pressure head which crushes the two glass vials of chemicals. These react to cause a flame that sets off the detonator, booster, and main charge.

(2) *Snap or tilt fuze.* Sideward pressure on the snap fuze breaks it, releasing the striker and on the tilt rod, depresses it releasing the striker. The released striker, in either case, plunges into the percussion cap, firing the detonator, booster, and main charge.

d. Installing and Arming Topfmines A and B.

(1) *Topfmine fuze SF1.*

(*a*) Unscrew the glass fuze assembly plug from the mine.

(*b*) Screw the fuze, with detonator into the wooden fuze and booster charge holder.

(*c*) Firmly screw the glass fuze assembly plug into the bottom of the mine, making sure that the rubber washer and its groove in the mine case are perfectly clean.

(*d*) Lay the mine in the hole with the pressure plate up and cover with no more than a 2-inch camouflage layer. Keep a distance of 2 meters between mines to guard agains sympathetic detonation.

(2) *Snap or tilt fuze.*

(*a*) Turn the mine upside down and place it in the hole.

(*b*) Remove the activating fuze well plug and screw a snap fuze or tilt fuze, with detonator, into the activating fuze well in the glass fuze assembly plug.

e. Installing and Arming, Topfmine C.

(1) *Topfmine fuze SF1.*

(*a*) Unscrew the glass pressure plug from the mine.

(*b*) Screw the fuze with detonator, into the booster charge.

(*c*) Firmly screw the glass pressure plug into the mine case.

(*d*) Lay the mine in the hole with the

glass pressure plug up and cover with no more than a 2-inch camouflage layer. Keep a distance of 2 meters between mines to insure against sympathetic detonation.

(2) *Snap or tilt fuze.*

(*a*) Unscrew the glass pressure plug from the mine.

(*b*) Screw either a snap or tilt fuze, with detonator, into the booster charge.

f. Disarming Topfmines A and B.

(1) *Pressure plate up.*

(*a*) Check for and remove any antilift devices. These mines have activating fuze wells.

(*b*) Make sure that the pressure plate is not depressed and the mine not damaged, especially along the shear groove.

(*c*) Unscrew the fuze from the wooden fuze and booster charge holder.

(*d*) Separate the fuze and detonator.

(*e*) Remove the mine and fuze to a safe storage or disposal area.

(2) *Pressure plate down.*

(*a*) Check for and remove any antilift device.

(*b*) Carefully uncover the mine and fuze.

(*c*) Trace and cut any slack trip wires.

(*d*) Insert a safety pin in the safety pin hole of the fuze.

(*e*) Remove mine and fuze to a safe storage or disposal area.

g. Disarming Topfmine C.

(1) *Topfmine fuze SF1.*

(*a*) Check for and remove any antilift devices.

(*b*) Make sure that the glass pressure plug is not depressed and the mine is undamaged.

(*c*) Unscrew the glass pressure plug from the mine.

(*d*) Unscrew the fuze from the booster charge.

(*e*) Unscrew the detonator from the fuze.

(*f*) Remove the mine and fuze to a safe storage or disposal area.

(2) *With snap or tilt fuze.*

(*a*) Check for and remove any antilift devices.

(*b*) Carefully uncover the mine.

(*c*) Trace and cut any slack trip wires.

(*d*) Insert a safety pin in the safety pin hole of the fuze.

(*e*) Remove the mine and fuze to a safe storage or disposal area.

h. Additional Precautions. Topfmines, or any other mines, fitted with tilt fuzes are extremely dangerous and many are impossible to disarm. **Such mines should be detonated in place, except in tactical emergencies.**

187. Probe-Proof Antitank Mine, Model 1951 (France)

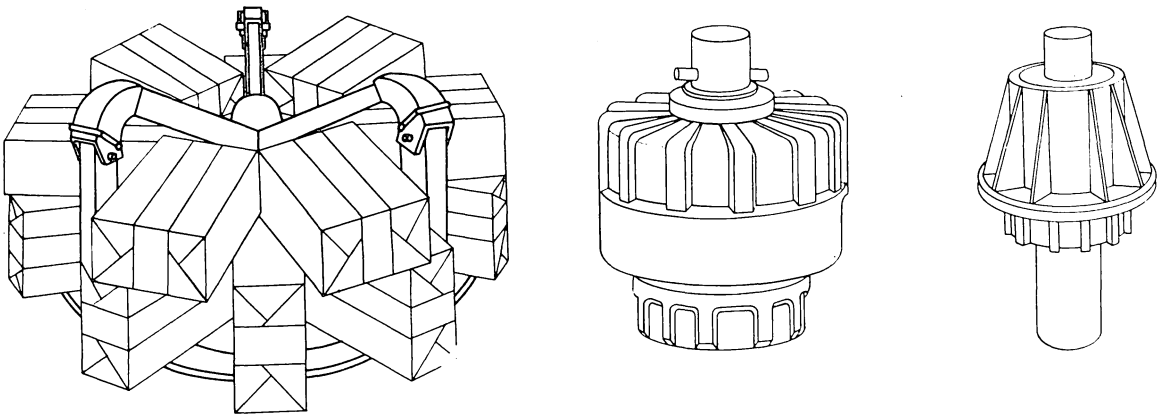


Figure 259

This probe-proof mine has a light frame or grille made of plastic. The bottom has three posts that rise from its perimeter to support a three-armed "spider" on shear pins. A cylindrical container holding the booster charge and a well for the main fuze is mounted in the center of the base directly below the junction of the spider arms. Another well in the bottom may be used for boobytrapping. The plastic explosive charges resembling cakes of brown laundry soap are stacked in the mine frame like wedges of cake, with their inner edges touching the booster and fuze container. As the plastic explosive has about the same consistency as earth and the only rigid material is the frame or grille, the mine is almost probe proof. The mine is approximately 23.8 centimeters in diameter and 14.9 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Roughly cylindrical.	Pressure-friction or pressure-chemical.	550 lb....	11 to 16 lb. PETN plastic, varying.

Markings

Code number, abbreviated nomenclature, manufacturer's symbol, lot number.

b. Use. This mine is used as an undetectable trackcutting antitank obstacle.

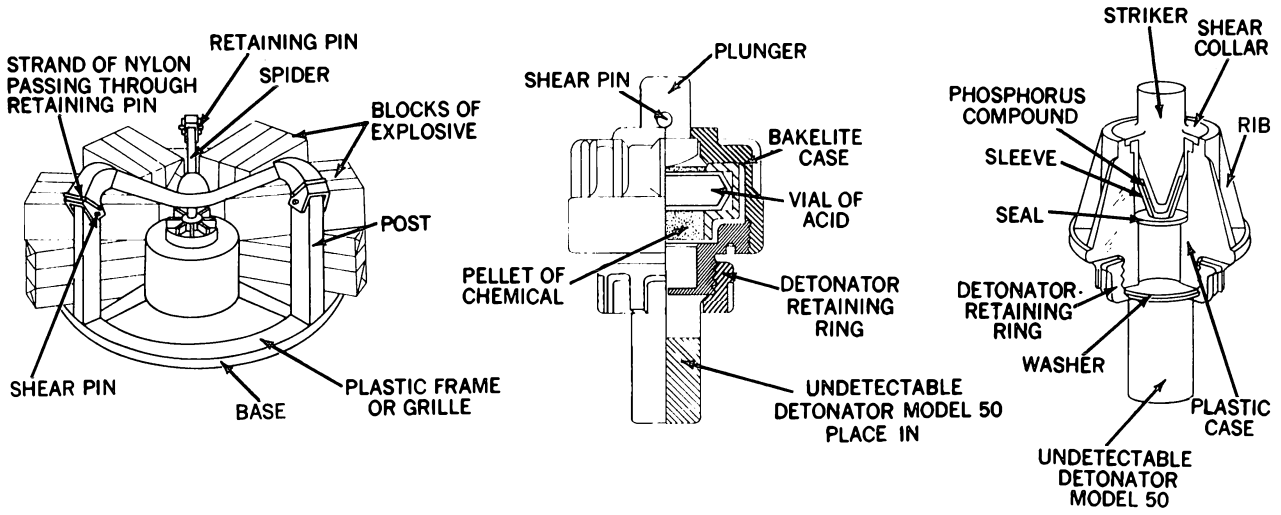


Figure 260

c. Functioning. The application of pressure on top of the mine causes one or more of the spider-supporting shear pins to fail, transmitting the pressure to the centrally located fuze. The plastic shear collar of the friction fuze then fails, which presses the phosphorus-and-glass charged cone into a mating sleeve. A small movement (2-mm) of the cone against the sleeve causes enough friction to flash the phosphorus mixture and initiate the firing chain. If a Model 1952 pressure-chemical fuze is used, the vial of sulphuric acid is broken by the pressure and mixes with the chlorate powder, causing a flash that initiates the firing chain.

d. Installing and Arming.

(1) Remove the spider.
(2) Place the plastic base in the ground.
(3) Attach detonator to a Model 1950 pressure-chemical fuze or Model 1952 pressure-friction fuze.
(4) Install the fuze in the fuze well.
(5) Replace the spider.
(6) Stack the explosive in the frame, being careful not to put pressure on the spider.
(7) Boobytrap the mine if desired.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the spider.
(3) Remove the fuze and detach the detonator.
(4) Remove the explosive and fuze to a safe storage or disposal area.

f. Additional Precautions. A Model 1952 pull-friction fuze may be placed in the well in the bottom of the booster container.

188. Antitank Mine, Model 1951 (France)

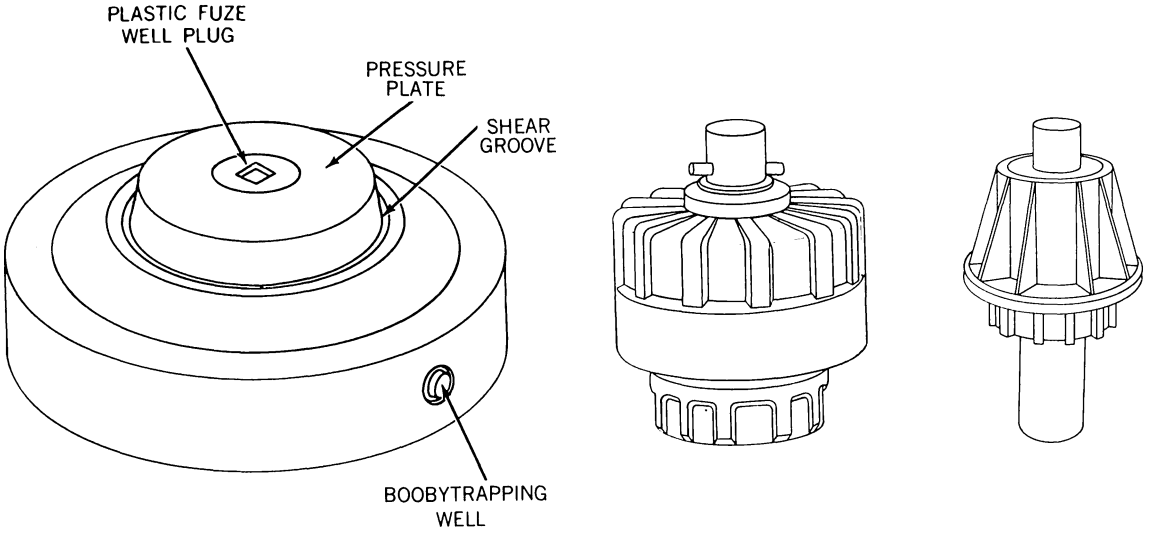


Figure 261

This mine has no case. It consists of three sections of cast TNT reinforced with glass wool (about 5 percent by weight). These include a pressure-plate section, a central core that holds the fuze and detonator, and an outer clamping ring that holds the first two sections together. Every part of the mine except the plastic fuze-well plug, booster container, and fuze is explosive. It is not locatable by conventional electronic detectors. This caseless mine is 29.9 centimeters in diameter and 9.8 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular...	Pressure-chemical or pressure-friction.	660 lb. (approx).	Either 16-minus lbs. or 20-minus lbs. cast TNT.

Markings

Code number, amount and type of explosive, manufacturer's symbol, lot number, and year of fabrication.

b. Use. This is an undetectable mine designed to damage the tracks of medium and heavy armor.

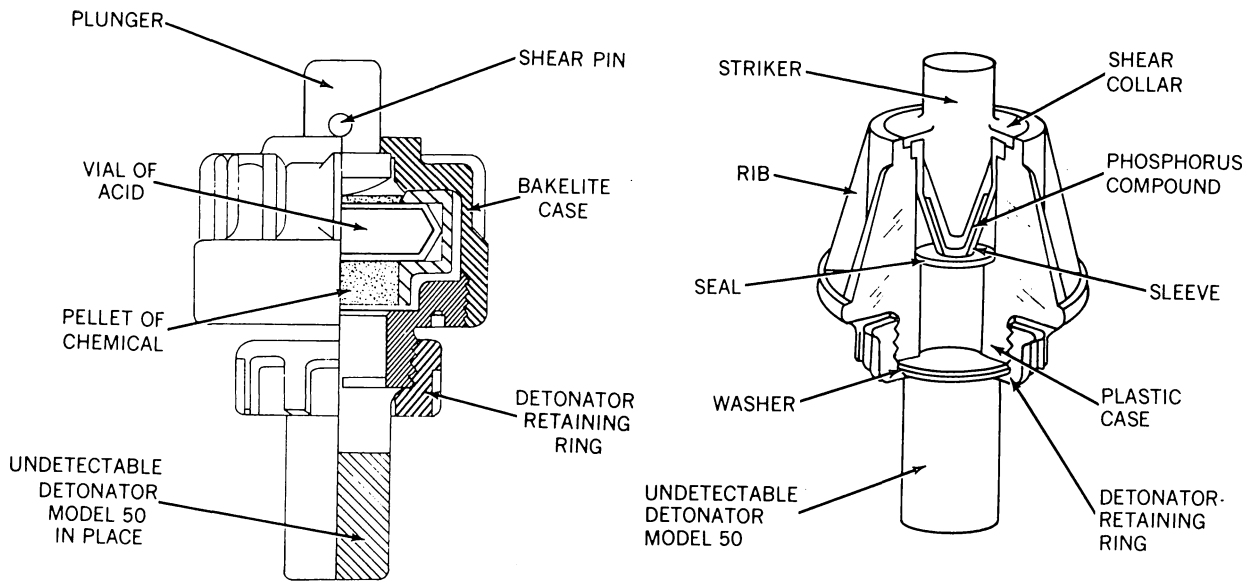


Figure 262

c. Functioning. The unit detonates under pressure on the top. This shears away the pressure plate and actuates the fuze (pressure-friction, Model 1952). The plastic fuze collar fails and a plastic cone loaded with a glass-and-phosphorus mixture is pressed into a plastic mating sleeve. The friction thus caused flashes the mixture and initiates the firing chain. If the unit is fitted with the Model 1950 pressure-chemical fuze, the pressure breaks a vial of acid that mixes with a chemical powder to produce a flame that starts the firing chain.

d. Installing and Arming.

(1) Remove the fuze well cover.

(2) Insert a detonator into the fuze (Model 1952 undetectable pressure-friction, or Model 1950 pressure-chemical).

(3) Put the fuze into the well.

(4) Replace the fuze well cover (covers must not be interchanged between mines.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the fuze well cover.

(3) Pull the fuze from the mine and separate the detonator from the fuze.

(4) Take the mine and fuze to a safe storage or disposal area.

189. Antitank Mine, Model Mi-101 (Sweden)

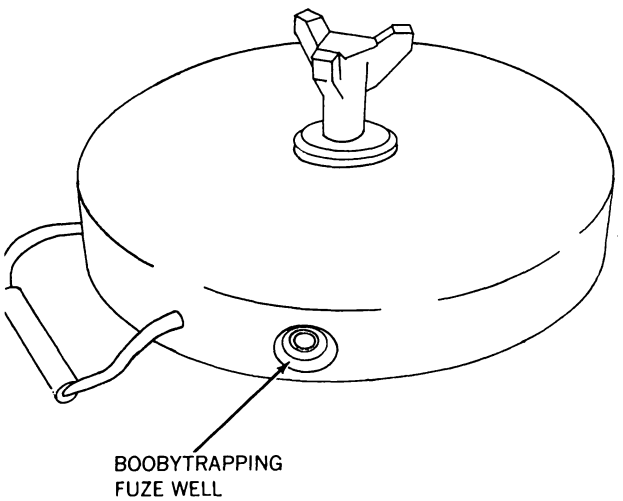


Figure 263

This is a caseless mine with a fiberglass-reinforced outer surface. About 95 per cent of its total weight is explosive. As the fuze does not become inoperative by deterioration from moisture, the mine remains effective when buried in the ground over a long period of time.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	Secondary fuze wells
Cylindrical...	Integral..	440 lb....	26.4 lb. hexatol (RDX/TNT (50/50)).	2

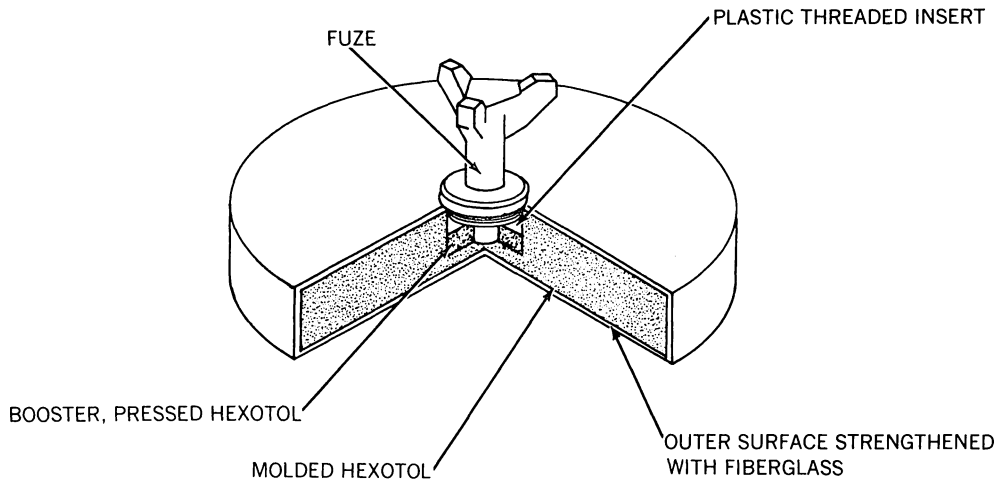


Figure 264

b. Installing and Arming.
(1) Emplace the mine.
(2) Remove the fuze well cover.
(3) Screw in the fuze.

c. Disarming Procedure.
(1) Search for and remove any antilift devices.
(2) Unscrew the fuze from the mine.
(3) Remove the mine from the emplacement and take to a safe storage or disposal area.

Note. The Mi-102 and Osten M-5 antitank mines are similar to the Mi-101 except for their size and the pressure required for detonation. These are a family of mines designed to defeat electronic detection. The M-5, however, has no boobytrapping wells; but a pressure-release device is designed for use beneath it.

190. Terra Cotta Land Mine, Type 3 (Japan)

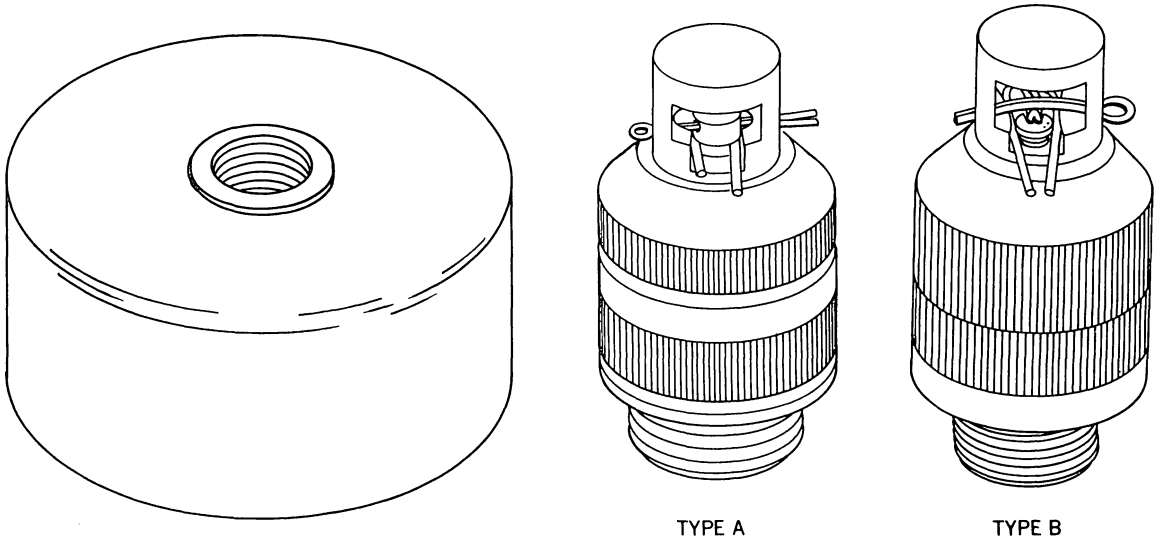


Figure 265

This antivehicular–antipersonnel mine is circular with slightly convex top and a moderately concave base made of terra cotta. A rubber fuze seat is sealed in place in a hole in the center of the top of the mine. The explosive is contained inside the mine in a light rubber bag. The fuze body, cover, plunger, and striker support are made of bakelite. The springs, percussion hammer, striker, and release fork (metal parts) are found inside the fuze. The outer core is 10.4 centimeters high without fuze and 15.7 centimeters with fuze, and 21.8 centimeters in diameter. A larger model of this mine appeared, measuring 26.6 centimeters in diameter and 8.87 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical...	Bakelite pressure-pull fuze.	20–25 lb. pressure 22 lb. pull.	4.5 lb. type 88 6.5 lb. 50% TNT; 50% ammonium nitrate, 4.5 lb. 90% ammonium nitrate; 10% dinitronapthalene.

b. Use. Although these mines are sometimes laid in roads and airfields, they are generally used as antipersonnel mines with trip wires attached to the hammer-release fork.

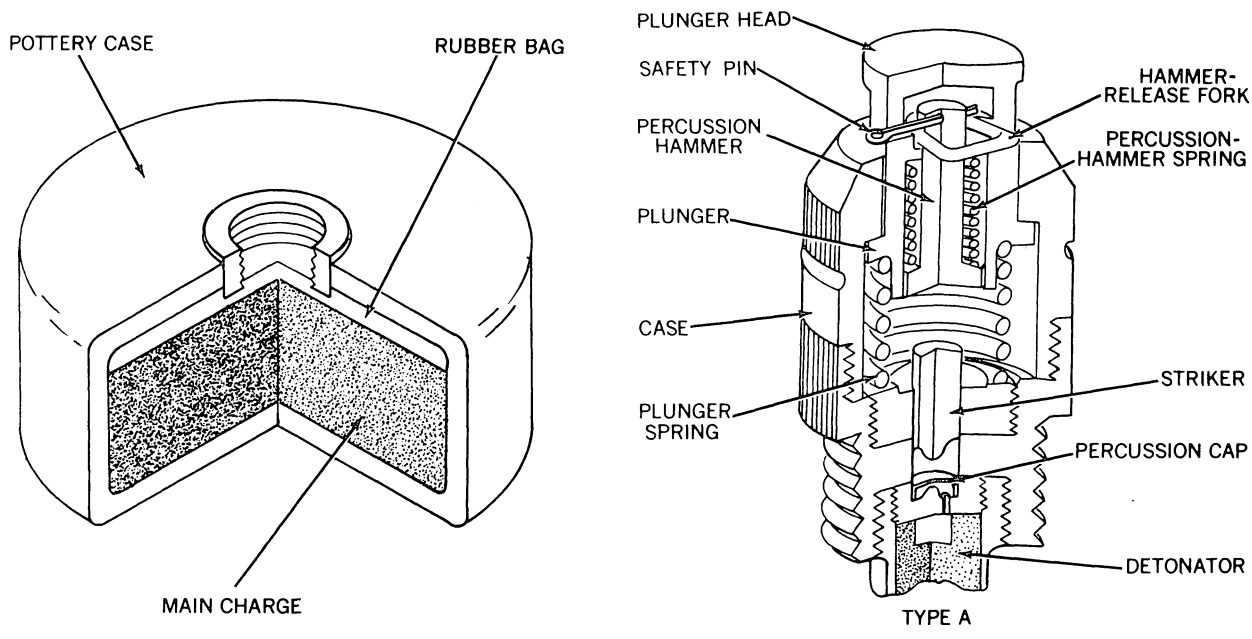


Figure 266

c. Functioning. Pressure on the top of the fuze case spreads the hammer-release fork and fires the striker, or a pull on the trip wire removes the release fork and fires the striker. In either case the freed striker slams against the percussion cap and fires the mine.

d. Installing and Arming.

(1) Insert the percussion cap and detonator into the fuze.
(2) Screw the fuze and detonator into the threaded rubber fuze adapter. (Tie a pull wire to the hammer-release fork, if setting the mine for antipersonnel use, and fasten to an anchor.)
(3) Remove the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Insert a safety pin or nail into the fuze.
(3) Cut the pull wire.
(4) With the safety pin in and the trip wires out, unscrew the fuze from the mine (type A fuze has right hand threads, type B, left hand threads).
(5) Remove the percussion cap and detonator from the fuze.
(6) Move the mine and fuze to a safe storage or disposal area.

191. Clay Antitank Mine (Germany)

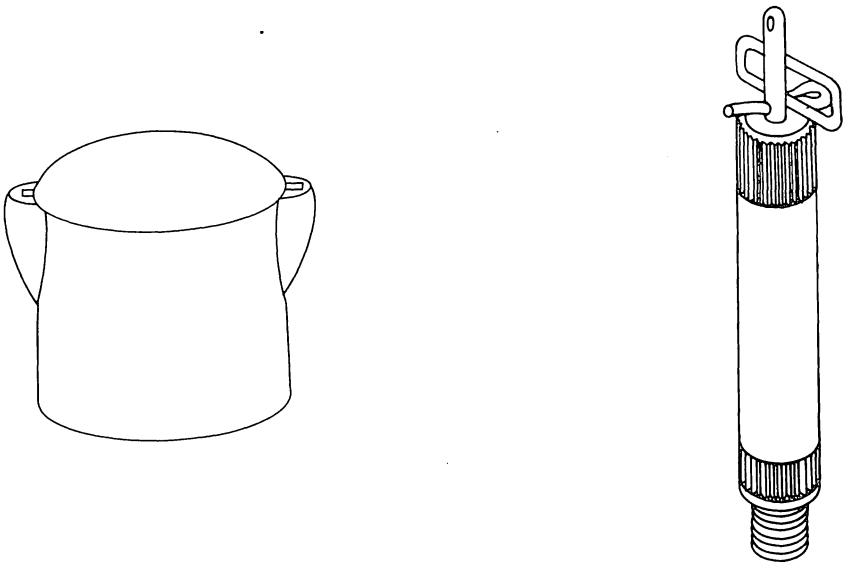


Figure 267

This antitank mine consists of a baked-clay case 21.5 centimeters in diameter and 25.4 centimeters high. On the opposite sides of the case are two round bulges that house pull fuzes. The detonators are connected by detonating cord to the booster charges in the bottom of the case. The clay pressure lid has two notches on opposite sides which clear the fuze striker shafts but not the wings of the retaining pins.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Urn....	Pull fuze 42, with retaining pin removed by pressure.	150 to 200 lb.	Unknown.	Unknown.

b. Use. This mine is laid in areas being abandoned to the enemy. Its clay construction prevents electronic detection.

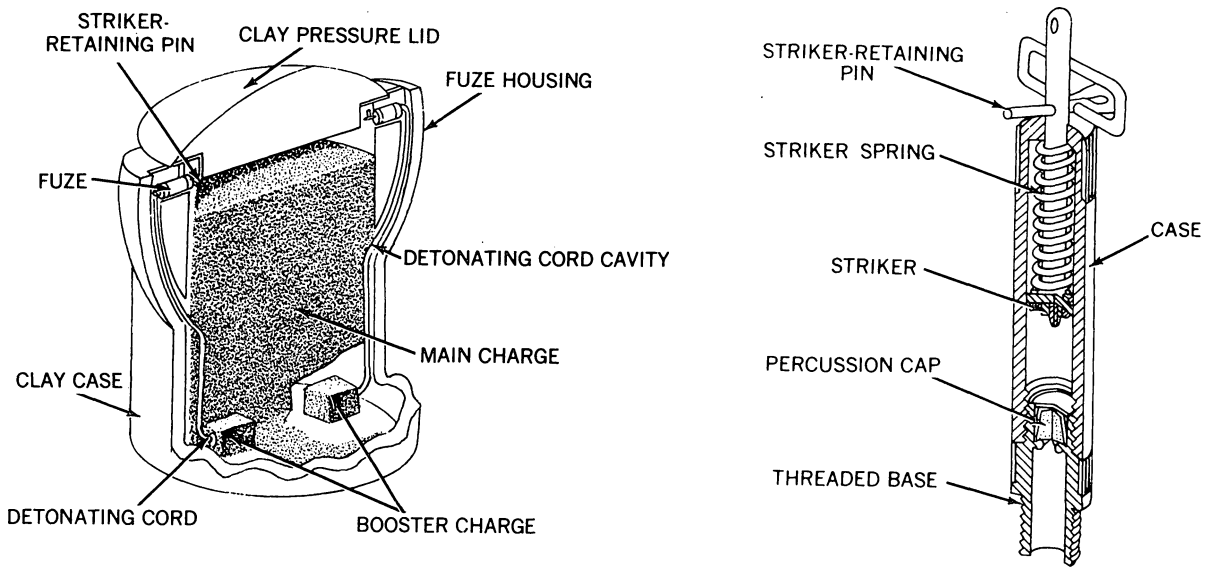


Figure 268

c. Functioning. Pressure on the clay lid lowers it and pushes out the striker retaining pins, releasing the spring-driven strikers against the percussion caps and firing the mine.

d. Installing and Arming.

(1) Remove the pressure lid.

(2) Thread the detonating cord through the cavities and connect each of the two lengths to a booster charge in the bottom of the case.

(3) Connect the other end of each length of detonating cord to the detonator of the pull fuze 42.

(4) Insert the main charge in the clay case and install the pull fuzes so that the wings of the retaining pins of both fuzes are horizontal and below the striker shaft.

(5) Replace the pressure lid so that the notches line up with the fuzes and place the mine in a hole so that the pressure lid is level with the ground surface. Mines should be laid at least 2.74 meters apart to prevent sympathetic detonation.

e. Disarming Procedure.

(1) Check for and remove any antilifting devices.

(2) Carefully lift up the pressure lid.

(3) Examine the striker retaining pins to see that they extend all the way through the striker shafts.

(4) Cut the detonating cords near the fuzes and remove the fuzes.

(5) Remove mine and fuzes to a safe storage or disposal area.

192. Shell Mines (U.S.S.R.)

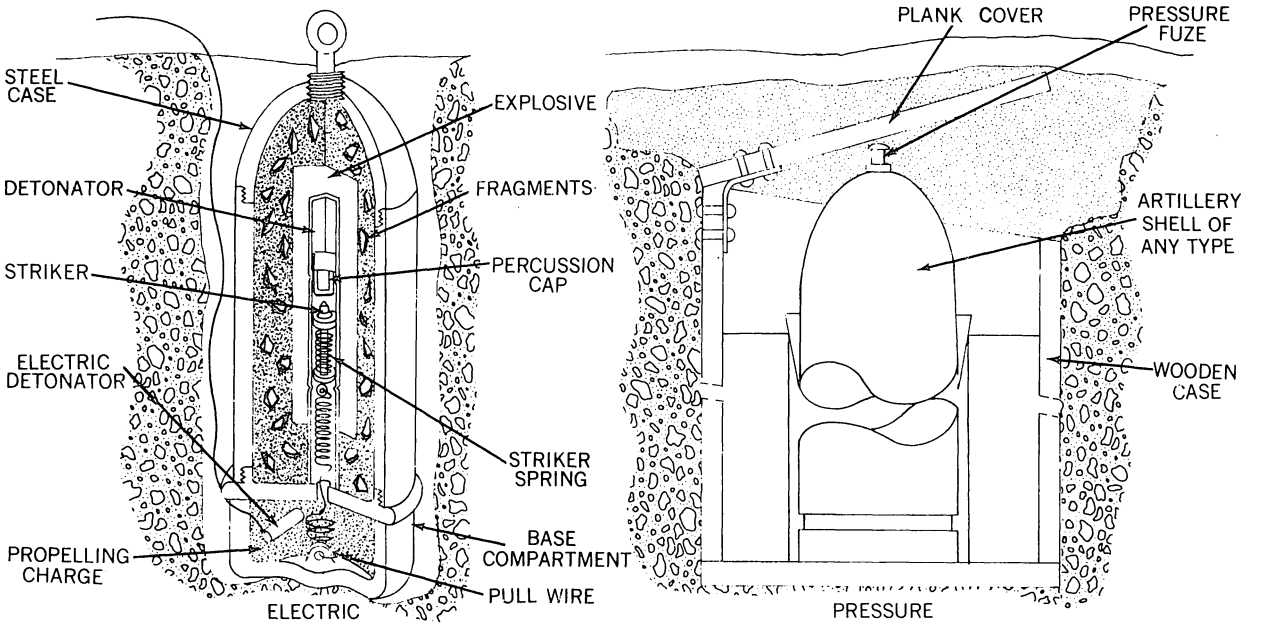


Figure 269

Artillery and mortar shells, bombs, and rockets were used very effectively in World War II as improvised mines. They were fuzed and laid in many ways for antitank and antipersonnel use. Usually they were buried and fuzed to fire either electrically or by pressure with a pressure board or by tripwires attached to a pull fuze in the nose of the shell. Bounding type shell mines were rigged with a steel pull wire about 1.4 meters long, fastened to the base, which, when the mine was thrust upward by a propellant, actuated a pull fuze and exploded the shell above the ground. Depending on the way shell mines are fuzed and laid, disarming may involve the cutting of the electric leads and removing the fuze, or removing the pressure board or lid and removing the fuze. In all cases, extreme caution must be taken in the event of actuation by antilift or antidisturbance devices.

193. Heavy Shell Mine, M-G (Switzerland)

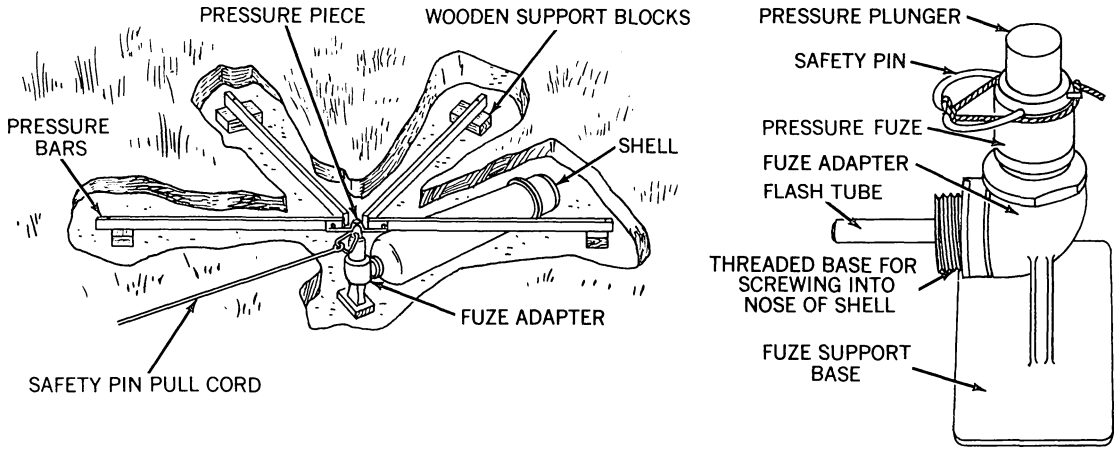


Figure 270

This 120 millimeter diameter shell mine is nearly identical to the French shell mine and is fuzed in a similar manner. Along with this mine, the Swiss use four to six angle-irons in 0.6 meter lengths laid with one end resting on the fuze to function as pressure bars and radiating from the fuze like the spokes of a wheel.

a. Use. This improvised mine is laid against tanks and vehicles in protective minefields and road blocks.

(No drawing available.)

b. Functioning. Pressure on the angle irons is transferred to the pressure fuze, shearing the shear pin and firing the percussion cap and primary detonator. The flash from the primary detonator passes through the flash tube and ignites the powder train, exploding the main detonator, booster, and shell.

c. Installing and Arming.

(1) Screw the pressure fuze and flash tube into the adapter.
(2) Screw the fuze adapter into the nose of the shell.
(3) Lower the pressure bars into place on the head of the pressure fuze.

d. Disarming Procedure.

(1) Carefully check the loose pressure bars for and remove any pull wires and activating devices.
(2) Remove the pressure bars.
(3) Unscrew the fuze without putting any pressure on the pressure plunger.
(4) Remove the percussion cap, percussion cap holder, and the primary detonator.
(5) Check the shell for and remove any antilift devices.
(6) Unscrew the fuze adapter from the nose of the shell.
(7) Remove the main detonator from the shell.
(8) Take all parts of the disassembled mine to a safe storage or disposal area.

194. Airstrip Mine

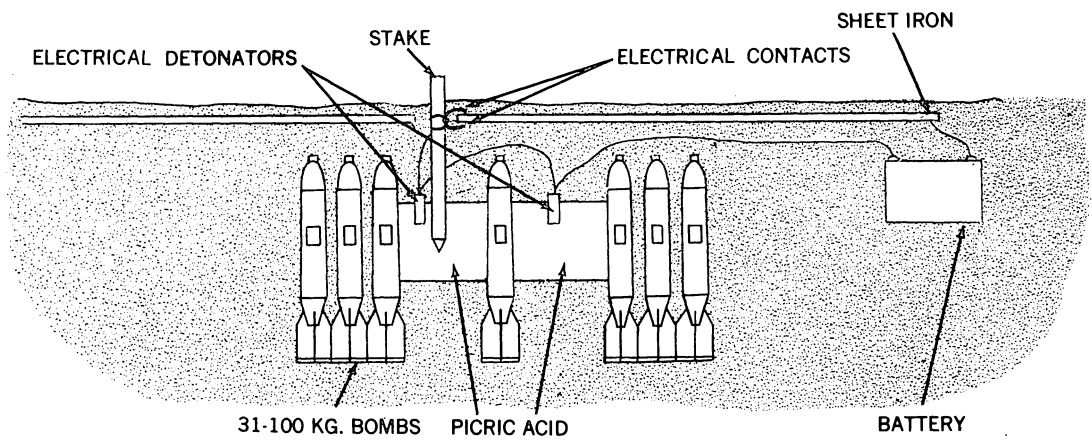


Figure 271

The airstrip mine consisted of seven 31–100 kg bombs, picric acid blocks, two sheet iron plates, two detonators, electric wiring, and a battery. The bombs were stacked around the picric acid blocks into which the electric detonators were inserted. The mine was rigged to complete an electric circuit, either by lifting or depressing the sheet iron plates. A clockwork fuze was also provided to fire the charge, if the sheet iron plates were not disturbed.

195. Improvised Antitank Mine (Japan)

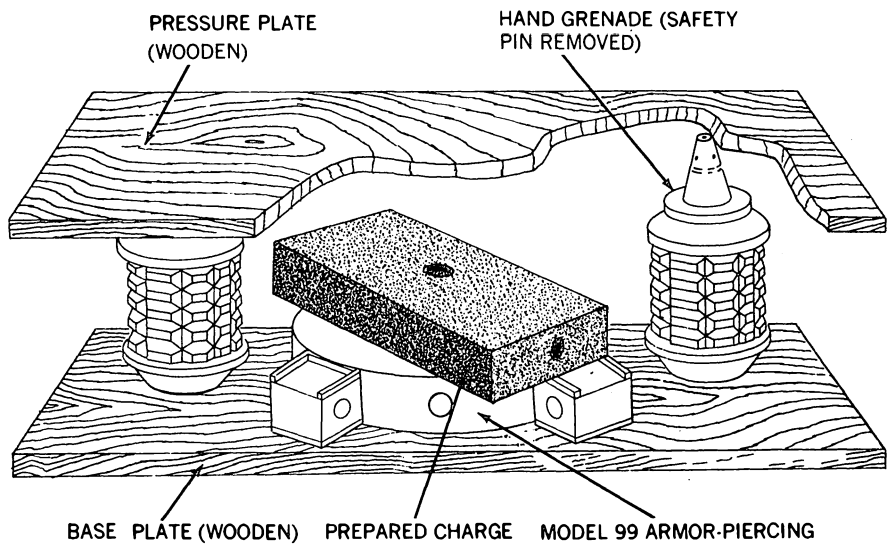


Figure 272

This caseless mine consists of a wooden base plate and a wooden pressure plate supported by two hand grenades, a 2-pound prepared charge of picric acid and a model 99 magnetic armor-piercing mine.

a. Use. This mine is laid against tanks.

(No drawing available.)

b. Functioning. Pressure on the pressure board actuates the hand grenades, which when exploding, set off sympathetically the 2-pound charges and the magnetic mine.

c. Installing and Arming.

(1) Prepare a hole for laying the mine.

(2) Lay the base plate in the bottom of the hole.

(3) Place on the base plate two hand grenades with pins removed and the magnetic mine. On top of these, place the 2-pound block of picric acid.

(4) Place the pressure plate on top of the grenade fuze caps.

(5) Cover the mine.

d. Disarming Procedure. Because of the picric acid charge, this mine is dangerous to disarm or remove. Explosive salts may be formed, and caution must be taken during hand removal. If the explosive appears crystallized, explode the mine in place.

196. Improvised Antitank Shell Mine (Germany)

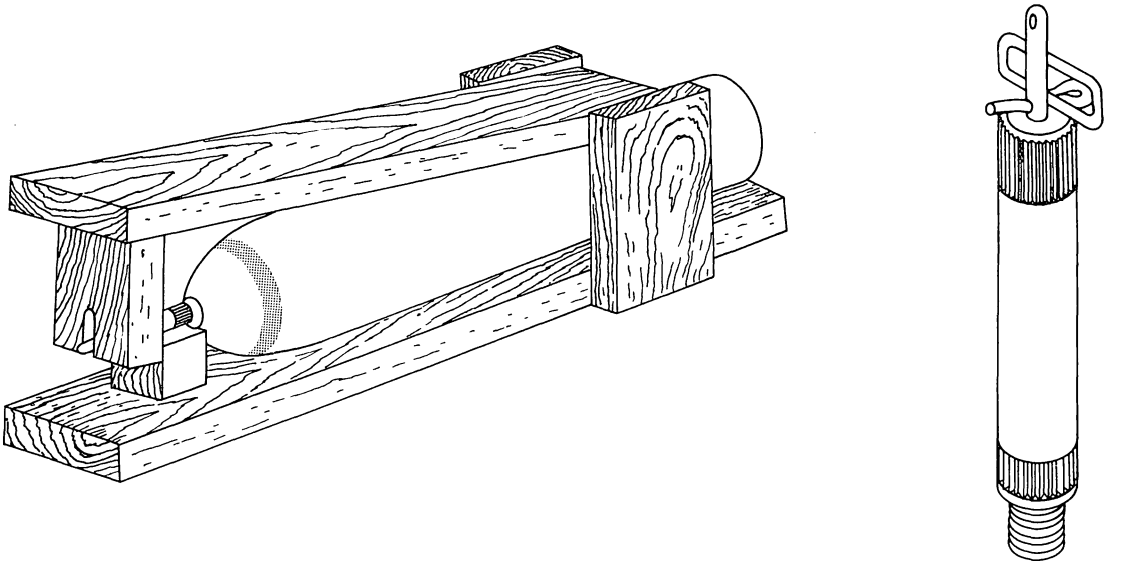


Figure 273

The improvised antitank shell mine is a large-caliber artillery shell set in a wooden frame and a pull fuze screwed into the head. The fuze case rests on the fuze support block. The actuating block is fastened at right angles to the free end of the hinged pressure board. It is slotted to clear the striker shaft but not the wings of the retaining pin. The actuating block rests on two wooden dowels or wire nails projecting from the fuze support block.

a. Characteristics.

Shape	Fuze	Operating force
Rectangular.....	Pull fuze 42.....	50 to 60 lb.

b. Use. The shell mine is used for antitank purposes on beaches, using captured shells as charges. It is also used in road blocks and minefields. Smaller shells, such as mortar shells, are useable as antipersonnel mines.

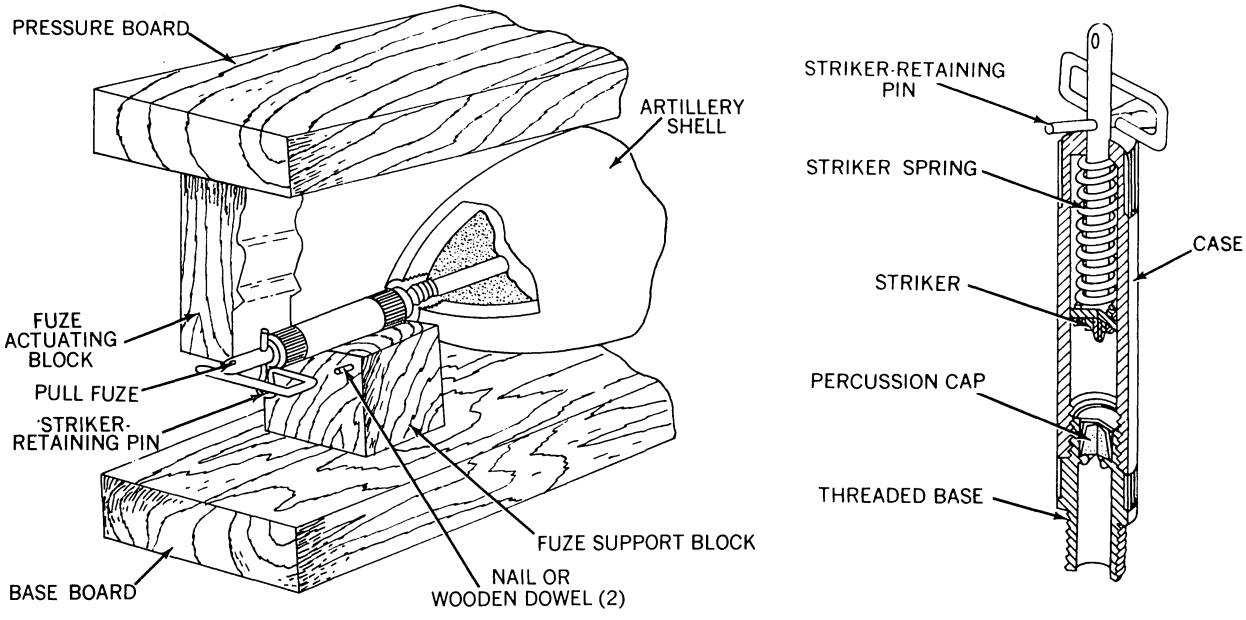


Figure 274

c. Functioning. Pressure on the pressure board shears the two wooden dowels or bends over the two wire nails, pushes the winged retaining pin from the striker, and releases the striker to fire the shell.

d. Installing and Arming.

(1) Adapt the shell head to receive the fuze.

(2) Screw the pull fuze 42 with detonator into the shell. The wings of the retaining pin should be horizontal and under the striker shaft.

(3) Lower the pressure board until the actuating block rests on the wooden dowels or nails projecting out from the fuze supporting block.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Make sure that the striker retaining pin of the pull fuze extends entirely through the striker shaft.

(3) Lift the pressure board.

(4) Unscrew the fuze and detonator from the shell.

(5) Separate the fuze and detonator.

(6) Remove to a safe storage or disposal area.

197. Wood-Cased Improvised Shell Anti-tank Mine (France)

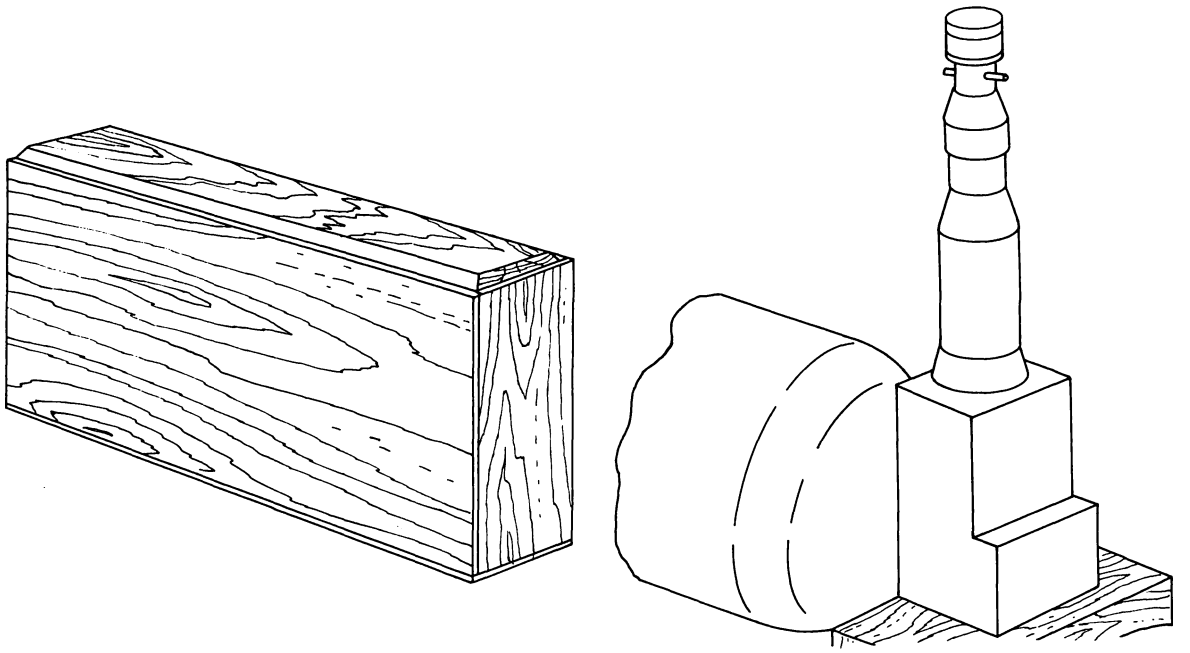


Figure 275

This improvised mine is a single 120-mm shell in a wooden case fitted with a wooden pressure board, one end of which rests on the pressure head of the special fuze. The mine is 55.8 by 12.7 by 25.4 centimeters. This metallic fuze has a pressure head, striker shaft, shear pin, percussion cap, and detonator assembly containing the primary detonator. From the primary detonator is a powder train extending from the bottom of the flash tube to the main detonator, which is located in the L-shaped adapter. The fuze has a safety spring that is placed between the pressure head and the top of the fuze case.

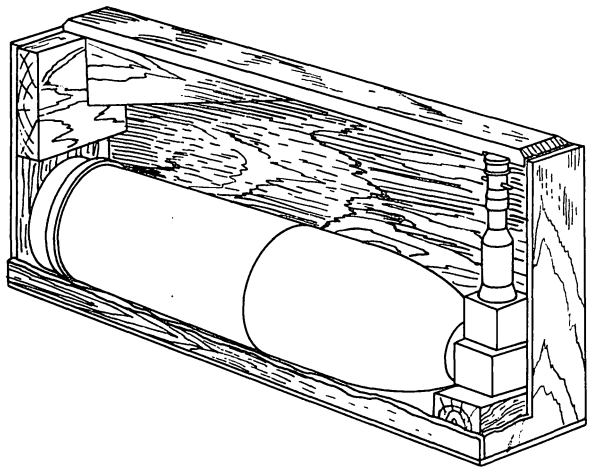
a. Characteristics.

Shape	Fuze	Operating force
Rectangular....	Special, mechanized with percussion striker.	680 lb. or over.

Fuze hazards

A pull wire may be attached to the shear pin and pull wire or pressure-release antilift devices may be placed underneath the mine.

b. Use. This mine is used in minefields and road blocks.



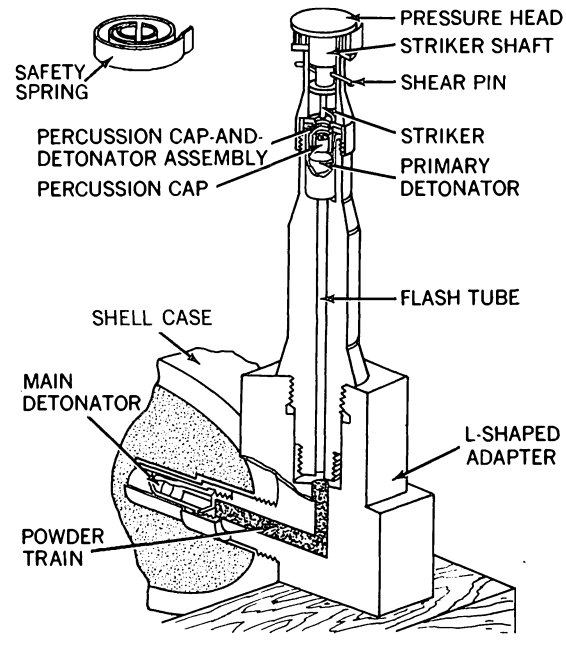


Figure 276

c. Functioning. Pressure on the pressure board transmitted to the fuze pressure head shears the fuze shear pin, forcing the striker onto the percussion cap. This fires in turn the percussion cap, primary detonator, powder train, main detonator, and the charge in the shell.

d. Installing and Arming.

(1) Insert a detonator in a detonator holder and screw the holder onto the side of the L-shaped adapter.

(2) Screw the L-shaped adapter into the nose of the shell and the flash tube into the top of the adapter.

(3) Insert a percussion cap and detonator (primary) into the well in the top of the flash tube, and screw the fuze onto the flash tube.

(4) Remove the safety spring from the fuze.

(5) Fit the wooden pressure board on the mine case.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the fuze from the flash tube without putting any pressure on the pressure head.

(3) Remove the percussion cap and detonator assembly from the flash tube; and unscrew the flash tube from the L-shaped adapter.

(4) Unscrew the adapter from the shell and the detonator holder from the adapter.

(5) Take the mine and fuze to a safe storage or disposal area.

198. Improvised Panzerfaust Antitank Mine (Germany)

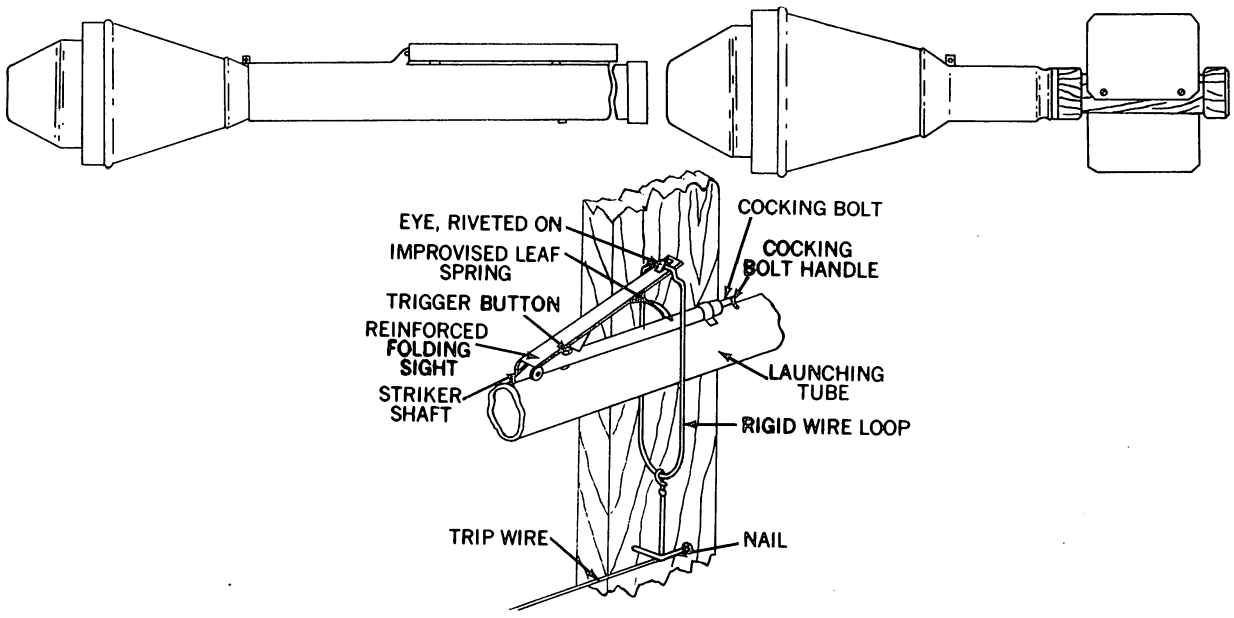


Figure 277

This is a recoilless weapon often used as an improvised antitank mine. The *gross* 30 M model is the most widely used. It consists of a projectile, launching tube, propelling charge, firing mechanism, and folding sight. The launching tube is about 8.8 centimeters long and 5.0 centimeters in diameter. The projectile is 49.5 centimeters long, weighs 6.75 pounds, and will penetrate 20.3 centimeters of armor. The firing mechanism consists of a spring-loaded striker, percussion cap, cocking bolt, and trigger button. When the weapon is used as an antitank mine, the firing mechanism is actuated by a tripwire.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical	Integral, pressure or pull.	25 lb. (approx).	3.5-lb. main charge 3-oz. propellant.

b. Use. This improvised mine is used chiefly against tanks.

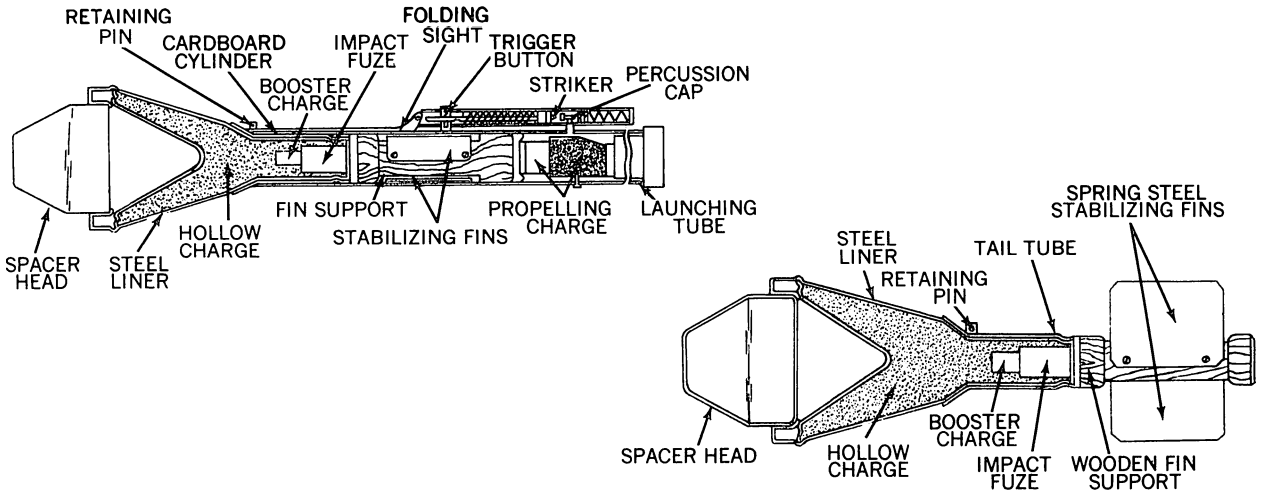


Figure 278

c. Functioning. When the tank or vehicle strikes the tripwire, the folding sight is pulled down until it depresses the trigger button, releasing the striker against the percussion cap, which fires the propelling charge. When the spacer head of the propelled projectile strikes the tank or vehicle, the impact fuze operates, firing the hollow charge.

d. Installing and Arming.

(1) Secure the *panzerfaust* in an avenue of approach to a tree or some other suitable object.

(2) Place an improvised leaf spring consisting of a bent strip of metal between the case that houses the firing mechanism and the folding sight.

(3) Fasten the trip wire to a tree or stake, draw it across the avenue of approach and attach it to the bottom of the wire loop.

(4) Cock the firing mechanism by rotating the cocking-bolt until the cocking-bolt handle is vertical. Press in the cocking-bolt to its full extent. The trigger button should retain the striker in cocked position by a notch in the striker shaft. Allow the cocking bolt to return to its original position and rotate it until the cocking-bolt handle is again horizontal.

e. Disarming Procedure. The *panzerfaust* is cocked if the striker shaft is protruding, the trigger button is raised and the cocking-bolt handle is horizontal.

(1) Uncock the firing mechanism by rotating the cocking bolt until the handle is vertical and press in the cocking bolt to its full extent. Then press the trigger button and, keeping it pressed, allow the cocking bolt to return slowly to its original position. Rotate the cocking bolt until the handle is horizontal.

(2) Cut the slack tripwire.

(3) Remove the device to a safe storage or disposal area.

199. Rocket Antitank Mine, LMG (U.S.S.R.)

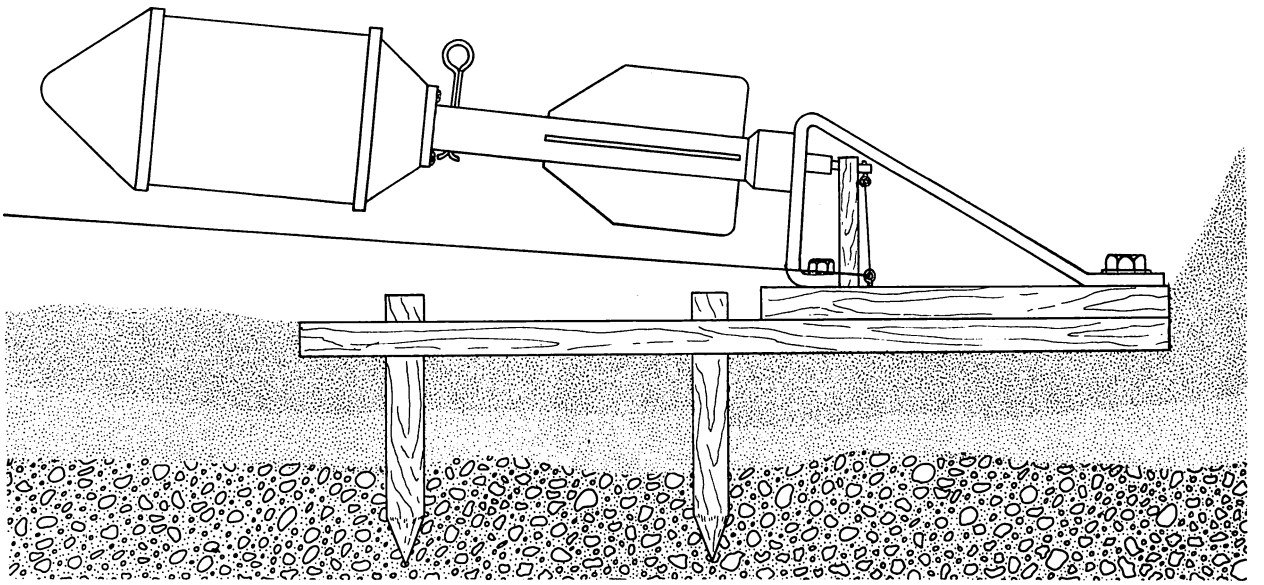


Figure 279

The LMG rocket mine, which functions as a statically-operated bazooka, delivers a projectile or rocket from a mounting on a wooden platform placed in a shallow trench in the ground. It is aimed at a probable tank approach. The device is fired by a force pulling or breaking a wire attached to an MUV pull fuze in the rocket base. An impact fuze is also included in the rocket for detonation at impact.

a. Characteristics.

Shape	Fuze	Explosive
Elongated cylinder.....	MUV pull and impact.....	Main charge: 6.6 oz. TNT (shaped charge). Propellant: 7 oz. black powder. Flash charge: ignition pellet from rifle cartridge.

b. Use. The rocket antitank mine is used to penetrate the side armor of tanks. Units are usually spaced about 30.5 meters apart.

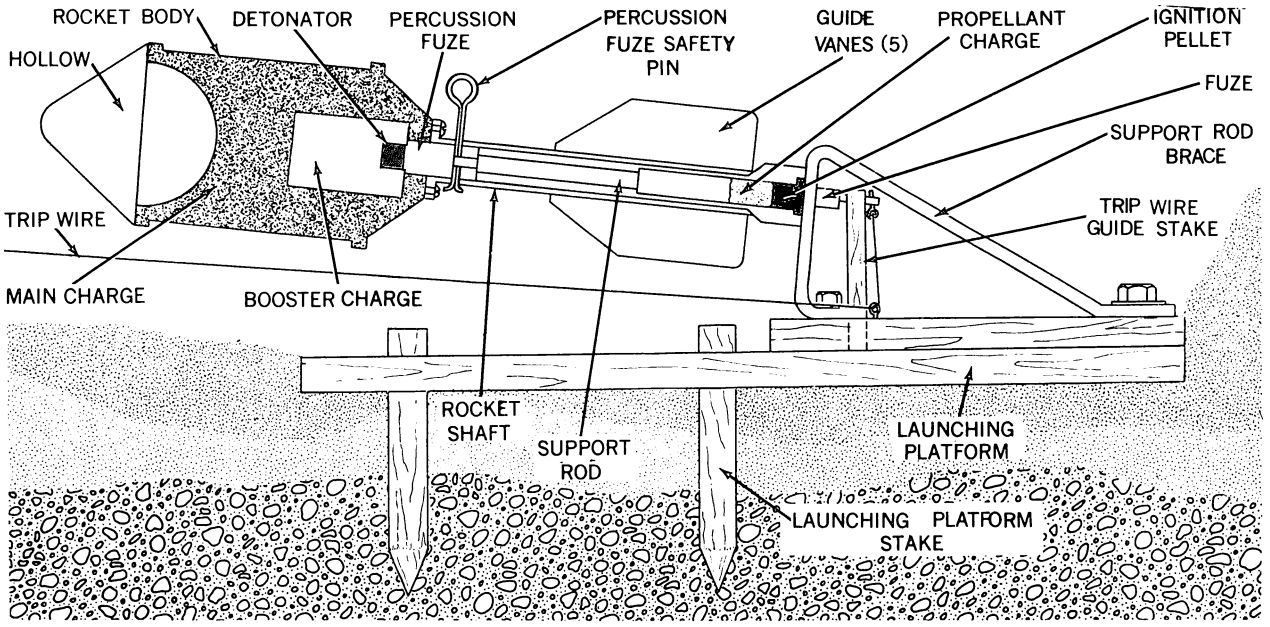


Figure 280

c. Functioning. A pull on the tripwire by a moving tank or a concealed observer, sets off the ignition pellet and detonates the propelling charge. The impact fuze is actuated when the rocket strikes the tank.

d. Installing and Arming.

(1) Dig a shallow trench about 25 to 30 centimeters deep, 20 centimeters wide, and 76.2 centimeters, sloped in the direction in which the rocket will travel and at such an angle that the rocket in flight will not exceed a height of 1.5 meters above the ground.

(2) Lay the rocket platform in the trench and stake it down.

(3) Insert the propellant charge and ignition pellet within the rocket shaft.

(4) Install the rocket on the support rod brace on the platform.

(5) Insert an MUV pull fuze and MD-2 detonator assembly through the hole in the end of the support rod base and into the rocket shaft.

(6) Attach the pull wire to the striker release pin. For controlled actuation, extend the pull wire to the concealed observation point; for noncontrolled actuation, extend the pull wire in the direction the rocket is aimed and lay it in groove-topped stakes spaced about 6.5 meters apart and 40 centimeters above the ground. Wire should cross the vehicle path or road at a height of 25 centimeters. Anchor the pull wire to a stake or some other stationary object.

(7) Remove the safety pin from the impact fuze in the rocket.

e. Disarming Procedure.

(1) Cut the pull wire near the MUV fuze.

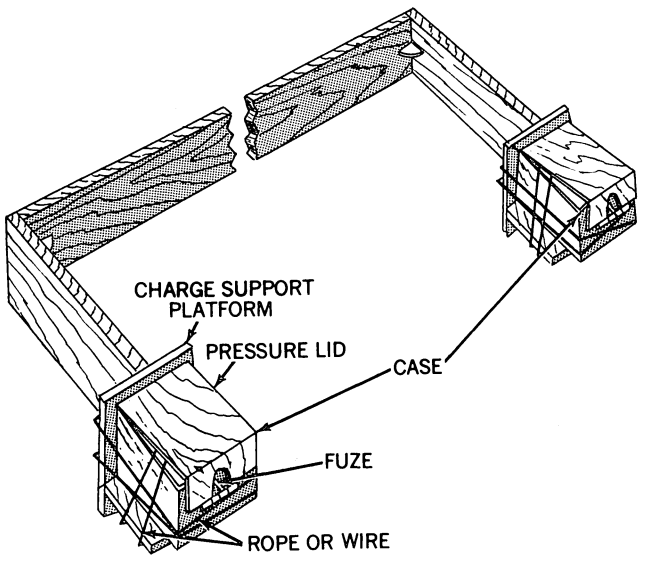
(2) Insert a nail or wire in the safety-pin hole in the impact fuze.

(3) Remove the fuze and detonator assembly.

(4) Unscrew the detonator.

(5) Remove the mine and fuze to a safe storage or disposal area.

200. Rolling Beam Antitank Mine (U.S.S.R.)



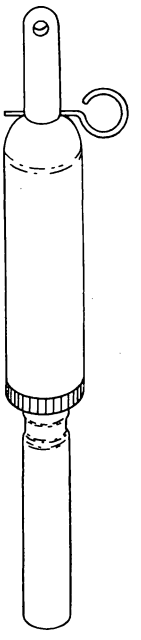


Figure 281

This wooden improvised mine consists of two wooden box mines attached to a rolling beam. This is a board or beam 5.0 by 20.0 centimeters with two arms extending from it at right angles on which the mines are placed. Either pressure or pull actuation may be used.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	MUV pull MV-5 pressure.	10 to 50 lb. pull 25 lb. or more.	2 to 6 lb. TNT.

b. Use. These mines are best employed in high grass but are effective under 30 to 35 centimeters of snow.

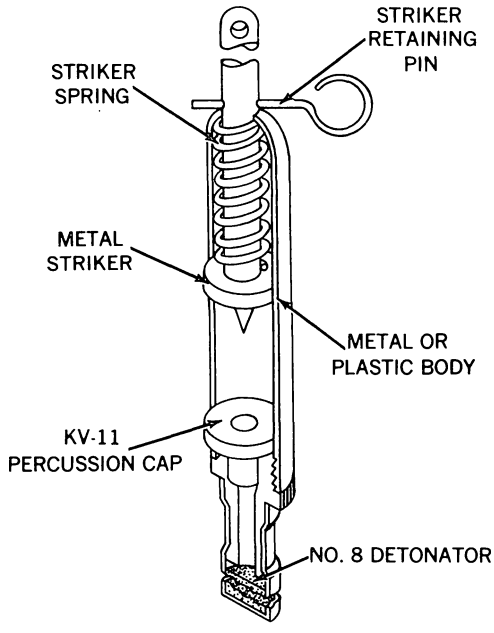


Figure 282

c. Functioning. These mines operate in the same manner as a hoe or rake lying on the ground, the handle of which springs up when the metal end is stepped on. When the vehicle hits the rolling beam, the arms and charges spring up against the body to actuate the fuze and detonate the charge. The mines will also function when a tank runs over them.

d. Installing and Arming.

(1) Place the assembly on the road or ground so that the tank or vehicle running over the beam will rotate it.

(2) Insert an MUV pull fuze or an MV–5 pressure fuze into the charges.

e. Disarming Procedure.

(1) Check for and remove any antilift or antidisturbance devices.

(2) Lift the pressure lids and remove the fuzes.

(3) Separate the detonators and fuzes.

(4) Transport the mines and fuzes to a safe storage or disposal area.

201. Wooden Outrigger Antitank Mine (U.S.S.R.)

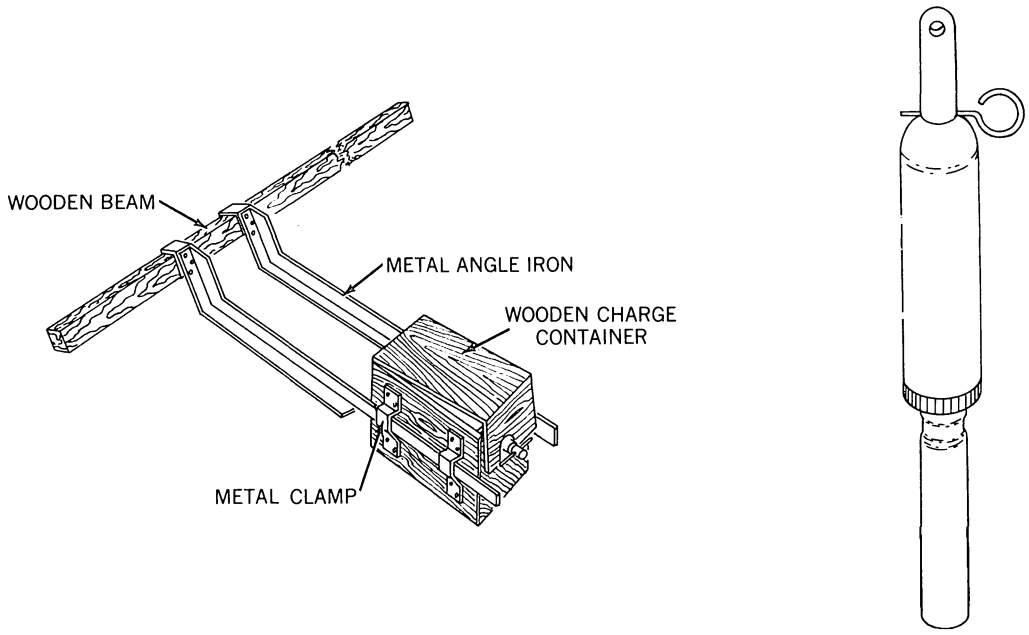


Figure 283

This improvised antitransport mine consists of a wooden beam with arms or outriggers of angle iron fastened to the center. These outriggers support the wooden charge container between them. The bend in the angle iron near the wooden beam acts as a fulcrum. Thus when the tank or vehicle strikes the wooden beam, it presses it downward and raises the mine to strike the body of the vehicle.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	MUV pull MV-5 pressure.	10-20 lb. pull 25 lb. or more pressure.	2-6 lb. TNT.

b. Use. This mine is best employed in high grass, but is also very effective under 30.4 to 35.4 centimeters of snow.

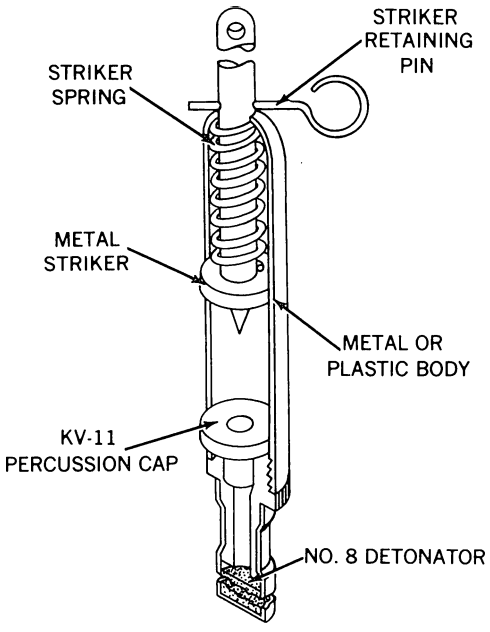


Figure 284

c. Functioning. The treading of the track of a tank or the wheel of a vehicle on the outrigger bar springs the mine up against the body of the tank or vehicle, removing the winged retaining pin or freeing the retaining ball and releasing the striker to fire the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Place the mine on the road or ground so that a tank or vehicle running over the beam will rotate it.

(2) Insert an MUV pull fuze or an MV–5 pressure fuze into the mine.

e. Disarming Procedure.

(1) Check for and remove any antilift or antidisturbance devices.

(2) Lift lid and remove pull or pressure fuze from the charge.

(3) Unscrew the detonator from the fuze.

(4) Take the mine and fuze to a safe storage or disposal area.

202. Lunge Mine (Japan)

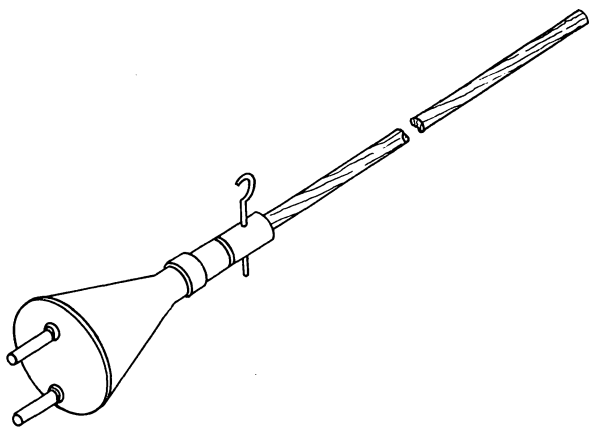


Figure 285

The conical-shaped hollow-charged lunge mine is housed in a steel container with a wooden handle at the apex and three metal legs 15.2 centimeters long welded to the base at 120° intervals. Fitted into the base is a hollow truncated cone designed to increase the power of penetration of the hollow charge. The detonator is placed in a well in the apex of the charge. A steel striker is fastened on the end of the handle, which is fitted into the metal cylinder at the apex of the container. The steel striker is retained by a safety pin and a copper shear wire. The mine is 2 meters long, including handle and legs, and 20.3 centimeters in diameter at the base.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cone.....	Integral percussion type, with shear-pin release.	25 lb. (approx)...	6.6 lb. crude TNT.

b. Use. This is a "suicide" antitank weapon capable of penetrating 15.2 centimeters of steel plating.

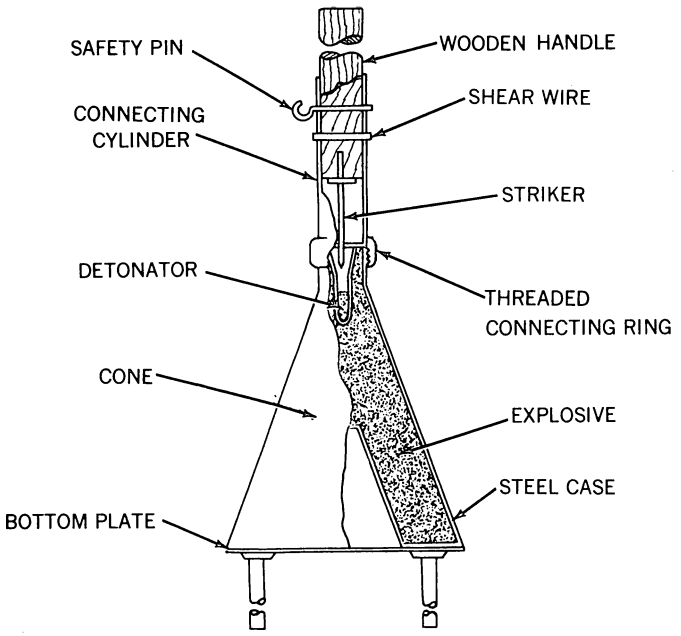


Figure 286

c. Functioning. The operator pulls out the safety pin while pushing the legs of the mine against the target. This force drives the handle forward, shearing the shear pin and driving the striker into the detonator.

203. Suction Cup Mine (Japan)

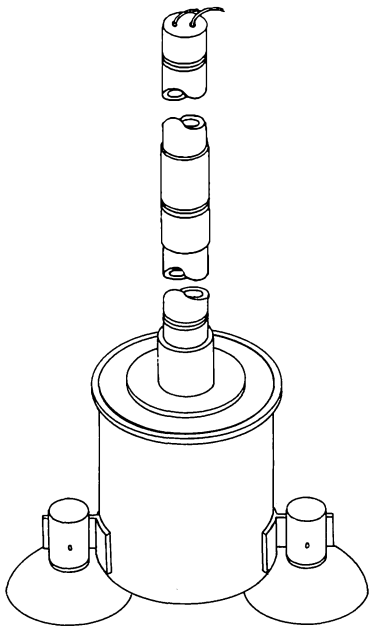


Figure 287

The mine body is a black, longitudinally-welded cylinder with a metal cap spot-soldered over each end. Two metal loops to receive the suction cups are soldered to the circumference of the forward end. A wooden handle, consisting of two pieces held together by a metal sleeve, fits into a hollow extension welded to the top of the mine body. The mine has two pull igniters, safety fuse, prima cord, and four blasting caps. The mine body is 13.4 centimeters long and 10.8 centimeters in diameter; the handle, 1.5 meters long and 3.6 centimeters in diameter.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical...	Pull type...	10 lb. (approx).	4 lb. 7½ oz. RDX 53% and TNT 47%.

b. Use. This mine has proved effective against parked aircraft.

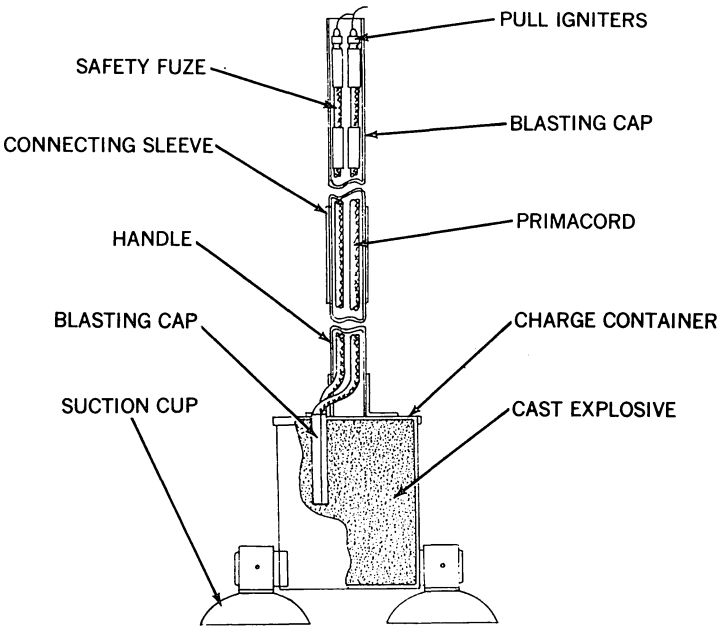


Figure 288

c. Functioning. After the mine has been placed on a surface and held by the suction cups, the operator pulls the friction igniter, starting the safety fuse burning. This provides a 10- to 15-second delay, after which the upper blasting caps, primacord, blasting caps in the charge, and the main charge are initiated in sequence.

d. Installing and Arming. After the mine has been placed in position, arming is merely the pulling of the friction igniters, which also initiates actuation.

e. Disarming Procedure. Disarming is impossible. Once the mine has been armed, explosion follows in 10 to 15 seconds.

204. Hemispherical Antitank Mine, 5-Kg (Japan)

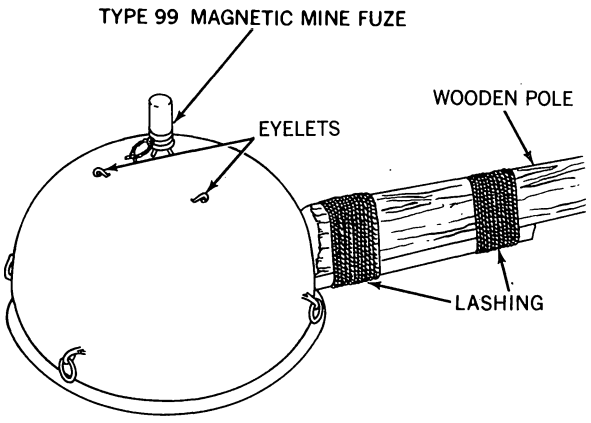


Figure 289

This hemispherical mine has a fuze mounted in the dome-shaped top of the case. There is also a straight projection from the side to which a pole may be lashed. This mine uses the same fuze as the type 99 magnetic mine (par. 184). Only a few hemispherical mines were produced, as they were designed to help overcome a shortage of antitank weapons and armored vehicles.

a. Use. This is a suicide weapon, intended for placement against the target by hand or by a pole or line.

b. Functioning. Hand pressure on the top of the sliding pressure cap depresses it, permitting the striker retaining balls to release the striker, which, driven by its spring, fires the percussion cap, delay pellet, and main charge.

c. Installing and Arming.

(1) Insert the percussion cap into the delay pellet and screw the delay pellet into the body of the fuze.
(2) Screw the detonator onto the delay pellet.
(3) Screw the fuze into the mine.
(4) Pull out the safety pin.
(5) Depress the sliding pressure cap.

d. Disarming Procedure. As the mine detonates in about 4 seconds after the sliding pressure cap is depressed, the safest thing to do is take cover for several minutes after discovering the mine. If it does not explode, disarm it, as follows:

(1) Check for and remove any antilift devices.
(2) Insert the small stop screw and the safety pin.
(3) Unscrew the fuze from the mine.
(4) Unscrew the detonator from the delay pellet and the delay pellet from the fuze.
(5) Remove the mine and fuze to a safe storage or disposal area.

205. Fougasses (U.S.S.R.)

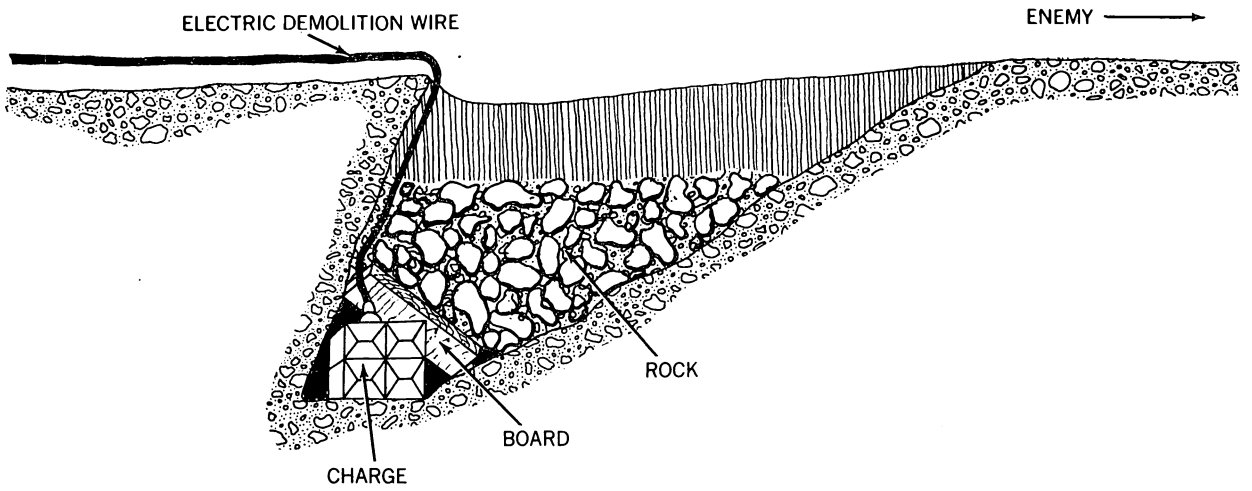


Figure 290

A fougasse is a mine covered with rocks or other missiles placed so that, on detonation, they are hurled in a certain direction. The side of the hole toward the opposing force into which the charge and missiles are placed is sloped at an angle of about 45°. A wooden board, resting against the charges and placed perpendicular to the slope of the hole, supports the rocks. These are about 10.0 to 15.0 centimeters in diameter, and piled upon the board at the ratio of 0.38 cubic meters for each 15 pounds of explosive. The charge is detonated electrically by remote control.

a. Use. Fougasses are usually laid for the defense of narrow defiles and reinforcement of obstacles and field fortifications. They are also placed under water to impede the movement of enemy vessels, hinder assault landings, and deny likely fording sites. On land they are frequently emplaced in groups of 5 to 10 staggered in 2 to 3 rows with 9 to 14 meters between them and 23 to 28 meters between rows.

(No drawing available.)

b. Functioning. One or more fougasses are detonated electrically at the approach of foot troops or tanks of the opposing forces. The detonation of the charge hurls the rocks out of the hole to a distance of 180 to 275 meters with a lateral dispersal of 45 to 55 meters.

c. Disarming Procedure. Locate and cut the electric firing cable.

206. Wooden Barrel Mine (U.S.S.R.)

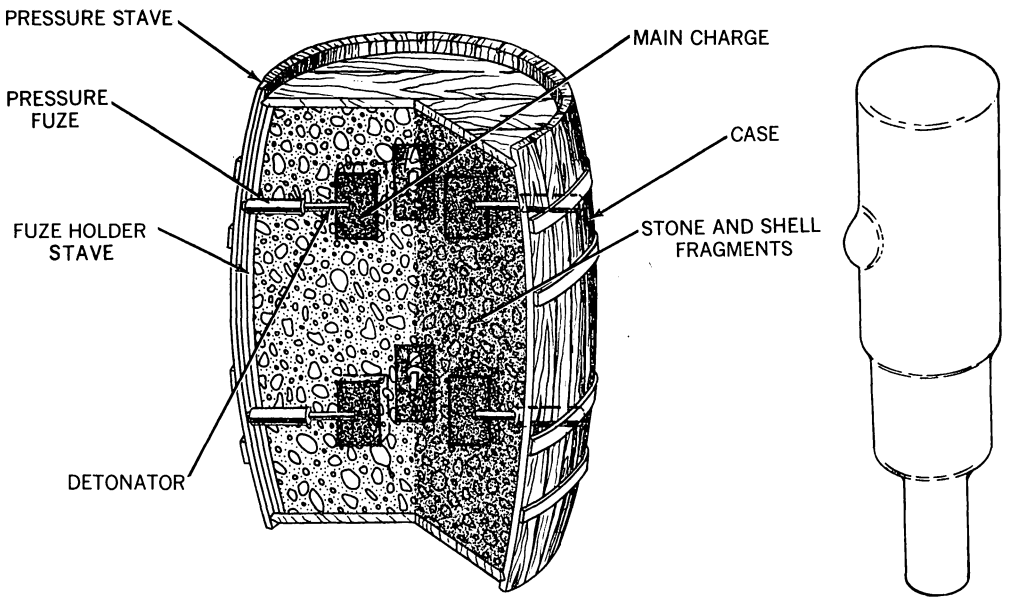


Figure 291

This type of mine is usually equipped with eight MV–5 pressure fuzes, four in the upper and four in the lower half of the mine. Four staves are replaced with thin flexible staves and fuze-holder staves. As changes in the appearance of the barrel are not noticeable from the outside, chalk marks are used to distinguish them from ordinary barrels.

a. Use. The barrel mine is generally laid on roads and trails to give the impression that it is a barrel lost or forgotten. Any attempt to tip it over to roll it pushes in one of the pressure staves. This actuates a fuze and explodes the mine. Barrel mines have been found floating in ship channels of rivers or harbors or buried in the ground. The latter are often attached by detonating cord to a pressure fuze placed under a pressure board buried flush with the top of the ground.

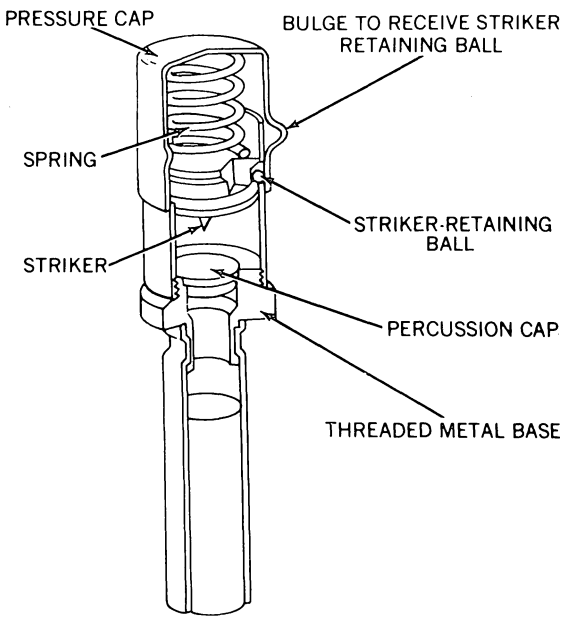


Figure 292

b. Disarming Procedure.

(1) Do not move the barrel whether in standing or lying position.

(2) Remove the hoop nearest the top without applying pressure on the staves.

(3) Take off the lid or base and carefully remove the contents.

(4) Take the mine and fuzes to a safe storage or disposal area.

207. Oil Drum Mine

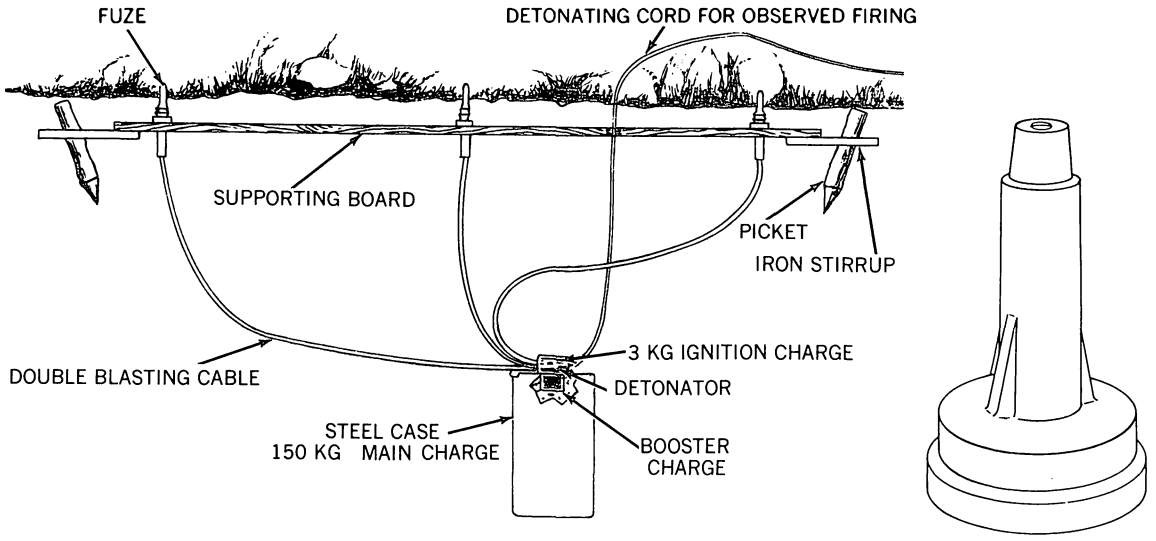


Figure 293

The oil drum mine was usually emplaced as shown above and wired to one or more EKhZ chemical-electrical fuzes. It was often armed for detonation by a length of detonating cord ignited by remote control from an observation position. To disarm such a mine, cut the wires connecting the fuzes and detonator or the detonating cord.

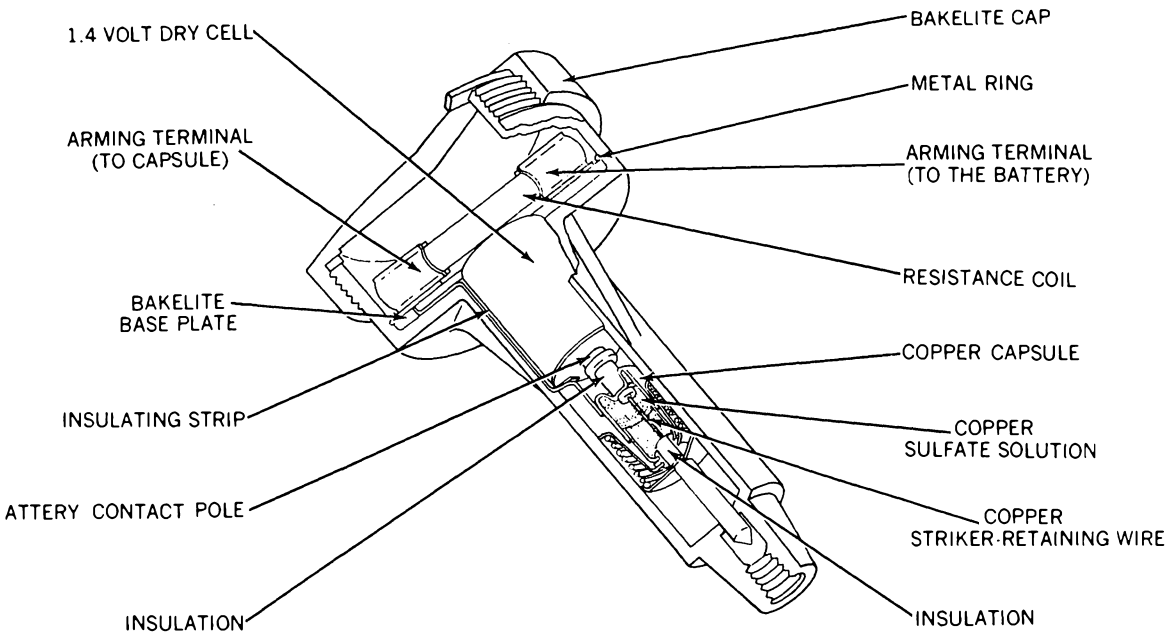

1.4 VOLT DRY CELL
ARMING TERMINAL (TO CAPSULE)
BAKELITE BASE PLATE
INSULATING STRIP
ATTERY CONTACT POLE
INSULATION
BAKELITE CAP
METAL RING
ARMING TERMINAL (TO THE BATTERY)
RESISTANCE COIL
COPPER CAPSULE
COPPER SULFATE SOLUTION
COPPER STRIKER-RETAINING WIRE
INSULATION

Figure 294

208. Spheroid Drifting Mine (K. Tr. Mi. 41) (Germany)

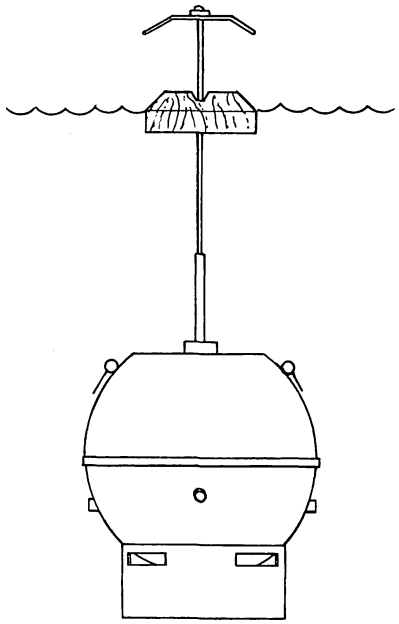


Figure 295

This is a spherical mine consisting of two steel halves joined together by a horizontal weld and a strip on the inside. A steel collar which acts as a stand is tack welded onto the bottom of the mine. A 1.5-meter telescopic contact rod with antenna at the top is mounted in a central tube. An ignition tube containing a clockwork delay mechanism, detonator, booster charge, and a battery is connected by insulated wire leads to the central rod contact tube at the brass contact ring. The horizontal diameter of the mine is 1 foot 38.1 centimeters, and the height, 43.1 centimeters.

a. Characteristics.

Shape	Fuze	Explosive charge
Oval spheroid...	Tilt rod, electric, with clockwork actuation or tilt rod deflection to complete firing circuit.	25.5 lb.

b. Use. This mine is designed to damage pontons, ponton bridge superstructures, bridge piers, and low-level bridges. It is launched upstream to drift downward and be fired by contact with the objective. It may also be used as an antitank mine.

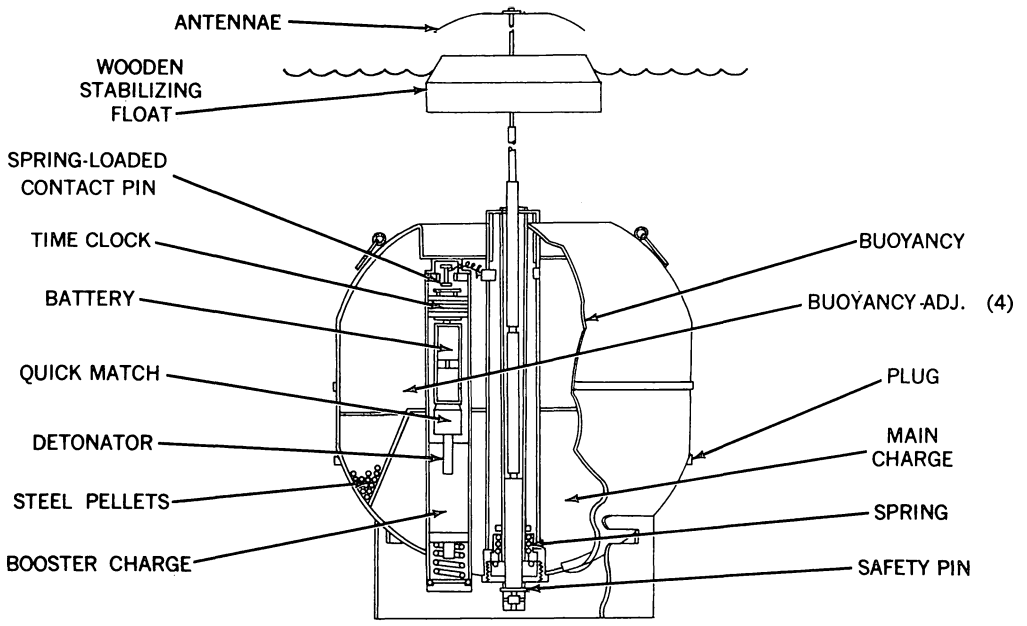


Figure 296

c. Functioning. After the mine has been floated, water dissolves the soluble plug at the base of the telescopic contact-rod case, freeing the spring-loaded contact rod. As the mine sinks below the surface of the water, the wooden stabilizing float attached to the contact rod case causes the contact rod to expand to its full 1.5-meter length. This float also keeps the mine upright. When an object deflects the telescopic contact rod, it touches the brass contact ring and completes the firing circuit detonating the mine. (The small clockwork mechanism in the fuze can be regulated to detonate the mine after any set time up to six days, even if the rod is not deflected; but if it is deflected before the set time, the clockwork delay mechanism will be short-circuited and fire the mine.)

d. Installing and Arming. Place the mine in the water and remove the safety pin. When the soluble plug dissolves, the mine arms itself as described in subparagraph *c*, above.

e. Disarming Procedure. This mine cannot be disarmed.

209. Improvised River Mine (Behelfs—Flusstreib Mine) (Germany)

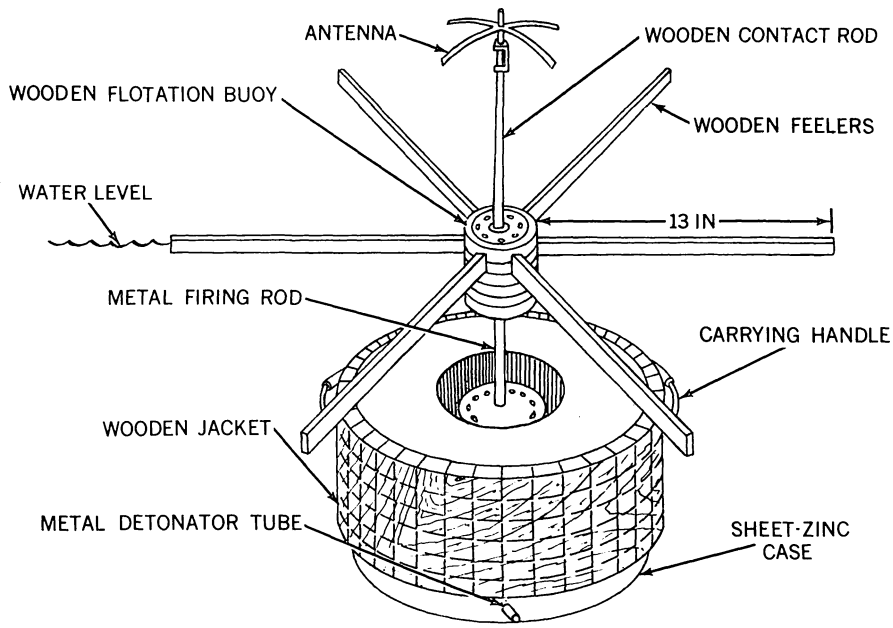


Figure 297

This floating contact river mine is a circular sheet-zinc case and wooden jacket 45.0 centimeters in diameter and 15.8 centimeters high. It has two carrying handles, two small detonator tubes, a firing mechanism, a fuze mechanism, and an arming lever. From the centrally located firing mechanism extends a metal firing rod with antennae at the top to which is attached a wooden floating buoy with 6 wooden feelers about 32.9 centimeters long. The firing rod extends through the buoy about 1.2 meters. The fuze has a clockwork delay mechanism, which arms the contact firing mechanism after 10 minutes and may explode the mine after a preset delay of 10 minutes to 6 hours, in the event that the mine has not already been detonated. In the safe position, the end of the arming lever enters a groove marked *sicher* (safe); in the armed position, it enters a groove marked *scharf* (armed).

a. Characteristics.

Shape	Fuze	Explosive charge
Cylindrical.....	Contact rod with retracting tongue release and clockwork arming device.	44 lb.

b. Use. This mine is designed chiefly for use against bridges, rafts, shipping, and similar targets.

(No drawing available.)

c. Functioning. Any sideward movement against the antennae or wooden feelers is communicated to the metal firing rod, the base of which pushes against the bushing of the spring-loaded striker allowing a metal tongue to retract and release the striker to fire the percussion cap and detonate the mine.

d. Installing and Arming. Set the delay arming clock to the right position, and place the mine in the water. After a preset period the mine arms itself.

e. Disarming Procedure. This mine cannot be disarmed because of its very delicate mechanisms. The antennae or wooden feelers must not be touched. If the mine is lodged against a bridge or other vital installation, a line may be attached to one of the carrying handles and the mine towed very gently from a distance of about 100 meters to a suitable demolition site.

210. Raft Mine (U.S.S.R.)

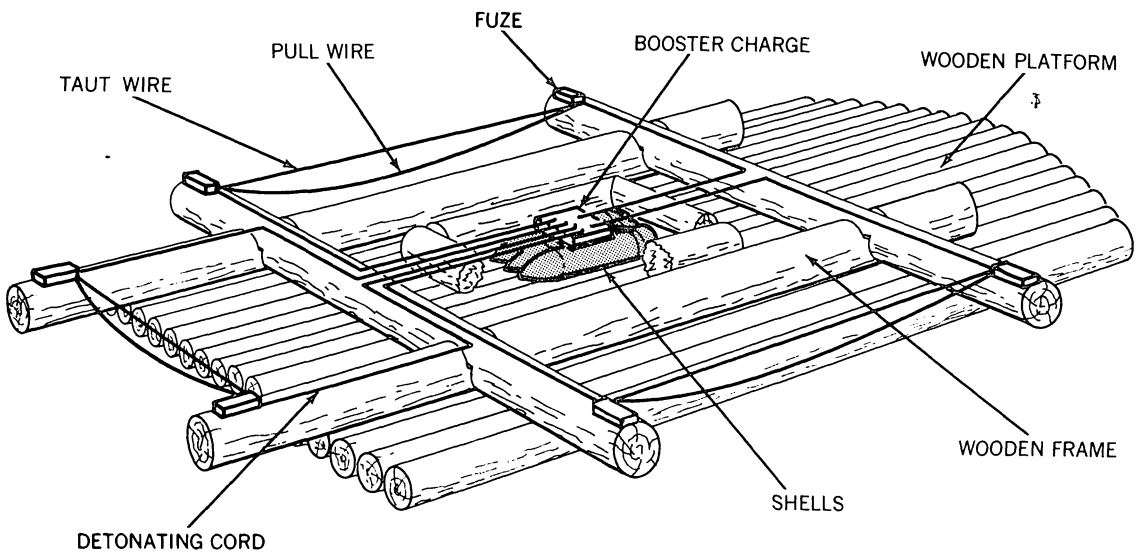


Figure 298

This mine is essentially a timber raft carrying three aerial bombs or other charges, a booster, and six MUV pull fuzes. These are mounted on crossarms that extend beyond the edge of the raft. Detonating cord connects the fuzes to the booster charge; and the fuzes in turn are interconnected by taut and slack pull wire. The effectiveness of the mine varies with the size of the charge and the contact made with the objective. This mine should not be disarmed unless absolutely necessary. It should be detonated by small arms fire or explosive charges placed near it.

211. Floating Lever Mine (U.S.S.R.)

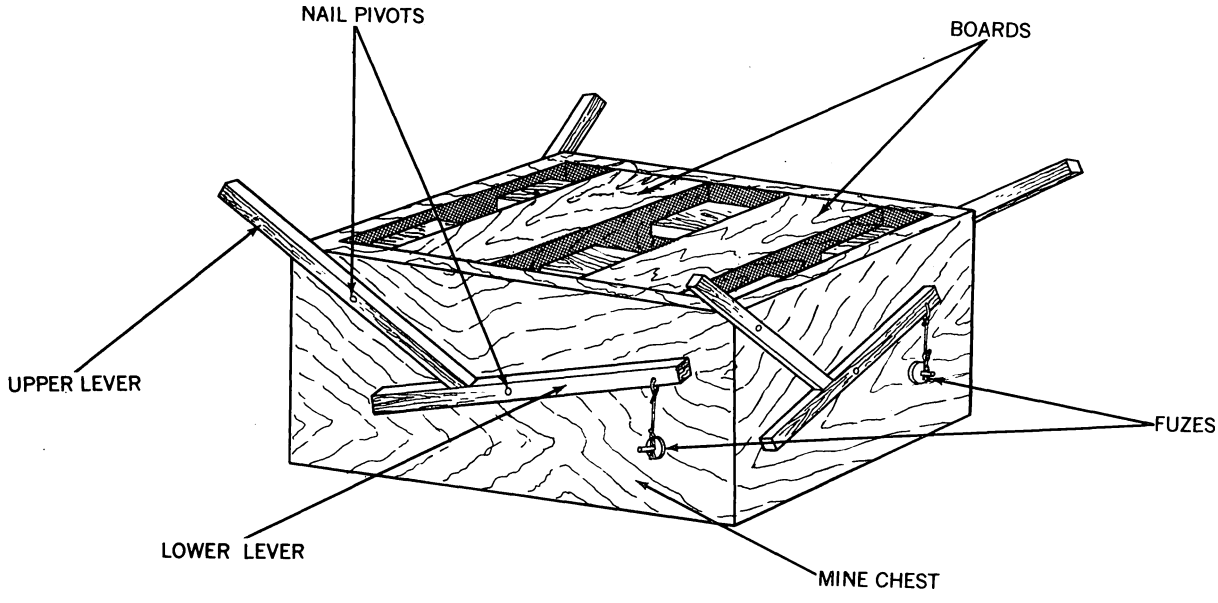


Figure 299

This device consists of a waterproofed wooden box and frequently as much as 120 pounds of explosive. A pair of actuating levers is nailed to each side of the box, the lower one being tied to an MUV pull fuze. The mine may be disarmed by carefully cutting the wires between the levers and the fuzes, after which the fuzes are removed.

212. Anchored Barrel Mine (U.S.S.R.)

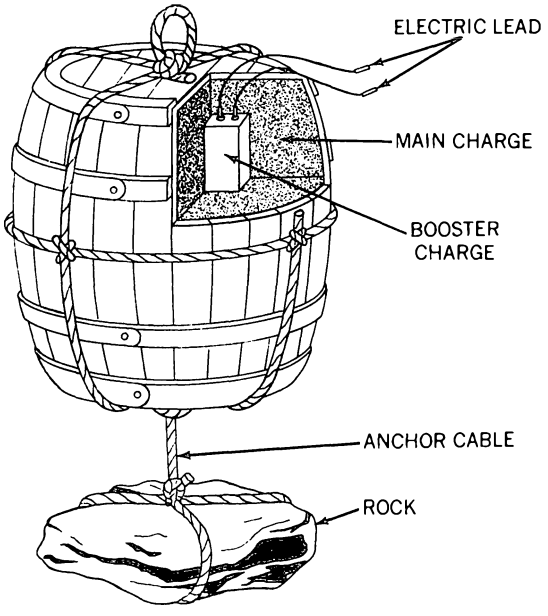


Figure 300

This is an improvised underwater obstacle consisting of a waterproofed barrel filled with explosive and wired electrically to a remote control point. Barrel mines are laid in much the same manner as bottom mines (par. 215).

213. Floating Mines (U.S.S.R.)

Rafts or floats for explosive charges are usually made of dry lumber tarred inside and outside. Double boxes are used if immersion for a long period is required. The space between the walls is waterproofed by filling with a compound of liquid tar, calcium, cinders, chalk, and other material. To keep the mines afloat, only about half of the charge container is filled with explosive; the remainder is filled with sawdust or paper. These mines are used to destroy crossings, bridges downstream, and enemy floating mines. They are generally prepared in advance and brought to the river banks at night. The launching site is as near the front lines as possible. Hand disarming of these mines is not recommended.

214. Anchored Mines (U.S.S.R.)

Anchored mines are used to deny likely river crossings to the opposing force and to interrupt river traffic. They are generally laid across the river in a checkerboard pattern in several rows 106 to 153 meters apart and the mines 16 to 25 meters apart within the rows. They are launched from a boat or raft. These mines are detonated by mechanical or electrical methods. Electrical detonation is usually from an observation point and control station set up near the river bank at a strategic vantage point. Anchored mines may be disarmed by cutting the anchor cable so that they will float to the surface where they may be destroyed by rifle fire or towed to a safe storage or disposal area.

215. Bottom Mines (U.S.S.R.)

These are generally explosives encased in concrete, metal, or some other type of waterproof container. They are generally placed below the low-tide mark along beaches or on the river bottom at likely assault crossing and fording sites. They are usually detonated electrically by a concealed observer; but they may be fitted with pressure fuzes for detonation upon contact. Bottom mines may also be in the form of fougasses. They all may be neutralized by cutting the electric cable or by disarming the pressure fuze.

CHAPTER 10

ANTIPERSONNEL MINES

Section I. METALLIC ANTIPERSONNEL MINES

216. Bounding Shrapnel Mine, PP-Mi-Sr (Czechoslovakia)

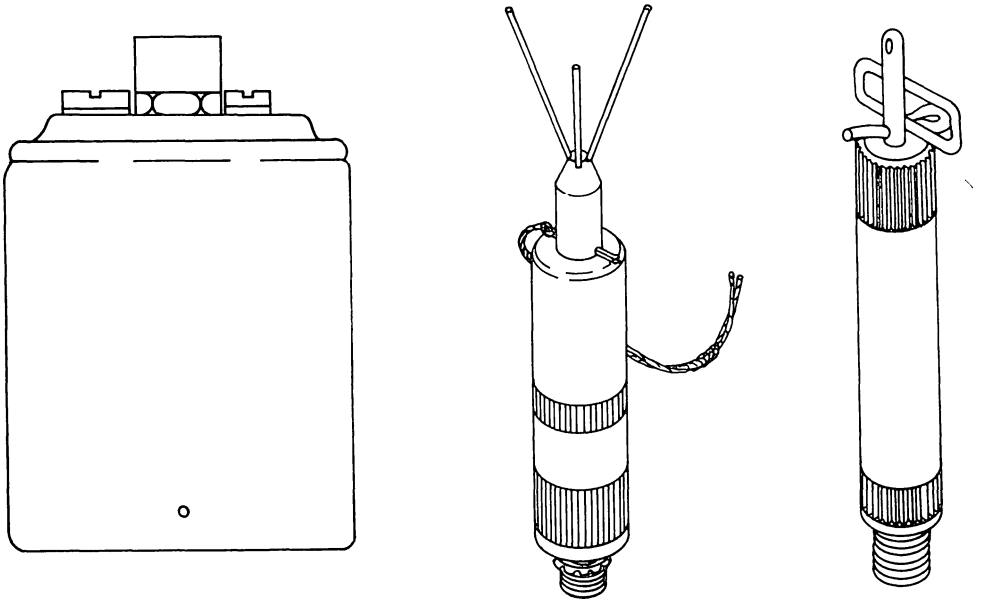


Figure 301

This metallic antipersonnel mine has a centrally located fuze well with a transit cap. On the opposite sides of the fuze well are the filler and detonator well plugs. The body of the mine fits into an outer casing that also contains the propelling charge. Shrapnel made of short pieces of steel rod are contained between the inner and outer walls of the mine body. The mine is fitted with a delay train. The mine case is 10.1 centimeters in diameter and 13.9 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force
Cylindrical.....	RO–8 pressure or RO–1 pull.	8 lb. (approx).

Explosive		Markings
Main charge	Propellant charge	
11.5 oz. TNT.....	Black powder.....	PP-Mi-Sr.

b. Use. This antipersonnel mine is laid in antipersonnel minefields along with antitank mines in minefields or laid along possible enemy routes. It may be buried with only the end of the fuze exposed or placed on top of the ground with the container removed, in which case the igniter is usually an RO–1 fuze with a tripwire.

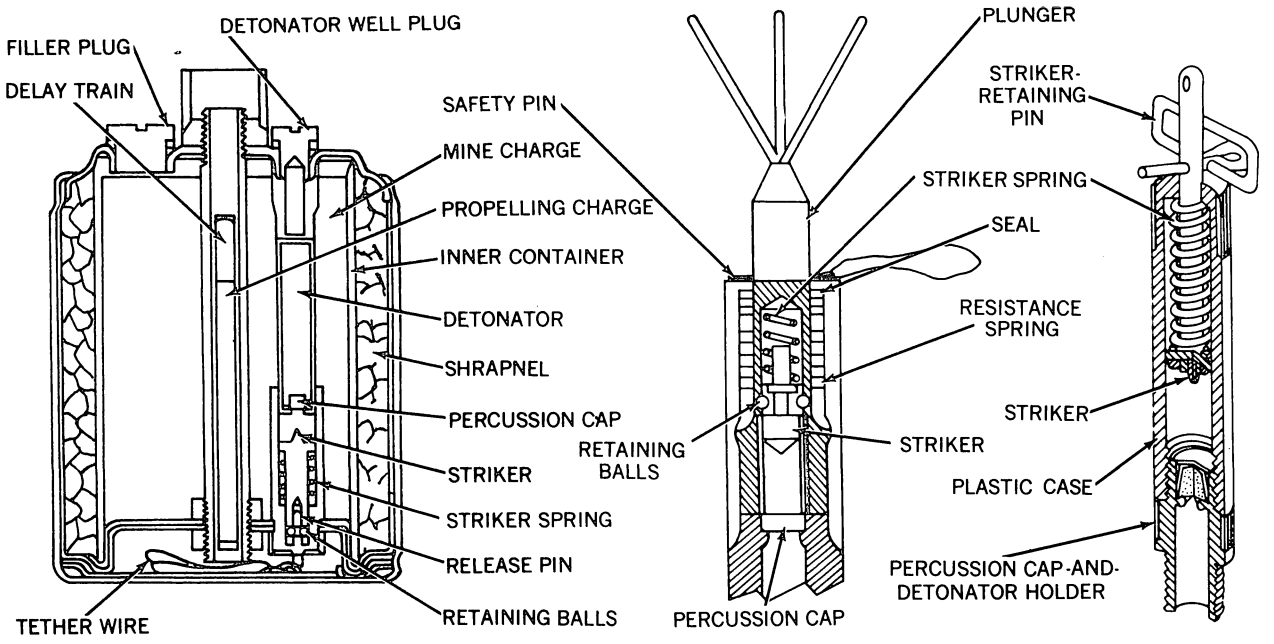


Figure 302

c. Functioning. The percussion cap is fired by pressure on the RO–8 fuze or pull on the RO–1 tripwire, which in both cases ignites the delay train. After 3 to 5 seconds the propellant charge ejects the body of the mine from the container, taking with it a wire attached to the bottom of the container. When this wire becomes taut (the ejection has reached a height of approximately 1 meter off the ground), it activates the integral fuze, which fires the detonator and then the mine.

d. Installing and Arming.

(1) Emplace the mine.
(2) Remove the transit cap.
(3) Screw an RO–8 or RO–1 fuze into the well.
(4) If the RO–1 fuze is used, attach the anchored trip wire to the striker retaining pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Trace and cut any slack tripwires.
(3) Replace the safety pin.
(4) If an RO–8 fuze is used, unscrew the fuze.
(5) Unscrew the detonator well plug.
(6) Remove the detonator.
(7) Remove the fuze and mine to a safe storage or disposal area.

217. Bounding Shrapnel Antipersonnel Mine, Model 1951 (France)

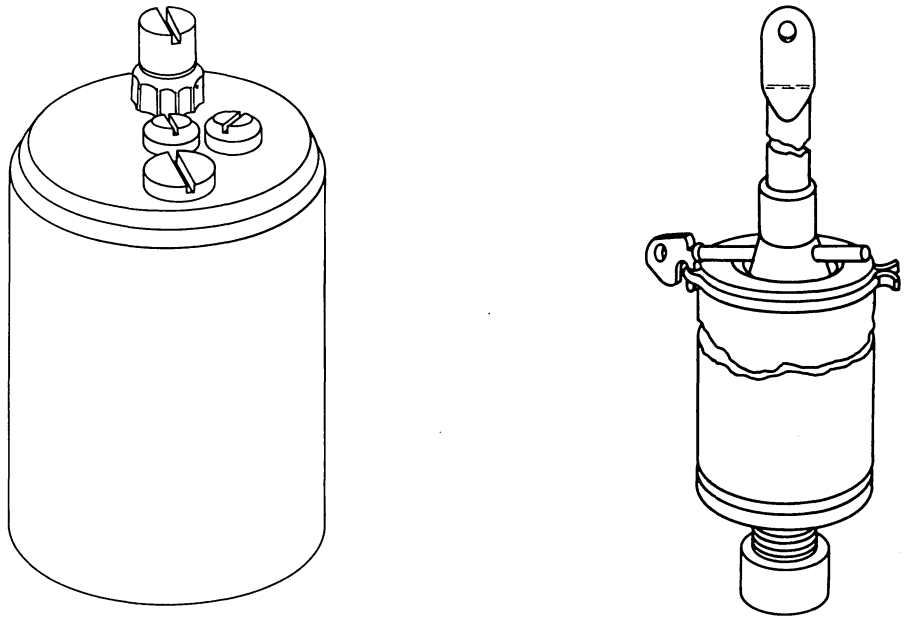


Figure 303

This device resembles the World War II German "S" mine. It has a metal case that acts as a mortar and a canister that contains the main charge, the integral fuze, and steel shrapnel. The mine has a delay mechanism to detonate the main charge, even if the propelling charge fuze or the canister fuze does not function. The lid contains a main, a central, and a self destruction fuze-well plug. The mine case measures 16.0 centimeters in height and 9.8 centimeters in diameter.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical...	Combination..	6.6 lb. or more.	0.9 lb. picric acid (par. 6x).

b. Use. This mine is used in minefields end for defense and nuisance purposes.

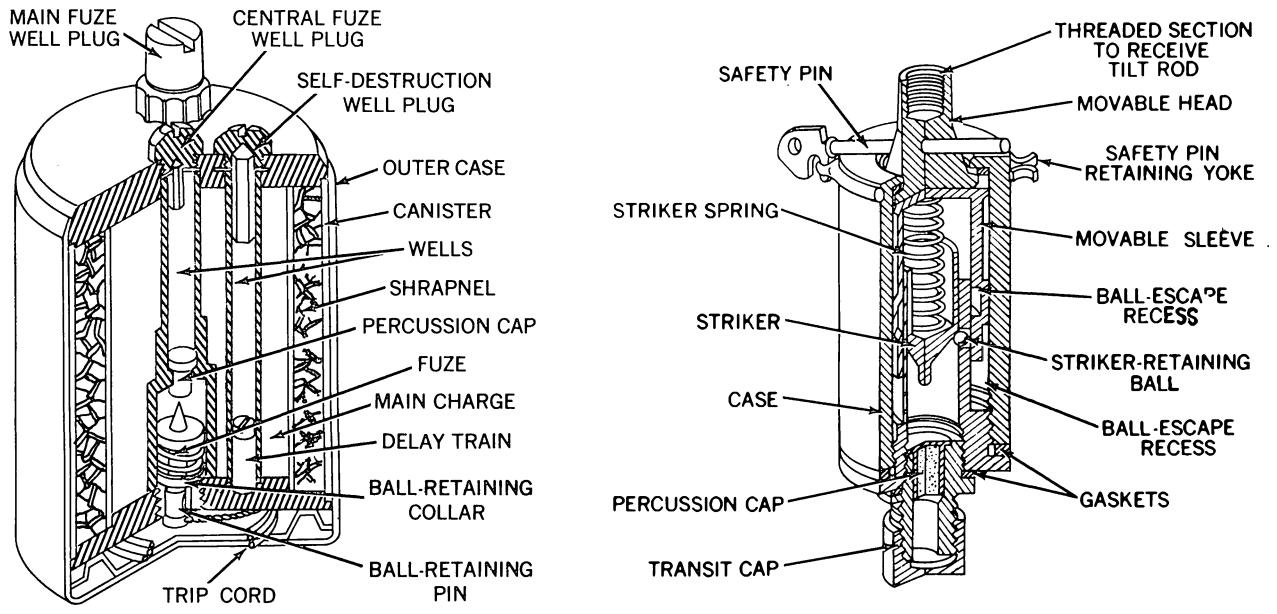


Figure 304

c. Functioning. A tilt of the rod, a pull on the tripwire, or pressure downward on the rod actuates the fuze, firing the delay train and propelling charge. The expanding gases of the propelling charge project the canister into the air. When a cord attached to the bottom of the outer case and the integral fuze has reached its full length, it pulls out the ball retaining pin of the canister fuze. The removal of this pin releases the striker retaining-balls to escape and free the spring-driven striker, which initiates the firing chain that consists of a percussion cap, a detonator, and a main charge. When the main charge is fired, it hurls the shrapnel in all directions up to a radius of 50 meters.

d. Installing and Arming.

(1) Remove the plugs from the central, the self-destruction, and the main fuze-wells. (Do not remove plug from filler well.)

(2) Place a No. 8 blasting cap, open end down, in the self-destruction and the central fuzewells.

(3) Replace the center and self-destruction fuze-well plugs.

(4) Screw the fuze (tilt-rod Model 1952) in the main fuzewell.

(5) Emplace the mine with its top flush with the surface of the ground.

(6) Fasten the trip wire to its anchor and then to the fuze.

(7) After insuring that there is no tension on the trip wire, remove the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Trace and cut the tripwire.

(3) Replace the safety pin in the fuze and lift the mine.

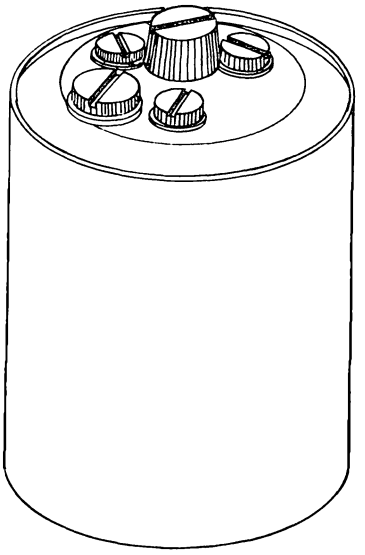
(4) Remove the fuze.

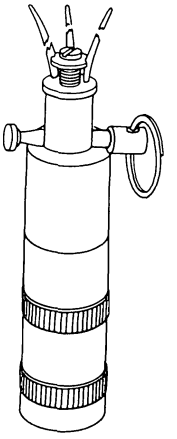
(5) Remove the plugs from the central fuze- and self destruction fuze-wells.

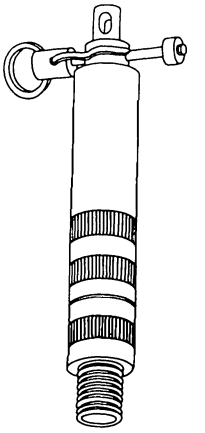
(6) Remove the blasting caps.

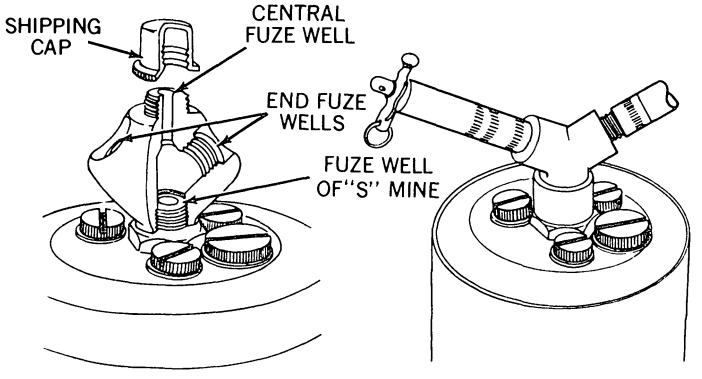
(7) Take the mine and fuzes to a safe storage or disposal area.

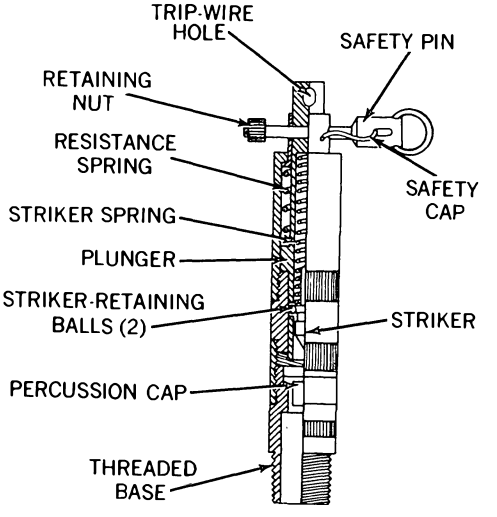
218. Bounding Shrapnel Mine, S-Mine 35 (Germany)

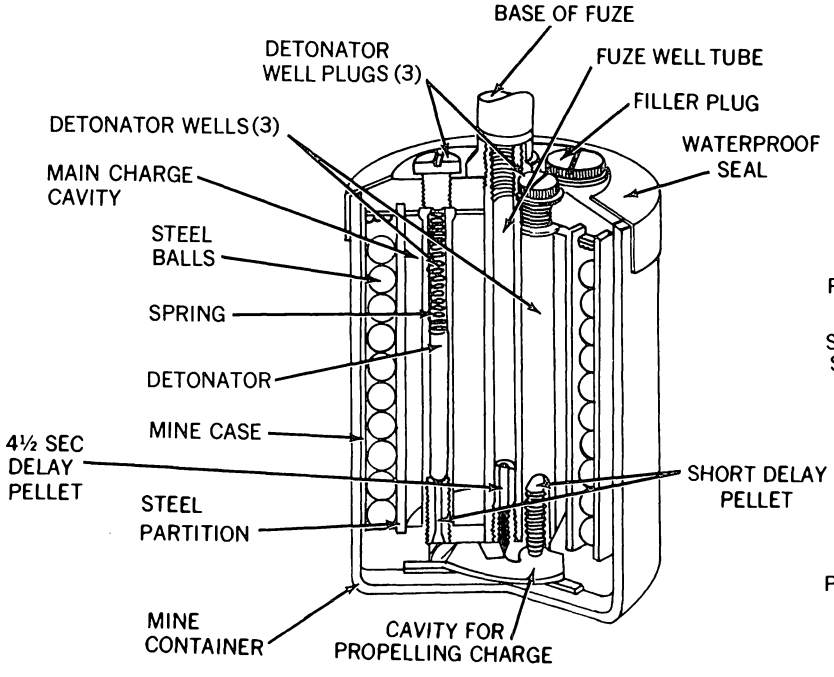












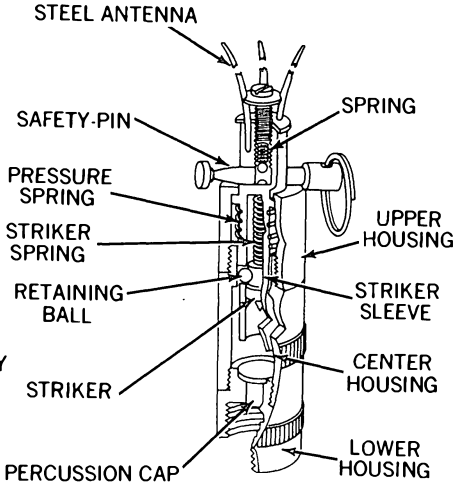


Figure 305

This is a steel cased mine 10.1 centimeters in diameter and 12.7 centimeters high. It has a pressure fuze, detonator, main charge, propellant charge, and a 4½—second delay pellet, which permits the mine to jump about 1 meter into the air before it explodes, scattering its 300 to 350 steel balls or shrapnel in all directions.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Propellant
Circular . . .	S.Mi.Z-35 and E.S. Mi.Z-35 pressure; Z.Z-35 and Z.U. Z.Z-35 pull.	4 to 5 lb.	8 to 14 oz. cast or powdered TNT.	20 grms. black powder.

b. Use. This mine is laid as an antipersonnel obstacle, either singly or in groups of 2 to 5 mines, with one pressure fuze or 2 or 3 fuzes and rigged with tripwires or with an electrical circuit with up to 8 electric fuzes laid around the mine in parallel.

(No drawing available.)

c. Functioning. Ignition of the fuze sets off the 4½-second delay pellet. The pellet ignites the propelling charge which projects the mine upward and at the same time ignites the short-delay pellets. The short-delay pellets set off the detonators and main charge when the mine is from 1 to 1½ meters in the air.

d. Installing and Arming.

(1) Remove the three screw plugs from the detonator wells and insert three detonators OPEN END DOWN.

(2) Replace screw plugs.

(3) Remove fuze-well plug and screw in a pressure fuze (or a Y or W adapter for two or three pull and/or pressure fuzes).

(4) Place mine in a hole so that the ends of the pressure prongs or pull rings are just above ground livel.

e. Disarming Procedure.

(1) *Pressure fuze:* Insert a nail or other safety pin through the safety-pin hole in the fuze and unscrew the fuze from the mine. Unscrew the detonator well plugs and slide the detonators out of the mine.

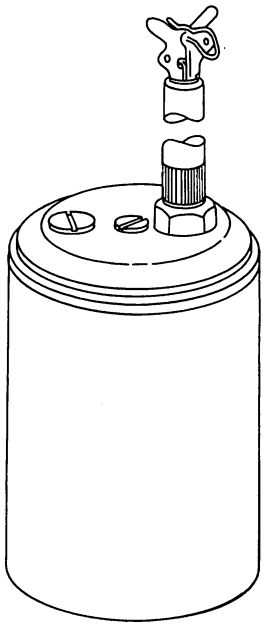
(2) *Pull fuzes and trip wires.* Trace and cut all *slack* trip wires attached to fuzes and unscrew fuzes from the mine. Remove detonators.

Note. If a *taut* trip wire is attached to one of the fuzes, DO NOT CUT IT but insert a safety pin through the safety-pin hole in the fuze first, then cut the wire and proceed as above.

(3) Remove the mine and fuzes to a safe storage or disposal area.

f. Additional Precautions. Some, but not all, models of this mine have a supplementary fuze well in the bottom for inserting a pull fuze for boobytrapping purposes.

219. S-Mine 44



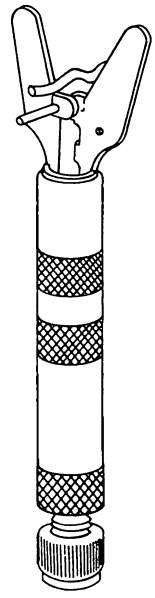


Figure 306

The chief differences between S-mine 44 and S-mine 35 are in the use of the push-pull type igniter (S. Mi. Z 44) and detonation at a predetermined height of approximately 1 meter above the ground. The igniter tube in the S-mine 44 is not located in the center as in the S-mine 35. This S-mine 44 has an outer steel case about 10.1 centimeters in diameter and 14.7 centimeters high, and an inside canister, which holds the explosive charge. This is surrounded by small shot. There are 3 screw-covered openings in the cover plate-one for pouring the charge, one for the igniter socket under which is the propellant and a 4½-second delay pellet all in one case, and a third for a pull igniter and detonator.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Propellant
Cylindrical.	S. Mi. Z. 44	21 lb. pressure or 14 lb. tension.	.5 lb. TNT...	.105 oz. gunpowder.

b. Use. This mine is used in antitank and antipersonnel minefields to make clearing operations difficult and for security against foot troops.

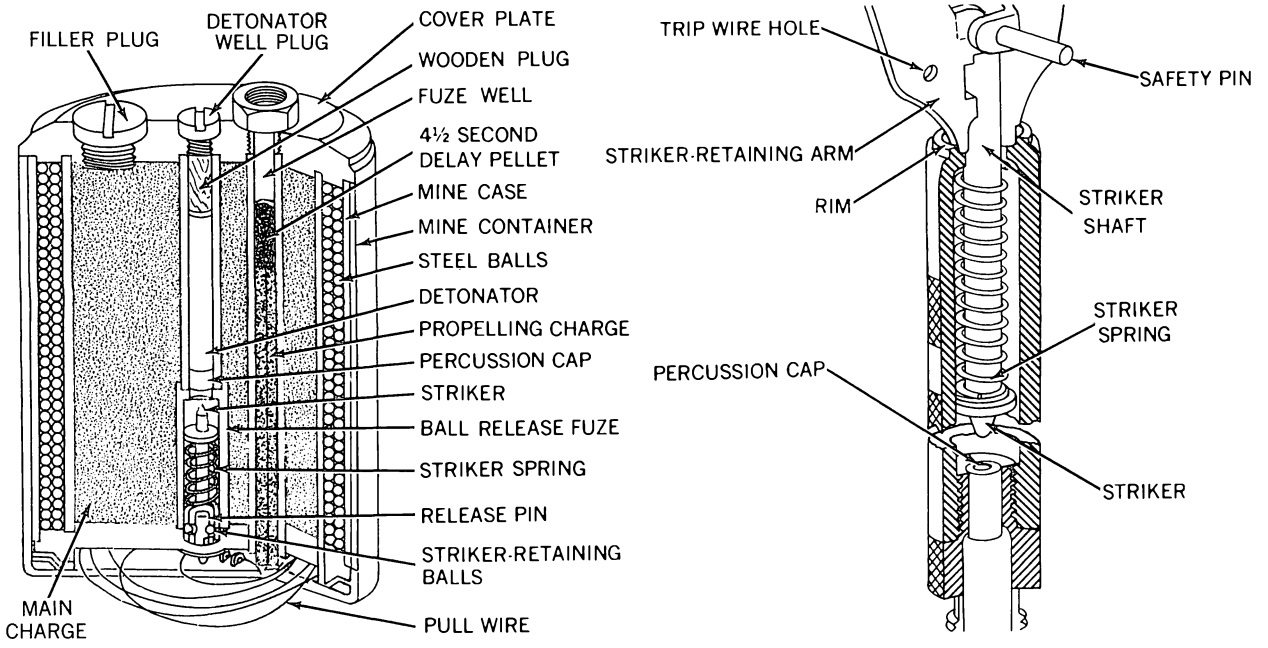


Figure 307

c. Functioning. Pressure or pull on the retaining wings opens them wide enough to release the striker, which is then driven by its spring into the percussion cap, firing it and the 4½ second delay pellet. After the delay, the propellant is fired, forcing the mine upwards. When the coiled wire is fully extended, it pulls the pin from the igniter, releasing the retaining balls to move inward and release the striker upwards to fire the cap, detonator and bursting charge.

d. Installing and Arming.

(1) Lay the mine in a hole in the ground with only the retaining wings or arms showing. In winter, however, the entire top of the fuze must be above ground level to avoid freezing.

(2) Unscrew the detonator well plug and insert a detonator, open end down, and replace the plug.

(3) Screw an S-mine fuze 35 or 44 into the fuze well, and attach tripwires to the arms of the S-mine fuze 44, if desired.

(4) Arm the fuze by pulling out the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) When the mine is armed with the S-mine fuze 44, extreme care is necessary in disarming it. When the safety pin has been removed, the striker-retaining arms are holding the spring-loaded striker only by friction. Jarring or touching the striker-retaining arms could easily cause them to fall off, releasing the striker. Carefully insert a nail or wire through the safety-pin holes before cutting any tripwires. Then cut the tripwires.

(3) Unscrew the fuze.

(4) Unscrew the detonator-well plug and remove the detonator.

(5) Remove the mine and fuzes to a safe storage or disposal area.

f. Additional Precautions. When removing the detonator. do not let the mine fall out of the mine container. Should this happen, the pull wire may actuate the mine.

220. Training S-Mine 35 (Germany)

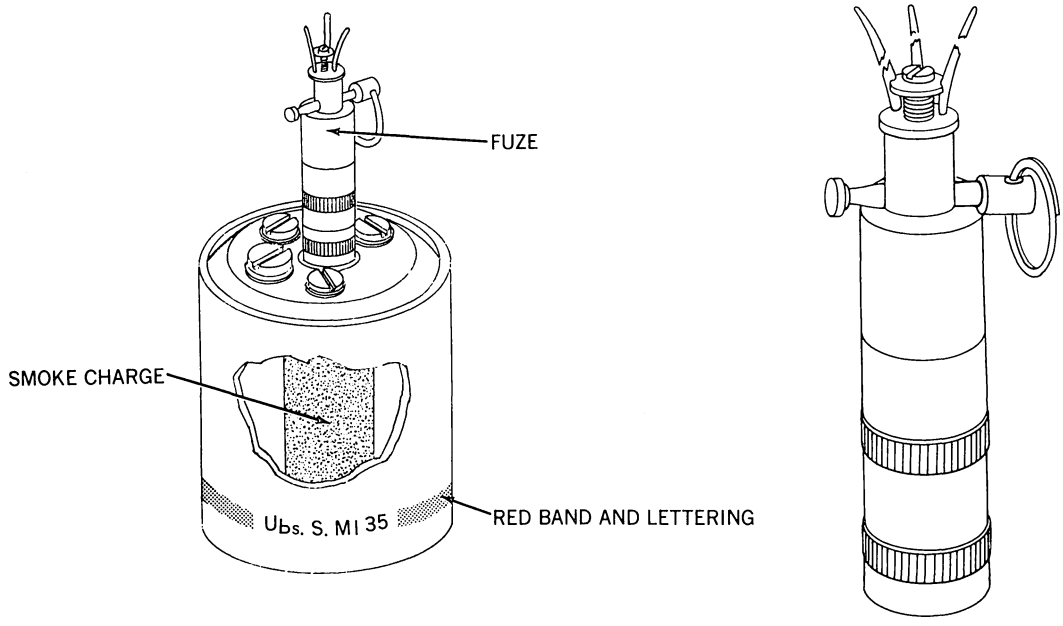


Figure 308

This is similar to the standard S-mine 35, except that the filling is inert material, such as sand or chalk, and that it contains a wooden-cased smoke charge. The mine is marked with a red band; the letters *Ubs.S.Mi. 35* are painted on the side.

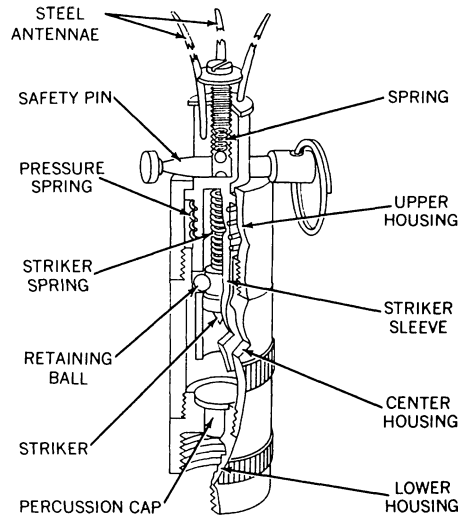

STEEL ANTENNAE
SAFETY PIN
SPRING
PRESSURE SPRING
UPPER HOUSING
STRIKER SPRING
STRIKER SLEEVE
RETAINING BALL
CENTER HOUSING
STRIKER
LOWER HOUSING
PERCUSSION CAP

Figure 309

221. Bounding Shrapnel Antipersonnel Mine (U.S.S.R.)

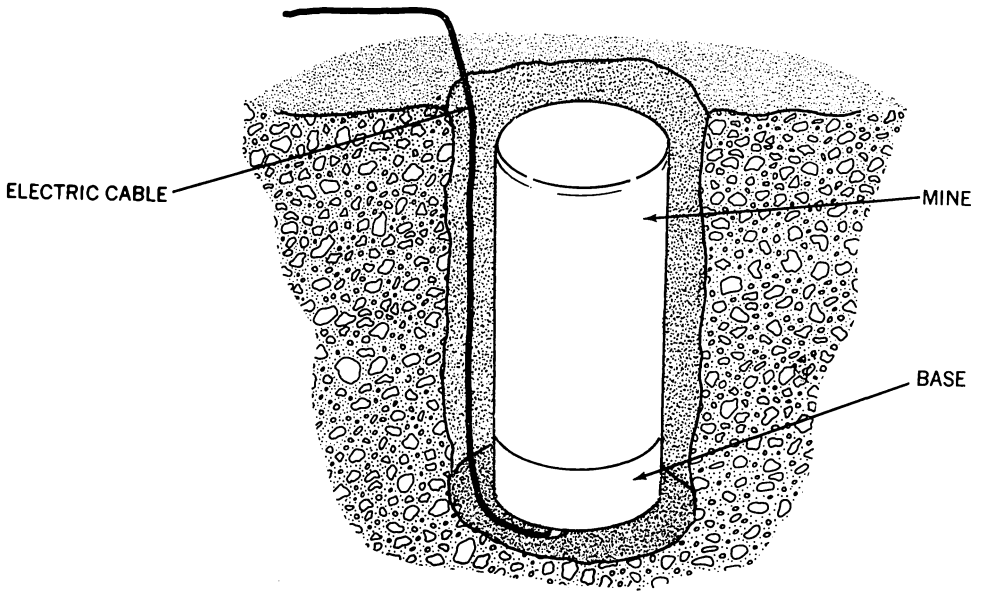


Figure 310

This is a controlled mine, consisting of a metal case 12.7 centimeters in diameter and 27.9 centimeters high. It contains an explosive and 9 pounds of metal fragments or shrapnel.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical...	Electric blasting cap or MUV pull fuze with trip wire.	20 lb. pull	2.5 lb.

b. Use. Two or more of these mines are laid together, connected electrically by wires to a central detonating point. They are used in much the same way as the German S-mines 35 and 44 (par. 218–219). These mines may also be laid to fire by tripwire.

(No drawing available.)

c. Functioning. The propellant charge is detonated at the closing of the circuit, which forces the mine into the air, where it explodes at a height of about 1 meter and scatters shrapnel within danger radius of about 60 meters. If armed by an MUV pull fuze, a tug on the tripwire pulls out the retaining pin and releases the striker to fire the percussion cap and continue the firing circuit until the mine explodes above ground.

d. Installing and Arming.

(1) Prepare a hole in the ground for the mine.

(2) If fired electrically, insert an electric detonator and connect the wires to a remote detonating station.

(3) If using a tripwire, insert an MuV pull fuze into the base of the mine and attach the tripwire to a stake above the ground and to the eye in the striker retaining pin.

e. Disarming Procedure. The Soviets do not recommend disarming this mine unless the remote detonating station is found and the electric leads are disconnected. This mine has no safety device.

222. Pot Mine (U.S.S.R.)

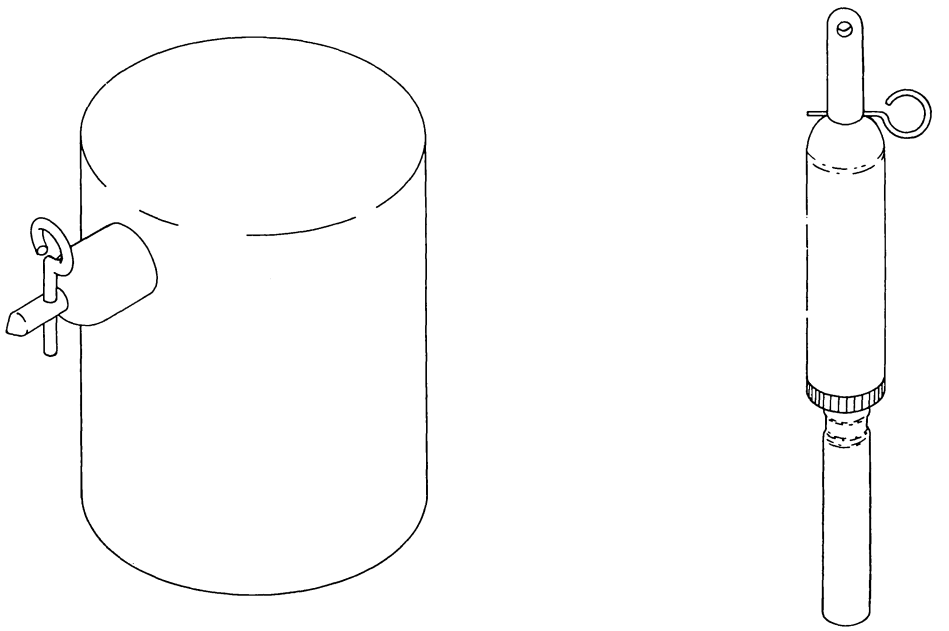


Figure 311

This metal antipersonnel mine is 15.2 centimeters in diameter and 17.7 centimeters high. The lid extends all the way to the base of the charge container. The top of the charge container is closed with a plywood disc. The disc has a hole in the center for placing the detonator in the main charge. The fuze, the propellant powder sack, and the detonator are inserted only when the mine is laid. This mine is waterproofed with tar or pitch.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Propellant
Cylindrical.	Muv pull, with trip wire (may also have a controlled electrical fuze).	20 lb. pull on trip wire.	0.5 lb. TNT...	Powdered explosive.

b. Use. This mine is used as a controlled mine detonated by a concealed observer or as a tripwire mine in minefields.

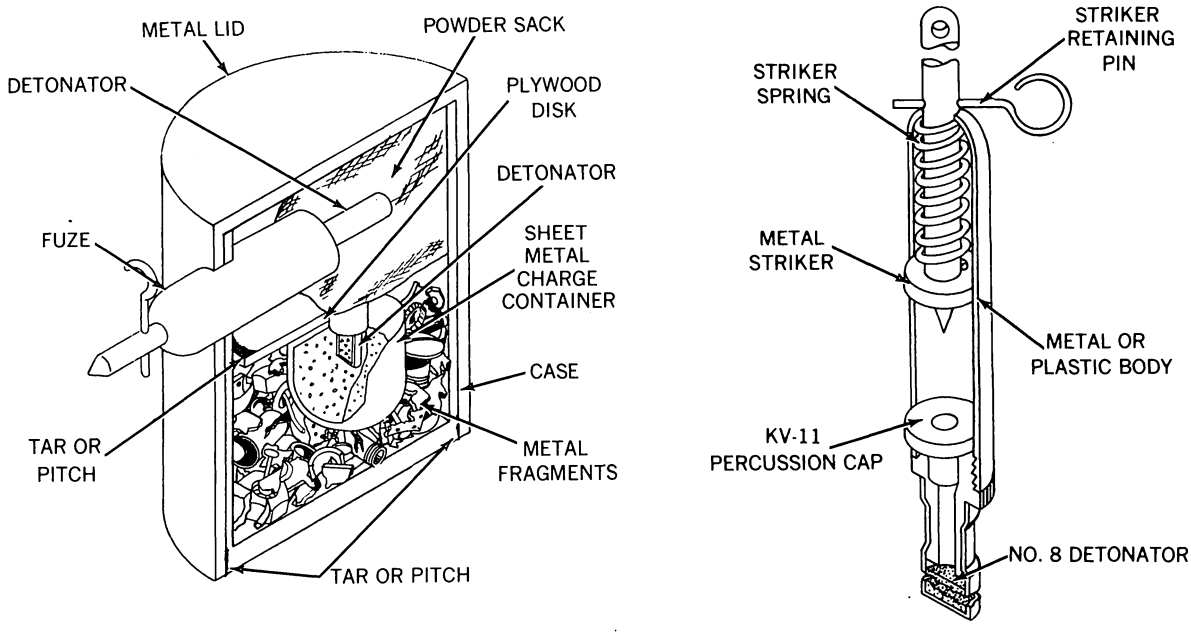


Figure 312

c. Functioning. A pull on the tripwire, removes the retaining pin, permitting the striker to fire the percussion cap, which initiates the firing chain. The ignition of the electric detonator sets off the powder sack, the second detonator, and the main charge.

d. Installing and Arming.

(1) Remove the lid.
(2) Insert the detonator in the charge.
(3) Place the powder sack over the detonator hole in the plywood disk.
(4) Replace the lid.
(5) Screw a detonator assembly onto the base of an MVV pull fuze and insert it through the hole in the lid, or insert an electric detonator through the hole.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) If laid with a pull fuze, trace and cut the wire attached to the fuze and carefully pull out the fuze, remove the lid and the powder sack, and tip the mine so that the second detonator slides out.
(3) If laid with an electric detonator, cut the lead wires *one at a time* and remove the detonator. Proceed as in (2) above.
(4) Remove mine and fuze to a safe storage or disposal area.

223. Antipersonnel Mine, E.P. (Egyptian Pattern) No. 5 (United Kingdom)

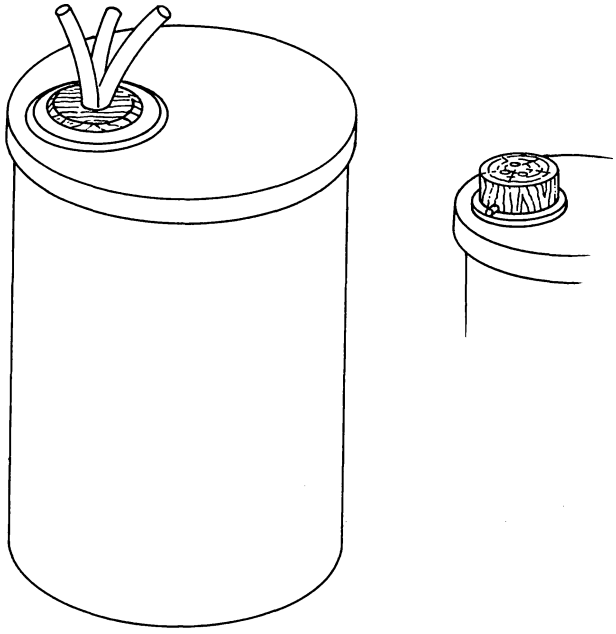


Figure 313

This mine consists of a metal case 5.0 centimeters in diameter 7.6 centimeters high, an off-center vertical well housing a wooden pressure plunger, and an integral fuze, which is merely a glass ampoule of chemical placed in the open end of the detonator and sealed in place with putty, clay, or cement. This mine is often called the chemical pressure fuze E.P. No 2, when used as the main fuze in the antitank mine E.P., Mark 5.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical...	Integral, chemical-pressure.	10 to 12 lb.....	5 oz. main charge 1.5 oz. booster.

b. Use. This mine is laid in antitank and antipersonnel minefields to hinder reconnaissance and breaching parties.

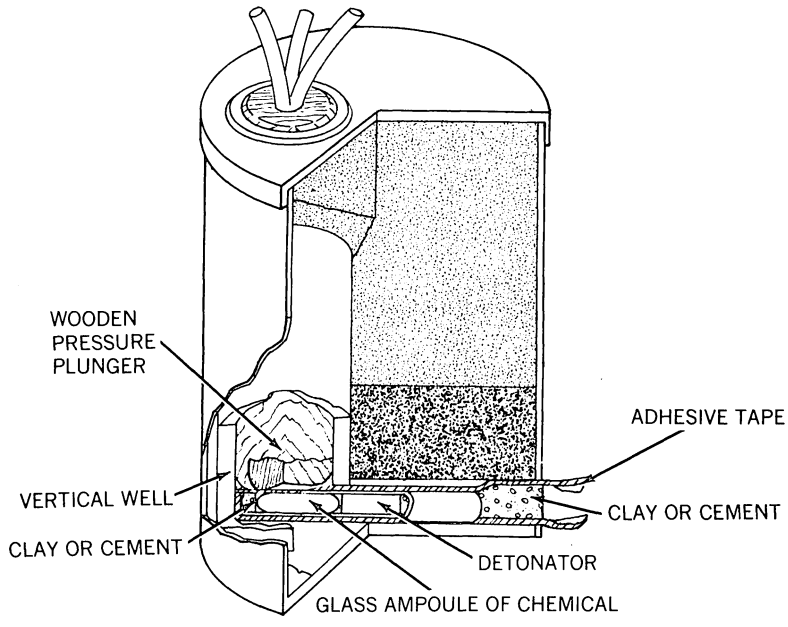


Figure 314

c. Functioning. Pressure on the pronged pressure head depresses the wooden plunger, which, moving downward, crushes the glass ampoule of chemical and produces a flash that actuates the mine.

d. Installing and Arming.

(1) Insert the ampoule of chemical in the open end of the detonator and plug with putty, clay, or cement. Do not allow any putty, clay or cement to project above the rim of the detonator.

(2) Wrap adhesive tape around the detonator and insert the detonator, ampoule end first, into the horizontal fuze well.

(3) Fill the open end of the fuze well with putty, clay, cement, or a piece of cork.

(4) Place the mine in a hole so that the top of the case is at ground level.

(5) Gently lower the wooden pressure plunger into the well in the top of the case until it rests on the detonator. (When using this mine as a fuze, remove the prongs from the wooden pressure plunger and insert a shear pin through the top of the plunger so that it rests in the well.)

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the wooden pressure plunger.

(3) Lift the mine and pull out the detonator by the tape ends extending out of the fuze well.

(4) Remove the mine and fuze to a safe storage or disposal area.

224. Antipersonnel Mine No. 5 Mark 1 (United Kingdom)

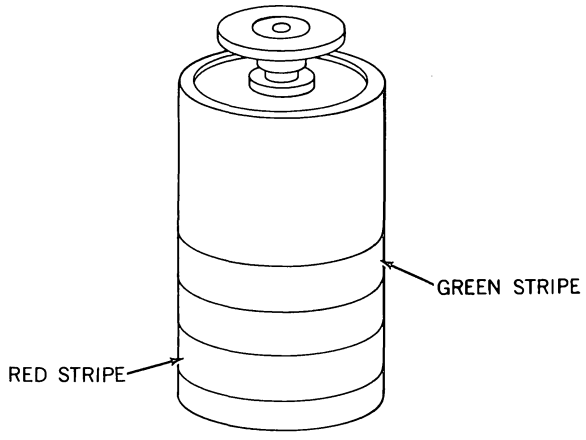


Figure 315

The No. 5 Mark 1 antipersonnel mine has a shellacked cardboard case. Its No. 89 plastic fuze has a metal pressure plate. The fuze well is large enough to accommodate the fuze loosely, permitting lateral movement of the striker retaining balls. For shipping, a wooden plug is placed in the fuze well. The mine is 5.0 centimeters in diameter and 8.87 centimeters in height.

a. Characteristics.

Shape	Fuze	Operating force	Explosives	Markings
Cylindrical.	Pressure with ball release.	6 to 12 lb.	6.75-oz. pentolite (PETN (TNT) or 50/50 RDX/TNT main charge 2.5 oz. booster.	One red and one green stripe painted around the lower half of the case.

b. Use. This mine is laid in trails and roads to cause casualties to foot troops or where it will damage tires of vehicles.

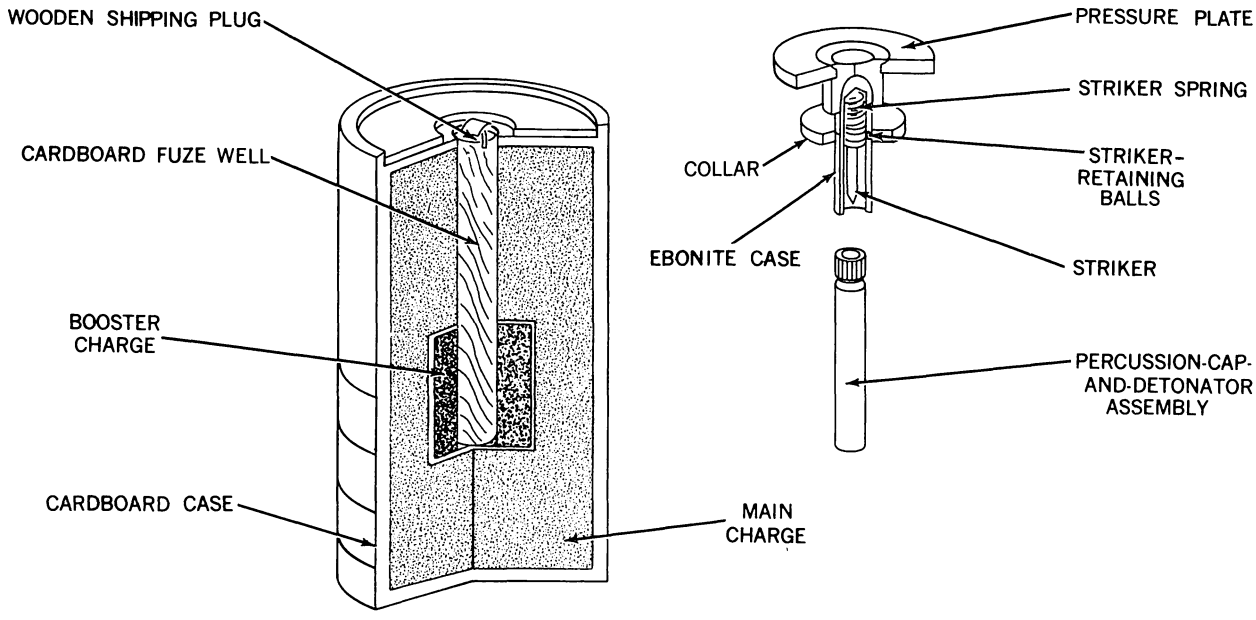


Figure 316

c. Functioning. Pressure on the top forces the fuze case through its collar, releasing the striker retaining balls. The striker, thus freed, fires the percussion cap.

d. Installing and Arming.

(1) Place the mine in a hole so that the top will be just below the surface of the ground.

(2) Remove the wooden shipping plug from the fuze well.

(3) Insert the detonator assembly in the fuze well.

(4) Insert the fuze and pressure plate so that the collar rests on top of the mine. Avoid putting pressure on top of the fuze during installation.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Carefully lift the fuze from the mine (be sure that no pressure is applied on the movable collar as it has to move only a fraction of an inch to release the striker retaining balls).

(3) Remove the percussion cap and detonator assembly from the fuze well.

(4) Transport the mine and fuze to a safe storage or disposal area.

225. Ration-Can Antipersonnel Mine (Germany)

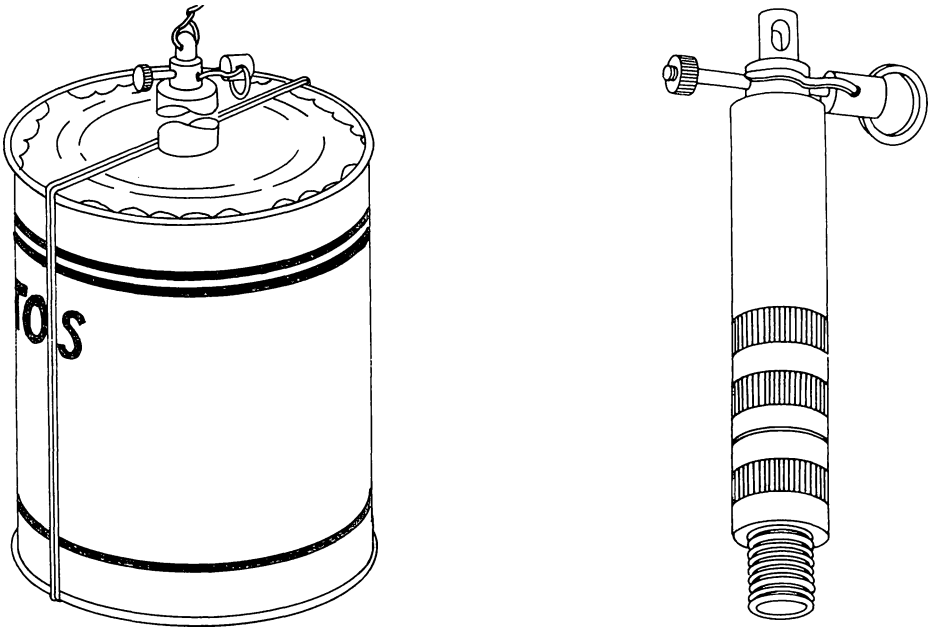


Figure 317

The improvised ration-can antipersonnel mine is merely an empty metal ration can with a hole pounched in the lid to install a fuze and with an explosive charge, which is surrounded by broken glass, scrap metal, and other shrapnel fragments. The lid is held in place by a wire or cord wrapped a number of times lengthwise around the can.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical...	Pressure or pull.	10 lb. or more, pressure or pull.	.22 lb.

b. Use. The mine is laid either as a tripwire or pressure type antipersonnel mine or boobytrap.

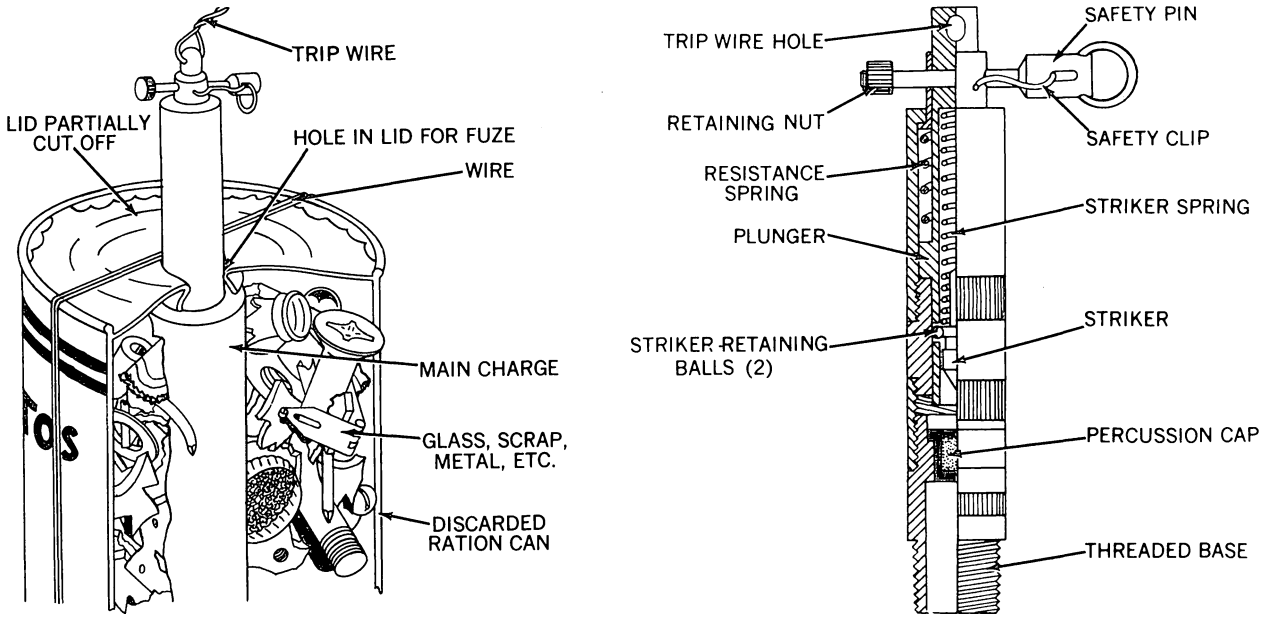


Figure 318

c. Functioning.

(1) *Pressure fuze.* The application of pressure on the top of the fuze forces the plunger down releasing the retaining balls and freeing the striker to fire the percussion cap, detonator, and main charge.

(2) *Pull fuze.* A pull on the tripwire removes the retaining pin from the striker, releasing it to fire the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Pierce a hole in the lid of an empty ration can that still has the lid attached.

(2) Insert the main charge into the can, with the fuze well up.

(3) Fill the can with rocks, scraps of metal, or glass fragments.

(4) Close the lid and screw a pressure or pull fuze with detonator into the fuze well of the main charge through the hole in the lid of the can.

(5) Wrap a wire or cord lengthwise around the can to keep the lid in place.

(6) Lay the mine in a hole and arm the fuze.

e. Disarming Procedure.

(1) Disarm the fuze.

(2) Unscrew the fuze from the main charge.

(3) Remove the detonator.

(4) Take the mine and fuze to a safe storage or disposal area.

226. Trip Flare, Model 1950 (France)

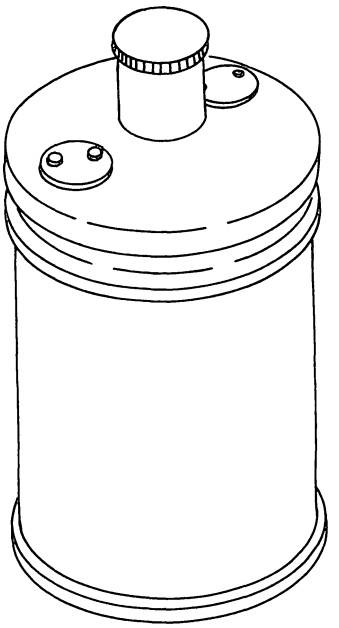


Figure 319

This is a flammable composition and an igniting pellet in a cylindrical metal case. On the top is a raised fuze well closed with a transit plug. When the light producing chemical starts to burn, two thin lead diaphragms in the top of the flare melt out. The unit may be fitted with either a tilt rod or a pull fuze.

a. Physical Features.

Case	Fuze	Measurements		Time of burning	Zone of light
		Ht	Diam		
Galvanized steel.	Tilt rod or pull.	11.4 cm.	5.5 cm	45 seconds	46-meter radius.

Markings

Manufacturer's symbol, lot number, and year of manufacture.

b. Use. This device is used as a warning flare. With tilt rod fuzes, two or more units may be attached to a common tripwire.

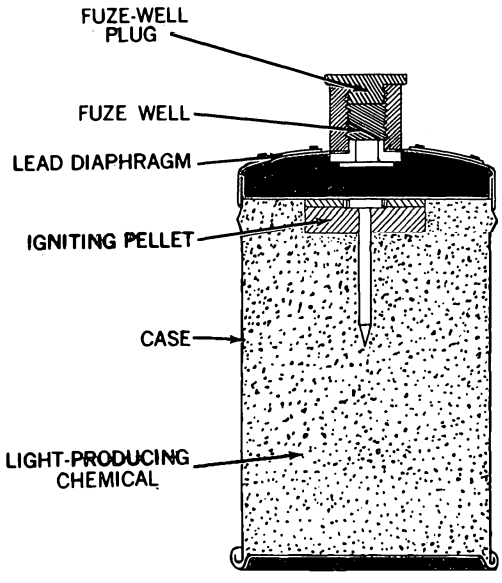


Figure 320

c. Functioning. A pull on the tripwire actuates the fuze, igniting the pellet, which in turn ignites the ligh-producing chemical.

d. Installing and Arming.

(1) Fix the flare to a support or bury it in the ground (The top of the flare, if buried, should extend above the ground level).
(2) Arrange the trip wire and anchor the outer end.
(3) Remove the fuze well plug.
(4) Place a detonator in the fuze well.
(5) Place the fuze in the well (tilt rod Model 1952 or pull fuze Model 1951).
(6) Attach the trip wire to the fuze.

e. Disarming Procedure.

(1) Cut all loose trip wires.
(2) Remove the fuze from the detonator.
(3) Remove the detonator from the flare.
(4) Take the flare to a safe storage or disposal area.

227. MZ Mine (U.S.S.R.)

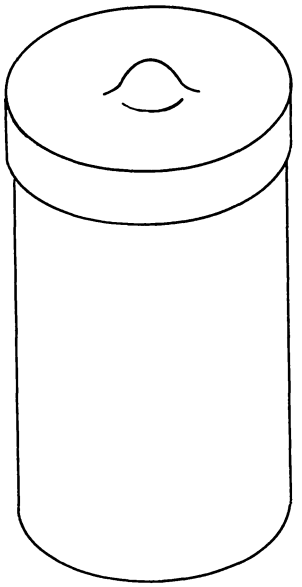


Figure 321

The MZ mine is a cylindrical sheet-steel container, 12.7 centimetêrs in diameter and 25.4 centimeters high. The mine is similar to the British No. 5 antipersonnel mine, Mark I. The centrally located pressure fuze is welded to the top of the container. This fuze has a shear pin holding back a springloaded striker. If the mine is to be actuated by pull, a tripwire can be attached to the eye in one end of the shear pin. The lid has a slot in one side of insertion of the tripwire. A spring type safety clip fits around the plunger.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical.....	Pressure or pull.	50 lb. or more pressure, 10 lb. or more pull.	4 lb.

b. Use. The MZ mine is normally laid in clusters of two or three mines, each mine placed in the ground with only the lid above ground. This mine is primarily used against personnel but is also effective against vehicles.

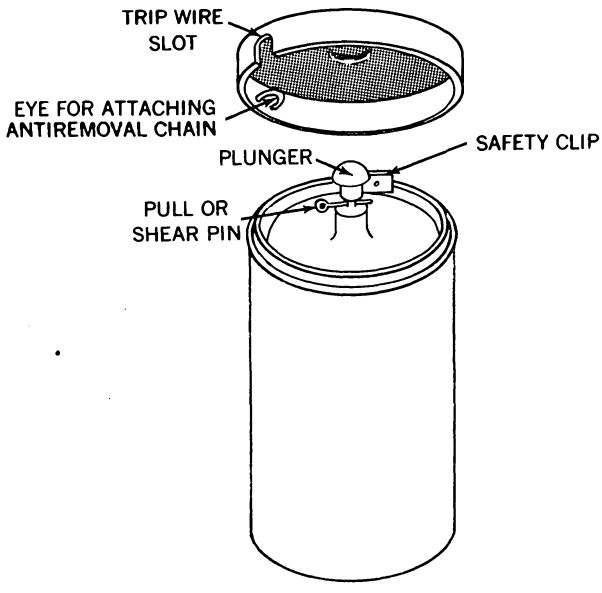


Figure 322

c. Functioning.

(1) *Pressure.* Pressure on the lid shears the shear pin and releases the spring-loaded striker against the percussion cap which fires the mine. The container is shattered into many small fragments.

(2) *Pull.* A trip wire is attached to the eye at one end of the shear pin and runs out through the hole in the lid to an anchor. A pull on the wire pulls out the shear pin, releasing the spring-loaded striker.

(3) *Antiremoval.* A chain with a snap hook may be attached to the lid and the eye in the shear pin. When the lid is raised, the chain pulls the shear pin out of the fuze.

d. Installing and Arming.

(1) Dig a hole and place the mine therein.

(2) Remove the lid and take off the safety clip. If desired, attach an anchored pull wire to the eye of the shear pin or attach a chain to the under side of the lid and to the eye of the shear pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Trace and cut any pull wires attached to the mine and gently lift the lid enough to be able to feel or see if there is an antiremoval chain attached to the shear pin. If not, remove the lid. If the chain is present, cut it with pliers and remove the lid.

(3) Wrap or clip a safety device around the plunger of the fuze.

(4) Remove the mine and fuze to a safe storage or disposal area.

228. Bounding Antipersonnel Mine, M–1939 (France)

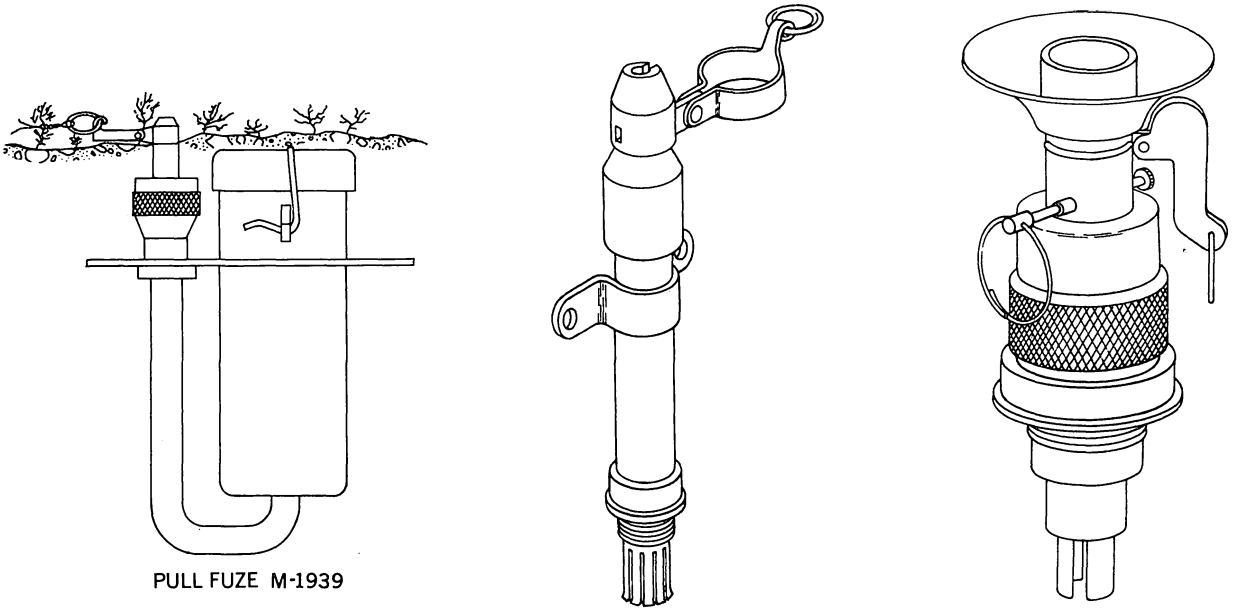


Figure 323

The M–1939 is a mortar shell inclosed in a steel tube closed at the top by a cover, with an L-shaped flash tube extending from the bottom. The top of the flash tube is threaded to receive a fuze adapter. A rectangular metal support plate surrounds the flash tube and the container tube. The propelling charge is located in the flash tube. The mine is about 20.9 centimeters high and about 18.4 centimeters in diameter. A winged plug is provided to screw into the tail of the bomb for screwing it onto the fuze assembly (flash tube). Two types of fuzing may be used—the M–1939 pull fuze, and the S.E.M.G. pressure pull fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Propellant
Cylindrical.	M-1939 pull fuze or S.E.M.G. pressure-pull fuze.	Pull fuze—10-20 lbs. force on tripwire S.E.M.G. pressure-pull fuze —90 to 100 lb. on pressure head or a 9 lb. pull on tripwire.	5-oz. melinite.	0.03-oz. black powder.

b. Use. This mine was designed for emplacement in antitank and antipersonnel minefields.

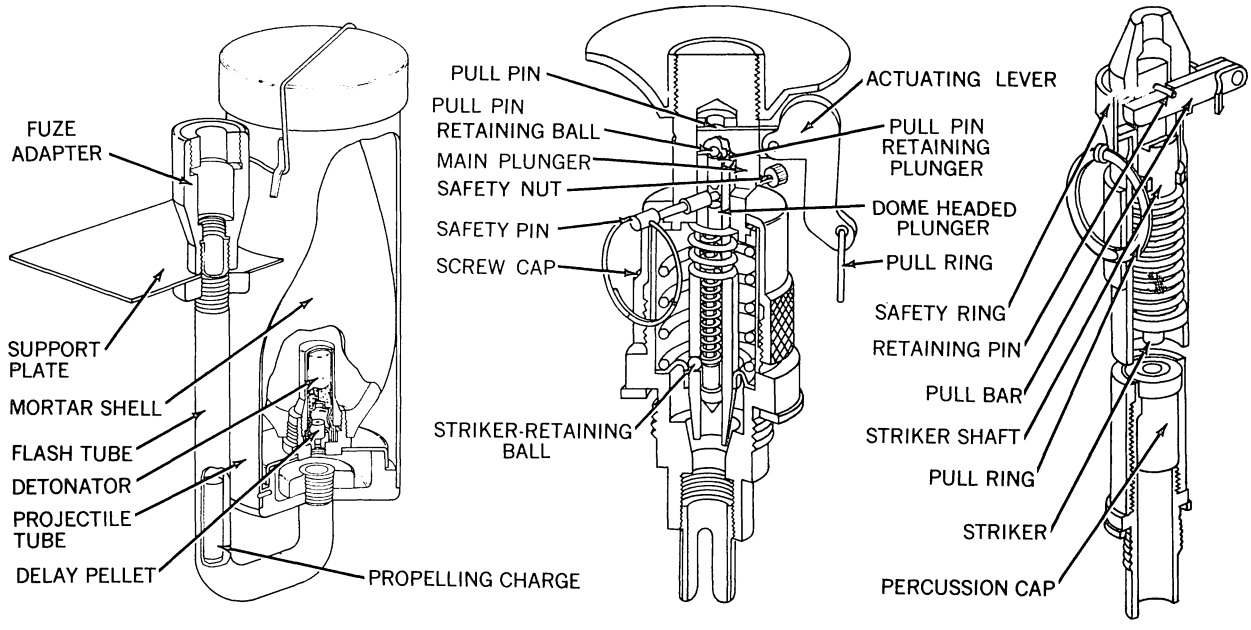


Figure 324

c. Functioning.

(1) With pull fuze, M–1939, a tug on the ring pulls out the pull bar, releasing the striker to fire the percussion cap, the flame of which ignites the propelling charge. The propelling charge then shoots the mortar shell from the tube and at the same time ignites the delay pellet, which burns through and fires the detonator. The detonator then fires the main charge, which fragmentizes the mortar shells at a height of 0.6 to 2 meters above the ground.

(2) With the pressure-pull fuze, S.E.M.G. pressure on the pressure head or a pull on the tripwire attached to the pull ring, actuates the fuze, releasing the spring-loaded striker against the percussion cap. The flame from the percussion cap ignites the propelling charge, which forces the mortar shell from the tube and also ignites the delay pellet. The delay pellet burns through and fires the detonator, which then fires the main charge and fragmentizes the mortar shell about 0.6 to 2 meters above the ground.

d. Installing and Arming.

(1) *Pull fuze, M–1939.*

(*a*) Place the mine in a hole so that only the top of the fuze extends above the ground surface.

(*b*) Screw the threaded collar into the top of the fuze adapter.

(*c*) Screw the fuze into the base of the fuze adapter.

(*d*) Remove the safety ring from the top of the fuze.

(*e*) Connect the anchored tripwire to the pull ring.

(2) *Pressure-pull fuze, S.E.M.G.*

(*a*) Place the mine in a hole so that the top of the fuze will be flush with the surface of the ground.

(*b*) Screw the fuze into the top of the fuze adapter.

(*c*) Connect an anchored tripwire to the pull ring.

(*d*) Unscrew the safety nut from the safety pin and pull out the safety pin.

(*e*) If desired, place a pressure board over the fuze for greater contact area.

e. Disarming Procedure. The first operation is to check for and remove any antilift devices.

(1) *Pull fuze, M–1939.*

(*a*) Trace and cut the slack tripwire.

(*b*) Place the safety ring over the top of the fuze.

(*c*) Unscrew the fuze from the fuze adapter.

(2) *Pressure-pull fuze, S.E.M.G.*

(*a*) Insert the safety pin in the fuze. As the safety pin has a beveled end, it must be inserted with the edge uppermost to engage the dome-headed plunger blocking the safety-pin hole. Screw the safety nut onto the end of the safety pin.

(*b*) Trace and cut the tripwire.

(*c*) Unscrew the fuze from the fuze adapter.

(3) *Remove the mine and fuze to a safe storage or disposal area.*

f. Additional Precautions. When unscrewing the fuze, *never* grip the fuze by the knurled screw cap since this action will unscrew the screw cap from the fuze case, allowing the main plunger and actuating sleeve to rise under the action of the compressed main spring until the striker-retaining ball clears the top of the guide piece, releasing the spring-loaded striker against the percussion cap. The fuze must be gripped by the slotted collar. A special C spanner wrench should be used on this collar.

229. Bounding Antipersonnel Mine, Mark 2 (United Kingdom)

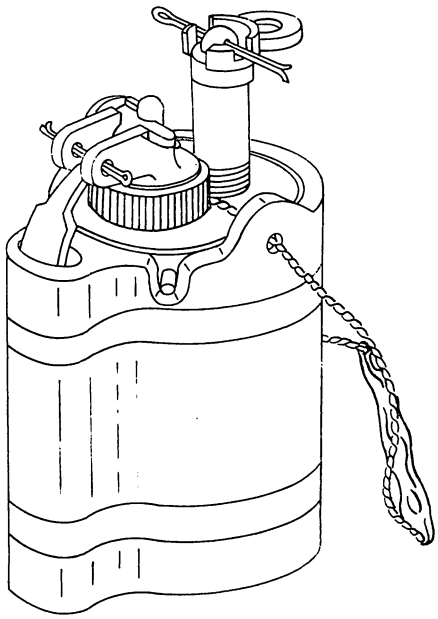


Figure 325

This is a bounding fragmentation mine consisting of a cast iron case 13.9 centimeters high and 8.8 centimeters in diameter, containing a steel-cased cylindrical projectile fastened to the bottom of the case by two machine screws. The mine has two mechanical fuzes, one for firing the propelling charge and one for the main charge. Although the effective casualty radius is 9 to 14 meters, it is dangerous to personnel at distances up to 46 meters.

a. Characteristics.

Shape	Case	Operating force	Fuze		Explosive
			Main charge	Propellant	
Cylindrical with a bulge on one side for the lever case.	Cast iron.	4 lb. pull.	Mechanical lever-release.	Pull, requiring 4 lb. force for release.	1 lb. amatol.
Markings					
Two red stripes are painted around the case.					

b. Use. This mine is laid in antipersonnel minefields for security and in antitank minefields to hinder reconnaissance and breaching parties.

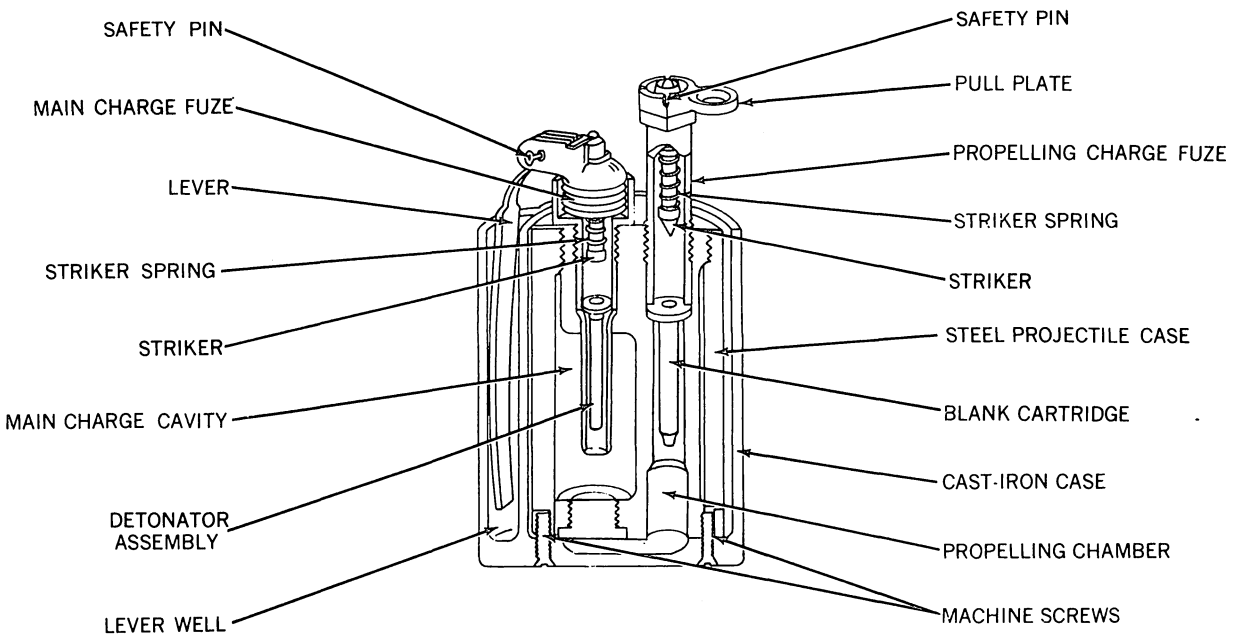


Figure 326

c. Functioning. Force applied to the tripwire of the propelling fuze pull-plate pulls out the plate releasing the spring-driven striker against the blank cartridge. The pressure from the blank cartridge explosion breaks the screws holding the projectile to the case and propels it into the air. The lever retaining the striker of the main charge fuze clears the well on the side of the case and springs outward, which releases the spring-actuated striker against the detonator assembly and fires the main charge at about 1 meter above the ground.

d. Installing and Arming.

(1) Unscrew the propelling charge fuze with a wrench.
(2) Insert the blank cartridge in the fuze well and replace the fuze.
(3) Unscrew the main charge fuze.
(4) Insert the detonator assembly with with the percussion cap uppermost and replace the fuze with its striker retaining lever extended downward into its well.
(5) Place the mine in the hole so that the pull plate of the propelling charge fuze is just above ground level.
(6) Attach the tripwire to an anchor and to the pull plate.
(7) Remove the safety pins from both fuzes.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Insert a safety pin or rail in the safety-pin hole of each fuze.
(3) Trace and cut the tripwire.
(4) Unscrew the propelling charge fuze and remove the blank cartridge.
(5) Unscrew the main charge fuze and remove the detonator assembly.
(6) Transport mine and fuzes to a safe storage or disposal area.

230. Antipersonnel Shrapnel Mine, Mark 1 (United Kingdom)

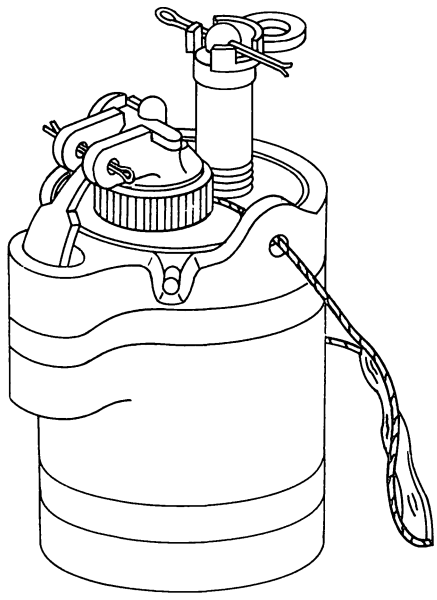


Figure 327

The British antipersonnel shrapnel mine, Mark I, is an earlier model of the shrapnel mine, Mark II (par. 229). It is identical to the Mark II except for the following differences: the lever on the detonating fuze in the Mark I is short and does not extend the full depth of the mine case; the percussion-cap-and-detonator assembly in the Mark I has a delay pellet; the mine case of the Mark I has "71A" stenciled on it in black, and the Mark I has a leather carrying strap instead of a wire handle. For use, functioning, installing and arming, and disarming procedures, see paragraph 229.

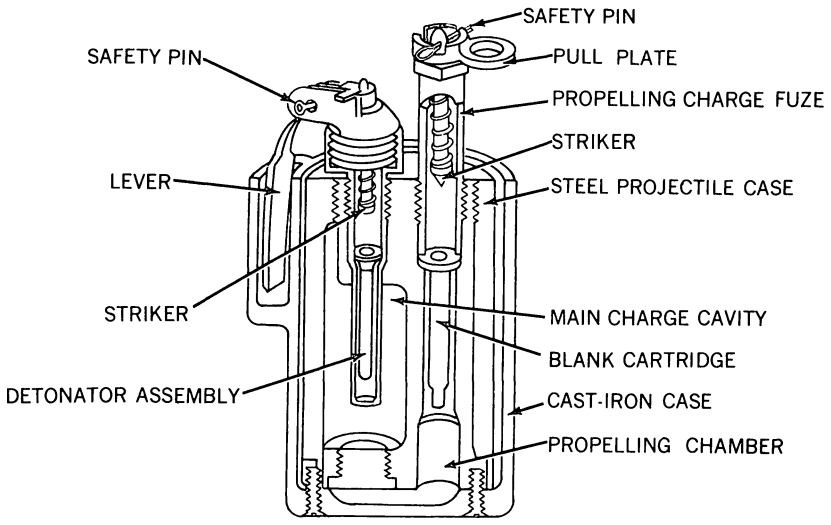

SAFETY PIN
SAFETY PIN
PULL PLATE
PROPELLING CHARGE FUZE
STRIKER
LEVER
STEEL PROJECTILE CASE
STRIKER
MAIN CHARGE CAVITY
BLANK CARTRIDGE
DETONATOR ASSEMBLY
CAST-IRON CASE
PROPELLING CHAMBER

Figure 328

231. Antipersonnel Mine, B–4 (Italy)

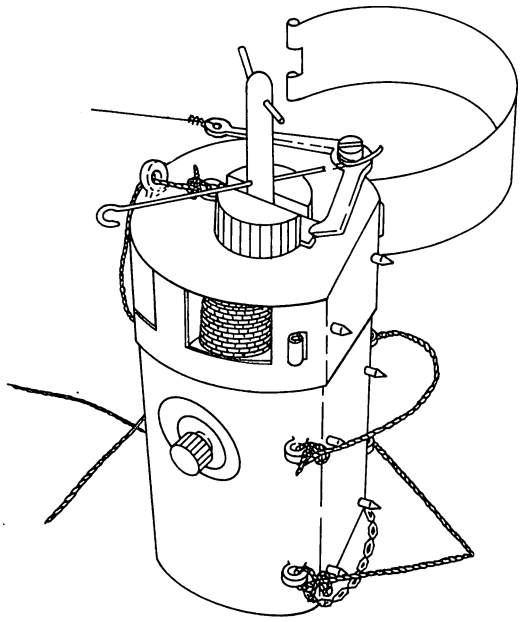


Figure 329

The B–4 is composed of two concentric steel cylinders with a common base and superimposed top cover. The mine is 6.8 centimeters in diameter and 12.9 centimeters high. In the flattened portion of the outer cylinder are six spikes for fastening the mine against a tree or post. A percussion-cap holder is inserted diametrically through the side of the mine case. The detonator and booster are inserted in a well in the bottom of the fuze housing. Tripwires, wound on spools, are carried in recesses in the top portion of the case and covered by a hinged flap closed by a pin. This pin also serves as a safety pin for arming the mine. On some models, an auxiliary firing mechanism is provided—a spring-loaded actuating lever held cocked by a taut tripwire.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical flattened on one side.	Integral pull.....	10 to 20 lb.....	0.25 lb. TNT.

b. Use. This mine is employed in antitank minefields in an irregular line in the front. It may also be found in antipersonnel minefields and wire obstacles along with other mines.

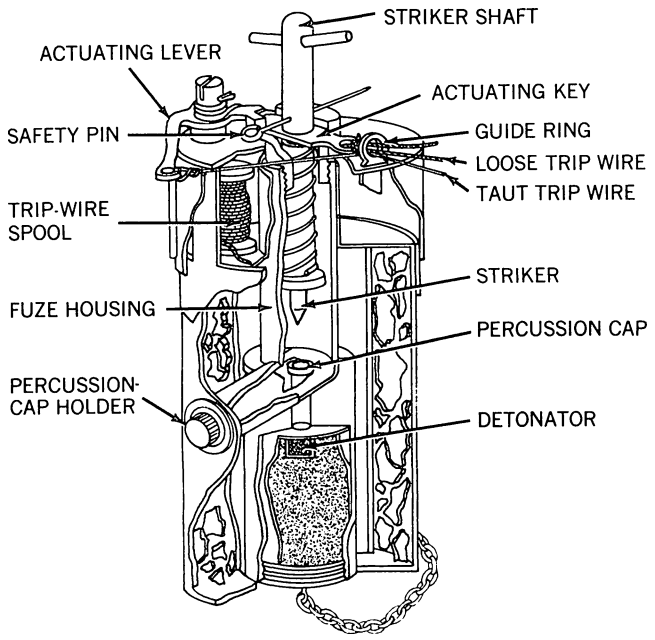


Figure 330

c. Functioning.

(1) *With slack tripwire.* A pull on the slack tripwire pulls the actuating key away from the striker shaft permitting the striker shaft to slip through the circular hole in the actuating key. The released striker then sets off the percussion cap and fires the mine.

(2) *With taut tripwire.* The cutting or breaking of the taut trip wire releases the spring-loaded actuating lever against the actuating key. The actuating key is then pushed outward until the striker shaft slides through the circular hole in the key. After this the released striker sets off the percussion cap and fires the mine.

d. Installing and Arming.

(1) *Slack tripwire.*

(*a*) Attach the mine to a tree, post, or wooden object.

(*b*) Anchor the slack trip wires and attach them to the actuating key, passing them through the guide ring.

(*c*) Cock the striker by pulling out the striker shaft and insert a safety pin in the exposed hole. The pin in the hinged flap may be used for this purpose.

(*d*) Push the actuating key to engage the striker shaft.

(*e*) Insert a percussion cap in the percussion cap holder and push the holder into place.

(*f*) Attach a cord to the safety pin and from a safe distance, remove it.

(3) *Taut tripwire.*

(*a*) Anchor one end of the wire, thread it through the guide ring, and attach the other end to the eye in the actuating lever.

(*b*) Adjust the tension to have a 0.6 centimeter space between the actuating key and the actuating lever.

(*c*) The remaining steps are the same as (1) (*c*) through (*f*), above.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert a safety pin into the hole in the striker shaft.

(3) Remove the percussion cap from the mine by removing the percussion-cap holder.

(4) Disengage the actuating key from the striker shaft.

(5) Uncock the striker by removing the safety pins and gently lowering the striker shaft.

(6) Trace and cut the tripwires.

(7) Remove the mine and fuze to a safe storage or disposal area.

232. Bounding Antipersonnel Mine (Hungary)

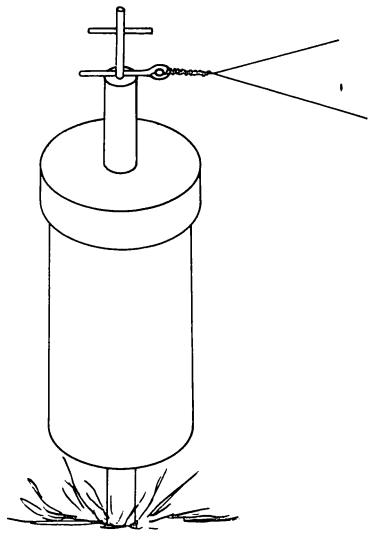


Figure 331

This cylindrical, metal-cased bounding mine is hurled into the air, where it explodes and scatters a steel-ball shrapnel charge in all directions. The bottom of the case is recessed to accommodate a wooden mounting stake. This mine has a black powder propellant charge. Such mines are laid in rows about 10 meters apart at a space of about 20 meters between individual mines. Those in one row are staggered between those in adjacent rows. The case is 30.0 centimeters high and 12.0 centimeters in diameter.

a. Characteristics.

Shape	Fuze	Operating force
Cylindrical.....	Pull.....	10 to 20 lb.
Explosive		
Main charge	Propellant	
1.7 lb. TRI-II.	Black powder.	

b. Employment. Bounding mines are laid in pattern in minefields.

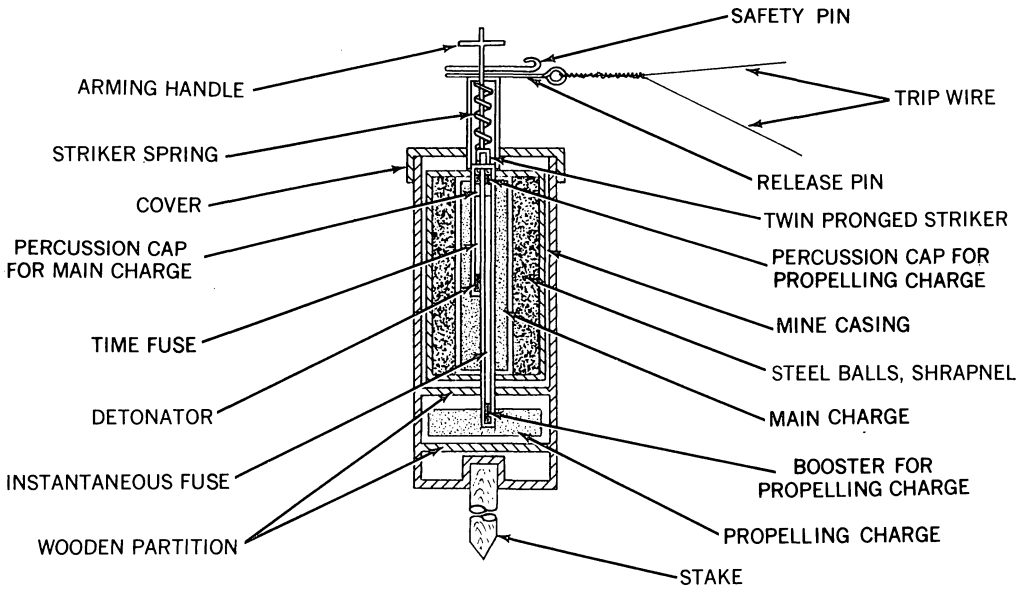


Figure 332

c. Functioning. A pull on the tripwire removes the striker retaining pin and releases the double-pointed striker. It then simultaneously hits two percussion caps igniting a short piece of time fuse and a longer piece of instantaneous fuse. The latter burns through first, setting off the black powder propellant. This projects the mine about .5 meter above the ground, where the main charge explodes, scattering the steel balls in every direction.

d. Installing and Arming.

(1) Drive the mine stake into the ground and fasten the container on the top.
(2) Insert the mine into the container.
(3) Pull out the cocking handle of the fuze to expose the two holes in the striker shaft.
(4) Insert the striker release pin in the innermost hole.
(5) Insert the safety pin in the outer hole.
(6) Insert the fuze in the mine.
(7) Drive a stake 10 meters to each side of the mine and anchor one end of a tripwire to each stake.
(8) Tie the loose ends of the tripwires to the pull pin of the fuze.
(9) Remove the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Insert a nail or wire in the safety-pin hole.
(3) Trace and cut the tripwire close to the fuze.
(4) Remove the fuze.
(5) Remove the mine and fuze to a safe storage or disposal area.

233. Bounding Gas Mine 37 (Sp. Bü. 37) (Germany)

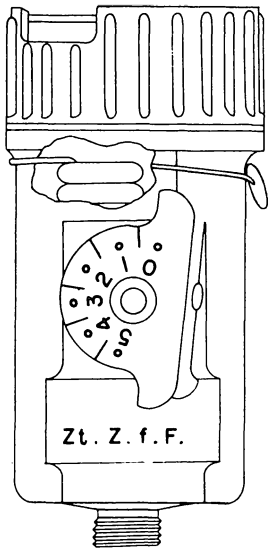


Figure 333

The bounding gas mine 37 closely resembles a large S-mine and is very similar to the Soviet bounding gas mine KhF–1. The steel case is 17.7 centimeters in diameter and 40.6 centimeters high, and fitted with a handle of wood and wire. It houses a cylindrical metal unit containing about 2 gallons of liquid contaminant. The central ignition tube, welded to the bottom of the mine, contains the main charge, detonator, and wooden plug with a delay pellet. The propelling charge, in a metal case, is screwed into the base plug.

a. Characteristics.

Shape	Fuze	Contaminant	Explosive	
			Main charge	Propellant
Cylindrical.	5-minute clockwork delay Zt.Z.f.F.	Usually 2 gals. mustard.	.....	0.66 lb. block powder.

Markings

The letters Sp.Bü. are stenciled in white on the side of the case and two yellow bands are painted on the upper part of the mine unit. All points where leakage might occur are painted with a pink contaminant-detector varnish that turns red when contacted by gas.

b. Use. This mine is placed in areas to be denied to opposing forces by gas contamination. The mine may be laid to give an air burst or ground burst. One mine will contaminate an area of 150 square meters in a ground burst and up to 502 square meters in an air burst.

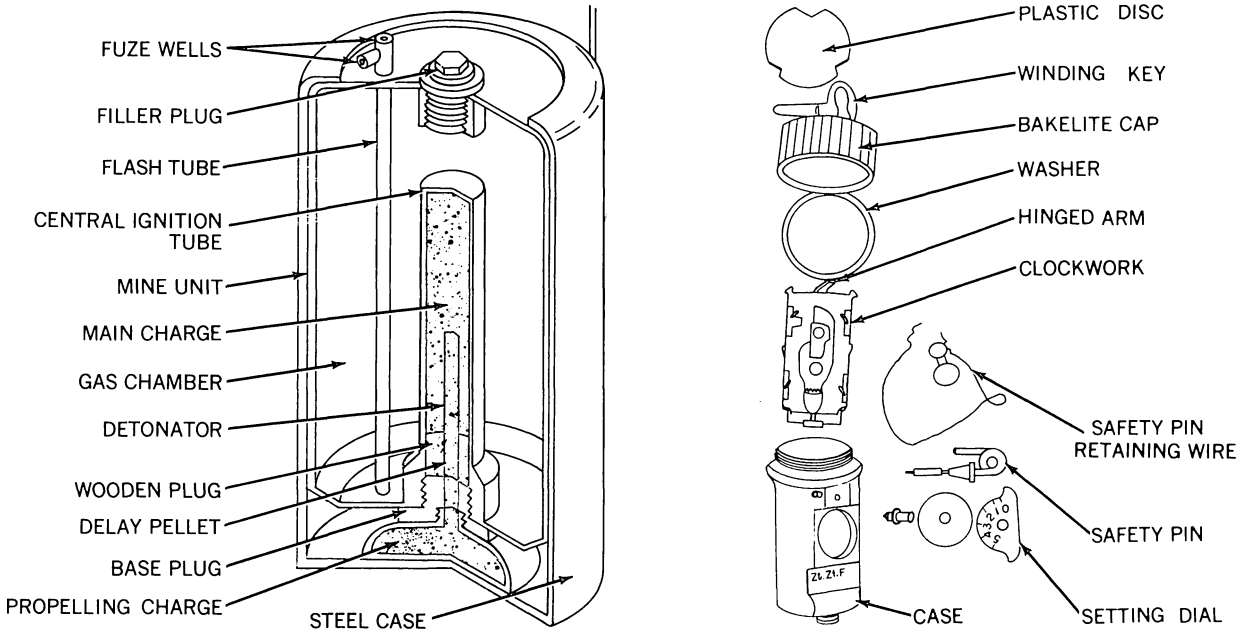


Figure 334

c. Functioning.

(1) *Air burst.* The 5-minute clockwork delay ignites the propelling charge, forcing the mine out of the case 3 to 6 meters into the air before the delay pellet (0.4 sec.) sets off the detonator and the main charge.

(2) *Ground burst.* The 5-minute clockwork delay fuze, screwed into the base plug, sets off the detonator and the main charge. The explosion bursts the mine unit.

d. Installing and Arming.

(1) *Air burst.*

(*a*) Place the mine in the ground so that ¼ of it extends above the ground.

(*b*) Loosen the turned-over lip at the top of the steel case with a screw driver or a pair of pliers.

(*c*) Wind the clockwork delay fuze and set the dial at the number of minutes desired, but never less than 2 minutes.

(*d*) Screw the clockwork delay fuze into one of the fuze wells.

(*e*) Remove the safety-pin retaining wire and pull the safety pin out of the fuze.

(2) *Ground burst.*

(*a*) Remove the mine unit from the steel case.

(*b*) Unscrew the propelling charge and base plug and remove the delay pellet.

(*c*) Replace the base plug and screw the clockwork delay fuze into it.

(*d*) Proceed as in (1) (*c*) above.

(*e*) Place the mine on the ground.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert a wire or nail in the safety-pin hole of the 5-minute clockwork delay fuze and unscrew it from the mine. If a type III 5-minute clockwork delay fuze has been used, turn the arming knob to *sicher,* insert a safety pin, and unscrew the fuze.

(3) Remove the mine and fuze to a safe storage or disposal area.

234. Chemical Bounding Mine, KhF (U.S.S.R.)

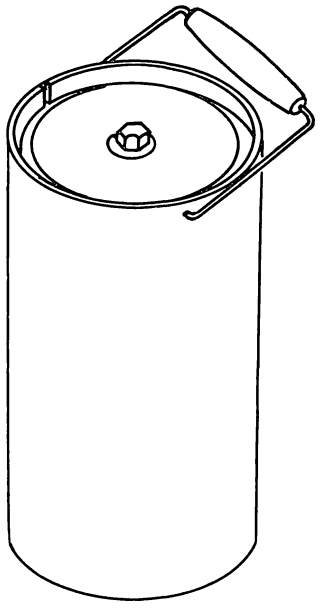


Figure 335

This steel cased mine was produced in quantity by the Soviets in World War II, but was never used tactically. The Germans captured two models—KhF1 and KhF2, which differed only in dimensions. Both contained about 1.2 gallons of liquid contaminant.

a. Characteristics.

Model	Shape	Fuzes	Measurements	
			Diam	Ht
KhF1...	Cylindrical.	Elec. detonated and 1.5 sec time delay.	15.24 cm	35.0 cm
KhF2...	Cylindrical.	Time delay.	18.7 cm	28.4 cm

Main charge	Propellant
.353 oz toluol or melinite.	.353 oz black powder.

b. Use. This mine is designed for laying individually or in minefields in a checkerboard pattern at intervals of 9 to 15 meters. It is buried about 1.27 centimeters below the ground, or placed in the open and well camouflaged, and detonated electrically from a protected position some 200 or 300 meters away.

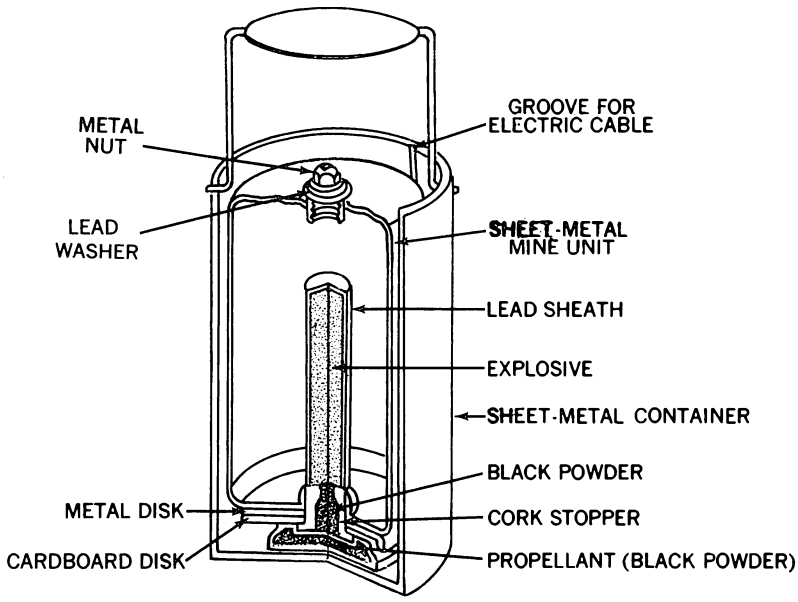


Figure 336

c. Functioning. The propellant is ignited by the electric detonator, which hurls the mine out of the container and simultaneously ignites the delay fuze. After about 1 to 1.5 seconds the delay fuze sets off the explosive charge, shattering the mine and scattering the contaminant over a 250- to 300-square meter area at an average concentration of 20 to 50 grams per square meter.

d. Installing and Arming.

(1) Insert the electric detonator in the doughnut-shaped propellant charge in the bottom of the mine unit.

(2) Hold the detonating cable to the side of the mine unit and slide it into the container, allowing the cable to follow the groove in the side for easy insertion.

(3) Wire the detonating cable to the remote electric exploder.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Lift out the mine unit.

(3) Pull the electric detonator from the propellant charge and unscrew the main charge from the bottom.

(4) Unscrew the plug in the top and pour the liquid contaminant into a deep pit. Persons removing or disarming this mine should wear gas masks and protective clothing.

(5) Remove the mine to a safe storage or disposal area.

235. Variation of the KhF Mine (U.S.S.R.)

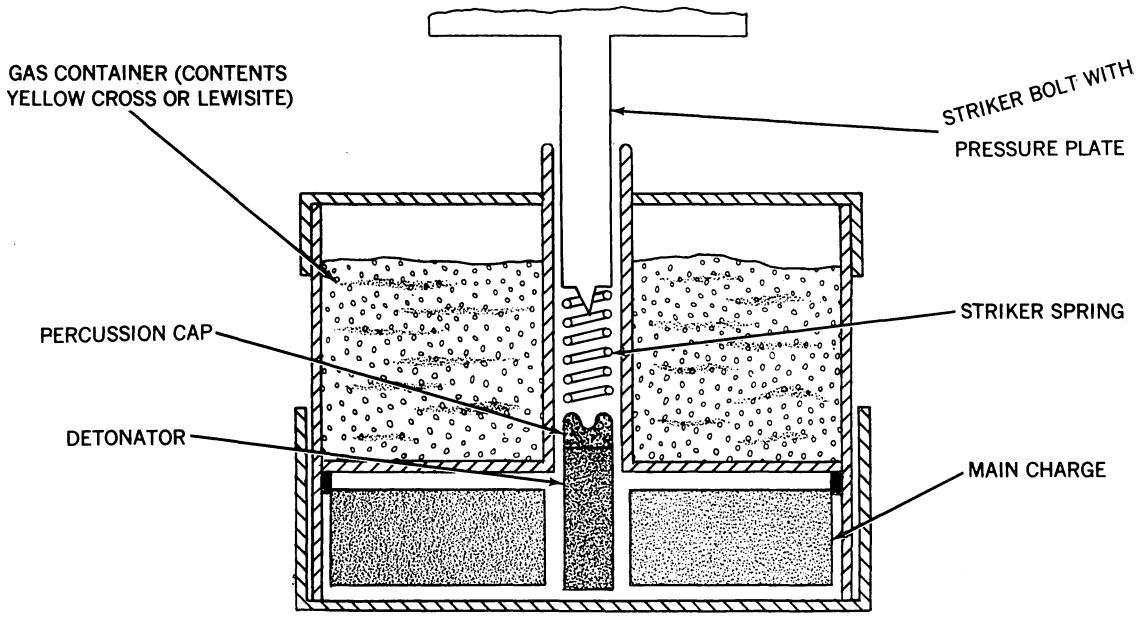


Figure 337

This is a metal mine unit with the chemical charge in the upper compartments and the explosive charge in the lower. A central spring-loaded striker bolt is built into the mine. The end of the striker bolt is connected to a metal pressure plate. The mine is buried with the pressure plate flush with the top of the ground. Pressure from the foot of the soldier overcomes the resistance of the striker-bolt retaining spring and forces the point of the striker into the percussion cap which then fires the explosive charge and scatters the gas into the atmosphere.

236. Bounding Fragmentation Antipersonnel Mine, No 3, Mark I (United Kingdom)

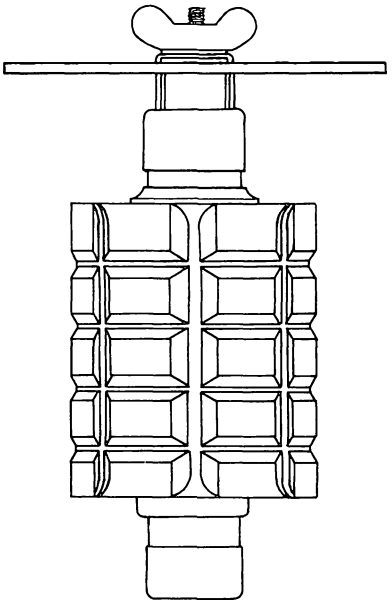


Figure 338

This antipersonnel mine has four chief components—the serrated steel loaded mine body, the pressure plate, the special percussion fuze, and the base propellant charge. The pressure plate is a 10.1 centimeter diameter steel disc, threaded to the top of the fuze mechanism. The mine body consists of an outer casing containing the explosive main charge and a central tube, threaded into the base of the mine body for the insertion of the fuze mechanism and the propellant charge. The mine is approximately 6.27 centimeters in diameter and 15.5 centimeters high. Delay is provided by a short length of safety fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Propellant
Cylindrical.	Special pressure.	Soldier's foot; 38 lb. at center of plate, 7 lb. at edge.	3½ oz. TNT.	100 grains G-20 gunpowder.
Markings				
1.2-cm ring of red crosses near top; 1.2 cm green ring near base.				

b. Use. This is a bounding antipersonnel mine, with a casualty radius of about 27.5 meters.

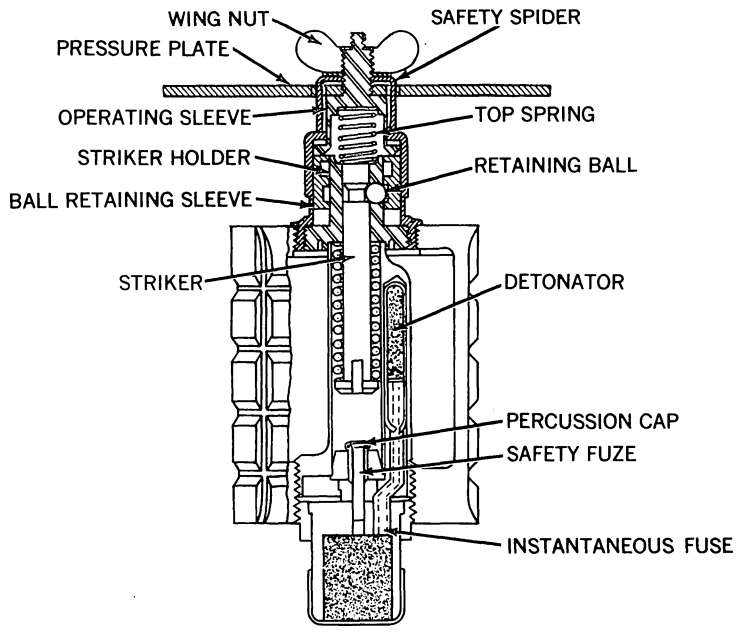


Figure 339

c. Functioning. Pressure on the pressure plate causes it to tilt or force the operating sleeve downward; which in turn, forces the ball-retaining sleeve downward until the retaining balls can move into the deep upper groove. The striker is then released against the percussion cap. This ignites the safety fuze, which after burning from 1 to 2 seconds (permitting the soldier to move forward and remove his foot from the mine), produces a flash that ignites the propellant charge and projects the mine into the air. Simultaneously, the flash from the gunpowder ignites the instantaneous fuze, which fires the detonator when the mine has reached a height of 0.6 to 1.5 meters in the air.

d. Installing and Arming.

(1) Place the mine in the ground on a drilled block of wood for support.
(2) Pack earth around the mine.
(3) Remove the wing nut and safety spider, being careful not to put any pressure on the pressure plate.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Screw on the wing nut and replace the safety spider.
(3) Remove the mine to a safe storage or disposal area.

237. Bounding Fragmentation Mine, OZM (U.S.S.R.)

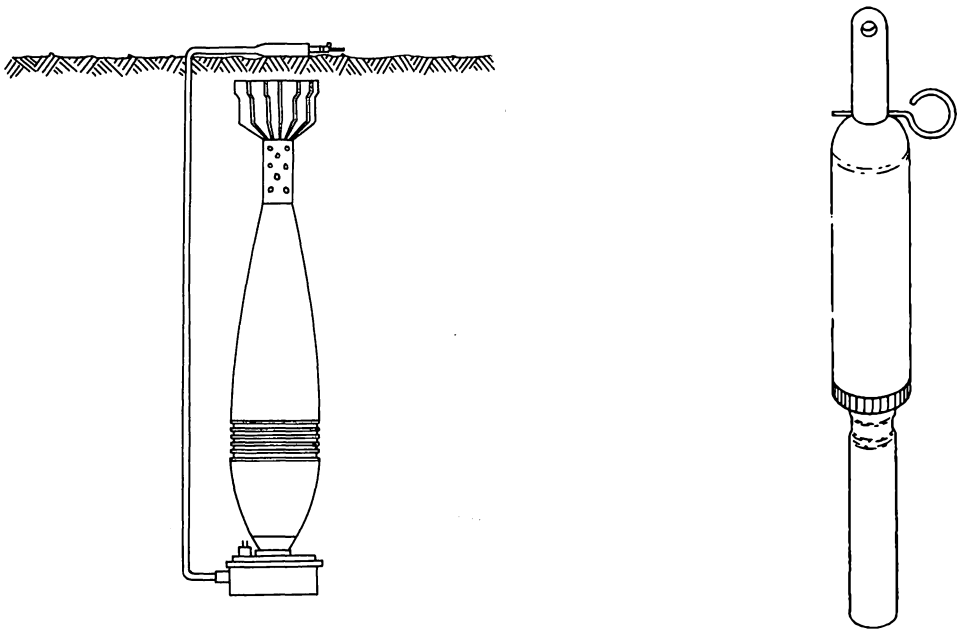


Figure 340

This is a field-assembled device—a combination of an artillery or mortar shell with an explosive charge, a UKV–1 propellant apparatus, and a fuze. It was used in substantial quantities against the Germans in World War II. The OZM bounding mine was usually emplaced in controlled minefields, permitting passage of friendly troops but detonated at the passage of the enemy. Although primarily an antipersonnel mine, it was successful against German tanks, if exploded underneath them.

a. Characteristics.

	120 mm mortar shell	122 mm artillery shell	152 mm artillery shell
Weight of explosive.	4.0	7.5 lb.	13.7 lb.
Casualty radius.	+12m	+17.6m	+20m
Height at which mine exploded above ground.	1.8 to 2.4m	1.8 to 2.4m	1.52m

b. Use. This mine is laid singly or in groups in defensive or barrier minefields at a density of 100 per kilometer of front. It is also employed in controlled minefields to provide protected yet safe lanes for friendly troops.

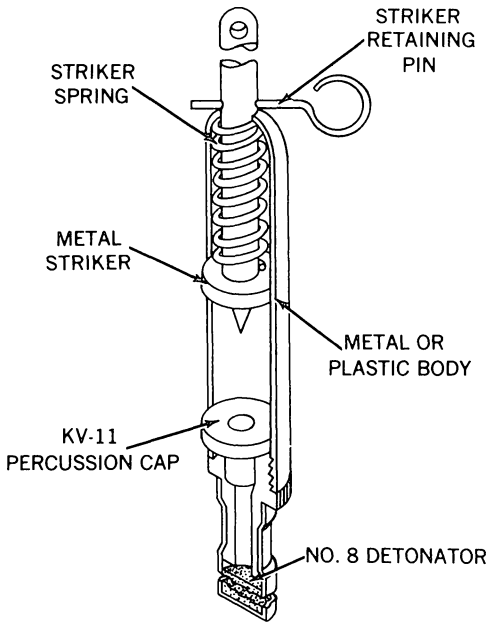


Figure 341

c. Installing and Arming.

(1) Prepare a hole so that the top of the shell fixed on its propellant base will be just below the ground level.

(2) Prepare the UVK–1 propellant assembly for either mechanical or electrical ignition and place it at the bottom of the hole.

(3) Place the shell on the assembly so that the fuze well fits over the booster charge of the assembly.

(4) Camouflage.

(If wired for electrical ignition, the control point must be at least 91.5 meters away from the mine.)

d. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Cut the electrical leads, if any, close to the mine, one wire at a time, or disarm the mechanical fuze attached to the flash tube of the propellant base.

(3) Remove the mine assembly to a safe storage or disposal area.

238. Antipersonnel Mine, W–1 (Behelfs Mine, W–1) (Germany)

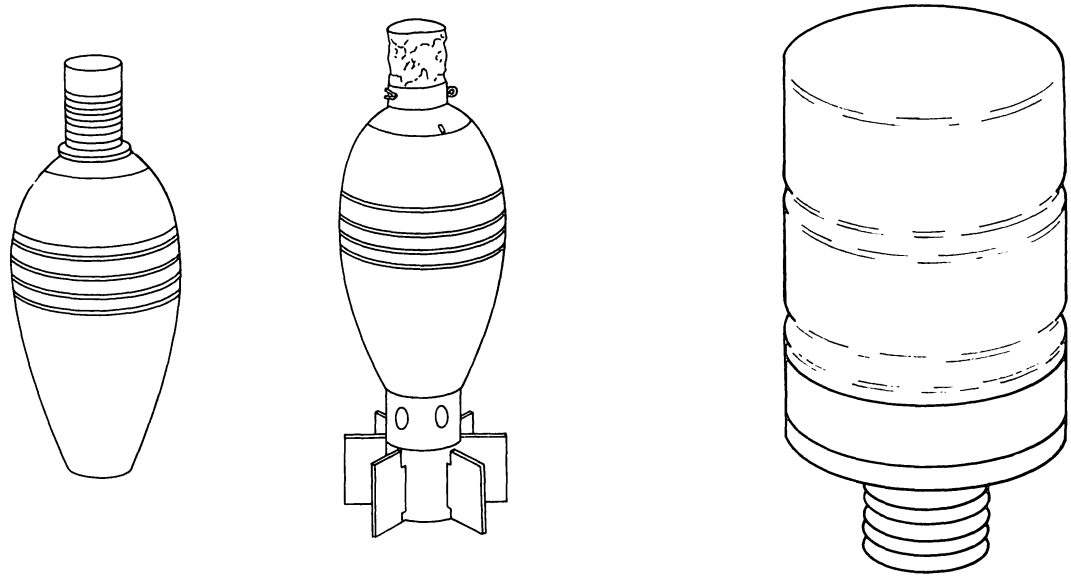


Figure 342

Antipersonnel mine, W–1, is improvised from a French 50-mm mortar shell with the tail fins and nose fuze removed. A Buck chemical fuze is inserted in the nose by means of a plastic adapter. The mine, overall, measures approximately 5.0 centimeters in diameter at the widest part and 12.1 centimeters high, including the fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Mortar shell. . .	Buck chemical pressure igniter.	35 lb.	4 oz. picric acid and granulated TNT (par. 6*x*).

b. Use. This improvisation is laid in antitank minefields to hinder reconnaissance and breaching parties and in paths, ditches, and other places where foot soldiers are most likely to walk.

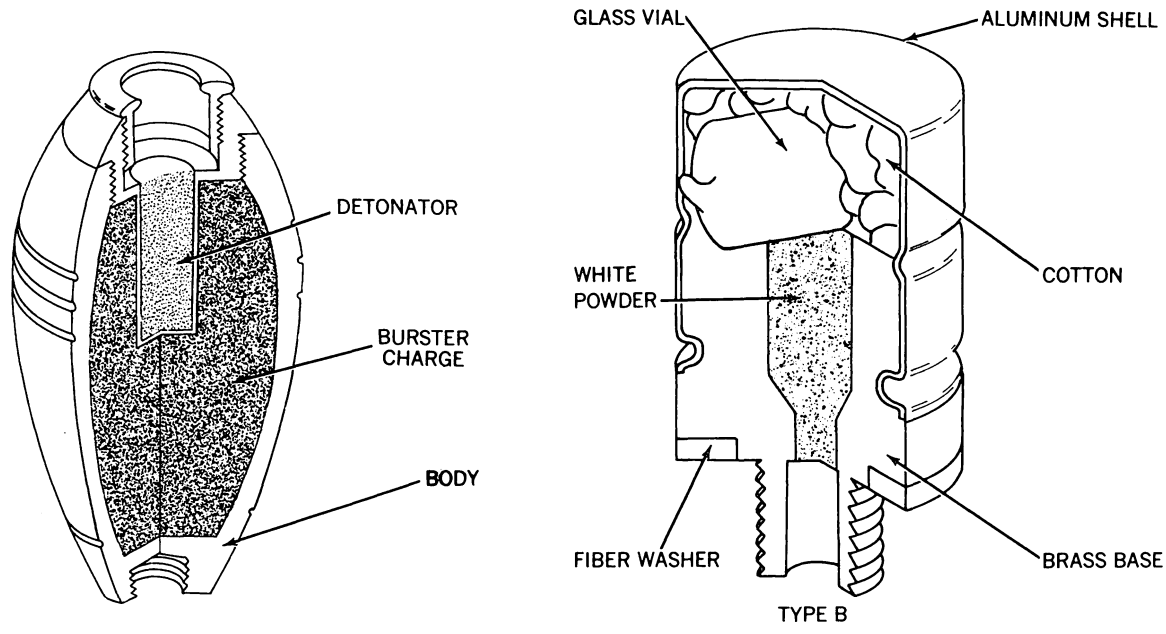


Figure 343

c. Functioning. Pressure on top of the Buck chemical fuze crushes the corrugated aluminum cylinder, breaking the ampoule and releasing the chemical to mix with the surrounding white powder. This forms a flash which detonates the shell.

d. Installing and Arming.

(1) Screw a Buck chemical-pressure fuze and detonator into a bakelite adapter and screw the assembly into the nose of the 50-mm mortar shell.

(2) Bury the mine with the aluminum pressure head protruding slightly from or level with the surface of the ground, whichever seems the more desirable.

e. Disarming Procedure.

(1) Check for and remove all antilift devices present.

(2) Remove the fuze by unscrewing the adapter from the mortar shell. Grasp the fuze as near to the base as possible in order not to crush the aluminum cylinder.

(3) Remove the detonator from the fuze.

(4) Remove the mine and fuze to a safe disposal area.

f. Additional Precautions. This fuze has no safety. If the aluminum cylinder is at all defaced, destroy this improvised mine in place.

239. Grenade Mine E–5 (Behelfsmine, E–5) (Germany)

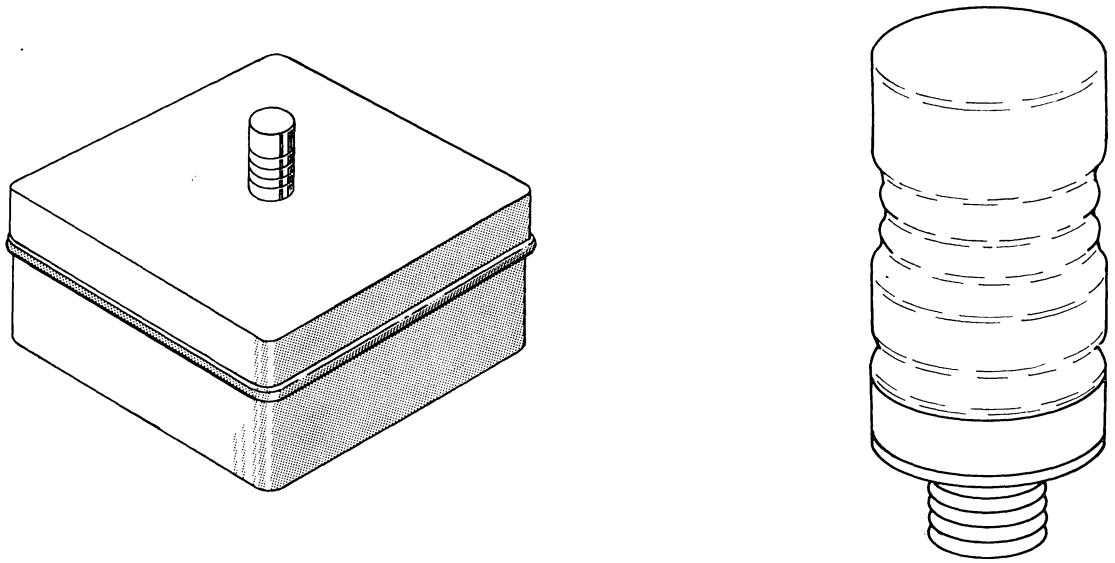


Figure 344

This improvised unit consists of a steel box with lid 20.3 by 20.3 by 10.1 centimeters, which contains 5 standard French egg-grenades. The four outer grenades are of the thin-shelled concussion type; the fifth or central grenade, a thick-shelled fragmentation type, serves as the booster charge. The Buck igniter screws into a metal adapter in the control fuze well in the lid. The adapter is also screwed into the fuze well of the fragmentation grenade.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Square box....	Buck pressure-chemical.	35 lb.....	5 thin-shelled hand grenades.

b. Use. This improvised grenade mine is laid along road shoulders, trails, and hedgerows against foot troops.

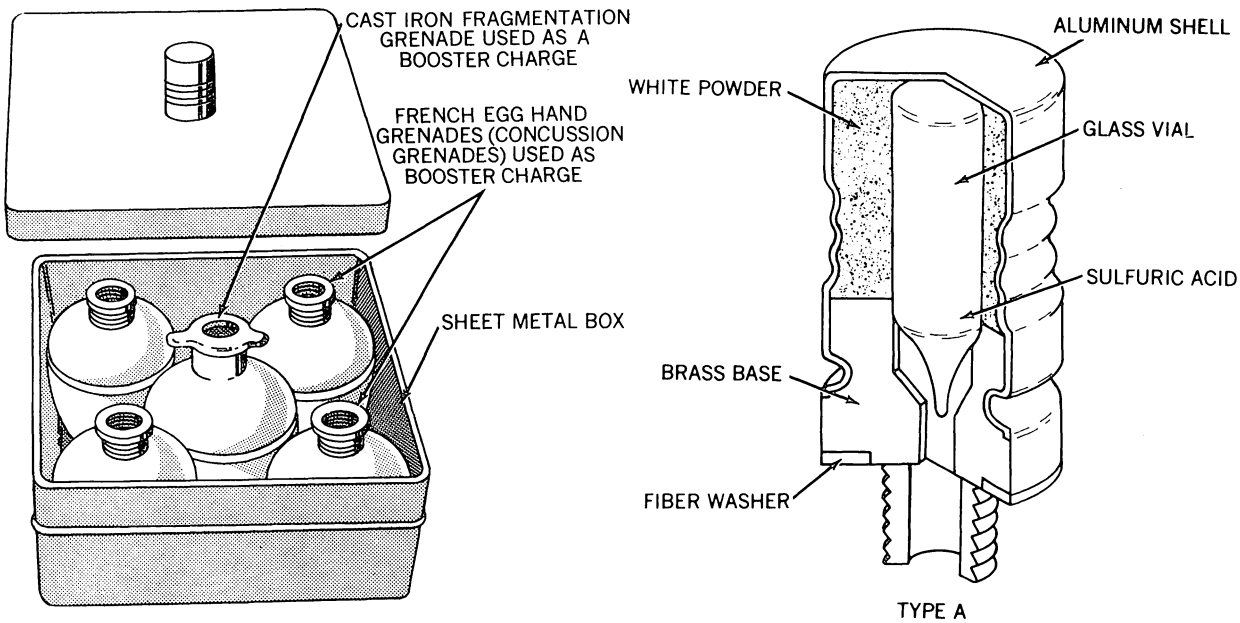


Figure 345

c. Functioning. Pressure on the corrugated aluminum tops of the fuze or on a pressure board laid over the mine, crushes the fuze, mixing the acid and white powder, forming a flash that explodes the detonator, booster, and the main charge.

d. Installing and Arming.

(1) Place four concussion grenades in the corners of the box and a fragmentation grenade in the center.

(2) Place the lid on the box.

(3) Grasping the Buck chemical fuze as near the base as possible, screw it with the attached detonator into the fuze well in the center of the lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Unscrew the fuze, holding it as near the base as possible.

(3) Remove the detonator from the fuze.

(4) Remove the mine and fuze to a safe disposal area.

f. Additional Precautions. This fuze has no safety devices. If the aluminum cylinder is at all defaced, the mine should be destroyed in place.

240. Antipersonnel and Antitire Mine (United Kingdom)

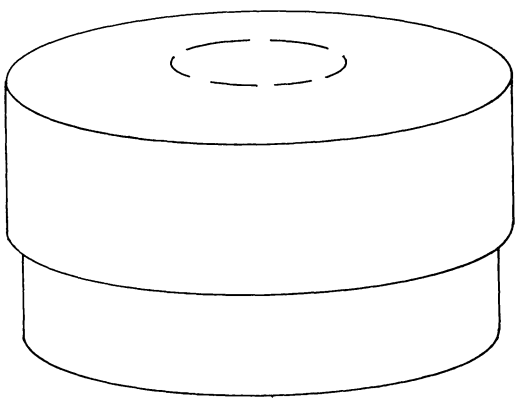


Figure 346

This combination mine resembles a round tin ointment box. It consists of two telescoping steel halves about 5.0 centimeters in diameter and 2.8 centimeters high. The bottom, or smaller half, contains the igniter; the top, or larger half, contains the doughnut-shaped explosive charge glued to the underside with a sticky adhesive substance. Two diametrically opposed detonators are located in the detonator holder.

a. Characteristics.

Shape	Fuze	Operating pressure	Explosive
Circular...	Integral pressure fuze...	25 to 75 lb.....	2 oz.

b. Use. This mine is designed for employment by the airborne forces. It is laid in fields, along the edges of roads, or in other conspicuous places where foot soldiers and light transport may go. The charge will blow off a man's foot or rupture the tire of a vehicle. It is easily located by any type of detector.

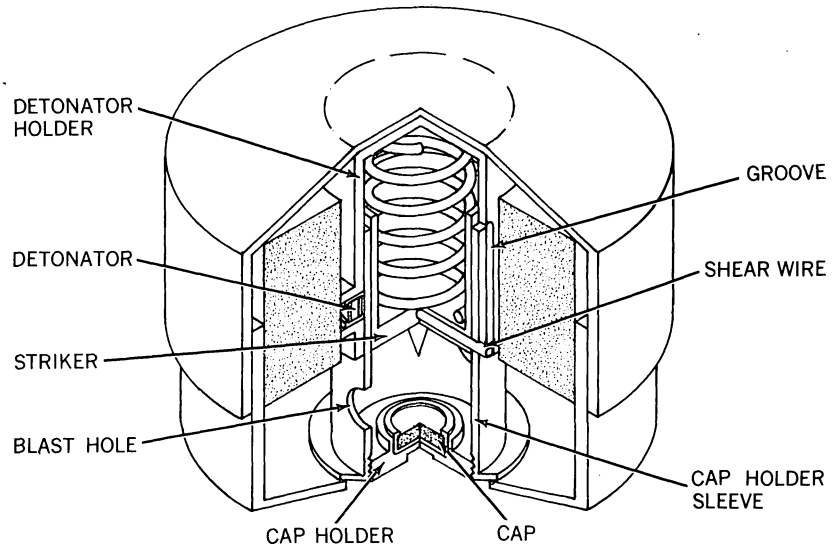


Figure 347

c. Functioning. When the two halves of the case are compressed, the detonator holder slides down, compressing the striker spring and at the same time forcing the striker through the copper shear wire. The spring then forces the striker against the cap, the flame of which escapes into both detonators, exploding them and then the main charge.

d. Installing and Arming.

(1) Inspect the copper shear wire to make sure that it is not wholly or partially sheared and that the striker is held securely to the sleeve.

(2) Screw in the percussion cap with a screwdriver.

(3) Fit the detonator holder over the sleeve.

(4) Fit the top section into the bottom section.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the top section from the bottom section.

(3) Remove the detonator holder from the cap holder sleeve.

(4) Unscrew the percussion cap.

(5) Remove the mine and fuze to a safe storage or disposal area.

241. Fragmentation Tread Antipersonnel Mine (U.S.S.R.)

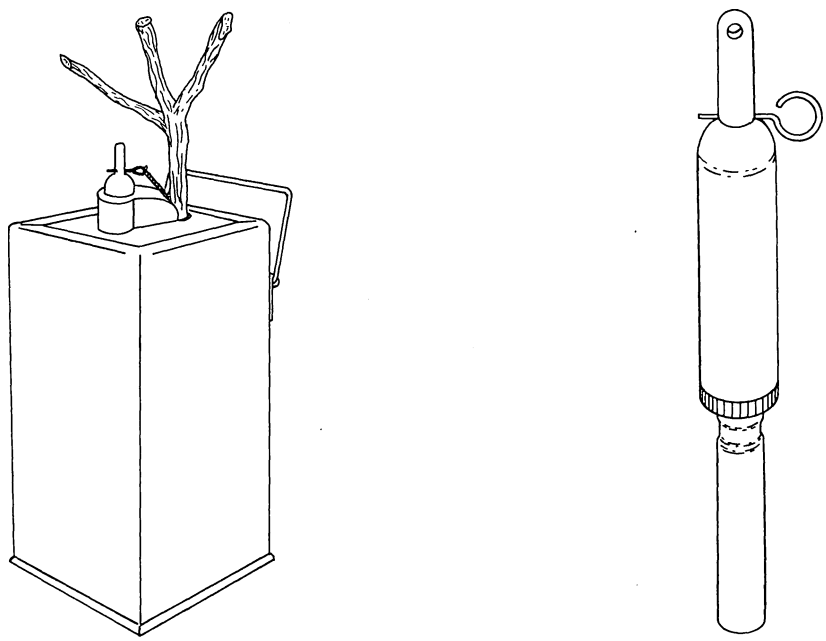


Figure 348

This antipersonnel mine consists of a case about 8.2 centimeters square and 19.7 centimeters high that contains an explosive charge and steel fragments. It has a carrying handle on the side and two metal tubes protruding from the top into the explosive. One of these holds the MUV pull fuze and detonator, the other, a wooden or metal pressure rod, grooved at the bottom and attached to a cord or wire that is fastened in the eye of the striker retaining pin.

a. Characteristics.

Shape	Case	Fuze	Operating force
Rectangular.	Metal or wood.	MUV pull, with pressure-rod-removed retaining pin.	10 to 20 lb.

b. Use. This antipersonnel mine is placed in the ground with only the pressure rod extending above the surface.

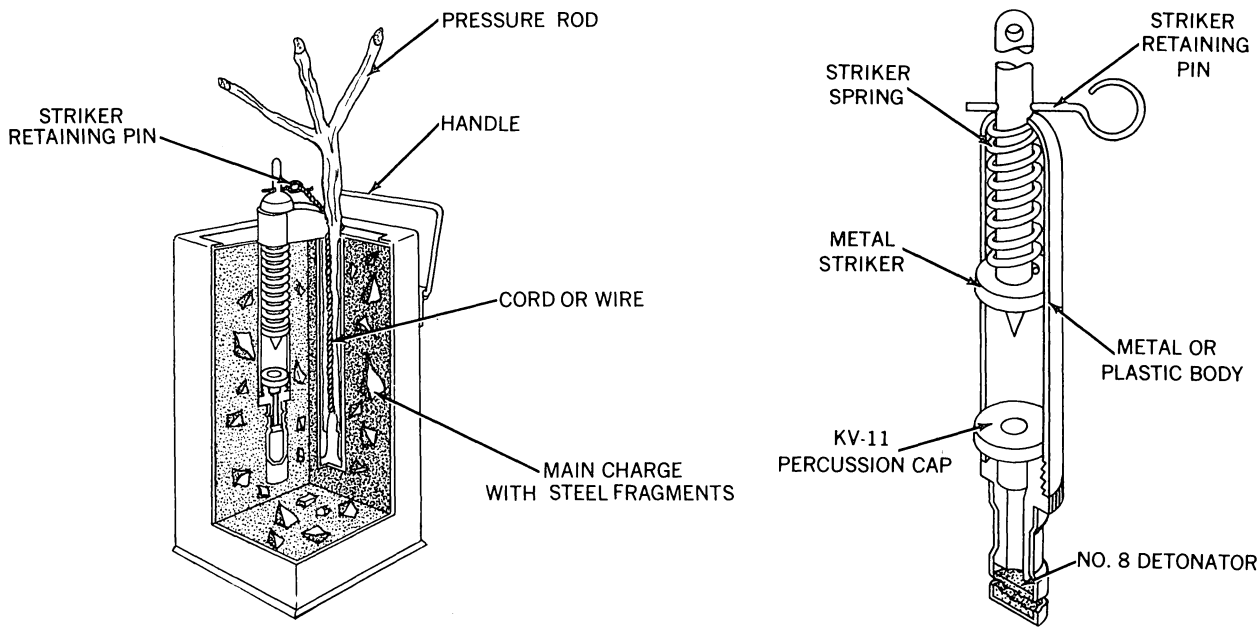


Figure 349

c. Functioning. Pressure from treading on the rod depresses it and causes the cord or wire to pull the retaining pin out of the fuze and explode the mine.

d. Installing and Arming.

(1) Dig a hole deep enough for the mine.

(2) Loop a cord or wire in the groove at the base of the metal or wooden rod. Gently push the rod into the tube nearest the handle until the slack in the cord or wire is taken up.

(3) Screw a cap and detonator assembly into the MUV pull fuze and insert it in the other tube.

(4) Carefully tie the loose end of the cord or wire to the eye of the striker retaining pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Uncover the mine.

(3) Cut the cord or wire connecting the rod and the fuze.

(4) Pull out the rod and the fuze.

(5) Take the fuze and mine to a safe storage or disposal area.

242. Antiskier Mine, PMM-5 (U.S.S.R.)

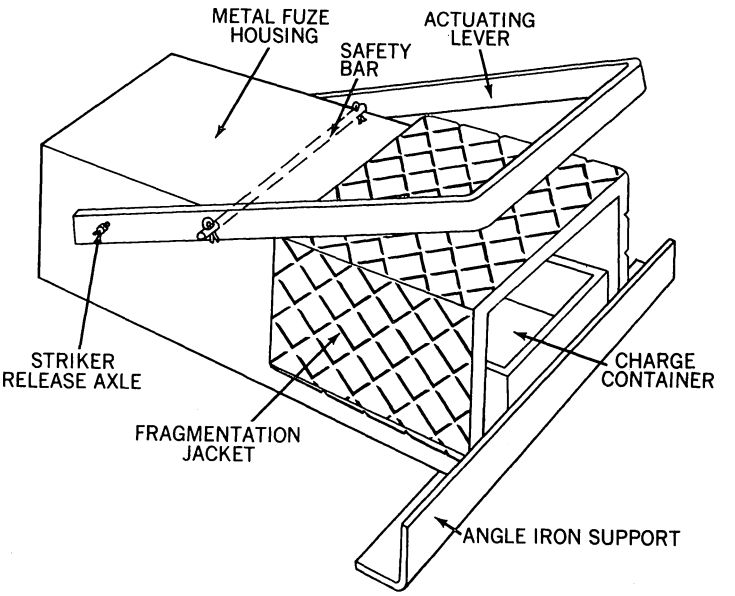


Figure 350

This mine is an explosive charge contained in a metal box about 15.2 centimeters, 6.2 centimeters, and 5.0 centimeters high. The box is divided into two compartments, one containing the built-in striker and the other, the charge. The charge container which slides in and out has a piece of angle iron welded to it to provide support and a stable bearing surface when the mine is laid. A U-shaped metal actuating lever firmly fixed to the striker-release axle is provided with a metal safety bar to prevent moving. A serrated fragmentation jacket surrounds the charge container.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	Integral pressure.	10 to 20 lb....	7.05 oz.

b. Use. This mine is especially designed for security against ski troops. It is laid in ski trails and covered with snow.

(No drawing available.)

c. Functioning. Pressure on the actuating lever revolves the striker-release axle, which frees the spring-loaded striker to fire the percussion cap.

d. Installing and Arming.

(1) Slide out the charge container and place in it the explosive block and MD–2 detonator assembly. Slide the container back into the mine.
(2) Bury the mine.
(3) From a prone position or defilade, pull out the safety bar using a long cord or wire.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Carefully uncover the mine.
(3) Insert a nail or wire into the safety-bar hole.
(4) Gently lift the mine, slide the charge container out, remove the charge, and unscrew the MD–2 detonator assembly.
(5) Remove the fuze and mine to a safe storage or disposal area.

243. Shrapnel Mine, POMZ-2 (U.S.S.R.)

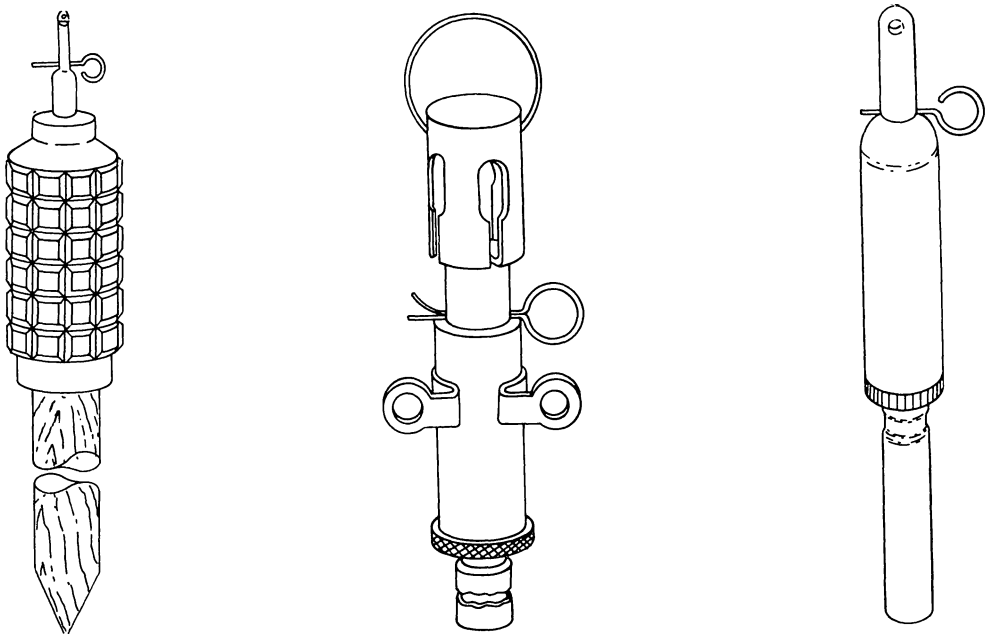


Figure 351

In World War II, this was one of the most commonly used Soviet metal-cased antipersonnel mines. It is still standard. It was so effective that the Germans made a concrete-bodied copy called the stake mine. It is 6.0 centimeters in diameter and 13.4 centimeters high.

a. Characteristics.

Shape	Color	Fuze	Operating pressure	Explosive
Cylindrical.	May be painted any color, for camouflage purposes.	MUV, or VPF pull.	2 lb. or more.	2.7 oz. TNT.

b. Use. POMZ-2 mines are generally laid in clusters of 4 and mounted on stakes at a height of about 25.5 centimeters above the ground in high grass, bushes, or woods. Occasionally they are interspersed in antitank minefields.

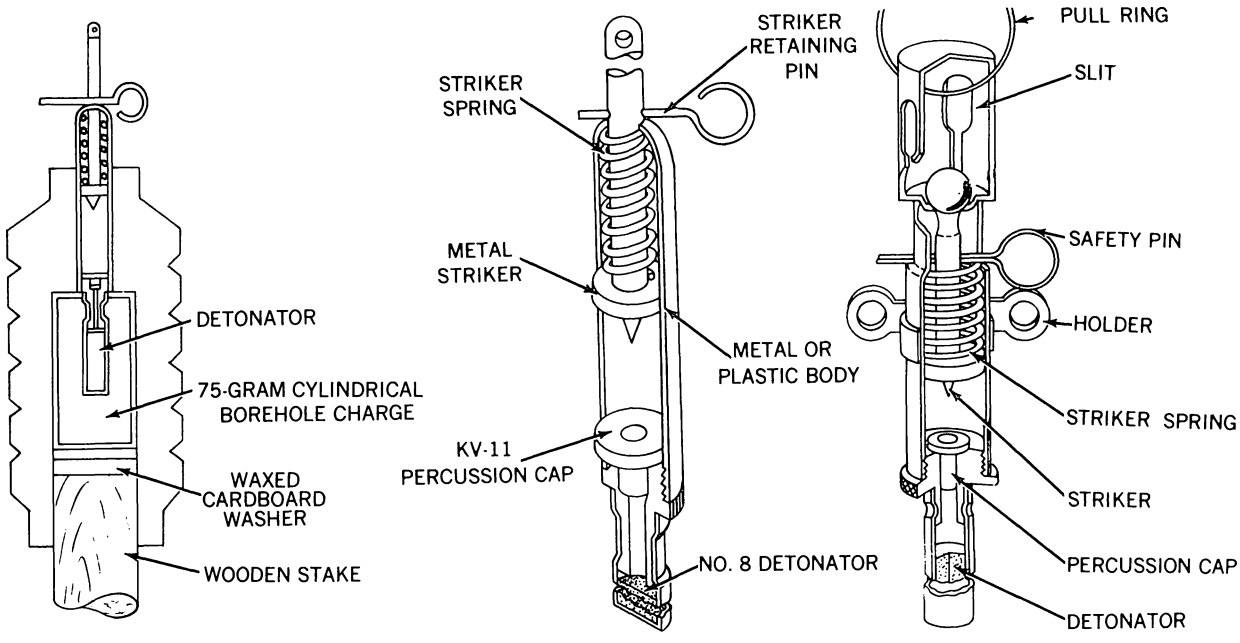


Figure 352

c. Functioning. If fitted with the MUV fuze, a pull on the tripwire removes the striker retaining pin, releasing the spring-driven striker against the percussion cap. If fitted with the VPF fuze, a pull on the tripwire removes the pull-clamp from the round head of the striker bolt, releasing the spring-loaded striker against the percussion cap.

d. Installing and Arming.

(1) Drive the mounting stakes about halfway into the ground.
(2) Put the charge in the large open end of the shell.
(3) Place the mine on the stake.
(4) Screw a detonator on the base of the MUV or VPF pull fuze and insert assembly in hole in top of the mine.
(5) Attach the tripwire to an anchor and then to the MUV striker retaining pin or the VPF pull clamp.

e. Disarming Procedure.

(1) Cut the tripwires.
(2) Pull out the fuze-detonator assembly.
(3) Unscrew the detonator.
(4) Remove the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. This mine may be rigged for tension release action by holding the fuze striker in cocked position by a taut trip wire instead of a striker retaining pin. Under such conditions the striker retaining pin or substitute should be replaced before the trip wire is cut.

244. Antipersonnel Mine, V (Italy)

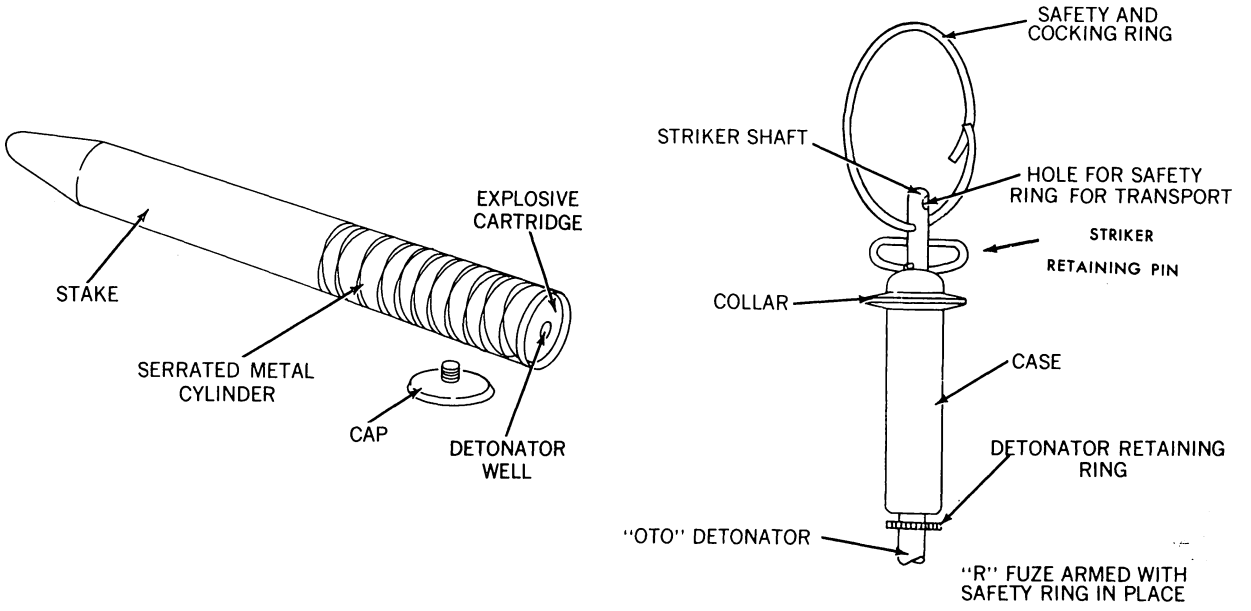


Figure 353

This metallic trip-wire actuated mine consists of a wooden stake, a serrated metal cylinder and a threaded cap, and a cylindrical explosive charge. The cap has a threaded collar in the center for an R-fuze and a detonator. At detonation, the case fragments, scattering pieces within an effective radius of about 14 meters. The mine measured 3.5 centimeters in diameter and 14.0 centimeters without the stake.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical.....	Pull.....	4.4 to 6.6 lb...	0.2 lb. TNT.

b. Use. This stake mine is emplaced at 9-meter intervals.

(No drawing available.)

c. Functioning. A pull on the trip wire removes the striker retaining pin, which frees the striker to slam down on the OTO detonator, which explodes the main charge.

d. Installing and Arming.

(1) Drive the stake into the ground.
(2) Remove the threaded cap from the mine body.
(3) Insert the OTO detonator in the cap and screw the R-fuze into the cap.
(4) Place the cap-and-fuze assembly on the mine body.
(5) Arrange and fasten the trip wire to an anchor and to the mine.
(6) Remove the fuze safety pin.

e. Disarming Procedure.

(1) Check for and remove all antilift devices.
(2) Remove the cap from the mine.
(3) Remove the detonator and fuze from the cap.
(4) Remove the mine and fuze to a safe disposal area.

245. Grenade Mines (U.S.S.R.)

The Soviet Army gives instruction in the use of standard hand grenades as improvised antipersonnel mines or boobytraps. The grenade is often provided with a pull fuze and generally tied to a stake, a tree, or some other support above the ground. One end of the tripwire is attached to the pull pin of the grenade or to the pull pin of the fuze, and the other end is anchored. Thus the improvised mine is emplaced and actuated in the same manner as the POMZ–2 shrapnel mine (par. 243).

246. Ski Mine (Germany)

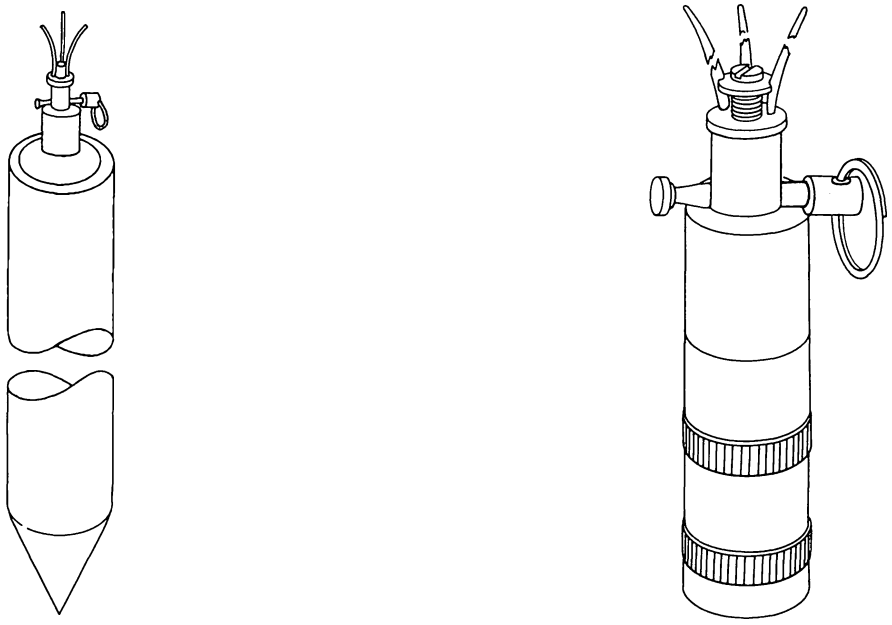


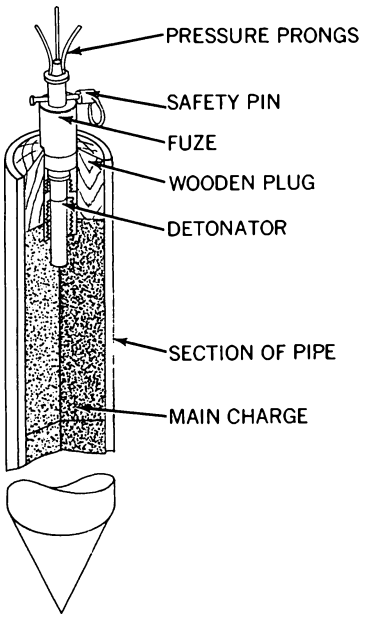
Figure 354

The metal ski mine, which resembles the concrete stake mine in shape, is improvised. It consists of a pointed pipe containing a main charge and fuze. A wooden plug, with a hole in the center to receive the fuze, fits into the top of the mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylinder...	S.Mi.Z.35 pressure.	15 lb.....	.66 lb. (approx).

b. Use. This mine was designed for use in winter warfare for installation in ski or sled trails and in front of unit positions.



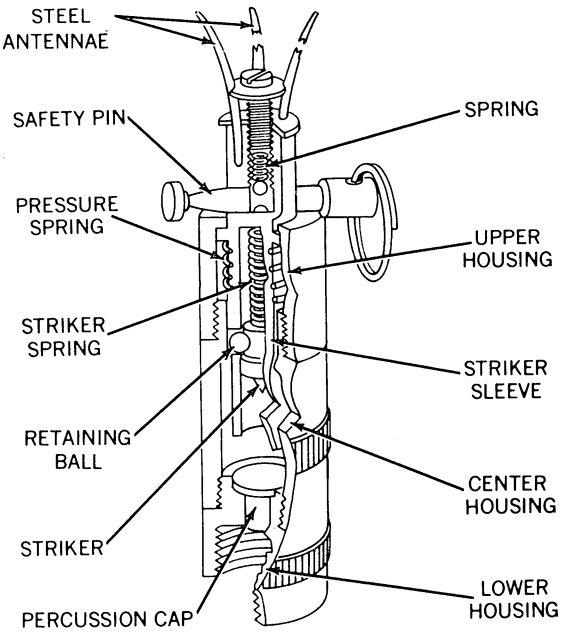


Figure 355

c. Functioning. After the safety pin has been removed from the fuze pressure on the prongs overcomes the resistance in the plunger spring and depresses the plunger. This action releases the two retaining balls and frees the spring-loaded striker to fire the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Drive the pointed pipe part way into the ground at an angle of 45° to 60° to the direction of expected traffic.
(2) Place the cylindrical charges in the pipe.
(3) Insert the wooden plug in the top of the pipe.
(4) Insert the detonator in the base of the fuze.
(5) Screw the fuze into the mine.
(6) Unscrew the retaining nut from the end of the safety pin and withdraw the safety pin.
(7) Cover the remainder of the mine with snow.

e. Disarming Procedure.

(1) Insert a safety pin in the fuze.
(2) Unscrew the fuze from the mine.
(3) Remove the detonator
(4) Remove the mine and fuze to safe disposal area.

247. Tubular Antipersonnel Mine (Finland)

Figure 356

This tubular mine consists of a metal outer fragmentation case with a wooden plug at each end. The top plug is drilled for the fuze and detonator; the lower is removed when necessary to emplace the mine on a stake. An inner case contains the main and booster charges. The mine is 6.0 centimeters in diameter and 37.0 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Vylindrical.	Pull...	22 lb. or more (4.4 lb. without stiffening plate on fuze).	0.8 lb. ammonal..	2.6 oz. TNT.

b. Use. Tubular fragmentation mines are used as security against infantry and in antitank minefields to hinder reconnaissance and breaching parties.

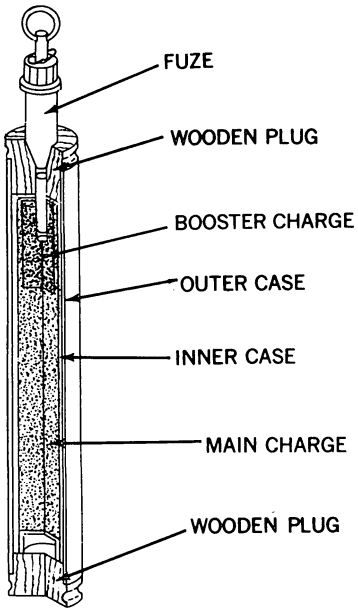


Figure 357

c. Functioning. Force on the trip wire removes the striker retaining pin. This frees the spring-loaded striker to initiate the firing chain.

d. Arming Procedure.

(1) Plant the mine firmly in the ground at a point that allows about 15 centimeters of the top to extend above the surface; or remove the bottom plug and mount securely on the top of a stake.
(2) Crimp a detonator to the fuze.
(3) Seat the fuze in the mine.
(4) Attach an anchored trip wire to the striker retaining pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Trace and cut the slack tripwire.
(3) Remove the fuze and detonator from the mine.
(4) Take the mine and fuze to a safe storage or disposal area.

248. Training Stake Mine (Germany)

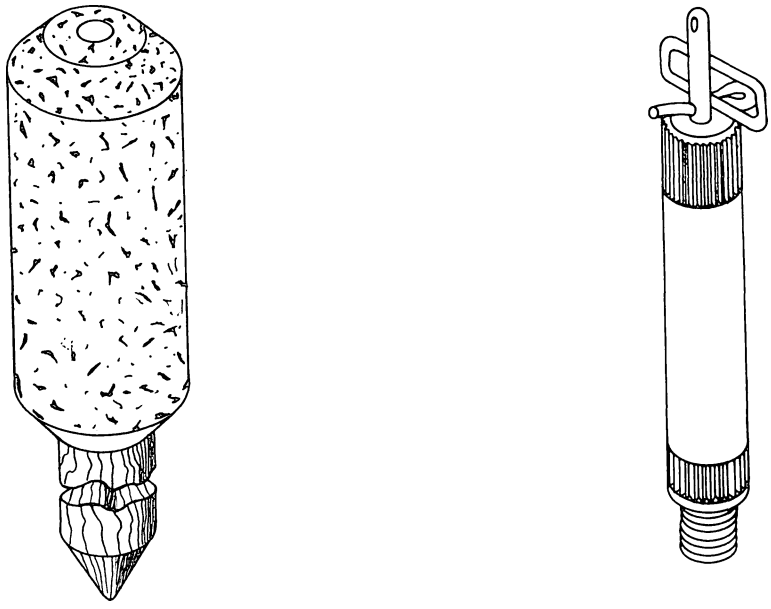


Figure 358

This training mine is identical to the concrete stake mine except that the bore-hole charge and the detonator are replaced by a wooden-cased smoke charge. The fuze is the same as that of the standard model.

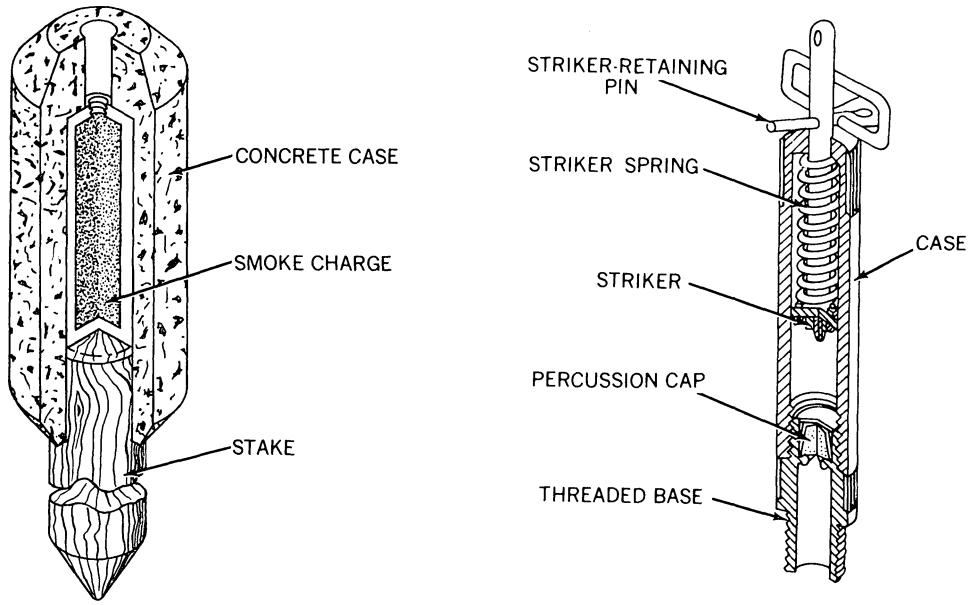

CONCRETE CASE
SMOKE CHARGE
STAKE
STRIKER-RETAINING PIN
STRIKER SPRING
CASE
STRIKER
PERCUSSION CAP
THREADED BASE

Figure 359

249. Picket Mine (Italy)

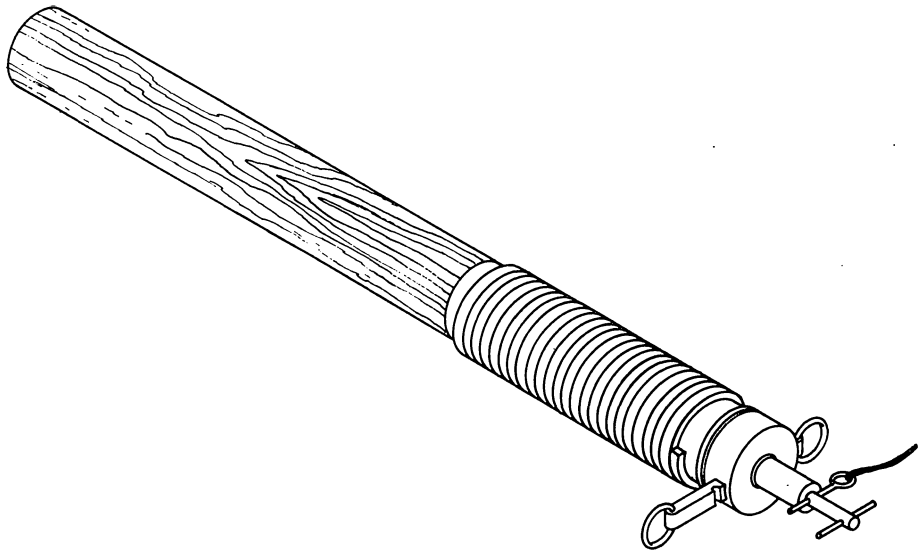


Figure 360

This antipersonnel mine consists of a metal case approximately 3.7 centimeters in diameter and 19.0 centimeters long, surrounded by a steel fragmentation coil. The top is closed by a threaded cap, on the top of which is a housing for a spring-loaded striker, held in cocked position by a retaining pin with a loop on one end for attaching a trip wire. Passing through the threaded cap and extending on two sides is a percussion cap holder, which is removed when the percussion cap is installed. The mine is mounted on a 25.5 centimeter wooden picket. In the detonation of the mine the outside fragmentation coil is blown into thousands of bits that fly through the air in all directions.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Tubular...	Pull.....	8 to 10 lb. force on trip wire.	3.5 oz.

b. Use. This mine is laid in antitank minefields to hinder enemy breaching and reconnaissance parties and provide security against infantry.

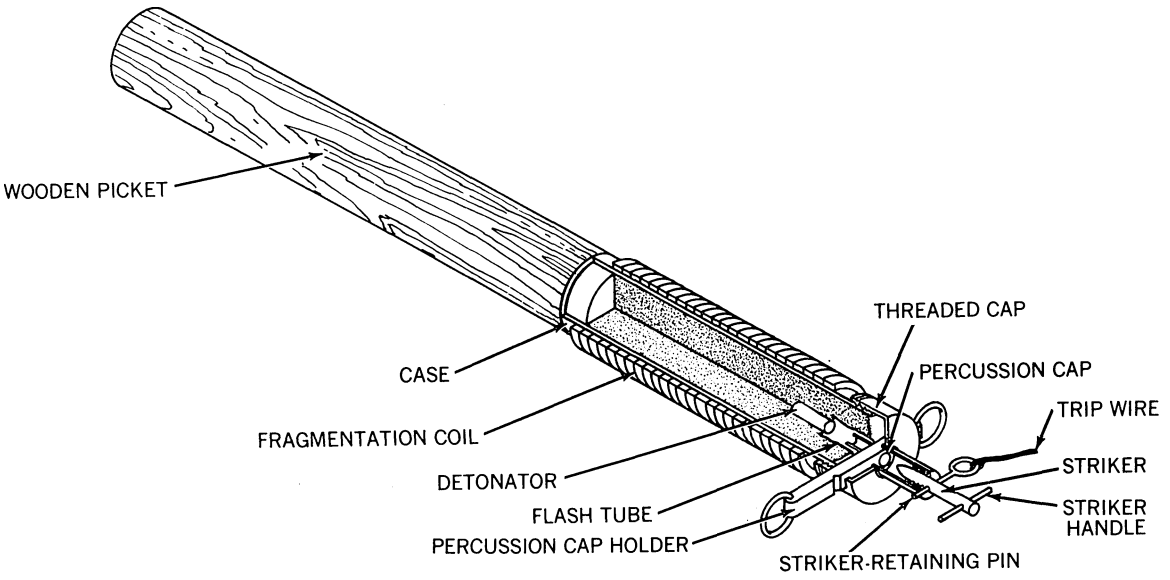


Figure 361

c. Functioning. A pull on the trip wire attached to the loop of the striker retaining pin releases the spring-driven striker against the percussion cap, firing the mine.

d. Installing and Arming.

(1) Drive the picket into the ground, leaving 5.0 centimeters exposed.
(2) Unscrew the threaded cap on the top of the mine case, place a charge in the mine, and mount it on a wooden picket.
(3) Insert a detonator into the charge and screw on the threaded cap.
(4) Cock the striker by pulling out the striker shaft and inserting the retaining pin in the hole provided.
(5) Pull the percussion cap holder out and insert a percussion cap.
(6) Connect an anchored trip wire to the loop of the striker retaining pin.
(7) Position the percussion cap in the armed position by pushing in the percussion cap holder.

e. Disarming Procedure.

(1) Pull the percussion-cap holder to the side and remove the percussion cap.
(2) Cut the trip wire attached to the striker retaining pin.
(3) Unscrew the threaded cap and remove the detonator.
(4) Hold the striker shaft firmly and remove the striker retaining pin; lower the striker shaft gently.
(5) Replace the threaded cap.
(6) Remove the mine from the wooden picket.
(7) Remove the mine and fuze to a safe storage or disposal area.

250. "Beehive" Nonstandard Fragmentation Antipersonnel Mine (Japan)

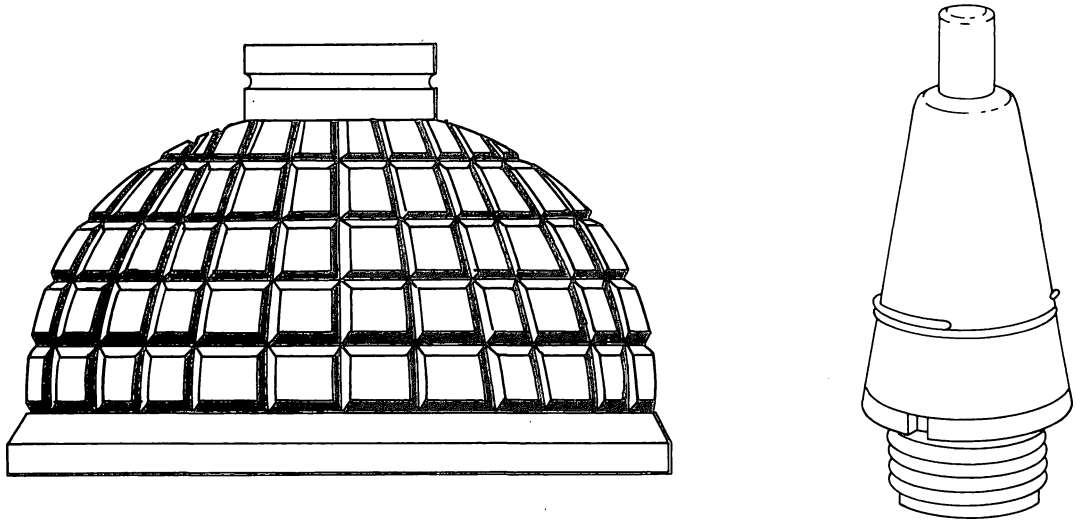


Figure 362

This mine is contained in a mound-shaped serrated coat metal fragmentation case approximately 1.0 centimeter thick. The mine is 20.3 centimeters in diameter at the base and 11.4 centimeters high. The central hole in the top of the case is internally threaded to receive an adapter for either the plastic fuze used in the type 3 ceramic land mine and type 3 wooden land mine or the type 88 instantaneous artillery fuze from which the centrifugal detents have been removed.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Hemispherical.	Bakelite pressure-pull; artillery instantaneous 88 pressure.	Bakelite: 4.5 lb. pressure, 22 lb. pull; artillery: 20 lb. pressure.	5 lb. TNT.

b. Use. This mine is used primarily against personnel, but may also be used against light vehicles.

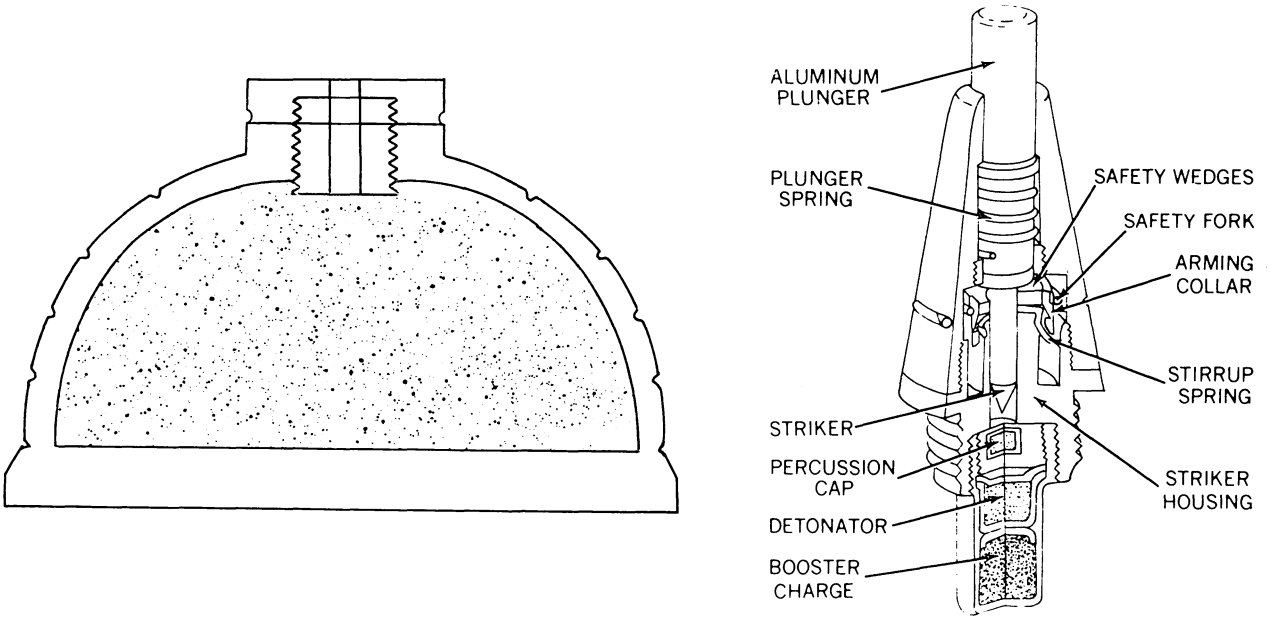


Figure 363

c. Functioning. With bakelite pressure-pull fuze, pressure on the plunger head depresses the plunger until the hammer release fork bears against the top of the fuze case. Further pressure causes the hammer-release fork to spread, releasing the spring-loaded percussion hammer against the striker which is driven against the percussion cap. This sets off the detonator and then the main charge. Also, a pull of 22 pounds on the pull wire removes the hammer release fork and frees the percussion hammer against the striker.

d. Installing and Arming.

(1) Screw a suitable fuze adapter into the the fuze well of the mine and screw in the fuze.

(2) If the artillery fuze is used remove the safety fork.

(3) If the bakelite pressure-pull fuze is used, tie a pull wire to the hammer-release fork and remove the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert a safety pin or a wire into the safety-pin hole of the fuze.

(3) Trace and cut any pullwires attached to the fuze.

(4) Unscrew the fuze from the mine.

(5) Remove the percussion cap and detonator from the fuze.

(6) Remove the mine and fuze to a safe storage or disposal area.

251. Picket Ball Mine (Netherlands)

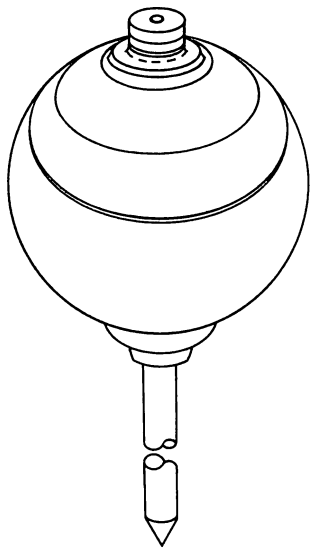


Figure 364

The "Dutch" picket ball mine consists of a round cast iron body containing a fuze and charge, weighing about 18 pounds. The body is 20.3 centimeters in diameter and 25.5 centimeters high, including the raised threaded fuze well and shipping plug. The mine is set on a steel picket. The cast iron case separates into thousands of pieces and scatters into the air in all directions at the detonation of the explosive charge.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Spherical..	Pull or tension.	3 to 10 lb. on taut or trip wire.	10 lb. pressed TNT.

b. Use. This mine was designed especially for use as a shrapnel antipersonnel mine in high grass and thick undergrowth.

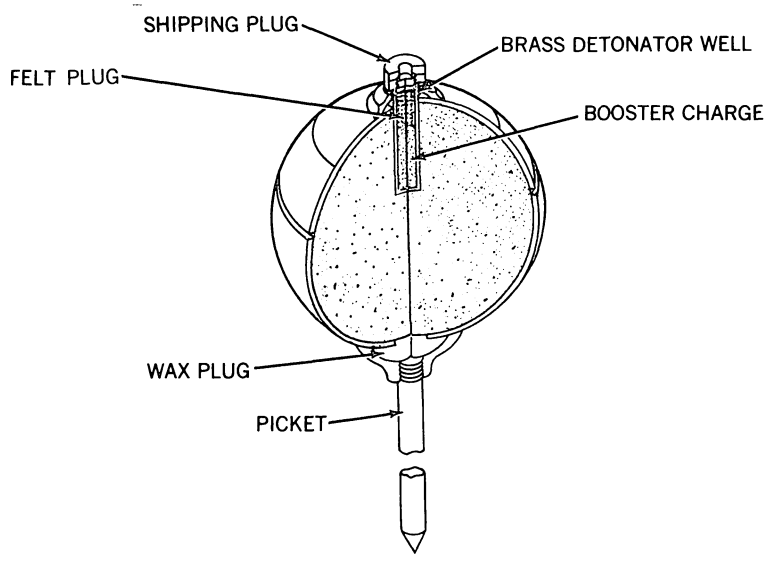


Figure 365

c. Functioning. This mine functions by pull or pressure release by trip or taut wire. A pull on the trip wire removes the striker retaining pin, firing the striker to slam against the percussion cap and detonate the mine. A pull or break of the taut wire frees the striker to slam against the percussion cap and detonate the mine.

d. Installing and Arming.

(1) Drive the picket into the ground and attach the mine.
(2) Remove the shipping and felt plugs from the fuze well.
(3) Insert the fuze.
(4) Arm the fuze.

e. Disarming Procedure. This depends on the type of fuze used. Identify the fuze, if possible, before proceding to disarm.

252. "Ointment Box" Antipersonnel Mine (United Kingdom)

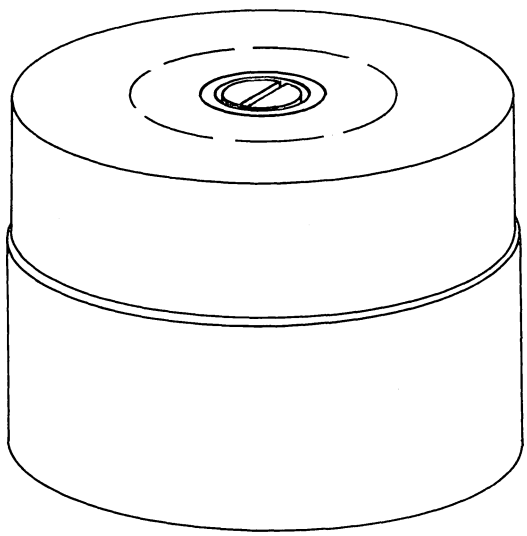


Figure 366

The British "ointment box" antipersonnel mine looks much like the antitire antipersonnel mine. It consists of a steel case 5.0 centimeters in diameter and 2.8 centimeters high made up of two sections, the top one fitting into the bottom. The bottom contains the ring-shaped main charge. A well, centrally located in the top section, receives the percussion cap. Below is a spring-loaded striker held in position by a copper shear wire. A cross-shaped detonator holder fits over the striker sleeve.

a. Characteristics.

Shape	Case	Fuze	Operating force	Explosive
Circular.	Steel...	Integral pressure with 2 detonations.	35 to 75 lb.	3 oz.

b. Use. This mine is laid around unit positions, in ditches, and along roads and trails for its nuisance value. It is often camouflaged as lumps of dirt, dung, or coal. This mine is effective only against the person that steps on it, but it may burst the tire of a vehicle running over it.

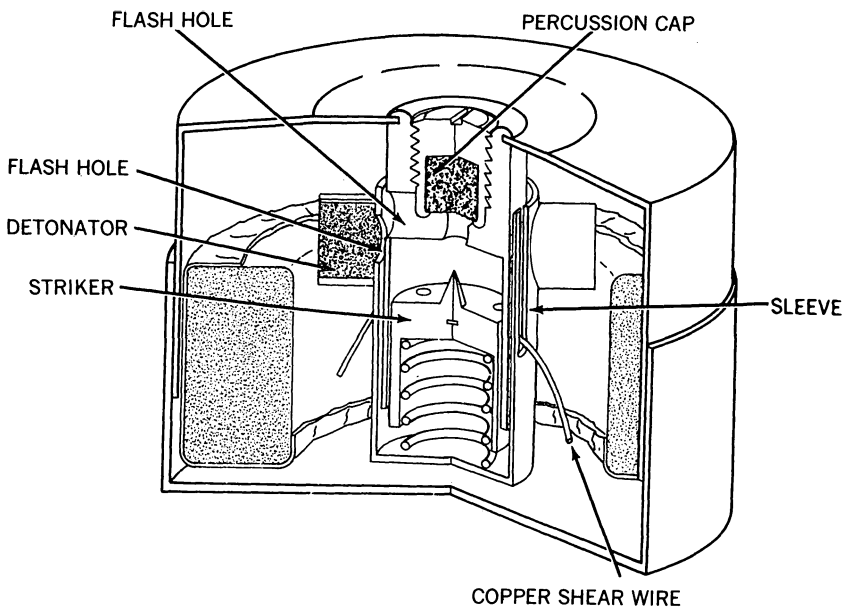


Figure 367

c. Functioning. Pressure on the top forces the sleeve and striker downward, compressing the striker spring until the striker shaft rests on the bottom of the detonator holder. Continued pressure shears the copper wire, forcing the sleeve to the bottom of the detonator holder, which releases the striker against the percussion cap and fires the mine.

d. Installing and Arming.

(1) Place the detonator holder over the cap holder sleeve and screw the cap into the bottom half of the mine body.

(2) Fit the top half of the mine with the bottom half.

(3) Lay the mine in the ground.

e. Disarming Procedure.

(1) Separate the top section from the bottom section.

(2) Remove the detonator holder from the sleeve.

(3) Unscrew the percussion cap.

(4) Remove the mine to a safe storage or disposal area.

253. Aluminum Antipersonnel Mine (Greece)

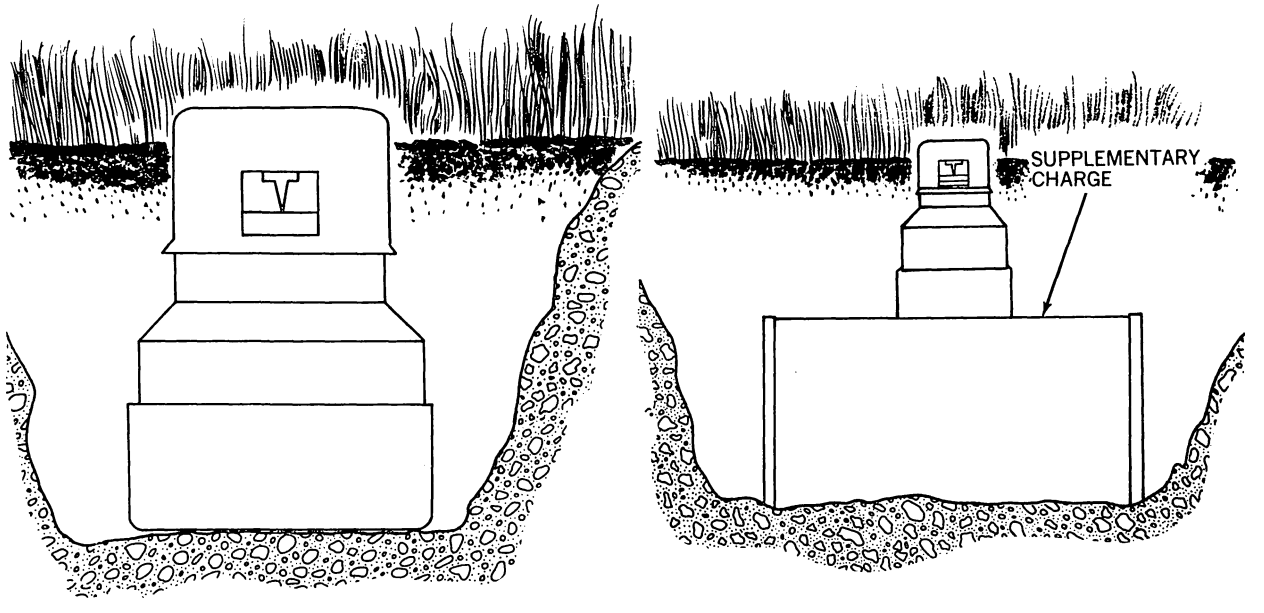


Figure 368

This aluminum-cased antipersonnel mine is about 5.9 centimeters high and 3.7 centimeters in diameter. The case has a deep pressure lid with a needle-like striker firmly fixed to the under side. The slot in the side of the pressure lid is for viewing the striker. The percussion cap and a detonator are fixed in the center of the mine. A striker-protector safety cover fits inside the lid to keep the striker from accidentally hitting and setting off the percussion cap. A supplementary charge may be placed underneath the mine if a more powerful explosion is desired.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Tubular...	Integral, with fixed striker.	25 lb. or more.	2 oz. TNT.

b. Use. This mine is generally used against personnel but is effective against vehicles when laid in or on a supplementary charge.

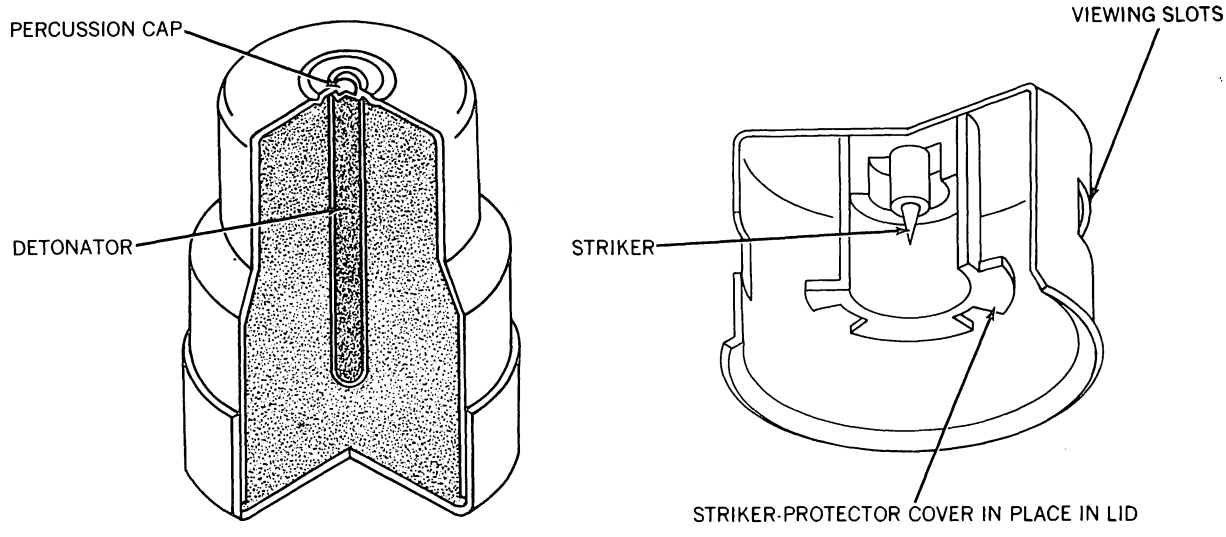


Figure 369

c. Functioning. Pressure on the pressure lid forces it down so that the needlelike striker hits and sets off the percussion cap. The explosion of the detonator and main charge follows.

d. Installing and Arming.

(1) Place the mine in the ground so that the pressure lid is just slightly above the surface.

(2) Remove the striker-protector cover from the pressure lid.

(3) Looking through the viewing slots, place the pressure lid on the mine so that the striker is just over the percussion cap.

e. Disarming Procedure.

(1) Gently lift the pressure lid off the mine, being careful to keep the striker from accidently hitting the percussion cap.

(2) Replace the striker-protector cover if it is available. If not, use an improvised striker-protector cover.

(3) Replace the pressure lid.

(4) Remove the mine to a safe storage or disposal area.

254. Metallic Antipersonnel Mine, PMM-3 (U.S.S.R.)

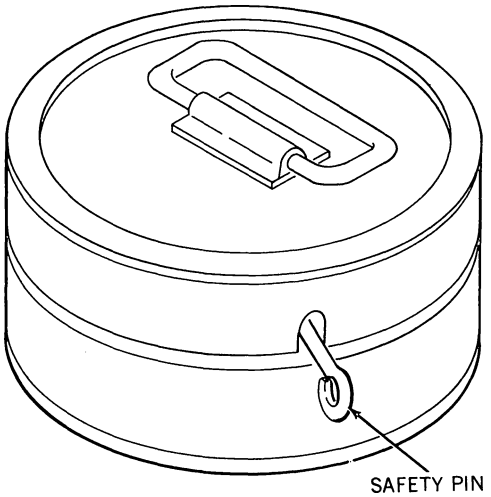


Figure 370

This is a small pressed steel-cased mine about 10.1 centimeters in diameter and 3.7 centimeters high. The case consists of a charge container and a lid with a hinged oval carrying handle. A safety pin projects through a hole in the side of the lid and the charge container into the percussion cap detonator, which is screwed into the bottom of the charge container.

a. Characteristics.

Shape	Fuze	Operating pressure
Circular.....	Integral pressure.	Weight of man walking.

b. Use. This mine is scattered in grassy areas or along trails and road shoulders to hinder foot troops.

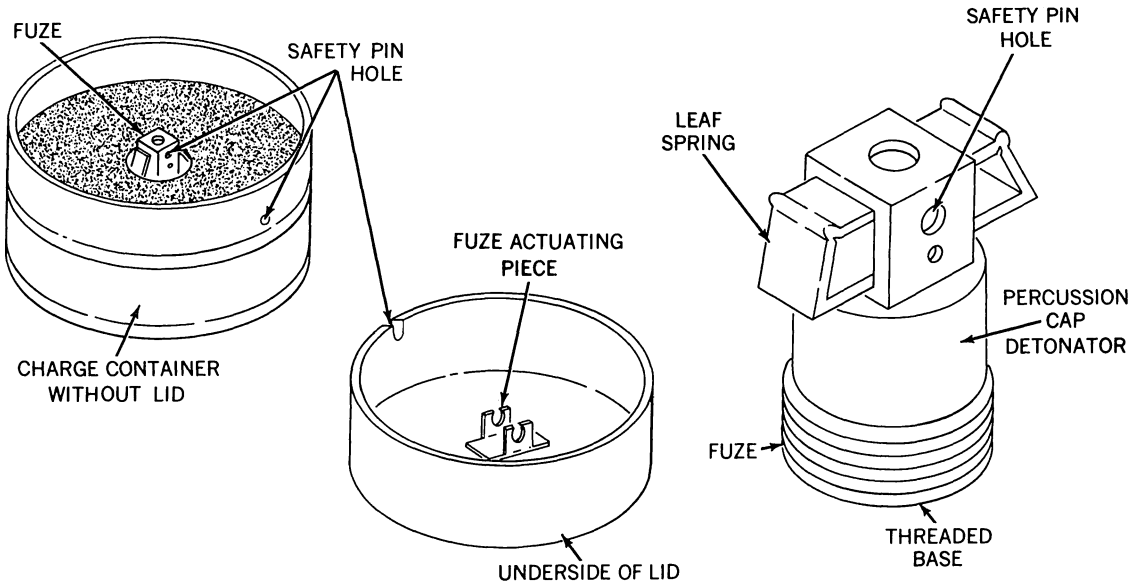


Figure 371

c. Functioning. Pressure on the lid depresses the leaf spring until it snaps over and forces the striker against the percussion cap, which fires the detonation and the main charge.

d. Installing and Arming. Lay the mine and remove the safety pin.

e. Disarming Procedure.

(1) Gently remove the lid from the mine.

(2) Unscrew the fuze from the charge container.

(3) Remove the mine and fuze to a safe storage or disposal area.

255. Dutch (Antitank) Antipersonnel Mine (Japan)

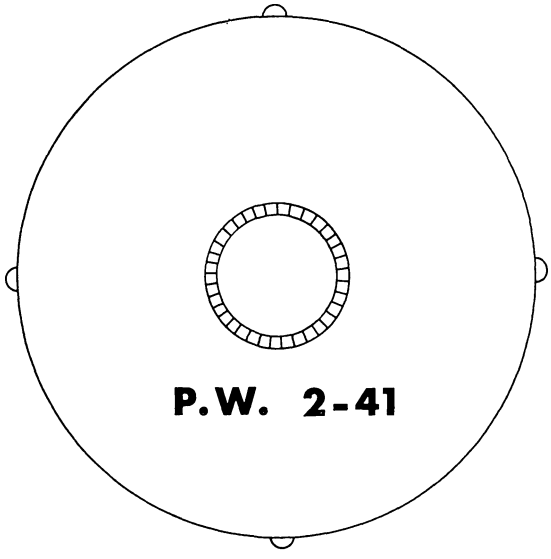


Figure 372

The "Dutch" mine has a pressed steel body with a crimped-on metal base. The cover has four side slats corresponding with screw holes in the body that accommodate the small fixing studs. In the center of the cover is a brass plug under which is a spiral spring that holds the cover away from the body. The fuze and detonator assembly screws into the well in the top of the body of the mine. There is no safety pin. The mine is 8.8 centimeters high and 20.9 centimeters in diameter.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	Markings
Circular, dome-shaped.	Integral, pressure, with soft copper shear wire.	50 lb...	5¼ lb. TNT.	P.W. 2–41 in red across both cover and mine body. P.W. 2–41 also on fuze head.

b. Use. This mine is laid in narrow trails, on beaches, and at entrances to bivouac areas. It is usually laid on top of the ground.

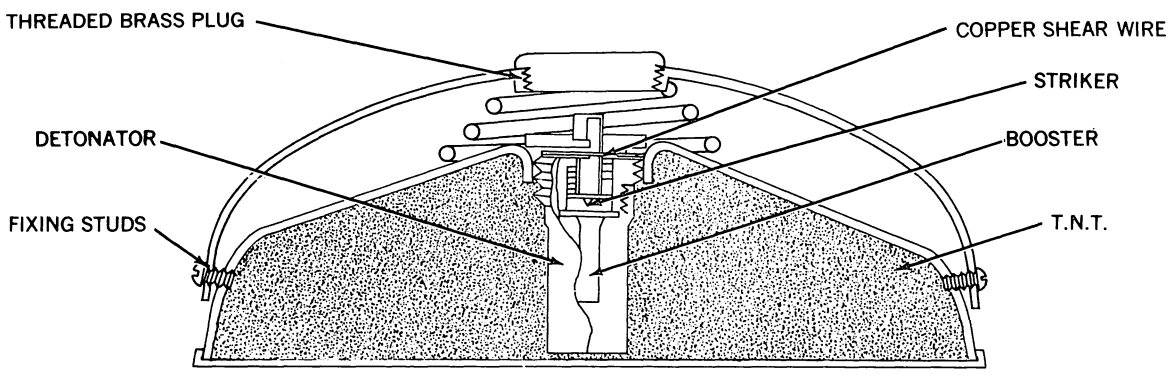


Figure 373

c. Functioning. Pressure on the top compresses the helical cover spring, moving the cover downward in the slots onto the striker head, shearing the shear wire and freeing the spring to drive the striker into the percussion cap.

d. Installing and Arming.

(1) Unscrew the brass plug from the top of the cover.
(2) Screw a fuze and detonator assembly into the fuze well.
(3) Replace the brass plug.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Unscrew the brass plug from the cover of the mine.
(3) Unscrew the fuze and detonator assembly from the fuze well.
(4) Separate the fuze and detonator.
(5) Replace the brass plug in the top of the cover.
(6) Remove the mine and fuze to a safe storage or disposal area.

256. Horseshoe Mine (U.S.S.R.)

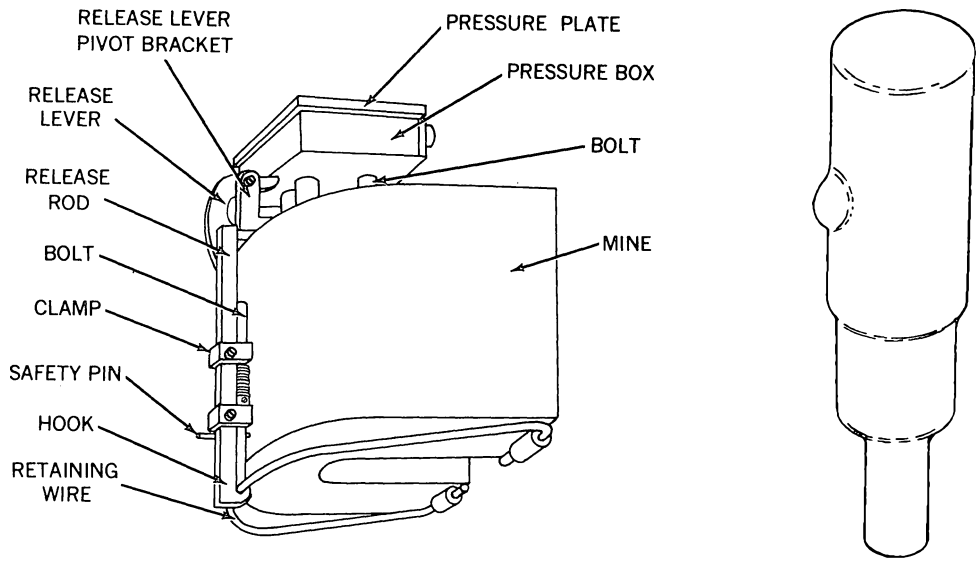


Figure 374

The horseshoe mine has a metallic case 10.1 centimeters wide and 10.1 centimeters long. Two pressure fuzes with MD–2 detonator assemblies, inserted into wells in the top of the mine, are covered with a pressure box and a pressure plate. A release lever which is welded to a release rod is hinged to a U-shaped pivot bracket welded to the top of the mine. The release lever is depressed until its tip rests under the edge of the pressure box. The release lever is prevented from pivoting by a U-shaped retaining wire in the hooked end of the release rod. A spring-actuated bolt, held in place by a safety pin and clamped to the lower end of the release rod, holds the retaining wire in place.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Horseshoe . . .	Two MV–5 pressure fuzes.	20 lb. or more.	2 lb.

b. Use. The horseshoe mine is used as an antipersonnel mine when used alone and as an antitransport mine when used with supplementary charge. Twenty are usually buried in the ground on a board or plank with an additional charge. The open end of the horseshoe-shaped mine faces the charge. A hole is provided in the plank to fit the hooked end of the release rod and to allow it to move outward when pressure is applied to the mine. A pressure board is usually laid over the pressure plate with one end on the supplementary charge.

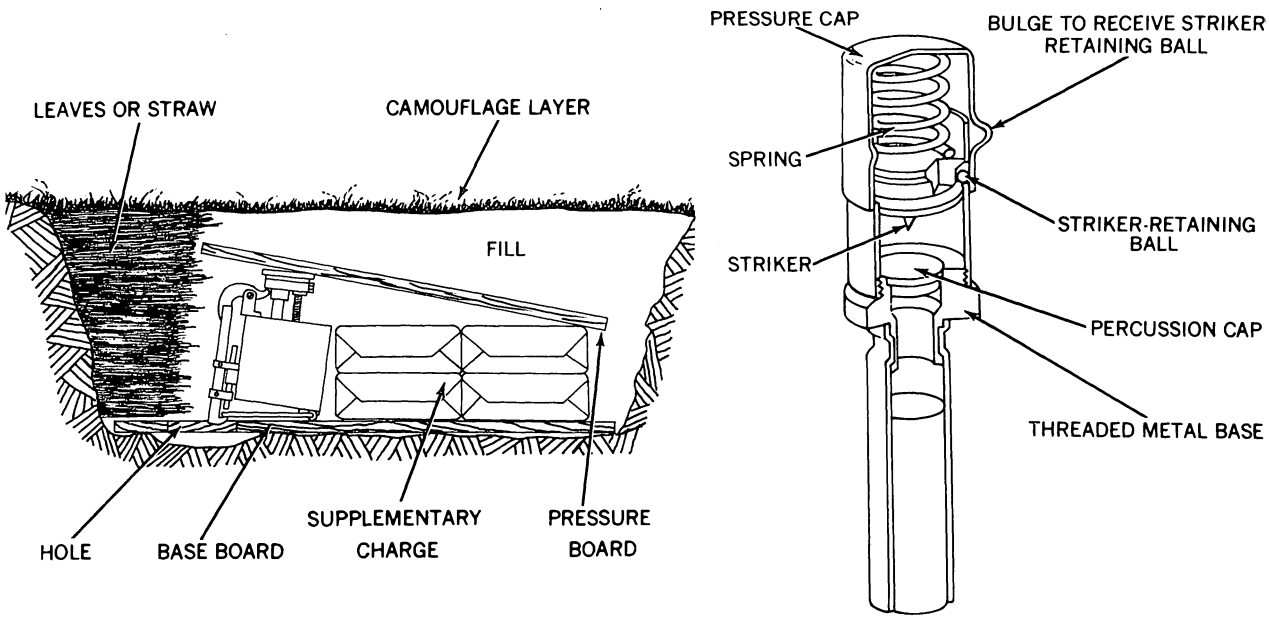


Figure 375

c. Functioning. Pressure on the pressure box rotates the freed lever-and-rod assembly and moves its lower end outward. This allows further pressure to depress the pressure box, eventually actuating the fuzes.

d. Installing and Arming.

(1) Dig a hole for the mine and place a wooden plank with a hole bored through it in the bottom of the hole.

(2) Place the mine on the plank so the hooked end of the release rod extends into the hole in the plank.

(3) Emplace any additional charges desired on top and on either end of the board or plank.

(4) Insert two pressure fuzes with MD-2 detonator assemblies and cover with the pressure box.

(5) Remove the safety pin. This causes the spring-actuated safety bolt to rise, permitting the U-shaped retaining wire to disengage itself from the hooked end of the release rod.

(6) Cover the mine and place a pressure board over the pressure plate.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Uncover the pressure board and lift it from the mine.

(3) Lift off the pressure plate and the box.

(4) Remove the two pressure fuzes.

(5) Without exerting any pressure on the pressure cap, unscrew the MD-2 detonator assembly from each of the fuzes.

(6) Remove the mine and fuzes to a safe storage or disposal area.

257. Pot Mine S150 (Behalfs Schutzen Mine S150) (Germany)

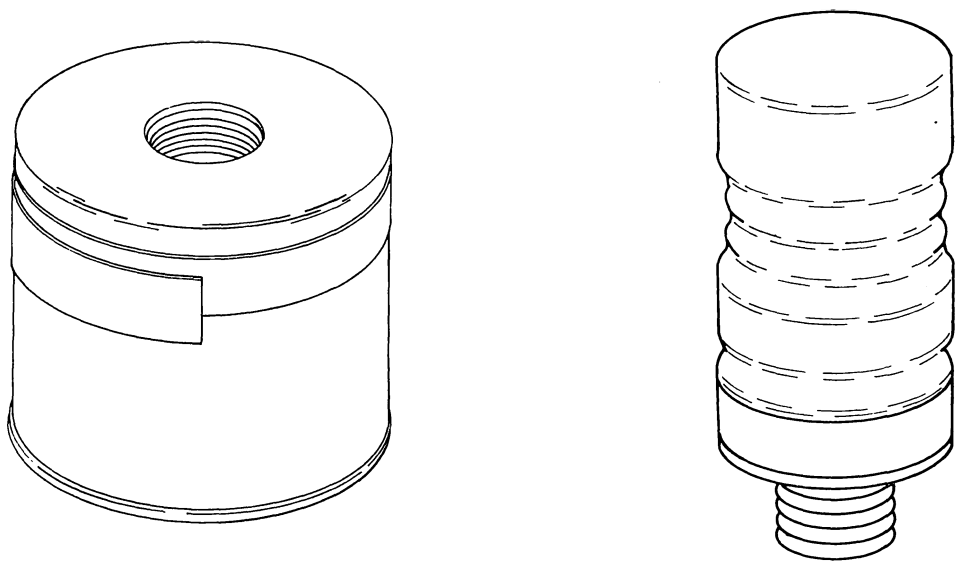


Figure 376

This "pot" mine is similar to the A 200 except for a thinner metal case with a removable lid. The case is 6.2 centimeters in diameter and 5.0 centimeters high. The lid, which overlaps the case, is held in place with adhesive tape. In the top of the case, centrally located, are the plastic detonator holder, detonator, fuze adapter, and the Buck chemical fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical.	Buck pressure-chemical.	15 lb. or more.	5.25 oz. picric acid (par. 6x).

b. Use. This mine is placed for the security of units in ditches and on trails along the approach routes to unit positions. It is also used for boobytrapping.

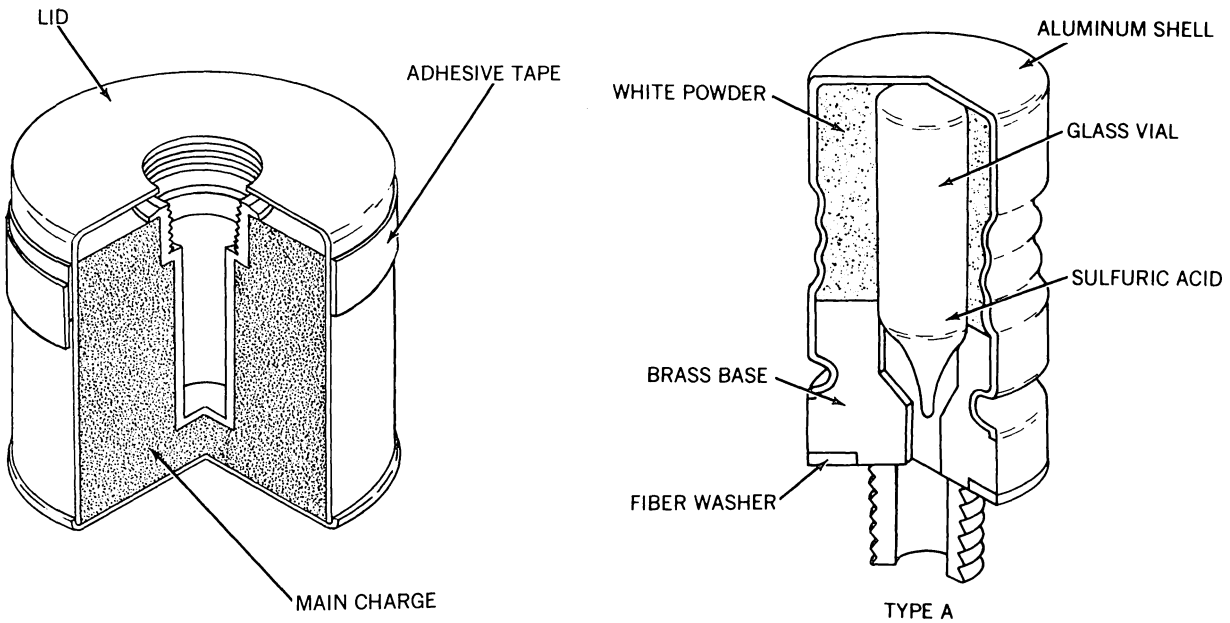


Figure 377

c. Functioning. Pressure on the fuze, crushes it, breaking the glass vial. The escaping chemical mixes with the white powder around it and produces a flash, which sets off the detonator and the main charge.

d. Installing and Arming.

(1) Insert the detonator in the detonator holder.

(2) Screw a Buck chemical fuze into the fuze adapter, holding it by the base and not by the fragile aluminum shell.

(3) Install the mine in one of the following ways:

(*a*) Place the mine in a hole so that the top of the fuze is level with or slightly below the ground surface. If desired, carefully place a pressure board over the fuze to increase the pressure area; or

(*b*) Place the mine in a hole so that the entire fuze projects above the surface of the ground; or

(*c*) Lay the mine on the surface of the ground.

e. Disarming Procedure.

(1) Unscrew the Buck chemical fuze by holding it by the base, not by the fragile aluminum shell.

(2) Tip the mine so that the detonator falls out into the hand.

(3) Remove the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. This mine has no safety devices or activating fuze wells.

258. Pot Mine A200 and A202 (Behelfs Schutzen Mine A200 and A202 (Germany)

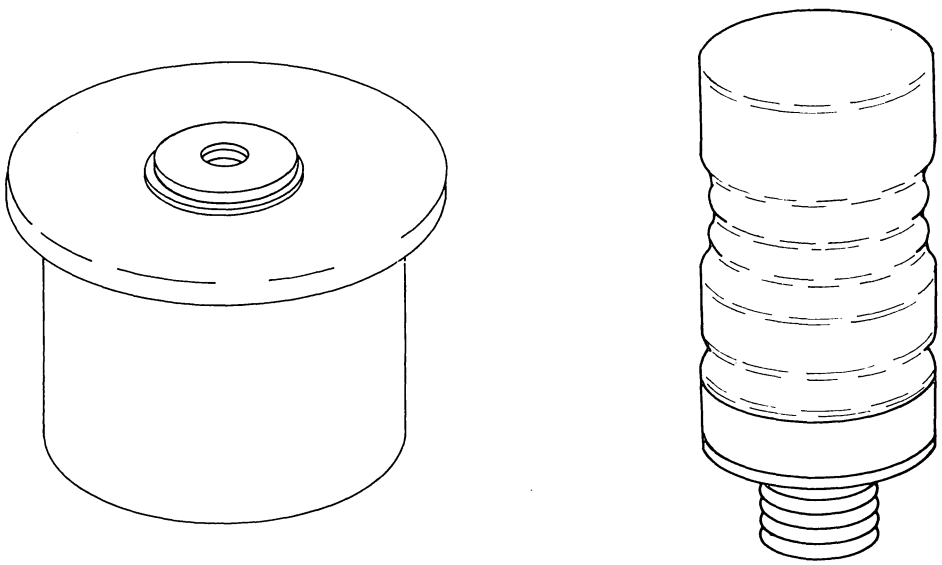


Figure 378

This mine, often called the "mustard pot," consists of a small metal cylindrical case, 5.0 centimeters high and 7.6 centimeters in diameter at the top. A plastic detonator holder and detonator, a fuze adapter, and a Buck chemical fuze are centrally located in the top of the case. A modification of this mine—the A202—differs only slightly from the A200. It has, however, a threaded fuze well that receives the fuze directly without an adapter and a built-in metal detonator holder attached to the removable lid.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical.	Buck pressure-chemical.	15 lb. or more.	7 oz. powdered picric acid (par. 6x).

b. Use. This mine is placed along road shoulders, trails, and hedgerows against personnel. It is usually buried with only the fuze extending above the ground.

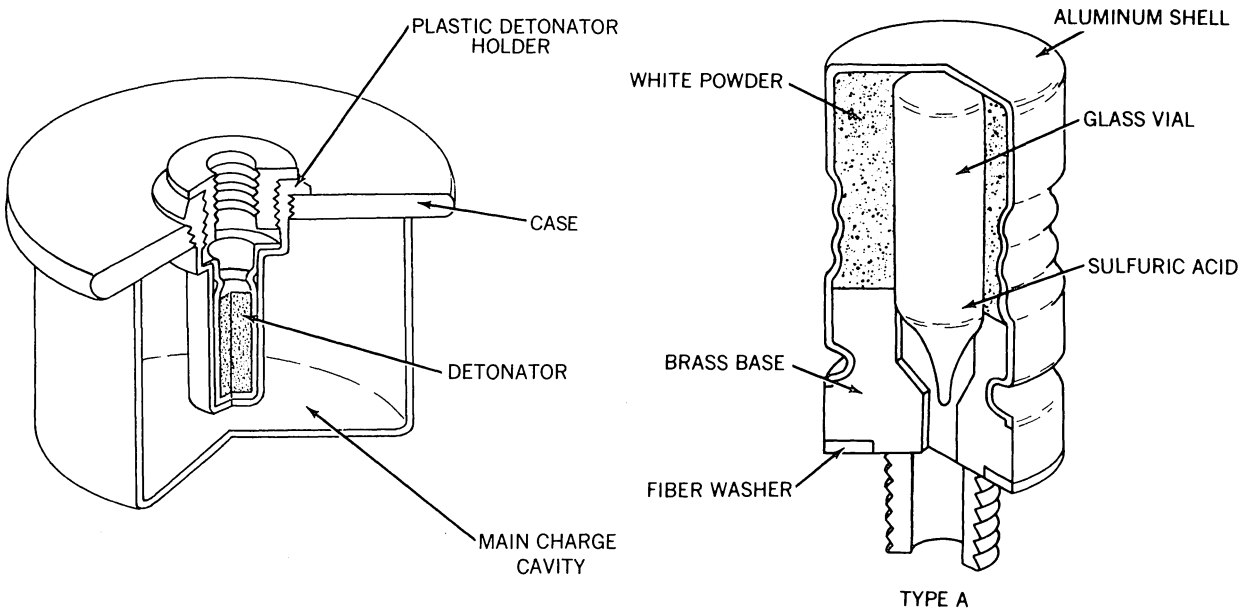


Figure 379

c. Functioning. Pressure on the fuze crushes it, breaking the glass vial and releasing the chemical to mix with the white powder surrounding it. This produces a flash that sets off the detonator and the main charge.

d. Installing and Arming.

(1) Unscrew the fuze adapter and insert the detonator into the detonator holder.

(2) Screw the fuze adapter into the detonator holder.

(3) Screw a Buck chemical fuze into the fuze adapter, holding it by the base and not by the fragile aluminum shell.

(4) Install the mine in one of the following ways:

(*a*) Place the mine in a hole so that the top of the fuze is level or slightly below the surface of the ground. If desired, carefully place a pressure board over the fuze to increase the pressure area; or

(*b*) Place the mine in a hole so that the entire fuze projects above the surface of the ground; or

(*c*) Lay the mine on the surface of the ground.

e. Disarming Procedure.

(1) Unscrew the Buck chemical fuze by holding it by the base, not by the fragile aluminum shell.

(2) Unscrew the fuze adapter and tip the mine so the detonator falls out into the hand.

(3) Remove the mine and fuze to a safe storage or disposal area.

259. Picric Pot Antipersonnel Mine (A200) (France)

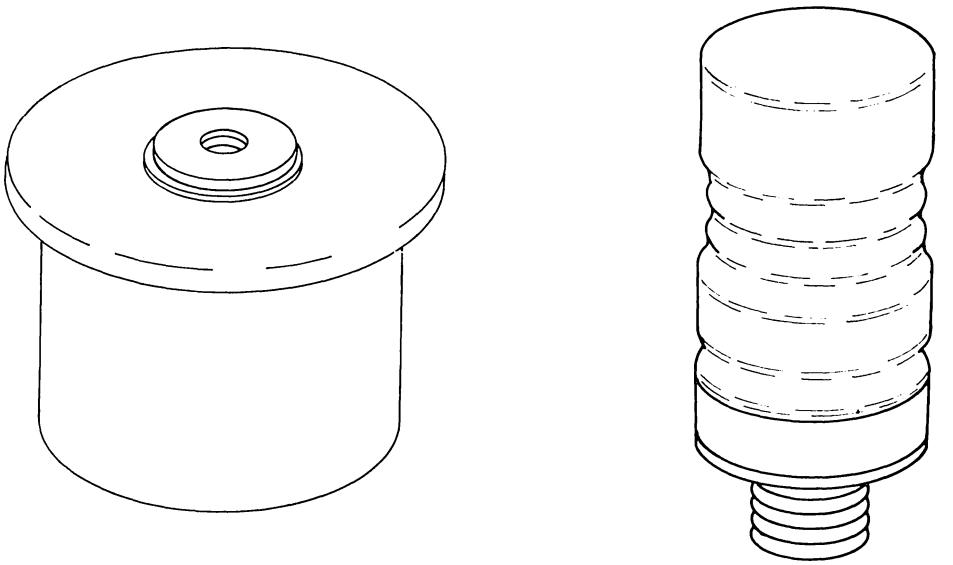


Figure 380

This mine is an exact copy of the German pot mine A200 and A202. For description, characteristics, use, functioning, installing and arming, and disarming, see paragraph 258.

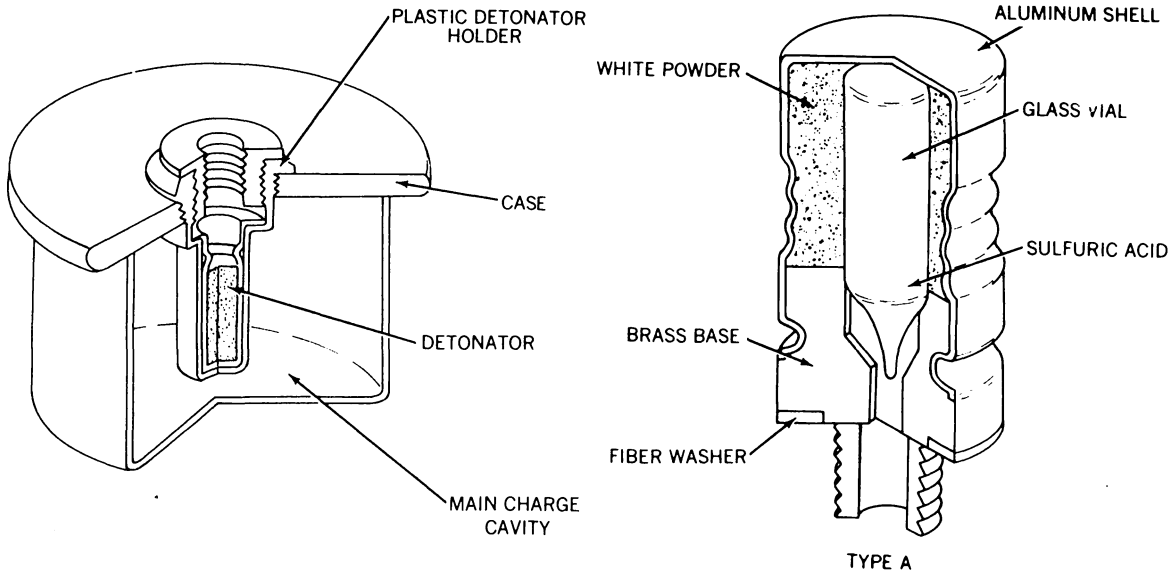

PLASTIC DETONATOR HOLDER
CASE
DETONATOR
MAIN CHARGE CAVITY
ALUMINUM SHELL
WHITE POWDER
GLASS VIAL
SULFURIC ACID
BRASS BASE
FIBER WASHER
TYPE A

Figure 381

260. Antipersonnel Mine, V-5 (Italy)

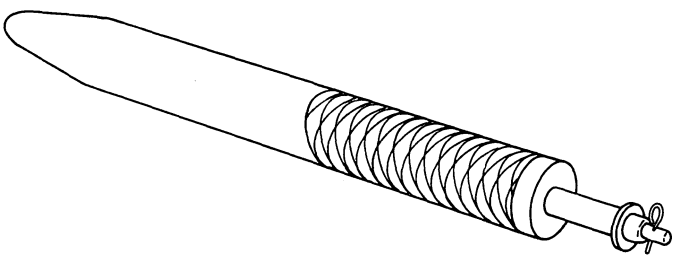


Figure 382

This mine consists of a metal tube 1.2 meters long and 5.0 centimeters in diameter supported on springs in a sheet steel box open at the top. A built-in fuze with a spring-loaded striker is located at each end of the mine, the main charge lying between the strikers. A removable percussion cap holder is provided for the insertion of the percussion cap. An actuating bolt extends upward from the bottom of the steel box to contact a U-shaped spring clip that fits around the fuze housing.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Tubular...	2 integral pressure fuzes.	44 lb.....	2 lb.

b. Employment. This mine is used in much the same way as the N–5 antitank mine. Its length makes it very desirable for laying in roads, trails, and passes.

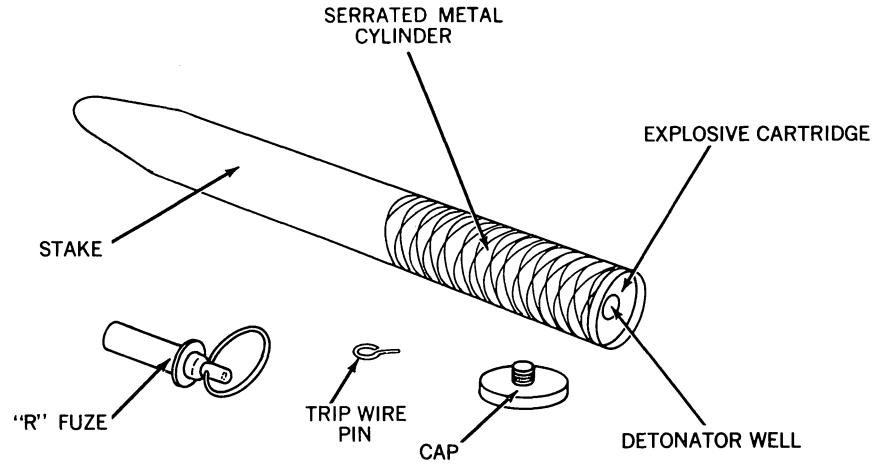


Figure 383

c. Functioning.

(1) Pressure on the case depresses the pressure spring around the actuating bolt, forcing it upward on the U-shaped spring clip.

(2) The U-shaped spring clip is forced upward against the actuating pin, freeing the spring loaded striker to set off the percussion cap and fire the mine.

d. Installing and Arming.

(1) Withdraw the percussion cap holders and the actuating pins.

(2) Cock the striker of each fuze by pulling outward on the cocking-tube grips.

(3) Push the cocking tubes all the way in and insert a safety pin in the hole in the ends of the striker shafts.

(4) Place the mine in a hole so that its top is flush with the top of the ground.

(5) Insert the actuating pins.

(6) Insert the percussion cap holders with percussion caps in the openings in the side of the mine.

(7) Withdraw the safety pins.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert nails or safety pins in the holes in the ends of the striker shafts.

(3) Remove the activating pins.

(4) Remove the percussion-cap holders.

(5) Reinsert the activating pins.

(6) Uncock the strikers by grasping the cocking-tube grips, lift up slightly on the actuating pins, and let the strikers go forward gently.

(7) Remove the mine to a safe storage or disposal area.

261. Ramp or 3-Pound Antipersonnel Mine (Hungary)

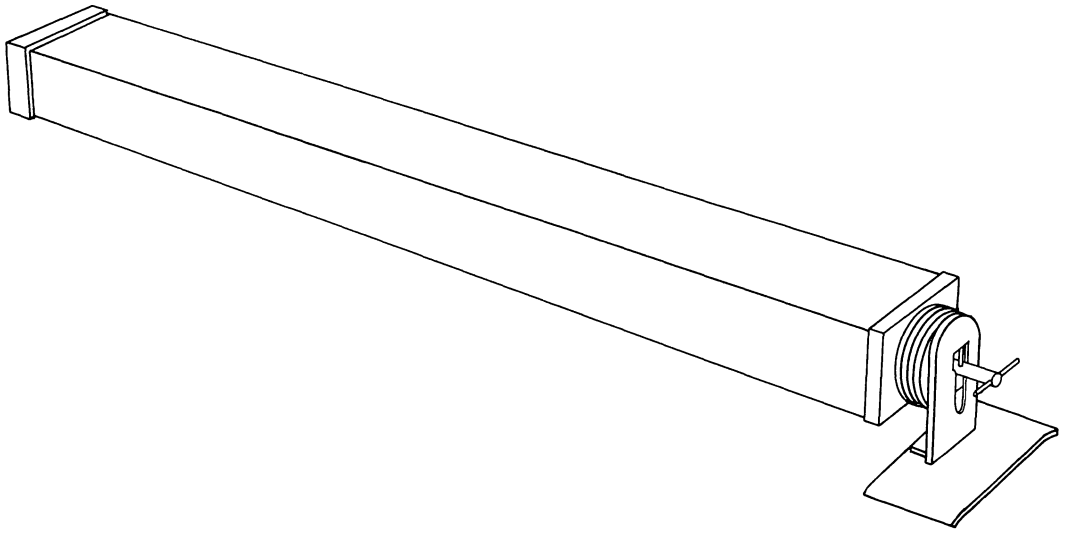


Figure 384

This mine is essentially four blocks of explosive placed in an elongated sheet metal case. It has a mechanical fuze with a spring-loaded striker and a metal stand to hold it in armed position. The mine measures 48.2 by 5.0 by 3.1 centimeters.

a. Characteristics.

Shape	Type fuze	Operating force	Explosive	Markings
Rectangular...	Pull...	Less than 10 lb.	1.8 lb. TNT.	On one side: GY 1941-SZ 1941. GY and SZ denote the year of manufacture and delivery, respectively. The letters HAK may also appear signifying Army Mine.

b. Use. These mines are frequently laid in small trenches about 1 meter apart, with about 1 meter between the individual mines. They are then covered with a 5 centimeter layer of ground.

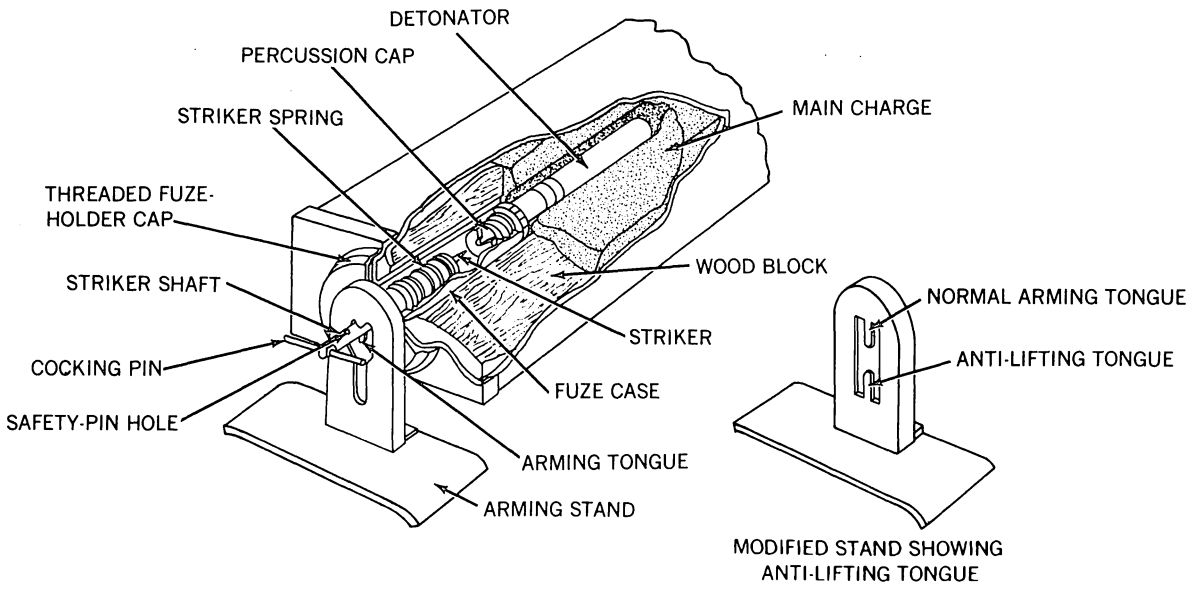


Figure 385

c. Functioning. Force on the elevated or fuze end of the mine pushes the tongue out of the hole in the striker and releases it to hit the percussion cap.

d. Installing and Arming.

(1) Pull back on the cocking pin and insert a safety pin (with string) through the outer hole in the striker shaft.
(2) Screw a percussion cap and detonator assembly into the base of the fuze.
(3) Screw the fuze assembly into the fuze end of the mine.
(4) Place the mine in the prepared spot, lift the fuze end, and slide the slot of the arming stand over the striker shaft.
(5) Pull back on the cocking pin until the inner hole in the striker shaft is exposed and slide the arming tongue on the stand into this hole.
(6) Release the cocking handle until the tongue bears against the fuze-holder cap and cover the mine.
(7) Remove the safety pin by pulling on the string attached to it.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Insert a wire or nail into the safety-pin hole.
(3) Disengage the tongue of the stand from the striker bolt and let the latter slide in until it is held by the safety pin.
(4) Unscrew the fuze assembly from the mine.
(5) Unscrew the detonator assembly from the fuze.
(6) Remove the mine and fuze to a safe storage or disposal area.

f. Additional Precautions.

(1) If the tongue has been inserted in the safety pin hole so that the inner hole is not visible, the striker shaft must be pulled out carefully until the inner hole is exposed and a safety pin is inserted. **Insert the safety pin before disengaging the tongue from the striker shaft.**
(2) **A modified arming stand has an anti-lifting tongue projecting up from the bottom of the slot in the stand.** In this case, the lower tongue is inserted

in the inner hole in the striker shaft, so that the mine may function only when the fuze end is lifted. Disarming with the modified arming stand, however, is the same as for the original.

262. Bangalore Torpedo, Type 99 (Japan)

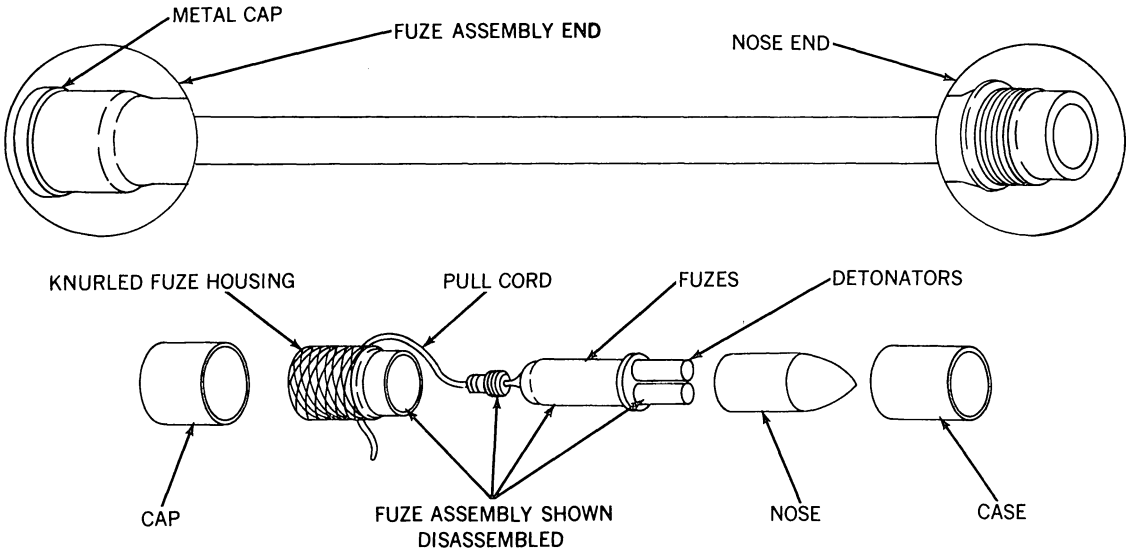


Figure 386

This improvised metal-cased antipersonnel mine consists of a piece of pipe 1.18 meters long and 3.5 centimeters in diameter at the fuze end. It has two pull-friction type fuzes, two 7-second delay pellets, two detonators, a safety pin, and a pull cord.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Elongated cylinder.	2 pull-friction type.	5 to 10 lb.	3.2 lb. picric acid (par. 6x).

b. Use. The bangalore torpedo with trip wire actuation is used along trails and approaches to unit positions. It is also used as a prepared charge for boobytraps.

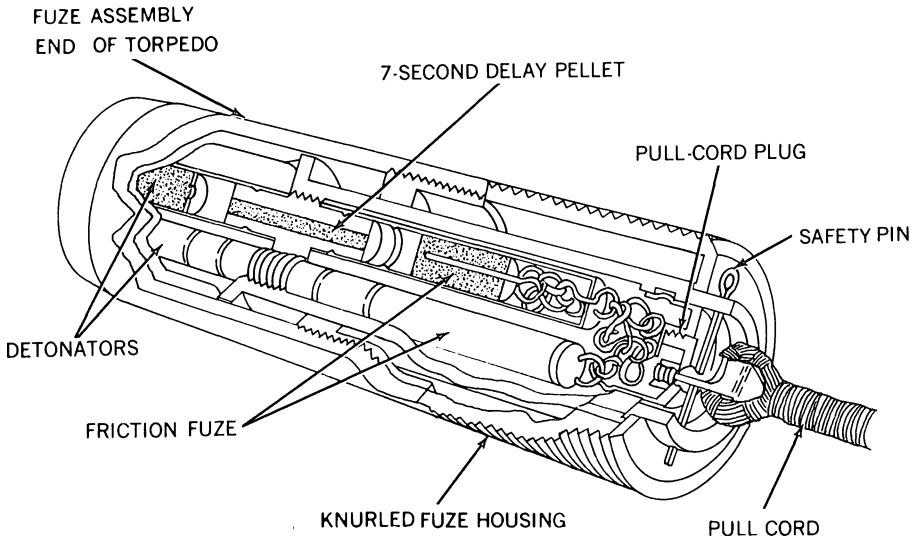


Figure 387

c. Functioning. After the safety pin is removed and the pull-cord plug unscrewed, a pull on the pull cord actuates the two friction fuzes and ignites the 7-second delay pellets. These burn through and fire the two detonators, which explode the main charge.

d. Installing and Arming.

(1) Remove the fuze assembly and nose from the case. Unscrew the fuze assembly from the nose.
(2) Screw the fuze assembly into the fuze assembly end of the torpedo.
(3) Screw the nose on the nose end of the torpedo.
(4) Install the torpedo in a concealed position above the ground.
(5) Attach a tripwire to the pull cord of the fuze assembly.
(6) Remove the safety pin.
(7) Unscrew the pull cord plug.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Screw in the pull cord plug, insert a wire or nail in the safety pin hole, and cut the tripwire.
(3) Unscrew the fuze assembly and nosepiece from the torpedo and screw the fuze assembly into the nosepiece.
(4) Remove the disassembled torpedo to a safe storage or disposal area.

263. Beer Stein Antipersonnel Mine (U.S.S.R.)

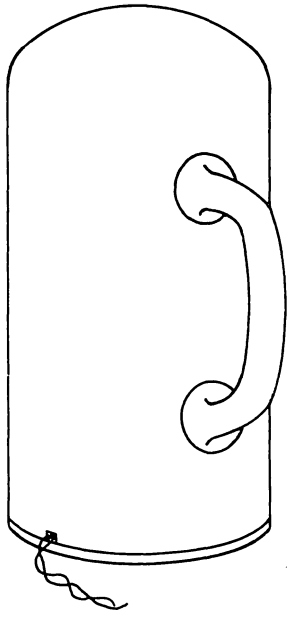


Figure 388

This antipersonnel mine has a cast iron case shaped like a beer stein with a handle. It is closed by means of a metal disk swinging in and out on a pivot: The mine is 15.2 centimeters in diameter and 30.4 centimeters high. It is fired either by pull or pressure, or electrically.

a. Characteristics.

Shape	Fuze
Cylindrical.....	Pull or pressure or electrical.

b. Use. This mine is usually detonated (120 volts are required) by electrical control; two or more are connected and placed at 1-meter intervals. If controlled, they are laid with the open end down; but with a pull or pressure fuze, the open end is up.

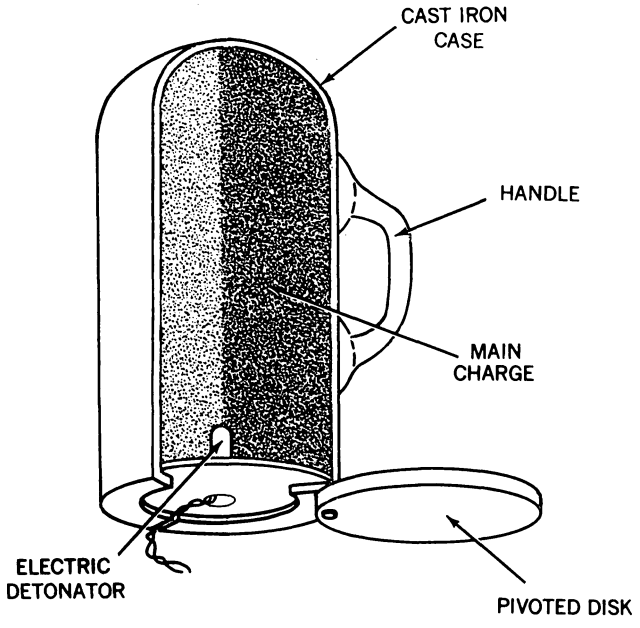


Figure 389

c. Functioning. The ignition of the fuze explodes the detonator and the main charge, shattering the cast-iron shell.

d. Installing and Arming.

(1) Rotate the metal disk.
(2) Insert an electric detonator (or a pull or pressure fuze).
(3) Lay the mine.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Cut the wires attached to the mine.
(3) Remove the detonator (or the fuze).
(4) Take the mine to a safe storage or disposal area.

264. Antipersonnel Vise Mine (U.S.S.R.)

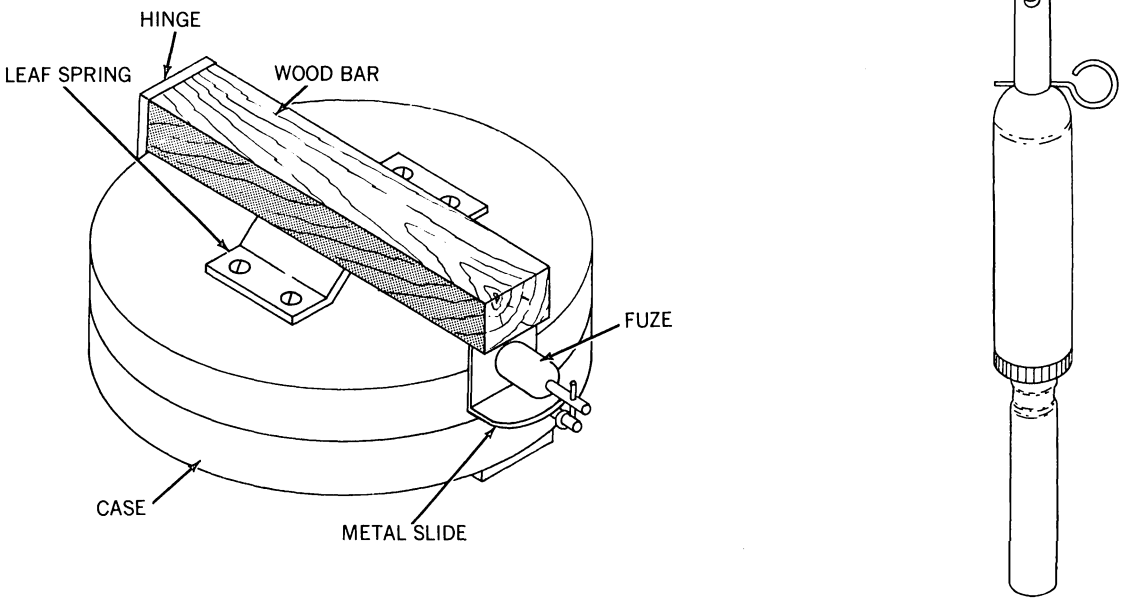


Figure 390

This antipersonnel mine consists of a flat sheet metal case about 30.4 centimeters in diameter and 6.27 centimeters high. The mine is held between the hinged legs (wooden bars) of a wooden vise. The top leg or larger wooden bar lies on a leaf spring fixed to the top of the mine. The fuze is inserted through a slot in a metal slide on the side of the top half of the mine. The bottom of this slide, pointed and bent out, engages in the eye of the striker retaining pin.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular . . .	MUV pull.	2 lb. or more.	2.5 lb.

b. Employment. This mine is employed in the same places and laid in the same manner as other antipersonnel types.

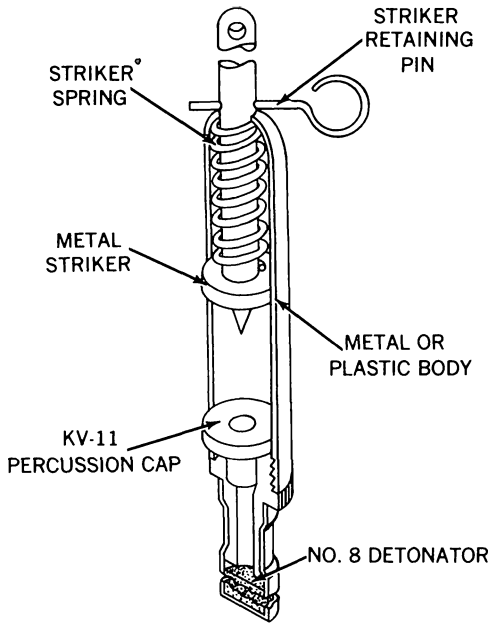


Figure 391

c. Functioning. Pressure on the top leg of the vise depresses the leaf spring and the metal slide, forcing the striker retaining pin out of the MUV pull fuze and exploding the mine.

d. Installing and Arming.

Insert an MD–2 detonator assembly into an MUV pull fuze.

(2) Insert the fuze into the mine through the slot in the metal slide, so that the end of the slide engages in the eye of the striker retaining pin.

(3) Place the vise so that the longer wooden bar rests on the leaf spring on top of the mine.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Uncover the mine and carefully pull out the fuze.

(3) Remove the mine and fuze to a safe storage or disposal area.

265. Hawkins Grenade Mine, No. 75 Mark 2 (United Kingdom)

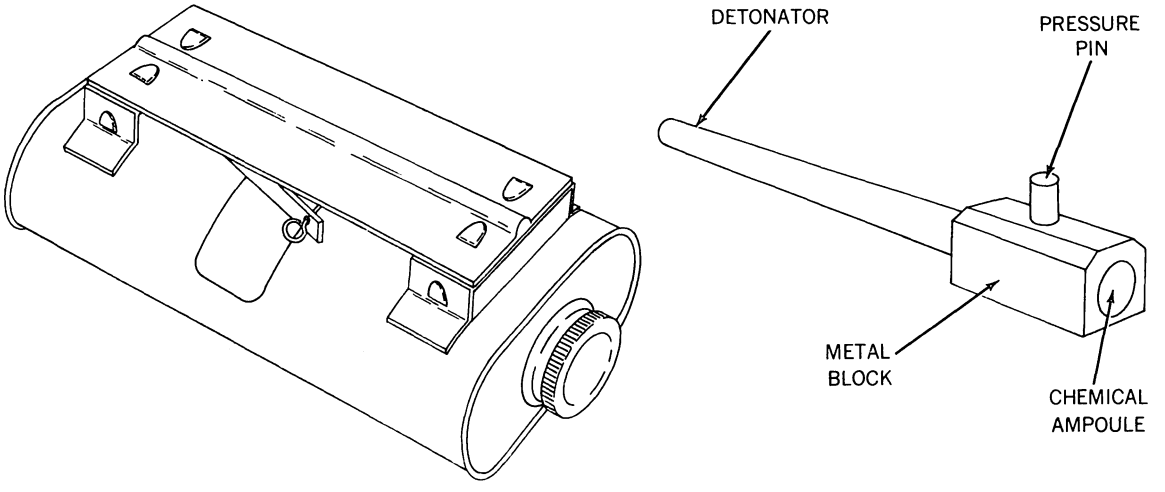


Figure 392

Hawkin's grenade mine No. 75, Mark II consists of a steel case containing a main charge and a booster charge. A filler cap is located in the end of the case. The top of the case is fitted with two fuze wells which lie flat in a V-shape. These fuze wells are covered with a pressure plate with a longitudinal ridge. The chemical pressure fuze No. 98 is employed with this mine. The mine is 17.7 centimeters long, 10.1 centimeters wide, and 6.2 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Tubular flattened.	Two No. 98 chemical pressure.	80 to 100 lb.	1.5 lb.

b. Use. This dual-purpose mine is employed in security and protective type minefields. It is also installed in tactical minefields (in pairs and groups of four) and in roadblocks. One mine will seriously injure a man stepping on it. Mines laid in pairs will disable trucks and break the tracks of light tanks. Four mines laid together may break the track of a medium tank.

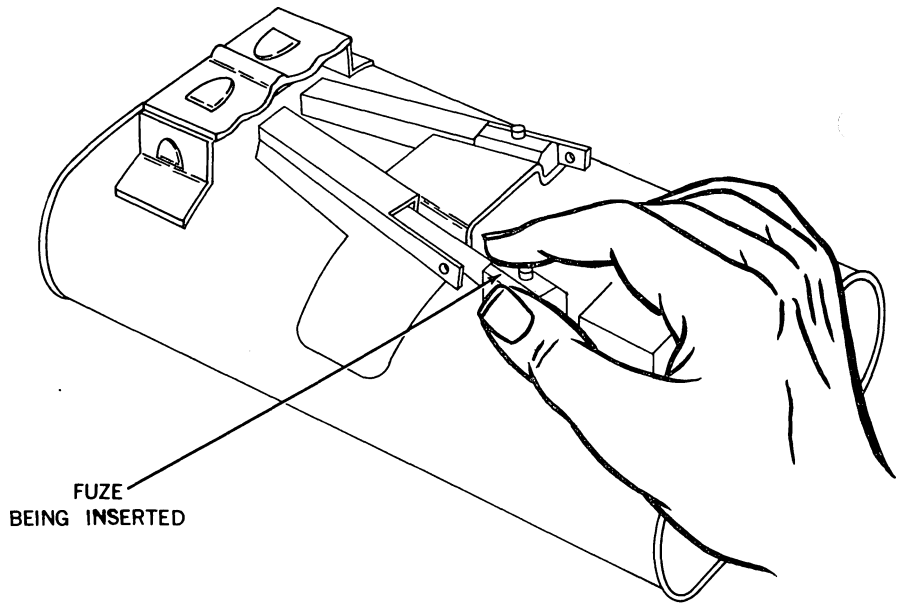


Figure 393

c. Functioning. Pressure on the pressure plate causes it to bend, forcing the pressure pin of one fuze, or both, against the ampoule of chemical and crushing it. A chemical reaction takes place producing a flame which sets off the detonator, firing the mine.

d. Installing and Arming.

(1) Insert the ampoules and detonators in the fuzes.

(2) Insert the fuzes in the fuze wells under the pressure plate, pushing in the detonator end first.

(3) Insert the fuze pin through the holes in the ends of the fuze wells.

(4) Place the mine in the ground with the filler cap pointing in the direction of the opposing forces. When installing the mines in pairs, place one mine on top of the other. Make sure that the pressure plate of the upper mine is flush with the surface of the ground.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Withdraw the fuze pin and pull out the fuzes.

(3) Remove the mine and fuzes to a safe storage or disposal area.

266. Hawkins Grenade Mine, No. 75 Mark I (United Kingdom)

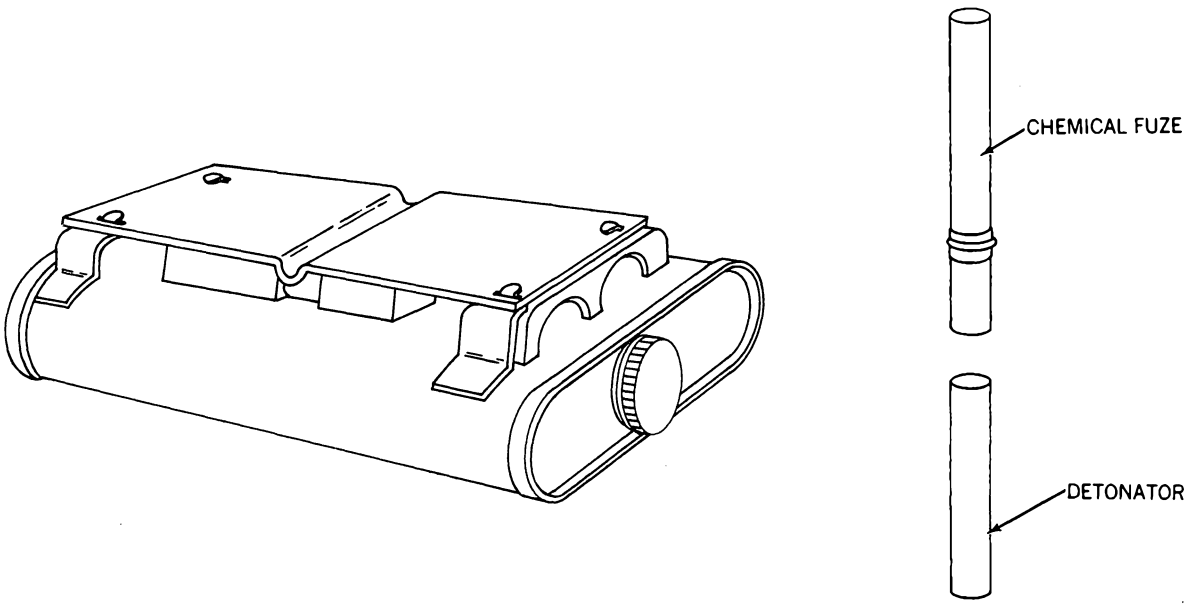


Figure 394

The Hawkin's grenade mine No. 75, Mark I, is an earlier model of the Hawkin's grenade mine No. 75, Mark II. The fuze wells are located parallel to each other, instead of in a V-shape as in the Mark II. The fuze is similar to the chemical pressure fuze No. 98, but lacks the metal block with the pressure pin. The pressure plate has a transverse groove instead of a longitudinal ridge. In all other characteristics, this mine is similar to the Hawkin's grenade mine No. 75, Mark II. Disarming is merely removing the fuzes.

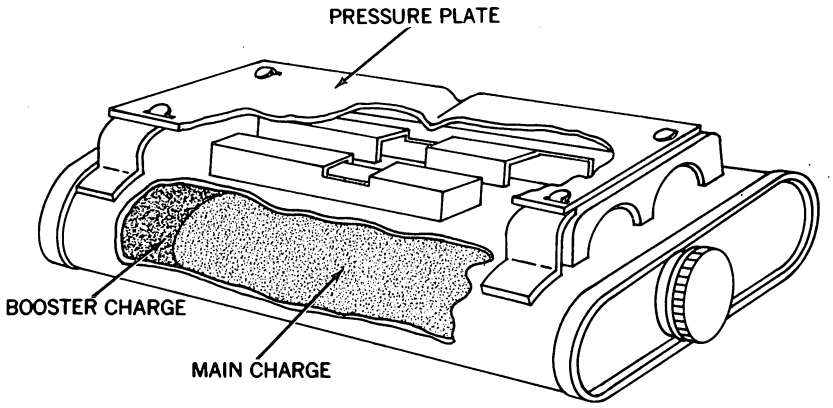


Figure 395

267. Nonstandard Antipersonnel Shell Mine (France)

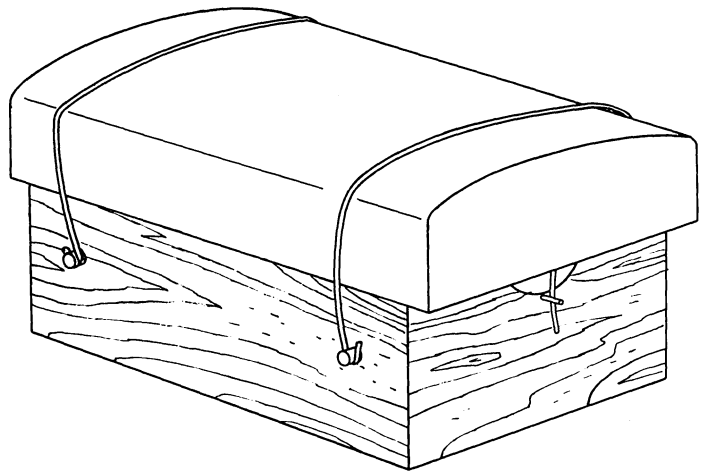


Figure 396

This mine, although nonstandard, is not field improvised. It consists of a wooden case containing a main charge of two high-explosive shells and a booster. A sheet-metal pressure cover, which fits over the case, is held on by two retaining wires that are fastened to pegs on the side of the case. The mine has a built-in fuze with an L-shaped actuating lever to which are attached two trip wires. The percussion cap and detonator assembly is located in the lower part of the fuze well tube.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Rectangular.	Integral pull-pressure fuze.	10 lb. or more.	2 high explosive shells.	4 sticks of gelignite.

b. Use. This antipersonnel mine is useful in hasty minefields and road blocks. It may also be used in antitank minefields to hinder the passage of reconnaissance and breaching parties.

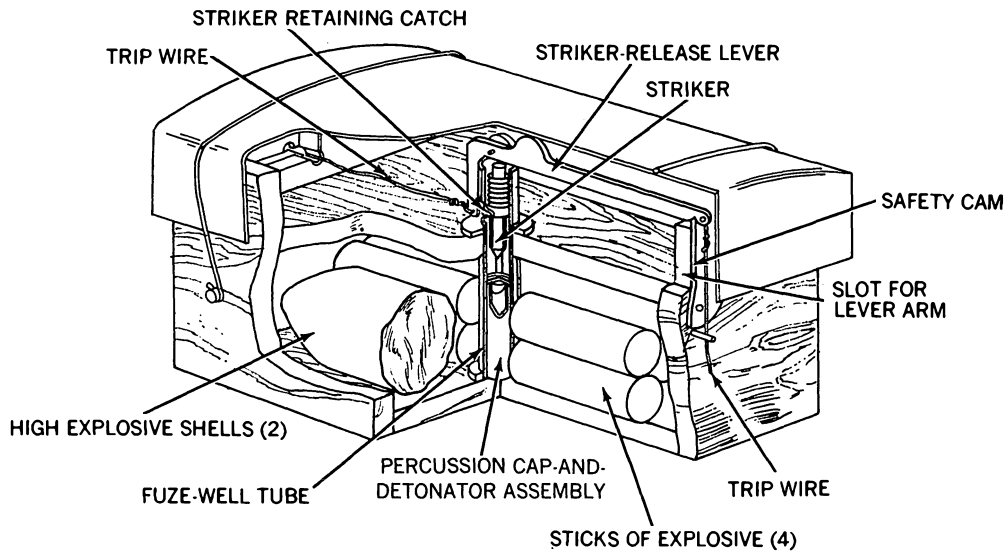


Figure 397

c. Functioning. A tug on the tripwire at either end of the case or pressure on the lid moves the actuating lever to release the spring-loaded striker to fire the percussion cap, detonator, booster, and main charge.

d. Installing and Arming.

(1) Insert the percussion cap and detonator assembly in the lower part of the fuze well tube.

(2) Insert the built-in fuze and make sure that the safety cam is up so that it engages in the groove at the end of the actuating lever.

(3) Install anchored tripwires to both ends of the actuating lever.

(4) Place the pressure cover on the mine and wire it in place.

(5) Rotate the safety cam so that it disengages from the groove in the striker release lever.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Rotate the safety cam until it engages in the groove at the end of the actuating lever; cut the tripwires; cut or disconnect the two wires that hold the pressure cover to the case; and remove the pressure cover.

(3) Carefully tape or wire the vertical portion of the actuating lever very lightly to the fuze well tube, and lift fuze from the mine.

(4) Remove the percussion cap and detonator assembly from the bottom of the fuze well tube.

(5) Take the mine and fuze to a safe disposal area.

268. Ground Spike Antipersonnel Mine (United Kingdom)

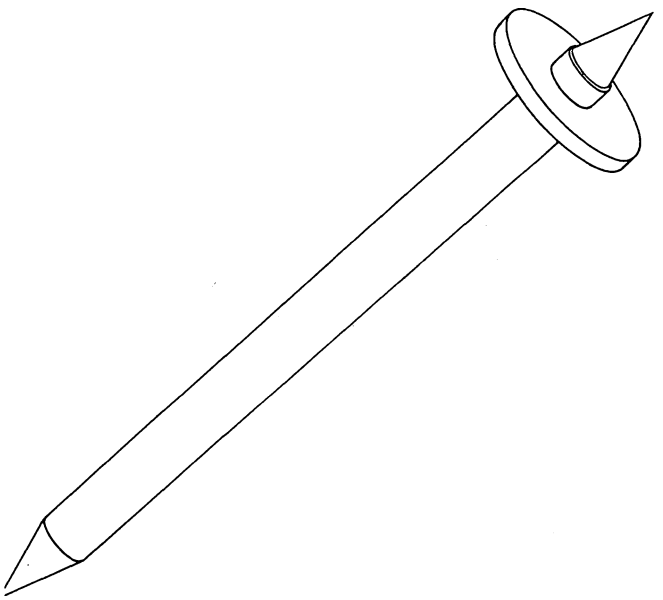


Figure 398

This antipersonnel mine is in effect a .30 caliber ball cartridge fitted into a firing device actuated by pressure of a soldier's foot. It has a pencil-shaped steel case, 3.7 centimeters in diameter and 14.6 centimeters long, with a 3.7-centimeter diameter flange at the top and a sharp point at the bottom. The spring-loaded sleeve is retained by an umbrella catch, which is mounted on the upper end of an anchored spindle that passes through the spring and the sleeve. A striker with a hollow shaft fits over the upper end of the spindle, just above the catch. The .30 caliber cartridge fits into the upper end of the case, the bullet projecting above the flange.

a. Use. This mine is installed in roads and pathways. The bullet will go through a man's foot or do much damage in the groin. It will also severely damage a pneumatic tire.

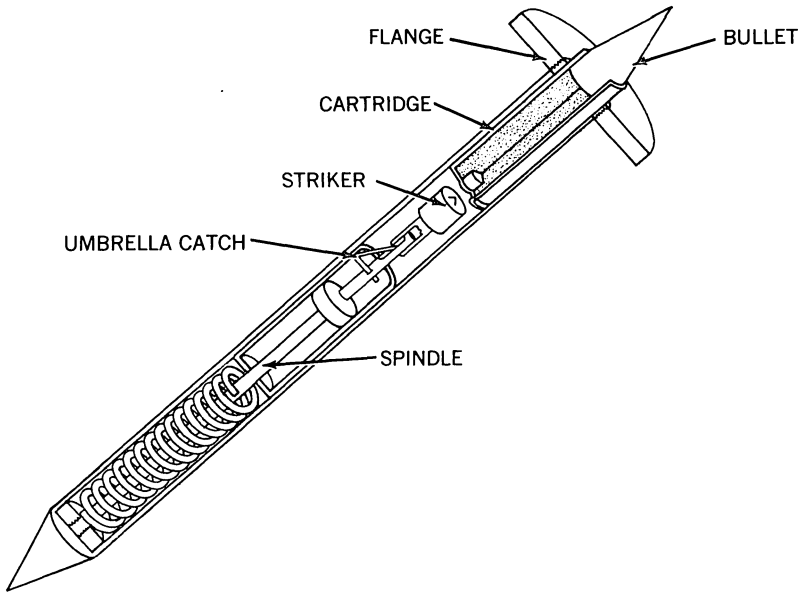


Figure 399

b. Functioning. A pressure of 4 pounds or more on the top of the bullet forces the cartridge down against the striker, forcing the hollow shaft of the striker over the umbrella catch. The released catch in turn releases the spring-loaded sleeve, which drives the striker against the cartridge cap, firing the cartridge and projecting the bullet upwards.

c. Installing and Arming. This mine is usually available armed ready for use, the striker being held in position in the case by a cork. If it is necessary to arm the mine, follow this routine:

(1) Tip the mine to remove the striker.
(2) Push the mine into the ground to the level of the flange.
(3) Push the sleeve down into the case, compressing the spring until the umbrella catch springs outward over the top of the sleeve. The catch holds the sleeve in the cocked position.
(4) Place the striker over the spindle.
(5) **At arm's length,** lower the cartridge gently into the fuze case until the rim rests on the striker. Hold the cartridge between the fingers so that in the event of premature firing a finger will not be blown off. A pressure of as little as 4 pounds is enough to actuate the firing mechanism.

d. Disarming Procedure. Carefully lift out the cartridge **at arm's length,** holding the cartridge between the fingers so that, in case of a premature firing, a finger will not be blown off. After disarming take the mine to a safe storage or disposal area.

Section II. WOODEN ANTIPERSONNEL MINES

269. Schümine 42 (Schü.Mi.42) (Germany)

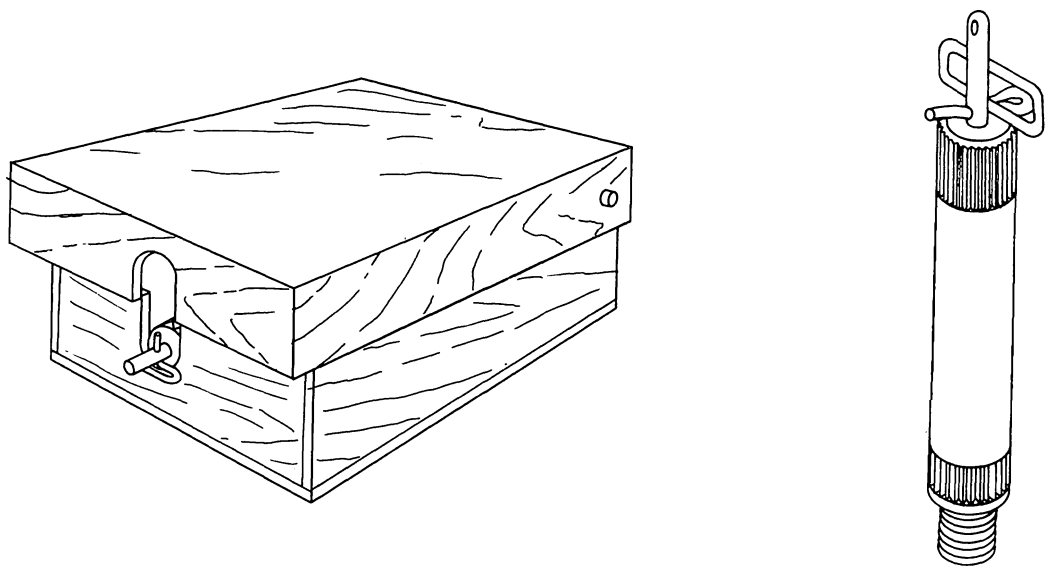


Figure 400

This was probably the most copied wooden antipersonnel mine of World War II; and many new models, some made of plastic, are currently produced. It had the advantage of quick, easy fabrication from available materials, light weight, and high dependability and effectiveness. The Schumine 42 has a compressed cardboard or plywood case 12.0 by 8.2 by 4.6 centimeters with a hinged overlapping pressure lid. In the center of the front edge of the lid is a slot cut to fit over the fuze striker shaft.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	.Z.Z.42 pull type.	6 to 11 lb.....	.44 lb.

b. Use. This mine is laid in antitank and antipersonnel minefields and along paths or trails, road shoulders, and fording places. It is often used unburied in wooded or grassy areas, but covered with leaves or other vegetation.

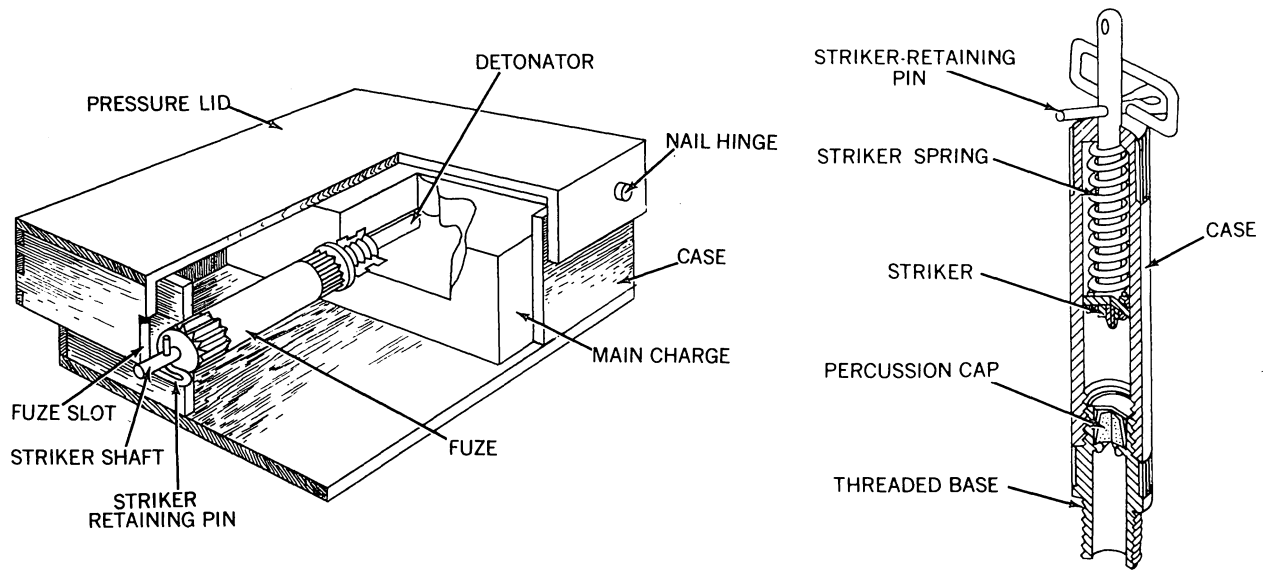


Figure 401

c. Functioning. Pressure on the pressure lid pushes the retaining pin out of the fuze, allowing the spring-loaded striker to slam against the percussion cap and fire the charge.

d. Installing and Arming.

(1) Open the pressure lid and place the main charge so that fuze well faces the hole in the front end of the case.

(2) Screw the fuze with detonator into the main charge through the hole in the mine case.

(3) Push the main charge and the fuze toward the back of the mine case until the striker pin touches the outside of the case.

(4) Turn the striker shaft so that the wings of the retaining pin are horizontal and below the striker shaft.

(5) If the mine is to be activated, drive a stake into the ground under the fuze and tie a length of wire to the stake and to the end of the loop of the striker retaining pin.

(6) Close the pressure lid very carefully so that the fuze slot fits over the fuze and the lid rests on the wings of the retaining pin. Lay the mine with the hinged end of the pressure lid toward the enemy.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Check the fuze to make sure that the retaining pin is seated firmly in the striker shaft (if not, explode the mine in place).

(3) Raise the pressure lid and unscrew the fuze from the mine.

(4) Unscrew the detonator from the fuze.

(5) Remove the fuze and mine to a safe disposal area.

270. Antipersonnel Mine, Model 1948 (France)

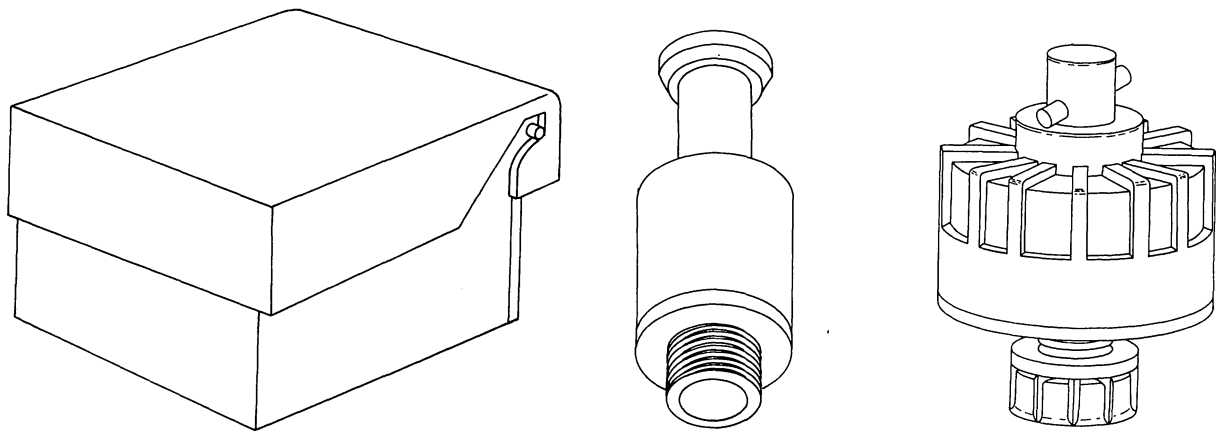


Figure 402

This is a small Schü type mine in a bituminous material case, not locatable by electronic detectors. It has a hinged lid, with a detonator well fitted with a screw plug at one end and a fuze well at the other. It is designed to wound rather than kill (can blow off a foot), having a light explosive charge and a relatively low shrapnel effect. The mine measures 10.8 by 9.8 by 6.5 centimeters.

a. Characteristics.

Shape	Type fuze	Operating force	Explosive	Markings
Rectangular box.	Pressure-chemical or pressure-friction.	44.0 lb. (approx).	6.0 oz. (approx) TNT or ammonium nitrate.	"Mi.AP. ID. Mle. 48" on top of mine.

b. Use. It is used to wound and not kill footsoldiers.

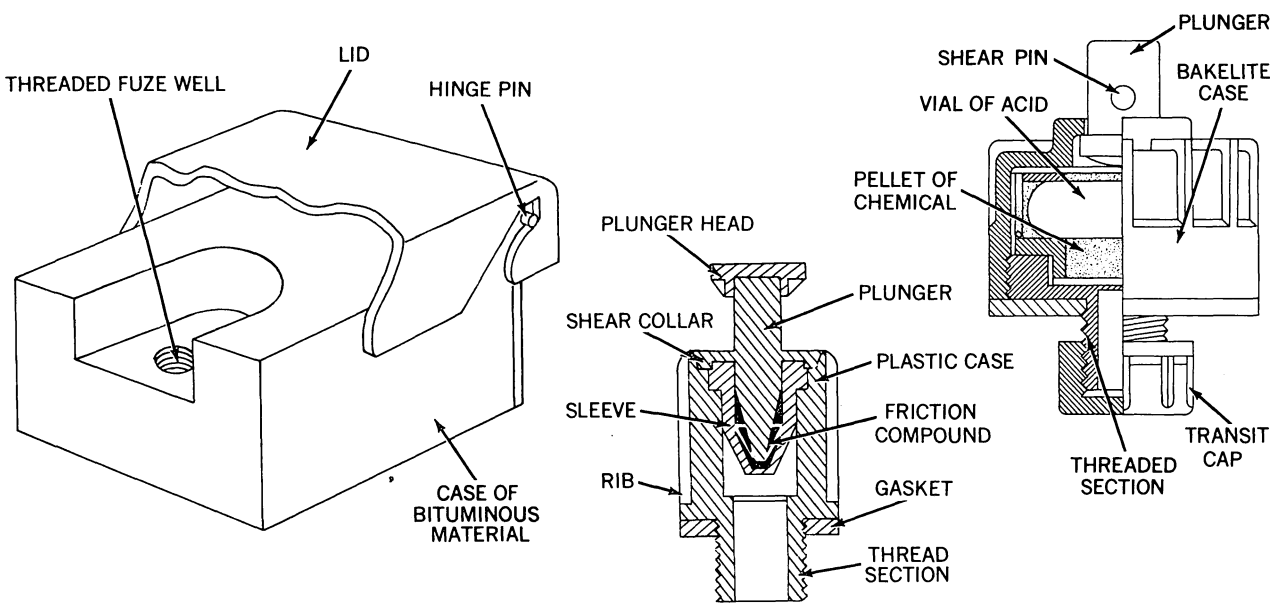


Figure 403

c. Functioning. The weight of a man on the mine rotates the lid about the hinge pins and applies pressure to the fuze, causing it to function and fire the detonator and the main charge.

d. Installing and Arming.

(1) Remove the lid.
(2) Remove the fuze well cover and screw the fuze (Model 1951 pressure-friction or Model 1949 pressure-chemical) into the well.
(3) Unscrew the detonator well plug.
(4) Place the detonator (Model 1949 undetectable) in the well and replace the cover.
(5) Replace the lid, being careful to keep the fuze free of pressure.
(6) Bury the mine, lid uppermost, and cover it with a thin camouflage layer.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the lid, being careful not to place any pressure on it.
(3) Unscrew the detonator well plug.
(4) Lift out the detonator.
(5) Remove the mine to a safe storage or disposal area.

271. Schümine 44 (Schü.Mi. 44) (Germany)

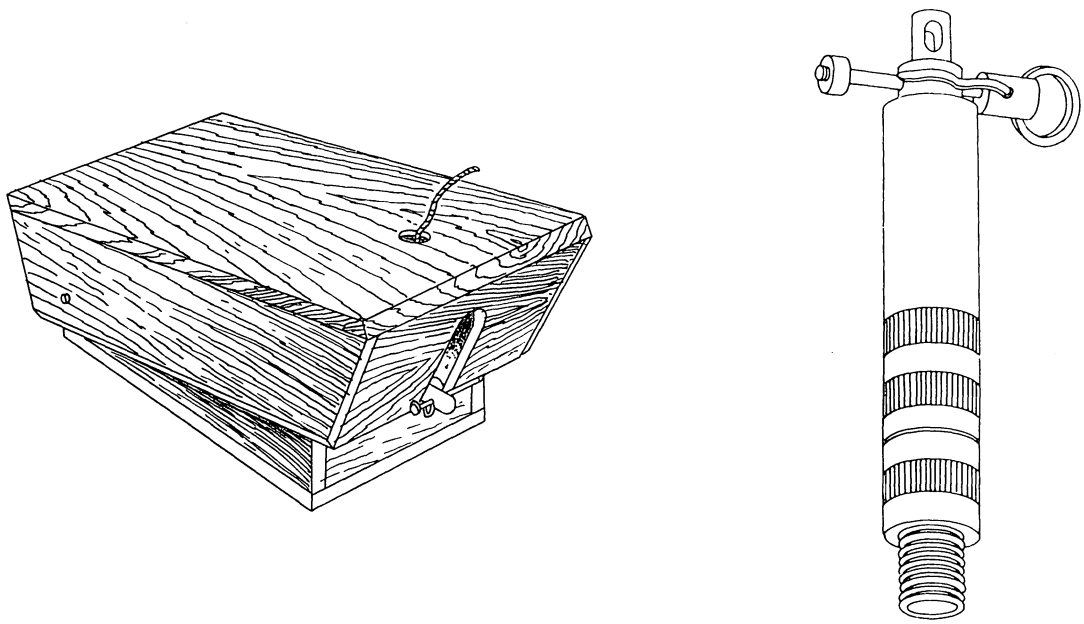


Figure 404

The Schumine 44 consists of a wooden box 12.7 by 9.8 by 4.5 centimeters, with a nail-hinged pressure lid with a recess in the front end to close over the striker shaft and rest on the winged retaining pin or wedge against a nail to push the striker shaft outward, depending on the type of fuze used.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	Z.Z.35, pull or Z.Z.42 pull.	Z.Z.35: 9 to 13 lb. Z.Z.42: 6 to 11 lb.	.44 lb.

b. Use. This mine is laid along paths, trails, road shoulders, and approaches to likely fords across rivers and streams and in antitank minefields. In grassy or wooded area it may be unburied, but concealed with a cover of leaves or other vegetation.

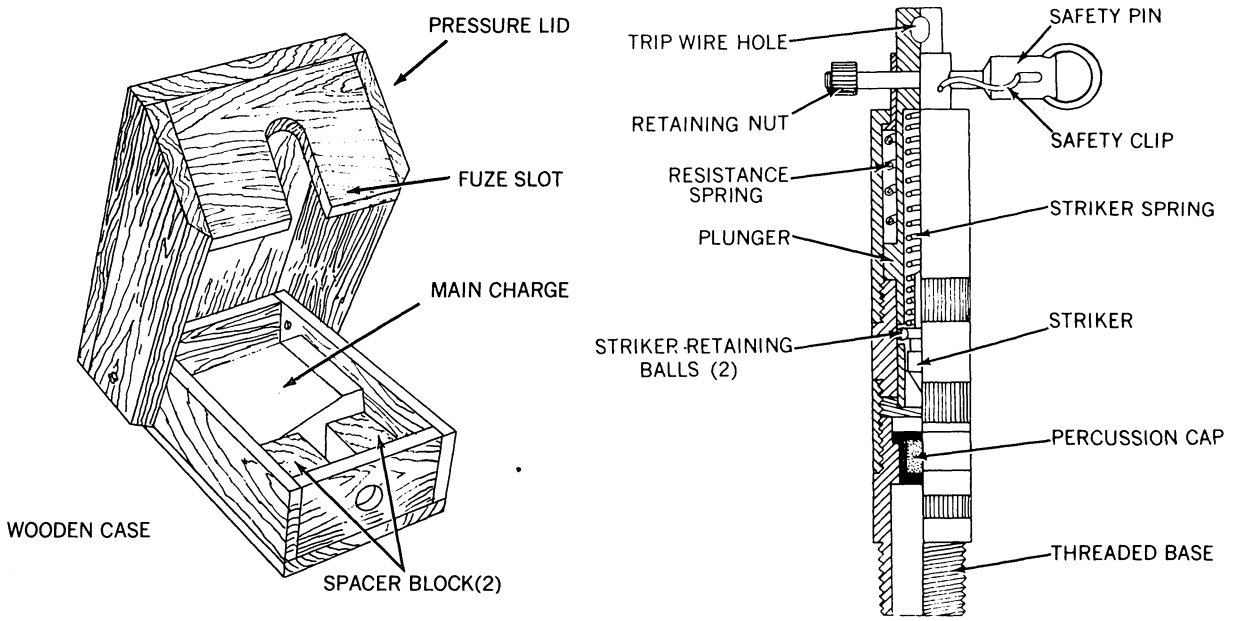


Figure 405

c. Functioning. Pressure on the pressure lid forces the sloped front of the pressure lid against the nail, pushing the striker shaft outward until the spring-loaded striker is released against the percussion cap, firing the mine.

d. Installing and Arming.

(1) Place the main charge in the mine and screw a pull fuze 35 with detonator into the main charge through the hole in the end of the mine.

(2) Insert a nail in the tripwire (outer) hole in the striker shaft and lead the safety-pin cord up through the hole in the pressure lid.

(3) Lower the pressure lid so that the lower part of the front rests against the nail, which is in the horizontal position.

(4) Remove the nut on the end of the safety pin.

(5) With the safety-pin cord, pull the safety pin through the hole in the pressure lid.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Carefully lift the pressure lid without applying any downward pressure and remove the nail from the striker shaft.

(3) Insert the nail in the safety-pin hole of the fuze.

(4) Unscrew the fuze from the mine, and separate the detonator from the fuze.

(5) Remove the mine and fuze to a safe disposal area.

272. Schümine, 400-Gram (Germany)

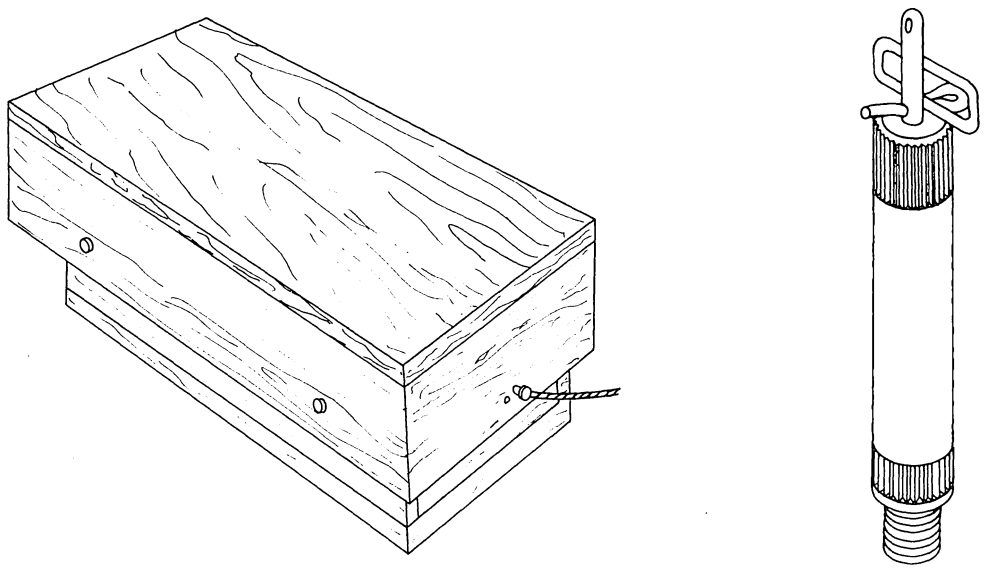


Figure 406

The 400-gram wooden Schümine is larger than previous models, contains more explosive, and has the fuze in the interior of the case. The case is 22.2 by 11.4 by 9.5 mentimeters. A wooden fuze-support block, is located between the main charge and the wooden pressure block with a fuze slot, which is nailed to the under side of the pressure lid. The fuze slot fits over the striker shaft and rests on the winged retaining pin. The actuating pin and the safety pin are merely nails, the latter leaving a string attached for easy removal. Two nails driven through the sides of the lid and the box act as hinges.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	Pull fuze 42	10 lb. or more	.88 lb.

b. Use. This mine is laid along paths, trails, road shoulders, and approaches to likely fords across rivers and streams, and in antitank minefields. It may be laid unburied in grass or wooded lands and covered with leaves or some other vegetation.

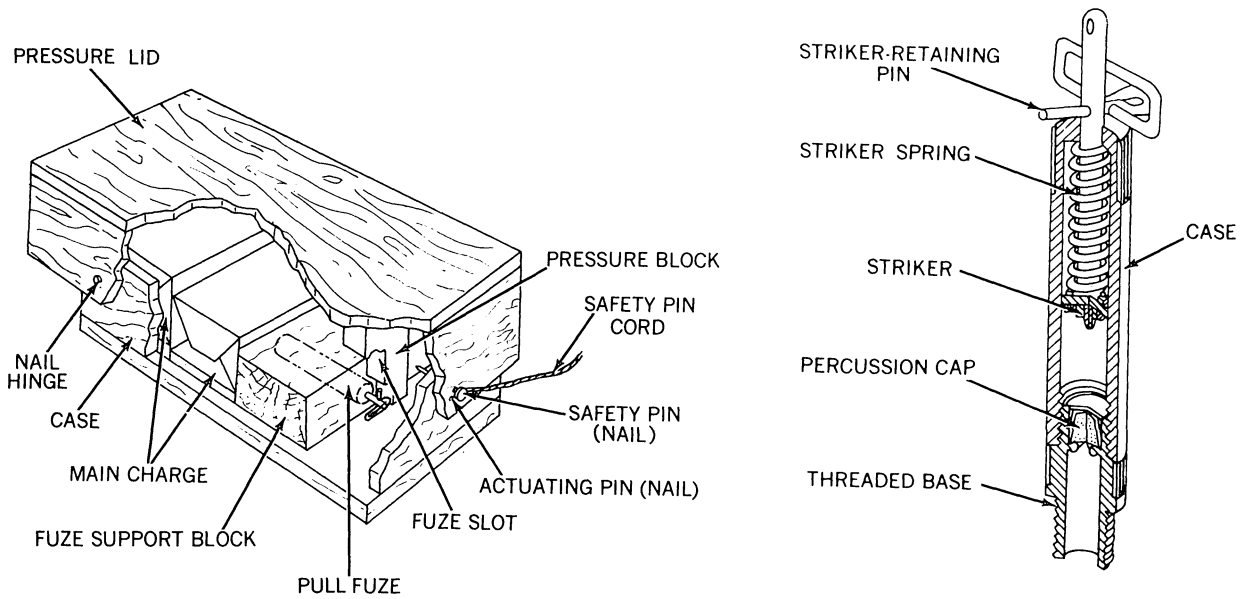


Figure 407

c. Functioning. Pressure on the pressure lid bends down the actuating pin (nail) moving down the pressure block and removing the striker retaining pin, which sets off the percussion cap and then the mine.

d. Installing and Arming.

(1) Insert a pull fuze 42 with detonator through the fuze support block and screw it into the fuze well of one of the two explosive charges.

(2) Position the retaining pin so that the wings are below the striker shaft and the fuze slot of the pressure block is directly above the wings.

(3) Lower the pressure lid until the safety pin rests on the mine case.

(4) Push a small nail through the small hole near the safety pin nail.

(5) Remove the safety pin nail.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Carefully extract the small nail in the hole near the safety pin hole and lift the pressure lid **as the nail clears the end of the mine case.**

(3) Unscrew the fuze from the mine.

(4) Separate the fuze and detonator.

(5) Remove the mine and fuze to a safe disposal area.

273. Wooden Antipersonnel Mine, PMD-6 (U.S.S.R.)

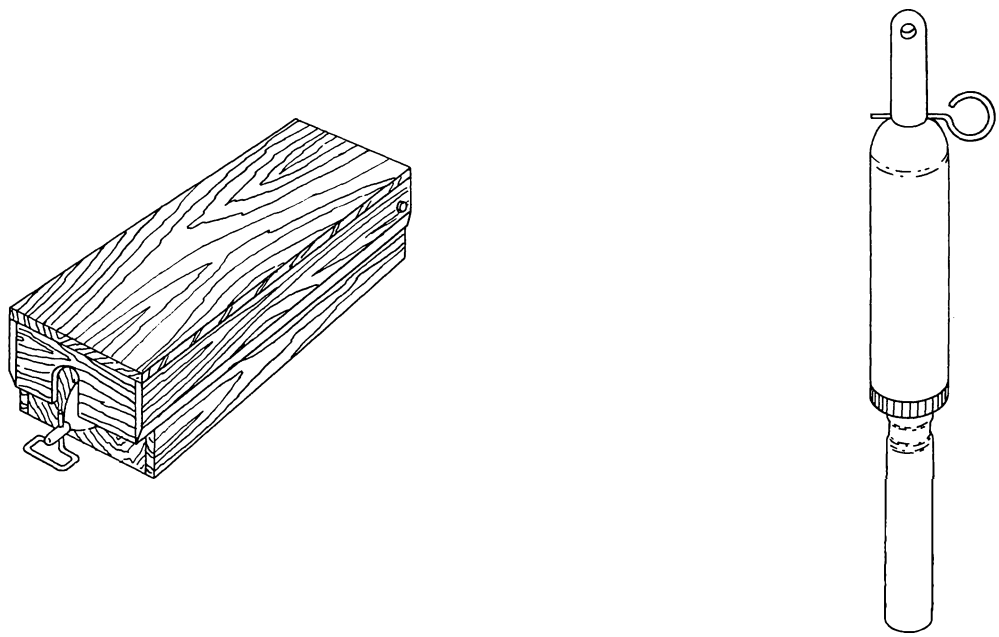


Figure 408

The PMD-6 is a wooden-cased mine with a hinged lid that overlaps the sides. A deep groove is cut in the front end of the lid so that it may fit over the fuze and rest on the striker retaining pin. Some units are fitted with a safety rod, which prevents the lid from actuating the fuze prematurely. The mine measures approximately 19.0 by 8.8 by 6.2 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular.	MUV pull type.	2 lb. or more.	7 oz. TNT.

Markings

Factory symbols, date of manufacture and "M-6" stenciled on underside of lid.

b. Use. The PMD-6 wooden mine is used in antipersonnel minefields around outposts and gun positions, along trails and road shoulders, and in grassy areas.

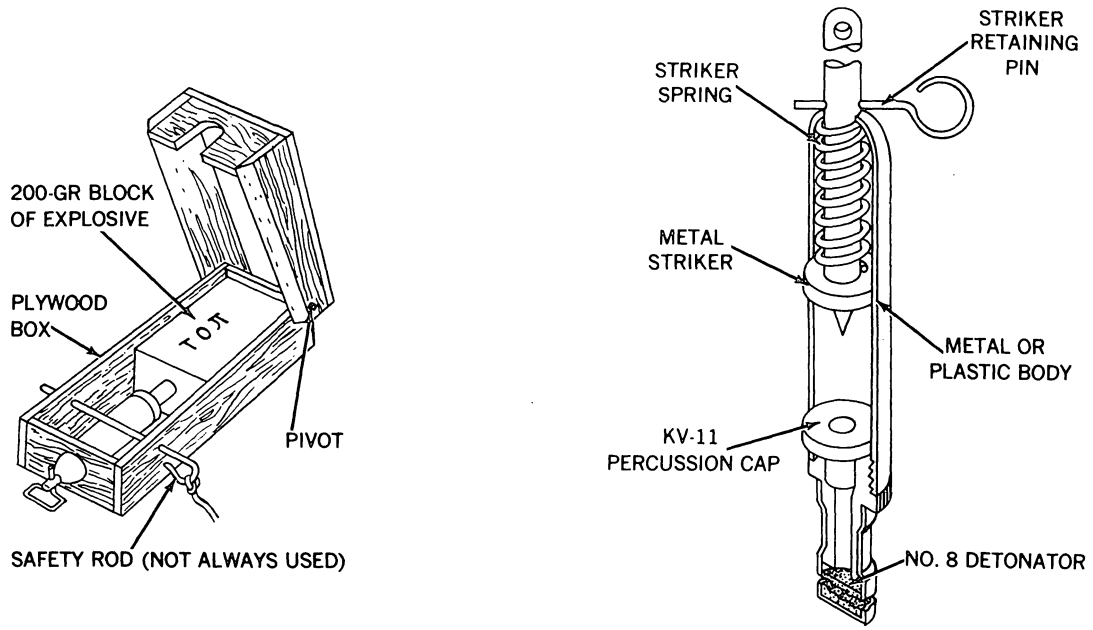


Figure 409

c. Functioning. Pressure on the lid forces the winged retaining pin from the striker, which thus released detonates the charge. The mine may be boobytrapped by connecting the eye of the striker retaining-pin by a wire or cord to a stake driven into the ground under it, or by other simple methods.

d. Installing and Arming.

(1) Lift the lid.
(2) Place the charge in the box so that the detonator well points toward the front.
(3) Insert the MUV fuze and Md–2 detonator through the hole in the front of the box and into the charge.
(4) Turn the striker retaining pin so that the loop is *down*.
(5) Close the lid.
(6) From a distance pull the safety pin from the mine (only a few units have the safety pin).

e. Disarming Procedure.

(1) Check for and remove all antilift devices.
(2) Lift the lid.
(3) Pull out the fuze and detonator assembly.
(4) Unscrew the detonator from the fuze.
(5) Remove the mine and fuze to a safe storage or disposal area.

274. Antipersonnel Mine, Model 43 (Finland)

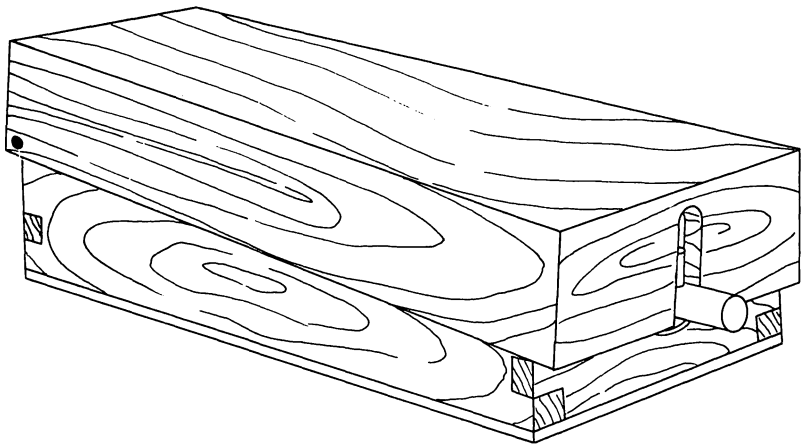


Figure 410

This is a replica of the German Schu mine and the Soviet PMD–6, so prevalent in use in World War II. It has a wooden case that holds the explosive and a hinged lid that acts as a pressure plate. The front end of the lid, which extends down over the side of the box, has a narrow, vertical, U-shaped recess that fits over the top of the striker and permits the lid to rest on the wings of the striker retaining pin. The mine measures 14.4 by 6.5 by 3.0 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular.	Pull.....	22 lb. or more (4 lb. without stiffening plate on fuze).	3.5 oz. TNT.

b. Use. This mine is used as security against foot troops and laid generally at a density of 4 to 10 mines per meter of front.

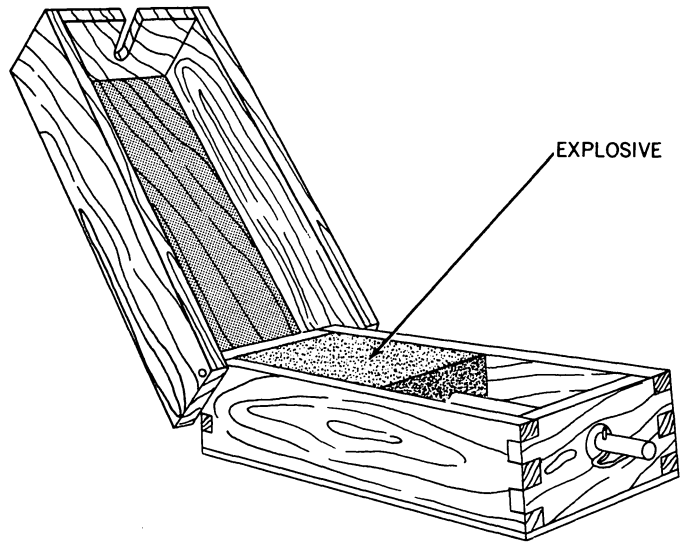


Figure 411

c. Functioning. The lid of the mine, forced down by pressure, removes the striker pin from the fuze. The striker, thus freed, slams down on the percussion cap, initiating the firing chain that explodes the charge.

d. Installing and Arming.

(1) Open the lid.

(2) Assemble and attach a detonator to the fuze.

(3) Insert the fuze and detonator through the hole in the front of the case so that the detonator is seated in the explosive block and the wings of the striker retaining pin are down.

(4) Gently lower the lid so that the slot in the front overlapping edge fits over the protruding striker shaft and the edge engages the wings of the striker retaining pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Open the lid and carefully remove the fuze and detonator. (Do *not* try to to separate the fuze and detonator, as the latter is crimped on.)

(3) Remove the mine and fuze to a safe storage or disposal area.

275. Wooden Antipersonnel Mine (North Korea)

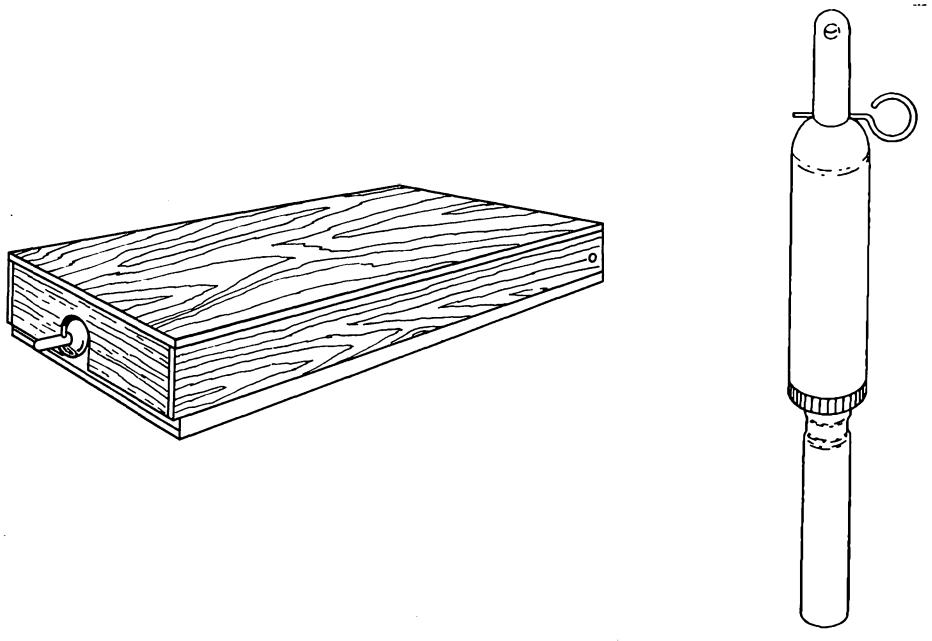


Figure 412

This is a wooden Schumine of the Soviet PMD series type, measuring 19.7 by 8.8 by 4.4 centimeters. It is made of lumber ¼-inch thick. The front end of the pressure lid is slotted to fit over the striker and rest on the retaining pin. The pressure lid is hinged on two wire nails driven into the sides at the rear.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	MUV pull....	2 lb. or more..	0.5 lb.

b. Use. This mine is employed as security against foot troops in minefields, paths, and trails.

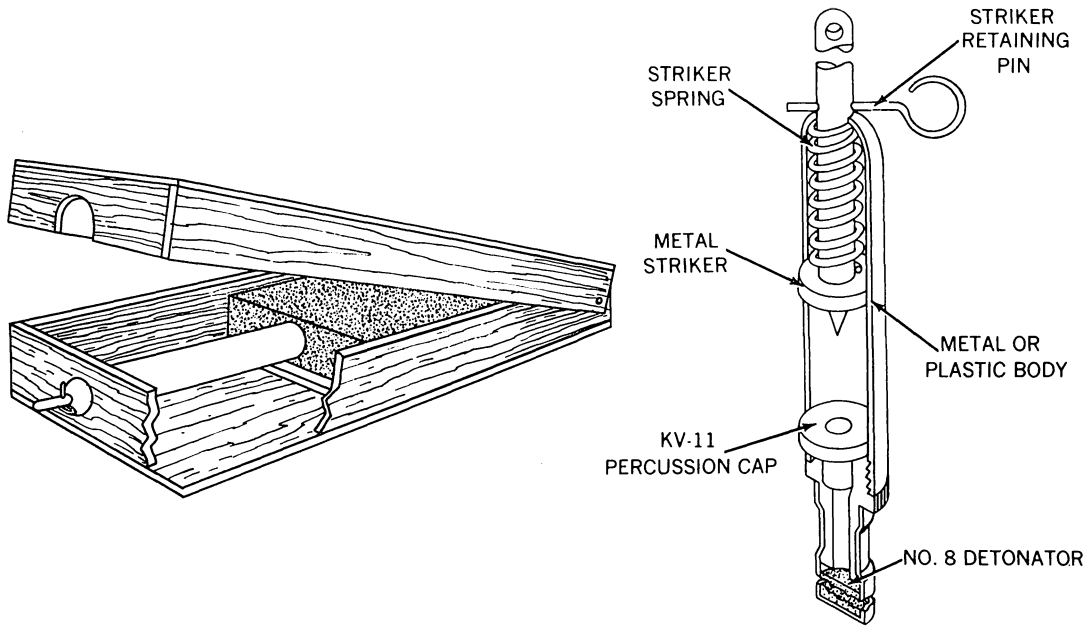


Figure 413

c. Functioning. Pressure on the lid forces the retaining pin out of the striker of the MUV fuze, releasing it to set off the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Lay the mine.

(2) Lift the lid and insert the explosive charge.

(3) Screw an MD-2 detonator assembly into an MUV pull fuze and insert the fuze into the charge with the T-end of the retaining pin down.

(4) Connect a tripwire to the retaining pin, if desired.

(5) Close the lid of the mine.

e. Disarming Procedure.

(1) Check for and remove any antilifting devices.

(2) Carefully lift the lid from the mine, remove the fuze and detonator assembly, and separate the detonator from the fuze.

(3) Remove the mine and fuze to a safe storage or disposal area.

276. Wooden Antipersonnel Mine, Model 1943 (Norway)

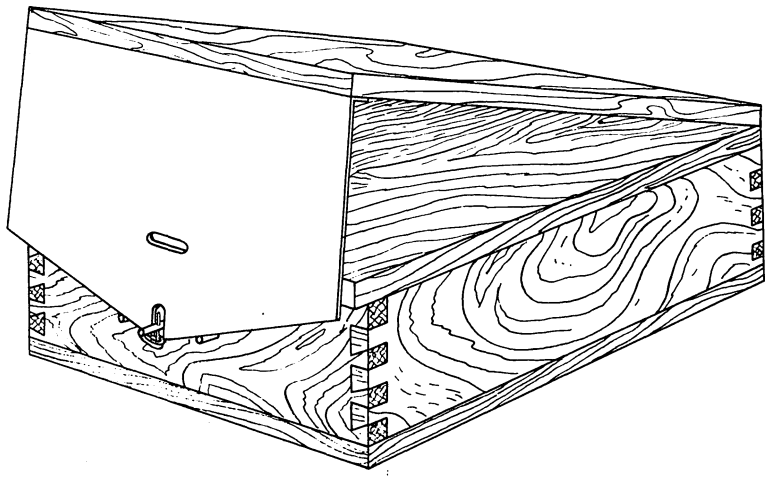


Figure 414

This wooden mine functions similarly to the German Schumine 42. Later models however, have cases of cement, glass fibre, and cellulose. The lid is hinged to the back of the case. The front of the lid has a metal plate with a fuze slot, which, when the mine is armed, rests on the striker retaining pin. The metal plate also rests on two wooden shear dowels, one on either side of the fuze. The mine measures 17.7 by 16.5 by 8.2 centimeters with the lid in closed position.

a. Characteristics.

Shape	Fuze	Operating force	Explosive	
			Main charge	Booster
Rectangular box.	Pull fuze.	75 lb. (approx).	3 lb. cast TNT.	Pressed TNT.

b. Use. This mine was produced for use against personnel and for its nuisance value in minefields. It is also used in the defense of strong points.

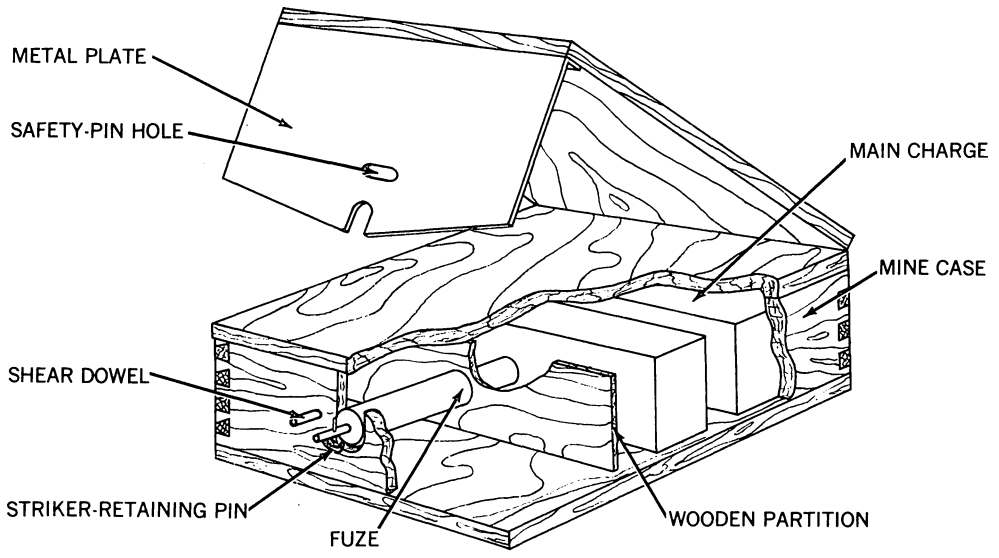


Figure 415

c. Functioning. Pressure on the lid shears the wooden dowels allowing the metal plate to push out the retaining pin, releasing the spring-loaded striker to fire the percussion cap, the detonator and the main charge in turn.

d. Installing and Arming.

(1) Place the main charge and booster charge in the mine.

(2) Screw a percussion cap and detonator into the base of the fuze and insert this assembly into the mine.

(3) Insert the safety pin and close the lid so that it rests on the shear dowels.

(4) Rotate the fuze until the wings of the retaining pin lie under the striker shaft.

(5) Lay the mine.

(6) Remove the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Put a safety pin or a piece of wire in the metal plate.

(3) Raise the lid, without downward pressure, and remove the fuze from the mine. Then separate the detonator and percussion cap from the fuze.

(4) Transport the mine and fuze to a safe storage or disposal area.

277. Wooden Antipersonnel Mine, PMD-7 and PMD-7ts (U.S.S.R.)

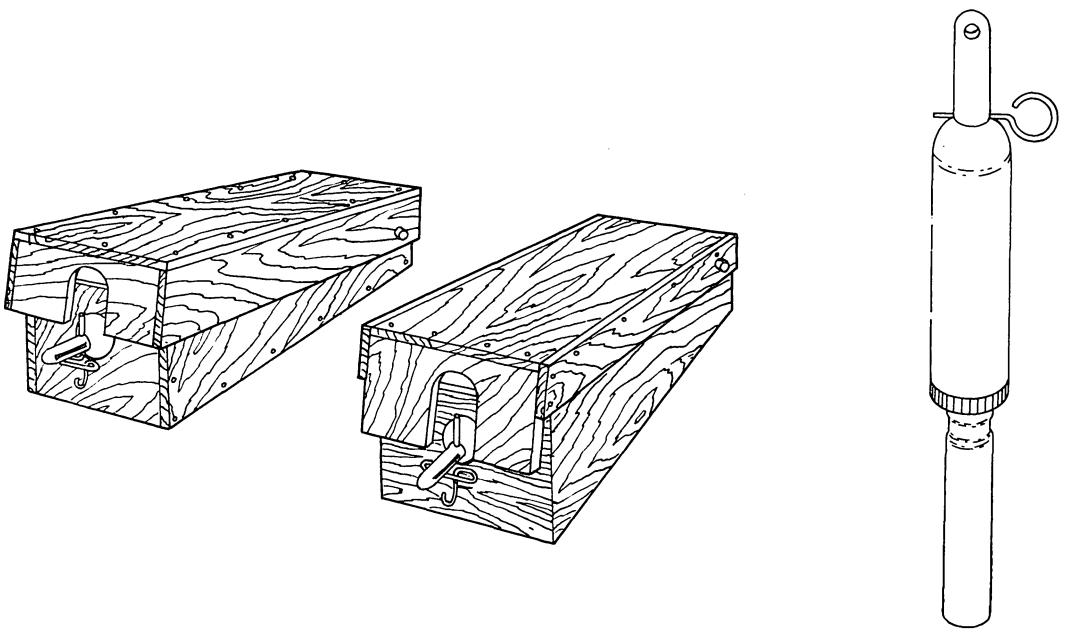


Figure 416

These mines are a smaller version of the Soviet PMD-6, having smaller overall dimensions, less weight, and less explosive. Both mines have a hinged lid and employ an MUV pull fuze. The PMD-7ts is a modification of the PMD-7, the body of which is hollowed out of a block of wood. Both of these types, field improvised and factory made, were used very effectively against the Germans in World War II. The mine measures 15.2 by 7.6 by 5.0 centimeters.

a. Characteristics. Both models have virtually the same dimensions and the same arming and explosive elements.

Shape	Fuze	Operating pressure	Explosive
Rectangular.	MUV pull....	2 lb. or more (approx).	2.6 oz. TNT.

b. Use. The PMD-7 and PMD-7ts mines are laid in antipersonnel minefields. Frequently they are interspersed in antitank minefields around outposts and gun positions, along trails and road shoulders, and in grassy areas.

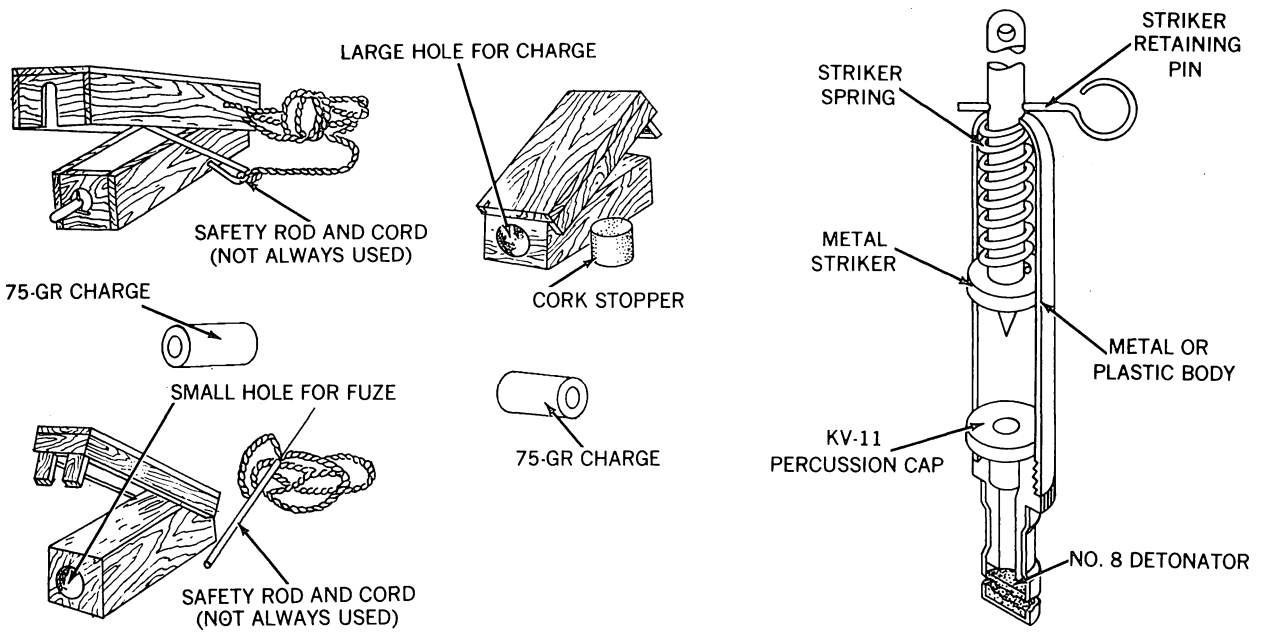


Figure 417

c. Functioning. Both models function in the same manner. Pressure on the lid forces the winged retaining pin from the spring-driven striker, which is released against the detonator, firing the mine.

d. Installing and Arming.

(1) Lift the lid.
(2) Place the charge in the box so that the detonator well points toward the front.
(3) Insert an MUV pull fuze and detonator through the hole in the front of the box and into the charge.
(4) Turn the striker retaining pin so that the loop is down.
(5) Close the lid.
(6) From a distance pull out the safety rod.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Lift the lid.
(3) Pull out the fuze and detonator.
(4) Unscrew the detonator from the fuze.
(5) Remove the mine and fuze to a safe storage or disposal area.

278. Wooden Antipersonnel Mine, Model 49 (Hungary)

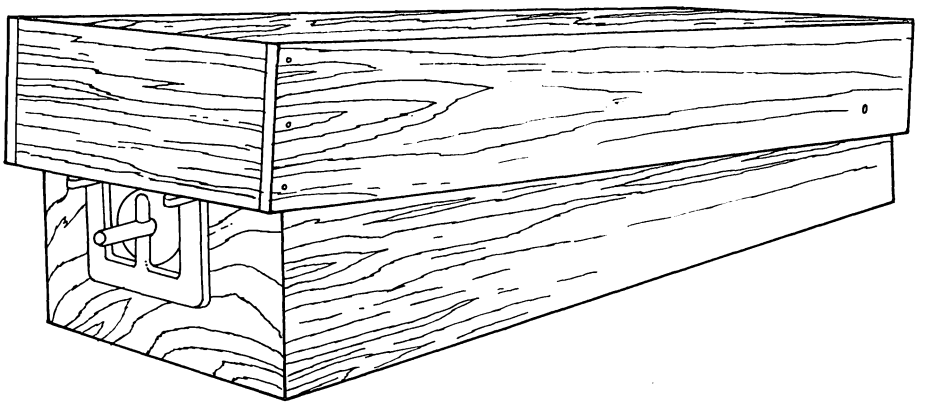


Figure 418

This small wooden-block mine was first reported in use in Hungary early in 1951. It is said to bear a close resemblance to the Soviet PMD–7ts antipersonnel mine, after which it appears to have been patterned. The mine is 16.5 by 4.4 by 5.7 centimeters in measurement.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular.	Pull.....	9.0 lb. with metal strip; 3.5 without metal strip.	2.6 oz. TNT

b. Use. This mine is used in antipersonnel and mixed minefields.

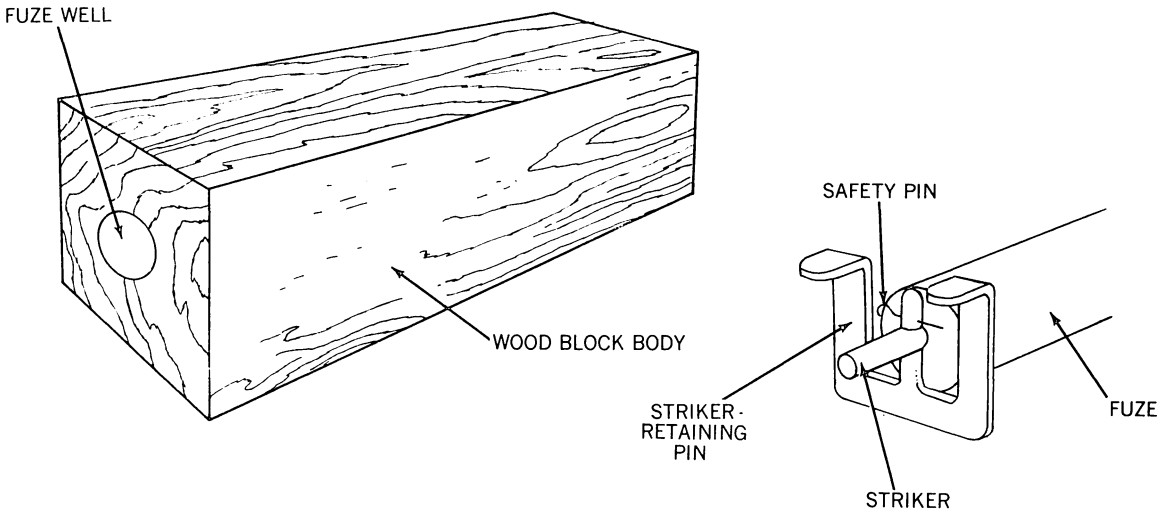


Figure 419

c. Functioning. Pressure on the lid forces the striker retaining pin out of the striker shaft, releasing the striker against the percussion cap.

d. Installing and Arming.

(1) Remove the closing plug.
(2) Insert the charge, hole end first, into the hole at the rear end of the mine body, and close the hole with a plug.
(3) Insert the assembled fuze, detonator end first, into the hole in the front of the mine (the detonator will project into the hole in the charge).
(4) Lay the mine and lower the lid to rest on the arms of the striker retaining pin.
(5) Camouflage the mine.
(6) Extract the safety pin (if provided).

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Lift the lid.
(3) Extract the fuze.
(4) Remove the detonator assembly from the fuze.
(5) Take the mine and fuze to a safe storage or disposal area.

279. Wooden Block Mine, Type A (Germany)

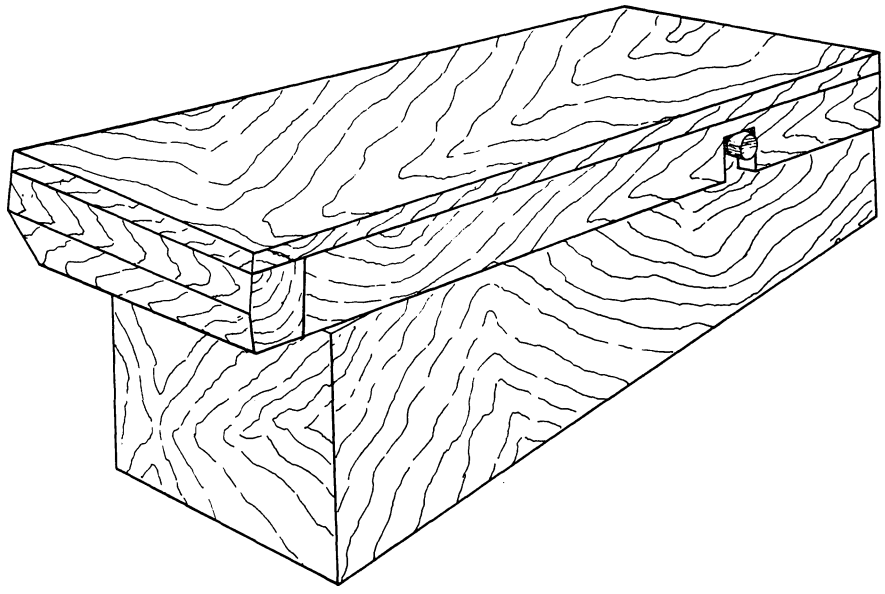


Figure 420

The type A is a rectangular wooden block approximately 67.7 by 5.0 by 5.0 centimeters. Bored lengthwise approximately two-thirds of the way through the center of the block is the charge hole which contains the main charge. At the solid end of the block, the fuze hole is bored part of the way from the top of the block for the use of two chemical vials and a wooden pressure block. A cardboard disk rests on the ridge and supports the pressure block. A small hole for the detonator connects the charge hole with the fuze hole. A wooden pressure lid pivots on wooden pegs and rests on the pressure block. The overall dimensions, including the lid are 20.3 by 6.2 by 6.2 centimeters at the charge hole end.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	Integral pressure-chemical.	10 lb. (approx).	0.22 lb.

b. Use. The wooden block mine, type A, is laid along paths, trails, road shoulders, and approaches to likely fords across rivers and streams and in antitank minefields. It may be unburied in grass or wooded areas and covered with leaves or other vegetation.

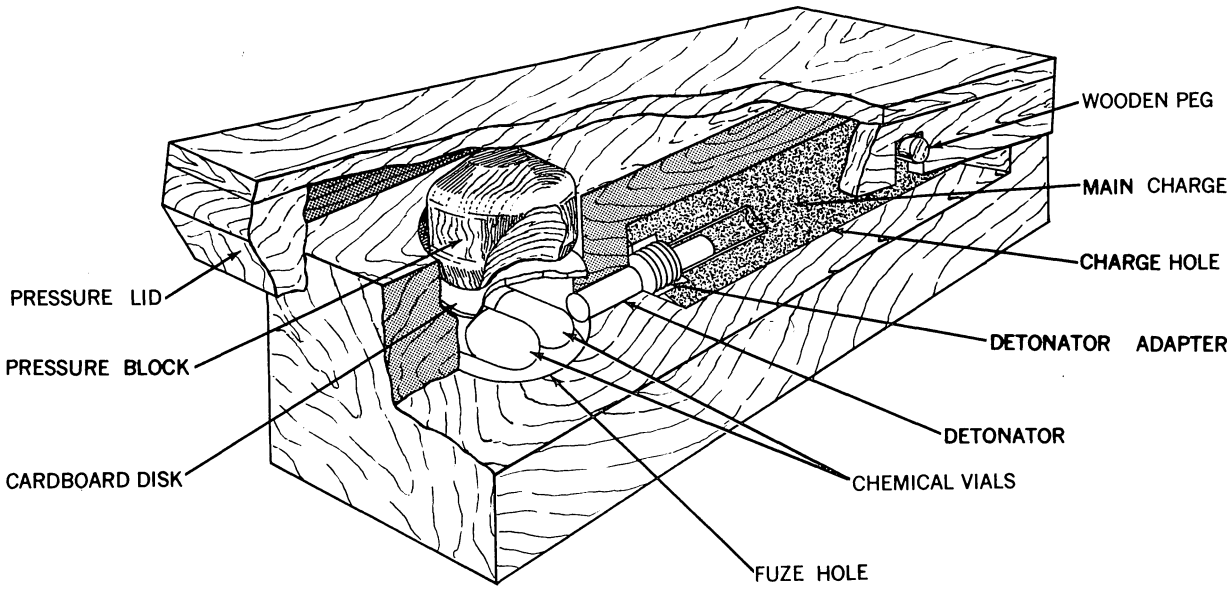


Figure 421

c. Functioning. Pressure applied to the pressure lid forces the pressure block through the cardboard disk and crushes the chemical vials, which starts a flame that fires the detonator and the main charge.

d. Installing and Arming.

(1) Remove the wooden or cork plug from the charge hole.
(2) Screw a detonator adapter into the fuze well of the main charge and insert a detonator in the adapter.
(3) Push the main charge and detonator assembly into the charge hole, detonator end first.
(4) Close the charge hole with the wooden or cork plug.
(5) Insert the two chemical vials into the fuze hole.
(6) Place the cardboard disk on the ridge in the fuze hole.
(7) Carefully rest the pressure block on the cardboard disk.
(8) Lay the mine in firm ground with the fuze end away from the enemy.
(9) Gently lower the pressure lid so that it rests on the pressure block.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Carefully raise the pressure lid, exerting no initial downward pressure.
(3) Lift out the pressure block and the cardboard disk.
(4) Carefully remove the two chemical vials.
(5) Remove the wooden or cork plug from the charge hole.
(6) Tip the mine so that the main charge and detonator assembly slides out.
(7) Remove the detonator from the main charge.
(8) Remove the mine and fuze to a safe storage or disposal area.

280. Wooden Block Mine, Type B (Germany)

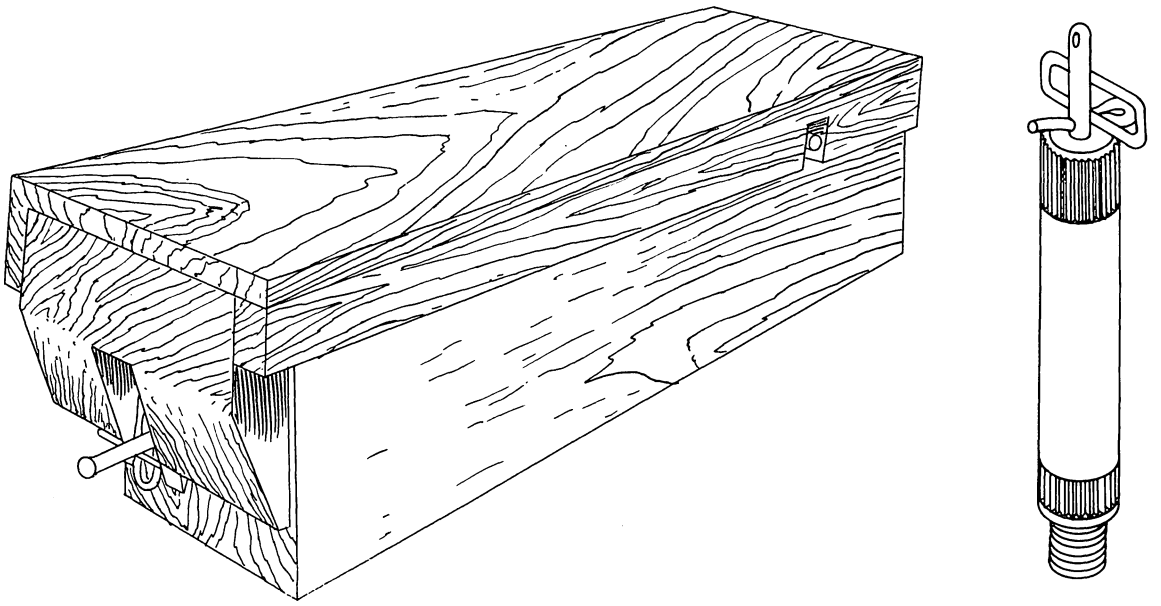


Figure 422

The type B wooden block antipersonnel mine is similar to type A except for the fuze and the pressure lid. The mine is 20.3 by 6.2 by 6.2 centimeters. A charge hole, to take the main charge is bored about 6 inches lengthwise through the center of the block. At the other end of the block is a fuze hole which extends into the charge hole. A wooden pressure lid pivots about wooden pegs and rests on the wings of the striker retaining pin. Two tongues on the pressure lid protrude through the wings. The open end of the charge hole is closed with a wooden or cork plug.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular	Pull fuze 42.	6 to 11 lb.....	0.22 lb.

b. Use. This antipersonnel mine is laid along paths, trails, road shoulders, and approaches to likely fords across rivers and streams and in antitank minefields. It may be placed unburied in grass or wooded areas and covered with leaves or other vegetation.

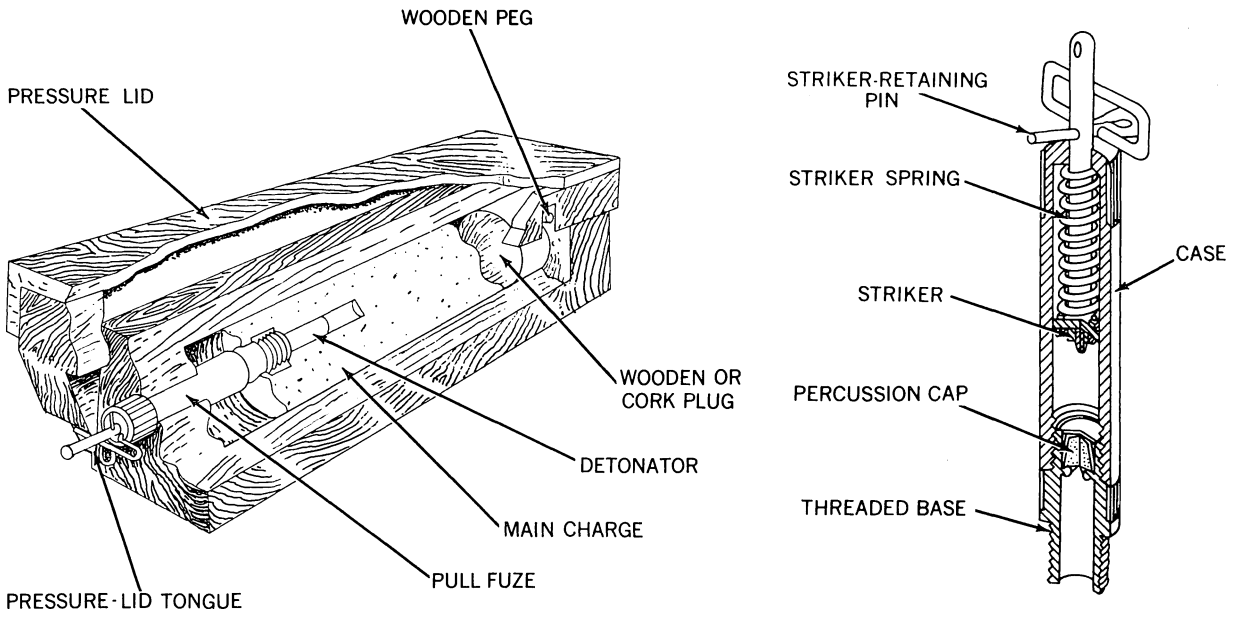


Figure 423

c. Functioning. Pressure on the pressure lid pushes out the retaining pin and releases the spring-loaded striker to fire the percussion cap and the main charge.

d. Installing and Arming.

(1) Push the main charge into the charge hole.
(2) Close the charge hole with a wooden or cork plug.
(3) Screw the pull fuze 42 with detonator into the main charge through the fuze hole. The wings of the striker retaining pin should be horizontal and below the striker shaft.
(4) Place the mine in the ground with the fuze end away from the enemy.
(5) Gently lower the pressure lid so that it rests on the wings of the striker retaining pin with the two tongues of the pressure lid protruding through the wings.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Raise the pressure lid.
(3) Unscrew the fuze and detonator from the main charge.
(4) Remove the detonator from the fuze.
(5) Remove the wooden or cork plug from the charge hole.
(6) Tip the mine so that the main charge slides out.

281. PMD Bottle Mine

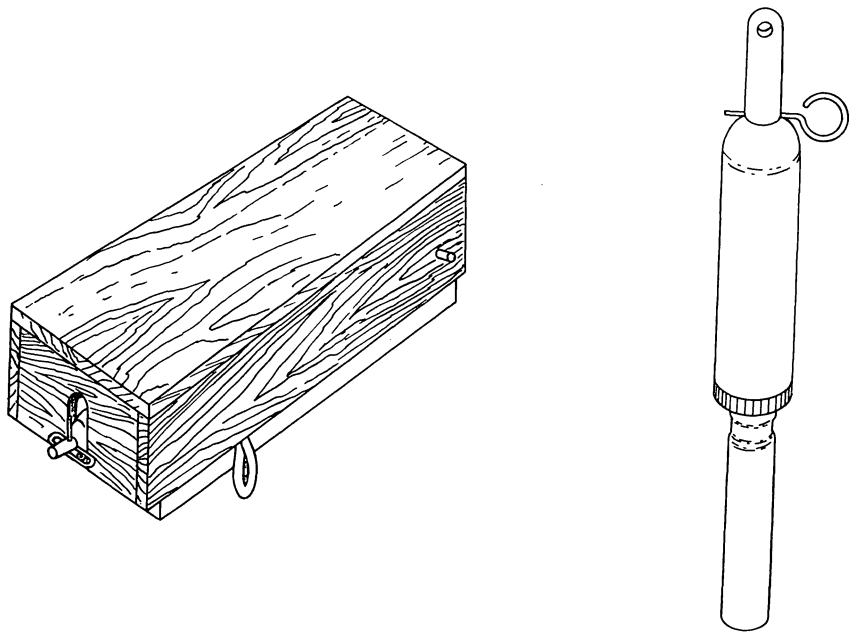


Figure 424

The PMD bottle mine is a PMD–6 or PMD–7 mine case containing a bottle filled with powdered explosive. It has an MUV pull fuze. The mine measures 19.0 by 8.8 by 6.2 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	MUV pull, with winged retaining pin removed by pressure.	25 lb. (approx).	3 oz. powdered explosive (approx).

b. Use. This mine is very effective against foot troops in minefields, paths and trails, road shoulders, and grassy areas.

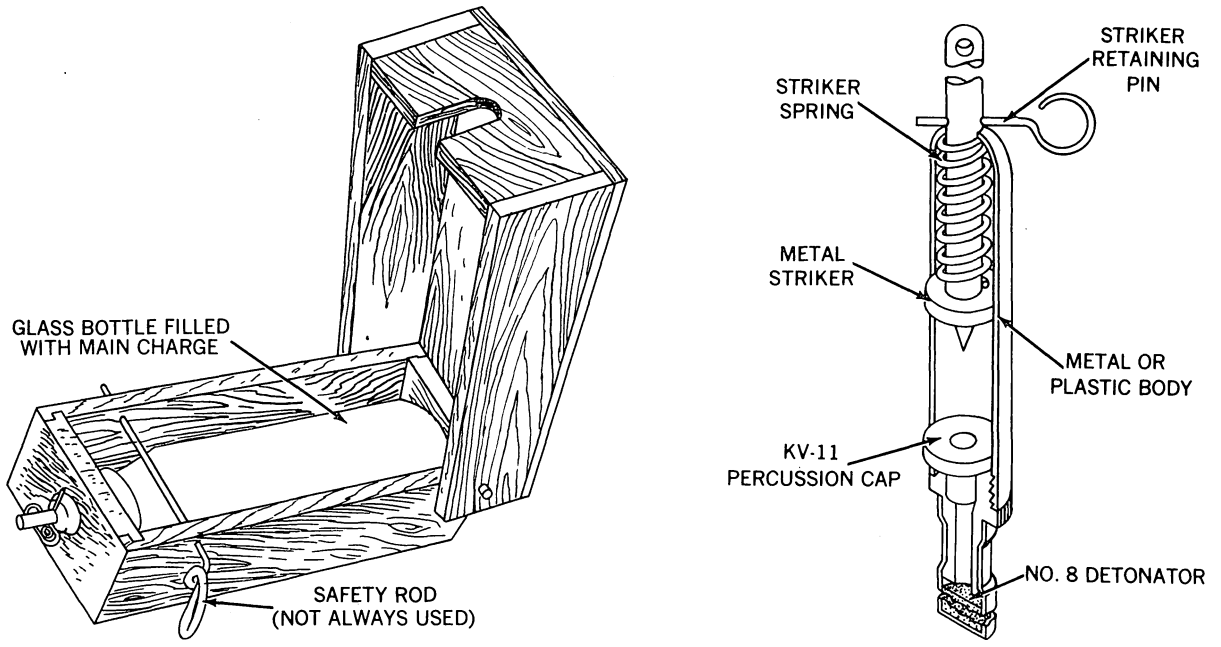


Figure 425

c. Functioning. Pressure on the lid forces the winged pin out of the fuze, releasing the striker to fire the mine. The mine may be activated by attaching a wire or cord to the eye of the retaining pin and anchoring it to a stake or pin driven into the ground underneath.

d. Installing and Arming.

(1) Lift the lid of the mine.

(2) Insert a fuze and detonator, end first, into the charge through the opening in the end of the mine case.

(3) Set the striker so that the wings of the retaining pin are down.

(4) Close the lid and pull the safety bar, if present, with a cord or wire.

e. Disarming Procedure.

(1) Search for and remove any antilift devices.

(2) Lift the lid carefully and slide the fuze out.

(3) Detach the detonator from the fuze.

(4) Remove the mine and fuze to a safe storage or disposal area.

282. PMD Mortar Mine

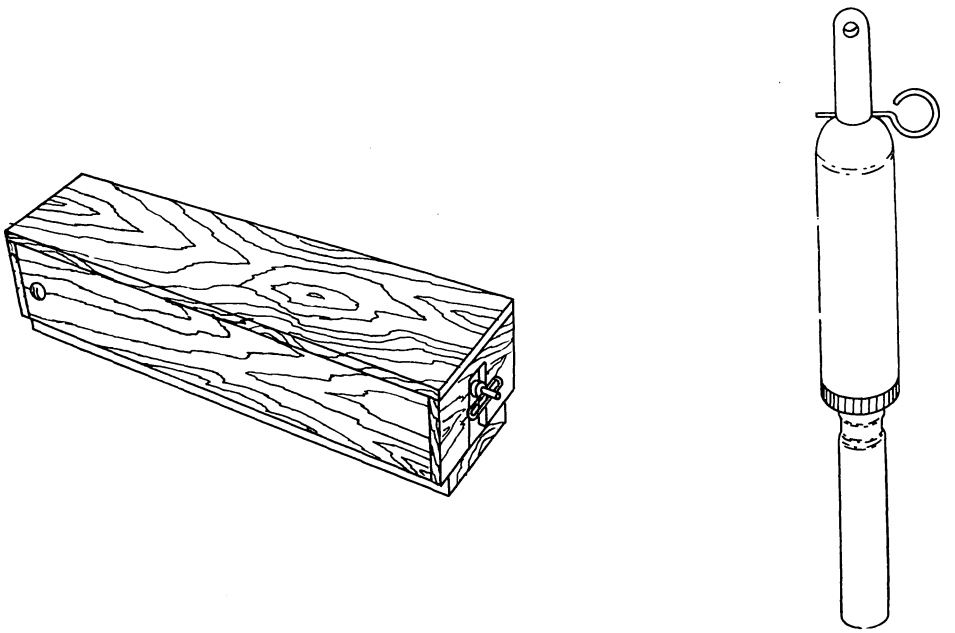


Figure 426

This mine consists of a PMD–6 or PMD–7 mine case and a mortar shell with the fuze removed. The shell is placed in the mine case and fitted with an MUV pull fuze. The mine is 7.6 by 5.0 by 15.2 centimeters in dimension.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box	MUV pull, with retaining pin removed by pressure.	25 lb. (approx).	Explosive content of motar shell.

b. Use. This mine is used in minefields, paths, and trails, road shoulders, and grassy areas as security against foot troops.

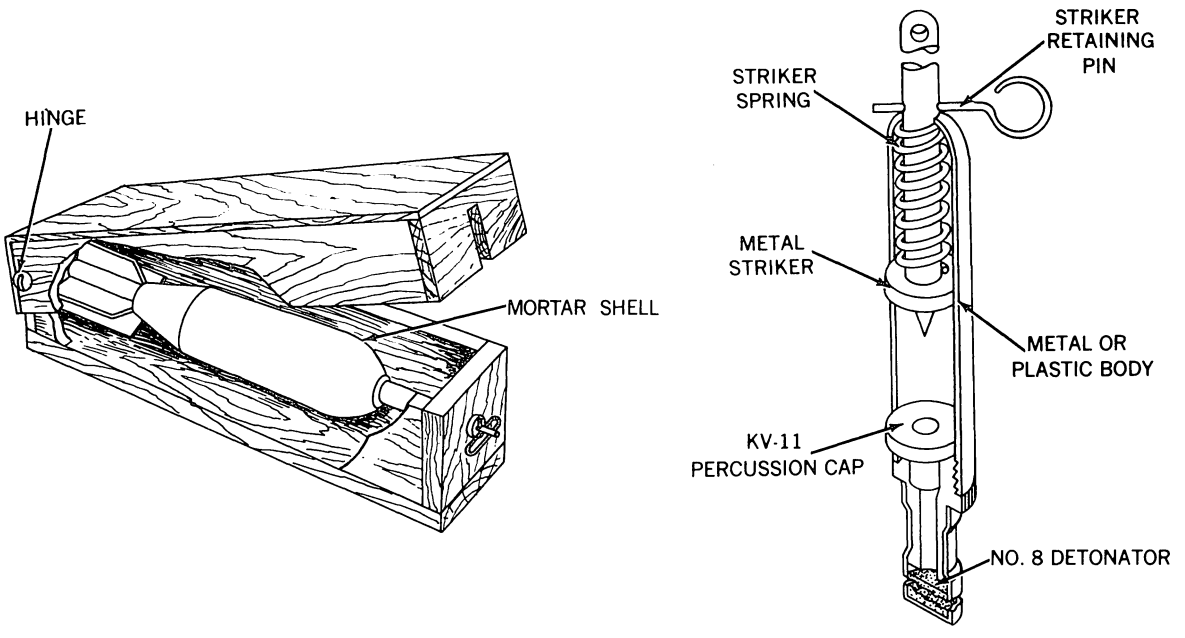


Figure 427

c. Functioning. Pressure on the lid removes the retaining pin from the fuze. This releases the spring-driven striker to fire the percussion cap, detonator, and main charge. This mine may be activated by fasting a wire or cord to the loop in the striker retaining pin and anchoring to a stake or pin driven into the ground underneath.

d. Installing and Arming.

(1) Lay the mine.

(2) Lift the lid and insert the mortar shell.

(3) Insert a detonator assembly into the MUV pull fuze and insert into the mortar shell through the hole in the front of the wooden mine case. The loop of the retaining pin should be *down.*

(4) Close the lid and remove the safety bar if present by a cord or wire.

e. Disarming Procedure.

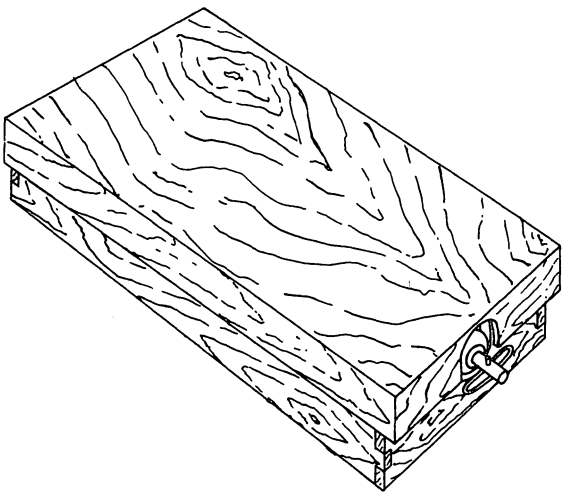
(1) Search for and remove any antilift devices.

(2) Lift the lid carefully and slide the fuze out.

(3) Detach the detonator from the fuze.

(4) Remove the mine and fuze to a safe storage or disposal area.

283. Antipersonnel Mine, R (Italy)



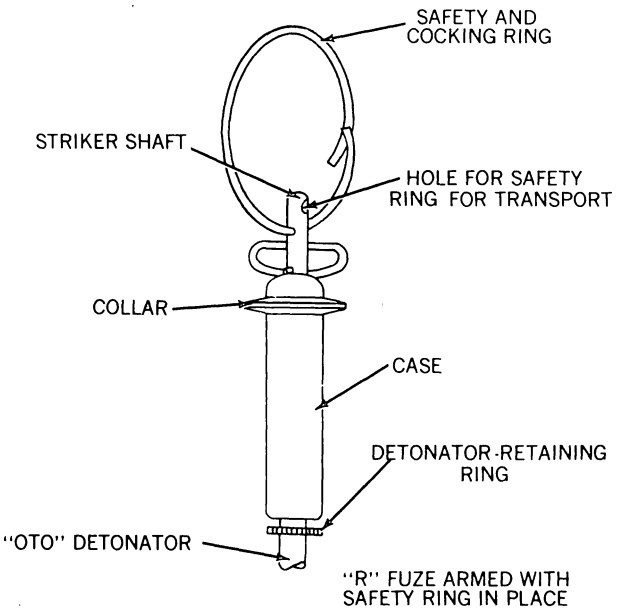


Figure 428

This small wooden device is similar in appearance to the World War II German Schu mine and the Soviet Model PMD–6. The Model R has three metal shrapnel plates, however. The charge is held in position by a wooden crossbar attached to the inside bottom of the case. The mine measures 14.9 by 8.3 by 4.5 centimeters.

a. Characteristics.

Shape	Type fuze	Operating force	Explosive
Rectangular box.	Pull.....	4.4 to 6.6 lb...	5.3 oz. TNT.

b. Use. This mine is used in both pattern and nuisance minefields, normally spaced at about 5-pace intervals. The shrapnel has an effective range of 4½ to 9 meters.

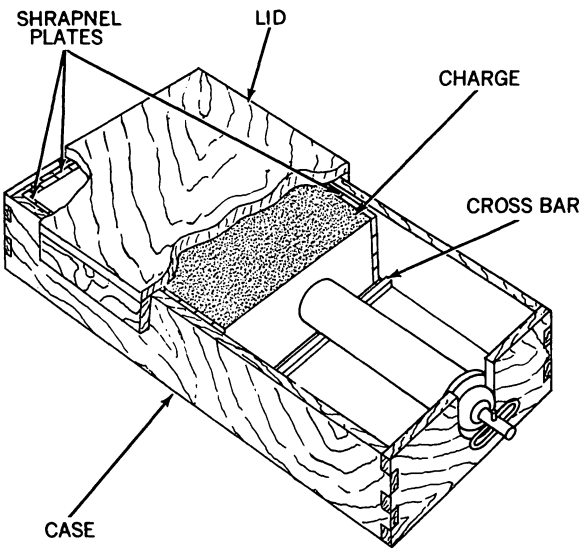


Figure 429

c. Functioning. Pressure on the lid forces it down, pushing the butterfly striker retaining pin from the fuze, initiating the firing chain.

d. Installing and Arming.

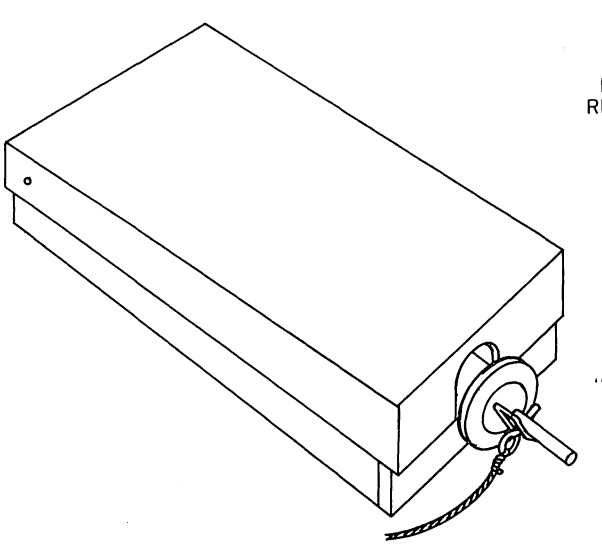
(1) Emplace the mine.
(2) Raise the lid.
(3) Prepare the R-fuze but do not remove the safety ring.
(4) Insert the fuze in the charge.
(5) Place the charge and the fuze in the mine case with the charge at the hinged end and the fuze resting in the saddle at the other end. The fuze collar should be inside the case, and the butterfly pin outside and close against it, with the wings of the pin down and parallel with the ground.
(6) Arrange the three shrapnel plates around the charge, one in the rear and one on each side.
(7) Lower the cover without putting any pressure on it.
(8) Gently remove the safety ring from the fuze.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Hold the butterfly striker retaining pin in place and insert the safety ring or a nail in the proper hole of the striker shaft.
(3) Open the lid and remove the fuze and the charge.
(4) Remove the fuze from the charge and the detonator from the fuze.
(5) Take the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. Pressure should never be put on the lid. If the striker retaining pin is partly removed from the striker shaft or if it is difficult to insert the safety ring blow the mine in place.

284. Antipersonnel Mine, RM (Italy)



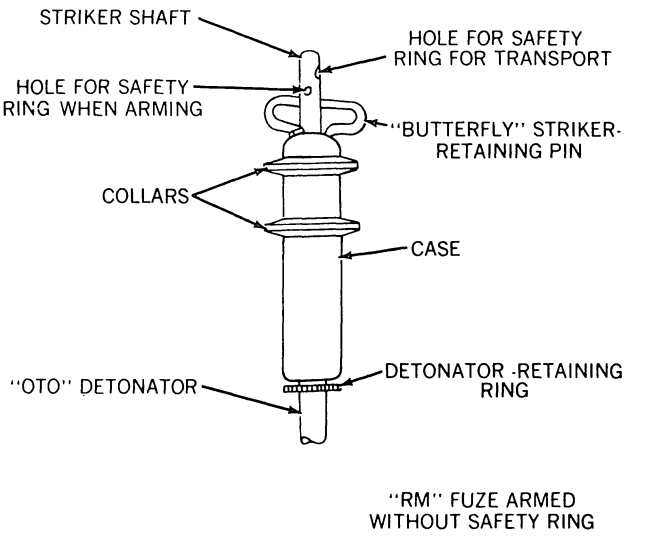


Figure 430

This is a modified wooden Model R antipersonnel mine. Unlike the parent, it is adaptable to either pressure or pull action. The mine has two wooden space blocks on the inside bottom of the case instead of the wooden cross bar, as in the Model R mine; and the shortest shrapnel plate is drilled to provide passage for the detonator. The mine measures 14.9 by 8.3 by 4.5 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	Pull.....	4.4 to 6.6 lb...	5.3 oz. TNT.

b. Use. This mine is used in patterned minefields, or in nuisance mining. It is usually laid at 5-pace intervals for pressure actuation and at 6- to 12-pace intervals for trip wire actuation. The shrapnel has an effective radius of 4½ to 9 meters.

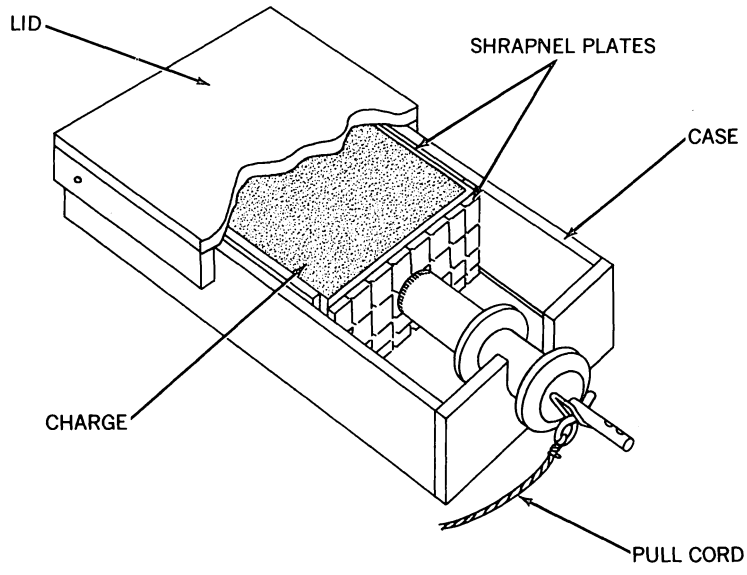


Figure 431

c. Functioning. As a pressure mine it functions in the same way as the antipersonnel R-mine (par. 283); and as a pull actuated mine, the striker pin is withdrawn by a trip wire initiating the firing chain and detonating the mine.

d. Installing and Arming.

(1) For pressure actuation, the method of arming and emplacing is the same as for the antipersonnel R-mine (par. 283), except that the Rm fuze is employed and the two wooden spacer blocks are placed in front of the charge along the sides of the box and parallel with the fuze.

(2) For pull actuation, the method of arming is the same as in (1) above, except that the wooden spacer blocks are placed behind the charge parallel and adjacent to the hinged end of the box, and the shortest shrapnel plate is placed in front of the charge. The fuze is set so that when the lid is closed, the front walls of the box and lid are between the collars of the Rm fuze.

(3) The mine is buried vertically, with the fuze projecting above the ground and the broader faces parallel to the line of the trip wire. One end of the trip wire is attached to a stake or fixed object 1 or 2 meters from the mine, and the other to the pull ring of the striker retaining pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Hold the butterfly striker retaining pin in place and insert the safety ring or nail in the proper hole in the striker shaft.

(3) Open the lid and take out the fuze and charge.

(4) Remove the fuze from the charge and the detonator from the fuze.

(5) Take the mine to a safe storage or disposal area.

f. Additional Precautions. Never put pressure on the lid. If the retaining pin is partly removed from the shaft or if it is difficult to insert the safety ring, blow the mine in place.

285. Wooden Box Antipersonnel Mine (U.S.S.R.)

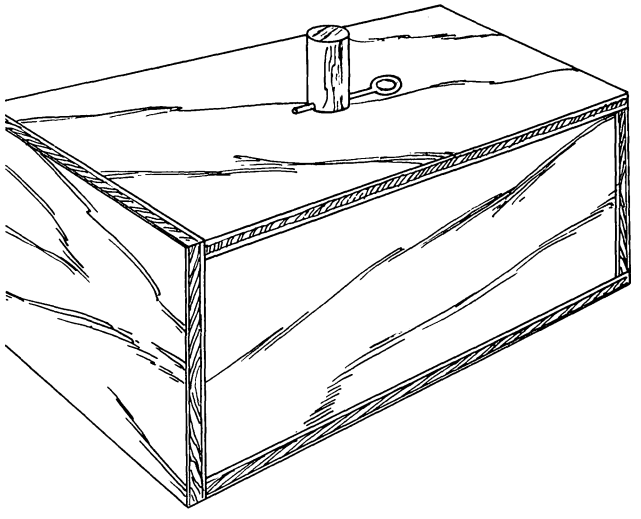


Figure 432

This Russian wooden box mine is 16.7 by 11.4 by 6.2 centimeters, in size and has a removable front. These dimensions may vary, however, with the size of the lumber used. The metal actuating lever is pivoted in a hole in the wooden support block nailed under the lid. One end of the lever is inserted through the lower-end of a wooden pressure piece projecting through the center of the lid, and the other end of the lever engages in the eye of the striker retaining pin.

a. Charactristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	MUV pull....	2 lb. or more..	1.32 lb.

b. Use. These mines are designed to secure unit positions against infantry attacks. They are often laid in pairs with a supplementary charge against vehicles and used as initiating mines for improvised incidiaries.

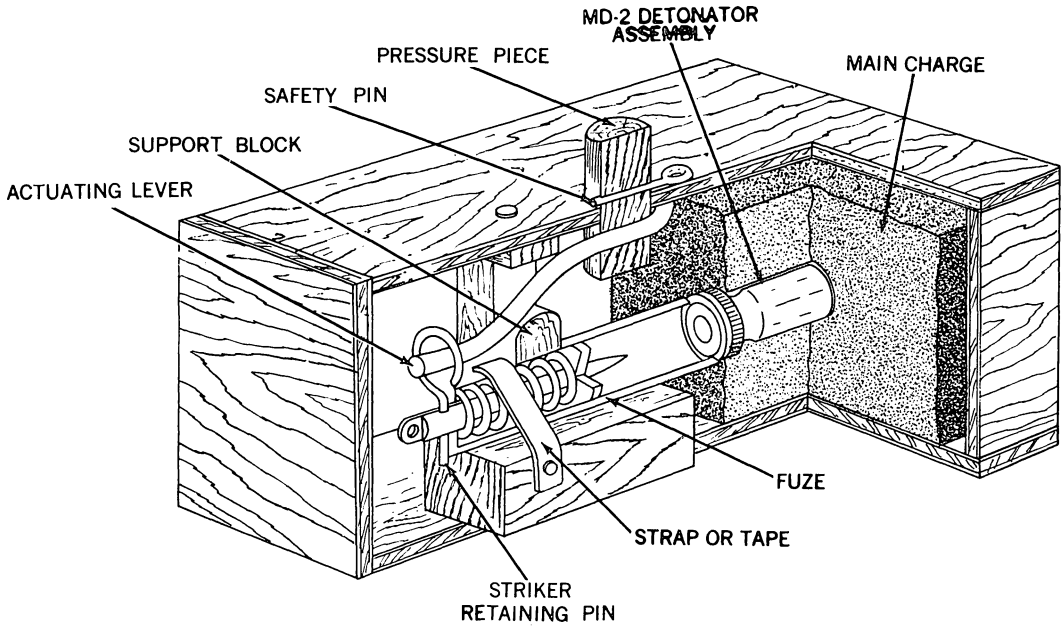


Figure 433

c. Functioning. Pressure on the pressure piece pushes the actuating lever down, withdrawing the retaining pin from the striker and firing the mine.

d. Installing and Arming.

(1) Open the front side of the box and insert the fuze and detonator.

(2) Tape the fuze to the wooden support block.

(3) Insert the end of the actuating lever through the eye of the retaining pin.

(4) Close the front cover and bury the mine.

(5) Pull the safety pin from the pressure block.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert a pin or wire through the exposed hole in the pressure block.

(3) Open the front side of the box and slide out the fuze and detonator. Separate the fuze and detonator.

(4) Remove the mine and fuze to a safe storage or disposal area.

286. Wooden Antipersonnel Mine (Norway)

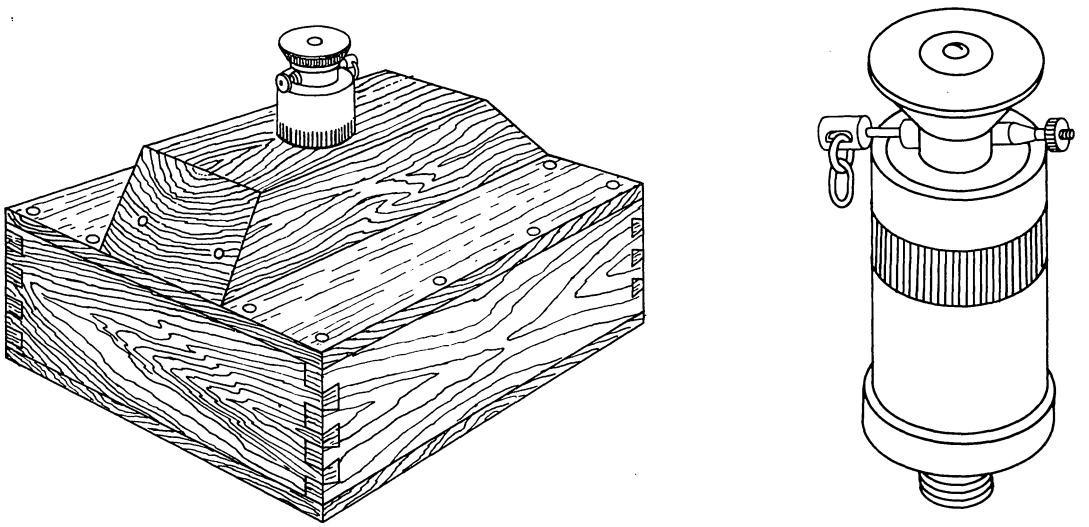


Figure 434

This Norwegian antipersonnel mine is a square wooden box 15.8 centimeters square by 6.9 centimeters high. It is made 1.1 centimeter thick impregnated lumber. The zine detonator holder, screwed into a hole in the center of the top of the mine, is internally threaded for the use of the German fuze. A wooden block fastened to the top with a hole drilled in the center holds the fuze.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	German D.Z 35 pressure.	65 lbs. or more	Main charge: 3 lb. cast TNT, booster: pressed TNT.

b. Use. This type of mine is used in unit security against infantry and in antitank minefields to hinder reconnaissance parties.

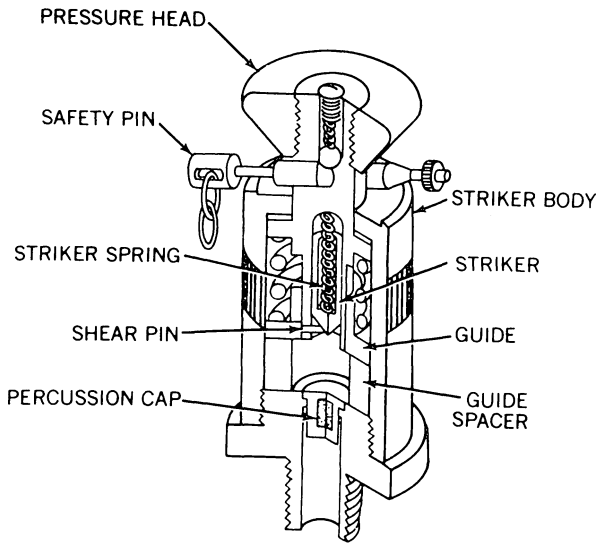


Figure 435

c. Functioning. Pressure on the pressure cap forces the cylindrical plunger downward against the resistance of the pressure spring. Two locking balls are then forced outward into the lower open space, releasing the striker to set off the percussion cap and the main charge.

d. Installing and Arming.

(1) Screw the fuze with detonator into the threaded detonator holder in the wooden block.

(2) Remove the safety pin.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Insert a nail or a stiff wire through the safety-pin hole just below the pressure head of the fuze.

(3) Unscrew the fuze from the mine and separate the detonator and fuze.

(4) Remove the mine and fuze to a safe disposal area.

287. Ski-Trail Mine (Finland)

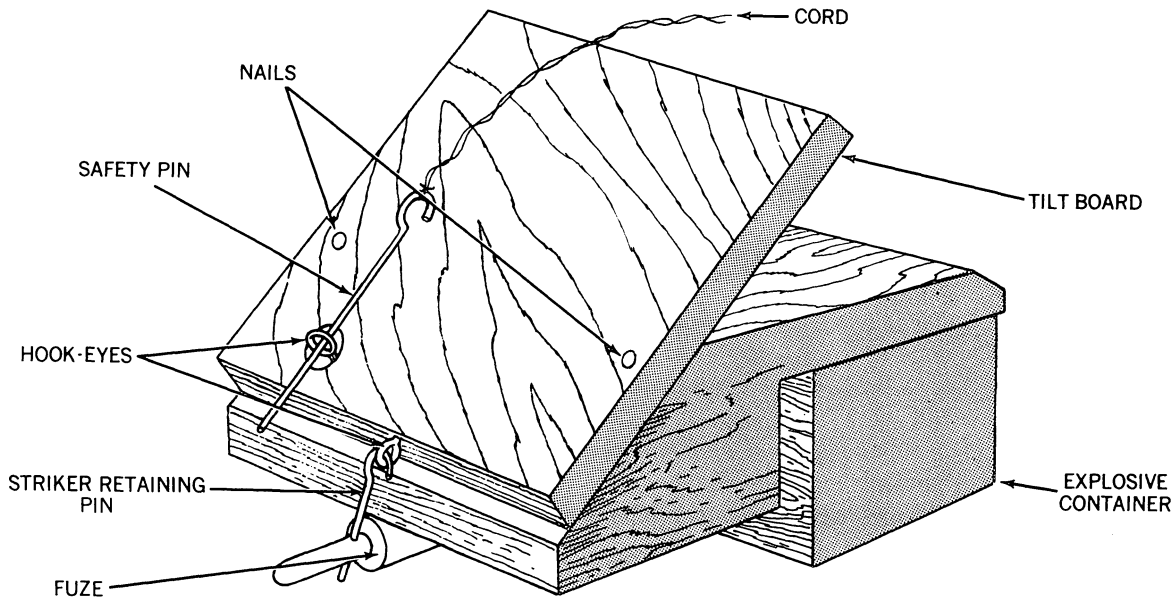


Figure 436

This mine has a pull fuze actuated by force on the tilt board, which, acting as a lever, removes the retaining pin. The operating force varies, being 22 pounds or more on the fuze if the stiffening plate is used, and 4.4 pounds without it.

a. Use. This mine is used primarily on trails and terrain traveled by ski troops.

(No drawing available.)

b. Functioning. Pressure on the tilt board pulls out the retaining pin which releases the striker to fire in turn the percussion cap, detonator, and charge.

c. Installing and Arming.

(1) Make certain that the safety pin is in place.

(2) Assemble the fuze and attach a detonator.

(3) Insert the fuze in the charge, at the same time carefully engaging the hooked striker retaining pin in the hook-eye in the tilt board.

(4) Carefully remove the safety pin by pulling the attached cord.

d. Disarming Procedure.

(1) Inspect for and remove any antilift devices.

(2) Insert a safety pin or a satisfactory substitute into the safety pin hole.

(3) Disengage the hooked striker retaining pin from the hook-eye in the tilt board.

(4) Remove the fuze from the mine.

(5) Remove the mine and fuze to a safe storage or disposal area.

288. Antipersonnel Mine, PMC (Italy)

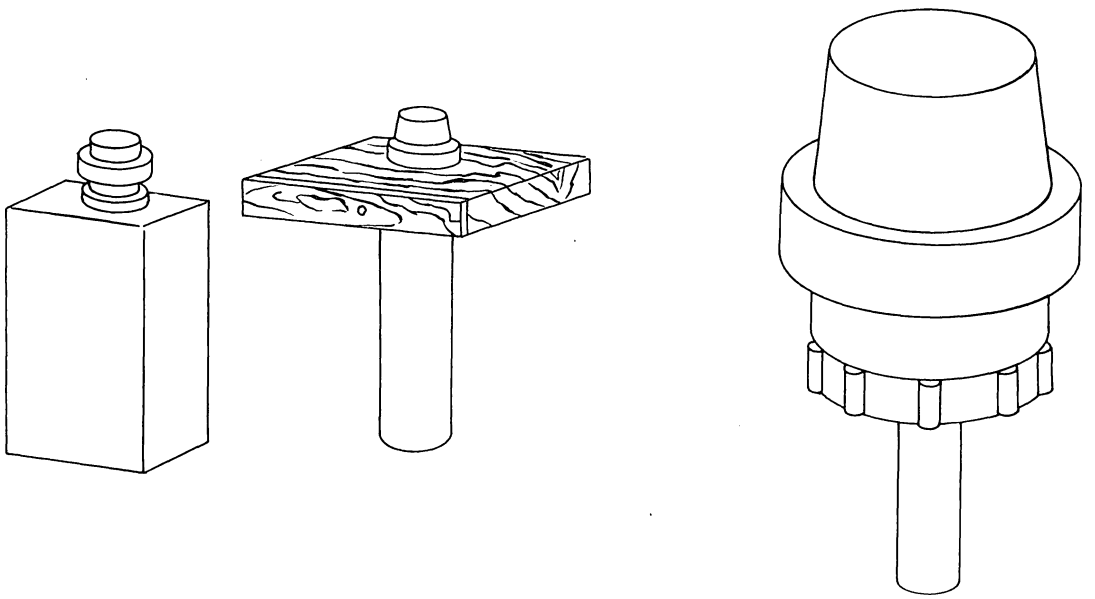


Figure 437

This unit comes in three parts—an explosive, a fuze, and a bearing board. It is undetectable by electronic methods, the only metallic parts being the fuze striker point and the aluminum detonator tube. The mine measures approximately 10.1 by 10.1 by 1.2 centimeters.

a. Physical Features.

Shape	Fuze	Operating force	Explosive
According to charge used; square bearing board.	Pressure.	30 lb. (approx).	Any demolition charge.

b. Employment. This antipersonnel mine is generally spaced at 2-meter intervals.

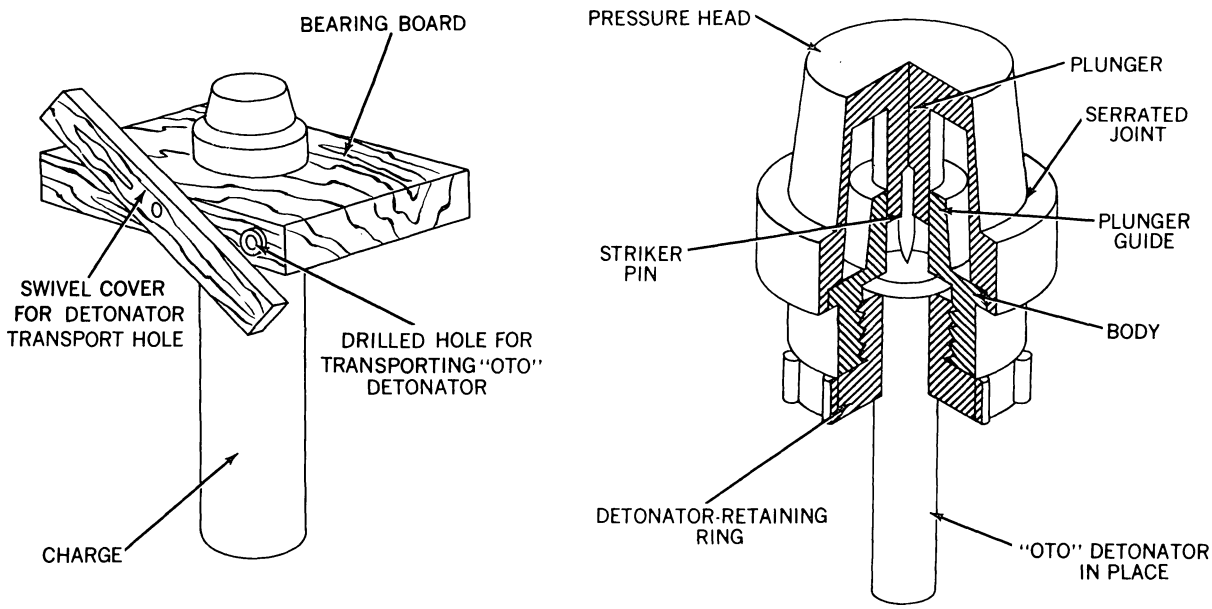


Figure 438

c. Functioning. Pressure on the top ruptures the serrated section of the fuze and forces the metal pointed striker down on the detonator. This fires the detonator and then the main charge.

d. Installing and Arming.

(1) Place the explosive cartridge in the ground.

(2) Put the bearing board on the explosive cartridge with the central recess upward (no bearing board is necessary if the cartridge is laid on firm ground).

(3) Attach an OTO detonator to the fuze.

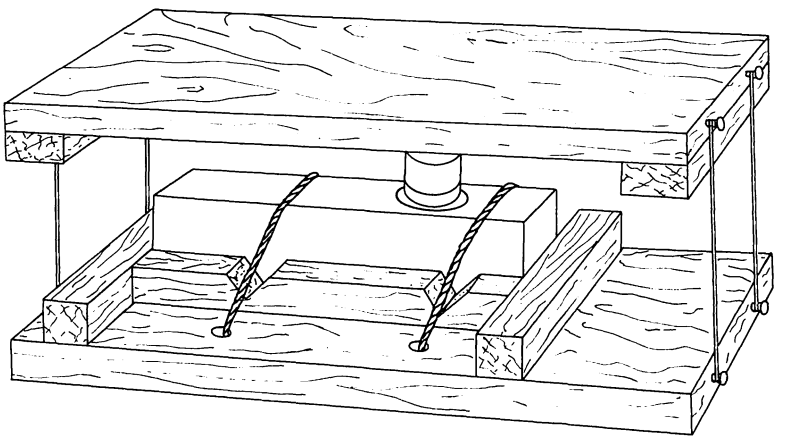
(4) Insert the detonator into the charge through the hole in the bearing board.

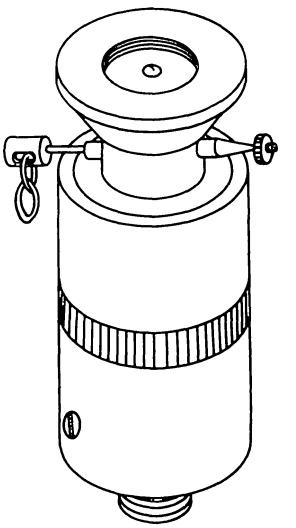
e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Gently withdraw the fuze and remove the detonator from it. If the fuze be difficult to remove, do not force it but destroy the mine in place, otherwise, remove the mine and fuze to a safe storage or disposal area.

289. Tread Mine (Behelfs Brettstuckmine) (Germany)





TYPE A

Figure 439

The improvised tread mine consists of a German standard explosive charge wired to a base board, fitted with a pressure fuze, and covered with a wooden pressure board fastened by wires to the base board.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular....	D.Z. 35 (A) or (C) pressure.	125 to 160 lb.	2.2 lb.

b. Use. The tread mine is used along road shoulders, trails, and hedgerows against foot troops.

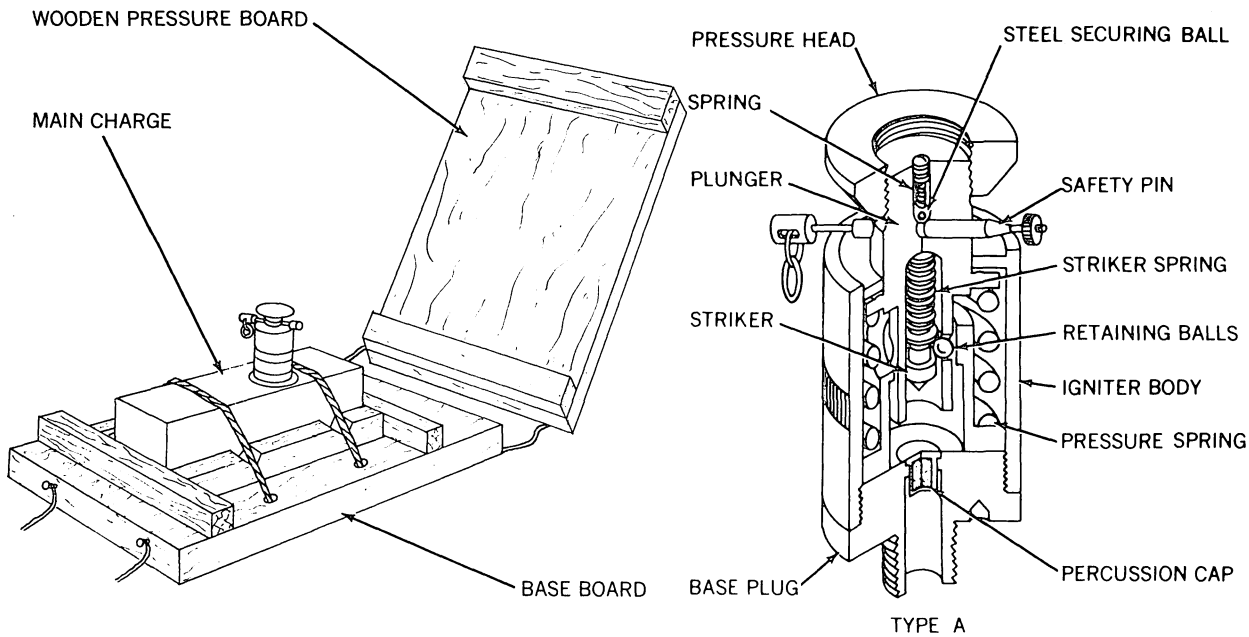


Figure 440

c. Functioning. Pressure on the pressure board forces the cylindrical plunger downward against the resistance of the pressure spring. This also releases two retaining balls, which free the spring-loaded striker to fire the percussion cap, the detonator, and the main charge.

d. Installing and Arming.

(1) Wire the main charge to a baseboard so that the fuze well of the charge faces upward.

(2) Screw a pressure fuze 35 with detonator into the fuze well.

(3) Adjust the height of the pressure cap by rotating it.

(4) Wire the pressure board on top of the fuze to the baseboard.

(5) Place the mine in a hole so that the pressure board will be level with the surface of the ground.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Cut the wires holding the pressure board to the base board and lift off the pressure board.

(3) Insert a nail or stiff wire in the safety-pin hole of the fuze and unscrew the fuze from the charge.

(4) Remove the detonator from the fuze.

(5) Take the mine and fuze to a safe disposal area.

290. Variation of VMG Seesaw Winter Mine (U.S.S.R.)

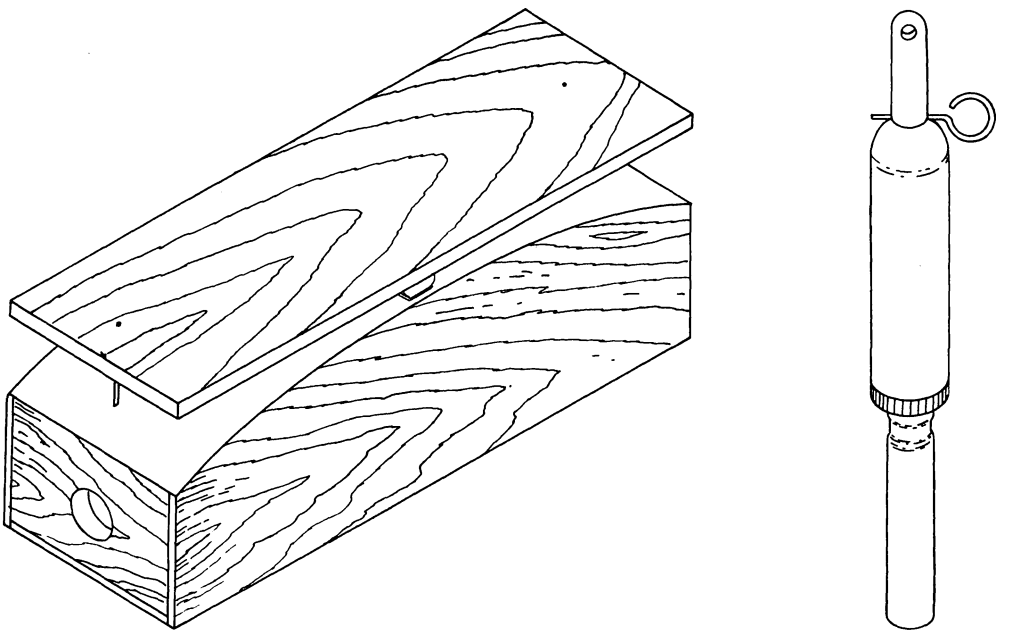


Figure 441

This model is similar in dimensions and weight to the VMG seesaw mine (47.6 by 11.9 by 22.8 centimeters) but is much simpler in design, as it has a wooden base and metal top, and two MUV pull fuzes, each of which is attached to the revolving lid by a wire fastened to the fuze striker retaining pin. Pressure on one end of the revolving lid actuates the fuze at the opposite end.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box with dome shaped metal lid.	Two MUV pull fuzes.	2 lb. or more.	6 to 8 lb. TNT.

b. Use. This mine was designed primarily for use in winter as an antitank mine and loaded with about 22 pounds of TNT. As it goes off under so little pressure it is also used against personnel. For this purpose it is loaded with 6 to 8 pounds of TNT and shrapnel, which fill up the space left inside the case by the reduced charge.

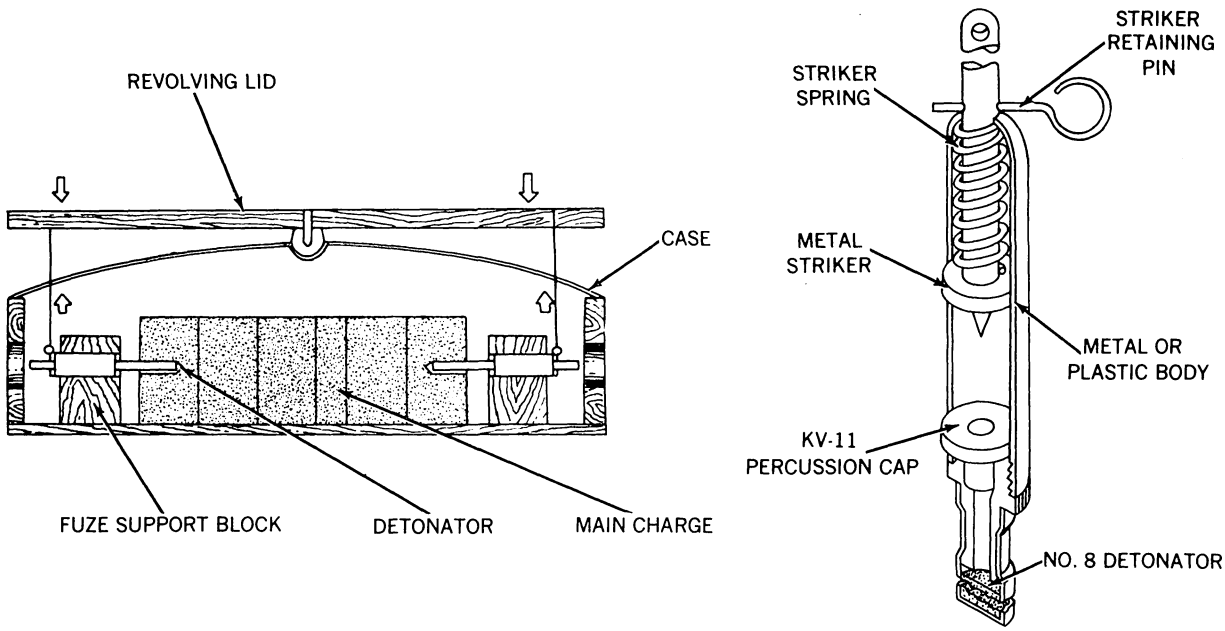


Figure 442

c. Functioning. Pressure on one end of the revolving lid removes the retaining pin from the fuze striker, releasing it to fire the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Insert two pull fuzes with detonators through the fuze access holes in the sides of the mine into the holes in the explosive blocks.

(2) Attach wires to the revolving lid and to the eyes of the striker retaining pins of the fuzes.

(3) Lay the mine.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Cut the wires connecting the fuzes to the lid, and pull out the fuzes.

(3) Remove the detonators from the fuzes.

(4) Transport the mine and fuzes to a safe storage or disposal area.

291. Seesaw Wooden Tread Antipersonnel Mine

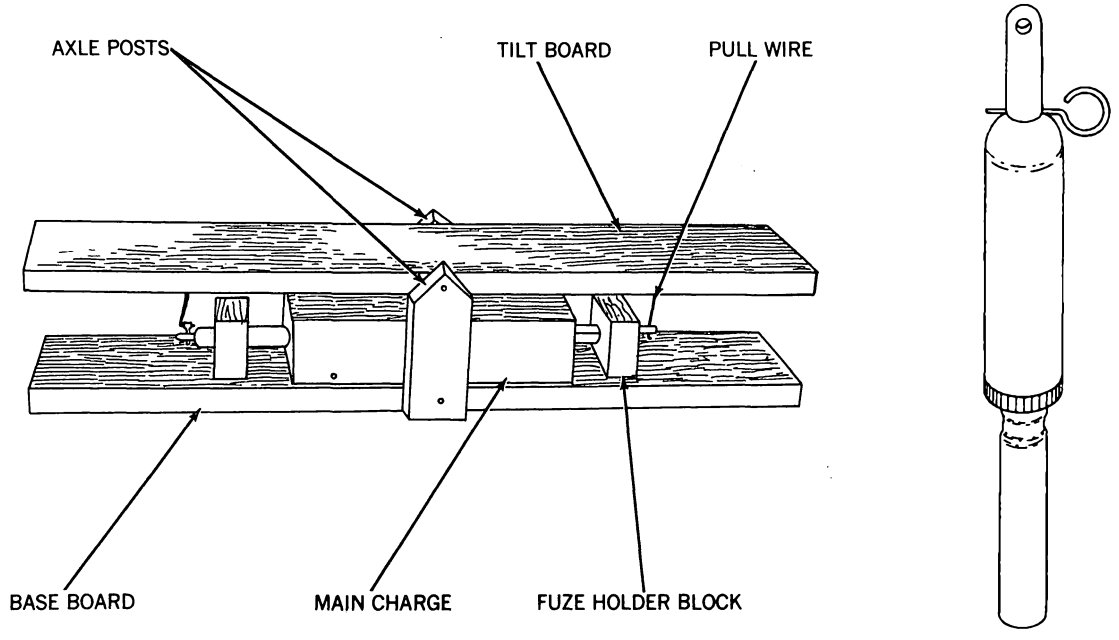


Figure 443

a. This is one of many Soviet improvised mines used in World War II for antivehicular as well as antipersonnel defense. The MUV pull fuzes provides a wide versatility of uses and methods of firing. Pressure applied to the top removes the striker retaining pin, which initiates detonation.

b. This seesaw unit consists of a base board, a block of TNT, two posts supporting a tilt board, and two blocks of wood that hold the fuzes. A wire is attached to the tilt board at each end and to the striker retaining pin of each fuze. **Disarming is not recommended unless the fuze can be correctly identified.**

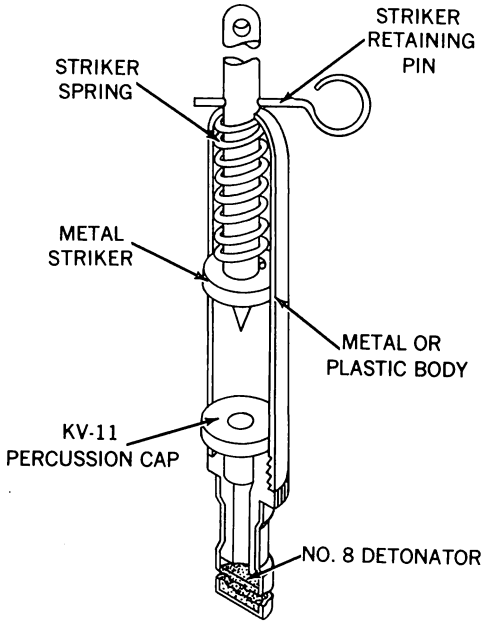

STRIKER
RETAINING
PIN
STRIKER
SPRING
METAL
STRIKER
METAL OR
PLASTIC BODY
KV-11
PERCUSSION CAP
NO. 8 DETONATOR

Figure 444

292. Lever Tread Antipersonnel Mine (U.S.S.R.)

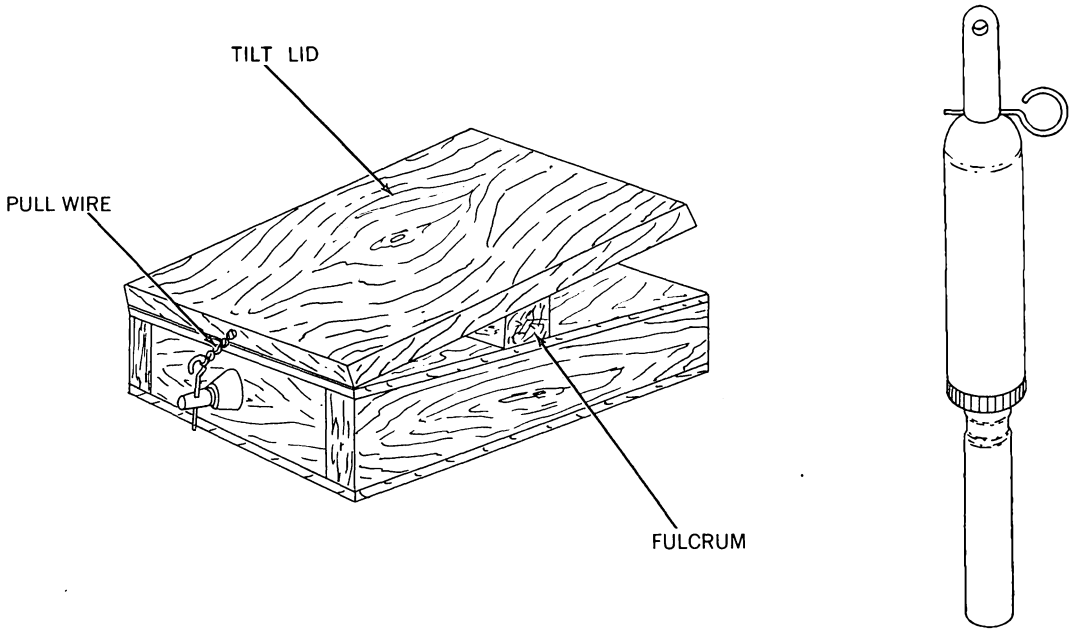


Figure 445

a. This was a wooden-cased device designed on the tilt lid actuation principle that was used consistently and with great effect by the Soviets in World War II against the invading Germans. A large supply of such mines is made in a relatively short time in field ordnance shops under flexible specifications.

b. The lever tread mine was a long shallow box fitted with an explosive charge and an MUV pull fuze. The tilt lid was nailed to a wooden strip that served as a fulcrum, located less than half way from one end of the mine. The short arm of the tilt lid was lightly nailed to the end. **Disarming is not recommended unless the fuze can be identified.**

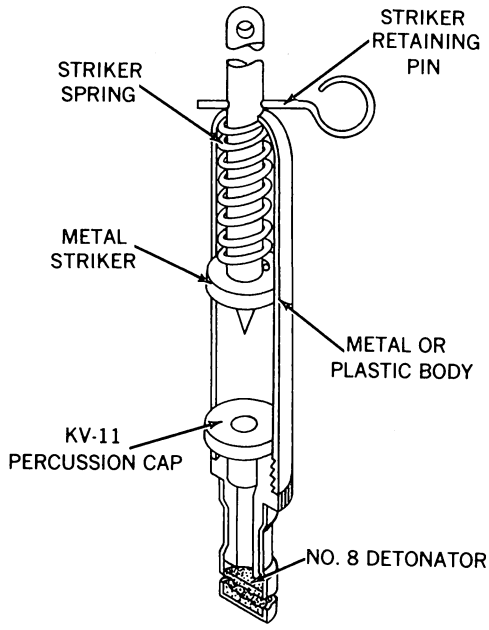

STRIKER
RETAINING
PIN
STRIKER
SPRING
METAL
STRIKER
METAL OR
PLASTIC BODY
KV-11
PERCUSSION CAP
NO. 8 DETONATOR

Figure 446

293. Roller Tread Antipersonnel Mine (U.S.S.R.)

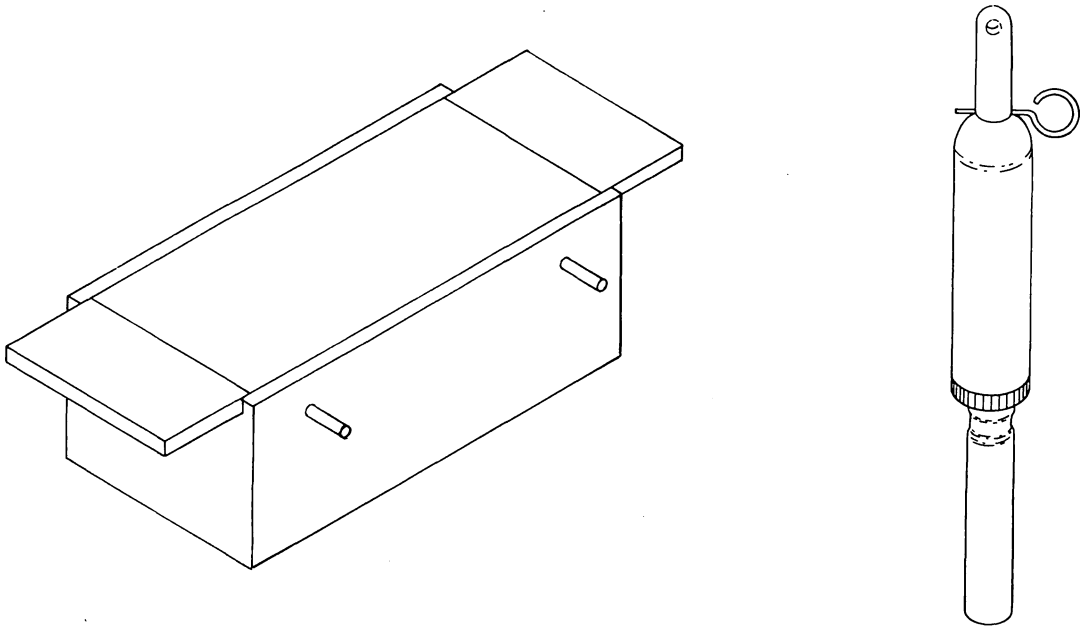
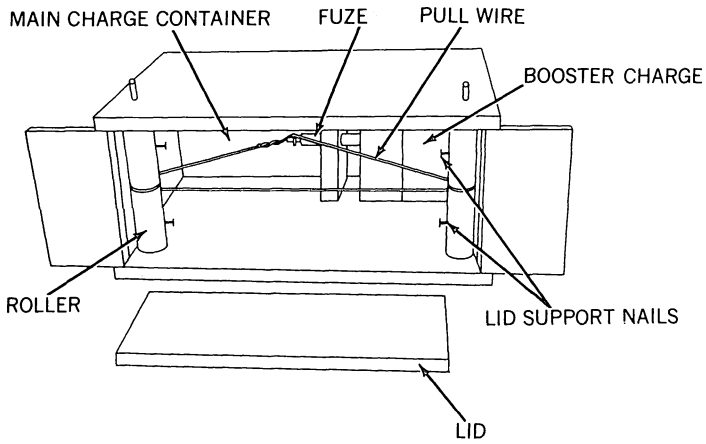


Figure 447

a. The roller tread antipersonnel mine is actuated by rollers that drop the lid on a trip-wire. This improvised device is nonmetallic except for the detonator-fuze assembly and several nails, which make electronic detection difficult.

b. This mine has a wooden case with a wooden roller attached at each end near the top. Two nails are driven halfway into each roller, which rotate and drop the lid when pressure is applied. The MUV pull fuze is held in place by a wooden block fastened to the bottom of the case. A pull wire runs over the rollers and down to the striker retaining pin. **The disarming of this mine is not recommended.**


MAIN CHARGE CONTAINER
FUZE
PULL WIRE
BOOSTER CHARGE
ROLLER
LID SUPPORT NAILS
LID

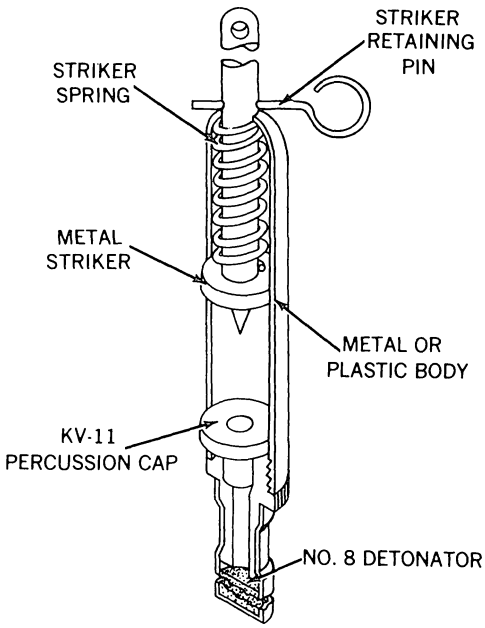

STRIKER RETAINING PIN
STRIKER SPRING
METAL STRIKER
METAL OR PLASTIC BODY
KV-11 PERCUSSION CAP
NO. 8 DETONATOR

Figure 448

294. Shear Tread Mine (U.S.S.R.)

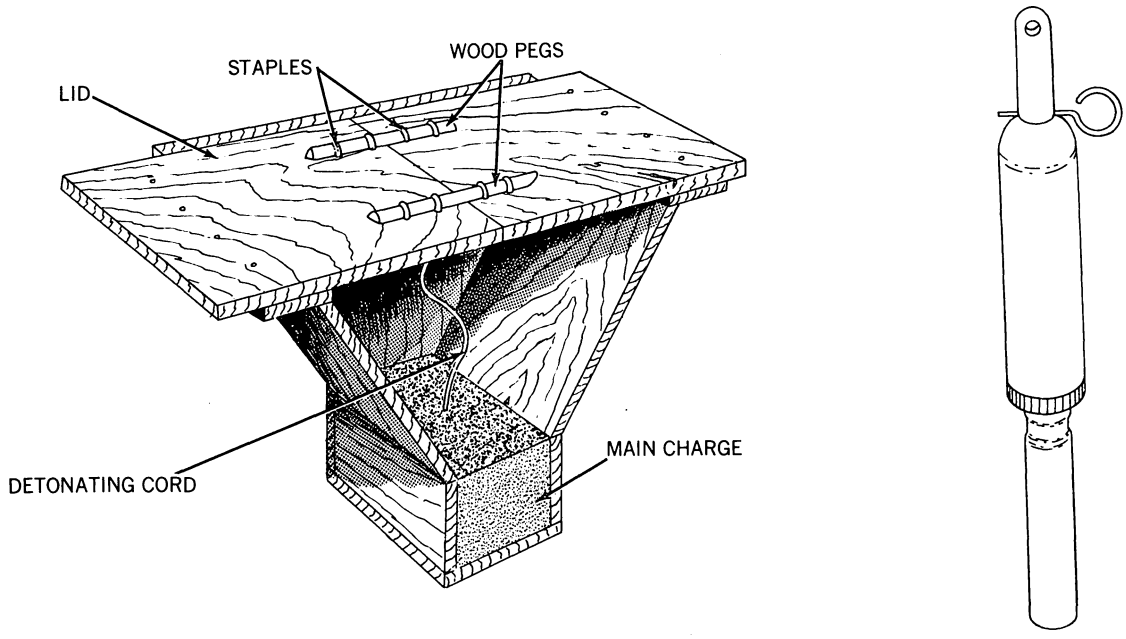
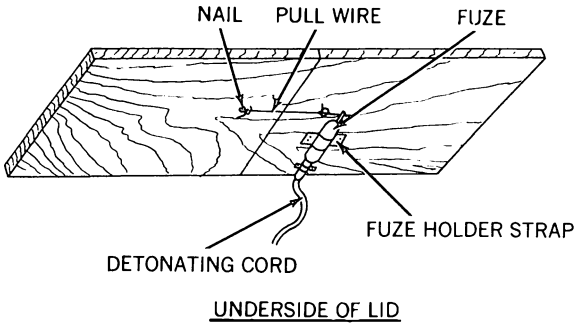


Figure 449

a. This is an improvised mine less simple in construction than the seesaw or lever tread mines. This is another example of what a soldier with imagination and initiative can do with an explosive charge and a common detonator.

b. This device is V-shaped with a lid cut in half in the center. The parts of the lid are held together by two wooden dowels or shear pins inserted and fixed in place by metal staples. On the under side of the one half of the lid an MUV pull fuze is fixed with a pull wire tied to the striker retaining pin and to a nail driven into the under side of the other half of the lid. The fuze is connected to the explosive charge in the bottom by a detonating cord. **Disarm this mine only on positive identification of the fuze.**


NAIL
PULL WIRE
FUZE
FUZE HOLDER STRAP
DETONATING CORD
UNDERSIDE OF LID

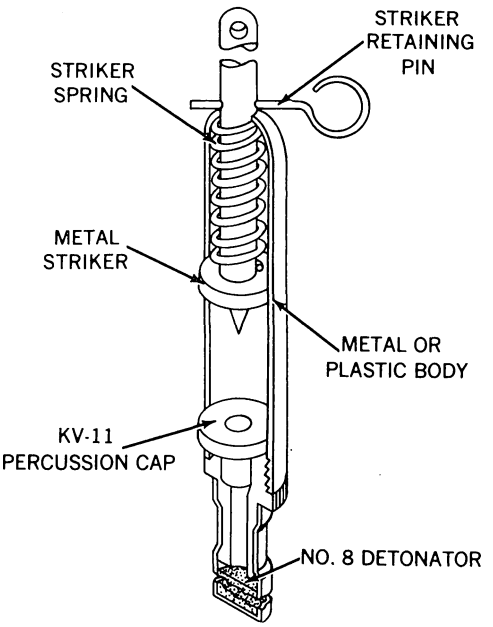

STRIKER RETAINING PIN
STRIKER SPRING
METAL STRIKER
METAL OR PLASTIC BODY
KV-11 PERCUSSION CAP
NO. 8 DETONATOR

Figure 450

295. Clothespin Electric Antipersonnel Mine (U.S.S.R.)

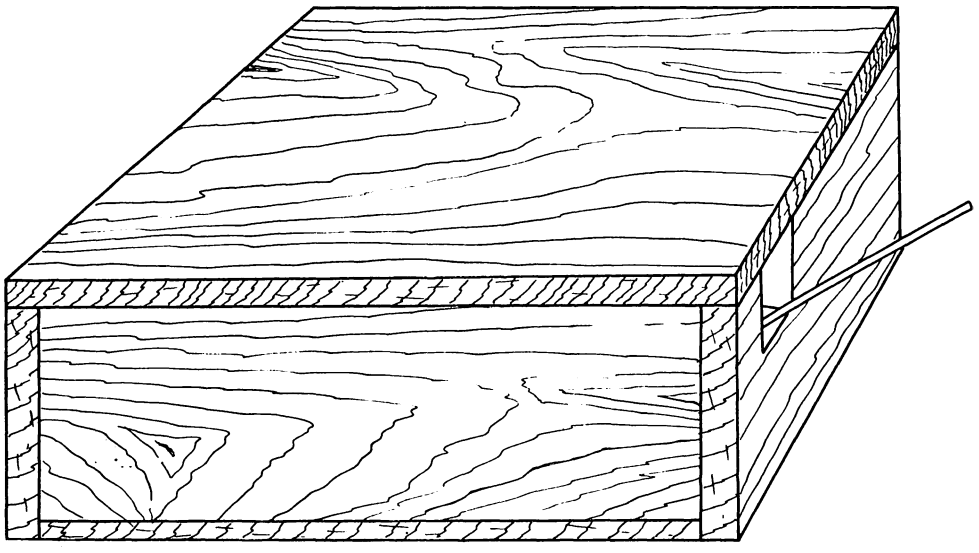


Figure 451

This improvised unit is electrically detonated by a clothespin circuit breaker operated by a trip wire. It is enclosed in a wooden box 15.2 by 7.6 by 5.0 centimeters. It consists of about 0.5 pounds of explosive, a small dry-cell battery, and an electric detonator. The clothespin circuit breaker is kept open by means of a small wooden wedge tied to a trip wire, which runs through a hole in the end of the mine and anchors to a stake about 1 meter away. It may be used as an antipersonnel mine or a booby-trap. **Disarm it by cutting the trip wire and the wires connecting the battery with the electric detonator and the clothespin contact.**

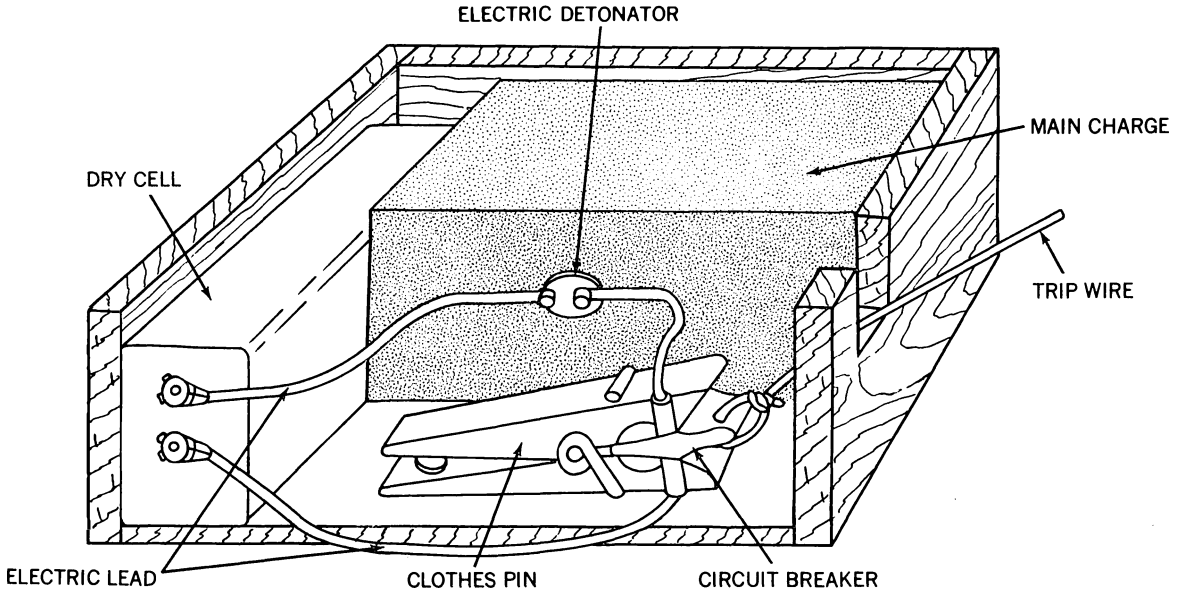
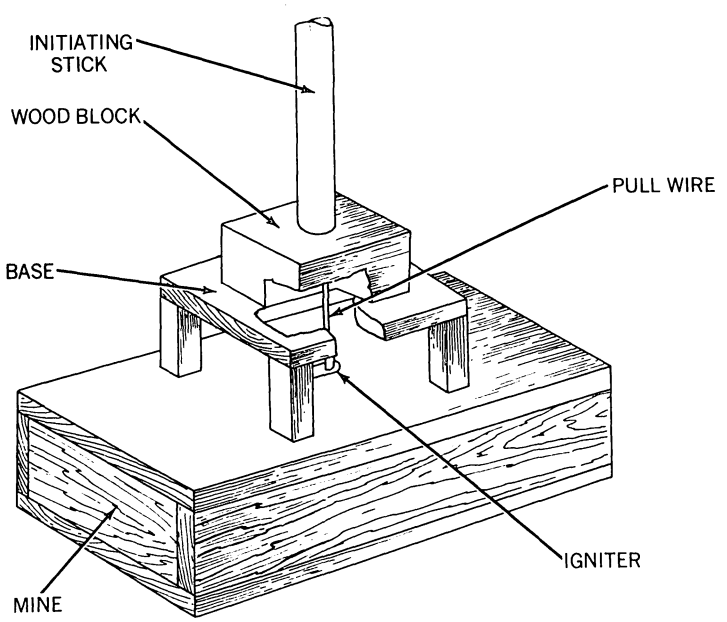

ELECTRIC DETONATOR
MAIN CHARGE
DRY CELL
TRIP WIRE
ELECTRIC LEAD
CLOTHES PIN
CIRCUIT BREAKER

Figure 452

296. B-Stabmine (Concealed Stickmine) (Germany)



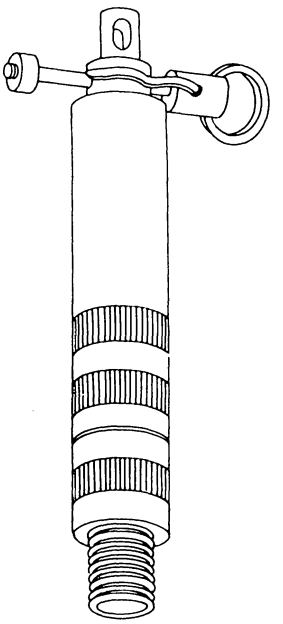


Figure 453

The body of this mine is a wooden box 25.4 by 15.2 by 8.8 centimeters containing an explosive charge. The initiating stick is fitted into a wooden block that is wedged into a base raised on supports above the cover of the box. In the base of the block, a metal hook is placed, to which a wire that extends from the pull igniter is attached. The pull igniter is held in a metal clamp on the under side of the box cover.

a. Characteristics.

Shape	Case	Color	Fuze	Operating force
Rectangular	Wood.	Camouflage brown.	Z.Z. 35 pull w/pin release.	9 to 13 lb.

b. Use. This mine is placed in tall grass and on beaches.

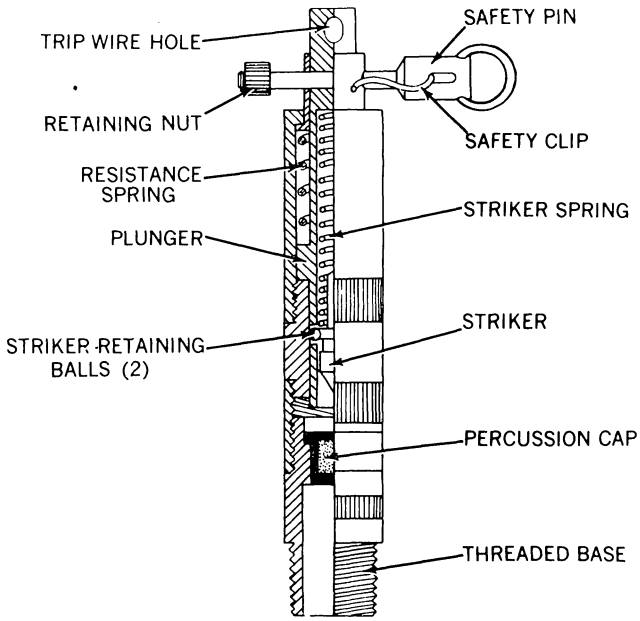


Figure 454

c. Functioning. Movement of the stick by personnel or some other object pulls the trip wire, removing the retaining pin and freeing the striker to fire the percussion cap and explodes the mine.

d. Installing and Arming.

(1) Insert a standard detonator into the base of the fuze.

(2) Clamp the fuze to the underside of the lid.

(3) Unscrew the retaining nut from the end of the safety pin and remove the safety pin.

(4) Attach a wire to the hole in the striker shaft and also to the hook in the block at the base of the wooden tilt rod.

(5) Fasten down the lid on the mine.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Cut the wire extending from the striker shaft to the block at the base of the tilt rod.

(3) Lift the lid, insert a safety pin in the striker shaft, and remove the fuze from the clamp on the under side of the lid.

(4) Replace the lid.

(5) Remove the mine and the fuze to safe storage or disposal area.

f. Additional Precautions. Extreme care should be taken to put no pressure of any kind on the tilt rod, as the safety pin cannot be inserted until after the pull wire has been cut and the lid raised. As it is very easy to activate this mine, it should be exploded in place. Only in cases of extreme necessity, should any attempt be made to disarm it.

Section III. MISCELLANEOUS NONMETALLIC ANTIPERSONNEL MINES

297. Bakelite (or Wooden) Antipersonnel Mine, 1-Pound (Italy)

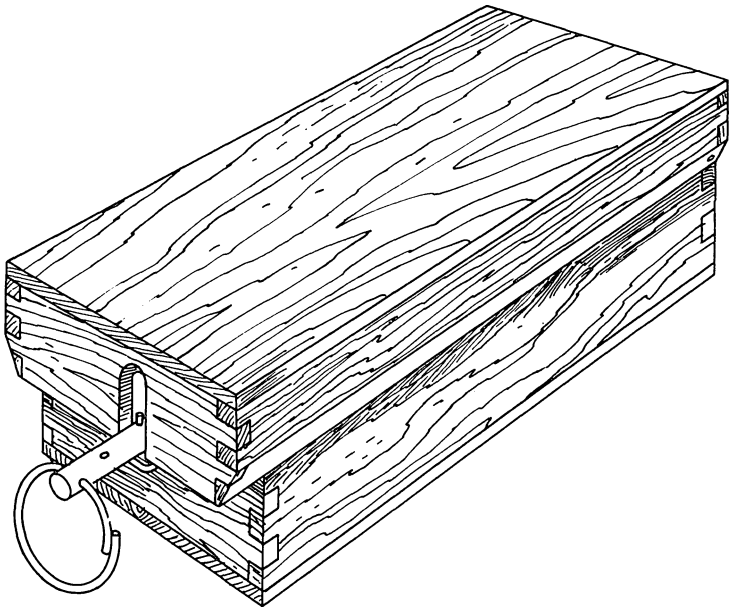


Figure 455

This Schü-type mine is found encased in two materials—bakelite and wood. In one end of the lid is a slot which fits around the striker so that the sides rest on the winged release pin. Metal fragmentation plates are located on three sides of the charge. The overall measurements of the mine are 13.9 by 6.2 by 3.7 centimeters.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular box.	Pull type.....	1 to 5 lb.....	.33-lb. block TNT.

b. Use. This 1-pound mine is laid along paths, trails, and road shoulders and in antitank minefields.

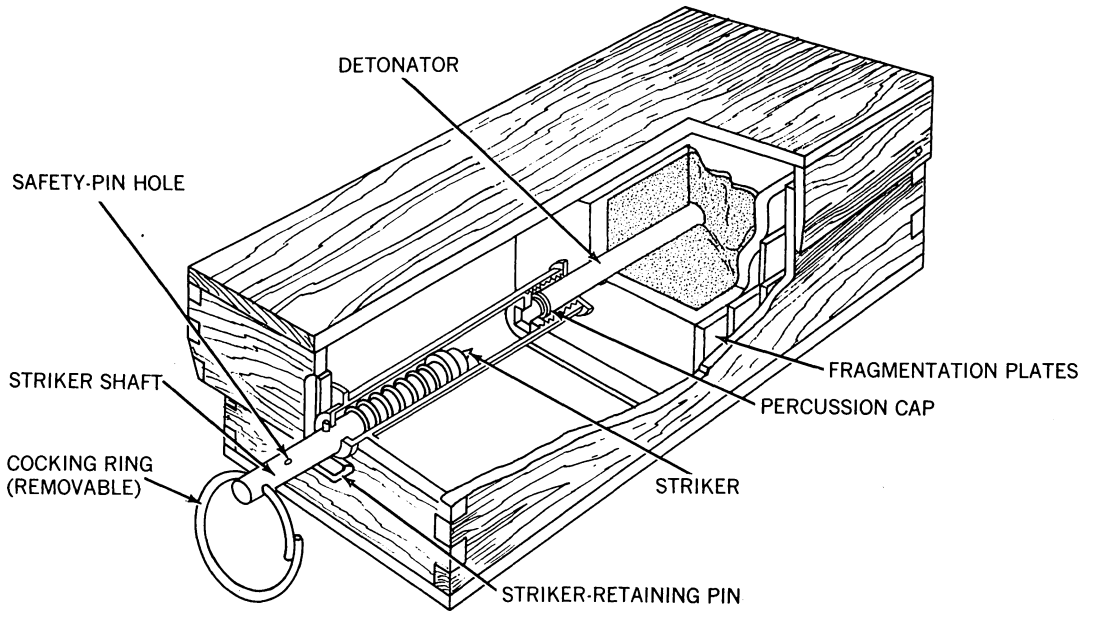


Figure 456

c. Functioning. Pressure on the hinged lid forces the winged retaining pin from the striker, which is driven by its spring into the percussion cap, detonating the main charge.

d. Installing and Arming.

(1) Pull out on the cocking ring and insert the retaining pin in the second hole exposed in the striker shaft.

(2) Place a safety pin in the safety-pin hole.

(3) Screw a percussion cap and detonator onto the fuze, using the special holder.

(4) Insert the fuze in the mine so that the detonator projects into the detonator well in the main charge.

(5) Turn the striker shaft so that the wings of the retaining pin are horizontal and below the striker shaft.

(6) Gently lower the pressure lid so that the fuze slot fits over the fuze and the edge of the lid rests on the wings of the retaining pin.

(7) From a safe distance of 46 meters, remove the safety pin by means of a rope or wire.

e. Disarming Procedure.

(1) Check for and remove any antilift devices present.

(2) Insert a pin or nail in the safety-pin hole and raise the pressure lid.

(3) Keeping the retaining pin in place in the striker shaft, unscrew the fuze from the mine. Remove the detonator from the fuze.

(4) Remove the mine and fuze to a safe storage or disposal area.

298. Plastic Can Mine (Schu. D. Mi. K.) (Germany)

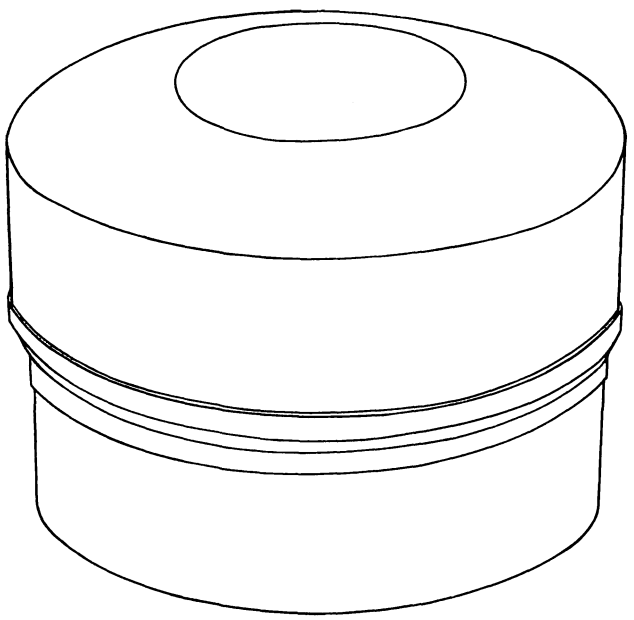


Figure 457

This is a copy of the British "tire buster" or "ointment box" mine. It is 6.0 centimeters in diameter and 4.0 centimeters high. The small plastic case with an overlapping lid contains the doughnut shaped main charge, a built-in spring loaded striker held by a shear wire, and a threaded percussion cap and detonator assembly. The pressure lid is held to the case by the adhesive tape.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical...	Integral pressure, with shear wire release.	30 lb (approx).	2.5 oz TNT.

b. Use. This mine is scattered along airfield runways, paths, roads, and road shoulders to injure personnel and destroy the tires of vehicles and aircraft.

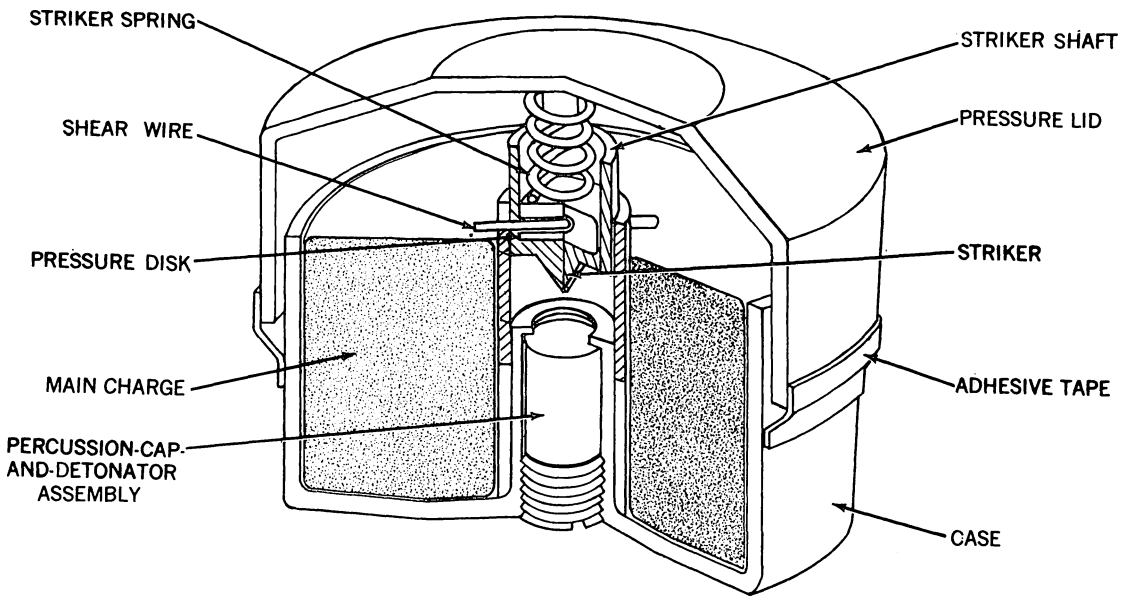


Figure 458

c. Functioning. Pressure on the top or bottom compresses the striker spring, which then bears on the pressure disk in the hollow striker shaft. Further pressure causes the pressure disk to shear the shear wire, freeing the striker against the percussion cap and detonator assembly, and firing the main charge.

d. Installing and Arming.

(1) Remove the shipping plug from the detonator well in the bottom of the mine.

(2) Screw in the assembled percussion cap and detonator.

(3) Place the mine in the ground or in a hole with the pressure lid slightly above ground level.

e. Disarming Procedure. Unscrew the percussion cap and detonator assembly from the bottom of the mine without putting any pressure on the pressure lid and remove the mine and detonator to a safe storage or disposal area.

299. Cardboard Antipersonnel Mine, PMK-40 (U.S.S.R.)

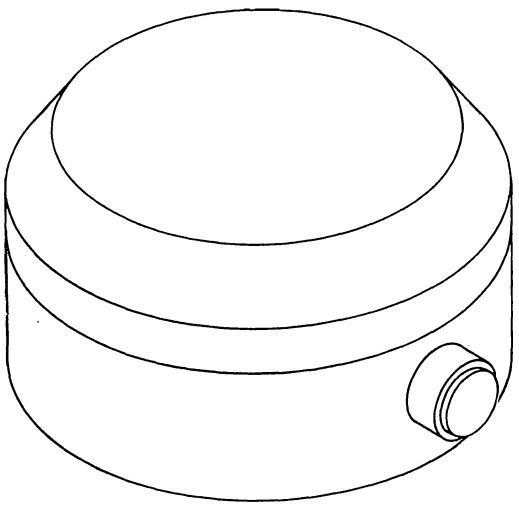


Figure 459

This antipersonnel mine, which looks much like a shoe polish can, contains a small charge of TNT and an integral pressure fuze. It is similar to the British "ointment box" and the more complicated United States Model M14. The Soviets also had a metallic model, which was the earlier of the two designs. The mine is 6.9 centimeters in diameter and 3.7 centimeters high.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Circular.....	Integral pressure type.	20 to 40 lb....	1.8 oz TNT.

b. Use. These mines are frequently scattered in front of antitank minefields or laid along trails, paths, and roadside ditches.

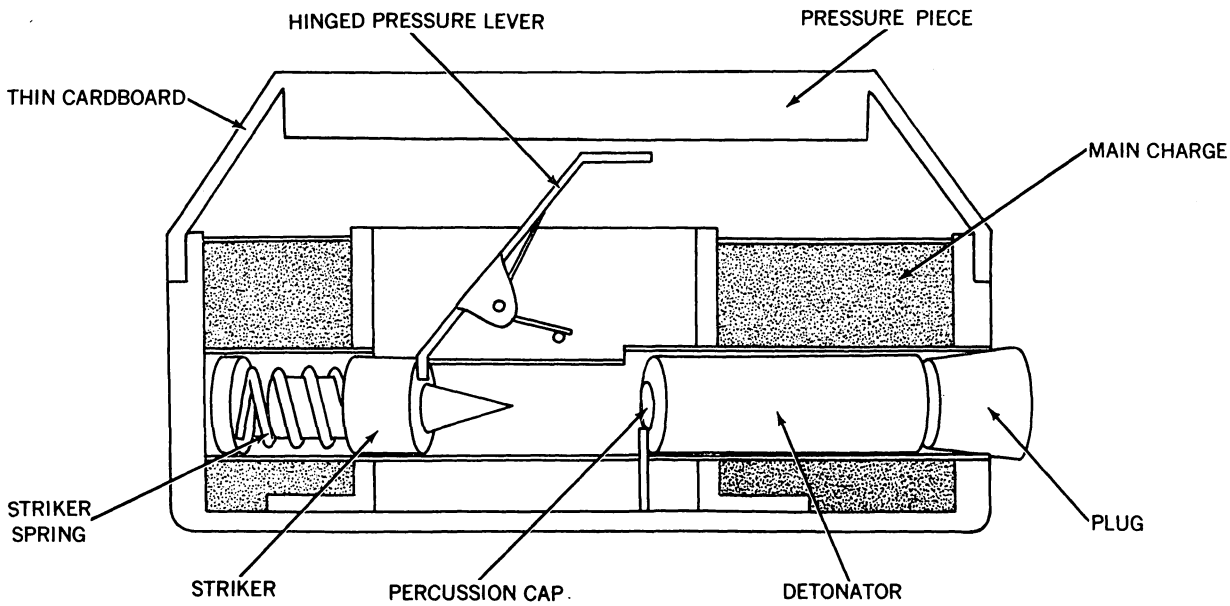


Figure 460

c. Functioning. Pressure on the lid depresses the lever, which releases the spring-driven striker against the percussion cap.

d. Installing and Arming.

(1) Remove the rubber cork plug at the side of the mine.

(2) Insert the percussion cap and detonator assembly into the horizontal detonator well.

(3) Replace the stopper.

e. Disarming Procedure.

(1) Remove the stopper and slide out the detonator.

(2) Remove the mine to a safe storage or disposal area.

300. Antipersonnel Mine, Model 1951 (France)

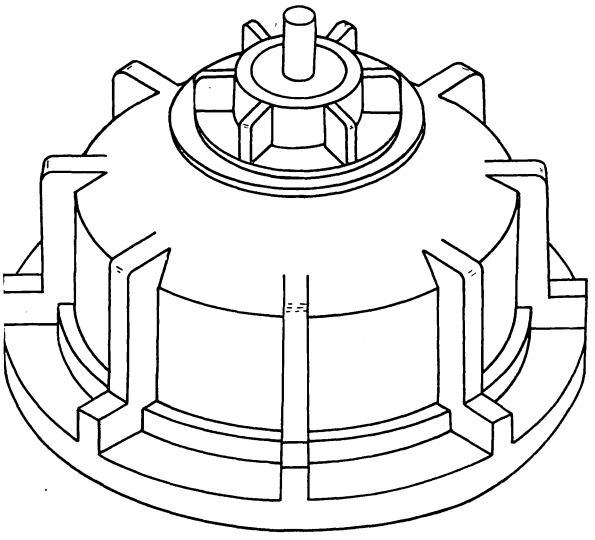


Figure 461

This is a small plastic concussion type mine with a cylindrical lower part, and a truncated cone top. It has an integral friction fuze. The mine is 7.0 centimeters in diameter and 5.0 high.

a. Physical Features.

Shape	Type fuze	Operating force
Lower part: cylindrical. Upper part: truncated cone.	Integral pressure-friction.	33 to 55 lb.

Explosive	Markings
1.8 oz tamped PETN.	Code number (12 digits), abbreviated nomenclature, and instruction for using on top surface. Manufacturer's symbol and date on bottom.

b. Use. This mine is used in large numbers as a light antipersonnel mine.

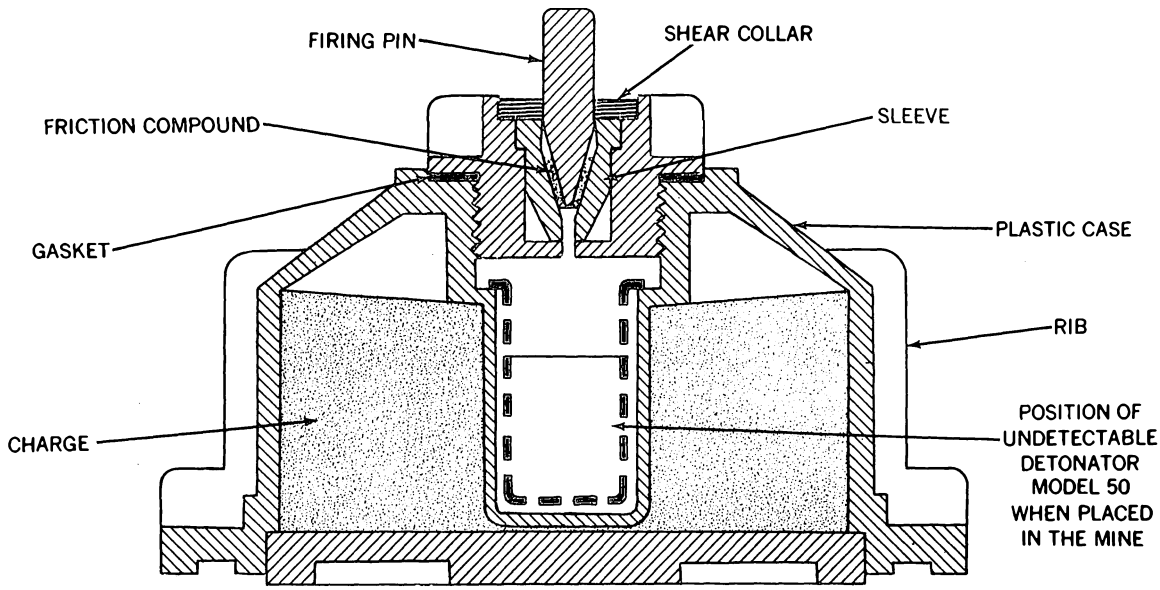


Figure 462

c. Functioning. Pressure put on top of the firing pin causes its shear collar to fail. The firing pin, charged with a friction compound of red phosphorous and glass, is abraded when its tapered end slides against a mating sleeve, producing a flame that fires the detonator and explodes the main charge.

d. Installing and Arming.

(1) Unscrew the fuze assembly.

(2) Place detonator (Model 1950 undetectable) in the well.

(3) Replace the fuze assembly.

(4) Bury the mine with just the top above the ground.

e. Disarming Procedure.

(1) Remove the fuze assembly and the detonator.

(2) Take the mine, fuze, and detonator to a safe storage or disposal area.

301. Antipersonnel Clay Mine (Germany)

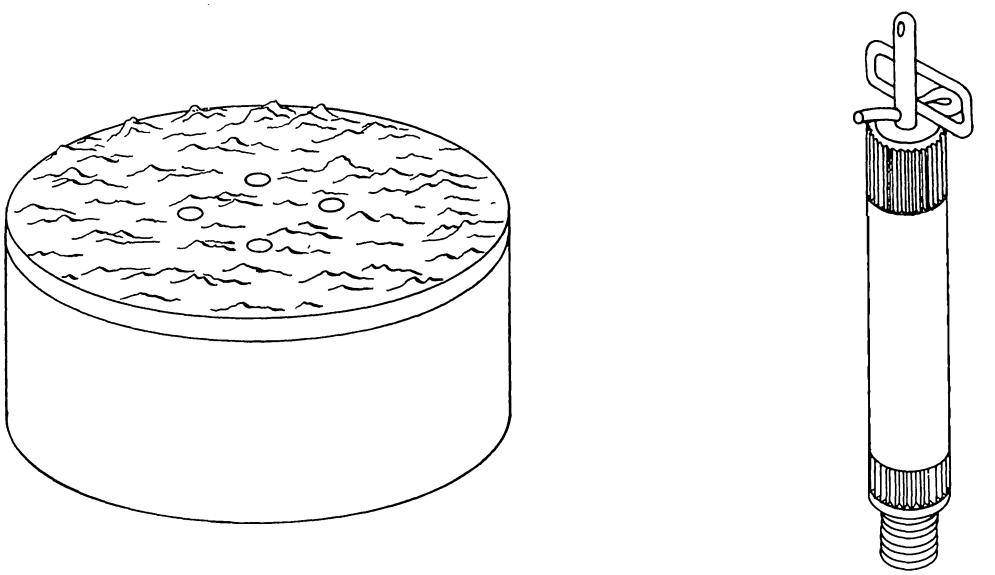


Figure 463.

This mine has a baked clay case with a flat stucco-like pressure lid. It is 20.3 centimeters in diameter and 7.6 centimeters high. Four pull fuzes with detonators attached are set in horizontal chambers in the lower part of the pressure lid, which lead to the central ignition chamber that contains the main detonator. The lid has four 1.2-centimeter holes in the top for the insertion of sprays of leaves or grass to aid in camouflage.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylindrical...	4 pull fuzes 42.	40 lb.....	3 lb.

b. Use. This mine is usually buried in antitank minefields to hinder reconnaissance and breaching parties.

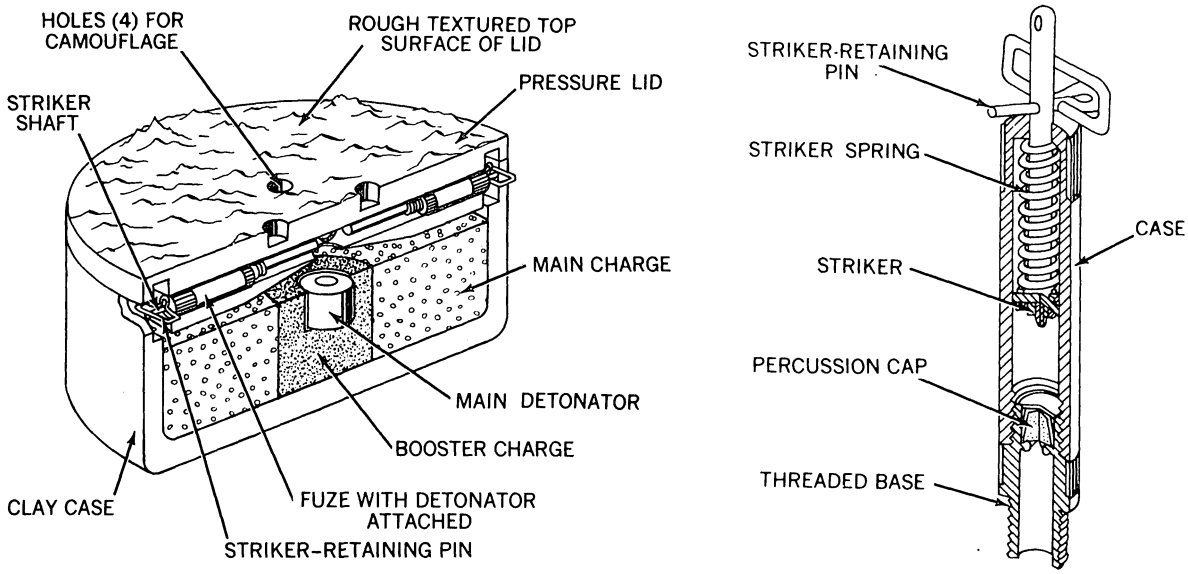


Figure 464

c. Functioning. Pressure on the lid shears off the rim and pushes the retaining-pin out of one or more of the pull fuzes releasing the striker against the percussion cap firing the detonator, then the main detonator, and finally the main charge.

d. Installing and Arming.

(1) Place the mine in a hole in the ground with the pressure lid even with the surface.

(2) Remove the pressure lid and place four pull fuzes 42 with detonators in the fuze wells in the pressure lid so that the wings of the retaining pins are above the striker shaft.

(3) Place the main detonator in the hole in the booster charge.

(4) Position the pressure lid on the mine so that the fuzes coincide with the four slats in the rim of the clay case.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Lift the pressure lid *vertically* with great care.

(3) Remove the fuzes and their detonators from the mine.

(4) Remove the main detonator.

(5) Separate the detonators from the fuzes.

(6) Remove the mine and fuzes to a safe storage or disposal area.

302. Nonstandard Ceramic Antipersonnel Mine (HQ Mine) (Japan)

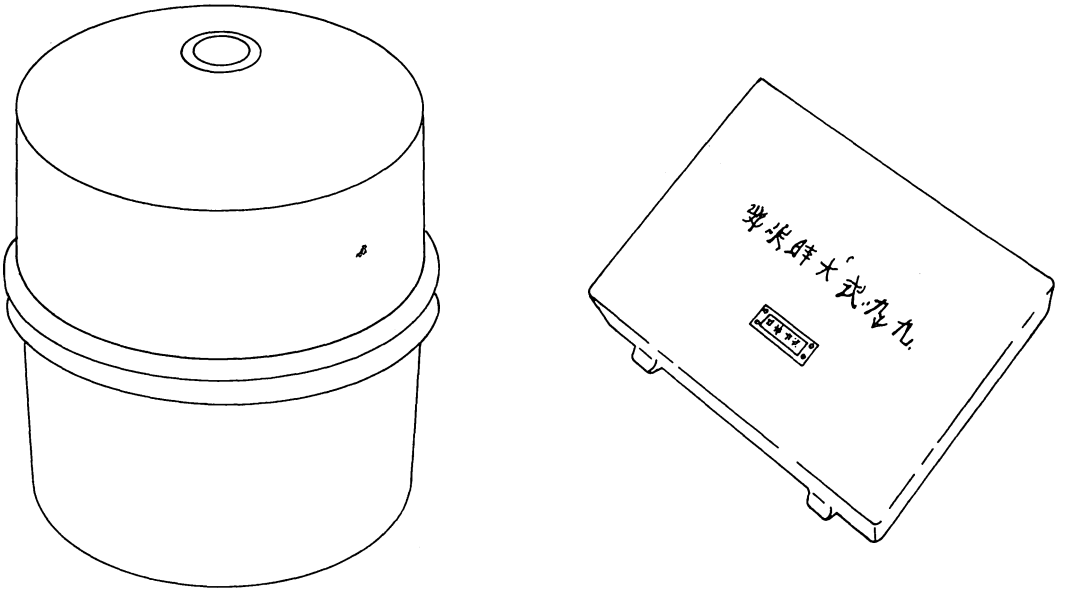


Figure 465

This unit is a large (45.7 centimeters in diameter by 60.0 centimeters high) pottery case, the two halves being joined together permanently. It is used with the type 99 demolition clock which is connected to the pottery mine by electric leads to the detonator in the main charge.

a. Characteristics.

Shape	Fuze	Explosive
Cylindrical...	Type 99 demolition clock.	140 lb TNT.

b. Use. This mine was designed as a large delayed-action charge for planting in buildings abandoned to the enemy, such as those usable for headquarters, barracks, and other purposes.

c. Functioning. It is possible to set the type 99 demolition clock to run in 2 hour increments over a period of 10½ days. At the end of the run, the bridging arm closes the primary circuit and explodes the mine.

d. Installing and Arming.

(1) Insert an electric detonator in the well in the mine case.
(2) Connect the electric leads to the demolition clock. Test the mechanism by setting it for a 5-minute delay period. If the current flows into the primary and secondary circuits, the clock functions properly.
(3) Open the knife switch on the demolition clock to prevent any possible premature detonation.
(4) Connect the wire leads from the demolition clock to the electric detonator in the main charge.
(5) Loosen the knurled nut holding the clock dial to the main shaft and turn the dial to the desired delay period.
(6) Close the knife switch.

e. Disarming Procedure.

(1) Check for and remove any antilifting devices present.
(2) Cut the leads, *one at a time*, that connect the demolition clock to the mine.
(3) Remove the mine to a safe disposal area.

303. "Eismine" 42 (Fl. Eis. Mi. 42) (Germany)

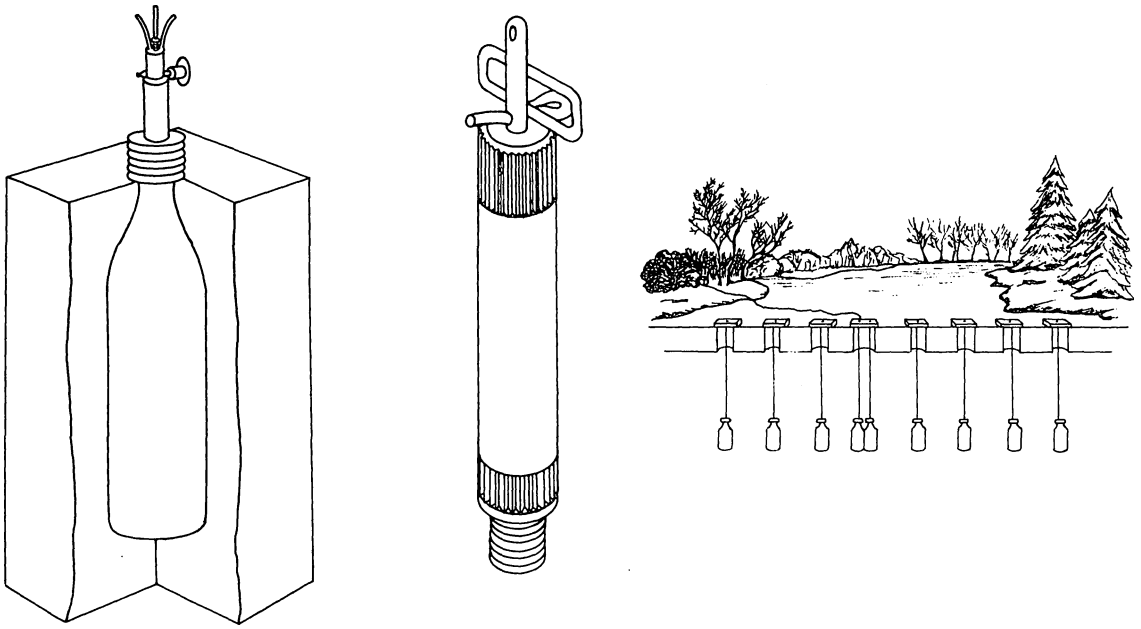


Figure 466

This mine consists of a thick glass bottle 26.6 centimeters long and 10.1 centimeters wide (maximum), resembling a quart milk bottle, with a wooden plug with a conical recess and central hole located at the top of the bottle-neck. The igniter, with the detonator crimped on, fits into this hole, the detonator extending also down into a hole in the booster. An aluminum cap screws onto the top of the bottle over the igniter. The hard rubber igniter striker is just below the cap. The cap, when in place, is waterproofed with a sealing compound, over which is fitted a rubber cap to insure complete waterproofing.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Bottle. . .	(1) Fl. Es. Mi.-Z. pressure.	(1) Fl. Es. Mi.-Z.—11 lbs.	4 lb gelatin-donarit.
	(2) S. Mi.Z. 35 pressure.	(2) S. Mi.Z. 35—8 to 10 lb.	
	(3) Z.Z. 42 pull or pressure.	(3) Z.Z. 42—6 to 11 lb.	

b. Use. The original purpose was to suspend these mines on 2-meter lengths of wire below the surface of ice-covered rivers about 5 meters apart. At intervals, mines were set for electric ignition, so that the explosion of one mine would sympathetically explode those in the adjacent area. Later on, however, they were used as antipersonnel mines and equipped with the Fl. Es. Mi. Z. fuze and an adapter for the accommodation of other fuzes. Many of these mines were set in concrete to provide a shrapnel effect.

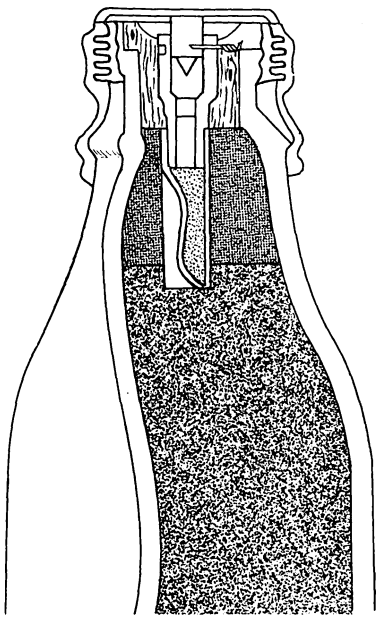


Figure 467

c. *Functioning.*

(1) *Impact fuze.* When the initiating mine with the electric fuze detonates, the concussion travels through the water to the nearest impact—fuzed mine, shearing the shear wire and releasing the striker to fire the percussion cap and detonate the mine. This continues until all mines in the area have detonated.

(2) *S. mine fuze 35.* Pressure on the pressure prongs overcomes the resistance in the plunger spring and depresses the plunger. This forces the retaining balls outward, releasing the striker against the percussion cap and firing the mine.

(3) *Pull fuze 42.* Pressure on the wings of the retaining pin or a pull on a tripwire attached to the loop on the retaining pin pulls it out and releases the spring loaded striker to fire the percussion cap and then the main charge.

d. *Installing and Arming.*

(1) *Impact fuze.*

(*a*) Place the fuze and attached detonator into the fuze well.

(*b*) Screw on the aluminum cap and place on it the rubber waterproofing band.

(*c*) Set the mine in place.

(2) *S-mine fuze 35.*

(*a*) Attach the fuze with detonator to the mine.

(*b*) Place the mine in the ground with just the pressure prongs extending above the surface.

(*c*) Unscrew the safety pin nut and withdraw the safety pin.

(3) *Pull fuze 42, set for pressure.*

(*a*) Screw the fuze with detonator into the mine.

(*b*) Turn the striker shaft so that the wings of the retaining pin are below it. This permits the removal of the pin when pressure is applied.

(4) *Pull fuze 42, set for pull.*

(*a*) Screw the fuze with detonator into the mine.

(*b*) Attach a slack tripwire to the loop of the retaining pin and anchor the other end of the tripwire to a stake or bush.

(5) *Pull fuze 42, set for tension-release.*

(*a*) Screw the fuze with detonator into the mine.

(*b*) Attach a taut tripwire to a stake or bush and then to the tripwire hole in the striker shaft. Be sure the tripwire is taut.

(*c*) Remove the retaining pin from the striker with a rope or wire from a minimum distance of 45 meters.

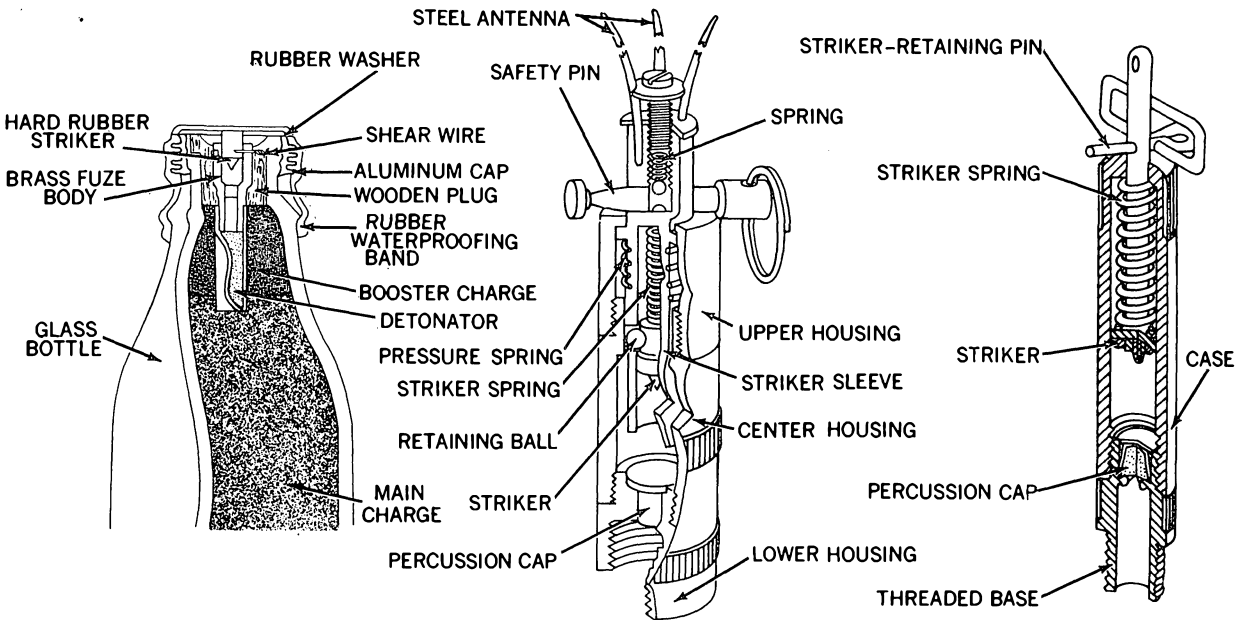


Figure 468

e. Disarming Procedure.

(1) Check for and remove any booby-trapping devices.

(2) *Impact fuze.*

(*a*) Pull the mine up through the hole in the ice.

(*b*) Remove the rubber waterproofing band.

(*c*) Unscrew the aluminum cap and lift out the fuze and detonator.

(*d*) Separate the detonator from the fuze.

(*e*) Remove the mine and fuze to a safe disposal area.

(3) *S-mine fuze 35.*

(*a*) Insert a safety pin in the safety pin hole.

(*b*) Cut *all the slack tripwires* connected to the striker retaining pin.

(*c*) Remove the fuze and detonator from the mine.

(*d*) Separate the fuze and detonator.

(*e*) Remove the mine and fuze to a safe disposal area.

(4) *Pull fuze 42.*

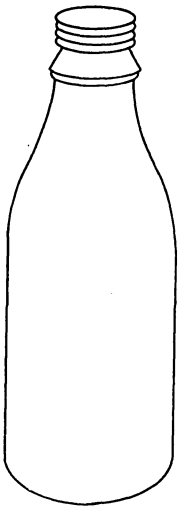
(*a*) For *pressure,* unscrew the fuze from the mine and separate the detonator and fuze.

(*b*) For *pull,* cut all slack tripwires connected to the striker retaining pin; unscrew the fuze from the mine; and unscrew the detonator from the fuze.

(*c*) For *tension-release,* insert a striker retaining pin or a cotter pin in the innermost hole in the striker shaft; then cut the taut tripwire after investigating the other end; unscrew the fuze from the mine; and unscrew the detonator from the fuze.

f. Additional precautions. If the striker retaining pin is not firmly seated in the striker shaft, the mine should be destroyed in place.

304. Ice Mine (Jäämiina) (Finland)



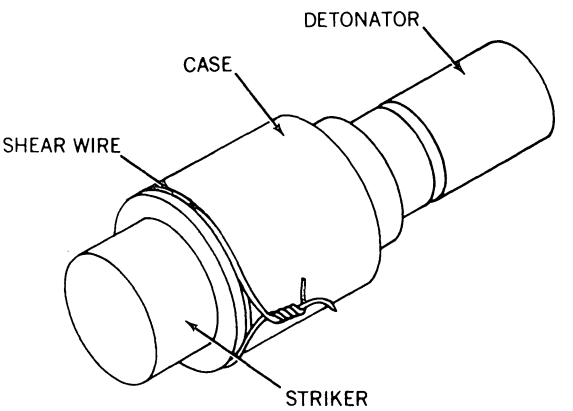


Figure 469

This is a dual purpose apparatus with a thick glass body, resembling a milk bottle, filled with explosive. The neck, topped with a wooden plug, contains the booster charge. Both plug and booster are provided with a hole for the fuze and detonator. A metal screw cap and a rubber ring make the mine waterproof. The mine measures 26.6 centimeters in height and 10.1 centimeters in diameter.

a. Characteristics.

Shape	Fuze	Operating force	Main charge	
			Type	Wt
Bottle..	Impact, pressure, or pull.	Depending on fuze used.	Varies....	3 to 4 lb.

b. Use. This mine was devised for making gaps in ice on rivers and lakes and for antipersonnel use. For the latter purpose it may be encased in concrete to produce a shrapnel effect.

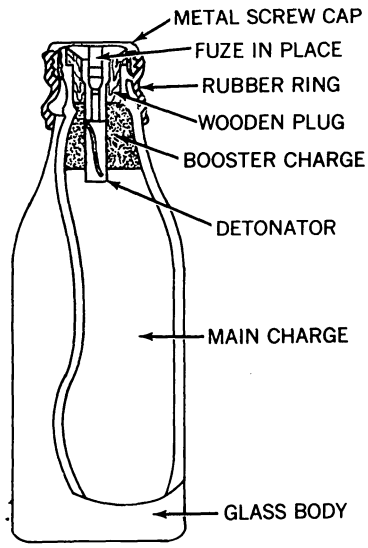


Figure 470

c. Functioning.

(1) *Impact fuzing.* Concussion from the initiating mine ruptures the fuze shear wire and drives the striker against the percussion cap, which continues the firing through the detonator to the main charge.

(2) *Pressure or pull fuze.* After the firing has been initiated by the force of pressure or pull, it proceeds through the percussion cap, detonator, and booster to the main charge.

d. Installing and Arming. For ice beaching:

(1) Place an impact fuze with detonator in each mine except the initiating mines.

(2) Screw on the aluminum cap and cover the joint with the rubber waterproofing ring.

(3) Place electric blasting caps in the selected initiating mines and screw on the caps.

(4) Waterproof the hole where the lead wires pass through the cap and install the waterproofing ring.

(5) Lower all mines through holes in the ice and suspend them so that they are about 2 meters below water level and space not over 5 meters on centers.

(6) Connect the blasting cap to the firing wire, which is then connected to the power source.

For antipersonnel use, arm according to the type of fuze used.

e. Disarming Procedure.

(1) For the initiating mines:

(*a*) Check for and remove any antilift devices.

(*b*) Disconnect the blasting cap leads.

(*c*) Remove the screw cap and lift out the blasting cap.

(*e*) Take the mines to a safe storage or disposal area.

(2) For impact-fuzed mines:

(*a*) Check for and remove any antilift devices.

(*b*) Remove the screw cap.

(*c*) Lift out the fuze.

(*d*) Separate the detonator from the fuze.

(*e*) Take the mine and fuze to a safe storage or disposal area.

f. Additional Precautions. For other fuzes, disarming should be done by applicable methods.

305. Antipersonnel Glass Mine 43 (Gl. Mi. 43) (Germany)

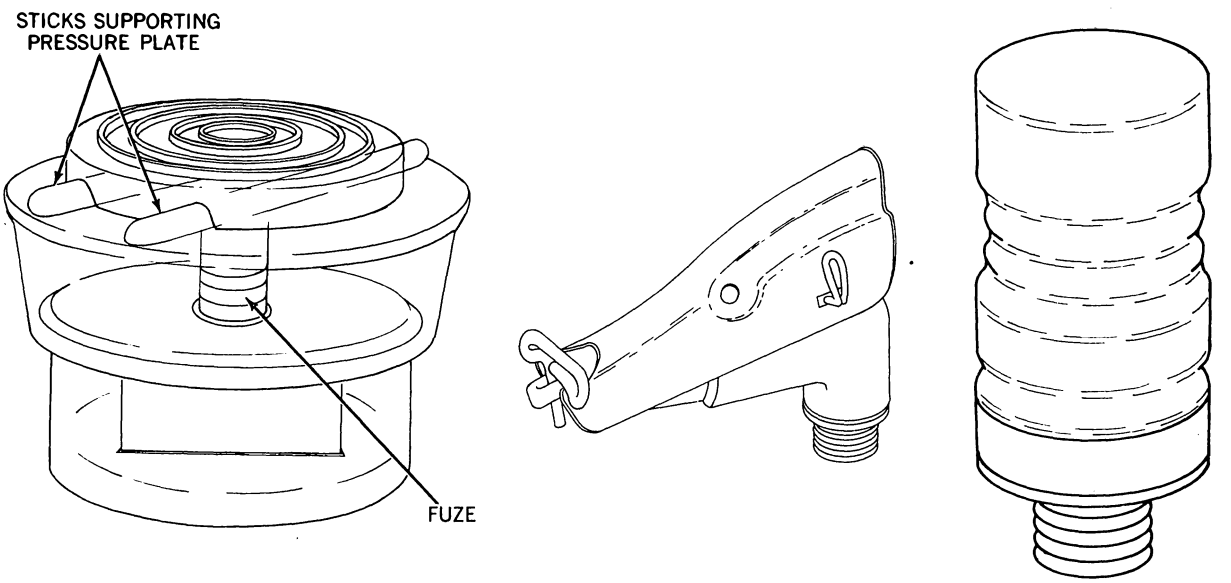


Figure 471

This mine is a "glass dish," the glass cover serving as a shear plate. A metal safety fork fits into grooves in the pressure plate, which provides a bridge to the outer edges of the mine and supports the plate until the mine is laid. The thin sheet metal igniter plate, with a central hole for the igniter, is supported by a grooved shoulder inside the case. This is for the "Schuko" igniter. If the Buck igniter is used, a plate with the same size hole but of stronger design is used. The mine is considered proof against air, moisture, and sea water. Each mine is supplied with putty sufficient for waterproofing. It is placed around the circumference of the igniter plate and around the edge of the glass shear plate. The mine is approximately 15.2 centimeters in diameter and 11.4 centimeters deep.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Dish-shaped..	Schuko pressure, or Buck pressure-chemical.	Schuko—40 lb. Buck—15 lb.	7 oz (approx) of Sprengkorper 28.

b. Use.

(1) *On land.* This mine is buried in the ground and covered with an inch of soil or surrounding material.

(2) *Underwater.* Here the mine is laid in beaches and likely river-crossing points. Both the friction fuze SF6 and chemical fuze SF18 are used.

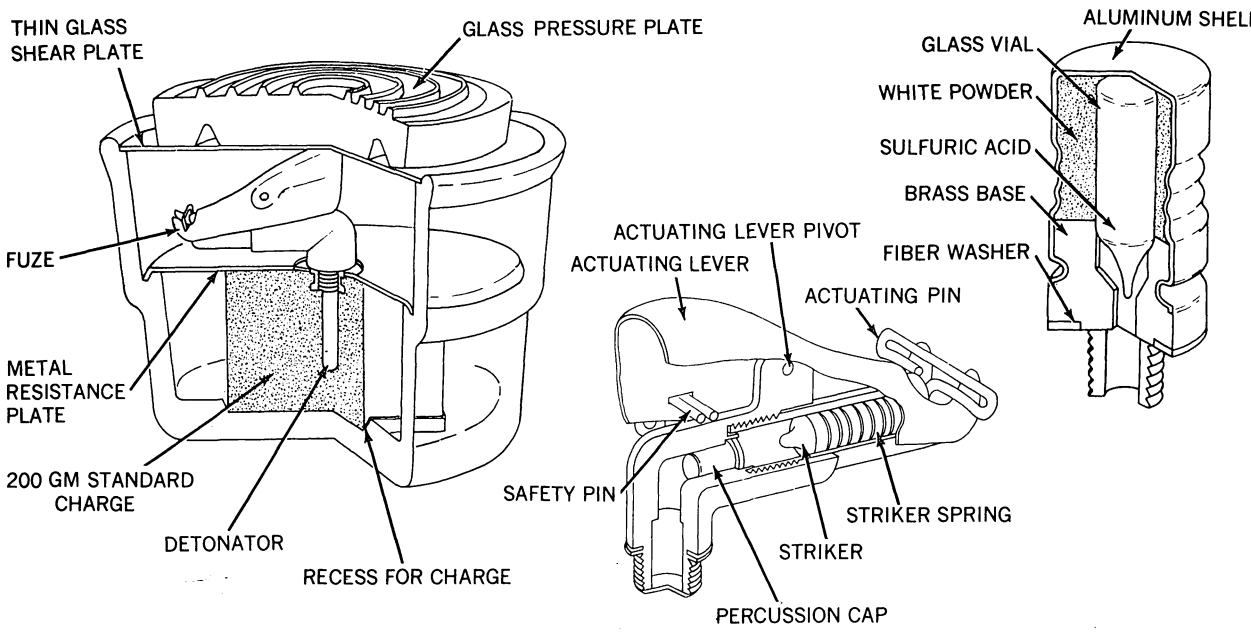


Figure 472

c. Functioning.

(1) *Buck igniter.* Pressure on the top crushes the vial of acid, which by mixing with the powder present causes a flash that ignites the detonator and explodes the mine.

(2) *Schuko fuze.* Pressure on the actuating lever forces it down and causes the removal of the striker retaining pin, which releases the striker against the percussion cap and detonates the mine.

d. Installing and Arming.

(1) Place the charge in the bottom of the glass case with the fuze well up.

(2) Glue the metal fuze holder plate onto the midsection ridge.

(3) Screw a Schuko assembled lever fuze or Buck chemical fuze with detonator into the fuze well of the explosive charge. Remove the safety pin from the Schuko lever fuze.

(4) Fix the glass pressure plate to the glass shear plate and fix them to the mine case. Be sure that the joint is well waterproofed (putty is generally used).

e. Disarming Procedure. **Do not attempt to disarm this mine, whatever fuze it may contain.** Carry it away intact to a safe disposal area.

306. Concrete Stakemine (Sto. Mi.) (Germany)

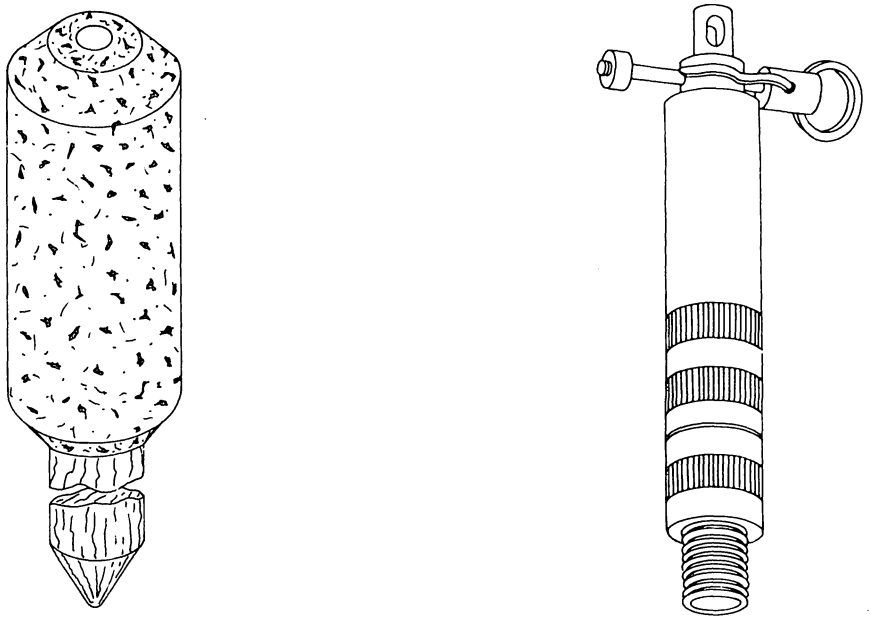


Figure 473

This is a weak cement and mortar stake mine with embedded places of shrapnel and an explosive charge inside. The mine is 16.5 centimeters long and 7.62 centimeters in diameter. Around wooden stake 35.4 centimeters long, 3.7 centimeters in diameter is set in the lower end of the concrete shell. Models of this mine have been found with a serrated cast iron cylinder around the concrete body to increase the shrapnel or fragmentation effect. It has a casualty radius of 9 meters and a danger radius up to 60 meters. This mine resembles the Soviet POMZ–2 stake mine.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Cylinder...	Z.Z. 42 pressure or pull. Z.Z. 35 pull. Z.U.Z.Z. 35 pull and tension release.	6 to 11 lb.....	4 oz (approx) bohrpatrone 28.

b. Use. These mines are usually placed in depth on narrow tracks and in ravines and defiles. They may also be placed in staggered rows to form mine belts.

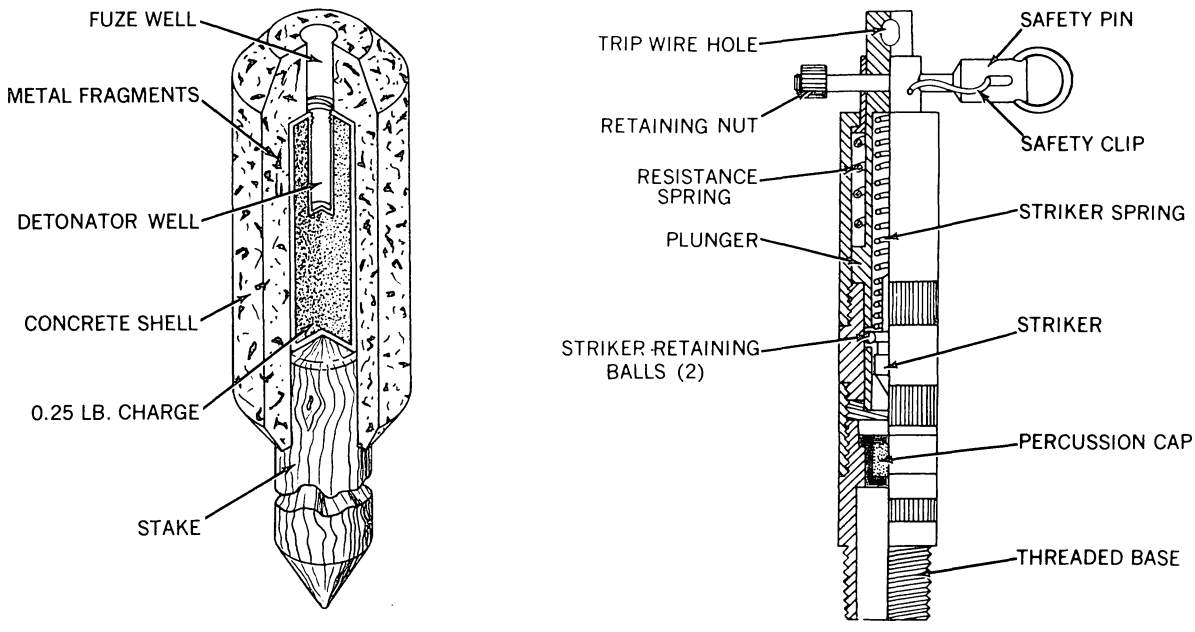


Figure 474

c. Functioning. A pull on the tripwire, moving the retaining pin, or the breaking of the taut wire releases the striker to ignite the percussion cap and explode the mine.

d. Installing and Arming.

(1) Drive the stake into the ground leaving about 12.7 centimeters extending above the surface.

(2) Assemble the mine by inserting the main charge, fuze-well-end first, in the large hole in the bottom of the concrete shell.

(3) Insert a pull fuze 42 or 35 with detonator into the small hole in the top of the case and screw it into the fuze well of the main charge.

(4) Put the mine on the stake; or if a tree is used, tie the mine to it and plug the hole in the bottom. If the pull fuze 35 is used, drive a second stake beside the mine, keeping it higher than the mine so that the tripwire will run up over it and pull upward on the fuze when it is tripped.

(5) Anchor the tripwire.

(6) Attach the loose end of the tripwire to the fuze.

(7) Pull out the safety pin if the pull fuze 35 is used.

e. Disarming Procedure.

(1) Check for and remove any antilifting devices present.

(2) For the pull fuze 42, hold the striker retaining pin firmly in place and cut the tripwire. For the pull fuze 35, insert a nail or wire in the safety pin hole of the fuze and then cut the tripwire.

(3) Unscrew the detonator from the fuze.

(4) Pull the mine and stake loose with a wire or rope from a distance of 46 meters, as the stake may be activated.

(5) Remove the mine and fuze to a safe disposal area.

307. Concrete Ball Antipersonnel Mine (Germany)

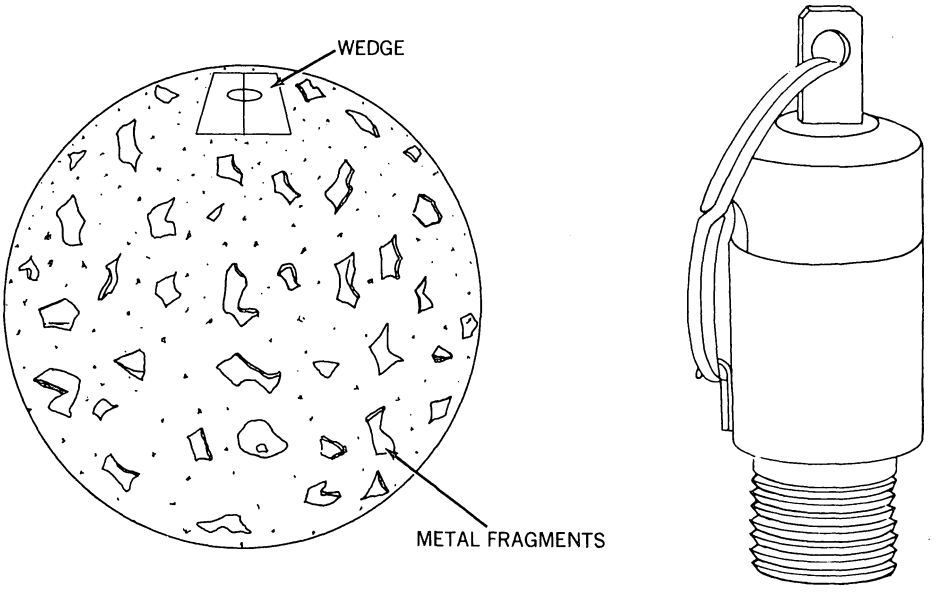


Figure 475

This antipersonnel mine is a spherical-shaped mass of concrete 25.4 centimeters in diameter with embedded shrapnel used as aggregate. The cavity in the center is provided for the insertion of the explosive charge. It may be rolled down a hill or cliff into enemy troops. It is also possible to peg the igniter to a stake below the mine so that an attempt at removal will explode it.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Spherical..	ZDSCHN-ANZ29 pull friction.	5 to 10 lb.....	1.5 lb of explosive block.

b. Use. This mine is rolled down hill as a grenade or emplaced along trails and in antitank minefields with one or more tripwires.

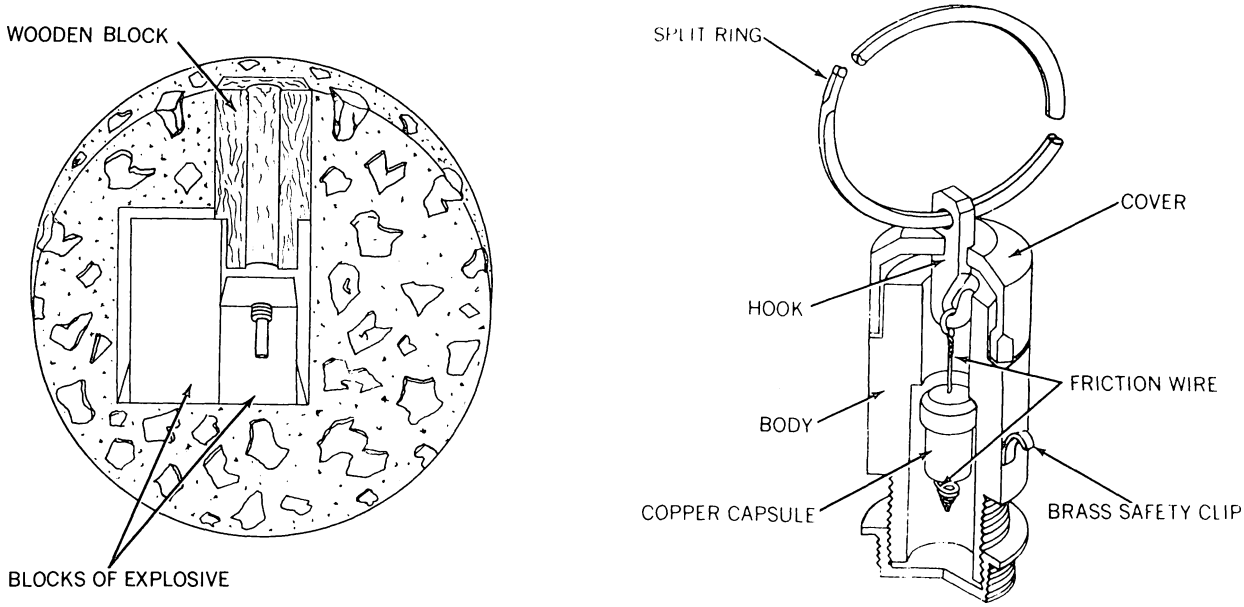


Figure 476

c. Functioning. The igniter may be actuated by hand, initiating the time fuze which then fires the detonator and the charge.

d. Installing and Arming.

(1) Attach the fuse lighter 29 by means of the time fuse adapter to a short length of time fuse equipped with a detonator and insert in a wooden block, wedging the fuse lighter in place with wooden wedges.

(2) Screw the detonator holder and detonator into a block of explosive.

(3) Install the fuze assembly in the concrete case.

(4) Place the mine on the ground with the fuze assembly horizontal and secure the mine in place with stakes so that it will not be pulled out of place by the pull required to actuate the fuze lighter by the tripwire.

(5) Attach the trip wire, first at the anchor end and then to the pull ring of the fuse lighter.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Cut the tripwire.

(3) Tape the pull ring to the case of the fuse lighter.

(4) Remove the fuze and detonator assembly.

(5) Separate the detonator assembly from the fuze.

(6) Take the mine and fuze to a safe disposal area.

308. Matchbox Antipersonnel Mine (Bulgaria)

(No illustration.)

This small antipersonnel mine is a wooden matchbox size container with several ounces of explosive. Its pressure-type fuze functions at about 90 pounds of pressure.

309. Glass Antipersonnel Mine (Bulgaria)

(No illustration.)

This mine is reported to be a pencil-shaped glass container about 10.0 centimeters long and 1.2 centimeters in diameter, painted for camouflage purposes. It has either a friction of chemical type fuze. Eighty mines are rolled together in tarred tape.

CHAPTER 11

FUZES

Section I. PRESSURE FUZES

310. Pressure Fuze, Mi. Z. 530(e) (Germany)

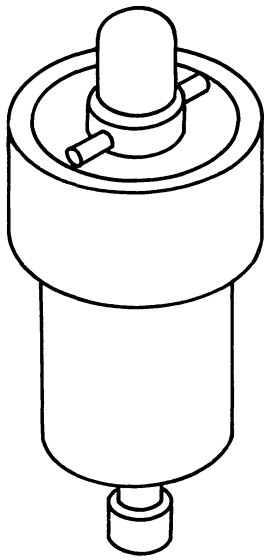


Figure 477

This fuze consists of a body housing a striker and a striker spring. It is retained in cocked position by a shear wire that runs through the striker stem and rests on the upper surface of the body. The percussion cap housing, which extends to form a flash channel, is at the base of the igniter. This extension has an annular groove into which a standard German detonator may be crimped.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Steel.....	Pressure mechanical, shear pin release.	640 lb (approx).

b. Use. This igniter was manufactured by the Germans for use in the British antitank mines Mark 3.G.S.

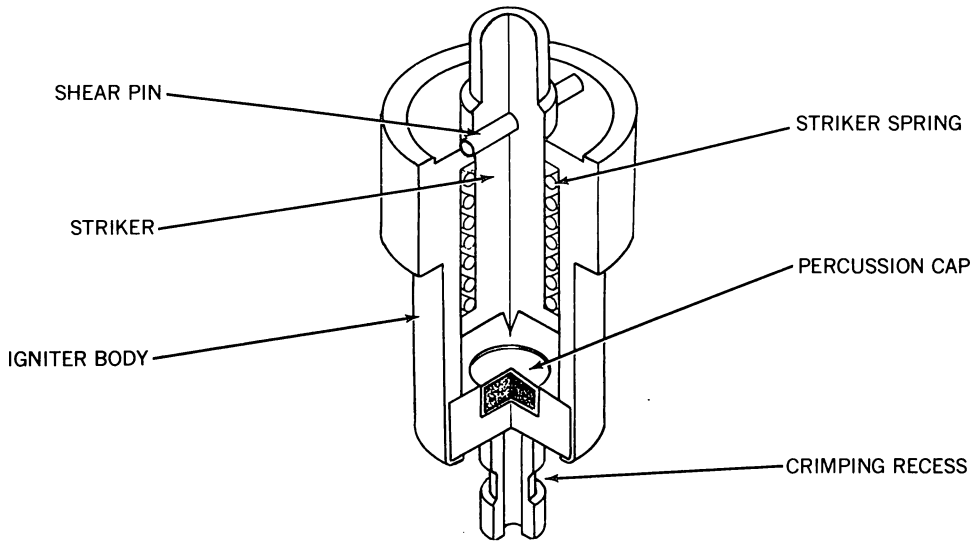


Figure 478

c. Functioning. Pressure on the head of the striker stem drives it through the shear wire, forcing the striker to fire the percussion cap, the detonator, and then the mine.

d. Installing and Arming.

(1) Crimp a standard detonator to the base of the fuze.

(2) Insert the fuze and detonator into the mine or charge.

e. Disarming Procedure. Remove the fuze from the mine. As the detonator is crimped to it, take both to a safe storage or disposal area.

311. Pressure Fuze, Model 1948 (France)

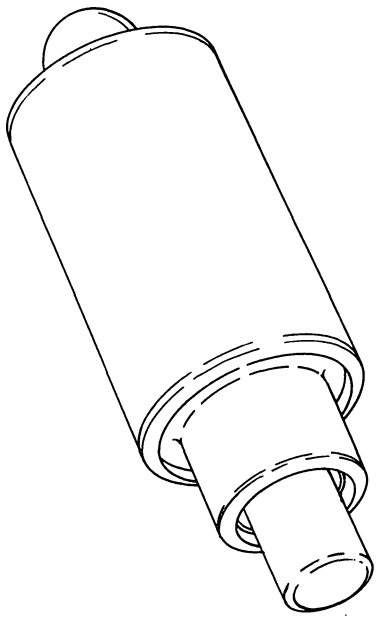


Figure 479

The Model 1948 pressure fuze is housed in a steel case. It has a spring-driven striker retained by a shear pin. The lower end of the case, which is smaller in diameter than the main part, is threaded and fitted with a detonator retaining-collar. The fuze is 5.5 centimeters long and 7.2 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Steel.....	Pressure mechanical, with shear pin release.	330 lb (approx).

b. Use. This fuze is designed for use in the Model 1948 antitank mine and in the metallic offset fuze device for plate-charge and shaped-charge mines.

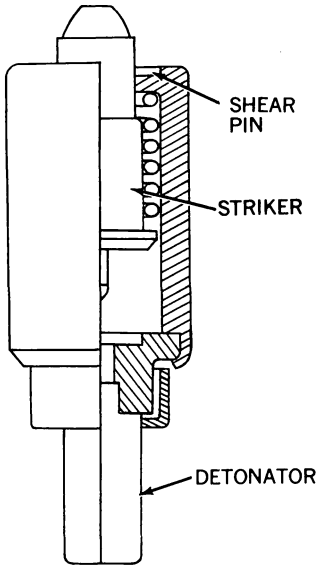


Figure 480

c. Functioning. The application of pressure to the striker head shears the shear pin, which releases the striker, driven by its spring, to fire the percussion cap and then the detonator.

d. Installing and Arming.

(1) Unscrew the collar from the lower end of the fuze.

(2) Insert a detonator (short AP–38) into the collar.

(3) Screw the collar back on the base of the fuze.

e. Disarming Procedure.

(1) Unscrew the collar from the base of the fuze.

(2) Separate the detonator from the collar.

(3) Remove the fuze to a safe storage or disposal area.

312. Pressure Fuze No. 3 Mark 1 (United Kingdom)

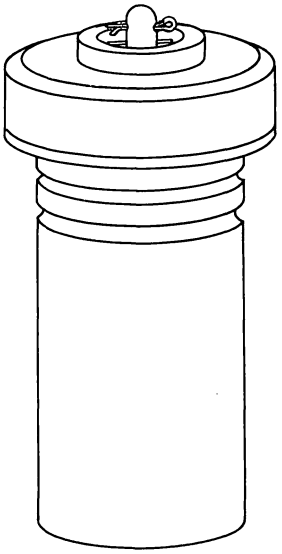


Figure 481

This pressure fuze is made for the Mark 4 and Mark 5 antitank mines. It is of the instantaneous variety with a spring-loaded striker, a cotter pin type safety pin that extends through the striker shaft just above the shear pin, and a detonator and a booster charge crimped to the base. The fuze is 8.8 centimeters high and 3.7 centimeters in diameter.

a. Characteristics.

Shape	Internal action	Operating force
Cylindrical...	Pressure mechanical, with shear pin release.	

b. Use. This fuze may be found in the Mark 4 or Mark 5 antitank mines.

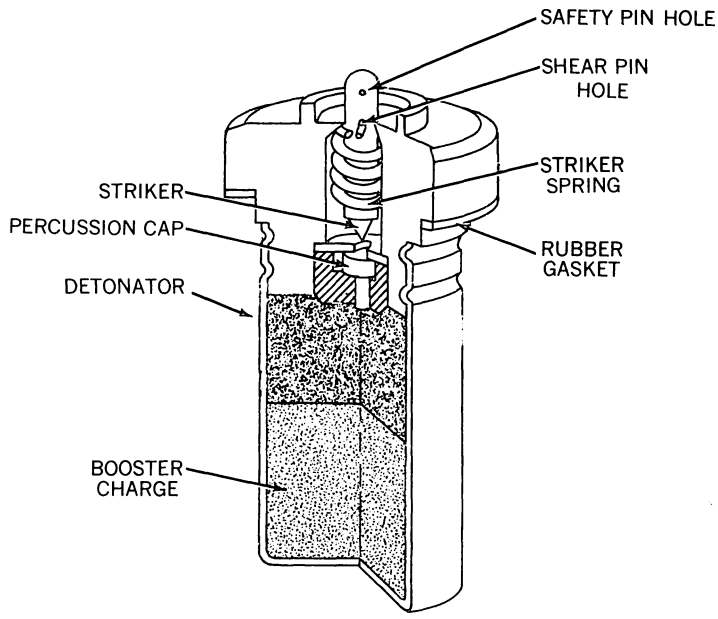


Figure 482

c. Functioning. The shear pin shears at the application of pressure on the striker shaft. This releases the striker against the percussion cap, firing the detonator and then the booster charge.

d. Installing and Arming. Insert the fuze in the mine and withdraw the safety pin.

e. Disarming Procedure.

(1) Insert a safety pin in the safety-pin hole. (This fuze is dangerous to handle because of the built-in detonator and booster charge. Handlers *must* be careful, even when the safety pin is in place.)
(2) Unscrew the fuze from the mine.
(3) Destroy this fuze after removing it from the mine.

313. Pressure Fuze for Antitank Mine M/39 (Finland)

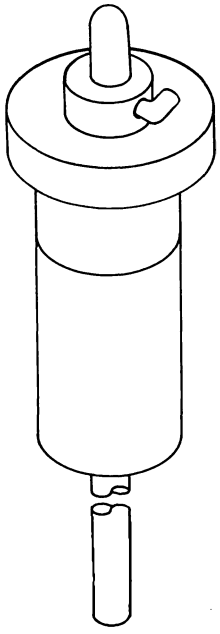


Figure 483

This fuze houses a spring loaded striker with a shear pin. The two halves of the case are fastened together by a threaded joint. The detonator is crimped to the percussion cap holder, which is screwed into the base of the fuze.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Pressure mechanical, with shear pin release.	Probably 300 lb or more.

b. Use. This fuze is used in the M/39 metallic and model M/144 antitank mines.

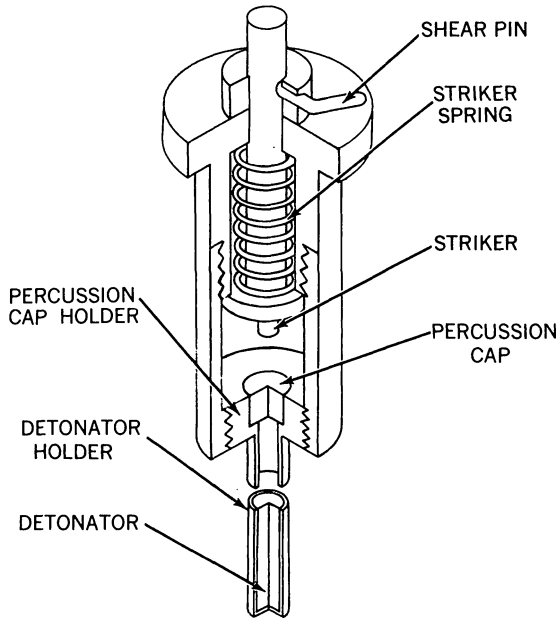


Figure 484

c. Functioning. Pressure on the striker shears the shear pin and releases the striker to fire the percussion cap. The firing of the detonator and main charge follows.

d. Installing and Arming.

(1) Screw the percussion cap holder into the base of the fuze.

(2) Crimp the detonator holder onto the percussion cap holder.

e. Disarming Procedure.

(1) Remove the fuze from the mine or charge.

(2) Unscrew the detonator and percussion cap holder from the base of the fuze.

(3) Take the fuze to a safe storage or disposal area.

f. Additional Precautions. This fuze has no safety.

314. Pressure Fuze, M-1935 and 1936 (France)

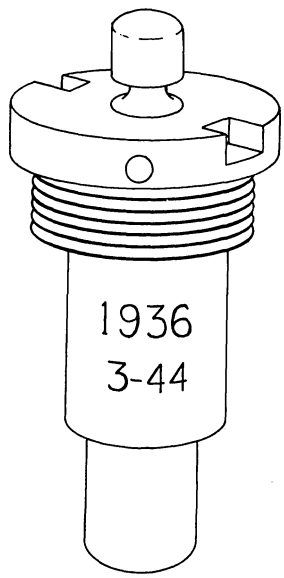


Figure 485

This antitank mine fuze has a spring loaded striker and a shear pin. The percussion cap is held in place in the detonator holder by means of a hollow screw that gives the striker point access to the cap. The detonator assembly is screwed onto the bottom of the fuze.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	M-1935—steel, with brass percussion cap holder M-1936—aluminum with aluminum percussion cap holder.	Pressure mechanical, with shear pin release.	400 lb or more.

b. Use. This fuze is used in both the light and heavy antitank mines.

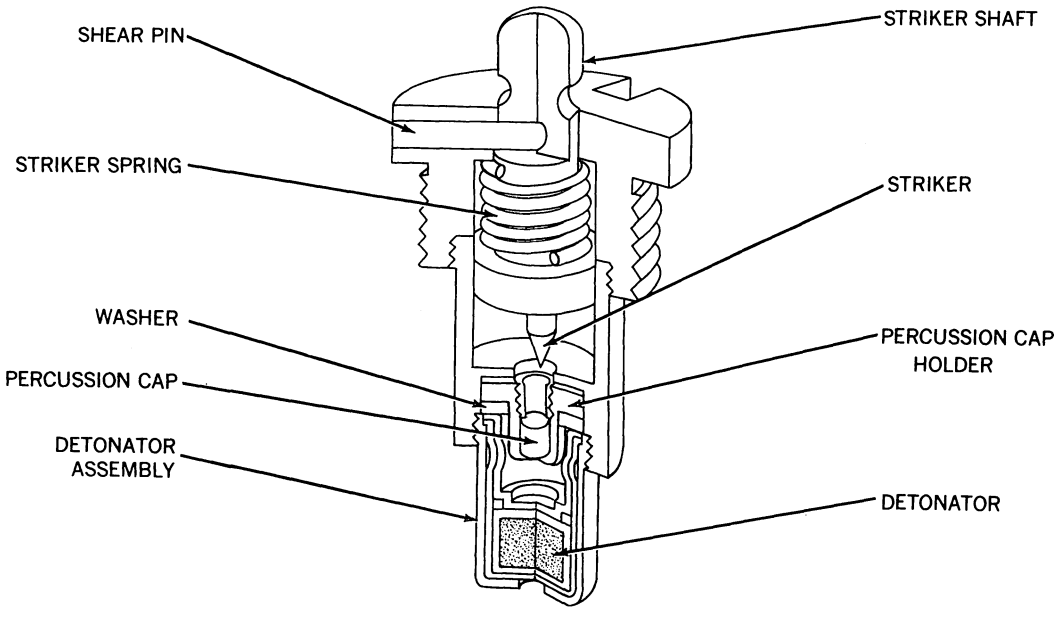


Figure 486

c. Functioning. Adequate pressure on the top of the striker shaft ruptures the shear pin and permits the striker to plunge forward and initiate the firing chain.

d. Installing and Arming.

(1) Hold the fuze upside down and insert the detonator holder containing the percussion cap. The washer is inserted after the holder.

(2) Screw the detonator assembly into the bottom of the fuze.

(3) Screw the fuze into the mine.

Note. As the fuze has no safety device, arming is merely the installation of the fuze and detonator assembly in the mine.

e. Disarming Procedure.

(1) Unscrew the fuze from the mine.

(2) Unscrew the detonator from the bottom of the fuze and remove the percussion cap holder.

(3) Remove the fuze to a safe storage or disposal area.

315. Pressure Fuze, Fi. Es. Mi. Z. (Germany)

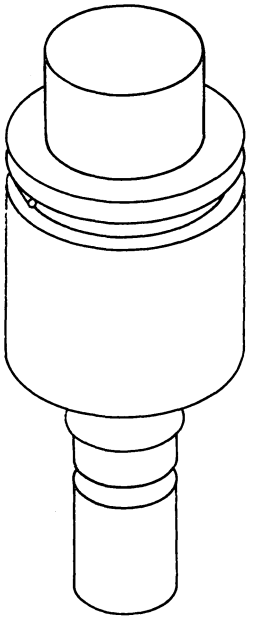


Figure 487

The body of the fuze houses the striker and percussion cap. The detonator crimps into a slot in the bottom sleeve. Holes are provided for the copper shear wire, which passes through the body and the striker, the ends being bent into the cannelure near the top of the fuze body. There is no striker spring. The fuze is 3.7 centimeters long and 1.1 centimeters in diameter.

a. Characteristics.

Shape	Case	Color	Internal action	Operating force
Cylindrical.	Brass..	Dark green.	Pressure mechanical, with shear wire.	11 lb.

b. Use. This fuze was made especially for the glass bottle antipersonnel mine.

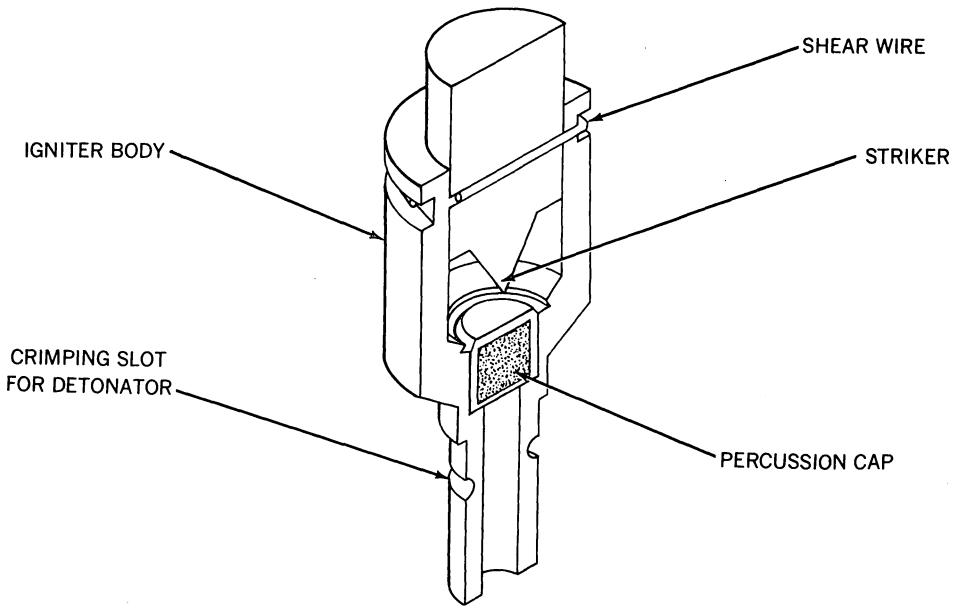


Figure 488

c. Functioning. Pressure on the head of the striker shears the copper shear wire, forcing the striker into the percussion cap. The subsequent flash passes to the detonator, which in turn explodes the main charge of the mine.

d. Installing and Arming.

(1) Attach a detonator to the base of the fuze.

(2) Place the fuze and attached detonator into the fuze well.

e. Disarming Procedure.

(1) Remove the fuze from the mine and separate the fuze and detonator.

(2) Take fuze to a safe storage or disposal area.

316. Pressure Fuze, T. Mi. Z. 42 (Germany)

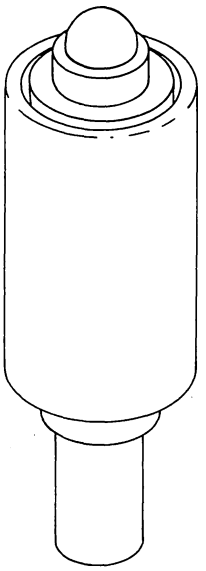


Figure 489

This is a Tellermine fuze with a body 5.2 centimeters long and 2.1 centimeters in diameter, bored to receive the striker, striker spring, and detonator cap housing. The striker is dome-shaped at the upper end. The lower end has a collar that forms a seat for the striker spring. A longitudinal inclined slot is machined in the lower end to prevent air cushioning. A retaining cap, screwed to the detonator cap housing, holds the detonator in a central position.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Steel.....	Pressure mechanical, with shear pin release.	250 to 400 lb.

b. Use. This igniter was designed to actuate the steel Tellermine 35, Tellermine 42, and mushroom Tellermine 43. The fuze has nonstandard German threading.

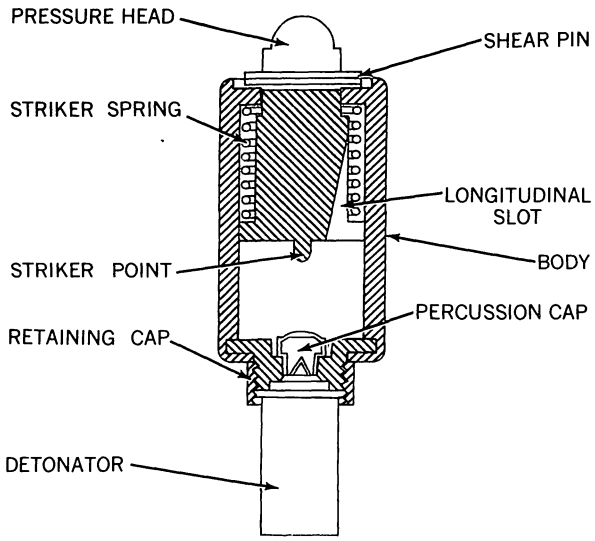


Figure 490

c. Functioning. Pressure applied to the striker head breaks the shear pin and releases the striker to fire the percussion cap and initiate the firing train.

d. Installing and Arming. As this fuze has no safety, installing and arming are no more than to screw the detonator retaining collar with the detonator to the base of the fuze and insert the assembly into the mine.

e. Disarming Procedure.

(1) Remove the fuze from the mine.

(2) Unscrew the detonator retaining collar from the base of the fuze and remove the detonator.

(3) Remove the fuze to a safe storage or disposal area.

317. Antitank Pressure Fuze No. 1 Mark 1 (United Kingdom)

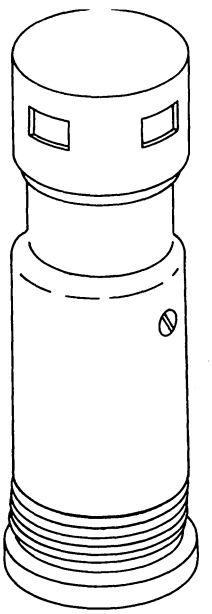


Figure 491

The No. 1 Mark 1 antitank pressure fuze is an instantaneous mechanical type with a brass case. The other components are a pressure head, plunger, brass safety sleeve with four safety prongs that retain the plunger and pressure head, spring-loaded striker held in place by two retaining balls, and a brass resistance collar that surrounds the pressure head. The base of the fuze contains a percussion cap and detonator. The fuze is 7.8 centimeters high and 2.2 centimeters in diameter.

a. Characteristics.

Shape	Internal action	Operating force
Cylindrical...	Pressure mechanical, with ball release.	350 lb.

b. Use. This fuze was designed for the No. 1 Mark 1 G.S. antitank mine.

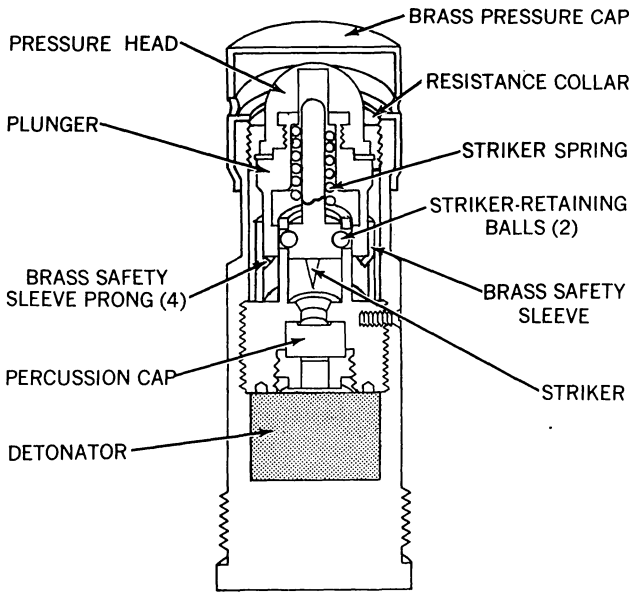


Figure 492

c. Functioning. Force on the top crushes the pressure cap and moves the pressure head down, pushing aside the four safety prongs and compressing the striker spring. The two retaining balls escape into an outer recess, freeing the striker against the percussion cap.

d. Installing and Arming. The fuze, having no safety, is fully armed. It is installed by merely screwing it into the mine.

e. Disarming Procedure. Although it has no safety, the fuze, requiring a high pressure for actuation, is relatively safe to handle.

(1) Unscrew the fuze from the mine.

(2) Remove the fuze and mine to a safe storage or disposal area.

318. Pressure Fuzes, Models RO–5 and RO–9

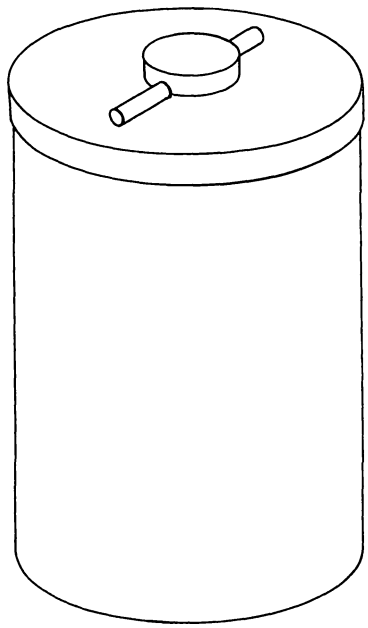


Figure 493

Both models are much alike except that the RO–9 has an integral booster charge, while the RO–5 is fitted into a separate booster charge placed in the mine. Both have shear-pin retained strikers. The fuzes are approximately 7.0 centimeters long and 5.0 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Pressure mechanical, with shear pin release.	660 to 880 lb.

b. Use. Both models are used with the Pt-Mi-K antitank mine.

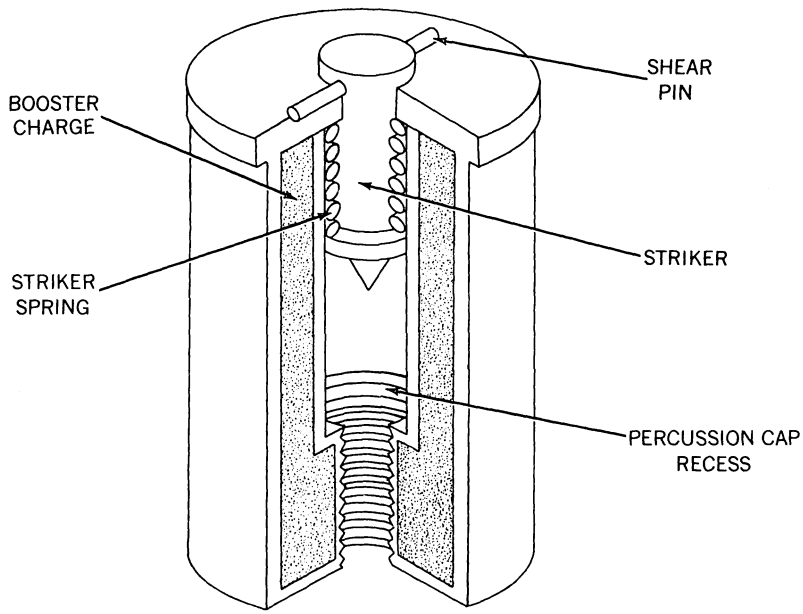


Figure 494

c. Functioning. The shear pin fails when adequate pressure is applied to the head of the striker which, driven by its spring, plunges into the percussion cap and fires the detonator.

d. Installing and Arming. Arming is merely installing either fuze in the mine.

e. Disarming Procedure. Remove the fuze from the mine and take it to a safe storage or disposal area.

319. Pressure Fuze for Antitank Mine, M/36 (Finland)

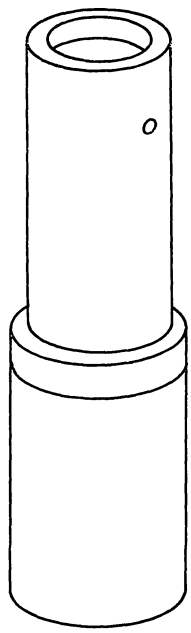


Figure 495

This fuze has a spring driven striker with a percussion cap in a holder that screws internally into the bottom of the case. It also has a detonator, and booster in a holder that screws externally on to the bottom of the case.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Pressure mechanical, with shear pin release.	Probably 300 lb or more.

b. Use. This fuze was designed as the igniter for the M/36 antitank mine.

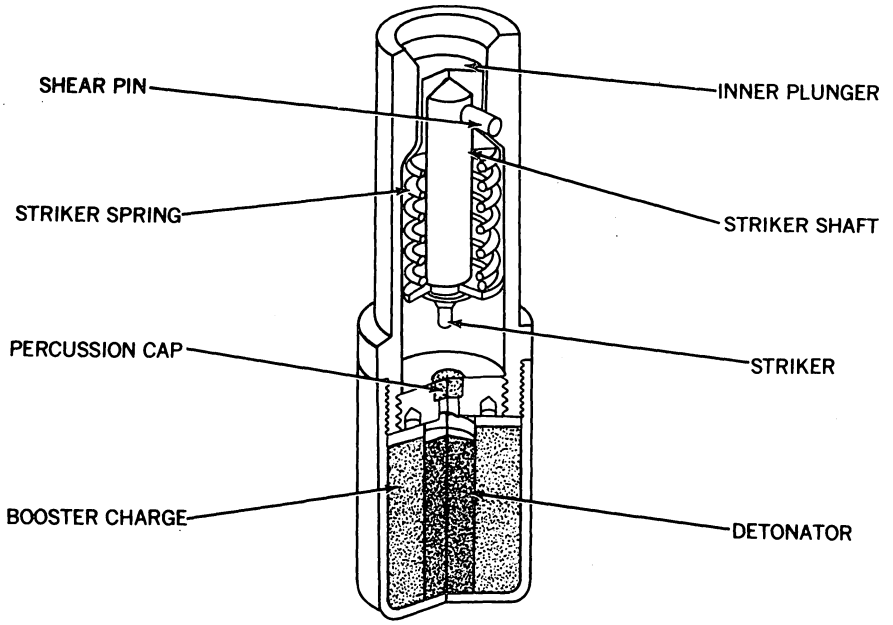


Figure 496

c. Functioning. Pressure on the pressure plug transmitted through the pressure bolt to the inner plunger breaks through the shear pin and releases the striker to fire the percussion cap and initiate the firing train.

d. Installing and Arming.

(1) Screw the percussion cap into the base of the fuze.

(2) Screw the case containing the detonator and booster into the base of the fuze.

e. Disarming Procedure.

(1) Remove the fuze from the mine.

(2) Unscrew the detonator and booster case and also the percussion cap from the base of the fuze.

(3) Remove the fuze to a safe storage or disposal area.

320. Pressure Fuze No. 44 NM (Netherlands)

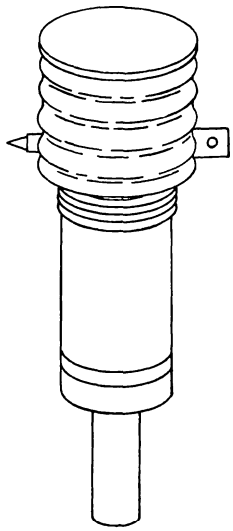


Figure 497

This is a fuze with a protective cap on top, a corrugated copper waterproofing sheath, a safety pin, a spring-loaded striker, a plunger housing, and a percussion cap and detonator assembly that screws into the bottom of the fuze case.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Pressure mechanical, with ball release.	165 lb or more.

b. Use. This fuze is used in the Type 2 (T-39 or T-40) antitank mine.

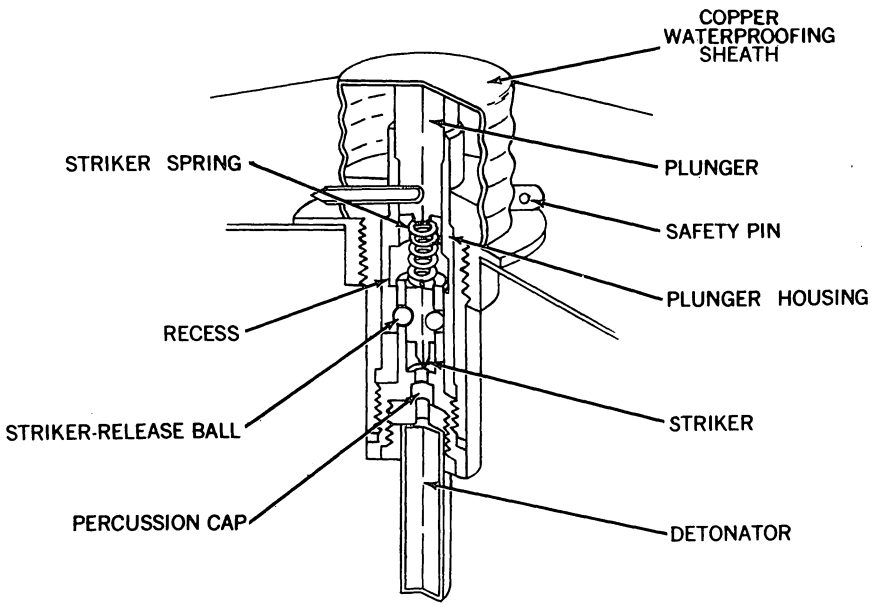


Figure 498

c. Functioning. Pressure on the fuze crushes the copper waterproofing sheath, depressing the plunger and releasing the retaining balls into the recess. This frees the striker, which, driven by its spring, slams into the percussion cap and initiates the firing chain.

d. Installing and Arming.

(1) Remove the protective cap from the mine.
(2) Screw the detonator into the base of fuze.
(3) Screw the fuze into the mine.
(4) Pull out the safety pin.

e. Disarming Procedure.

(1) Insert a safety pin or a nail or wire into the safety pin hole and unscrew the fuze from the mine.
(2) Unscrew the detonator from the fuze.
(3) Remove the fuze to a safe storage or disposal area.

321. Pressure Fuze D.Z. 35 (A), (B), and (C) (Germany)

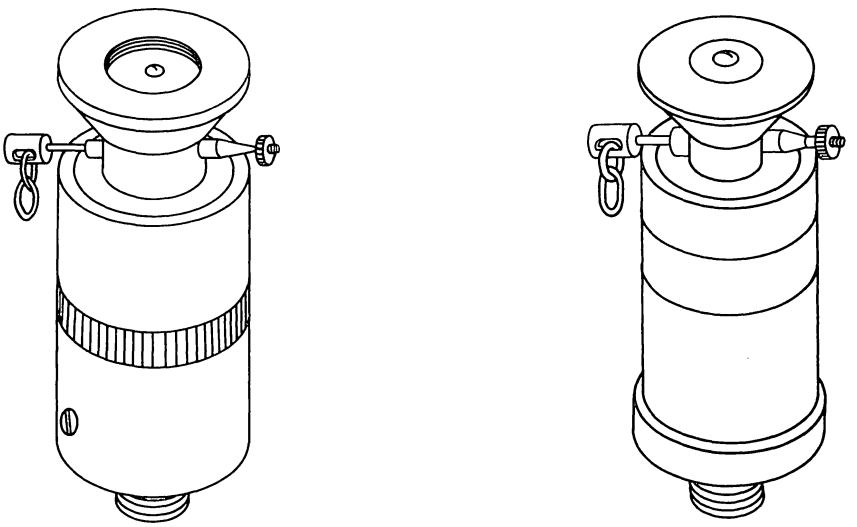


Figure 499

This model comes in three types: A, B, and C. Model A, the largest of the three, has a spring-loaded striker with a ball-release, a safety pin, and a heavy plunger spring. Model B, the smallest of the three, has a spring-loaded striker with two small retaining pins. Model C is the same as Model A except that the case is made of plastic. Models A and C are 6.9 centimeters long by 3.1 centimeters in diameter; Model B is 6.9 centimeters long by 2.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action
Tubular.....	Model A—Aluminum. Model B—Brass. Model C—Plastic.	Pressure mechanical, Models A and C, ball release; Model B, shear pin release.

Operating force
Models A and C—125 to 165 lb, Model B—65 lb

b. Use. Models A and C are generally placed in improvised wooden antitank mines. Model B is used in improvised antipersonnel mines and boobytraps.

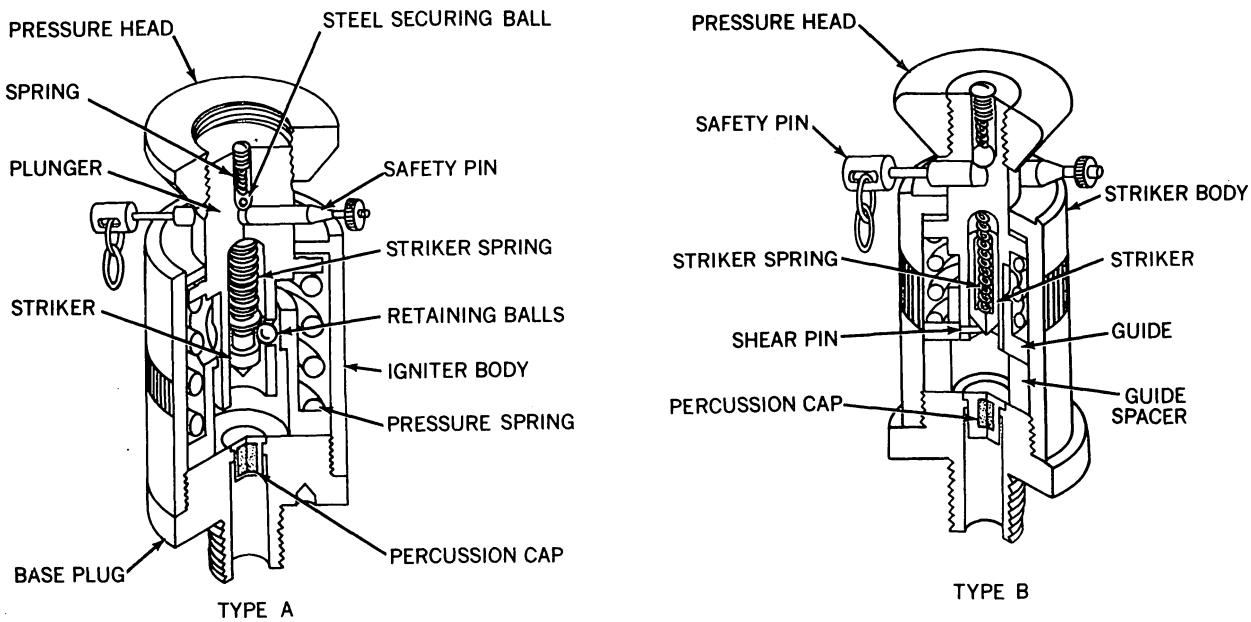


Figure 500

c. Functioning.

(1) *Models A and C.* Pressure on the pressure cap forces the plunger downward against the resistance of the plunger spring to the point where the retaining balls escape and release the striker to initiate the firing chain.

(2) *Model B.* Pressure on the pressure cap forces the plunger downward against the resistance of the pressure spring to the point where the retaining pins are forced outward into a lower space, which releases the striker to initiate the firing chain.

d. Installing and Arming (All Models).

(1) Examine the fuze to be sure that the percussion cap is intact and in place.

(2) Insert the detonator into the base of the fuze.

(3) Screw the fuze into the mine or charge.

(4) Adjust the height of the pressure cap by rotating it.

(5) Remove the retaining nut from the end of the safety pin; and withdraw the safety pin from a safe distance with a wire or string attached to the pull ring.

e. Disarming Procedure.

(1) Insert a safety pin, wire, or nail into the hole in the plunger.

(2) Remove the fuze from the mine, and unscrew the percussion cap and detonator from the fuze.

(3) Take the fuze to a safe storage or disposal area.

322. Pressure Fuze for the Type 93 Mine (Japan)

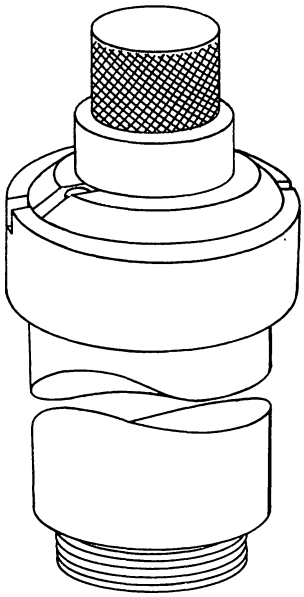


Figure 501

This fuze assembly consists of a case, spring-loaded striker, shear wire, striker guide, percussion cap, primary detonator, and main detonator. The fuze also has a knurled safety cap on top. Two types are in use—antivehicular and antipersonnel. The antivehicular fuze, type A, has a heavy shear wire; the antipersonnel fuze, type B, has a shear wire and a longer safety cap.

a. Characteristics.

Shape	Case	Internal action	Operating force	Markings
Cylindrical.	Metal..	Pressure mechanical, with shear pin release.	Antivehicular—250 lb. Antipersonnel—25 lb.	Antivehicular—unpainted. Antipersonnel—painted black on top.

b. Use. This fuze is designed for firing the type 93 antivehicular mine and improvised mines.

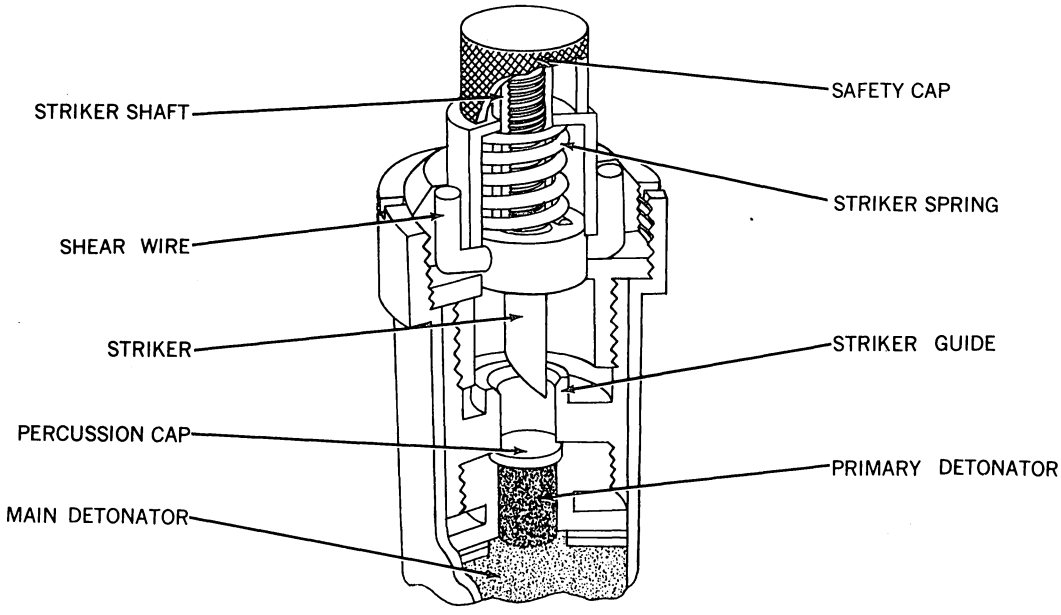


Figure 502

c. Functioning. When the safety cap is removed, pressure on the striker shaft shears the shear pin or wire and releases the striker against the percussion cap.

d. Installing and Arming.

(1) Screw the detonator into the fuze.
(2) Unscrew the safety cap.
(3) Screw the fuze into the mine.

e. Disarming Procedure.

(1) Unscrew the fuze from the mine.
(2) Unscrew the outer case of the fuze and remove the main detonator.
(3) Unscrew the percussion cap and primary detonator assembly.
(4) Remove the fuze and detonator to a safe storage or disposal area.

f. Additional Precautions: Fuzes should not be removed from mines containing picric acid explosives due to the possibility of explosive salts forming in thread area.

323. Artillery Fuze Type 88 (Japan)

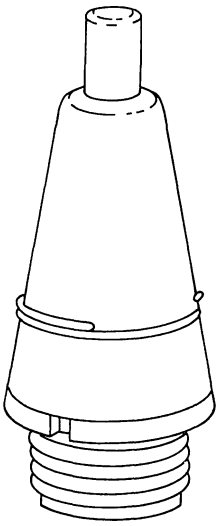


Figure 503

The aluminum plunger of the fuze, with a steel striker attached to its base, is held in forward position under spring tension against a shoulder of the fuze case. A stirrup spring, which consists of four leaf-springs projecting downward at an angle, is crimped around the striker housing. The fuze has an arming collar, circular in shape, with a groove machined around its inner surface to engage the stirrup spring. Four small safety wedges, located in the arming collar, retain the striker in cocked position. A safety fork fits into a groove in the arming collar.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cone.....	Brass or steel.....	Pressure mechanical, with safety wedge release.	20 lb (approx).

b. Use. This fuze, although designed for projectiles, was used in the nonstandard fragmentation antipersonnel mine.

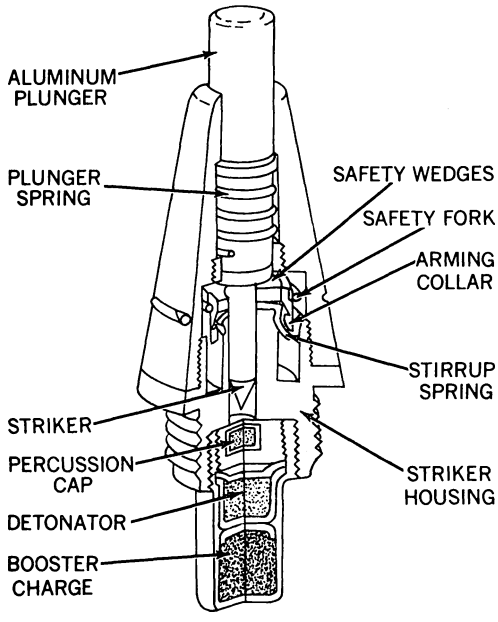


Figure 504

c. Functioning. A slight pressure on the aluminum plunger (after the arming collar and safety wedges have been removed) drives the striker down, compressing the plunger spring and forcing the striker into the percussion cap.

d. Installing and Arming.

(1) Disassemble the fuze and remove the arming collar and safety wedges.

(2) Reassemble the fuze and screw the percussion cap, detonator, and booster charge assembly into the bottom.

(3) Screw the fuze into the mine.

(4) Remove the safety fork.

e. Disarming Procedure.

(1) Insert the safety fork or a piece of wire into the transverse holes in the fuze case. (This, however, may not neutralize the fuzes as the arming collar and safety wedges may have been removed.)

(2) Unscrew the fuze from the mine, being very careful not to touch or depress the aluminum plunger.

(3) Unscrew the percussion cap, detonator, and booster assembly from the bottom of the fuze.

(4) Remove the fuze and booster assembly to a safe storage or disposal area.

324. Pressure Fuze No. 89 (United Kingdom)

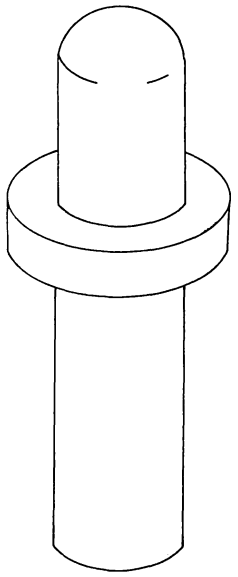


Figure 505

This antipersonnel mine fuze has an ebonite case open at one end. The metal striker is held in place by two retaining balls that in turn are held in place by a collar pressed onto the case. The fuze may be used with or without the pressure plate of the mine. The percussion cap and detonator assembly is a separate unit. The fuze is 4.5 centimeters long and 1.0 centimeters in diameter.

a. Characteristics.

Shape	Internal action	Operating force
Cylindrical...	Pressure mechanical, with ball release.	6 to 12 lb.

b. Use. This fuze is used in the No. 5 Mark 1 antipersonnel mine and the alarm M mine, a training model of the No. 5 Mark 1.

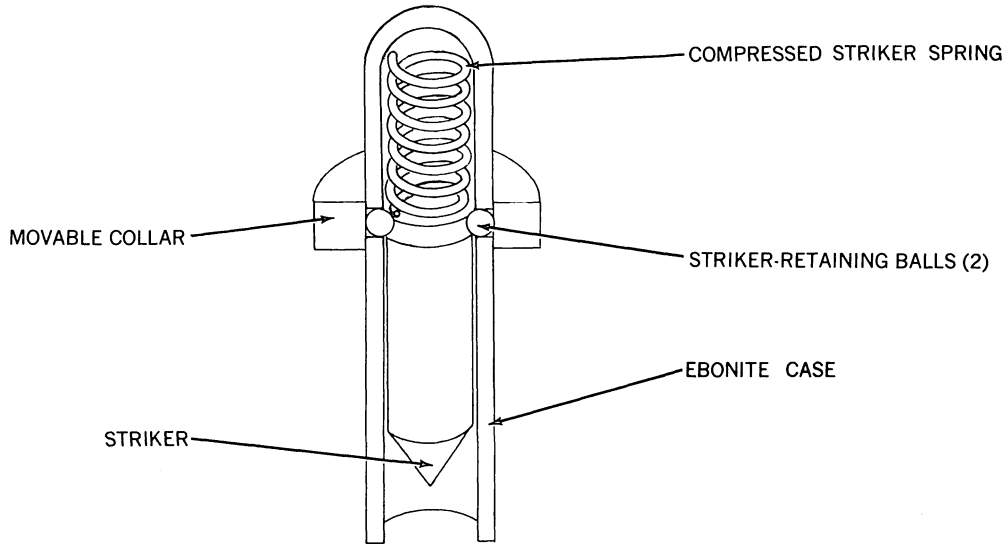


Figure 506

c. Functioning. Pressure on the closed end of the ebonite case forces it down through the collar, releasing the striker retaining balls and then the striker, which hits the percussion cap.

d. Installing and Arming.

(1) Insert the separate detonator assembly into the fuze well.

(2) Insert the fuze so that the collar rests on top of the mine. If the pressure plate is used, it should be placed on the fuze before the fuze is inserted in the mine.

e. Disarming Procedure.

(1) Carefully lift the fuze from the mine and remove the detonator assembly. Avoid touching the collar on the fuze, as it has to move only a fraction of an inch to free the striker retaining balls.

(2) Remove the fuze and mine to a safe storage or disposal area.

325. Pressure Fuze, Model RO–7–11 (Czechoslovakia)

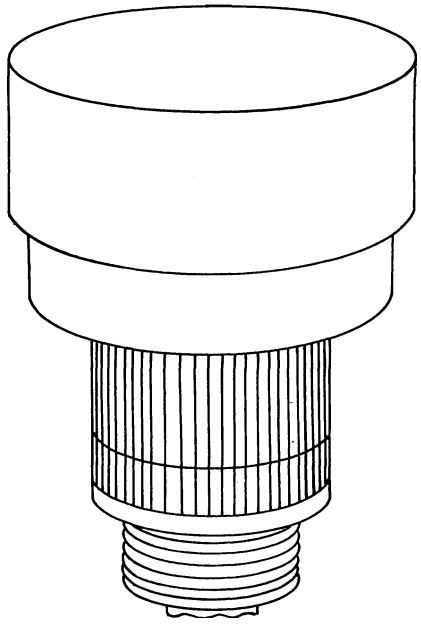


Figure 507

The Model RO–7–11 fuze has a plastic body with a plastic cap cemented on the top. It has only two metallic parts—the striker point and the helical striker spring, which rests between the cap and the striker. The fuze is 4.1 centimeters long and 2.8 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Plastic.....	Pressure mechanical, with shear release.	300–500 lb.

b. Use. This plastic-cased model is used as a pressure igniter in the PP-Mi-Ba bakelite antitank mine.

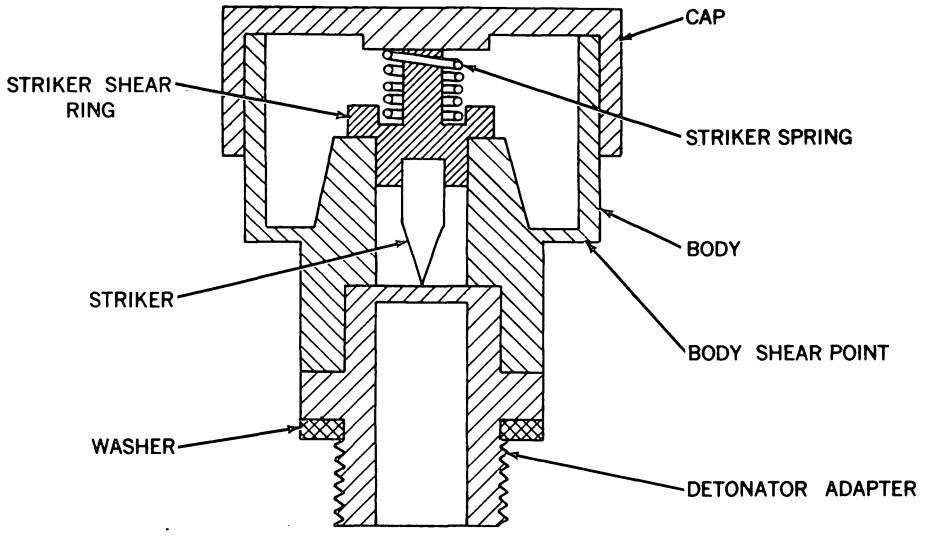


Figure 508

c. Functioning. A pressure load on the cap causes the failure of the body shear point, compressing the striker spring and breaking off the striker shear ring, which releases the striker to actuate the detonator.

d. Installing and Arming.

(1) Remove the detonator retaining collar.
(2) Insert the detonator in the collar.
(3) Screw the collar with the detonator back into the fuze.
(4) Screw the fuze-detonator unit into the threaded well of the booster block.
(5) Install the assembly in the mine.

e. Disarming Procedure.

(1) Remove the booster and fuze assembly from the mine.
(2) Unscrew the fuze from the booster.
(3) Unscrew the detonator retaining collar from the fuze.
(4) Remove the detonator.
(5) Take the fuze to a safe storage or disposal area.

326. Pressure Fuze, 42/2 (Italy)

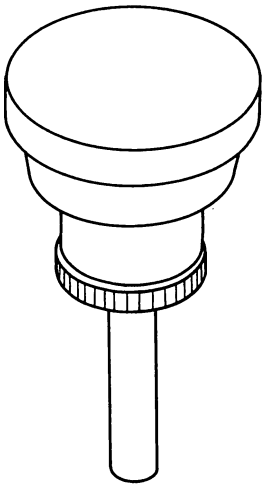


Figure 509

This small pressure-actuated fuze consists of a body, a cover, a plunger, and a detonator retaining ring. The striker pin is the only metallic part. The plunger is held in place by a shear collar. The upper end of the body has a cover cap; and the bottom, a detonator retaining-ring. The fuze measures 3.7 centimeters in diameter and 3.0 centimeters in length.

a. Characteristics.

Shape	Case	Internal action	Operating pressure
Cylindrical...	Synthetic plastic.	Pressure mechanical, with shear collar release.	220 lb (approx).

b. Use. It serves as a primary fuze for the CS 42/2, CS 43/3, and CC 48 antitank mines and improvised mines and boobytraps.

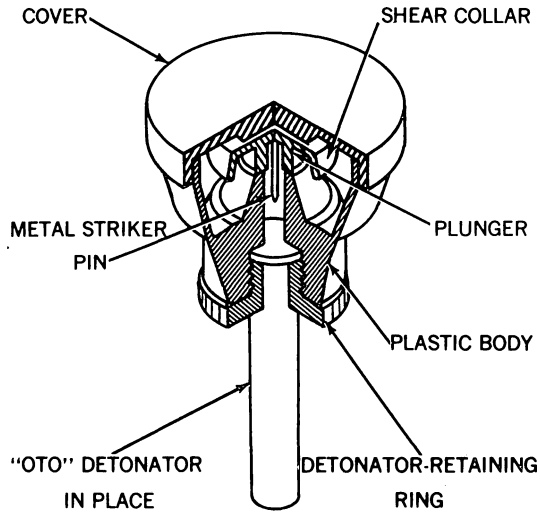


Figure 510

c. Functioning. Force of specified proportions on the top shatters the body. This brings pressure on the plunger, which forces the shear collar down over its supporting tip, releasing the striker to slam against the detonator.

d. Installing and Arming.

(1) Unscrew the detonator retaining ring.
(2) Insert an OTO detonator.
(3) Screw the retaining ring back onto the fuze body.
(4) Insert the fuze and detonator into the mine.

e. Disarming Procedure.

(1) Remove the fuze and detonator from the mine.
(2) Unscrew the detonator retaining ring and remove the detonator from the fuze.
(3) Take the fuze to a safe storage or disposal area.

327. Pressure Fuze, PMC 43 (Italy)

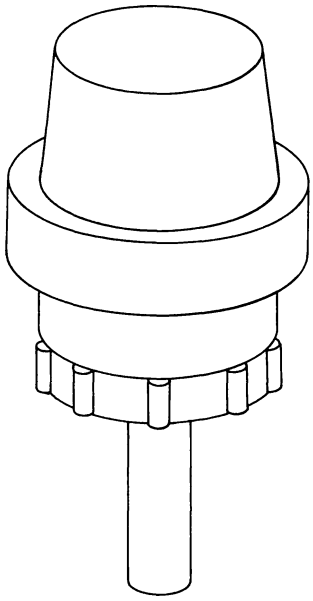


Figure 511

This plastic pressure fuze is approximately 30 centimeters in diameter and about 35 centimeters high. It operates on the shear principle. The striker pin is its only metallic part. The lower end of the fuze is provided with a detonator retaining ring.

a. Characteristics.

Shape	Case	Color	Internal action	Operating pressure
Cylindrical.	Plastic.	Varies.....	Pressure mechanical.	30 lb (approx).

b. Use. This model fuze is used in standard and improvised mines and boobytraps.

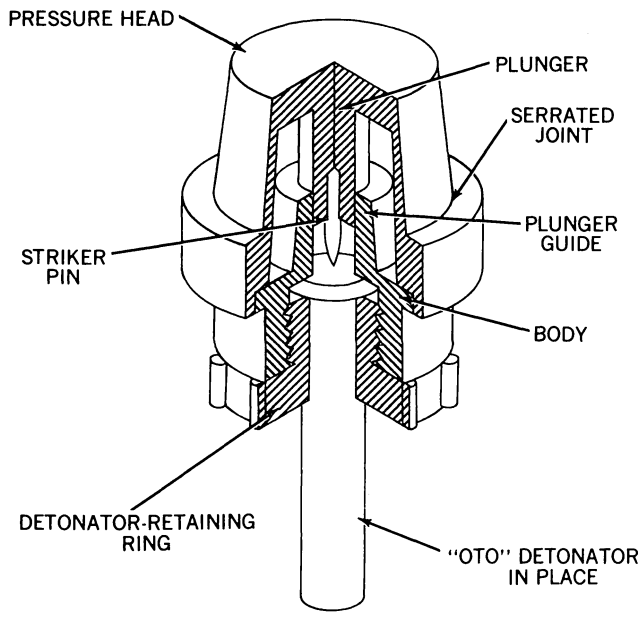


Figure 512

c. Functioning. Pressure on the top ruptures the serrated joint, forcing the plunger downward and firing the OTO detonator. This fuze may not function if buried under more than two inches of cover.

d. Installing and Arming.

(1) Remove the detonator retaining ring.

(2) Emplace the detonator and screw the retaining ring back onto the fuze.

(3) Place the armed fuze in the mine or charge.

e. Disarming Procedure.

(1) Remove the fuze from the mine or charge.

(2) Unscrew the retaining ring from the fuze and remove the detonator.

(3) Remove the fuze to a safe storage or disposal area.

328. Pressure, Pressure-Release Tellermine Fuze 43 (T.Mi.Z. 43) (Germany)

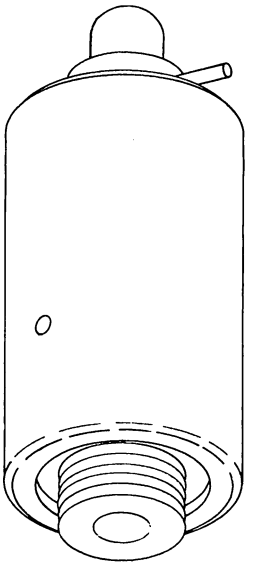


Figure 513

The Tellermine fuze 43 consists of an outer case, 5.6 centimeters in length and 2.2 centimeters in diameter. Inside is an outer sleeve that extends through the top of the casing, and a spring-loaded striker and striker rod. This is an antiremoval, antitank mine fuze. It closely resembles Tellermine fuze 42. The only noticeable difference is that the plunger of fuze 43 projects higher above the top than the end of the striker of fuze 42, and the shear pin of fuze 43 does not rest flush on top of the fuze as does that of the fuze 42. This fuze is also adaptable to pressure-release actuation.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Pressure mechanical, with shear pin and ball release.	400 lb (approx).

b. Use. Although this fuze was designed especially for Tellermine 43, it can also be used in Tellermines 35 (steel) and 42.

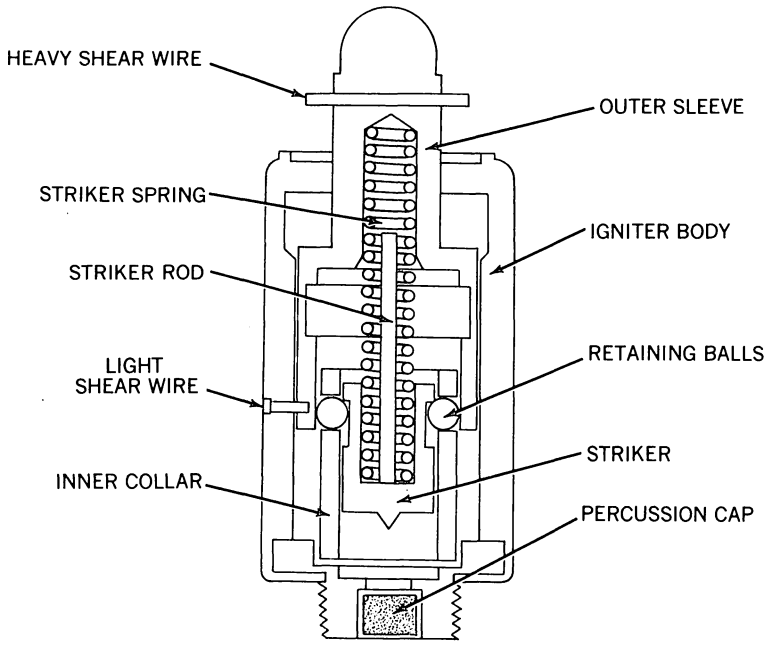


Figure 514

c. Functioning.

(1) *Pressure.* Pressure on the top of the plunger moves it downward, compressing the striker spring until the pressure pin bears on the top of the fuze case. The plunger then shears the shear pin and depresses further until the retaining-balls drop into their recesses, freeing the striker against the percussion cap.

(2) *Pressure-release.* Removing the pressure from the top of the plunger causes it to rise up under the force of the compressed striker spring until the retaining-balls are uncovered and fall into their recesses, freeing the striker to fire the percussion cap.

d. Installing and Arming.

(1) Attach a detonator to the fuze by screwing it into the base with a detonator retaining collar.

(2) Place the fuze into the mine.

(3) To arm the fuze, screw down pressure plug of the mine so that it bears on the end of the plunger, pressing against it until a click is heard. The click indicates that the arming shear pins that hold the plunger to the case of the fuze have sheared off. The plunger is now free to move upward under pressure-release or downward under pressure.

e. Disarming Procedure. Once this fuze has been armed, it cannot be removed from the mine or disarmed. It must be destroyed in place with the mine.

329. Antidisturbance Fuze, Model 1952 (France)

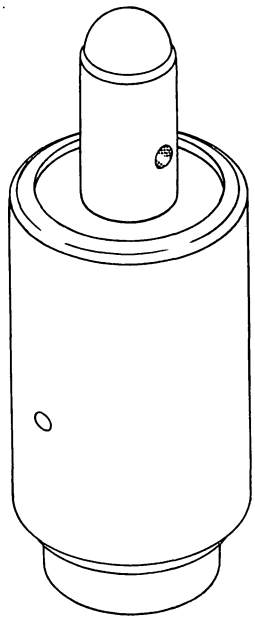


Figure 515

This is a copy of the World War II German T.Mi.Z. 43 fuze. It is the instantaneous mechanical type actuated either by pressure or pressure-release. The fuze is enclosed in a circular steel case 2.28 centimeters in diameter and 5.7 centimeters high. The plunger is fitted with a shear pin and retaining balls.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Steel.....	Pressure mechanical or pressure release.	330 lb (approx).

b. Use. This fuze is used with the Model 1948 antitank mine or with the offset fuzing device that actuates the plate-charge and shaped-charge mines.

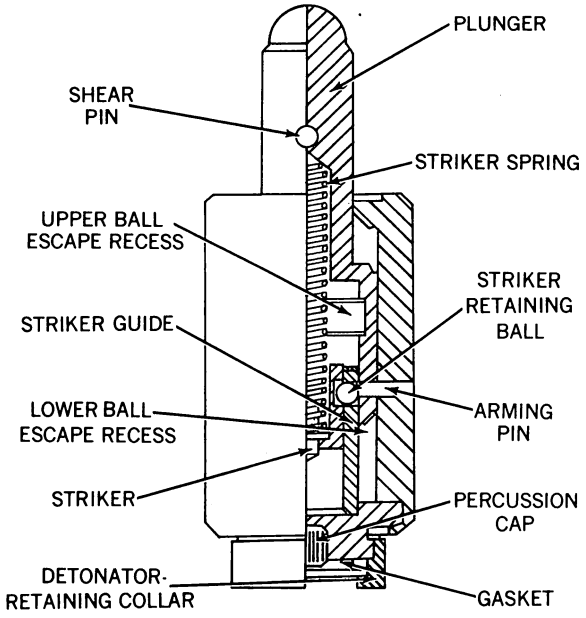


Figure 516

c. Installing and Arming. Attach the detonator (AP–38 short) to the fuze by means of the detonator retaining collar. The fuze is automatically armed when the cover of the Model 1948 antitank mine (or the cover of the offset fuzing device) is screwed down and the fuze arming pin is sheared, which produces a distinct click.

d. Disarming Procedure. This fuze cannot be disarmed. *Destroy the mine so fitted in place.*

330. Impact Fuze (Ice Mine) (Finland)

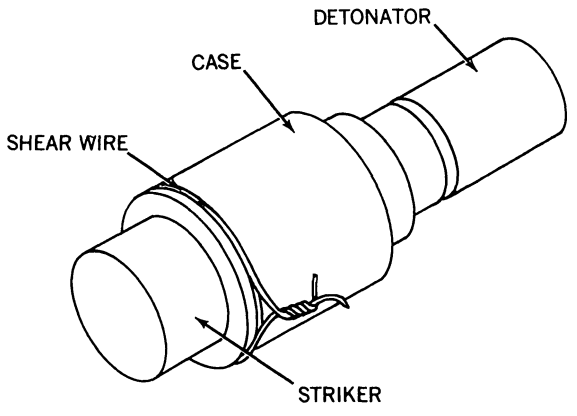


Figure 517

This fuze consists of a case 3.7 centimeters long and 1.5 centimeters in diameter, a striker assembly, and a percussion cap. Like many other fuzes the diameter varies, the lower being smaller than the upper and grooved for crimping the detonator thereto. The striker, which projects above the upper portion of the case, is held in position above the percussion by a shear wire that passes through both the striker and the case. The ends of the shear wire are twisted together outside of the case.

a. Physical Features.

Shape	Case	Striker	Color	Internal action	Operating pressure
Cylindrical.	Brass. .	Aluminum.	Natural	Impact mechanical.	Operates only on impact; a steady pressure will not set it off.

b. Use. This impact fuze is used with the ice mine.

c. Functioning. Impact on the aluminum striker drives down the striker and causes the failure of the shear wire. The striker then explodes the percussion cap and in turn the detonator.

d. Installing and Arming.

(1) Crimp the detonator to the fuze.

(2) Seat the fuze and detonator in the mine.

e. Disarming Procedure. As it is too dangerout to try to separate the detonator from the fuze case, the fuze should not be disarmed.

331. Impact Pressure Fuze, PX–32 (Germany)

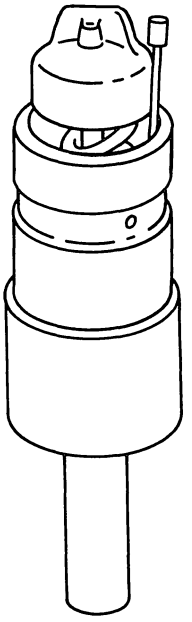


Figure 518

This is a pressure impact fuze in a case 8.8 centimeters long and 2.5 centimeters in diameter. The upper end of the striker is attached to the impact head by an adjusting value that is screwed down to compress the pressure spring between the impact head and the striker housing. A safety pin passes through the gap between the top of the striker housing and the impact head. The lower end of the safety pin fits into a hole in one end of the wing-shaped safety toggle, which is pushed clear of the percussion cap by a spring.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Impact mechanical, with shear pin release.	20 lb or more.

b. Use. This fuze is employed as an impact igniter for assault demolition charges.

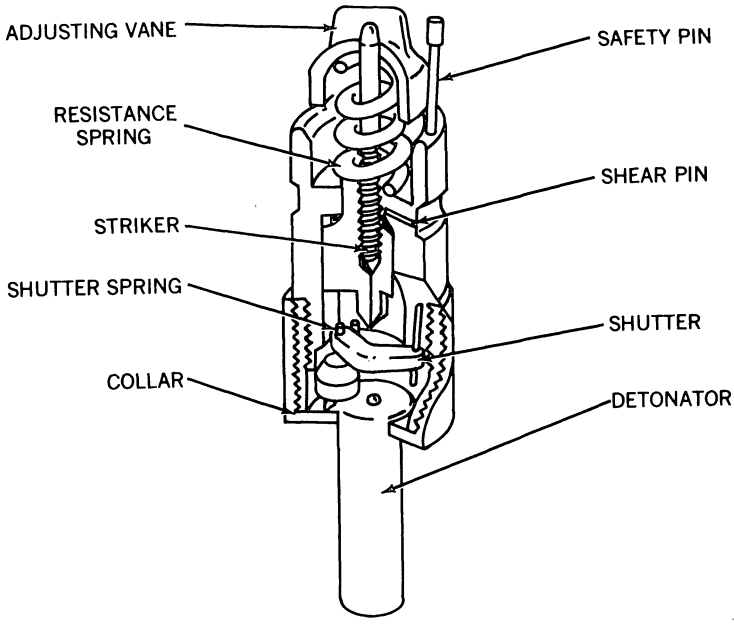


Figure 519

c. Functioning. A sudden impact on the impact head compresses the pressure spring, shears the shear pin, and forces the striker against the percussion cap to fire the detonator and the main charge.

d. Installing and Arming.

(1) Remove the collar from the base, insert the percussion cap and detonator, and replace the collar to hold them in position.

(2) Insert the fuze in the charge.

(3) Remove the safety pin.

Note. The fuze generally comes with fuze and detonator attached, in which case step (1) will not be required.

e. Disarming Procedure.

(1) Remove the fuze and detonator from the charge.

(2) Unscrew the collar and remove the percussion cap and detonator.

(3) Remove the fuze to a safe storage or disposal area.

332. Percussion Fuze (Japan)

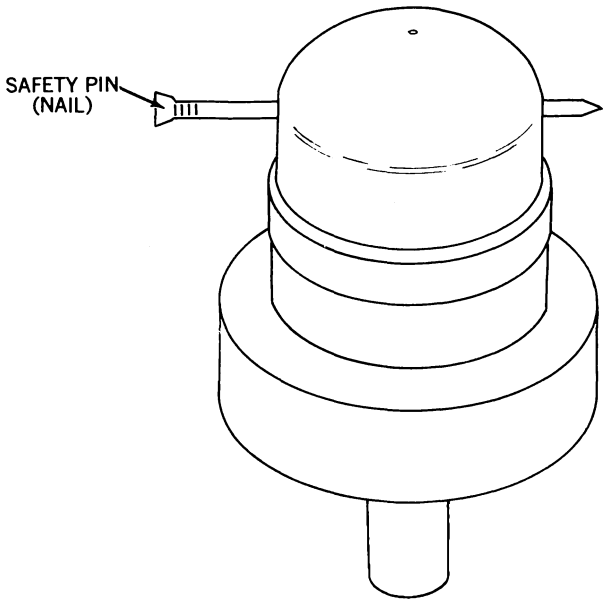


Figure 520

This fuze contains a striker and a percussion cap with a hair spring that permits striker contact after the safety pin has been removed. The striker and percussion cap holder rests in a well above the detonator and does not fasten in any way to the brass case.

a. Characteristics.

Shape	Case	Internal action
Cylindrical.....	Brass.....	Mechanical, with hair spring retained striker.

b. Use. This fuze was designed for use in the Molotov cocktail.

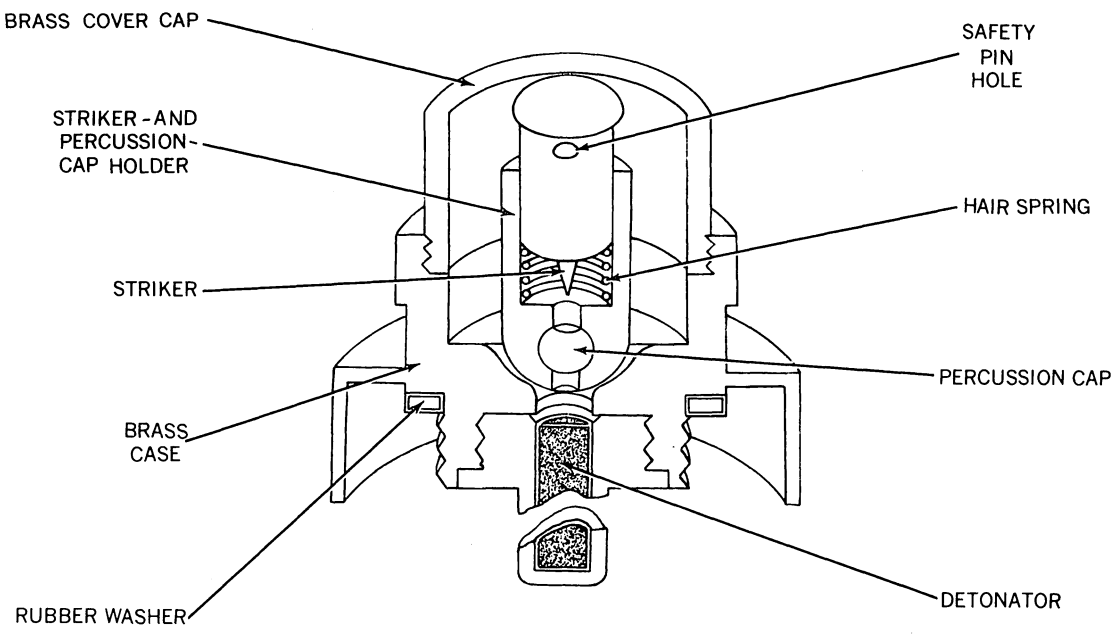


Figure 521

c. Functioning. After the safety pin has been removed the fuze functions when a sudden jar or shock causes the striker, held in place by a weak hair spring, to hit against and fire the percussion cap. The flame from the percussion cap sets off the detonator.

d. Installing and Arming.

(1) Screw the detonator into the base of the fuze.

(2) Remove the safety pin.

e. Disarming Procedure. After the safety pin has been pulled, it cannot be replaced in the safety pin hole. Thus, mines equipped with this fuze should be destroyed in place. If removal intact is necessary.

(1) Carefully unscrew the brass cover cap and lift out the striker and percussion cap holder.

(2) Unscrew the detonator from the fuze.

(3) Remove the fuze to a safe storage or disposal area.

333. Weissman Pressure and Impact Fuze (Germany)

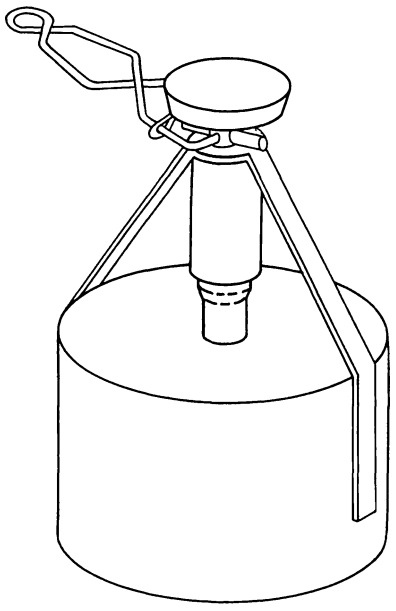


Figure 522

This fuze has a spring-loaded striker, at the top of which is a grooved pressure head. The striker bolt is held in place by a safety device and a 1.2-centimeter diameter glass rod, which passes through a hole in the bolt. The safety device is a small pair of tongs with turned-in ends that fit into another housing in the bolt and are retained in position by a small spring clamp. The percussion cap and short No. 8 detonator are in the base. The fuze is 6.0 centimeters long (w/detonator) by 1.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Tubular.....	Metal.....	Pressure mechanical, with glass shear rod release.	10 to 20 lb.

b. Use. This fuze was designed for use as a pressure fuze in improvised mines, or as an impact fuze with prepared charges in an assault on a fortified position.

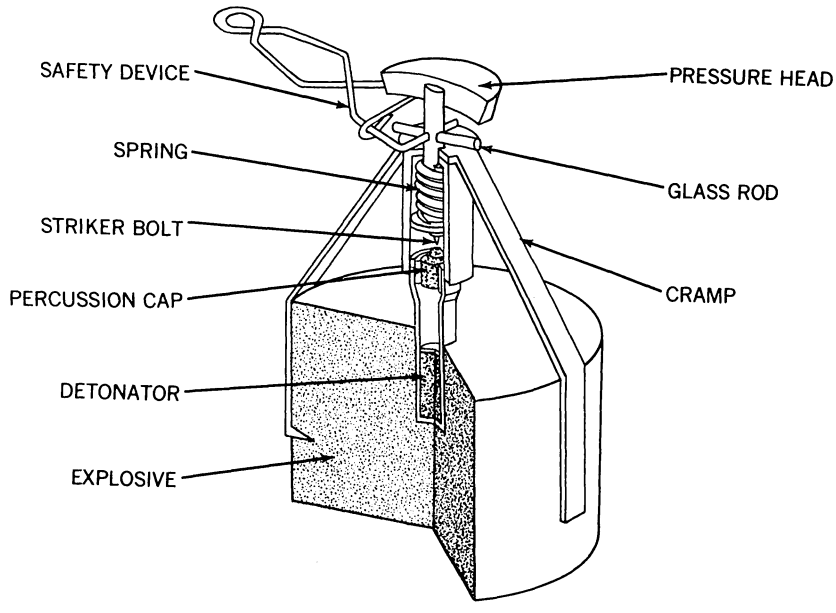


Figure 523

c. Functioning. Impact or pressure on the pressure head breaks the glass rod, releasing the striker to fire the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Insert the percussion cap and detonator assembly into the bottom of the fuze.

(2) Clamp the fuze to the main charge with the metal clamp.

(3) Remove the safety pin from the fuze.

e. Disarming Procedure.

(1) Inspect the glass rod to see whether it has been cracked or damaged. (If so, destroy the fuze in place with a prepared charge.)

(2) Carefully insert both ends of a wire or other suitable safety pin in both ends of the safety pin hole.

(3) Unclamp the fuze from the main charge and separate the percussion cap and detonator assembly from the fuze.

(4) Remove the fuze and detonator assembly to a safe storage or disposal area.

334. Topf Mine Fuze, SF1 (To. Mi. Z. SF1) (Germany)

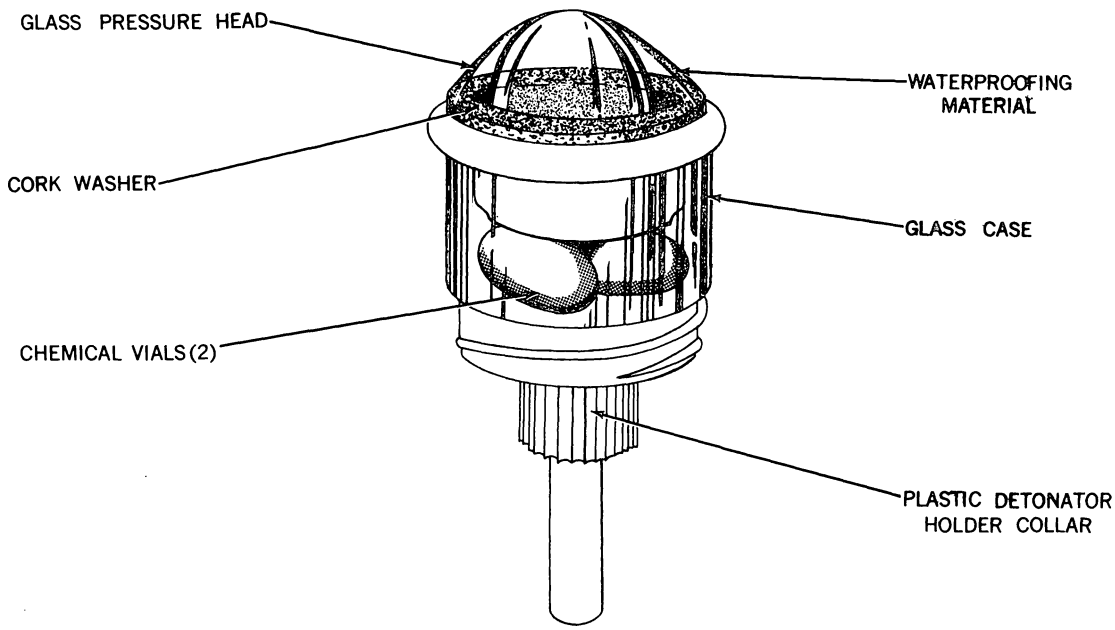


Figure 524

The SF1 has a chemical that produces a flame. The unit consists of a cylindrical glass case with a round thick glass pressure head that is glued to a cork washer. Inside the core and glued to a celluloid disk are two glass vials, one containing ethyl nitrate and the other a potassium and sodium compound. The case is threaded in the base to fit into a plastic detonator holder. The fuze with detonator attached is 8.8 centimeters high and 30.4 centimeters in diameter. It is waterproofed by a coat of thin plastic like material.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Glass.....	Pressure chemical with shear rim and shear groove release.	132 lb or more.

b. Use. This fuze was designed for use in the nonmetallic antitank Topfmine.

(No drawing available.)

c. Functioning. Pressure on the glass pressure head shears off the glass rim of the pressure head at the shear groove, the pressure head then crushes the two glass vials of chemical. The chemical reaction produces a flame that sets off the detonator.

d. Installing and Arming.

(1) Insert a nonmetallic detonator into the plastic detonator-holder collar and screw it to the base of the fuze.

(2) Screw the fuze into the wooden fuze adapter in the Topfmine.

e. Disarming Procedure.

(1) Remove the fuze from the wooden fuze adapter.

(2) Unscrew the plastic detonator holder and remove the detonator.

(3) Take the fuze to a safe storage or disposal area.

335. Buck Chemical Fuze, Types A and B (Germany)

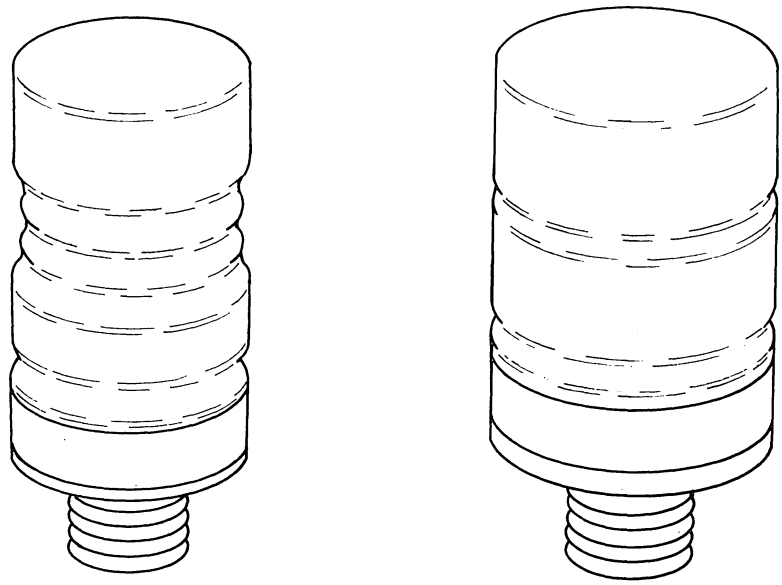


Figure 525

This fuze is a thin metal alloy foil drum containing a glass ampoule of sulphuric acid and a white powdered flash composition containing napthalene. A waterproof paper disk confines the flash powder in the fuze and prevents the entry of water. The bottom of the drum has a standard thread that screws into a German boobytrap demolition device. The Germans produced two types of this fuze, Type A and B. In type A the glass vial stands on end; in type B the glass vial which contains a purple colored acid and is protected by cotton, rests on its side.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass tube and aluminum alloy foil.	Pressure-chemical...	5 lb (approx).

b. Use. This fuze is used chiefly with the antipersonnel "pot" mine; but it is adaptable for any type of German boobytrap or demolition device.

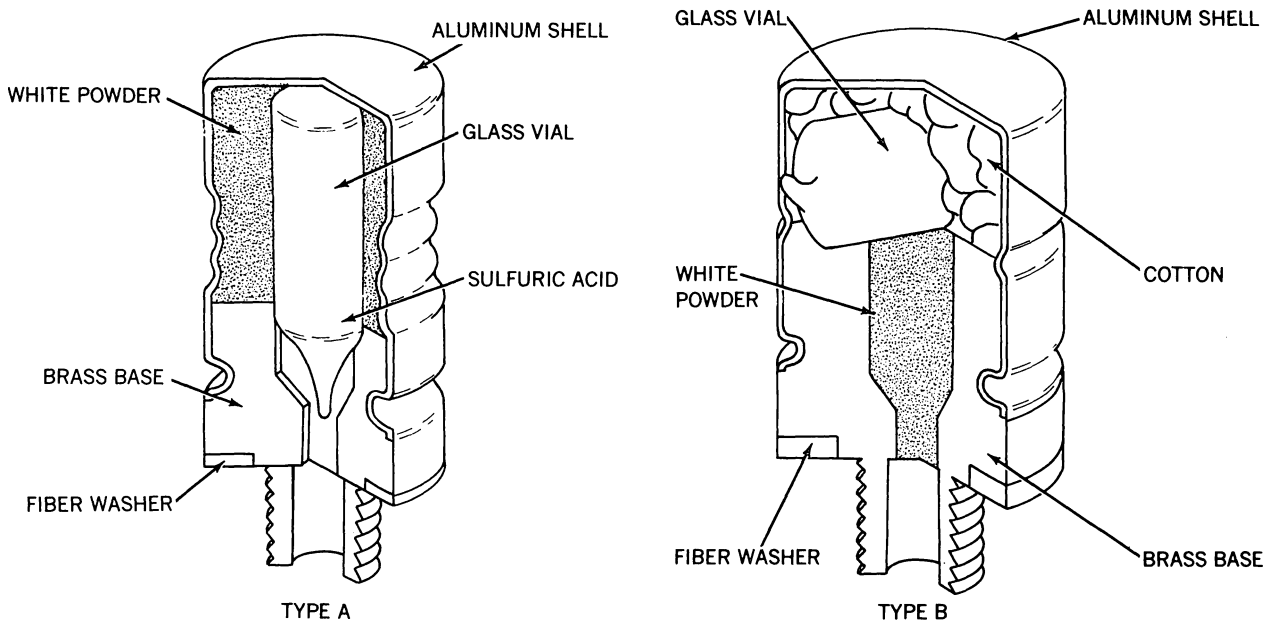


Figure 526

c. Functioning. Pressure on the top dents the foil drum and breaks the ampoule, after which the sulphuric acid mixes with the powdered flash composition. This forms a flash that sets off the detonator.

d. Installing and Arming.

(1) Unscrew the plastic shipping cap and and insert a detonator in the bottom of the fuze.

(2) Holding the fuze at its base, screw it into the mine or charge.

e. Disarming Procedure.

(1) Holding the fuze at its base, unscrew it from the mine or charge.

(2) Remove the detonator from the base of the fuze.

(3) Remove the fuze to a safe storage or disposal area.

336. Chemical Fuze SF18 (D.Z. SF18) (Germany)

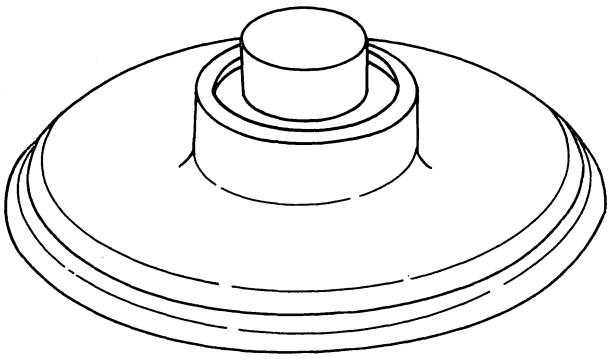


Figure 527

This fuze is an integral part of the glass separator plate situated between the glass pressure plate and the charge of the glass mine 43 (par. 305). The fuze is similar to the Topfmine fuze SF1 (par. 334), having a glass pressure head with a shear rim above two vials of chemical glued to a celluloid disk.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Non-metallic..	Pressure-chemical.	37 lb or more.

b. Use. This fuze is designed especially for use with the glass mine when emplaced under water.

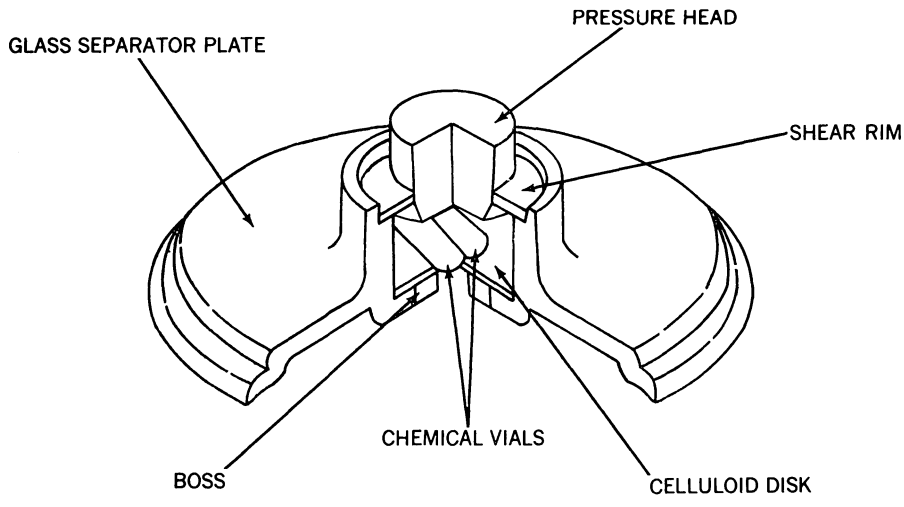


Figure 528

c. Functioning. Pressure on the glass pressure head shears off the glass rim, allowing the pressure head to crush the two vials of chemicals. The chemical reaction between the two chemicals creates a flame that sets off the detonator.

d. Installing and Arming. Place the fuze on the main charge in the bottom of the glass mine 43 so that the edge of the glass fuze housing rests on the ledge inside the mine.

e. Disarming Procedure. **Mines with this fuze should be blown in place.**

337. Pressure-Chemical Fuze, Model 1949 (France)

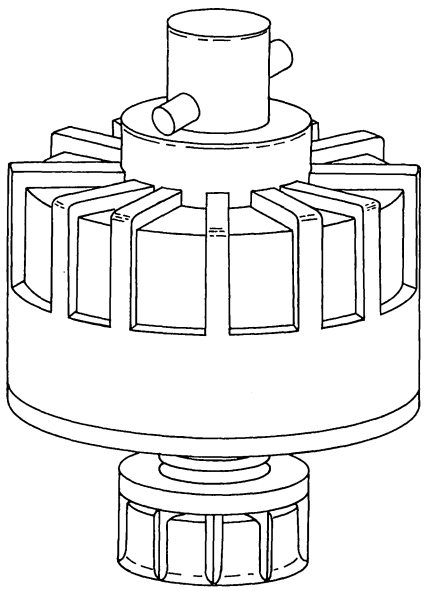


Figure 529

This is essentially a cylindrical case 4.0 centimeters long and 3.0 centimeters in diameter containing a vial of acid, a chemical pellet, and a plunger that rests on the vial and extends above the case. The lower threaded portion of the case is protected by a transit cap. This fuze is not detectable by ordinary electronic devices, as it is constructed entirely of nonmetallic materials.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Bakelite....	Pressure-chemical.	44 lb.

Markings
Roman letters, in relief, on top of case, for example, ICO."

b. Use. It is used in the Model 1948 undetectable antipersonnel mine and in improvised mines.

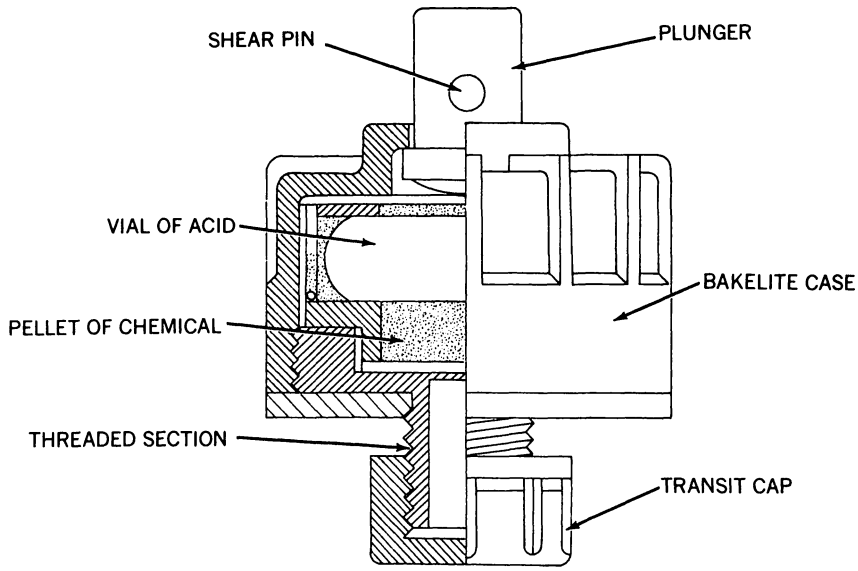


Figure 530

c. Functioning. Pressure on the top of the plunger causes the failure of the shear pin and forces the plunger down, breaking the vial of acid. The acid, mixing with the chemical, produces a flash that explodes the detonator.

d. Installing and Arming.

(1) Unscrew the transit cap from the base of the fuze.

(2) Place a Model 1950 detonator (or a No. 8 blasting cap) in the mine.

(3) Insert the fuze without putting pressure on the top of the plunger.

e. Disarming Procedure.

(1) Remove the fuze from the mine without putting any pressure on the top of the plunger.

(2) Remove the detonator from the mine.

(3) Take the fuze to a safe storage or disposal area.

338. Pressure-Chemical Fuze, Model 1950 (France)

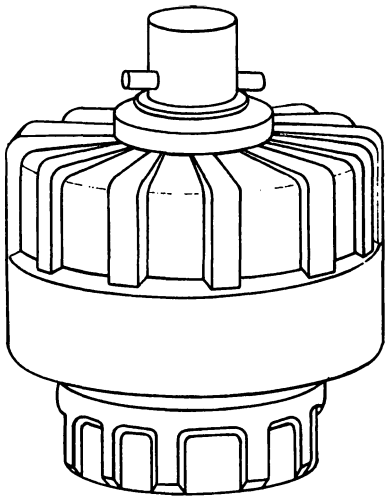


Figure 531

This device consists of a plunger, detonator retaining ring, vial of acid, and a chemical pellet enclosed in a case 5.5 centimeters long and 3.0 centimeters in diameter. The case is strengthened on the outside by the addition of vertical ribs; the lower portion is threaded to accommodate the detonator retaining ring. The plunger, held in place by a shear pin, rests on the vial.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Bakelite....	Pressure-chemical, with shear pin release.	77 lb.

b. Use. This fuze is used with the Model 1947, Model 1951, Model 1951 probe-proof, and Model 1951 undetectable shaped-charge antitank mines.

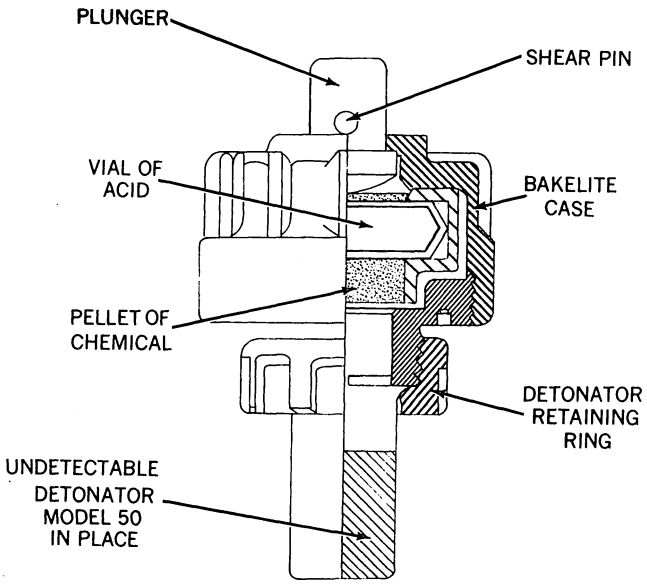


Figure 532

c. Functioning. When adequate pressure is exerted on the head of the plunger, the shear pin fails, and the plunger, forced downward, crushes the vial of acid. The acid, mixing with the chemical, causes a flash that sets off the detonator.

d. Installing and Arming.

(1) Remove the detonator retaining ring.
(2) Insert the detonator (Model 1950, undetectable).
(3) Replace the detonator retaining ring.
(4) Place the fuze in the well of the mine.

e. Disarming Procedure.

(1) Remove the fuze from the fuze well of the mine.
(2) Unscrew the detonator retaining ring and separate the detonator from the fuze.
(3) Remove the fuze to a safe storage or disposal area.

339. Pressure-Chemical Fuze No. 98 Mark 1 (United Kingdom)

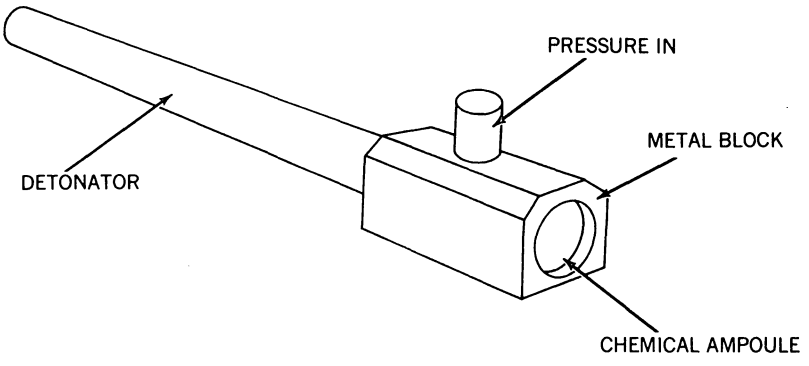


Figure 533

This instantaneous pressure fuze is a hollow metal block with an ampoule of chemical inserted in one end and a detonator in the other. A pressure pin is placed in a hole in the top of the metal block directly over the ampoule.

a. Characteristics.

Shape	Internal action	Operating pressure
Irregular.....	Pressure-chemical .	10 to 20 lb.

b. Use. This fuze was designed as the igniter for the Hawkins grenade mine.

(No drawing available.)

c. Functioning. Force on the pressure pin crushes the ampoule of chemical, after which a reaction takes place, producing a flame that sets off the detonator.

d. Installing and Arming.

(1) Lift the pressure pin and insert the ampoule of chemical in the one end of the metal block.

(2) Insert the detonator in the opposite end of the block.

(3) Place the fuze in the mine.

e. Disarming Procedure.

(1) Remove the fuze from the mine.

(2) Remove the detonator and chemical ampoule from the metal block.

(3) Take the fuze to a safe storage or disposal area.

340. Pressure Fuze (S.Mi.Z. 35) (Germany)

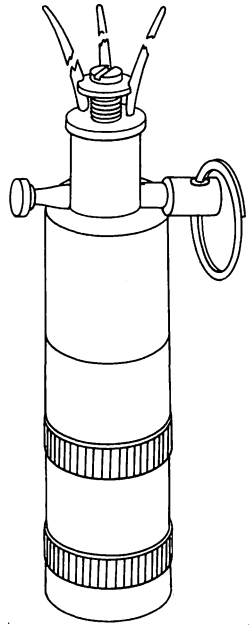


Figure 534

The S.Mi.Z. 35 is a prong-topped pressure fuze in three parts—upper housing, center housing, and lower housing. The upper housing contains the pressure spring and plunger which has three prongs attached to its upper end. The central housing serves as a guide for the plunger; and the lower part contains the percussion cap and threads for attachment to the mine. The fuze is 9.5 centimeters long and 1.8 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Aluminum..	Pressure mechanical, with ball release.	8 to 10 lb.

b. Use. This is a specially designed fuze for the S or bounding mine. Usually the tips of the prongs or antennae extend above the ground.

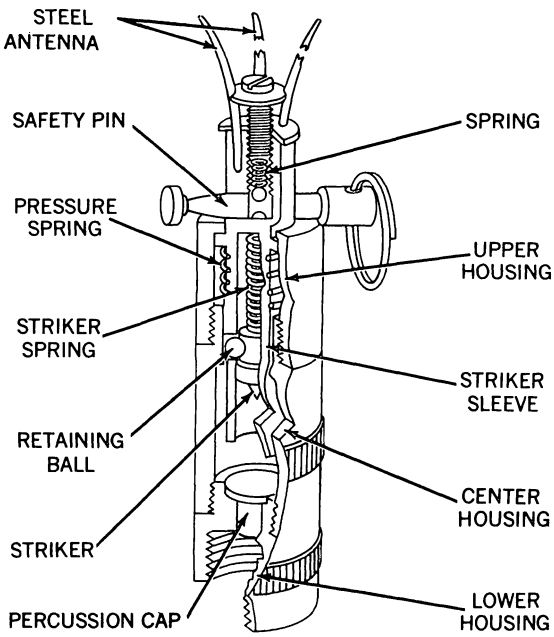


Figure 535

c. Functioning. Pressure applied on the prongs overcomes the resistance of the pressure spring and depresses the plunger. At a certain point, this depression frees the retaining balls and releases the striker, which is then driven into the percussion cap. This fires the percussion cap and continues the firing chain.

d. Installing and Arming.

(1) Screw the fuze into the mine.
(2) Place the mine in the ground.
(3) Unscrew the retaining nut from the end of the safety pin and withdraw the safety pin.

e. Disarming Procedure.

(1) Insert a nail or wire in the safety-pin hole.
(2) Remove the fuze from the mine and unscrew the percussion cap.
(3) Take the fuze to a safe storage or disposal area.

341. Pressure Fuze, Model RO–8 (Czechoslovakia)

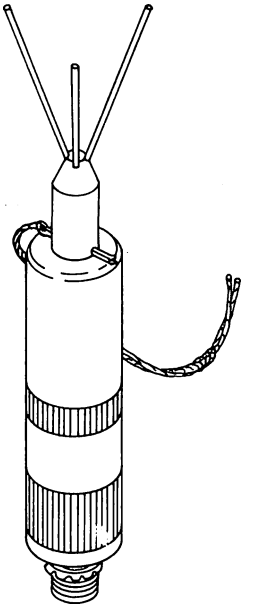


Figure 536

This fuze has a three-pronged plunger and a ball-retained striker. A safety pin is inserted through the plunger at the top of the fuze case. The fuze measures 10.7 centimeters in length and 1.7 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Steel.....	Pressure mechanical, with ball release.	8.0 lb (approx).

b. Use. This pressure fuze is used primarily in the PP–Mi–Sr bounding shrapnel mine.

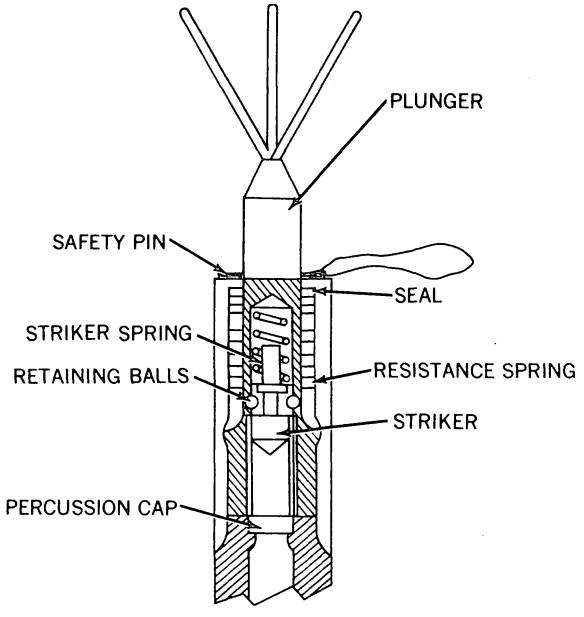


Figure 537

c. Functioning. Pressure on the three prongs depresses the plunger and compresses the creep spring, which also compresses the striker spring, permitting the retaining balls to escape into the recesses in the side of the case. The striker spring, at the release of the retaining balls, drives the striker into the detonator, starting the firing chain.

d. Installing and Arming.

(1) Screw the fuze into the mine.

(2) Remove the safety pin.

e. Disarming Procedure.

(1) Insert the safety pin into the hole in the plunger.

(2) Unscrew the fuze from the mine.

(3) Remove the fuze to a safe storage or disposal area.

342. Pressure-Pull Fuze 44 (S.Mi.Z. 44) (Germany)

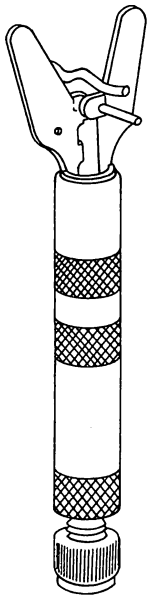


Figure 538

The fuze consists of a case threaded to accept an adapter into which is secured an igniter cap and a spring-loaded striker retained in cocked position by two winged detents, the jaws of which engage in recesses machined in the striker spindle. The detents are retained in position by a retaining collar mounted on the case. They are also secured against displacement by a safety pin inserted in a hole drilled in both detents.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Steel...	Mechanical with pressure on retaining arm or detent release, or pull on trip wires fastened to a retaining arm or detent release.	20 lb pressure 14 lb pull.

b. Use. This fuze was designed for the S-mine 44, but was so dangerous to handle that it was seldom used.

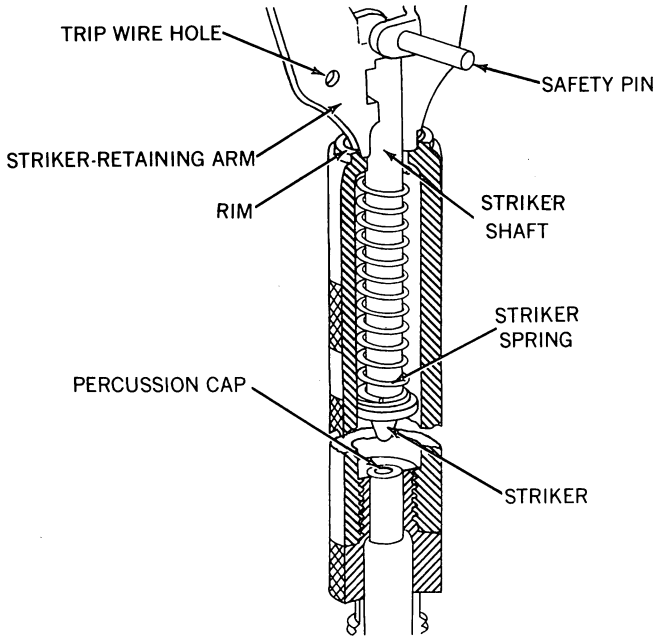


Figure 539

c. Functioning. Pressure on the top of the retaining arms of detents, or pull on the trip wires fastened to the detents, forces them outward releasing the striker to fire the percussion cap and initiate the firing train.

d. Installing and Arming.

(1) Remove the shipping cap from the base of the fuze.

(2) Insert a detonator in the base of the fuze and screw the fuze and detonator into the mine (S-mine 44).

(3) If desired, anchor trip wires to stakes in the ground and in the trip wire holes in the retaining arms.

(4) Carefully pull out the safety pin. This must be done by hand, as a sudden pull might dislodge the retaining arms.

e. Disarming Procedure.

(1) Carefully insert a nail or wire through the safety pin holes in the striker retaining arms.

(2) Cut any trip wires attached to the striker retaining arms.

(3) Unscrew the fuze from the mine and separate the fuze from the detonator.

(4) Remove the fuze to a safe storage or disposal area.

343. Electrical S-Mine Fuze (E.S.Mi.Z. 40) (Germany)

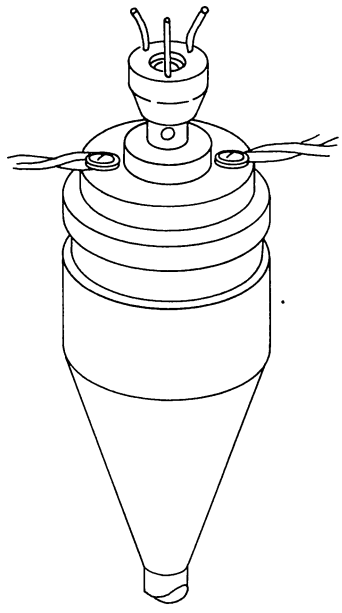


Figure 540

This fuze consists of cylindrical case into which is screwed a pressure fuze mechanism consisting of a spring-loaded striker held by two release balls. A cap is screwed on the top of the case during shipment. When the fuze is armed, a 3-pronged pressure head is pushed on over the plunger. Instead of a percussion cap, a porcelain fitting containing a glass ampoule of orange colored electrolyte is screwed into the bottom of the case. Two electrodes project into the ampoule cavity and are connected to terminals on top of the case where they are attached to wire loads. A spike-shaped aluminum base is screwed on to the bottom of the case and pushed into the ground.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Ebonite with aluminum bridge and base.	Pressure-chemical, electrolytic. Plunger with ball-release.	15 lb.

b. Use. These electric spike fuzes are used to explode the S-mine. The two chains of 9 fuzes used with each S-mine greatly enlarge the fuze area, making minefields with fewer mines equally as effective as those with more mines.

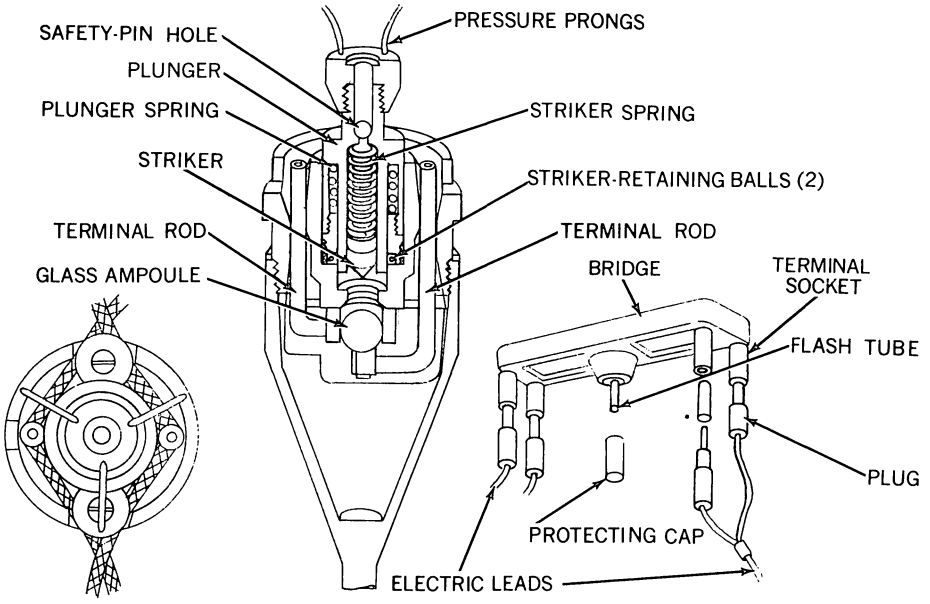


Figure 541

c. Functioning. Pressure on the prongs depresses the release plunger, releasing the two locking balls and permitting the striker to drive into the glass ampoule containing the electrolyte. The electrolyte sets up a current between the electrodes, which induces a flash in the flash tube of the firing bridge, exploding the mine.

d. Installing and Arming.

(1) If the fuzes are not already connected, connect the proper number in two chains. The fuzes must be connected parallel with each other and with the firing bridge within each chain. Each chain may include up to 9 fuzes. These should be spaced 0.6 to 1.0 meter apart.

(2) Dig a hole for the S-mine and firing bridge and make two furrows to accommodate the head wires from the fuze chains.

(3) Test the circuit with a lead tester (plug in the heads to the lead tester, short circuit both terminals of the most distant fuze, and break the circuit again).

(4) Push the spike of the fuze into the ground until the top of the shipping cap is level with the surface of the ground.

(5) Unscrew the shipping cap and press the pressure head onto the head of the plunger.

(6) Attach the snap clip of the safety cord to the pull ring of the safety pin.

(7) Screw the firing bridge onto the S-mine and install the U-clamp.

(8) Insert the red plug at one end of a chain of fuzes into the red bridge terminal socket. Insert the black plug into the black socket.

(9) If an increase in the possibility of detonation is desired, place a wooden pressure bar over the pressure heads of several fuzes.

(10) Pull out the safety pin with the safety cord.

e. Disarming Procedure. Insert a nail or wire into the safety pin hole and tape it in place or cut the wire leads, one at a time.

344. Universal Propellant Assembly, UVK-1 (U.S.S.R.)

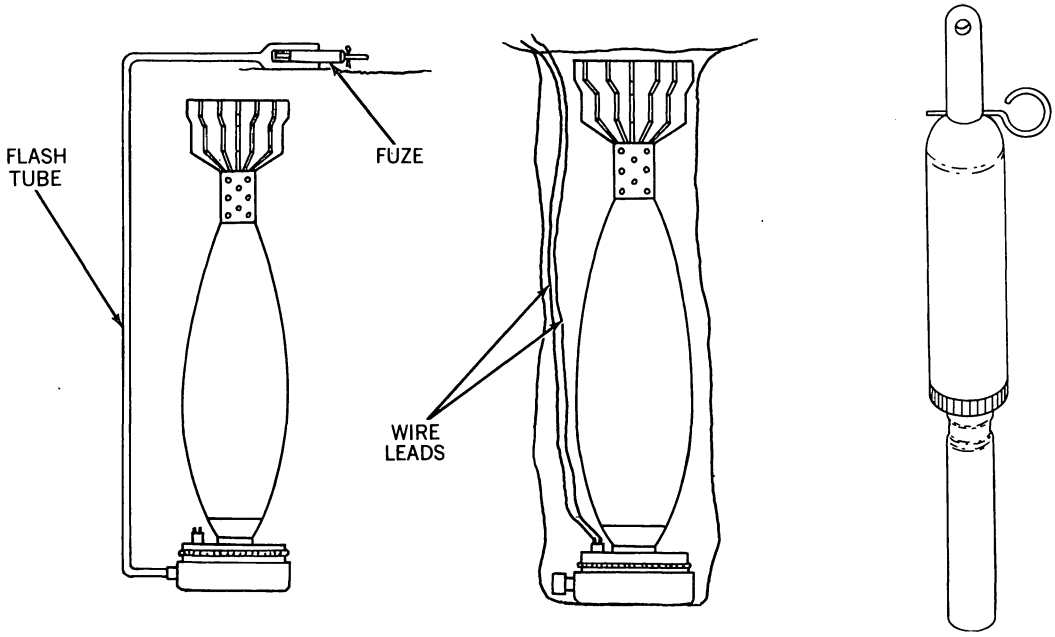
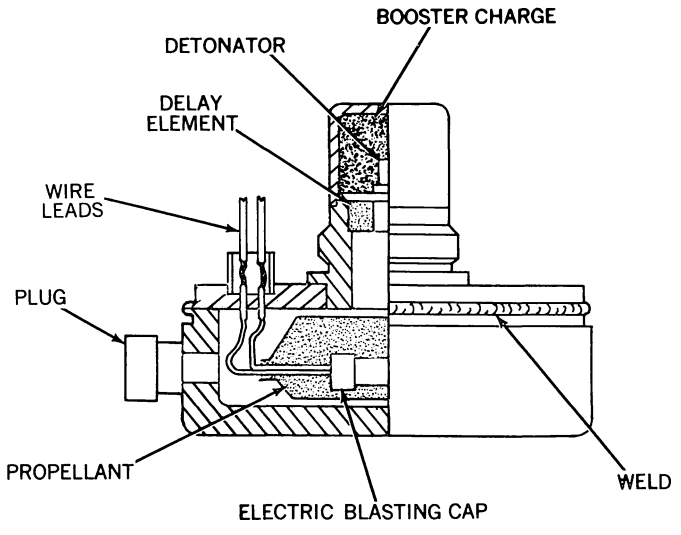


Figure 542

This device is especially designed for use with the OZM bounding fragmentation antipersonnel mine. Its purpose is to raise the mine several feet above the ground for detonating. It contains a propellant charge, a delay element, a detonator, and a booster charge. The unit is approximately 9.8 centimeters high and 11.8 centimeters in diameter.

a. Characteristics.

Case	Explosive		
	Propellant	Booster	Delay
Sheet metal.	3.5 oz black powder.	0.7 oz tetryl.	Black powder (0.8 sec delay).



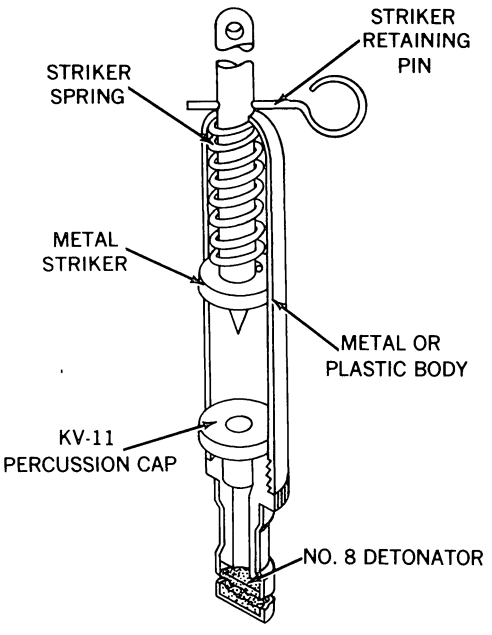


Figure 543

b. Installing and Arming. This assembly is adaptable to both electrical and mechanical ignition.

(1) For electrical ignition, connect the blasting cap wire leads inside the assembly to the electric firing wire leads from the control point.

(2) For mechanical ignition, unscrew the plug in the side of the assembly and insert in the mine one end of the flash tube; then screw a pull or pressure fuze to the other end.

c. Disarming Procedure. Cut the electric leads, one at a time, or unscrew the fuze from the flash tube. Remove the assembly to a safe storage or disposal area.

345. Pressure Fuze, No. 5, Mark 1 (United Kingdom)

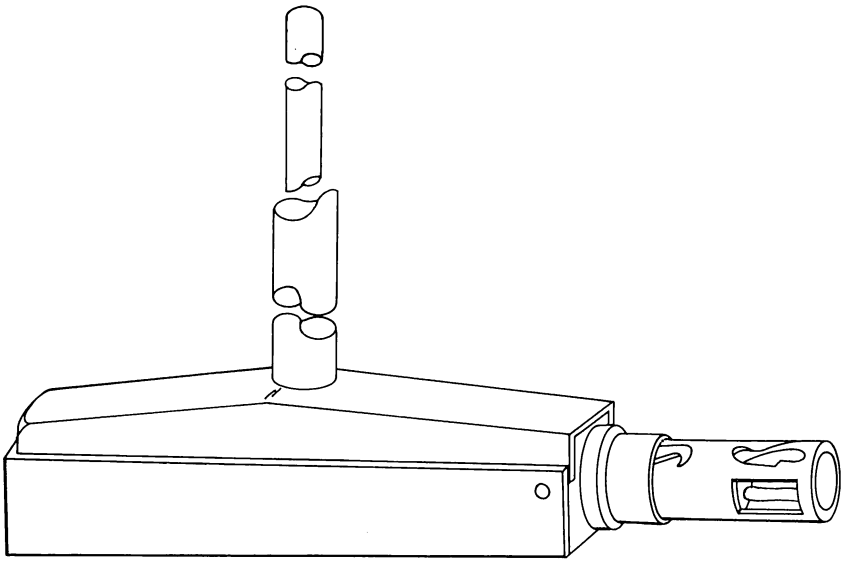


Figure 544

This is the instantaneous mechanical type fuze consisting of a sheet metal case that contains a spring-loaded striker with a trip lever release. The free or upper end of the trip lever is supported by two coil springs which hold the bottom in a notch in the under side of the striker shaft. The pressure lever, which is hinged at one end to the lower part of the case, rests on the projection of the trip lever. A brass sleeve may be screwed into the center of the pressure lid to take an adjustable extension pressure rod. A standard adapter assembly containing a percussion cap—to receive a nonelectric blasting cap or time fuze—is screwed into the base of the fuze. A safety pin is inserted through the fuze case and the striker shaft. The fuze measures 9.6 by 3.2 by 2.0 centimeters.

a. Characteristics.

Shape	Case	Internal action
Irregular.....	Sheet metal.....	Pressure, mechanical.

Operating pressure

21 to 60 lb. (or 40 to 50 lb. applied to extension rod).

b. Use. This fuze is adaptable to use in improvised mines and boobytraps in buildings under floorboards, staircases, and furniture and in roads or paths under stones and debris. The adjustable extension pressure rod makes it usable with charges under railroad tracks.

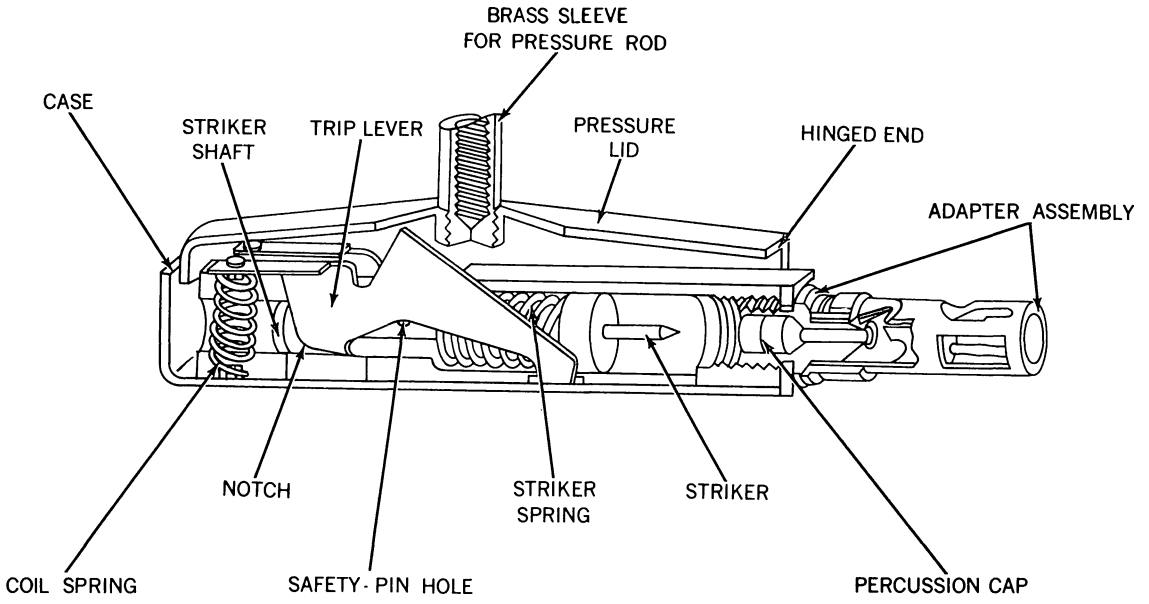


Figure 545

c. Functioning. A force of about 21 pounds on the free end of the pressure lid, 60 pounds at the center, or 40 to 55 pounds applied to the extension rod depresses the trip lever until it clears the notch in the striker shaft, releasing the striker to fire the percussion cap.

d. Installing and Arming. When used in boobytraps without the pressure rod:

(1) *Preliminary test.*

(*a*) Unscrew the adapter and install the fuze in close contact with the object that will conceal and operate the fuze.

(*b*) Remove the safety pin to determine that the striker will not be released by the object alone but by the weight of a man stepping on it.

(2) *Activating.*

(*a*) Reset the striker and insert the safety pin ((*f*) below).

(*b*) Screw the adapter assembly into the threaded end of the fuze.

(*c*) Insert a nonelectric blasting cap in the adapter assembly. (For delay, insert a length of time fuse in the adapter instead of the nonelectric blasting cap.)

(*d*) Connect the fuze to a demolition charge.

(*e*) Place the fuze and demolition charge in the same position as in the preliminary test.

(*f*) Remove the safety pin. This should withdraw easily; but if it resists, replace the fuze or check the setup.

e. Disarming Procedures.

(1) Insert a safety pin in the safety-pin hole through the striker shaft and out through the other side of the case.

(2) Cut or remove the time fuse, detonating cord, or cap that connects the fuze to the charge.

(3) Remove the fuze to a safe storage or disposal area.

346. Railroad Pressure Fuze, PV–42 (U.S.S.R.)

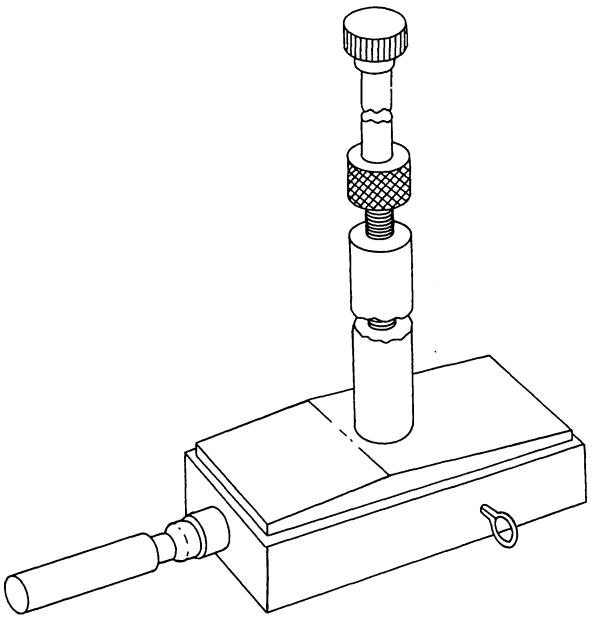


Figure 546

This railroad mine fuze consists of a rectangular case 6.9 by 4.3 by 1.5 centimeters with a hinged lid. The case contains a spring-loaded striker with a release trigger resting on two springs. The bottom of the trigger engages in a recess in the end of the striker and holds the striker and its spring under compression. A safety pin prevents the trigger from moving. A two-section metal rod is screwed into the middle of the lid. The top half of the pressure rod screws into the bottom half for height adjustment. One end of the fuze body is recessed and threaded to receive the MD–2 detonator assembly.

a. Characteristics.

Shape	Case	Internal action	Operating force
Rectangular....	Metal.....	Pressure mechanical, with trigger striker-release.	25 to 40 lb.

b. Use. This fuze was used primarily in improvised railroad mines. The rod was adjusted under the rail until it was flush with the under side. It was also used with improvised mines under bridges. Sometimes the fuze was installed with the detonator directly inserted into the charge; at other times detonating cord was placed between the detonator and the charge, the length depending on the distance between the charge and the fuze.

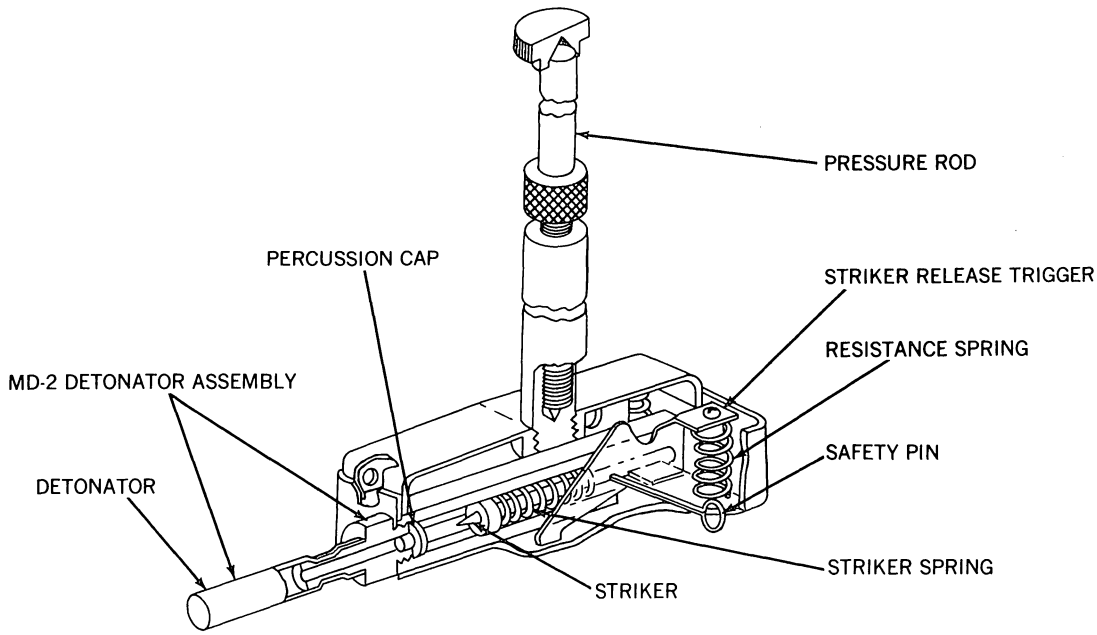


Figure 547

c. Functioning. Pressure on the pressure rod depresses the hinged lid which in turn presses on the trigger, compressing the springs until the bottom of the trigger is pushed out of the recess in the end of the striker. The striker is then released to fire the percussion cap.

d. Installing and Arming.

(1) At the place of use, insert the striker and spring into the open end of the fuze with the recess in the striker facing downward.

(2) Unscrew the top of the pressure rod and use it to push the striker back, compressing the spring until the recess in the end engages in the bottom of the trigger and cocks the striker.

(3) Insert the safety pin.

(4) Replace the pressure rod.

(5) Screw the MD–2 detonator assembly into the fuze and install the fuze into the charge, or connect the detonator to the charge by detonating cord.

(6) Adjust the pressure rod so that it will be flush with the bottom of the rail, board, or other elastic surface.

(7) From defilade, remove the safety pin by pulling it out with a cord.

e. Disarming Procedure.

(1) Uncover the fuze.

(2) Insert a wire or nail through the safety pin hole; cut the detonating cord, if any, and unscrew the pressure rod without putting any pressure on the lid.

(3) Unscrew the MD–2 detonator assembly.

(4) Remove the fuze to a safe storage or disposal area.

347. Railroad Electrical Fuze PZ–12 (U.S.S.R.)

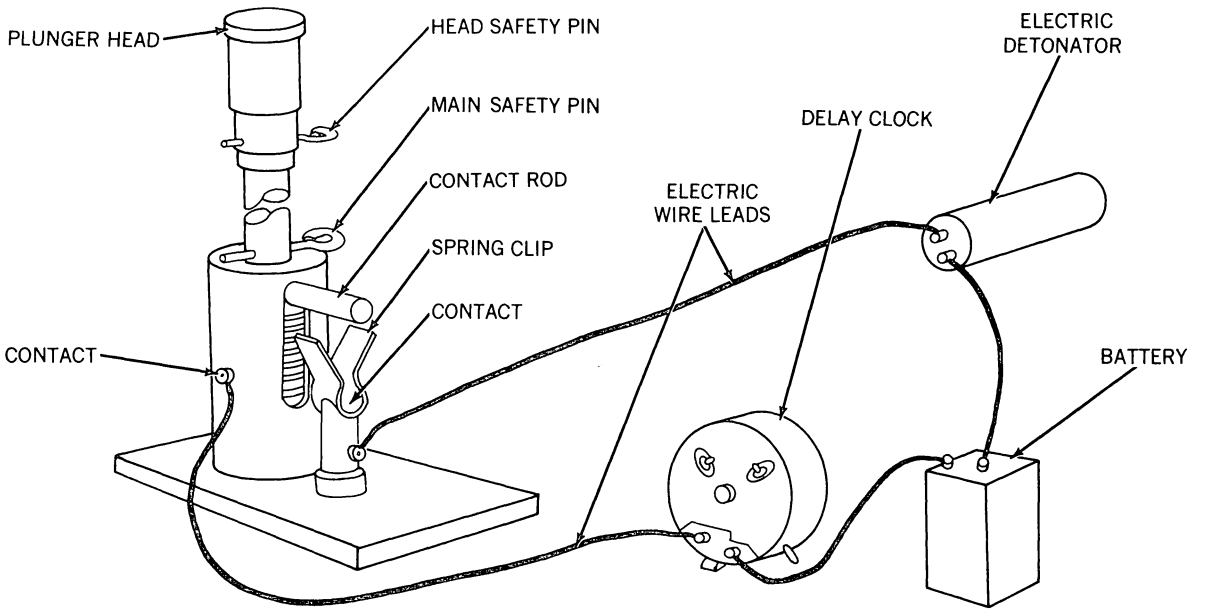


Figure 548

This fuze has a spring-loaded lever electric contact. It consists of a spring-loaded brass plunger, the contact end of which projects at right angles through a slot in the housing. A spring-clip type of contact is fixed to the base of the fuze outside of the plunger housing. At times this fuze may be placed in a wooden box and connected by lead wires to a battery and electric detonator. A clock time device may be inserted in the circuit. The fuze is 22.8 centimeters high and about 3.7 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Rectangular base on cylinder.	Metal....	Pressure mechanical, with electric contact.	25 lb. (approx).

b. Use. This fuze is used in mining sections of railroad track. The plunger head is placed flush or nearly flush with the under side of the rail or tie.

(No drawing available)

c. Functioning. Pressure on the plunger head depresses the plunger until its contact rod slides into the spring-clip contact and closes the circuit.

d. Installing and Arming.

(1) Dig a hole about 25.4 centimeters deep under a railroad rail or tie.

(2) Place a 20.3 by 30.4-centimeter board in the bottom of the hole and set the fuze on it so that the head is nearly flush with the bottom of the rail or tie.

(3) Connect the fuze to an electric detonating circuit. The delay clock may or may not be included.

(4) Remove the safety pins.

e. Disarming Procedure.

(1) Insert a pin or nail through the holes provided for the head safety pin and the main safety pin.

(2) Cut the wires, one at a time.

(3) Remove the fuze and charge to a safe storage or disposal area.

348. Pressure Fuze for Improvised Anti-tank Shell Mine

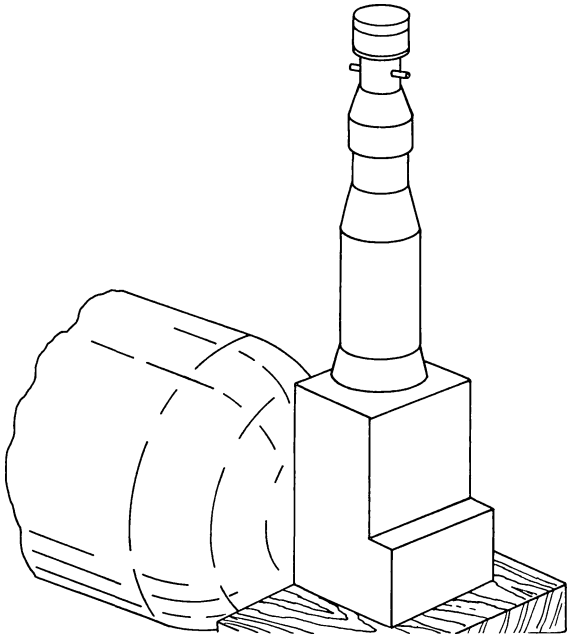


Figure 549

This specially designed fuze has a striker shaft with a pressure head and an elongated metal flash tube with a well in the top for the percussion cap and detonator assembly. To the bottom of the fuze is attached a metal L-shaped adapter with a powder train leading from beneath the flash tube to the main detonator, which is located in the nose of the shell. The primary detonator is assembled with the percussion cap. The safety device is a flat coil spring wound around the striker shaft, just below the striker head.

a. Characteristics.

Shape	Case	Internal action	Operating force
L-shaped cylinder.	Metal set on wood base.	Pressure mechanical, with shear pin release.	600 lb or over.

b. Use. This fuze was designed for use in an improvised shell mine.

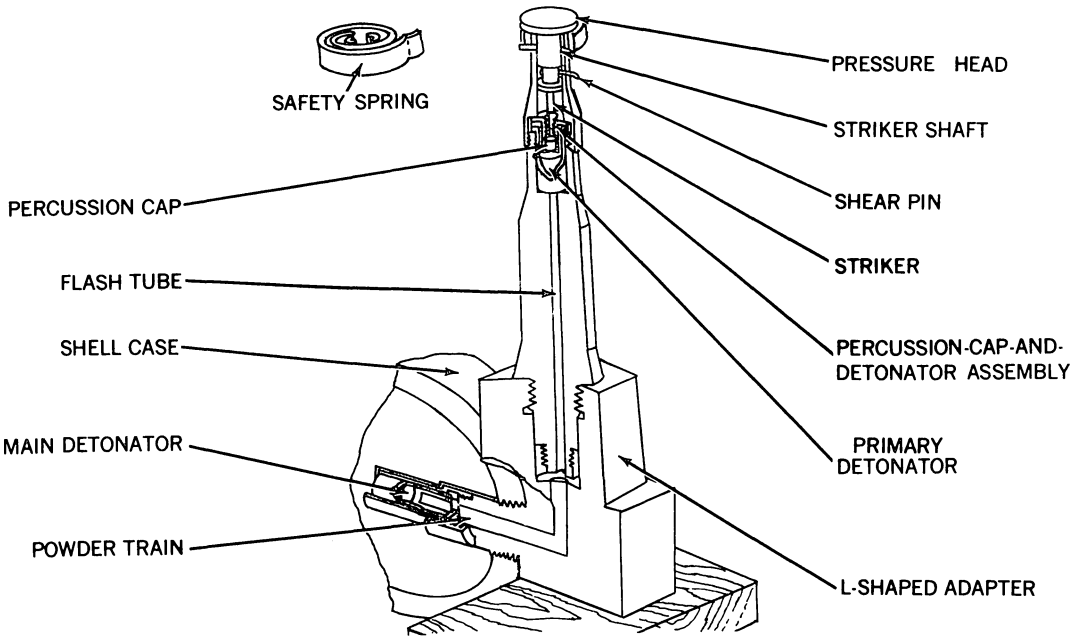


Figure 550

c. Functioning. Pressure on the striker shaft head shears the pin and forces the striker point into the percussion cap. This explodes in turn the primary detonator, powder train, main detonator, and shell.

d. Installing and Arming.

(1) Insert the percussion cap and detonator assembly in the well in the top of the flash tube.

(2) Screw the fuze onto the flash tube.

(3) Remove the safety spring.

e. Disarming Procedure.

(1) Unscrew the fuze from the flash tube without putting any pressure on the pressure head.

(2) Remove the percussion cap and detonator assembly from the flash tube.

(3) Take the fuze to a safe storage or disposal area.

349. Pressure Fuze No. 2, Mark 1 and Mark 2 (United Kingdom)

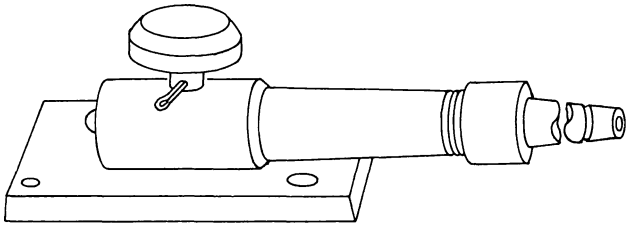


Figure 551

The housing of this fuze is mounted on a rectangular base plate. Inside is the spring-loaded striker which has a groove that is straddled by the milled-out sharp end of the shearing stud, on top of which is a flat disc-shaped pressure head. The cap holder is screwed over the open end of the housing. The striker is held in cocked position by a retaining pin at the top. In the Mark 1 the base plate is fastened to the housing by two screws; in the Mark 2 they are cast in one piece and the pressure cap is surrounded by a raised collar that contains a rubber washer. The dimensions of these fuzes are: width 3.7 centimeters, height 28 centimeters (armed), and length 11.7 centimeters with the fuze adapter, a special device for electric firing.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical tube on rectangular base plate.	Brass....	Pressure mechanical; shear stud breaks the striker spindle.	30 to 40 lb.

b. Use. This fuze is used with boobytraps placed under boards, door mats, and other locations where pressure initiation is desired. It may also be used to initiate demolition charges.

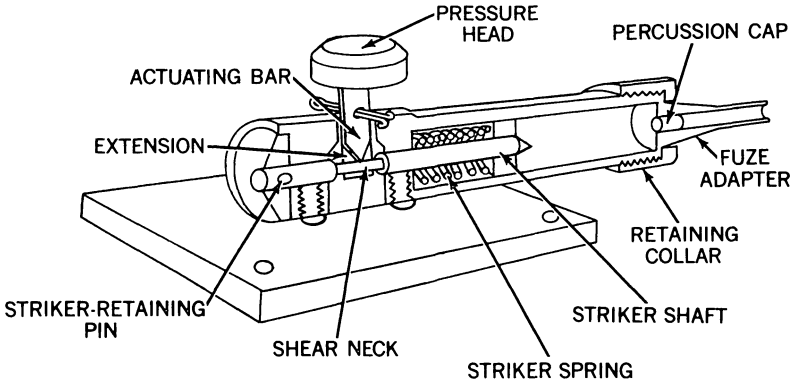


Figure 552

c. Functoning. Pressure on the pressure head forces the v-shaped cutting edge of the shear stud down to break the striker spindle. This releases the striker to fire the percussion cap and thus initiate the firing train.

d. Installing and Arming.

(1) Remove the pressure cap from its carrying hole in the base plate. Insert the pressure cap through the hole in the top of the housing and position it to straddle the striker. If properly placed the pressure cap cannot be rotated.

(2) Make certain that the safety pin is securely in position.

(3) Unscrew the collar and remove the fuse adapter.

(4) Connect the charge to the fuse adapter with instantaneous fuse.

(5) Reattach the collar and fuze adapter and gently remove the safety pin.

Note. If desired, a detonator No. 8 may be slipped directly into the fuse adapter and the connection to the charge be made with cordex.

e. Disarming Procedure.

(1) Insert a safety pin in the safety pin hole in the pressure cap.

(2) Remove the pressure head from the fuze.

(3) Cut the length of fuze connecting the fuze to the charge and remove the fuse adapter.

(4) Take the fuze to a safe storage or disposal area.

350. Pressure Fuze for Yardstick Mine (Japan)

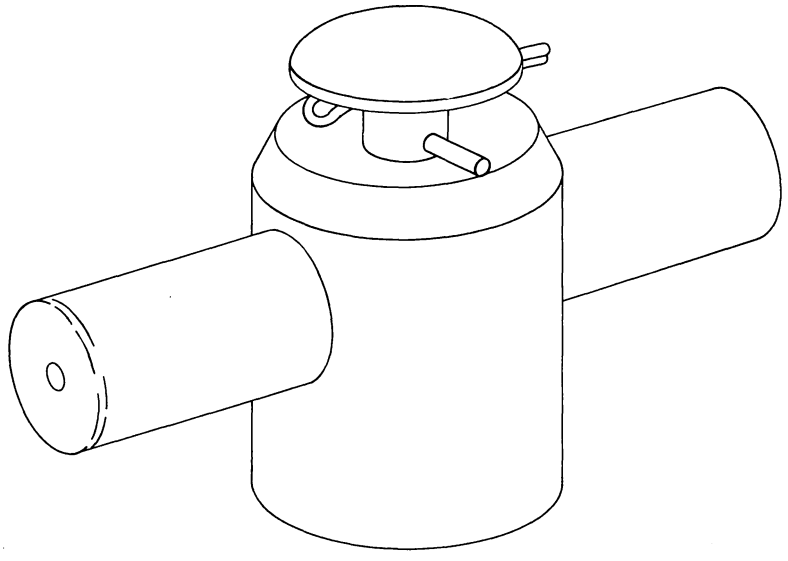


Figure 553

This fuze has a spring-loaded striker held back by a striker-release plunger, a percussion cap and detonator assembly, a safety pin, and a copper shear pin. The detonator holder is marked with a spot of red paint.

a. Characteristics.

Shape	Case	Internal action	Operating force
T-shaped, cylindrical...	Metal....	Pressure mechanical, with copper shear pin and grooved shaft release.	300 lb (approx); may operate at about 6 lb if shear wire is removed.

b. Use. This fuze was designed to detonate the yardstick mine. Usually four fuzes were placed in each mine.

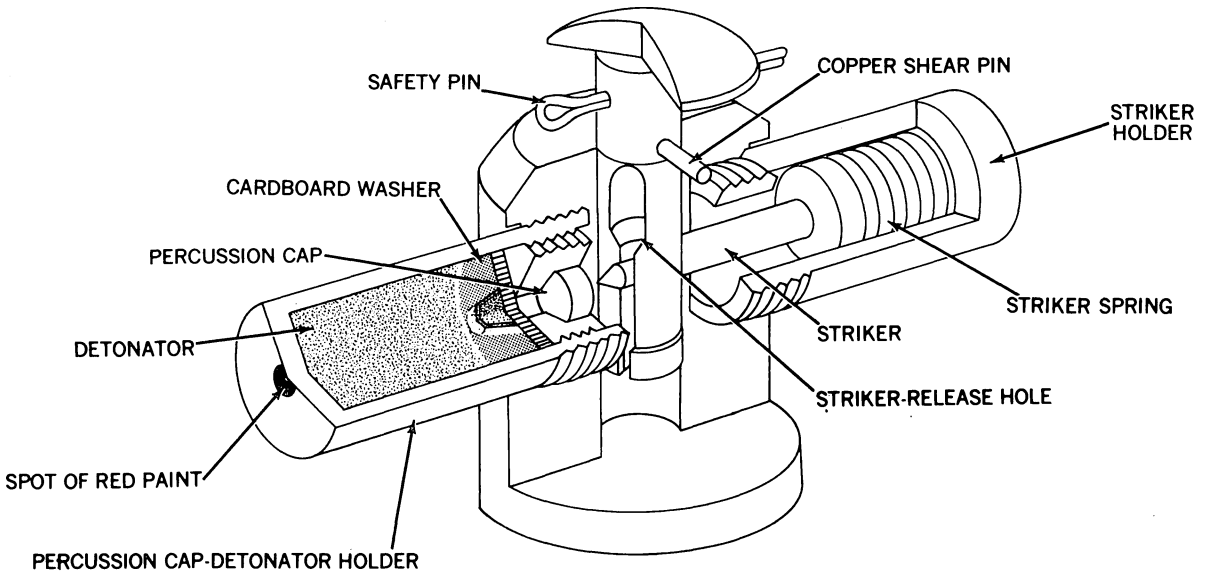


Figure 554

c. Functioning. Pressure on the striker-release plunger shears the shear pin, permitting the striker-release plunger to move farther down and free the spring-driven striker to ignite the percussion cap.

d. Installing and Arming. Remove the safety pin from each of the fuzes.

e. Disarming Procedure.

(1) Insert a wire or nail through the safety-pin hole in the plunger of each fuze. (par. 6*x*.)

(2) Remove the four fuzes and mine to a safe storage or disposal area.

351. Pressure Fuze MV-3 (U.S.S.R.)

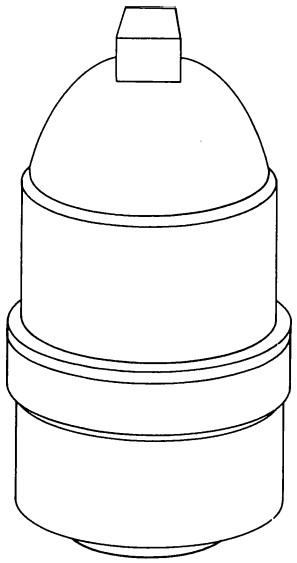


Figure 555

This pressure fuze measures about 8.2 centimeters in length and about 3.7 centimeters in diameter. The striker is held to a hollow plunger by two retaining balls. A hemispherical, soft sheet-metal head is soldered to the fuze and the plunger bolt. A metal-encased booster charge is screwed on the base of the fuze. There is no safety device.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical with cone-shaped top.	Aluminum alloy. . .	Pressure mechanical, with ball release.	150 lb (approx).

b. Use. The MV-3 fuze was designed for the PMZ-40 dual-purpose mine.

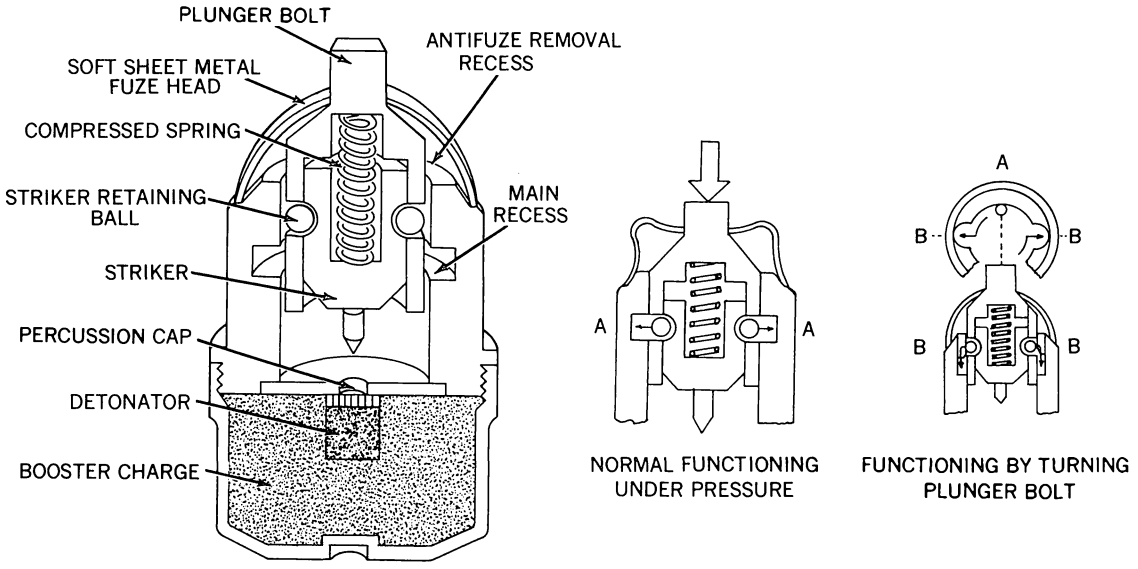


Figure 556

c. Functioning. Pressure on the pressure bolt crushes the soft metal head and depresses the plunger and striker by escaping into the horizontal recess. Also, turning the pressure bolt releases the striker balls into the vertical recesses, thus freeing the striker. This provides an antidisturbance feature, dangerous to friend and foe alike.

d. Installing and Arming. This fuze is armed when issued. It is merely inserted into the fuze well of the mine.

e. Disarming Procedure. The combination of the PMZ–40 mine and MV–3 pressure fuze was discontinued and replaced by the TM–41 mine, as they proved too dangerous to handle. Disarming is not recommended. **Destroy in place.**

352. Pressure Fuze, MV–5 (U.S.S.R.)

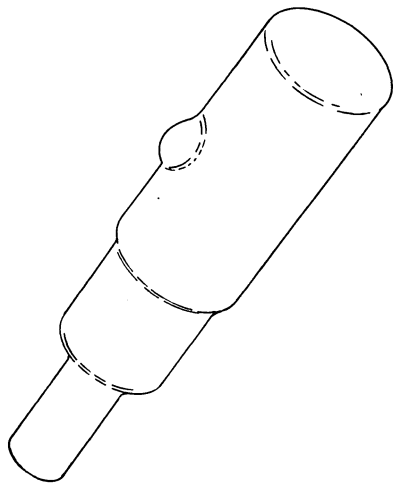


Figure 557

This is a mechanical action pressure fuze with a spring-loaded striker enclosed in a metal case. (It may also be found with a plastic case.) It has a pressure cap with a bulge or recess to release the striker retaining ball. This fuze case is 4.2 centimeters long by 1.2 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating pressure	Markings
Cylindrical.	Metal or plastic.	Pressure mechanical.	26 lb or more.	Factory number and year of manufacture stamped on top of pressure cap.

b. Use. The MV–5 pressure fuze is used in the TM–41, TMB–2, TMSB, TMD–B, TM–46 and TMD–44 antitank mines. In World War II and the Korean War, it was found in many types of improvised mines.

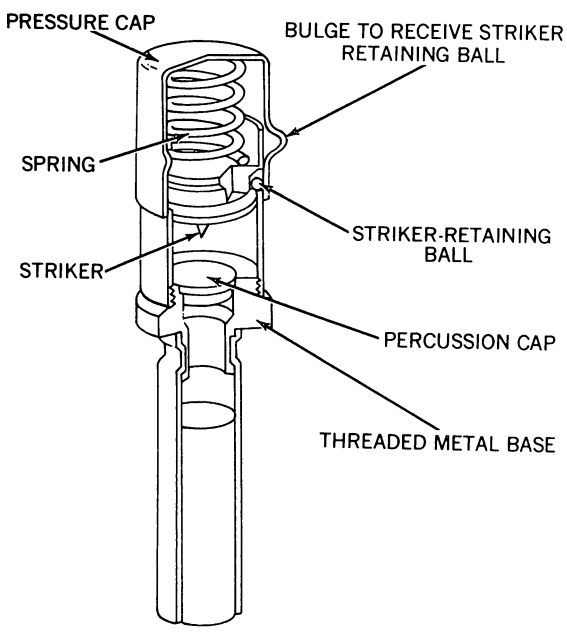


Figure 558

c. Functioning. A pressure of 26 pounds or more on the pressure cap forces it down, compressing the striker spring and releasing the retaining ball, which escapes into the bulge. The spring-driven striker, thus released, hits the percussion cap and in turn sets off the detonator and explodes the mine. (If the mechanism is faulty from deterioration or other causes, the fuze may function at less than 26 pounds pressure.)

d. Installing and Arming. Insert the fuze and detonator assembly into the mine. As the fuze has no safety device, the detonator is not attached until the mine is laid and ready for the installation of the fuze.

e. Disarming Procedure.

(1) Without applying pressure on the pressure cap, remove the fuze-detonator assembly from the mine and separate the detonator from the fuze.

(2) Remove the fuze to a safe storage or disposal area.

353. Wooden Pressure Fuze (Norway)

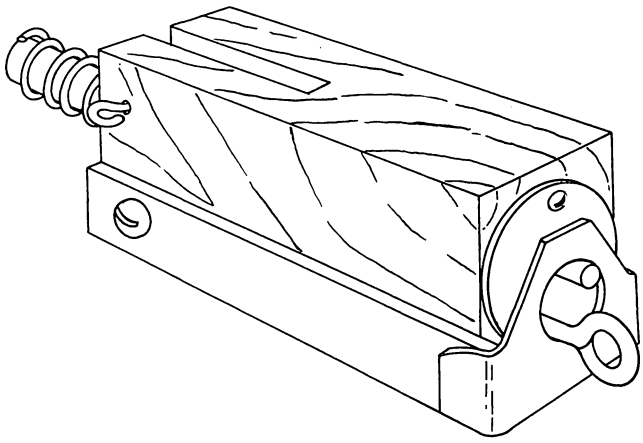


Figure 559

This wooden pressure fuze has a hollowed-out wood body, a metal safety pin holder, a spring loaded striker, and a pull pin. The striker is held by a notch in the striker release plate. Between the fuze body and the striker release plate is a spring which provides tension for holding the striker release plate in the notch. The detonator and percussion cap are inserted in the holding spring, which is held in place in the fuze body by a screw.

a. Characteristics.

Shape	Case	Internal action	Operating force
Rectangular, oblong.	Wood with metal release plate.	Pressure mechanical, with retaining notch and release plate.	20 lb or more.

b. Use. This fuze is designed for use in improvised antitank and antipersonnel mines and boobytraps.

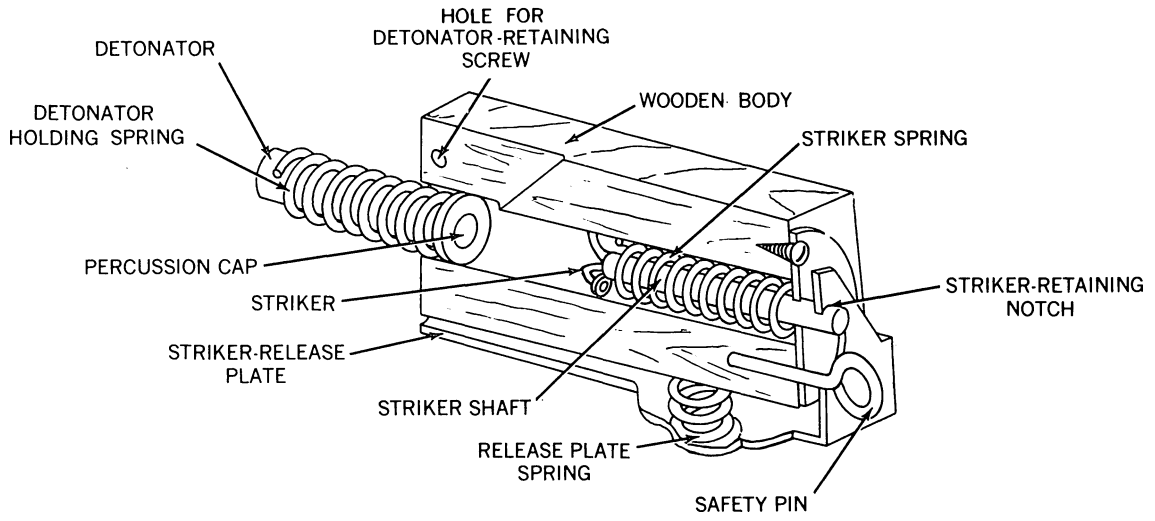


Figure 560

c. Functioning. Pressure on the release plate overcomes the resistance of the release plate spring, lifting the release plate from the notch in the striker shaft, freeing the striker to fire the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Insert the detonator and percussion cap in the detonator holding spring.

(2) Insert the assembly in the fuze body and secure with the detonator retaining screw.

(3) Remove the safety pin.

e. Disarming Procedure.

(1) Insert a nail or wire in the safety pin hole, unscrew the detonator retaining screw, and remove the detonator and percussion cap.

(2) Remove the fuze to a safe storage or disposal area.

354. Wood-Capped Metallic Pressure Fuze (U.S.S.R.)

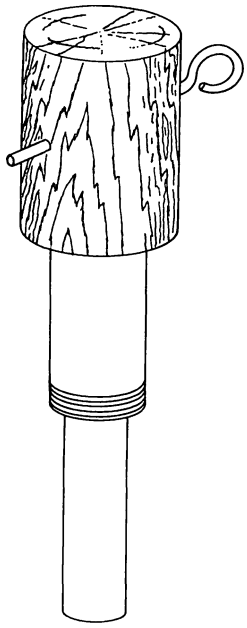


Figure 561

This is a metallic fuze with a spring-loaded striker and a wooden pressure cap and metal safety pin. It is about 5.2 centimeters high and 2.5 centimeters in diameter. The top of the striker shaft extends through the top of the case in the form of a square plunger bolt.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Pressure mechanical, with a 2 shear-pin release.	150 lb.

b. Use. This fuze was designed for use in the nonmetallic improvised mines and pressure-actuated boobytraps.

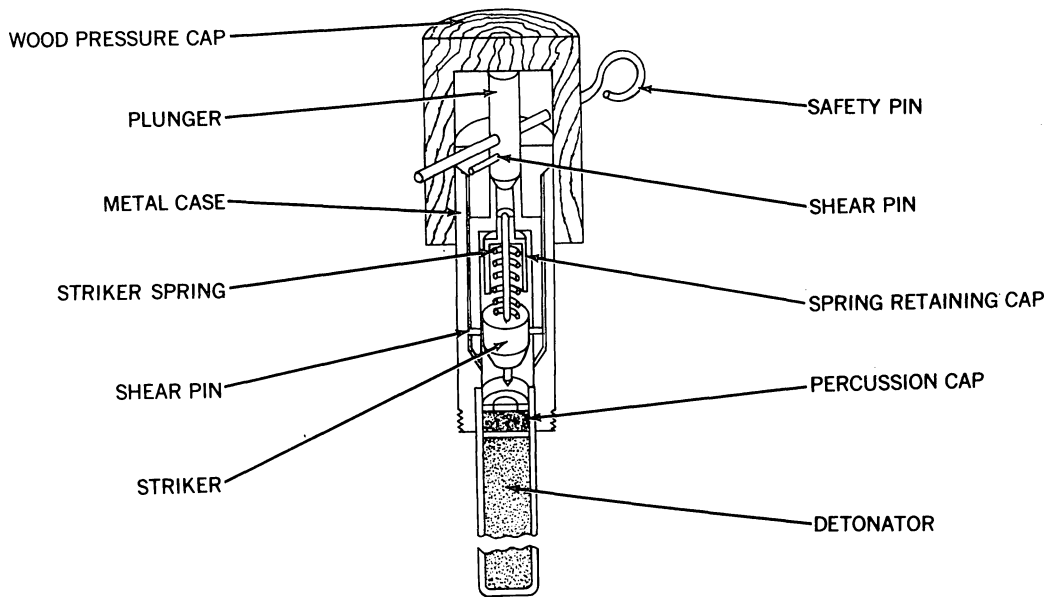


Figure 562

c. Functioning. Pressure on the wooden cap breaks the shear pin holding the plunger. The released plunger moves downward under pressure until the spring retaining cap bears against the striker head. Continuing pressure ruptures the striker retaining shear pin and releases the spring-loaded striker.

d. Installing and Arming.

(1) Insert the cardboard detonator into the bottom of the fuze.

(2) Place the fuze in the charge or mine.

(3) Remove the safety pin.

e. Disarming.

(1) Insert a safety pin or wire into the pressure cap and through the plunger.

(2) Remove the fuze and separate it from the detonator.

(3) Take the fuze to a safe storage or disposal area.

355. Ball-Release Pressure Fuze (Japan)

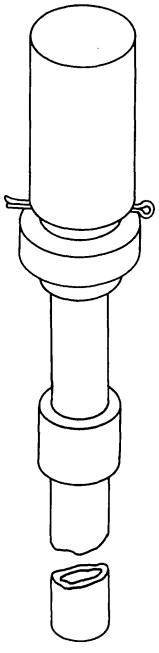


Figure 563

This fuze has a spring-loaded sliding pressure cap, a spring-loaded striker with two retaining balls, a cotter-type safety pin, a percussion cap, an 8- to 10-second delay pellet assembly screwed to the base of the fuze, and a detonator screwed to the base of the delay pellet assembly. A stop screw holds the pressure cap to the top of the fuze. The stop screw slot in the pressure cap permits the cap to slide down over the striker housing.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Pressure mechanical, with ball release and delay pellet.	Hand pressure.

b. Use. This unit was made especially for the antivehicular magnetic mine, type 99, but was also used in improvised mines.

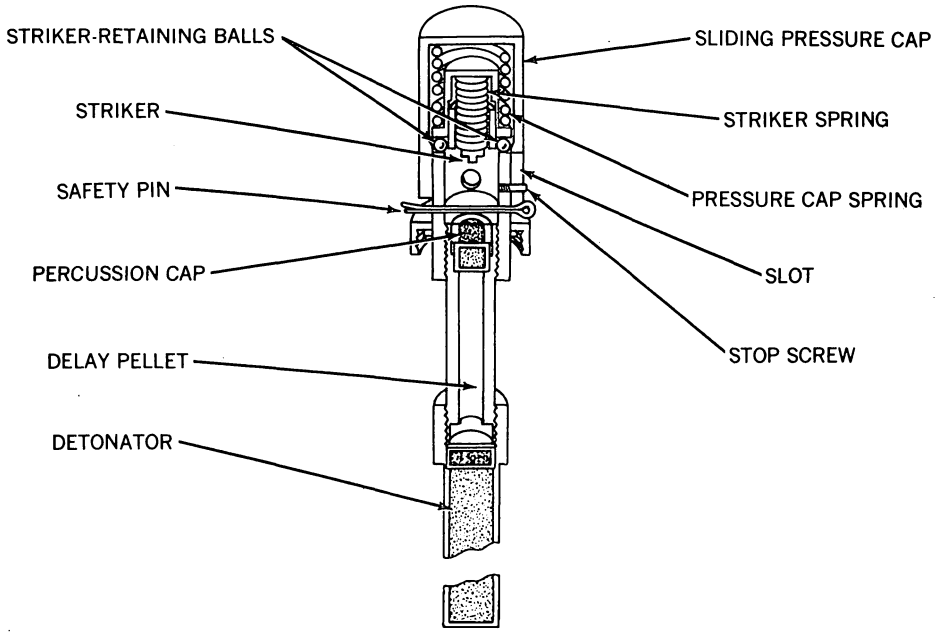


Figure 564

c. Functioning. Pressure on the sliding pressure cap causes it to slide downward until the retaining balls escape into the recess in the upper part of the sliding pressure cap. This releases the striker to set off the percussion cap, delay pellet, and detonator.

d. Installing and Arming.

(1) Screw the detonator to the percussion cap and delay pellet assembly and screw the assembly into the base of the fuze.

(2) Remove the safety pin.

e. Disarming Procedure.

(1) Insert a nail or safety pin into the fuze and unscrew it from the mine (par. 6*x*).

(2) Unscrew the detonator and percussion cap and delay pellet assembly.

(3) Remove the fuze to a safe storage or disposal area.

356. Schuko Pressure Fuze (Lever Fuze 44) (Germany)

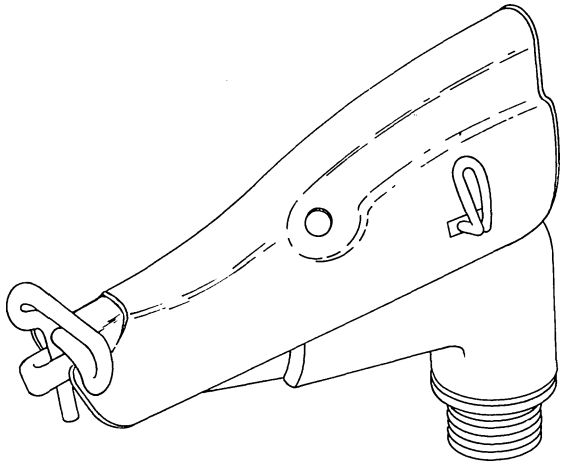


Figure 565

This fuze consists of an inverted L-shaped tube, the vertical arm of which is screw threaded externally to screw into the mine. The horizontal arm, which contains the percussion cap, is screw threaded internally to receive the steel striker housing and is shaped externally to provide a lug to mount the actuating lever and pivot. The striker housing contains a striker and striker spring. The striker is retained in cocked position by a pin which has two shoulders that extend over the end of the actuating lever. The fuze is 6.0 centimeters long and 4.7 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
L-shaped....	Metal.....	Mechanical pressure with lever and pull pin release.	20 lb (approx).

b. Use. This fuze is used in the glass mine 43 as an alternative to the Buck igniter.

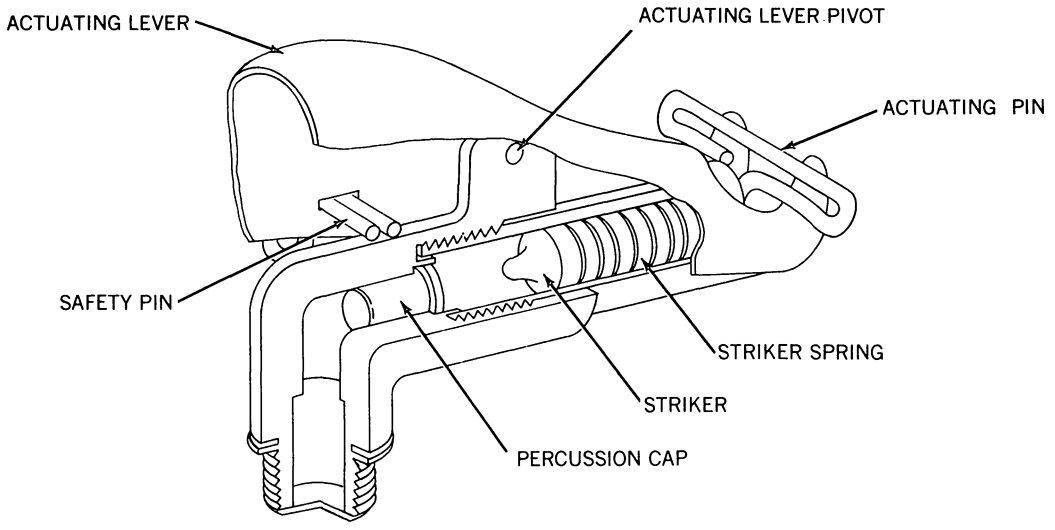


Figure 566

c. Functioning. Downward pressure on the actuating lever removes the retaining pin from the striker, which frees it to fire the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Insert a detonator into the base of the fuze.

(2) Screw the fuze into the mine or charge.

(3) Remove the safety pin.

e. Disarming Procedure.

(1) Make sure that the retaining pin is fully engaged in the striker.

(2) Insert a nail or wire in the safety pin hole.

(3) Unscrew the fuze from the mine or charge and separate the detonator from the fuze.

(4) Remove the fuze to a safe storage or disposal area.

357. Pressure-Pull Fuze (Communist China)

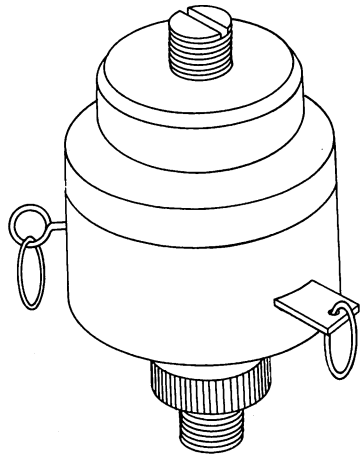


Figure 567

This fuze consists of a cylinder about 4.4 centimeters in diameter and 6.2 centimeters high. The striker spring compression is increased or decreased by a tensioning screw in the top of the fuze. To prevent accidental firing, a wide flat safety bar is inserted between the percussion cap and the striker. The safety bar cannot be removed when the striker is in an uncocked position. A brass shipping cap is placed on the threaded base. A variation of this fuze has a setting collar with the figures **1** and **2** marked on it. The collar is set on **1** for pressure, and on **2** for pull.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Pressure mechanical, with shear pin release; pull with pull pin release.	300 to 500 lb pressure; 10 to 50 lb pull.

b. Use. This fuze was designed for use in the dual-purpose mine No. 8. The variation with the setting collar was designed for the dual-purpose mine No. 4.

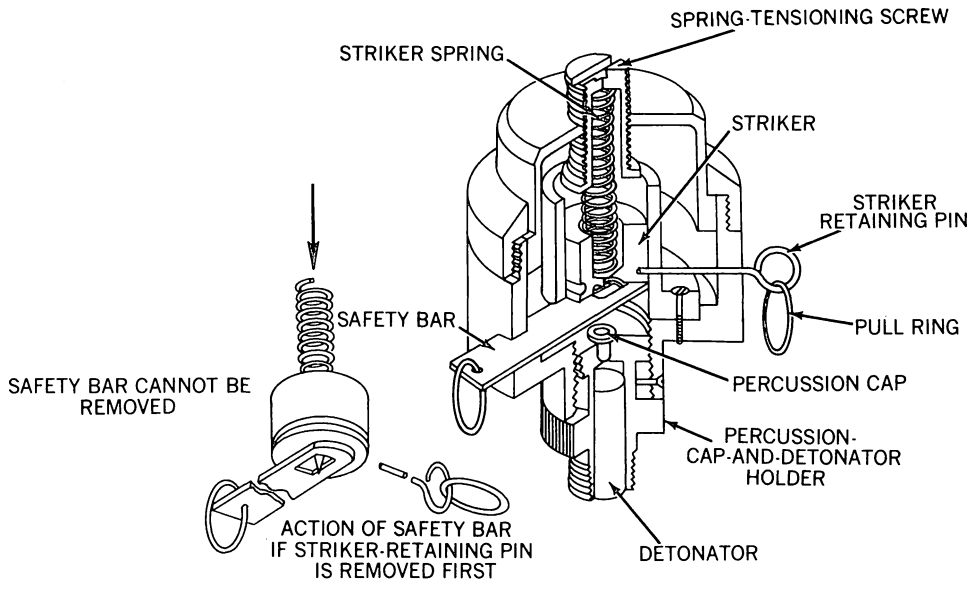


Figure 568

c. Functioning. Pressure on the top shears the retaining pin or a pull on the striker retaining pin releases the striker to fire the percussion cap.

d. Installing and Arming.

(1) Insert a detonator in the detonator percussion cap holder and screw into base of the fuze.

(2) Tighten the screw provided to lock the detonator percussion cap holder to the base of the fuze.

(3) For pressure, screw the fuze into the mine and remove the safety bar.

(4) For pull, position the fuze in the mine and adjust the tensioning screw for the pull desired. A pull of 10 to 50 pounds may be obtained by screwing the spring-tensioning screw for greater pull and unscrewing it for lesser pull. Remove the safety bar.

e. Disarming Procedure.

(1) Cut any slack trip wires and insert the safety bar in the slot in the side of the fuze.

(2) Loosen the locking screw in the base of the fuze and unscrew the percussion cap and detonator holder from the base.

(3) Remove the fuze to a safe storage or disposal area.

358. Variable-Pressure Pull Fuze (Hungary)

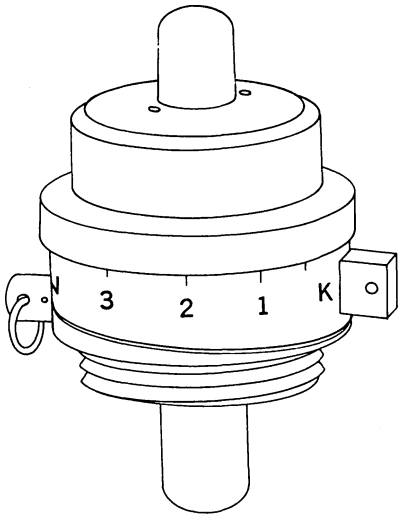


Figure 569

This metal fuze consists of a plunger, striker spring, striker, shear blade, setting ring, and safety pin. The operating pressure is varied by rotating the setting ring. The base of the setting ring projects into a slot in the shear blade. The shear blade, when the setting ring is rotated, is moved in or out, varying the thickness of the triangular brass striker flange that must be cut. This determines the operating pressure required. The red mark on the ring and the scale on the fuze body indicate the settings. The percussion cap screws into the base of the fuze.

a. Characteristics.

Shape	Internal action	Operating force (variable)	
Cylindrical...	Pressure or pull.	Scale settings:	Operating force (lb):
		K	70
		1	220
		2	440
		3	660
		N	770
		H	Trip wire actuation

b. Use. This fuze was developed for use in antivehicular and antipersonnel mines.

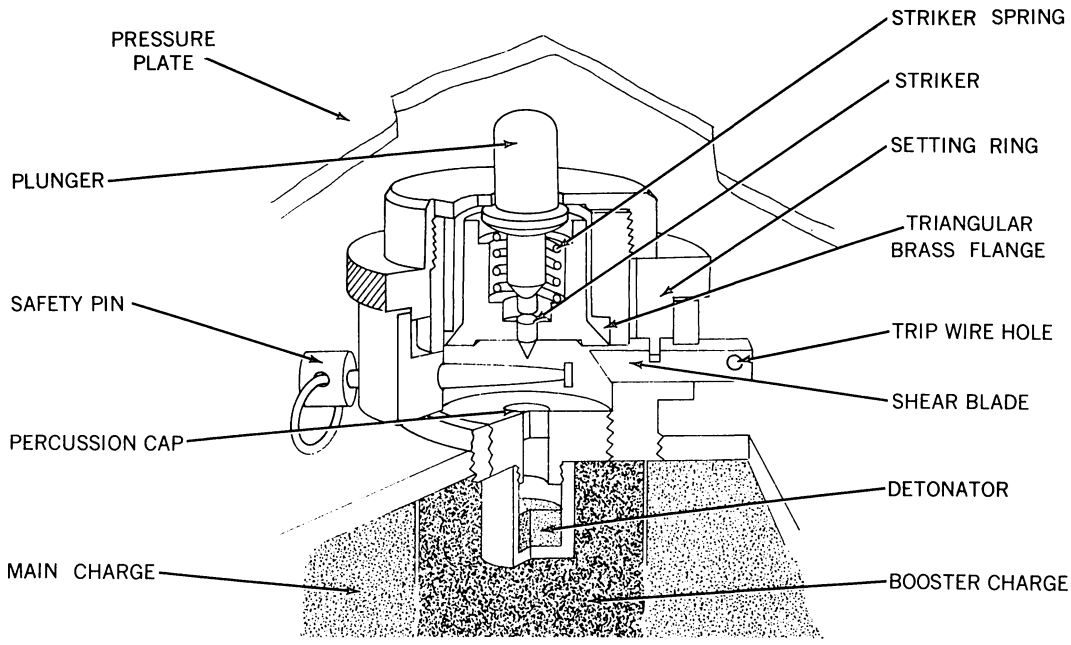


Figure 570

c. Functioning. Pressure on the plunger forces the striker assembly downward against the shear blade, shearing the flange and releasing the spring-driven striker against the percussion cap. If set for pull, a tug on the tripwire removes the shear blade, firing the striker against the percussion cap.

d. Installing and Arming.

(1) Turn the setting ring from the required actuating pressure.
(2) Screw the detonator into the fuze.
(3) Screw the fuze into the mine or charge.
(4) Attach an anchored tripwire to the shear blade, if setting H is used.
(5) Withdraw the safety pin by a string attached to the ring.

e. Disarming Procedure.

(1) Cut the slack tripwire, if any, without putting any pull on the shear blade.
(2) Insert a piece of heavy wire or a nail into the safety pin hole.
(3) If the setting ring is at H, press in the shear blade.
(4) Unscrew the fuze and remove it from the mine.
(5) Unscrew the detonator from the fuze.
(6) Remove the fuze and mine or charge to a safe storage or disposal area.

359. Pressure-Pull Fuze 29(Z.D.Z. 29) (Germany)

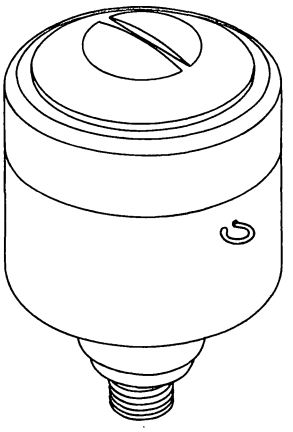


Figure 571

This is a firing device designed for either pressure or pull ignition. The body, 6.2 centimeters long by long by 4.7 centimeters inches in diameter, has a threaded base plug for a detonator and a pressure head and contains a striker assembly. The striker assembly consists of a striker, two shear pins, a pull pin, a metal guide, and a helical spring. On the top of the setting head is a cut mark and a slot beside which is engraved the word *"druck"* (pressure). Three settings for operating pressures marked "zug" (pull) (10 pounds), "125 kg" (226 lb.), and "45 kg" (99 lb.) appear on the top of the bushing. The head may be turned so that the mark comes opposite anyone of the three setting marks by using a coin or some other similar object in the slot. The safety key is a strip of flexible metal that fits between the striker and the percussion cap. Igniters recovered in Italy did not have firing pressures stamped on the settings but had the letters Z for *zug* or pull, S for *Schwer* or heavy, and L for *leicht* or light.

a. Characteristics.

Shape	Case	Internal actions	Operating force
Cylindrical...	Metal.....	Pressure mechanical, with shear pin or pull pin release.	10 lb pull 99 lb pressure (anti-personnel) 276 lb pressure (anti-tank).

b. Employment. This is the fuze employed in the Tellermine 29.

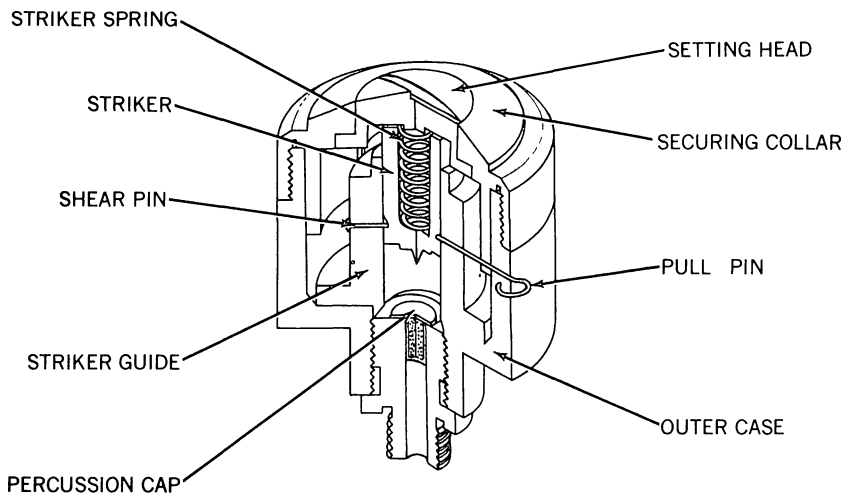


Figure 572

c. Functioning. Pressure on the fuze shears the shear pin, if the fuze is set for antipersonnel use, or shears the shear pins, if set for antitank use; or a pull on the pull pin releases the striker to slam against and ignite the percussion cap. This sets off the detonator and the main charge.

d. Installing and Arming.

(1) Remove the shipping cap and insert a detonator in the base of the fuze.

(2) Turn the slotted head to the desired setting—*zug* (pull), or *druck* (pressure) at 125 kg and 45 kg.

(3) Screw the fuze into the mine.

(4) Attach a wire or cord to the ring on the safety bar and remove the safety bar from a safe distance.

Note. If the indicator mark is set at ZUG and the pull pin is withdrawn by accident before the safety bar has been removed, the striker engages in a slot in the safety bar and prevents its removal.

e. Disarming Procedure. If the original safety bar is available, insert it in the slot marked *sich.* If it is not available, do not try to insert an improvised safety bar, as it may explode the percussion cap. In the latter event, disarm as follows:

(1) Cut any slack trip wires attached to the pull pin.

(2) Grasp the fuze around its base without touching the top.

(3) Gently unscrew the fuze from the mine and remove the detonator from the fuze.

(4) Unscrew the percussion cap set screw and unscrew the percussion cap holder from the base of the fuze.

(5) Remove the fuze to a safe storage or disposal area.

360. Bakelite Pressure-Pull Fuze, Type A and B (Japan)

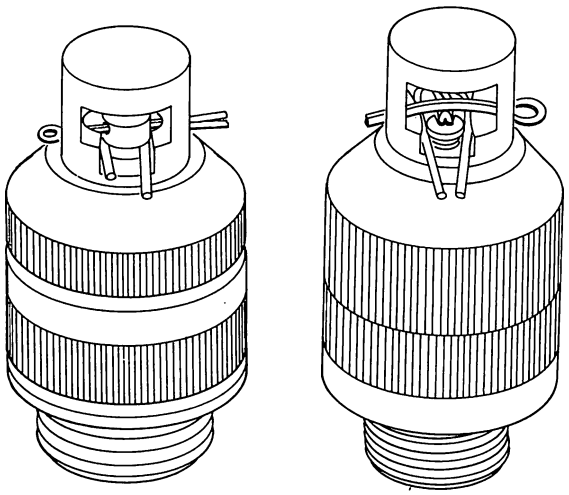


Figure 573

This fuze comes in two models, differing from each other only in the shapes of the plunger head and the hammer-release fork, the position of the safety pin, the direction of the threads on the base, and details on the side of the fuze case. The fuze case contains a percussion-hammer spring, a percussion hammer held in place by a hammer-release fork, a plunger spring, a striker, a percussion cap, and a detonator. Type A has a cotter type safety pin that passes through the plunger head and top of the hammer. In type B the safety pin passes through the plunger head only.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Bakelite....	Pressure mechanical, with hammer-release fork.	4.5 lb pressure 22 lb pull.

b. Use. This fuze was used in the type 3 ceramic mine. It was also to be used in the ceramic bounding antipersonnel mine, which was never issued to troops.

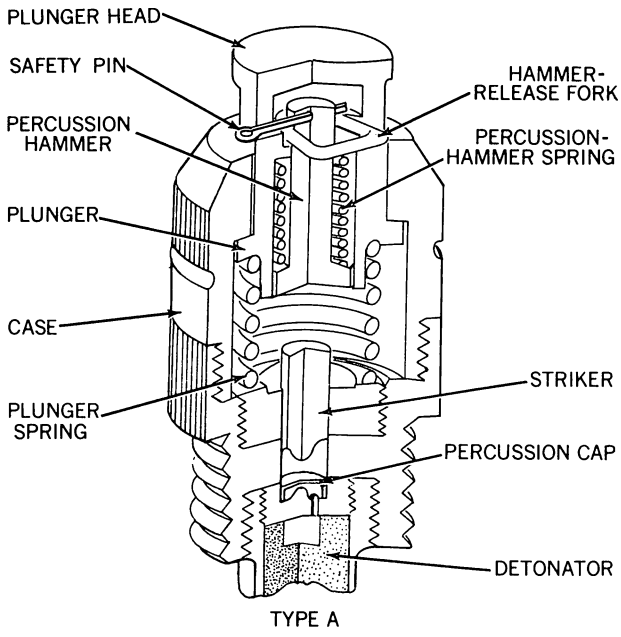


Figure 574

c. Functioning.

(1) *Pressure.* Pressure on the pressure head depresses the plunger until the hammer release fork bears against the top of the fuze case. This spreads the hammer release fork, freeing the spring loaded hammer to strike the striker and fire the percussion cap.

(2) *Pull.* A pull on the pull or trip wire pulls out the release fork and permits the spring-loaded percussion hammer to hit the striker, driving it against the percussion cap.

d. Installing and Arming. For pressure actuation, remove the safety pin. For pull actuation, tie an anchored pull or tripwire to the hammer-release fork and then remove the safety pin.

e. Disarming Procedure.

(1) Without pressing on the plunger, cut any pull wires attached to the hammer release fork (par. 6*x*).

(2) Unscrew the fuze from the mine and separate the fuze from the detonator and percussion cap.

(3) Remove the fuze to a safe storage or disposal area.

361. Pressure-Pull Fuze, Modified (South Korea)

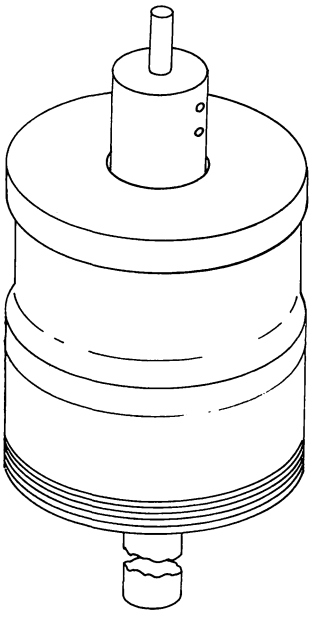


Figure 575

This is the modified South Korean conventional pressure-pull fuze contained in a metal housing with a threaded base. The removable shear and pull pins have been replaced with fixed shear pins. There is no safety pin.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical with shear or pull pin release.	Pressure: 300 lb. Pull: 10 lb.

b. Use. This fuze was designed for use in the heavy antitank mine.

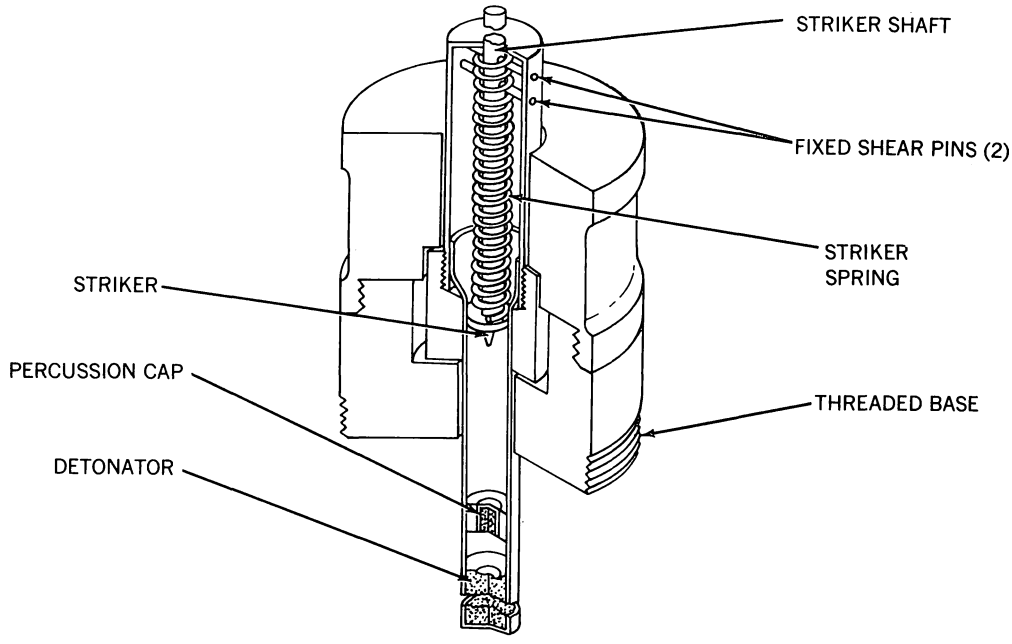


Figure 576

c. Functioning. Pressure on the end of the striker shaft, which shears both shear pins, or a pull on the pull pin releases the striker against the percussion cap.

d. Installing and Arming.

(1) Insert a detonator into the base of the fuze.

(2) Place the fuze into the metal housing and screw on the threaded base. Once assembled, the fuze is armed.

e. Disarming Procedure.

(1) Unscrew the fuze from the mine.

(2) Unscrew the threaded base and remove the fuze from the metal housing.

(3) Unscrew the percussion cap and detonator from the base of the fuze.

(4) Remove the fuze to a safe storage or disposal area.

362. Pressure-Pull Fuze S.E.M.G. (France)

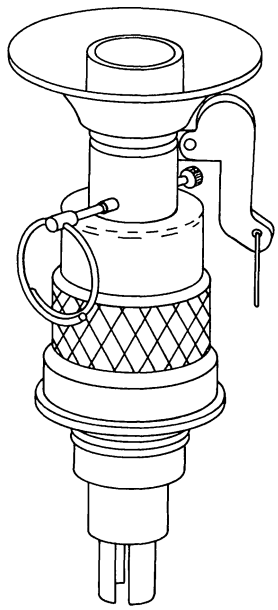


Figure 577

The striker of this fuze is actuated either by pressure or pull. The fuze consists of the main plunger, main spring, spring-loaded actuating sleeve, spring-loaded striker, guide piece, spring-loaded dome-headed plunger, pull-pin retaining plunger, pull pin, safety pin, screw cap, and fuze case.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Pressure mechanical, with actuating lever and ball release.	90 to 100 lb pressure 9 lb pull.

b. Use. This fuze is designed for use in the M-1939 bounding antipersonnel mine and in improvised mines.

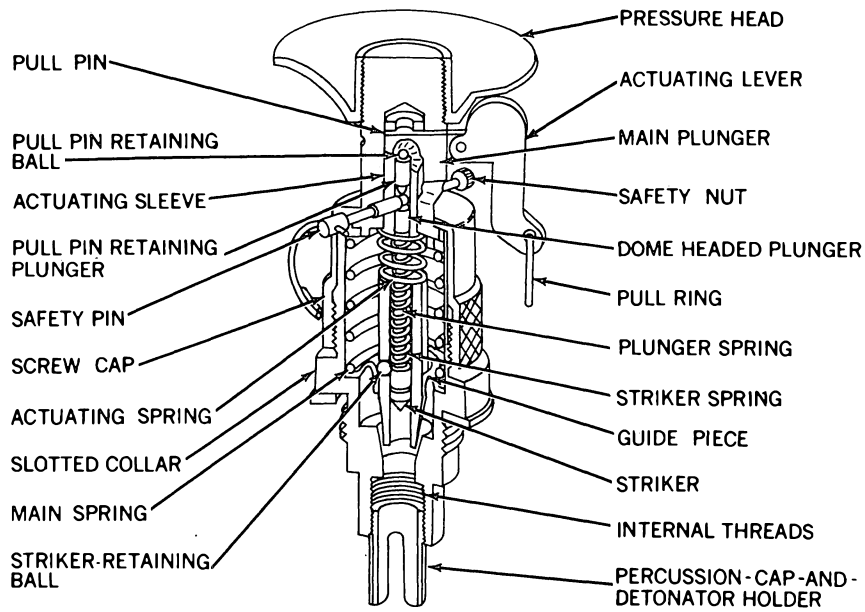


Figure 578

c. Functioning.

(1) *Pressure.* Pressure on the pressure head moves the main plunger and actuating sleeve downward against the resistance of the main spring until the retaining ball moves outward, releasing the striker against the percussion cap.

(2) *Pull.* A pull on the tripwire attached to the pull ring on the actuating lever removes the pull pin, freeing the actuating sleeve to move downward, clearing the retaining ball and releasing the striker against the percussion cap.

d. Installing and Arming.

(1) Screw the percussion cap and detonator holder, with detonator, into the base of the fuze.

(2) Screw the fuze into the fuze well of the mine or charge.

(3) Tie an anchored tripwire to the pull ring (if pull ignition is desired).

(4) Unscrew the safety nut from the safety pin and pull out the safety pin.

e. Disarming Procedure.

(1) Insert the safety pin and screw the safety nut on the end. (The safety pin has a beveled end and must be inserted with the edge uppermost to engage the plunger which has arisen and blocked the safety pin hole.)

(2) Cut the tripwire and unscrew the fuze from the mine or charge. Never grip the fuze by the knurled screw cap as this will actuate the striker. It must be gripped by the slotted collar.

(3) Unscrew the percussion cap and detonator holder from the base of the fuze and remove the detonator.

(4) Remove the fuze to a safe storage or disposal area.

363. Electrical Pressure-Pull Fuze, No. 7 Mark 1 (United Kingdom)

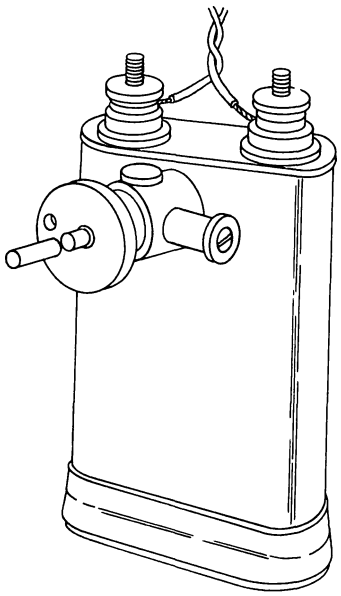


Figure 579

This electrical pressure-pull fuze is the type in which the fuze action closes an electric circuit that fires an electric detonator. The unit consists of a case containing a flashlight battery and a pressure pull mechanism. The top of the case has two terminals for making the connection to an electric detonator. The pressure-pull mechanism consists of a plunger with a pressure-pull plate on the outer end. The plate has two holes for attaching tripwires. An actuating pin, inserted through the inner end of the plunger, closes the switch by the application of either pressure or pull. Pressure required for actuation is adjusted by means of a screw located inside the case.

a. Characteristics.

Shape	Case	Internal action	Operating force
Like a pocket flask.	Sheet metal.	Pressure mechanical, with pressure or pull closing the electric circuit.	5 to 30 lb depending on the screw adjustment.

b. Use. This fuze is used chiefly as a booby-trap igniter. It is applicable as a pressure fuze under a pressure board or as a pull fuze with wires attached to the holes on the pressure-pull plate.

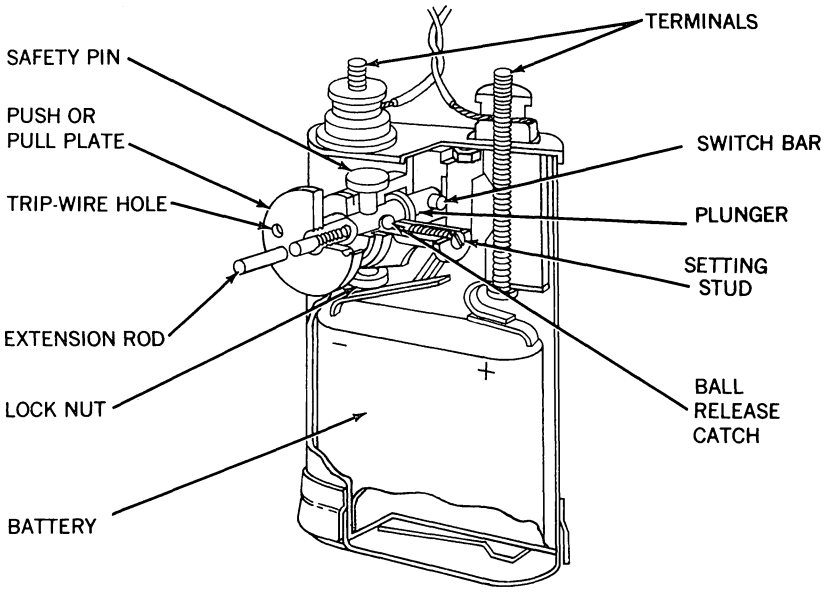


Figure 580

c. Functioning. Pressure or pull on the pressure-pull plate slides the plunger either in or out so that the actuating pin makes contact, completing the firing circuit.

d. Installing and Arming.

(1) Install the fuze for either pressure or pull.

(2) Adjust the amount of resistance offered by the spring-loaded ball release catch by screwing the adjusting screw **all the way in** and then backing off until the right resistance is obtained. (The range of resistance is from a max of approx 30 lb with the adjusting screw **all the way in** to a min of 5 lb, with it **all the way out**). After setting the adjusting screw, always lock it by means of the locknut.

(3) Connect the leads of an electric detonator to the terminals of the fuze case.

(4) Unscrew the retaining nut from the safety pin and remove the safety pin.

e. Disarming Procedure. Cut the tube wires one at a time, if any, and the leads to the battery or the electric detonator, and remove the fuze and detonator to a safe storage or disposal area.

364. Contact Strip Fuze, No. 11 Mark 1 (United Kingdom)

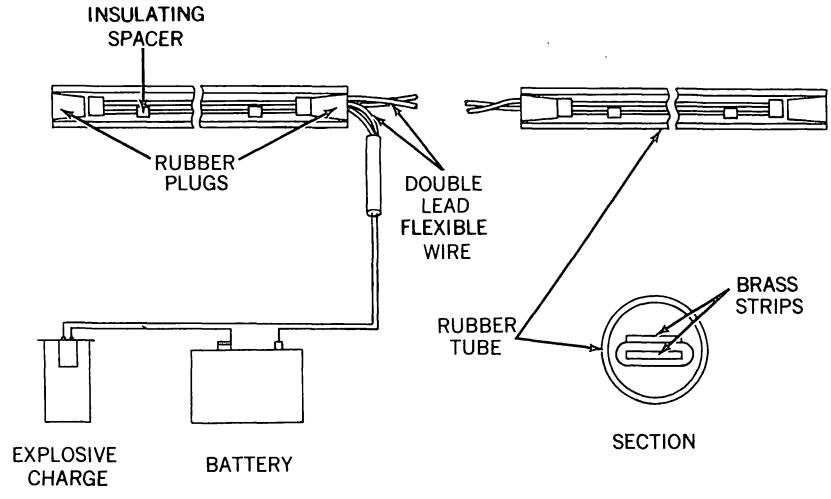


Figure 581

This device consists of two arms 83.4 centimeters long connected together by 15.2 centimeters of double-lead flexible wire. It also has another double-lead of flexible wire with plugs to fit into the fuze battery. Each arm contains two brass strips enclosed in red rubber tubing, the ends of which are closed with waterproof rubber plugs. This fuze overall is 1.8 meters long and 0.9 centimeters in diameter.

a. Characteristics.

Shape	Material	Internal action	Operating force
Tubular.....	Rubber tube.	Pressure electrical.	5 lb.

b. Use. This fuze is employed in a specialized form of trap designed to destroy wheeled or tracked vehicles. It is laid across a road surface in the probable path of enemy approach.

(No drawing available.)

c. Functioning. The passage of a vehicle over either arm forces the brass strips into contact with each other, completing the electrical circuit. This sets off the electric detonator and fires the charge.

d. Installing and Arming. Before connecting the battery to the charge, test the contact strips with an electric blasting cap to make certain that the brass strips are not in contact, that pressure produces the proper contact, and that contact is not maintained after the pressure ceases.

e. Disarming Procedure. Disconnect the detonator leads from the battery. Disconnect the fuze from the charge.

365. Mechanical-Delay Tilt Assembly (Two-Count) (Germany)

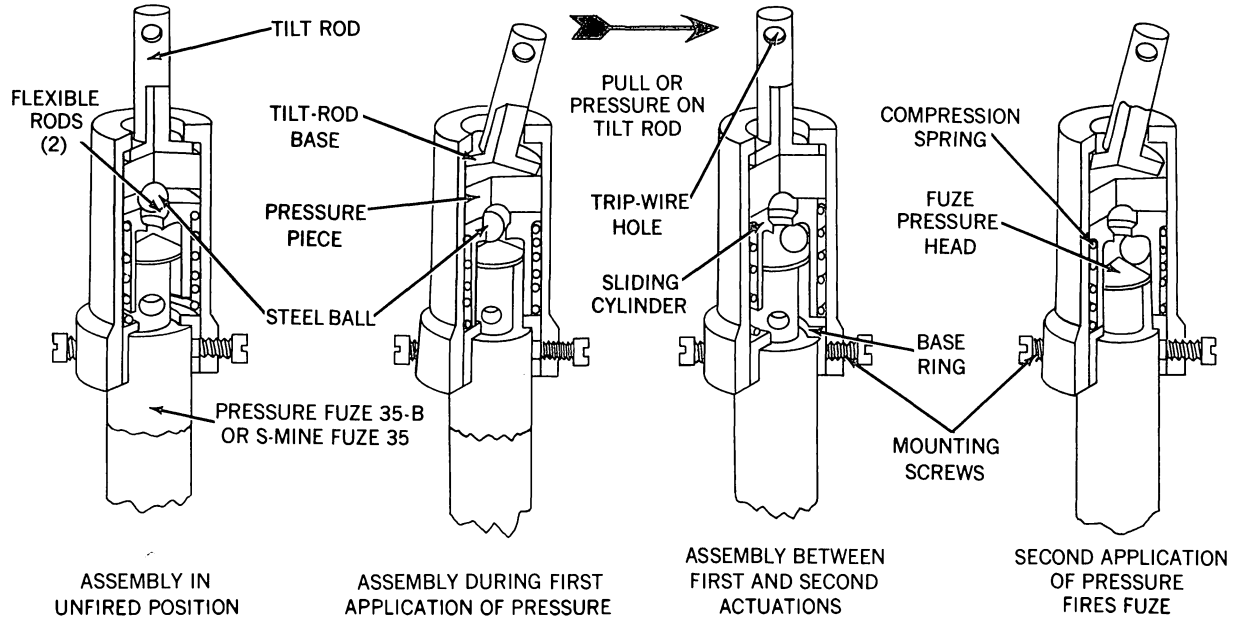


Figure 582

This assembly has a spring-loaded sliding cylinder with ball actuation. It consists of a housing with two mounting screws for clamping it over the case of a pressure fuze 35B with the head removed or over an S-mine fuze 35 (par. 340) with the prongs removed. The assembly also is fitted with a short tilt rod and base and a pressure piece that rests on a steel ball supported by two flexible rods soldered across a hole in the head of the sliding cylinder.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with ball delay.	10 to 20 lb.

b. Use. This fuze was designed to prevent tanks and tank-mounted clearing devices from opening lanes in minefields by only one depression of the tilt rod.

(No drawing available.)

c. Functioning. This fuze functions in two stages, which causes the delay. The first application of pressure on the tilt rod moves a ball which drops down onto the pressure head, taking up the previous space between the striker shaft head and the sliding cylinder head. When the vehicle passes over and the pressure is released the tilt rod and sliding cylinder return to their original position. The second depression of the tilt rod is transmitted through the steel ball directly to the pressure head, depressing the pressure head and actuating the fuze.

d. Installing and Arming.

(1) Remove the prongs from an S-mine fuze 35 or the pressure cap from a pressure fuze 35B and remove their safety pins.

(2) Fit the mechanical-delay tilt assembly over the fuze and secure it to the fuze case by tightening the mounting screws.

(3) Screw this fuze with the attached mechanical-delay tilt assembly into the mine, after inserting a detonator into the fuze well.

(4) Carefully attach a slack tripwire to the tilt rod, if required.

(5) Cover the mine and the tilt assembly so that only the short tilt rod shows above the ground.

e. Disarming Procedure.

(1) Cut the tripwires, if any; loosen the mounting screws at the base of the tilt assembly; and lift the tilt assembly off the fuze.

(2) Insert a nail or other suitable safety pin in the safety pin hole of the fuze and unscrew it from the mine.

(3) Separate the percussion cap from the fuze.

(4) Remove the fuze and tilt assembly to a safe disposal area.

f. Additional Precautions. In disarming, be extremely careful not to touch the tilt rod until the assembly is lifted off the fuze. The assembly has no safety device.

366. Tilt Fuze 43A (Ki. Z. 43A) (Germany)

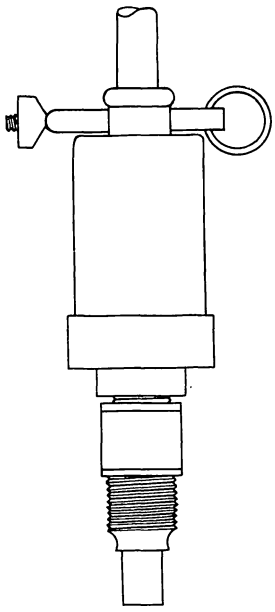


Figure 583

The Ki. Z. 43A has a spring-driven striker held by two retaining balls, a pressure piece, a pressure spring, and a striker guide that also holds the percussion cap. The tilt rod projects from its base on the top of the pressure piece. The tilt rod mechanism is held firmly in place by means of a safety pin. A 0.6-meter tilt rod extension and a metal retaining sleeve are provided for use in deep snow or high grass. The overall length of the fuze with tilt rod extension is approximately 71.1 centimeters.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical with ball-release.	15.5 to 24 lb release or pull 1.5 lb at end of extension.

b. Use. Like snap fuzes, tilt rod fuzes were designed for mines laid in grassy or bushy areas, or in snow. They are also used in some antipersonnel mines and boobytraps.

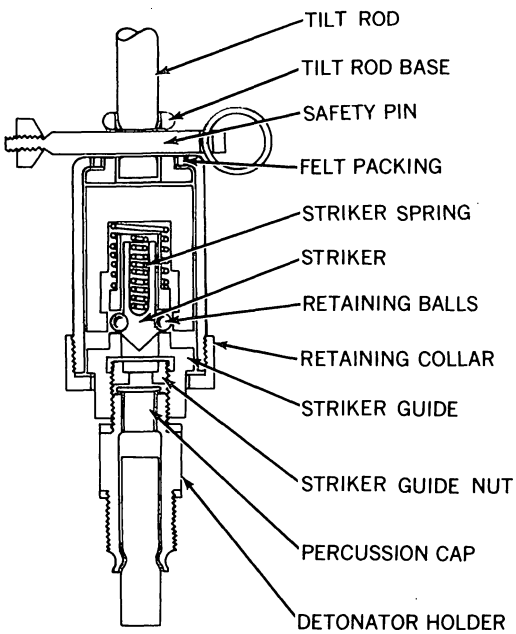


Figure 584

c. Functioning. When tilted, the tilt rod base depresses the pressure piece until the recess in the pressure piece is opposite the two retaining-balls, when they move outward into the recess, releasing the striker to fire the percussion cap.

d. Installing and Arming.

(1) Stake the mine down carefully so that it will not tilt when pressure or pull is applied to the tilt rod.

(2) Screw a percussion cap and detonator assembly into the fuze.

(3) Screw the fuze into the mine. If a very low functioning is desired, screw the retaining sleeve onto the tilt rod extension and place the tilt rod extension on the tilt rod.

(4) Unscrew the retaining nut from the safety pin and remove the safety pin from the fuze at a distance by using a wire or cord.

e. Disarming Procedure.

(1) Replace the safety pin or insert a nail or heavy wire in the safety pin hole, being extremely careful not to touch the tilt rod.

(2) Unscrew the fuze from the mine, and unscrew the percussion cap and detonator assembly from the fuze.

(3) Remove the fuze to a safe disposal area.

f. Additional Precautions. If the safety pin is difficult to insert, destroy the mine in place.

367. Tilt Fuze 43B (Ki. Z. 43B) (Germany)

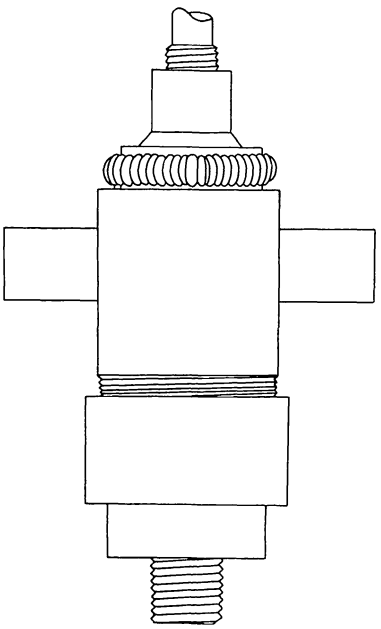


Figure 585

The basic principles of this fuze are the same as those of model Ki. Z. 43A (par. 366). Also the striker, striker guide, pressure pull, striker spring, pressure spring, and tilt rod base are all the same. The safety device, however, is different and there is only one retaining ball. A safety nut is screwed down tightly against a four-piece collar that is retained in place by a spring to prevent movement of the tilt rod. There is also a safety bolt that fits under one side of the tilt rod base. Movement of the safety bolt is controlled by two detachable chains connected to each end of the bolt by scarfed joints. One chain has an identifying tag marked *Sicher* (safe) and the other, an identifying tag marked *Scharf* (armed). The fuze without the tilt rod extension is approximately 13.1 centimeters high and 2.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical with ball release.	10 to 20 lb pressure against tilt rod 2 to 5 lb pull or pressure on the tilt rod extension.

b. Employment. Because of the tilt rod, this fuze is extremely versatile for use in mines planted in grassy and bushy areas or in snow. It is also applicable for some antipersonnel mines and boobytraps.

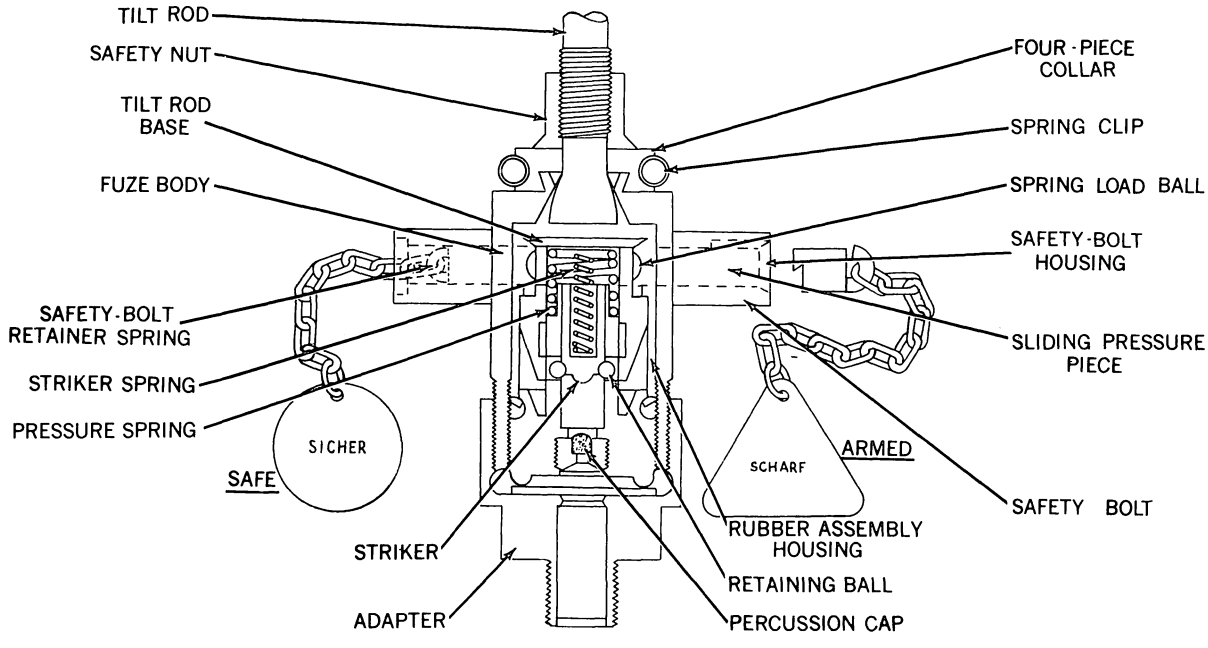


Figure 586

c. Functioning. Pressure or pull on the tilt rod depresses the tilt rod base which moves the pressure piece downward until the retaining ball escapes and releases the spring actuated striker. The striker then fires the percussion cap and detonator.

d. Installing and Arming.

(1) Screw the percussion cap into the base of the fuze.
(2) Screw the detonator adapter into the base of the fuze and insert a detonator in the adapter.
(3) Screw the fuze into the fuze well of the mine or charge.
(4) Attach a tripwire to the tilt rod (if a tripwire is used).
(5) Unscrew the safety nut at the base of the tilt rod.
(6) Pull out the arming chain (marked *scharf*).

e. Disarming Procedure.

(1) Screw the safety nut down tightly against the four-piece collar. If the safety nut is missing, pull the chain marked *sicher*. If the chains are missing, insert a nail into the end of the safety bolt housing marked *scharf* and push the safety bolt to the safe position.
(2) Unscrew the fuze from the mine and separate it from the detonator.
(3) Remove the fuze to a safe storage or disposal area.

f. Additional Precautions. Tilt rod fuzes are particularly dangerous to disarm because the tilt rod may have been moved partially but not enough to fire the percussion cap, which greatly increases their sensitivity to actuation.

368. New Type Tilt Igniter (Germany)

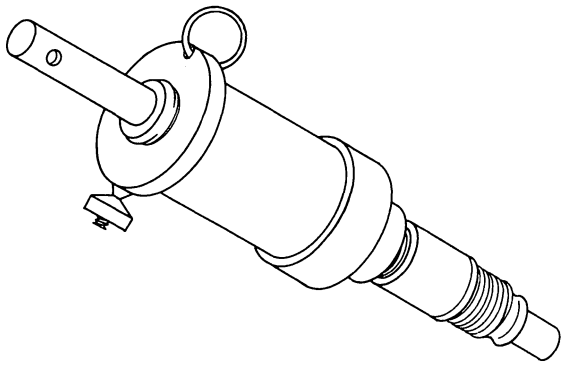


Figure 587

This unit looks and operates much like the tilt fuze 43. The striker, striker guide, pressure piece, striker spring, pressure spring, retaining balls, and tilt rod base are the same. The safety device is different, however. A four-piece collar that is held in place by a safety nut is screwed down tightly against a spring clip. A safety bolt is housed on the side of the igniter and fits one side of the tilt rod base preventing movement. Movement of the safety bolt is controlled by a spring-loaded ball fitting into one of the recesses. The igniter is approximately 12.7 centimeters long and 2.4 centimeters in diameter.

a. Characteristics.

Shape	Internal action	Operating force
Cylindrical...	Mechanical, pressure, with tilt rod and ball release.	15 to 25 lb.

b. Use. This fuze is screwed into the booby-trap well on the under side of antitank mines. This mine is laid upside down.

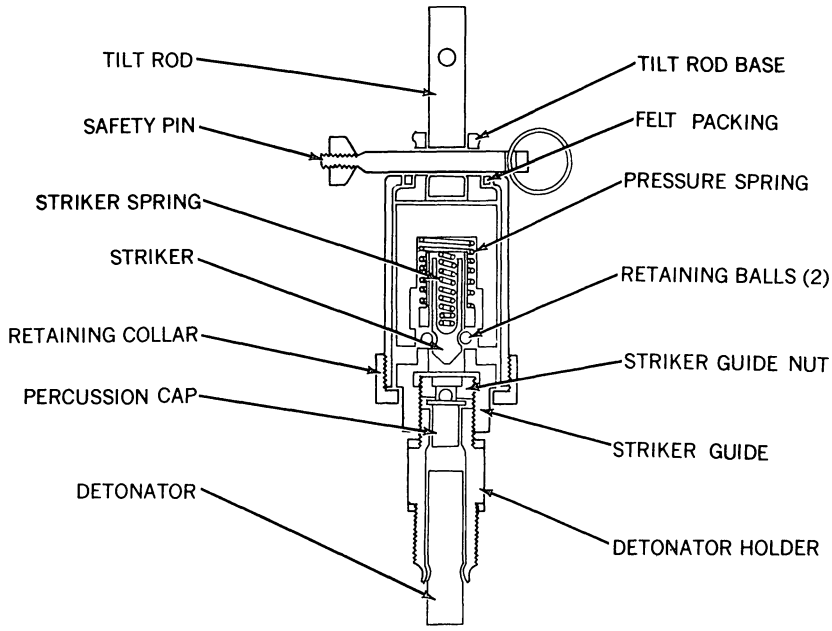


Figure 588

c. Functioning. Pressure on the tilt rod lowers the pressure piece, releases the retaining balls, and frees the striker to fire the percussion cap.

d. Installing and Arming.

(1) Position the igniter and detonator in the mine.

(2) A pull on the wire or chain marked *Scharf* moves the safety bolt until the spring-loaded ball drips into the recess at that end. The curved indentation will then be directly under the tilt rod base and the igniter will be armed. The metal piece will pull away from the *Scharf* end of the safety bolt.

(3) Remove the safety nut and collar or let them in position, as required.

e. Disarming Procedure. This fuze, like all other tilt rod fuzes is difficult and dangerous to disarm. Both the fuze and the mine should be destroyed in place.

369. Tilt Rod Fuze, Model 1952 (France)

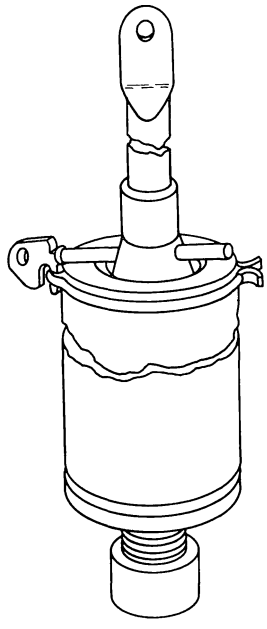


Figure 589

This metallic cased fuze is threaded at the base and protected by a transit cap. The movable head projects from the upper end. The tilt rod, which has a hole near the top for fastening the tripwire, is screwed into the movable head. A safety pin is located at the junction of the head and the fuze body. The safety is held in position by a yoke that passes around the fuze body. The spring-loaded striker is kept in place by two retaining balls. The fuze is approximately 7.1 centimeters high without tilt rod.

a. Characteristics.

Shape	Case	Internal action	Diam
Cylindrical...	Metal.....	Mechanical... with tilt rod and ball release.	2.5 cm (approx).

b. Use. The fuze, fitted with a short tilt rod or a 3-pronged head for pressure actuation, is used with the Model 1951 bounding shrapnel antipersonnel mine and Model 1950 trip flare. It is fitted with a long tilt rod for use with the Model 1948 plate-charge antitank mine.

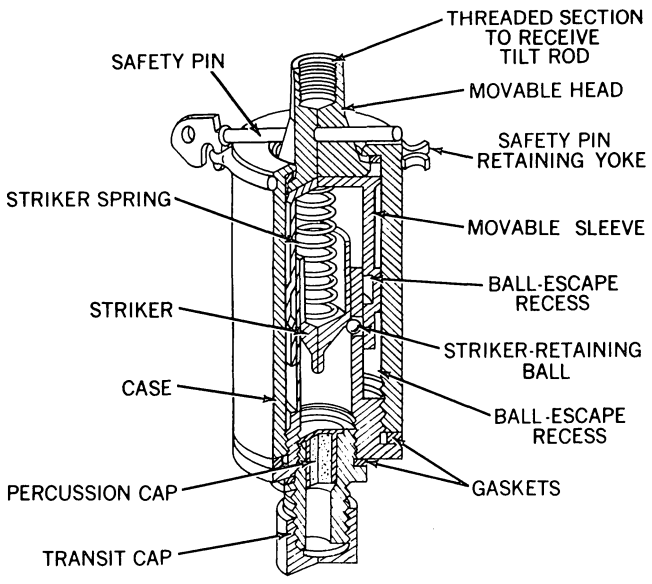


Figure 590

c. Functioning. A lateral force on the tilt rod causes the movable head to cam down the sleeve. When the sleeve has moved downward far enough, the holes in the sleeve aline with and release the retaining balls, freeing the spring-driven striker to slam against the percussion cap. The fuze also functions by a straight downward pressure applied to the top of the tilt rod.

d. Installing and Arming.

(1) Install a detonator in the mine, if required.

(2) Remove the transit cap and place the fuze in the mine.

(3) Attach the short tilt rod and arrange and fasten the pull wire. The long tilt rod may be used (usually without a pull wire).

(4) Remove the safety pin retaining yoke and the safety pin.

e. Disarming Procedure.

(1) Put a safety pin in the safety pin hole.

(2) Remove the fuze from the mine.

(3) Remove the detonator from the mine.

(4) Take the fuze to a safe storage or disposal area.

370. Fuze and Tilt Adapter for the Barrier Mine (Austria)

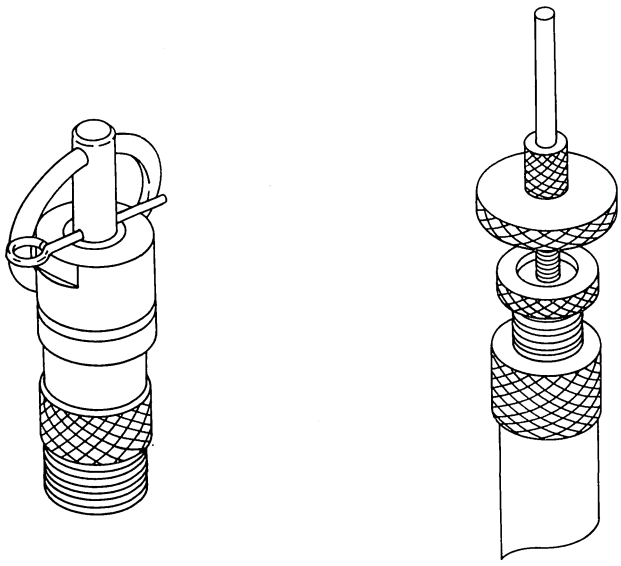


Figure 591

This fuze has a spring-loaded striker retained by a shear or pull pin. The striker shaft has two holes—one for the pull ring and one for the shear pin. The percussion-cap-detonator assembly is screwed onto the base of the fuze. The tilt adapter is a heavy tube about 12.0 centimeters long and 3.1 centimeters in diameter with a threaded swivel housing which has a ball swivel screwed into the top, to which is welded a threaded bolt with a longitudinal groove cut through the threads. The 4-inch long shear wire with a metal knob on one end extends through a hole in the bolt and the ball swivel.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Mechanical, with shear pin.	200 lb pressure on striker shaft, 20 lb on tilt rod.

b. Use. This fuze is placed in the barrier mine. The tilt adapter aids detonating in snow or tall grass.

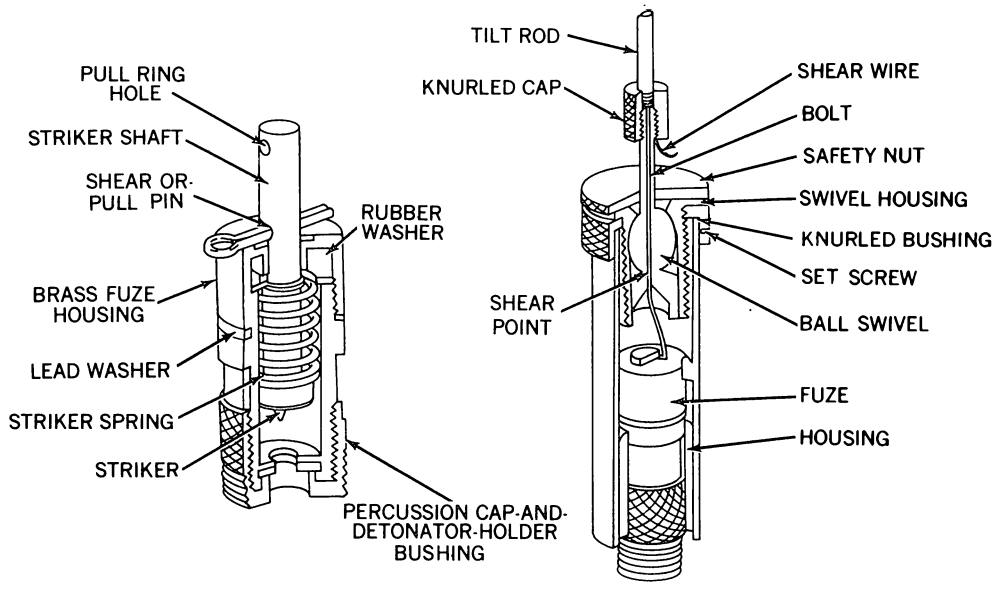


Figure 592

c. Functioning. Pressure on the striker shaft shears the shear pin and frees the striker to fire the percussion cap. Also, pressure on the tilt rod in any direction rotates the ball swivel and shears off the shear wire, releasing the striker.

d. Installing and Arming.

(1) *Pressure or pull.*

(*a*) Pull the striker upward with the pull ring and insert the shear or pull pin in the lower hole.

(*b*) Screw a percussion cap and detonator assembly onto the base of the fuze.

(*c*) If set for pressure, remove the pull ring; or for pull, fasten a pull wire to the shear or pull pin and remove the pull ring.

(2) *Tilt adapter.*

(*a*) Remove the pull ring and the shear or pull pin from the fuze.

(*b*) Push the long shear wire through the top hole in the striker until it is stopped by the metal knob at the end.

(*c*) Push the loose end of the shear wire straight up through the hole in the ball swivel and through the hole in the bolt of the tilt adapter. As the end of the shear wire emerges from the top of the bolt, pull it until the fuze is drawn into the base of the adapter. Bend the end of the shear wire down so that it fits on the longitudinal groove in the bolt.

(*d*) Screw the knurled cap onto the bolt and screw the 20-inch long metal tilt rod contained in the mine crate into the end of the cap.

(*e*) Screw the percussion cap and detonator assembly into the base of the fuze.

(*f*) Rotate the knurled bushing at the top of the tilt adapter so that it raises the ball swivel housing and at the same time pulls the striker bolt of the fuze up, compressing the striker spring.

(*g*) Turn the knurled safety nut until it moves up against the knurled cap.

e. Disarming Procedure.

(1) *Fuze.*

(*a*) Cut any slack tripwires.

(*b*) Unscrew the percussion cap and detonator assembly from the base of the fuze.

(*c*) Remove the fuze to a safe storage or disposal area.

(2) *Tilt adapter.*

(*a*) Rotate the safety nut until it moves down flush with the top of the swivel housing.

(*b*) Turn the knurled bushing until the swivel housing moves down flush with the knurled bushing. This releases the tension on the striker spring.

(*c*) Unscrew the percussion cap and detonator assembly from the base of the fuze.

(*d*) Remove the device and accessories to a safe storage or disposal area.

371. Rupture Igniter (France)

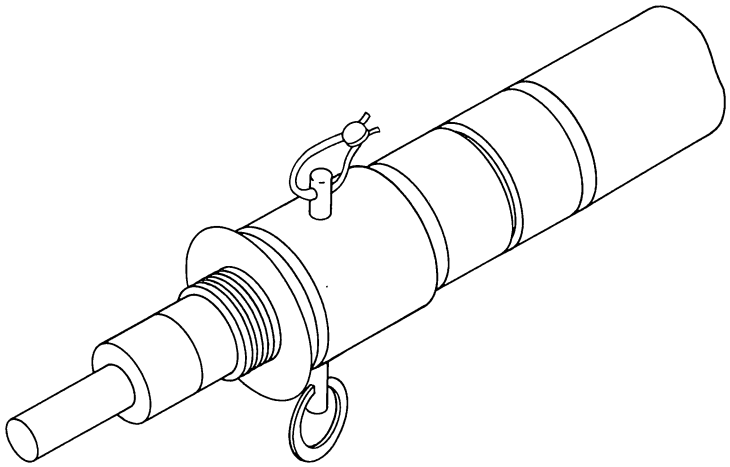


Figure 593

This French rupture igniter consists of a copper tube fitted with a boss piece, a striker guide piece, a striker held against a spring by a nut, a locking pin, and a safety shutter. The detonator holder and detonator are screwed into the open end of the cap holder. The igniter is 22.8 centimeters long and 4.3 centimeters in diameter.

a. Characteristics.

Shape	Case	Fuze action	Operating force
Tubular.....	Copper.....	Mechanical, with rupture of snap release.	115 lb.

b. Use. This fuze is screwed into the nose of obsolete 12- or 15-cm shells to convert them to land mines. A wooden picket is then fitted over the top of the igniter.

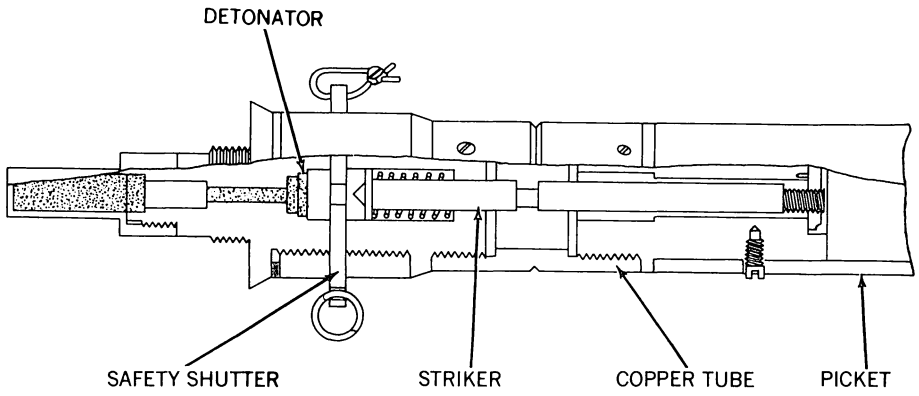


Figure 594

c. Functioning. After the seal is broken and the safety shutter is withdrawn by means of a cord attached to the ring, a thrust applied to the top of the picket ruptures the copper tube at the circumferential notch and shears the striker at the neck. Thus released, the striker drives forward firing in turn the percussion cap, the 0.75-second delay pellet, the powder train, and the detonator.

d. Installing and Arming.

(1) Place the obsolete shell in the ground.

(2) Screw the igniter and detonator into the nose of the shell.

(3) Fit a picket over the top of the igniter.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.

(2) Remove the picket from the top of the fuze, being careful to apply no pressure whatever on it.

(3) Unscrew the igniter from the nose of the shell.

(4) Separate the igniter and the detonator.

(5) Remove the shell and igniter to a safe storage or disposal area.

372. Snap Fuze 43/I (Kn. Z. 43/I) (Germany)

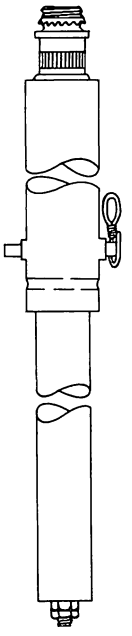


Figure 595

This snap fuze is about 88.9 centimeters long with the extension rod screwed on. It has a spring loaded striker and a fuze case. It may be screwed into any fuze well having standard threads. The extension rod, which consists of five sections of tube inside a metal sheath, contains a chain made up of metal hooks. The bottom hook is attached to a flat metal snapping piece.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with snapping piece release.	15 lb (approx).

b. Use. This fuze is applicable for the detonation of antitank mines buried in the ground or under snow. The extension rod is camouflaged as a seedling or clump of high grass.

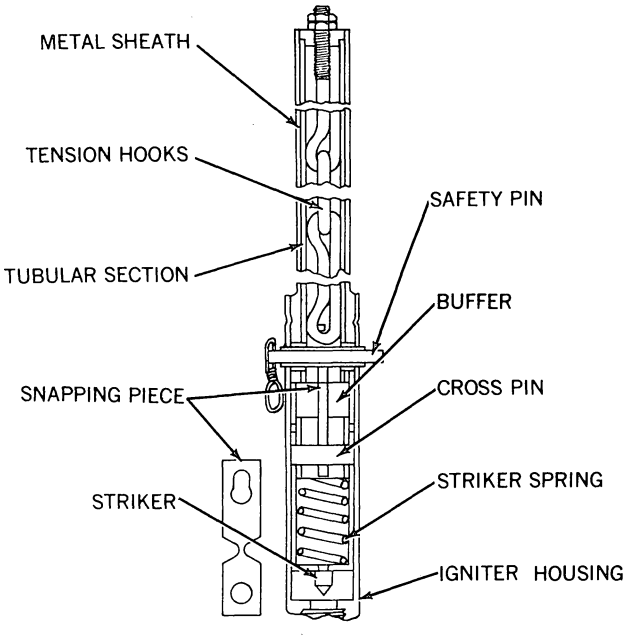


Figure 596

c. Functioning. A sideward pressure on the extension rod bends it causing the chain to pull the snapping piece upward together with the striker sleeve, the striker sleeve pin, and the striker. This compresses the striker spring, until the buffer is reached. Further pressure breaks the snapping piece at the groove, which releases the striker to fire the percussion cap.

d. Installing and Arming.

(1) Carefully stake the mine down to prevent it from tilting when the extension rod is bent.
(2) Insert the detonator into the fuze.
(3) Screw the fuze into the mine.
(4) Remove the safety pin retaining wire.
(5) Remove the safety pin by means of the attached safety pin removal wire.

e. Disarming Procedure.

(1) Do not move the extension rod as the fuze may be partially broken and subject to blast. Any movement might cause the detonation of the mine.
(2) Replace the safety pin with a nail or heavy wire and fix it firmly to the fuze by wiring it in place, and unscrew the fuze from the mine.
(3) Separate the detonator from the fuze.
(4) Take the fuze to a safe disposal area.

373. Snap Fuze 43/II (Kn. Z. 43/II) (Germany)

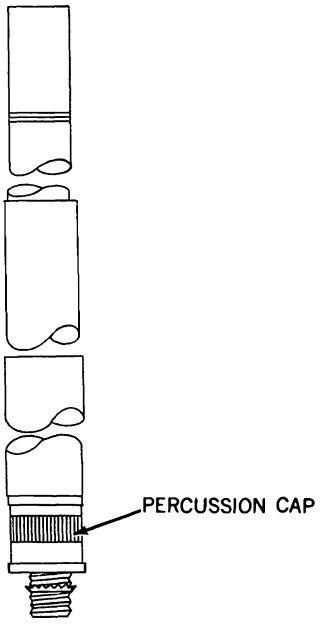


Figure 597

This snap fuze like the 43/I is about 88.9 centimeters long with the extension rod attached. It has a case, a spring-loaded striker, and a percussion cap. The lower end of the case is threaded for screwing into a mine. The metal extension contains a long snap rod made of brittle plastic. A shear or snap groove is located around the extension rod just above the fuze case. The shear-groove or weakened portion is protected by an outer removable collar against the accidental breaking of the plastic rod during the installation of the fuze.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical with snap-rod release.	10 to 50 lb.

b. Use. This fuze is installed in antitank mines buried in the ground or under snow.

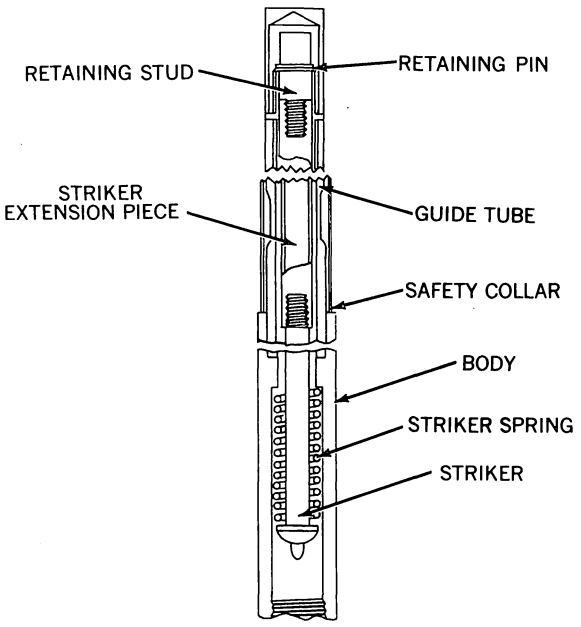


Figure 598

c. Functioning. A sideward pressure on the extension rod breaks it at the shear or snap groove, snapping the brittle plastic shear rod. This releases the spring loaded striker to fire the percussion cap.

d. Installing and Arming.

(1) Carefully stake the mine down so that it will not tilt when pressure is applied to the extension rod.

(2) Unscrew the percussion cap assembly and replace it with a percussion cap and detonator assembly. If the entire percussion cap assembly cannot be replaced, insert a detonator into the base.

(3) Remove the safety collar by sliding it upward and off the extension rod.

e. Disarming Procedure.

(1) Unscrew the fuze from the mine taking care not to put any sideward pressure on the extension rod.

(2) Remove the fuze to a safe disposal area.

f. Additional Precautions. As the only safety device is the safety collar (which will probably not be available and be too difficult to improvise), mines using this fuze should be detonated in place.

374. Snap Fuze, Ollivier (France)

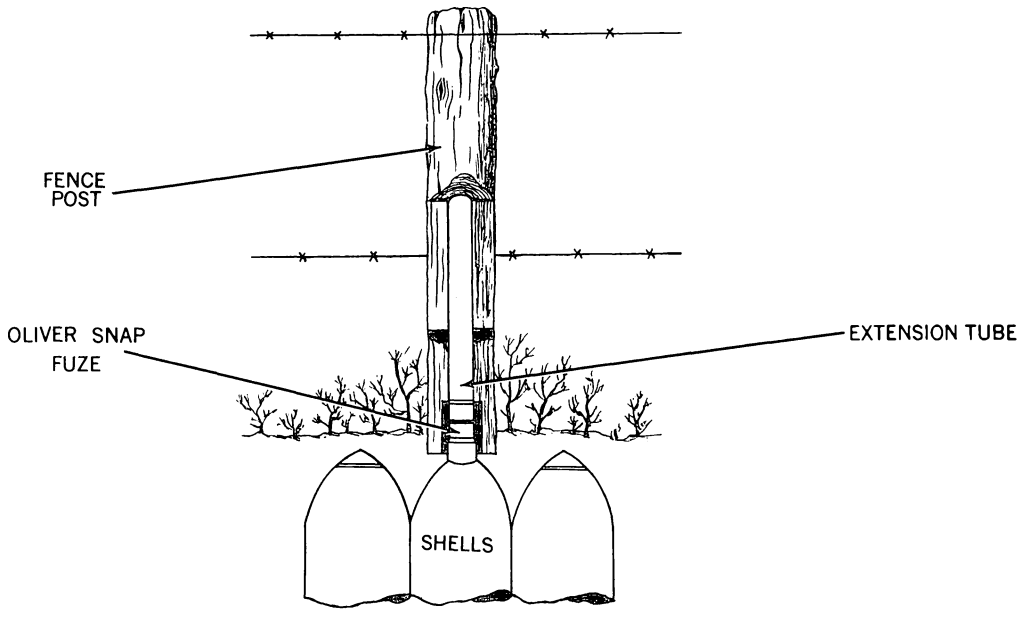


Figure 599

This snap fuze has a spring-loaded striker with a snap release. The middle of the striker shaft is turned down to a much smaller diameter than the rest of the shaft to form a snap neck, coinciding with the snap groove around the fuze case. The safety bar is inserted through the case between the striker and percussion cap. The base of the fuze is externally threaded to fit the nose of a 12- or 15-cm shell. The detonator, separated from the percussion cap by a ¾-second-delay powder train, is screwed onto the base of the fuze.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with snap release.	25 to 50 lb.

b. Use. This device was designed to detonate improvised mines. It was often camouflaged as a picket in wire obstacles and a fence post or was hidden in thick undergrowth or bushes.

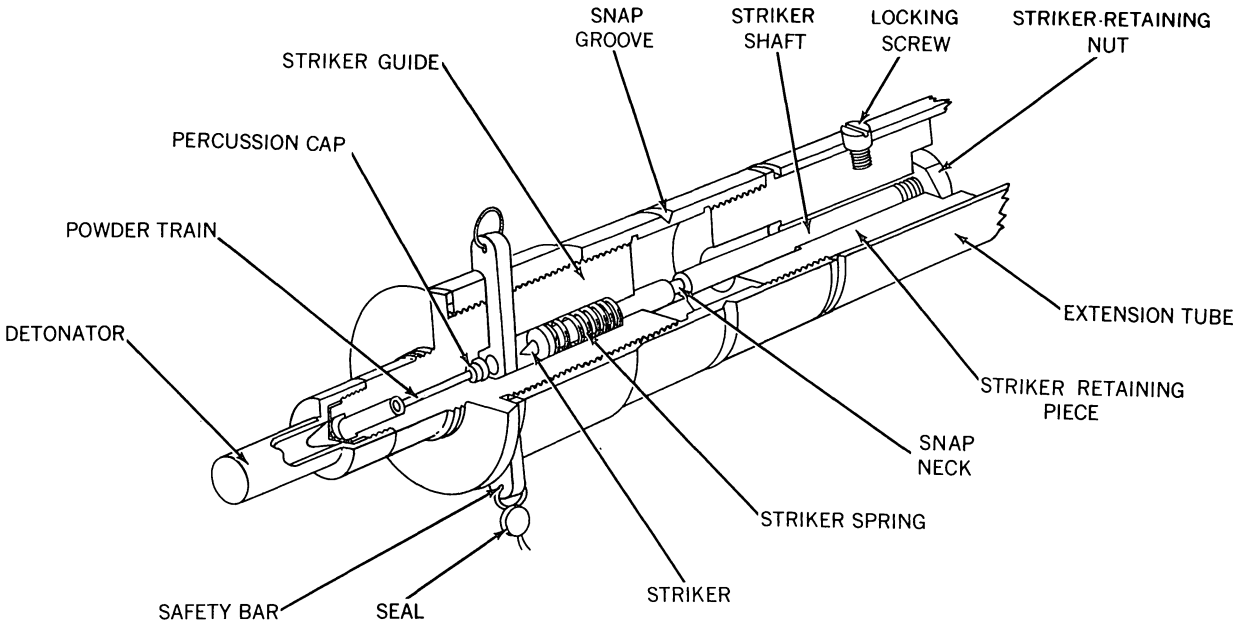


Figure 600

c. Functioning.

(1) Lateral pressure applied near the top of the extension tube snaps the fuze case at the snap groove and the striker shaft at the snap neck, releasing the striker to fire the percussion cap. This in turn ignites the ¾-second-delay powder train and the detonator.

d. Installing and Arming.

(1) Screw the detonator onto the base of the fuze.

(2) Screw the fuze into the nose of the shell, charge, or mine.

(3) Fit the extension tube over the top of the fuze and secure it with the locking screw.

(4) Break the seal and withdraw the safety bar.

e. Disarming Procedure.

(1) Replace the safety bar, if available, or insert a nail or narrow piece of metal.

(2) Unscrew the fuze from the shell, mine, or charge, gripping it below the snap groove.

(3) Unscrew the detonator from the base of the fuze.

(4) Remove the fuze to a safe disposal area.

375. Snap Fuze 43, Waterproof (Kn. Z. 43) (Germany)

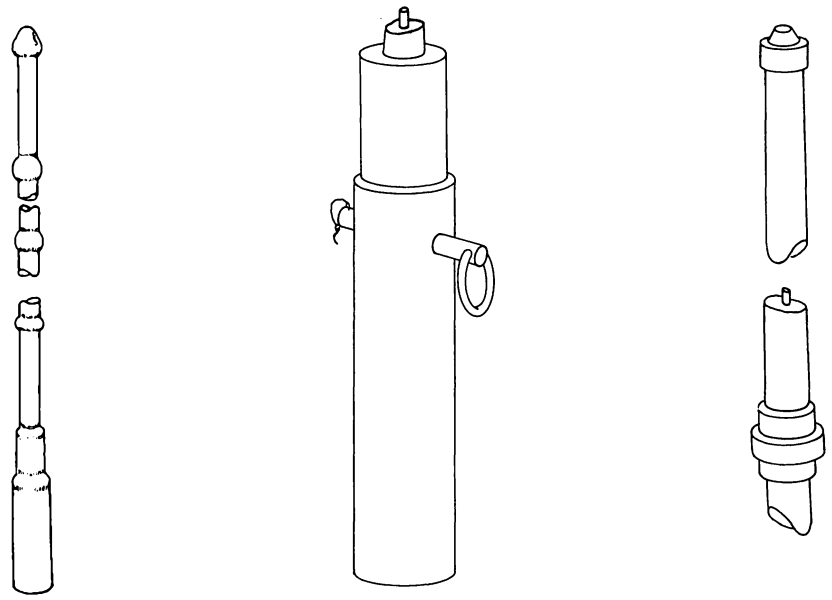


Figure 601

The snap fuze 43, waterproof, is similar to the snap fuze 43/I in operation. It is approximately 1 meter long. It has a spring-loaded striker and a striker shaft with a slotted end to receive a snap or shear strip that has a shear or snap groove. The extension rod is in six segments of tubing held at each joint by meal rings and collars. The pull rod is held to the top of the extension rod by a threaded nut. The entire fuze is completely covered with a waterproof material.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with snap or shear strip release.	10 lb or more.

b. Use. This snap igniter was designed for use in antitank mines buried in the ground or under snow, or in waterproof mines as an antiboat obstacle.

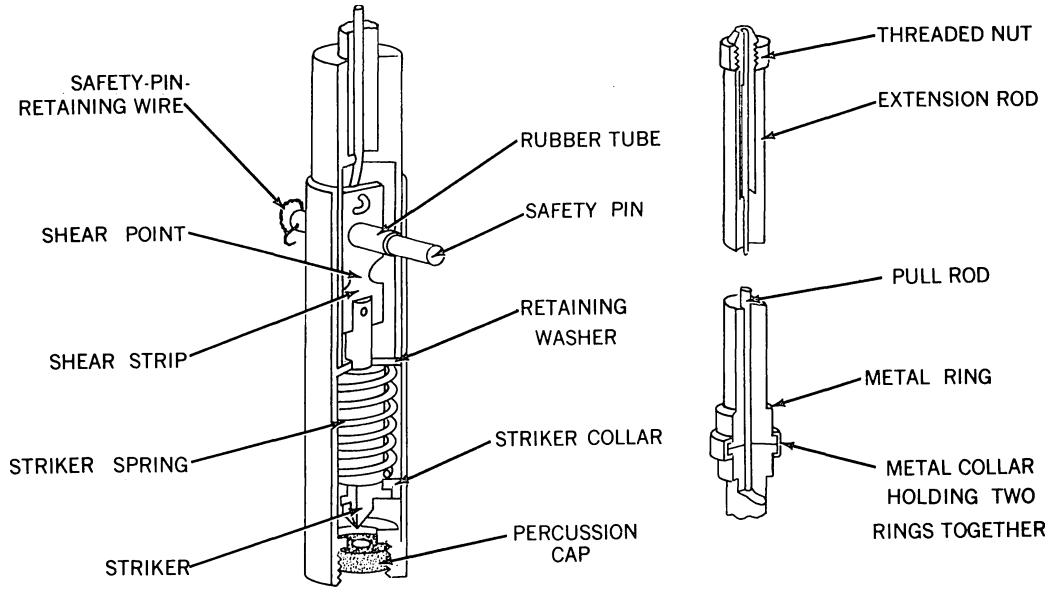


Figure 602

c. Functioning. Pressure on the extension rod bends it at one of the joints, causing the pull rod to pull up on the shear or snap strip and the striker assembly. This compresses the striker spring, exerting sufficient strain on the snap strip to break it off, releasing the striker against the percussion cap.

d. Installing and Arming.

(1) Carefully stake the mine down so that it will not tilt when pressure is applied to the extension rod.

(2) Screw the percussion cap and detonator assembly into the base of the fuze.

(3) Screw the fuze into the mine.

(4) Remove the safety pin retaining wire and the safety pin. The rubber tube around the safety pin should remain in the fuze case.

e. Disarming Procedure.

(1) Insert a nail or wire in the safety pin hole and secure it in place.

(2) Unscrew the fuze from the mine and unscrew the percussion cap and detonator assembly from the fuze.

(3) Remove the fuze to a safe disposal area.

376. Snap Fuze 43 (Short) (Kn. Z. 43) (Germany)

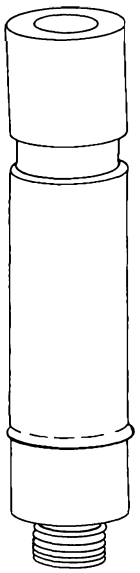


Figure 603

The operation of this fuze is similar to that of the snap fuze 43/II (par. 373), except that the plastic shear rod is not used and the striker has a larger diameter. A shear or snap groove is cut into the striker shaft and the fuze case to weaken them. The fuze is 7.62 centimeters long and 2.1 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with a shear or snap groove release.	150 lb or more.

b. Use. This fuze was designed late in World War II to replace the pull fuze 42 in the bar mine 43.

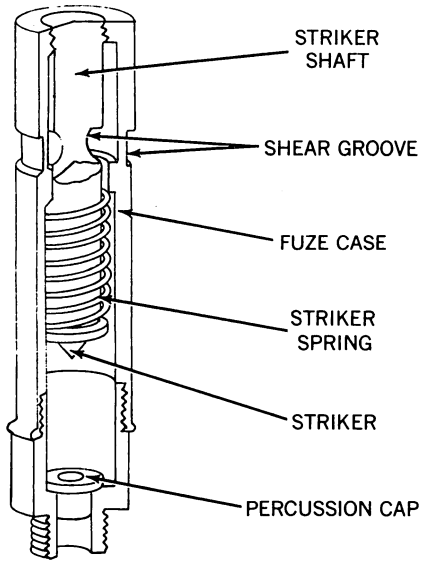


Figure 604

c. Functioning. Pressure on the side of the case above the shear groove snaps it at the shear groove and then bends the striker shaft, snapping it off and releasing the spring-loaded striker against the percussion cap and firing the detonator.

d. Installing and Arming.

(1) Insert the detonator in the fuze.

(2) Screw the fuze into the mine.

e. Disarming Procedure.

(1) Unscrew the fuze from the mine.

(2) Remove the detonator from the fuze.

(3) Take the fuze to a safe disposal area.

377. Pressure-Friction Fuze, Model 1951 (France)

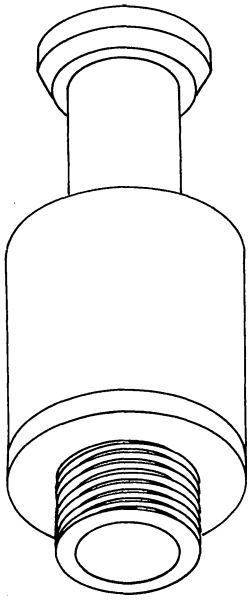


Figure 605

The case of this fuze is made of plastic and strengthened with vertical ribs. The threaded lower part is smaller in diameter than the main part. The plunger is supported and held in place by a shear collar. The cone-shaped end of the plunger fits into a mating sleeve charged with a friction compound. The fuze measures 28.9 centimeters in height and 1.7 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Plastic.....	Pressure friction.	11 lb.

b. Use. This unit is designed for detonating the Model 1948 antipersonnel mine.

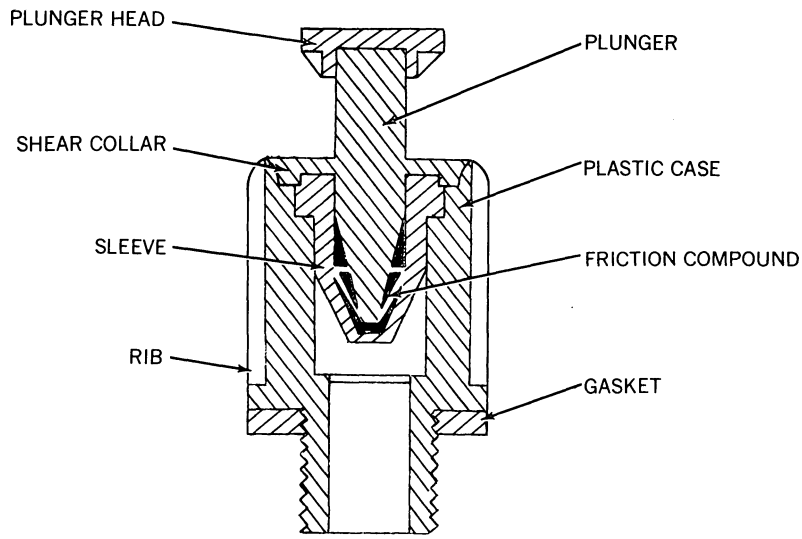


Figure 606

c. Functioning. A pressure of sufficient weight applied on top of the plunger breaks the shear collar and forces its cone shaped end into the mating sleeve. The resulting friction causes a flash that sets off the detonator.

d. Installing and Arming.

(1) Place a Model 1949 undetectable detonator or a No. 8 blasting cap into the detonator well of the mine.

(2) Screw a fuze into the fuze well, being careful not to exert pressure on the plunger.

e. Disarming Procedure.

(1) Unscrew the fuze from the fuze well.

(2) Remove the detonator from the well of the mine.

(3) Remove the fuze to a safe storage or disposal area.

378. Pressure-Friction Fuze, Model 1952 (France)

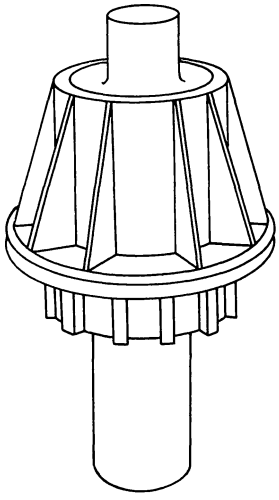


Figure 607

This cylindrical fuze, 4.0 centimeters long and 3.0 centimeters in diameter, is designed for igniting undetectable mines. The case is reinforced with wedge-shaped external ribs. The fuze is simple in construction and functioning. The lower part of the case is in the form of a ribbed collar threaded to the base of the main body for attaching the detonator. The striker is held in place and supported by a plastic shear collar. The upper portion of the striker extends above the fuze case; the lower portion is tapered to fit into a mating sleeve.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical (truncated cone).	Plastic.....	Pressure-friction.	10 to 20 lb.

b. Use. This fuze is used in a variety of mines—the antitank Models 1947, 1951, and 1951 probe-proof—and the undetectable offset fuzing device generally used with the Model 1951 undetectable shaped-charge antitank mine.

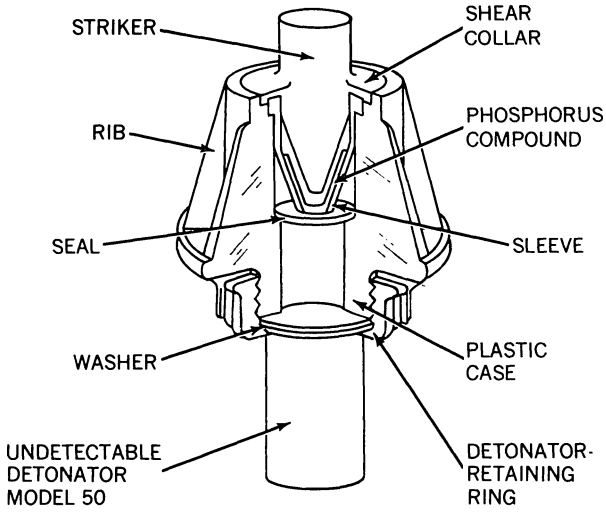


Figure 608

c. Functioning. Adequate pressure on the top of the plunger of the fuze shears the plastic retaining collar causing the plastic cone-shaped end of the plunger to move against the mating sleeve, which is charged with a phosphorous and glass mixture. This movement (about 2-mm or less) causes enough friction to fire the mixture and set off the detonator.

d. Installing and Arming.

(1) Unscrew the detonator retaining ring.
(2) Insert the detonator (undetectable Model 1950).
(3) Screw the detonator and retaining ring back on the base of the fuze.

e. Disarming Procedure.

(1) Unscrew the detonator retaining ring from the back of the fuze and remove the detonator.
(2) Take the fuze to a safe storage or disposal area.

379. Pressure-Friction Fuze SF6 (D.Z. SF6) (Germany)

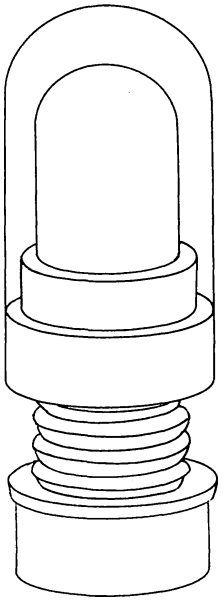


Figure 609

The SF6 is an instantaneous chemical fuze that produces a flash by friction action. A hemispherical aluminum hood containing a chemical compound is crimped to the top of the plastic case. A dome shaped glass cap encloses the hood and is held to the plastic case by a rubber seal. This fuze has no safety device. It is 3.1 centimeters high and 1.2 centimeters in diameter with the shipping cap attached.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylinder with dome-like top.	Plastic with aluminum cap and glass cover.	Pressure-friction.	26 lb (approx).

b. Use. This fuze was developed for use in the antipersonnel glass mine and improvised antipersonnel mines, particularly those laid under water along beaches and at fording points in rivers.

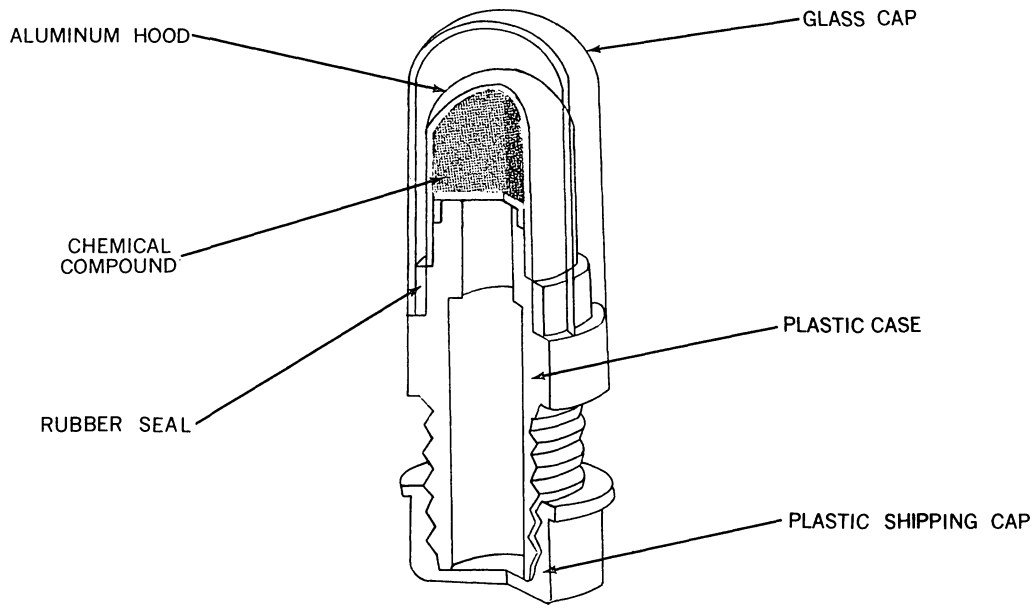


Figure 610

c. Functioning. Pressure on the glass cap crushes it and the aluminum hood. This ignites the highly sensitive chemical compound, causing a flame that sets off the detonator and then the main charge.

d. Installing and Arming.

(1) Unscrew the plastic shipping cap and insert a detonator into the base of the fuze.

(2) Screw the fuze and detonator carefully into the mine or charge, **exerting no pressure or the glass cap.**

e. Disarming Procedure.

(1) Holding the fuze at the base, unscrew it from the mine or charge.

(2) Remove the detonator from the fuze.

(3) Take the fuze to a safe storage or disposal area.

380. Wooden Pressure-Friction Fuze (U.S.S.R.)

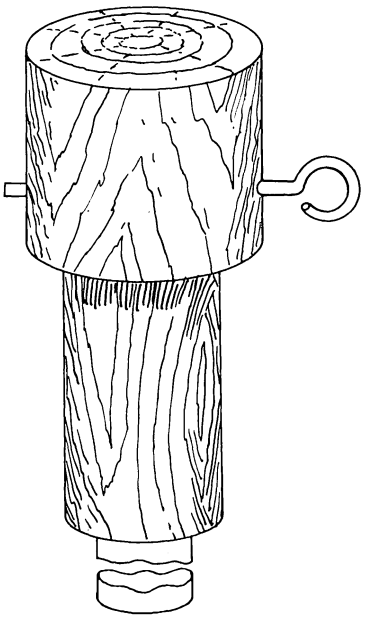


Figure 611

The Soviets constructed this fuze without metal except for the safety pin. The case is a hollowed out dowel fitted with a pressure cap on top and a recess in the bottom for inserting the percussion cap and cardboard encased detonator. The fuze is approximately 5.3 centimeters long (less detonator) and 2.5 centimeters in diameter at the percussion cap.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical.	Wood.....	Pressure friction-storm match striker and friction surface, with shear pin release.	Probably 50 to 100 lb.

b. Use. This fuze was used in nonmetallic improvised mines and in pressure actuated boobytraps.

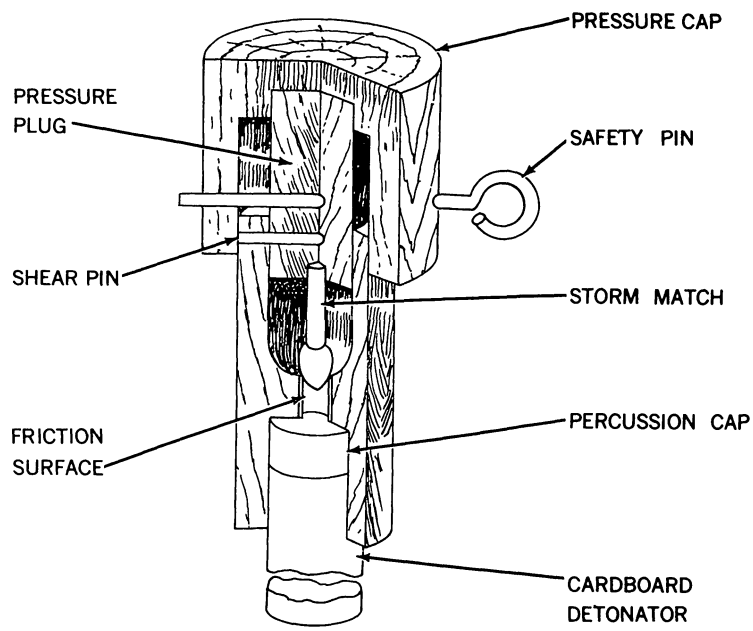


Figure 612

c. Functioning. Pressure on the pressure cap depresses the pressure plug and shears the shear pin, driving the storm match through the hole lined with friction material. The match ignites, firing the percussion cap, detonator, and main charge.

d. Installing and Arming.

(1) Insert the detonator into the fuze.

(2) Place the fuze in the charge or mine.

(3) Remove the safety pin.

e. Disarming Procedure.

(1) Insert a safety pin or wire into the pressure cap and through the pressure plug.

(2) Remove the fuze from the mine or charge and remove the detonator.

(3) Take the fuze to a safe disposal area.

381. Pressure-Release Fuze No. 6, Mark 1 (United Kingdom)

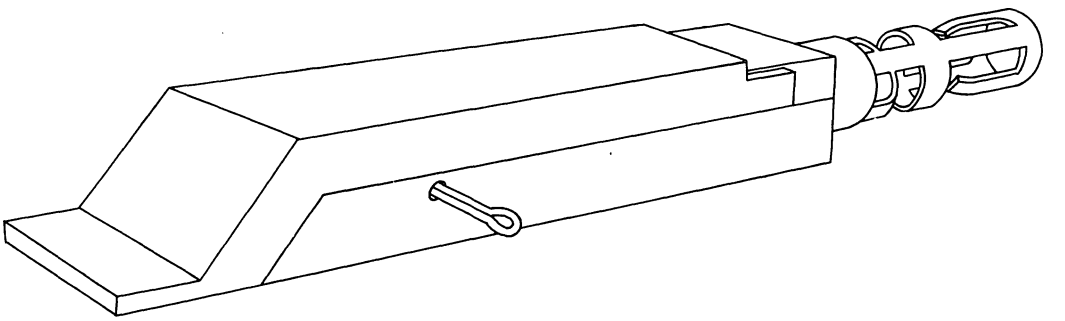


Figure 613

This is mechanical instantaneous type fuze containing a spring activated striker with a trip lever release. It is provided with a narrow rectangular metal case with a lid hinged at one end and resting on a hinged trip lever. This lever retains the striker by engaging in a notch in the top of the striker shaft. A cotter pin is used as the safety. A standard adapter with concussion cap is screwed into the base. The fuze measures 11.4 centimeters in length (with adapter), 1.5 centimeters in width, and 1.5 centimeters in height.

a. Characteristics.

Shape	Case	Internal action	Operating force
Rectangular..	Metal.....	Mechanical, pressure-release with trip lever.	7.0 lb (pressure required to keep the fuze from functioning).

b. Use. The No. 6, Mark 1 is used in boobytraps placed in narrow openings, such as under a door, behind a drawer, or under heavy objects, such as packing cases, that are likely to be lifted. It may also be installed in mines as a boobytrap.

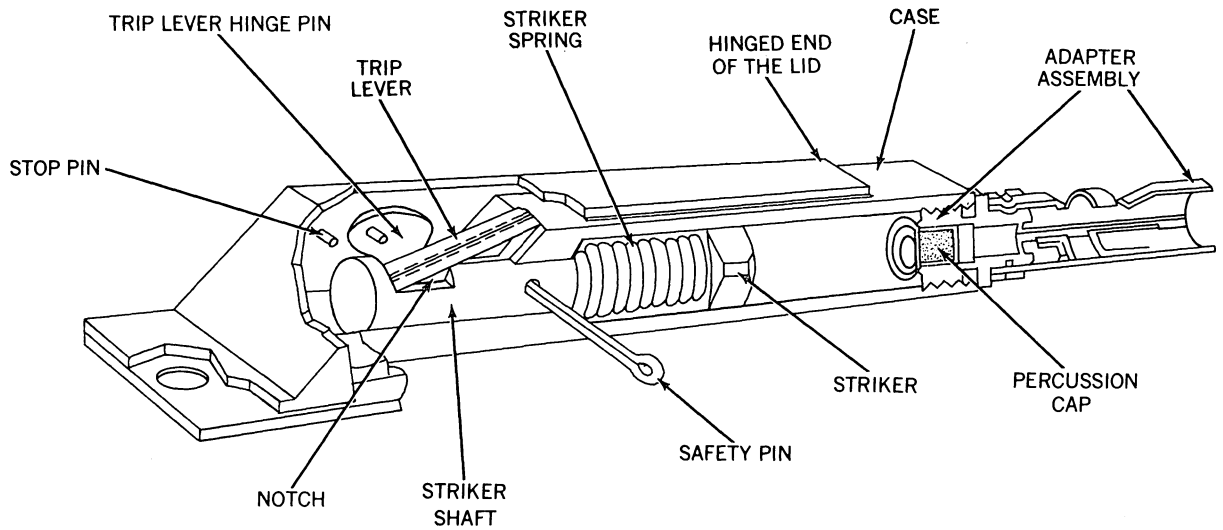


Figure 614

c. Functioning. At the removal of the weight from the hinged lid, the pressure of the compressed striker pivots the trip lever about its hinge pin, lifting the lid until the trip-lever clears the notch in the striker shaft and releases the striker against the percussion cap.

d. Installing and Arming.

(1) Screw the adapter assembly into the threaded end of the fuze.

(2) Insert a nonelectric blasting cap in the adapter assembly (for delay, insert a length of time fuze in the adapter instead of the nonelectric blasting cap).

(3) Connect the fuze to a demolition charge.

(4) Place the fuze and demolition charge under the mine or object to be booby-trapped so that the hinged lid is held down tightly.

(5) Remove the safety pin, which pulls out easily when the object on the lid weighs 7 pounds or more.

e. Disarming Procedure.

(1) Insert a safety pin or nail in the safety pin hole.

(2) Remove the fuze from the demolition charge.

(3) Unscrew the adapter assembly.

(4) Remove the blasting cap.

(5) Take the fuze to a safe storage or disposal area.

382. Pressure-Release Fuze No. 3 Mark 1 (United Kingdom)

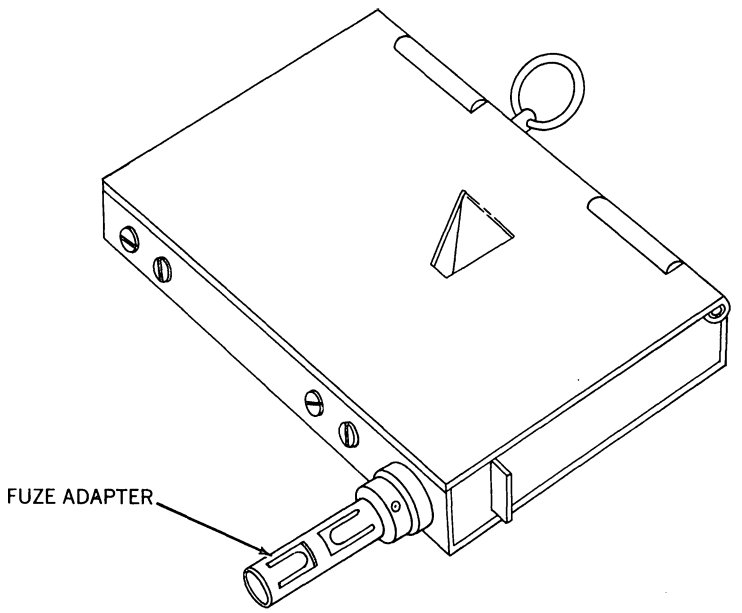


Figure 615

The No. 3 Mark 1 pressure-release fuze has an outer metal case 7.6 by 5.0 by 12.7 centimeters and a striker attached to the end of a leaf spring and held in cocked position by a safety pin. When armed, the striker is held by an inclined tongue in the hinged lid that acts as a stop for the leaf spring. A fuze adapter or a detonator adapter with a percussion cap is screwed into the side of the fuze.

a. Characteristics.

Shape	Internal action	Operating force
Rectangular. .	Pressure-release, with inclined tongue.	5 lb (approx).

b. Use. This mine fuze is used in charges placed under crates, packages, and similar objects as boobytrap devices.

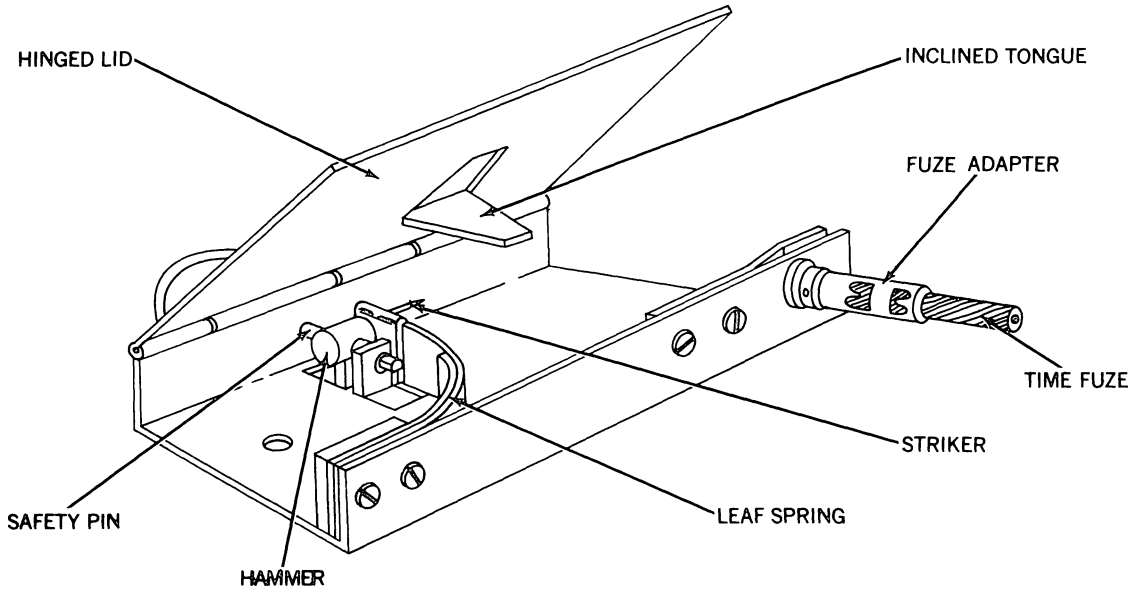


Figure 616

c. Functioning. The removal of weight off the hinged lid permits the leaf spring to force the lid upward and release the striker. The striker then hits and fires the percussion cap.

d. Installing and Arming.

(1) Bend the leaf spring back until the hole through the striker is in line with the hole in the fuze case and insert the safety pin.

(2) Screw the fuze adapter or detonator adapter into the fuze case.

(3) Set the fuze in position and connect it to the charge.

(4) Place the object to be boobytrapped on top of the fuze. (It must weigh at least 5 lb.)

e. Disarming Procedure.

(1) Insert a safety pin in the fuze and disconnect the fuze from the charge.

(2) Remove the boobytrapped object from the top of the fuze.

(3) Remove the fuse adapter or detonator adapter from the fuze.

(4) Take the fuze and charge to a safe storage or disposal area.

f. Additional Precautions. If the safety pin cannot be replaced and the fuze and charge are connected by a time fuse, cut the time fuse and then remove the boobytrapped object. Otherwise, if the safety pin cannot be replaced destroy the fuze and charge in place.

383. Pressure-Release Fuze, No. 12, Mark I (United Kingdom)

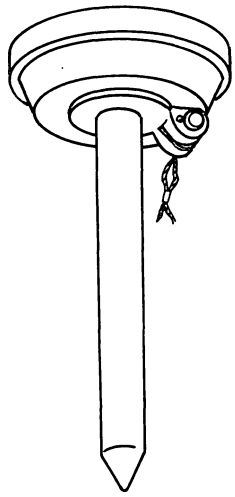


Figure 617

This is an antilifting instantaneous mechanical fuze that consists of a cylindrical metal tube pointed at the bottom and a mushroom-shaped metal container holding 4 ounces of explosive. In the tube is a spring-driven striker with a shaft with a split end that fits over a retaining rod permanently fixed to the bottom of the tube. An actuating sleeve clamps the split end of the striker shaft to the retaining rod. A lift spring that surrounds the retaining rod bears against the bottom of the actuating sleeve. A 4-gram detonator assembly with CE pellets and a percussion cap fits into a well in the explosive container. A safety pin held in place by a cotter pin is placed in the tube just below the explosive container. For shipment, a wooden plug is placed in the detonator assembly well and secured to the explosive container by adhesive tape.

This fuze is not issued to units, but employed only upon the Army Commander's authority.

a. Characteristics.

Shape	Case	Internal action	Operating force
"Mushroom"	Metal	Mechanical, pressure release with compressed spring actuation.	2.5 lb to keep the fuze from functioning.

Measurements				Explosive
L (tube)	Diam (tube)	Ht (mushroom)	Diam (mushroom)	
12.7 cen.	1.0 cen.	2.0 cen.	7.6 cen.	4 oz of RDX/TNT 50/50.

b. Use. This fuze is used for boobytrapping antitank mines or other objects weighing 2.5 pounds or more. It may be used with or without a supplementary charge.

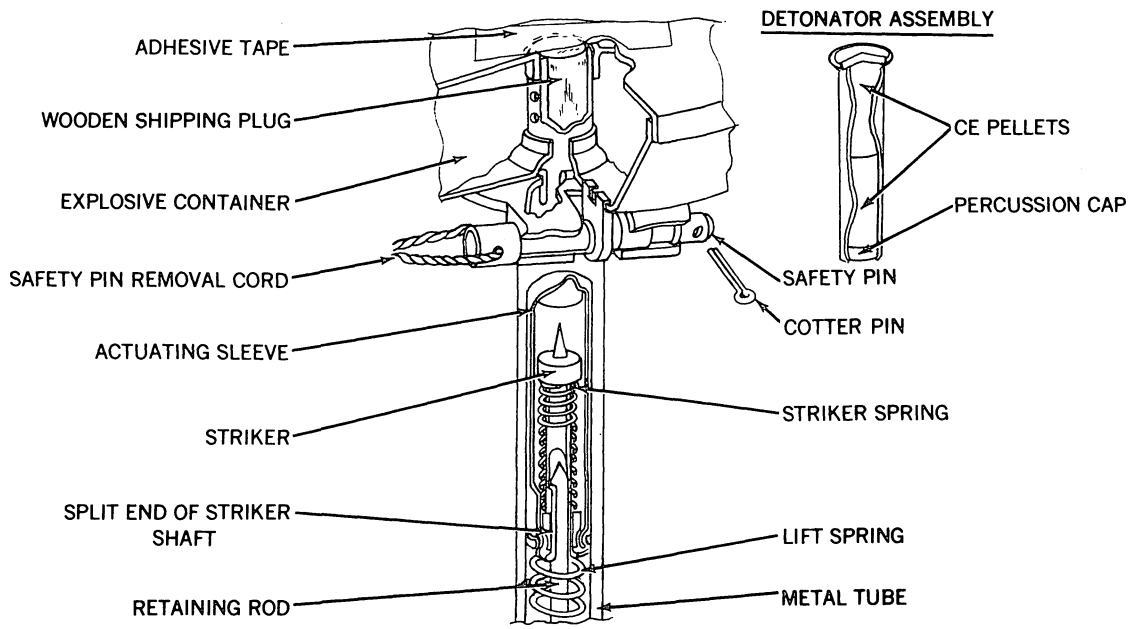


Figure 618

c. Functioning. At the removal of the weight from the top of the fuze, the explosive container, the actuating sleeve, and the striker move upward as a unit under the action of the compressed leaf spring until the striker shaft is freed from the retaining rod. This releases the striker shaft against the percussion cap, which fires the detonator and sets off the explosive in the mushroom container.

d. Installing and Arming.

(1) Push the pointed end of the fuze body into the ground until the safety pin is level with the surface.

(2) Remove the wooden shipping plug and insert the percussion-cap and detonator.

(3) Lay the mine or other object on top of the fuze.

(4) Remove the cotter pin from the end of the safety pin and pull it out. (The pin should come out easily.)

e. Disarming Procedure.

(1) Carefully insert a safety wire into the safety pin hole, while holding the mine or explosive down against the fuze.

(2) Remove the mine or explosive charge.

(3) Transport the fuze to a safe storage or disposal area.

f. Additional Precautions. It is recommended that this type of fuze not be disarmed.

384. Pressure-Release Antilifting Device, E.Z.SM 2 (E.Z.44) (Germany)

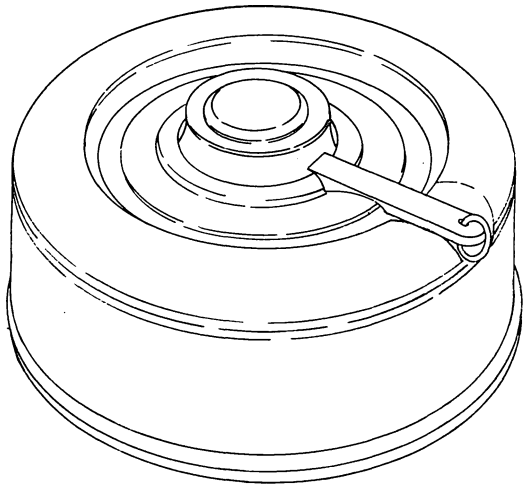


Figure 619

This device, formerly the E.Z.44, consists of a flat circular case 12.7 centimeters in diameter and 4.0 centimeters high. In the case are 2 semicircular 0.25 pound blocks of explosive, a clockwork mechanism with a spring loaded striker that withdraws the safety pin, and a detonator assembly. An externally located safety bar passes through the striker-release plunger and engages the rotor wheel. An internally located safety pin engages the striker shaft.

a. Characteristics.

Shape	Case	Internal action	Operating force
Circular.....	Metal.....	Mechanical, with clockwork arming and pressure-release striker.	4 to 6 lb (approx).

b. Use. This is placed beneath land mines as an antilift and antiremoval device.

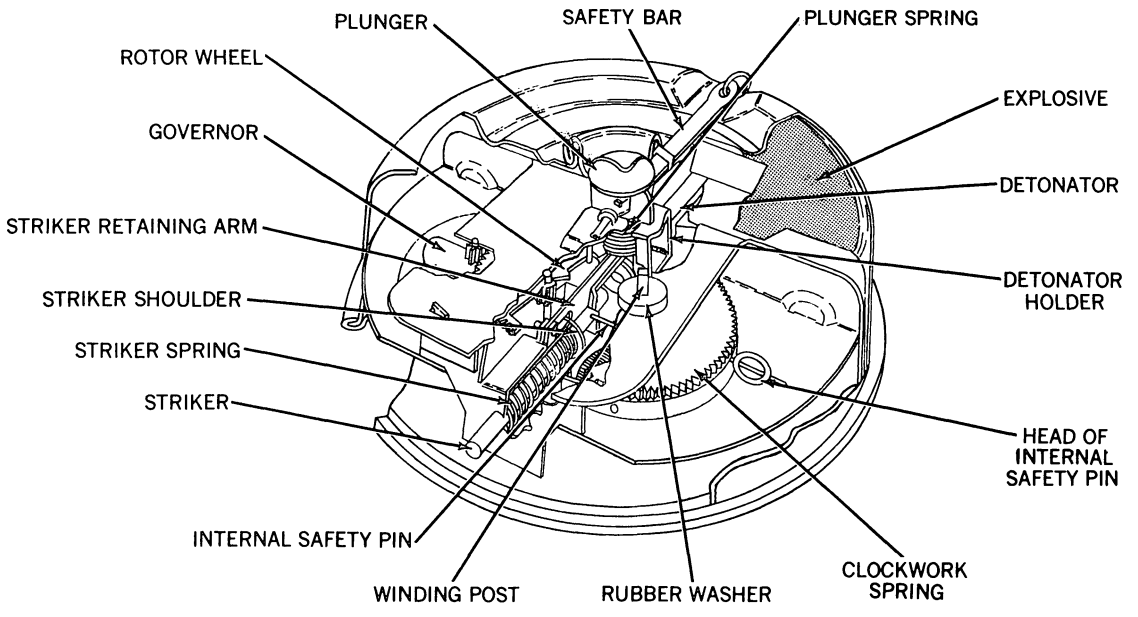


Figure 620

c. Functioning. When the weight is lifted from the pressure release assembly, the striker-release plunger and striker retaining arm move upward, releasing the striker to fire the percussion cap and the antilifting charge.

d. Installing and Arming.

(1) Wind the clockwork mechanism fully with the winding key.

(2) Place the mine to be activated on the striker-release plunger.

(3) Remove the arming bar with the arming cord, which frees the rotor wheel and permits the clockwork to function. When released, the clockwork runs for about 1 to 1½ minutes with a loud buzzing sound, during which the expanding main spring gradually forces the safety pin ring outwards, thus withdrawing the safety pin. This latter operating requires an average of 10 to 15 seconds. (Removal of the weight will then release the striker.)

e. Disarming Procedure. Once armed, this antilifting device cannot be disarmed. Destroy it in place.

385. Pressure-Release Antilift Device, SF3 (Germany)

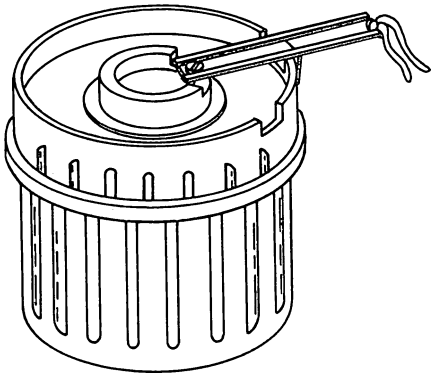


Figure 621

The SF3 consists of a bakelite case about 7.62 centimeters high and 7.9 centimeters in diameter with a screw-on lid containing a built-in fuze case, a spring-loaded striker with a release disk held down by a flat metal safety-and-arming bar, a striker-retaining arm, a glass vial of chemical, a soluble pellet, and an arming spindle that when turned crushes the vial of chemical. An arming cord is attached to the safety and arming bar. The fuze is covered by a rubber waterproofing cap. The 7-ounce main charge, integral with the device, is cylindrical and hollow like a section of pipe.

a. Use. This antilift is used to activate mines and as a boobytrap.

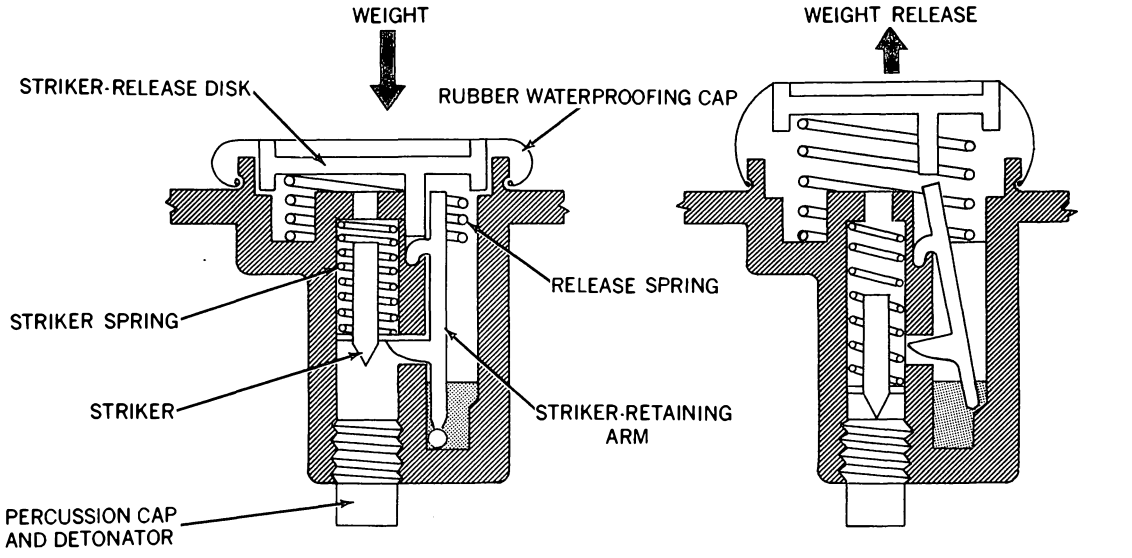


Figure 622

b. Functioning. When the retaining weight is lifted, the striker release disk rides upward under the force of the compressed release spring until the top of the striker retaining arm is no longer held in place by the projection on the under side of the striker release disk. The spring-loaded striker then forces the bottom of the striker retaining arm to tilt outward, releasing the striker against the percussion cap.

c. Installing and Arming.

(1) Before laying, loosen the arming cord from the lid to which it is fastened.

(2) Lay the device on a firm base in a deepened mine hole with the safety-and-arming bar pointing to the right, when facing the enemy, and with the arming cord lying out to the rear.

(3) Carefully press the earth around the device, keeping the top clear and the safety-and-arming bar free to move.

(4) Place the mine to be activated centrally on top of the device.

(5) Fill the hole.

(6) Pull lightly on the arming cord, rotating the safety-and-arming bar 90°. This causes the arming spindle to crush the glass vial of chemical, which dissolves the safety pellet and thus arms the mine.

d. Disarming Procedure. Once armed, this device cannot be disarmed. **Destroy the device and mine in place.**

386. All-Explosive Pressure-Release (Nipolite) Device (Germany)

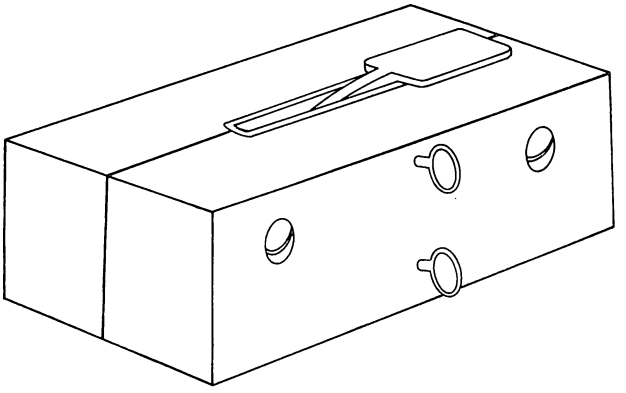


Figure 623

This device consists of two oblong blocks of molded explosive (probably Nipolite) held together by two hollow brass bolts. The blocks have molded recesses to contain the metal striker mechanism and a threaded detonator well. Two holes pass through the blocks for inserting the two safety pins. The striker mechanism has a stamped sheetmetal housing, a striker retaining arm, striker spring, and striker. The striker is held in cocked position by a notch or dent in the retaining arm. The dimensions of the fuze are 9.8 by 5.0 by 2.8 centimeters.

a. Characteristics.

Shape	Case	Internal action	Operating force
Oblong, rectangular...	Nipolite cast explosive.	Mechanical, with retaining arm release.	1 lb, pull or pressure.

b. Use. This device was designed especially for boobytrapping. It may readily be placed beneath ordinary household furnishings as well as mines and other suitable objects.

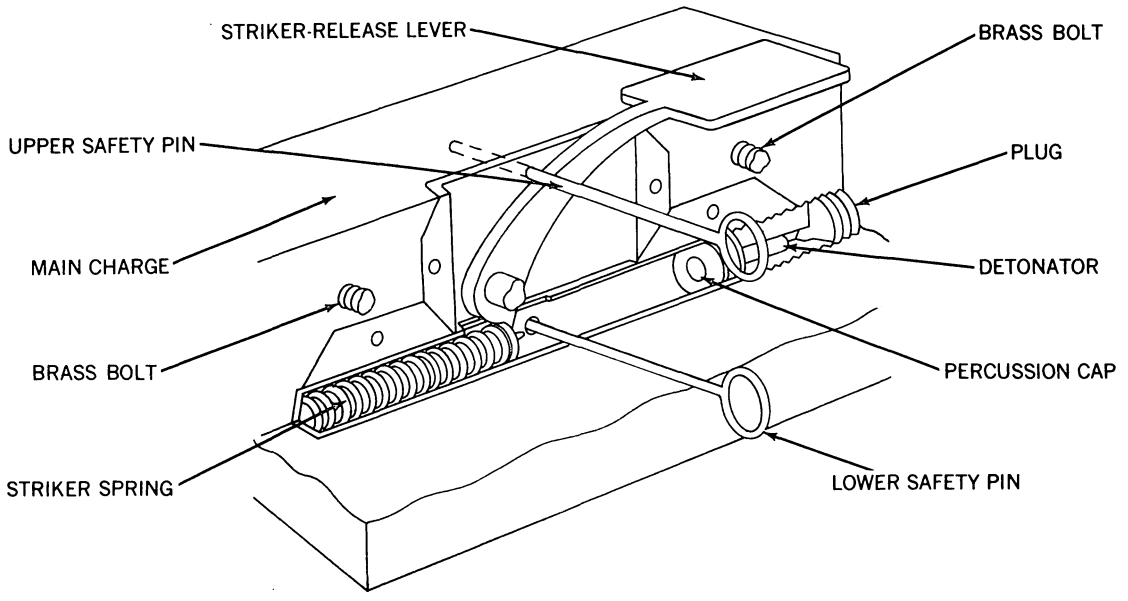


Figure 624

c. Functioning. When the external weight is lifted, the striker retaining arm, under pressure of the striker spring, pivots upward, releasing the striker and firing the percussion cap. This in turn fires the detonator and main charge.

d. Installing and Arming.

(1) Insert a percussion cap and detonator assembly, detonator end first, into the end of a Nipolite plug and screw in the plug.

(2) Place the object carefully on the top of the fuze so that it rests substantially on the striker retaining arm.

(3) Carefully remove the safety pins. (Always remove the upper safety pin first.)

e. Disarming Procedure.

(1) Insert a strong wire or nail through the lower safety pin hole.

(2) Unscrew the Nipolite plug and remove the percussion cap and detonator assembly from it.

(3) Remove the fuze and charge to a safe storage or disposal area.

387. Pressure Fuze T.Mi.Z.35 (Germany)

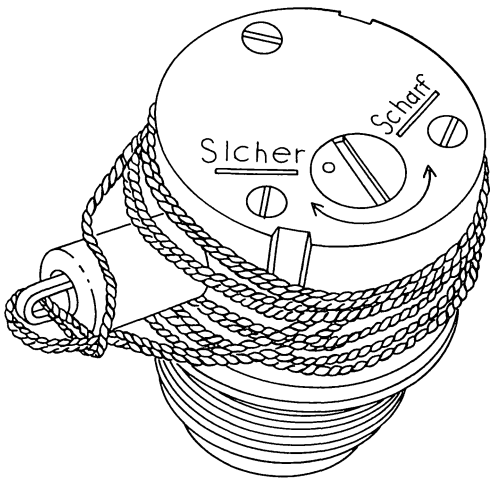


Figure 625

This Tellermine fuze is 5.3 centimeters high and 4.0 centimeters in diameter. It is composed of a case that contains a spring-loaded striker fastened by a shear pin to a cylindrical housing loosely retained in the fuze case by a threaded collar. The percussion cap screws into the base of the striker housing. The fuze has two safety devices—a horizontal safety bolt that passes through a hole in the striker, and a rod attached to a slotted screw head on the arming dial in the top of the fuze, with a cam at the lower end. When the screw head is turned to *sicher* (safe), the cam engages the striker and takes the pressure of the striker spring off the shear pin. When the screw head is turned to *scharf* (armed), the cam is disengaged from the striker.

a. Characteristics.

Shape	Case	Internal action	Operating force	Remarks
Cylindrical.	Brass. .	Mechanical, with shear pin release.	250 to 400 lb.	In disarming mines containing this fuze, the dial indications *sicher* and *scharf* should be disregarded, as they have been known to be purposely in error.

b. Employment. This fuze was designed especially for use in the Tellermine 35.

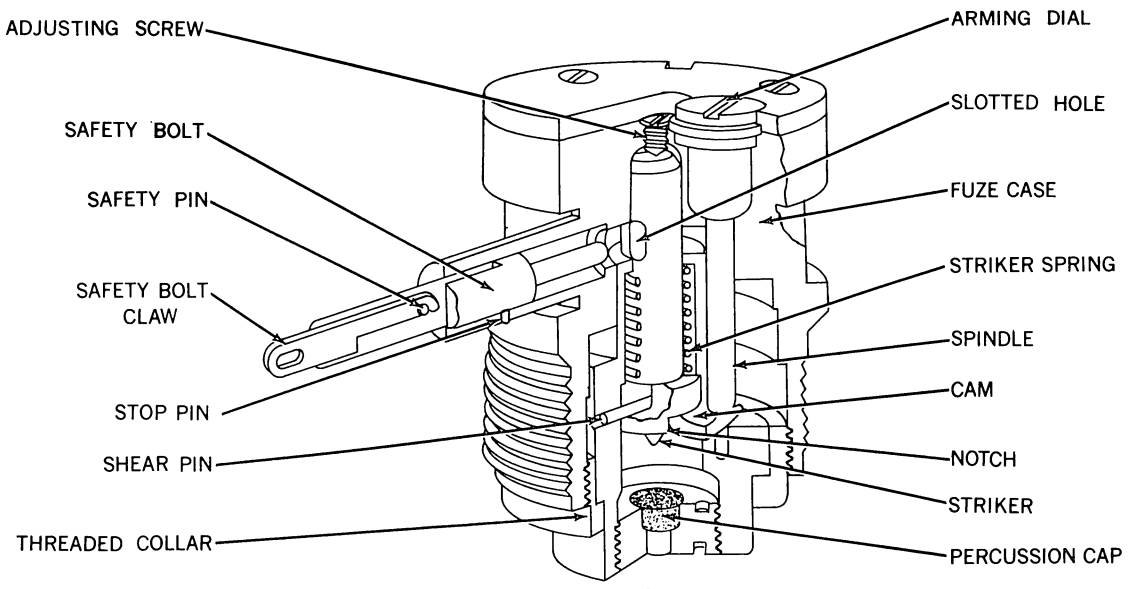


Figure 626

c. Functioning. After arming, proper pressure on any part of the lid of the mine will move the igniter body downward until it ruptures the shear pin, which permits the spring to force the striker against the percussion cap to undertake the firing chain.

d. Installing and Arming.

(1) Screw the fuze into the fuze well of the mine.

(2) Turn the setting dial counterclockwise until the red spot is opposite the red line under *scharf*.

(3) Withdraw the safety bolt until it is latched by the stop pin.

e. Disarming Procedure. Unscrew the fuze from the mine and remove it to a safe storage or disposal area.

388. Tellermine Fuze 44 (Germany)

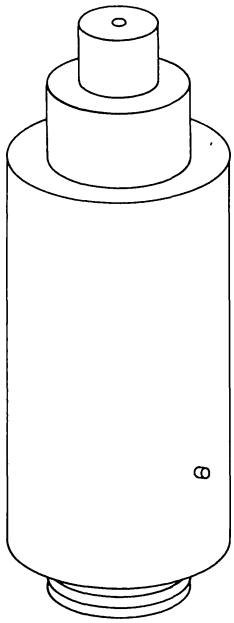


Figure 627

This fuze has a spring-loaded striker with both a shear pin and a ball release. It measures 5.8 centimeters in length and 2.2 centimeters in diameter. It resembles the Tellermine fuze 43, except that it has two telescoping flat-topped plungers instead of a round-ended one. The arming plunger is held within the main plunger by two arming shear wires.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical.	Metal.....	Pressure mechanical and pressure release.	250 lb.

b. Use. As this fuze was merely a pilot model at the close of the war, it was never used. It was designed for use in Tellermines 35 (steel), 42, and 43.

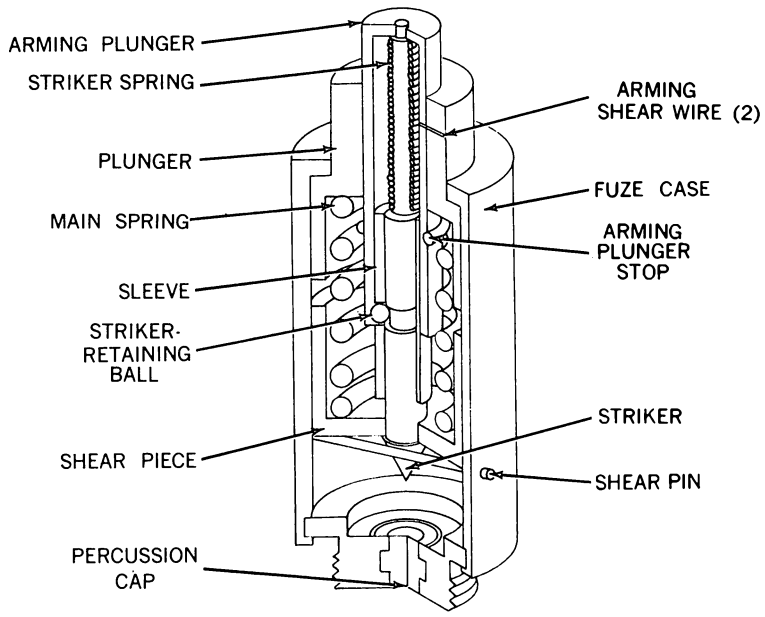


Figure 628

c. Functioning. After the fuze has been screwed in place, the mine pressure plate is screwed on. This moves down on the top of the arming plunger, forcing it down, compressing the striker spring, and shearing the arming shear wires. The arming plunger is now forced down flush with the top of the main plunger. The fuze is now armed. Pressure on the pressure plate forces the main plunger down on the shear piece, shearing the shear pin and forcing the striker down onto the percussion cap. Under pressure release, the unscrewing of the lid on the mine permits the arming plunger to rise up until it releases the retaining balls, firing the striker against the percussion cap.

d. Installing and Arming.

(1) Unscrew the pressure plate of the mine.

(2) Examine the fuze and percussion cap closely to make sure that the fuze has not been fired.

(3) Without putting pressure on the plungers, screw the fuze into the mine.

(4) Screw the pressure plate back on the mine until a slight clicking sound is heard. This is evidence that the arming shear wires have been sheared and the fuze is fully armed. There are no safety devices.

e. Disarming Procedure. Once armed, this fuze cannot be disarmed. Mines fitted with this fuze must be destroyed in place.

389. Tellermine Antilift Device (Germany)

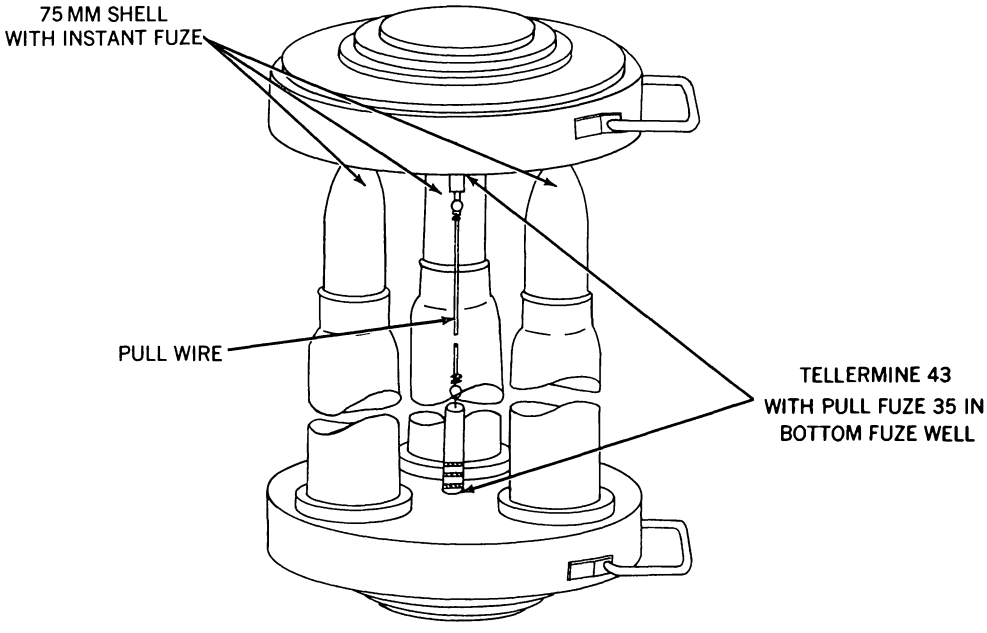


Figure 629

This is one of the many German antilift arrangements used to prevent or impede the removal of mines. It operates either by pressure, pressure-release, pull or a combination of these. The device consists of three 77-mm shells, with instant fuze, set upright with a Tellermine 43 on top and another on the bottom, the latter laid upside down. Two pull fuzes 35 are screwed into the bottom fuze well of each mine and connected at the pull rings by a taut pull wire, so that the lifting of the top Tellermine actuates both mines and the three shells as well.

a. Use. This improvisation is used in minefields and in roads where a boobytrapped heavy charge is required.

b. Disarming Procedure. Hand disarming of the Tellermine antilift is not recommended, as it is dangerous, tedious, and time-consuming. It should be attempted only when the tactical situation demands it.

390. Pressure-Pull Fuze (South Korea)

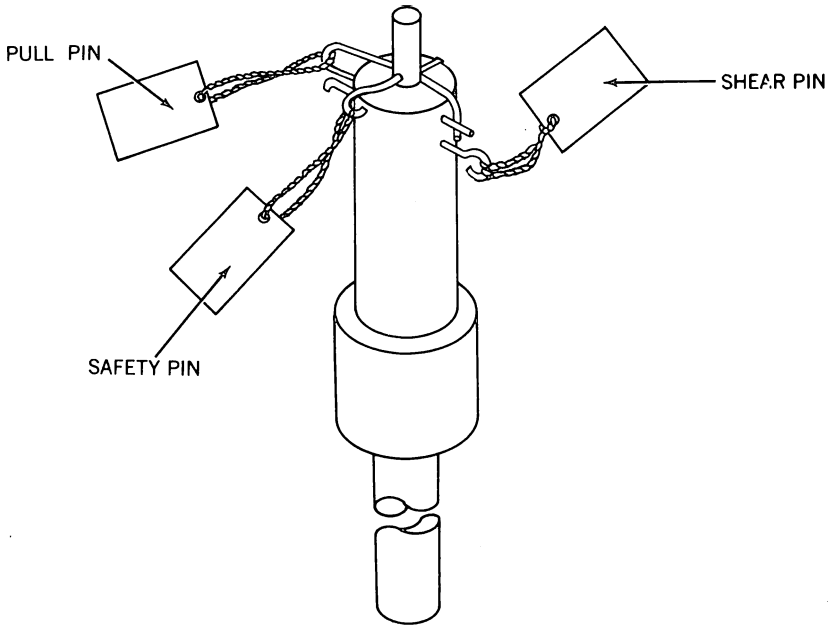


Figure 630

In this fuze, a cotter type safety pin fits through the top hole of the striker shaft; a pull pin is positioned through the center hole of the striker shaft and the upper hole in the top of the fuze; and a removable shear pin is positioned through the lower-most hole of the striker shaft and the lower hole in the top of the fuze. For identification, a tag inscribed in Korean characters is tied to the loop at one end of each pin. A detonator with a built-in percussion cap is fastened to the base by a threaded collar. The fuze is 10.1 centimeters long by 1.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Pull with pull pin release Pressure mechanical, with shear pin release.	10 lb pull, 300 lb pressure (antitank). 20 lb pressure (antipersonnel).

b. Use. The pressure-pull fuze is installed in both models of the South Korean dual-purpose mine.

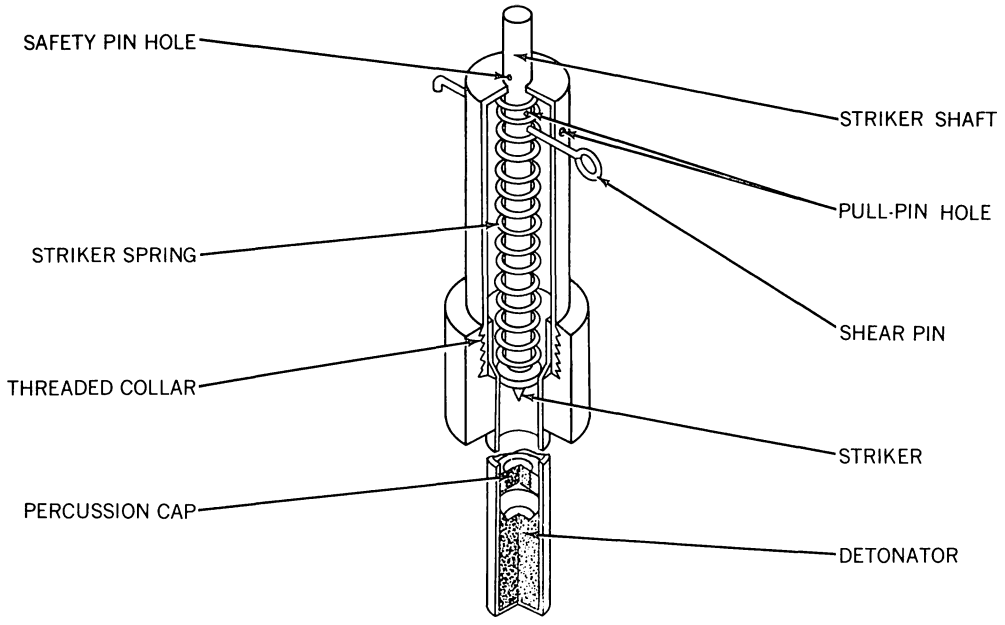


Figure 631

c. Functioning.

(1) *Pressure.* Pressure on the end of the striker shaft shears both the pull pin and the shear pin, releasing the spring-driven striker to fire the percussion cap. (For antipersonnel use the shear pin is unbent and removed; only about 20-lb pressure is required to shear the pull pin and fire the fuze.)

(2) *Pull.* A pull on the pull pin, releases the striker to drive against and fire the percussion cap.

d. Installing and Arming.

(1) *Assembling.*

(*a*) Unscrew the threaded collar from the base of the fuze.

(*b*) Insert a detonator with a built-in percussion cap into the base of the fuze.

(*c*) Screw the threaded collar back on the base of the fuze.

(*d*) Place the fuze in the mine or charge.

(2) *Pressure actuation.* To require the greatest amount of pressure or for antitank use, remove only the safety pin; for antipersonnel use, lower the required pressure by removing both the safety pin and the shear pin.

(3) *Pull actuation.*

(*a*) Anchor a trip wire.

(*b*) Tie the trip wire to the eye in the pull pin.

(*c*) Remove the safety pin and the shear pin.

e. Disarming Procedure.

(1) Insert a nail or piece of wire through the safety pin hole.

(2) Trace and cut the tripwire, if any.

(3) Unscrew the threaded collar and remove the detonator.

(4) Remove the fuze to a safe storage or disposal area.

391. Pull, Pressure, Pressure-Release Fuze, No. 13, Mark I (United Kingdom)

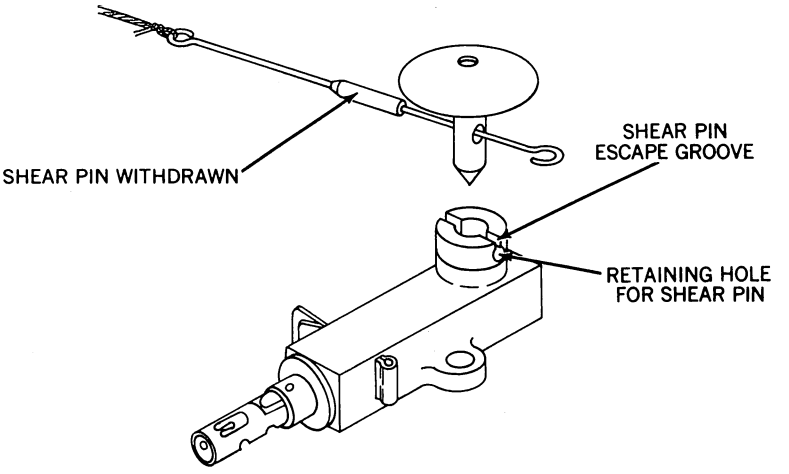


Figure 632

This is a rectangular fuze, 10.1 by 5.0 by 2.5 centimeters containing a spring-loaded striker, an actuating pin pointed on the bottom with a pressure head on top, and a shear pin. The shear pin, with piano wire attached to either end, extends through the turret and the actuating pin. A fuze adapter or detonator adapter with a built-in percussion cap is screwed into the one end of the fuze. The fuze also has a safety clip.

a. Characteristics.

Shape	Case	Internal action	Operating force
Rectangular..	Die-cast metal.	Mechanical, with removable shear pin.	35 lb or more.

b. Use. This fuze is employed as an antilifting device or a boobytrap igniter.

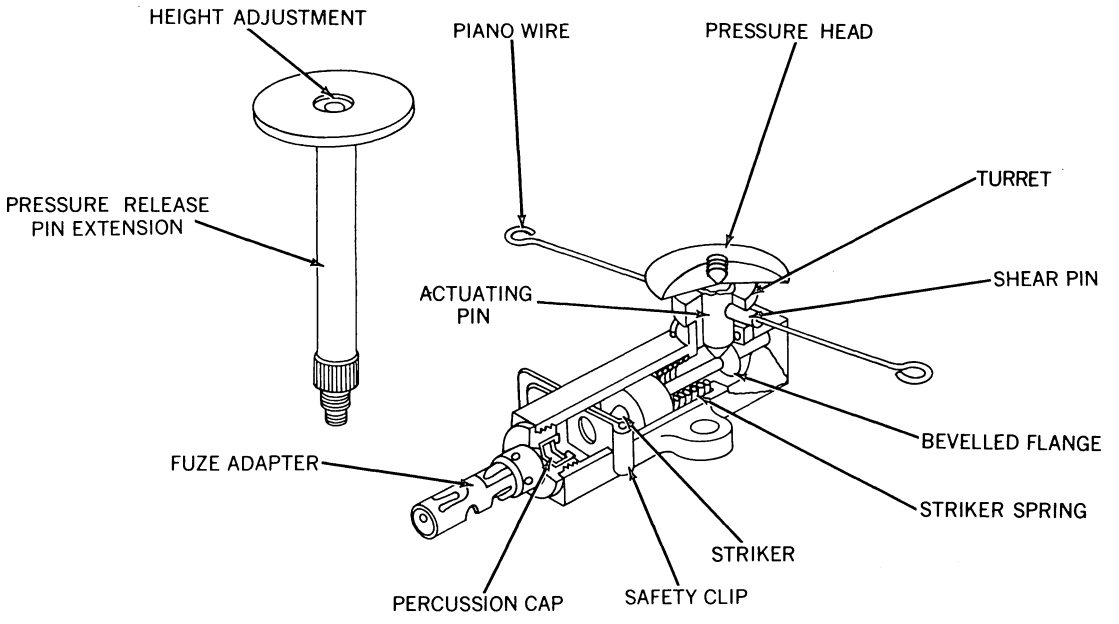


Figure 633

c. *Functioning.*

(1) *Pull.* A pull on one of the trip wires attached to the loop of the piano wire withdraws the shear pin, allowing the beveled flange on the striker shaft to raise the actuating pin, which releases the spring-loaded striker against the percussion cap.

(2) *Pressure.* Pressure either on the adjustable extension rod or the pressure head of the actuating pin, shears the shear pin and snaps the striker shaft just in front of the beveled flange, releasing the spring driven striker to fire the percussion cap.

(3) *Pressure-release.* The shear pin is withdrawn. The removal of the weight from the pressure head of the actuating pin allows the beveled flange on the striker shaft to raise the actuating pin, releasing the spring loaded striker against the percussion cap.

d. *Installing and Arming.*

(1) *Pull.*

(*a*) Attach the fuze to an object.

(*b*) Attach time fuse or detonating cord to the fuse adapter or insert a detonator in the detonator adapter.

(*c*) Rotate the turret to the desired position and tie an anchored trip wire to the loop of the piano wire on either end of the shear pin.

(*d*) Withdraw the safety clip.

(2) *Pressure.*

(*a*) Attach the fuse to an object.

(*b*) Attach time fuse or detonating cord to the fuse adapter or insert a detonator in the detonator adapter.

(*c*) If the adjustable extension rod is used, adjust it upward until contact is made with the object to be boobytrapped.

(*d*) Withdraw the safety clip.

(3) *Pressure release.*

(*a*) Attach the fuze to an object.

(*b*) Attach time fuse or detonating cord to the fuse adapter or insert a detonator in the detonator adapter.

(*c*) Place a weight (3 to 20 lb) on the pressure head of the actuating pin.

(*d*) Withdraw the shear pin and piano wire.

(*e*) Withdraw the safety pin.

Note. When set for pressure-release, the fuze will also function by pressure.

e. Disarming Procedure.

(1) *Pull or pressure.*

(*a*) See that the shear pin extends all the way through the turret.

(*b*) Cut the slack trip wires tied to the piano wire on either end of the shear pin.

(*c*) Insert the safety clip or a piece of sheet metal in the safety clip slot.

(*d*) Cut the time fuse or detonating cord that connects the fuze to the charge and remove the detonator from the fuze.

(2) *Pressure-release.*

(*a*) Insert the safety clip or a piece of sheet metal in the safety clip slot, being careful not to disturb the weight resting on the pressure head of the actuating pin.

(*b*) Insert the shear pin or a nail through the turret to prevent any vertical movement of the turret.

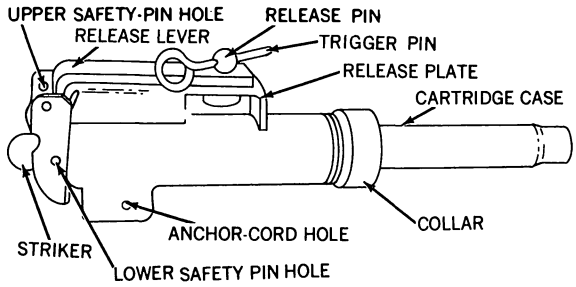
(*c*) Cut the time fuze or detonating cord that connects the fuze to the charge or remove the detonator from the fuze, whichever applies.

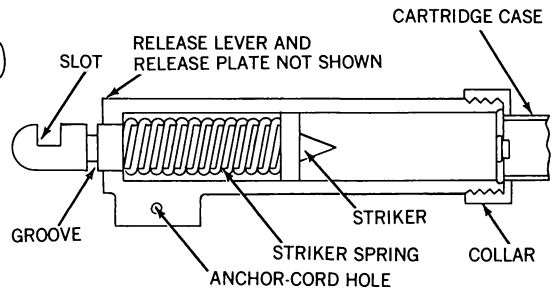
(*d*) Remove the weight from the pressure head of the actuating pin.

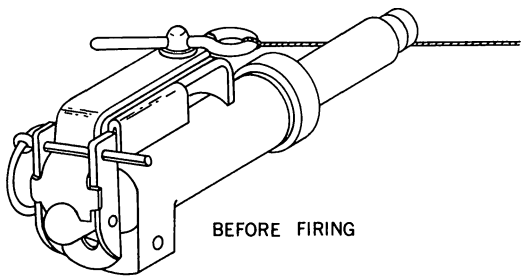
(3) After the fuze has been disarmed, remove it to a safe storage or disposal area.

f. Additional Precautions. Any increase in weight on the pressure head of the actuating pin will snap the striker shaft, releasing the striker against the percussion cap.

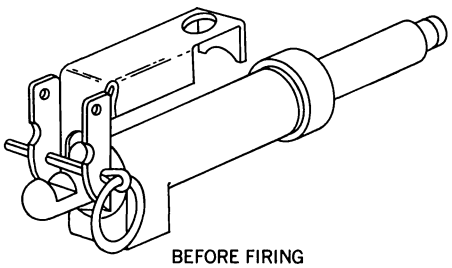
392. Murray Pull, Pressure, Pressure-Release Fuze, Mark I (United Kingdom)

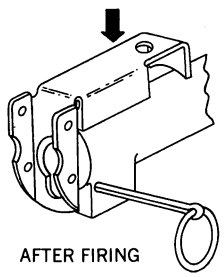




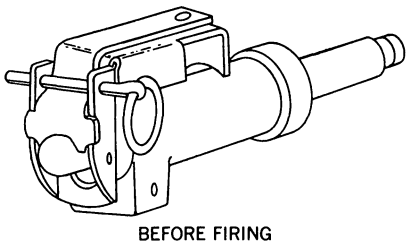


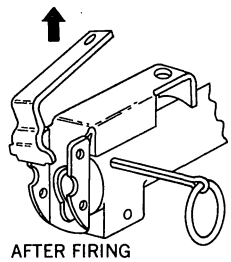
PULL OPERATION





PRESSURE OPERATION





RELEASE OPERATION

This combination fuze consists of a case containing a spring loaded striker held in place by either an L-shaped pressure plate, an L-shaped release lever, or a retaining bolt and pull pin, into which time fuze, detonating cord, or a detonator may be inserted. An empty cartridge case is held to the fuze by a threaded brass retaining collar. A cotter pin type safety pin holds the pressure plate or release lever in place. The fuze is 13.9 centimeters long and 3.5 centimeters high. A mounting hole is drilled into the base for attaching the fuze to a firm object.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Fire-cast brass and sheet metal.	Mechanical with pressure plate, lever, or pull wire pin release.	10 lb pull; 11 lb 2 oz pressure; lb 4 oz pressure-release.

b. Use. This fuze is generally installed in antipersonnel mines and in boobytraps.

c. Functioning.

(1) *Pressure setting.* Pressure on the raised pressure plate forces it against the fuze case so that the hole in the pressure plate disengages from the groove in the striker shaft, freeing the striker to fire the percussion cap in the cartridge case.

(2) *Pull or pressure-release setting.* Pulling out the pull pin from the retaining bolt or removing the weight from the pressure-release lever, whichever applies, permits the pressure-release lever to rise and disengage from the notch in the striker shaft, releasing the striker to fire the percussion cap in the cartridge case.

d. Installing and Arming.

(1) *Pressure.*

(*a*) Cock the fuze by unscrewing the retaining collar, removing the cartridge case, and pushing the striker back with a small rod or the unsharpened end of a pencil until the narrow part of the hole in the pressure plate engages the groove in the striker shaft. (The pressure-release lever is not used.)

(*b*) Insert the safety pin through the lower holes in the end of the pressure plate.

(*c*) Insert time fuse, detonating cord, or a detonator into the open end of the cartridge case.

(*d*) Replace the cartridge case and the retaining collar.

(*e*) Attach the fuze to an object.

(*f*) Withdraw the safety pin with a rope or wire from a distance of 46 meters. Friction between the hole in the pressure plate and the groove in the striker shaft is the only thing that keeps the pressure plate in place.

(2) *Pull or pressure-release.*

(*a*) Cock the fuze by unscrewing retaining collar, removing the cartridge case, and pushing the striker back with a small rod or the unsharpened end of a pencil until the pressure-release lever, placed in position over the lowered pressure plate, engages the notch in the striker shaft.

(*b*) Insert the safety pin through the upper safety pin holes in the end of the pressure plate.

(*c*) Insert time fuse, detonating cord, or a detonator in the open end of the cartridge case.

(*d*) Replace the cartridge case and the retaining collar.

(*e*) Attach the fuze to an object.

(*f*) Insert the retaining bolt up through the holes in the horizontal portions of the pressure plate and the pressure release lever; insert the pull pin through the hole in the top of the retaining bolt; and tie an anchored tripwire to the pull pin or place a

weight on the pressure-release lever, whichever applies.

(*g*) Withdraw the safety pin.

e. Disarming Procedure.

(1) *Pressure.*

(*a*) Insert the safety pin or a nail in the lower safety pin holes of the pressure plate, being careful not to disturb the pressure plate, as it is held in position only by friction.

(*b*) Unscrew the retaining collar and remove the cartridge case from the fuze.

(2) *Pull or pressure-release.*

(*a*) Insert a safety pin or nail on the upper safety pin holes of the pressure plate, being careful not to disturb the pull pin or the weight on the pressure-release lever, whichever applies.

(*b*) Cut the slack trip wire or remove the weight from the pressure-release lever, whichever applies.

(*c*) Unscrew the retaining collar and separate the cartridge case from the fuze.

(3) Remove the fuze to a safe storage or disposal area in all cases-pressure, pull, or pressure-release.

f. Additional Precautions. If possible destroy this fuze in place without attempting to disarm it.

393. Offset Fuzing Device (Metallic) (France)

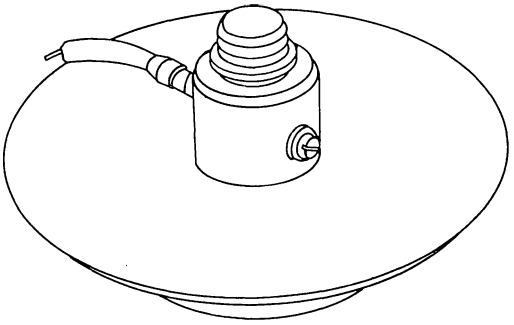


Figure 635

This device consists of a cylindrical metal case containing a charge, a collar around the upper portion of the case to serve as a bearing plate, and a pressure plate. The detonating well is closed by two plugs screwed into the case. The threaded section of the well accommodates the flexible tubes that house the detonating cord. The measurements are: diameter 29.9 centimeters and height 12.9 centimeters.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical body; circular pressure and bearing plates.	Metal.....	Pressure mechanical, or anti-disturbance.	330 lb.

Markings

Abbreviated nomenclature of the device; type of explosive.

b. Use. This is used as an offset fuzing device to actuate antitank plate-charge or shaped charge mines.

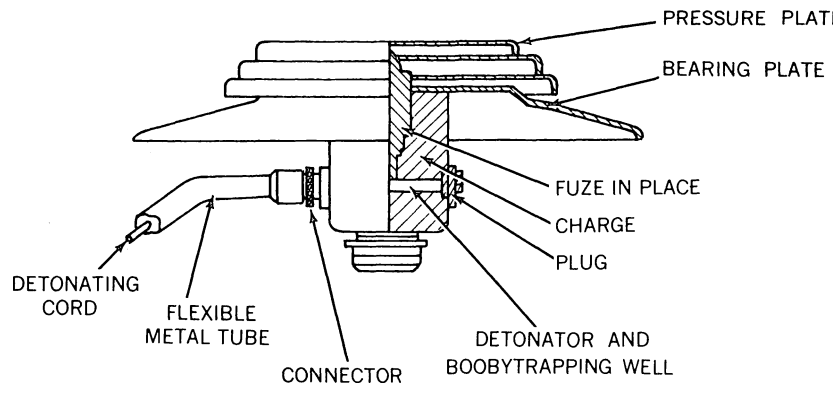


Figure 636

c. Functioning. Force applied to the top of the plate causes the Model 1948 pressure fuze or the Model 1942 antidisturbance fuze to function. The removal of the pressure plate also will cause the Model 1952 fuze to function. The firing of the fuze sets off the charge in the offset device, which is carried forward by the detonating cord encased in a flexible metal tube.

d. Installing and Arming.

(1) Unscrew the pressure plate.
(2) Attach the detonator to the fuze (Model 1948 or 1952).
(3) Place the fuze in the fuze well.
(4) Replace the pressure plate. (When the Model 1952 antidisturbance fuze is used, the pressure plate should be screwed down until the click of the breaking arming pin is heard.)
(5) Attach the metallic tubes containing the detonating cord to the mines.
(6) Boobytrap, if desired.

e. Disarming Procedure. This offset fuzing device cannot be disarmed. Mines so equipped should be destroyed in place. It is impossible to tell by inspection whether or not the antidisturbance fuze has been used. (If possible cut the detonating cord lead between the device and the charge.)

(1) Check for and remove any auxiliary antilift devices.
(2) Very carefully remove the dirt from the top of the upper mine and avoid touching or disturbing any trip or pull wires present.
(3) Cut all slack tripwires.
(4) Check again for and disarm any auxiliary activating fuzes.
(5) From a distance of approximately 15.2 centimeters from the side and at a level just slightly below the bottom, start digging toward the mine.
(6) If contact is made with any object under the mine, carefully clear away sufficient earth to identify it. *Do not* remove any earth from underneath the object; for if there is another antilift, it will not function so long as the weight of the mine presses on the top.
(7) If an antilift device is present, identify and disarm it according to the specific procedure.
(8) After this antilift has been removed and the pull wire between the two fuzes has been located, cut the pull wire and remove the top mine.
(9) At this point the shells and the bottom mine are still a problem. Deeper digging is required and the same precautions must be taken as indicated in (3) to (6) above.
(10) Remove the shells and the bottom mine from the hole.
(11) Remove the mines, shells, and fuzes to a safe storage or disposal area.

394. Offset Fuzing Device (Nonmetallic) (France)

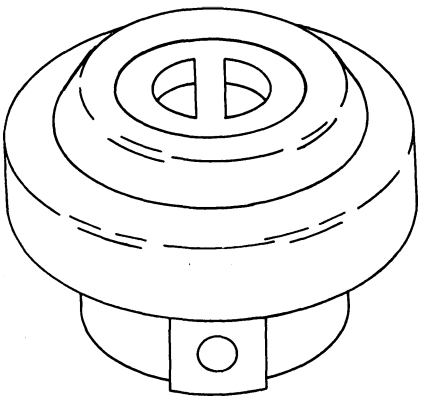


Figure 637

This apparatus consists of a circular bakelite case larger in diameter at the top than the bottom, and a centrally located fuze well with plug surrounded by a shear groove. The section within this shear groove acts as the pressure plate. The lower section of the device—it contains the charge—has two threaded wells to receive the ends of the detonating cord tubes. The device is 10.8 centimeters high and 21.0 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Bakelite.....	Pressure friction or pressure chemical.

Markings

Code number, abbreviated nomenclature, manufacturer's symbol, and year of fabrication.

b. Use. Used to activate groups of undetectable shaped-charge antitank mines.

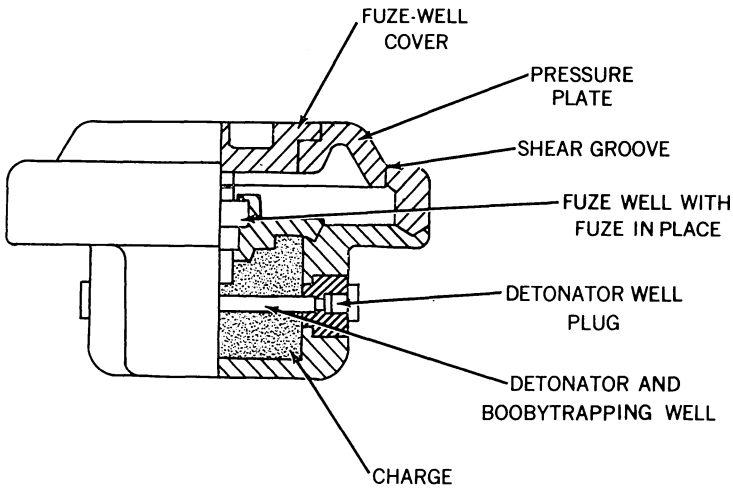


Figure 638

c. Functioning. Pressure on the top shears the pressure plate and activates the fuze, firing the detonator and in turn the main charge. This sets off the detonating cord, which fires the mines.

d. Installing and Arming.

(1) Remove the fuze well cover.
(2) Attach a detonator to the fuze.
(3) Insert the fuze and detonator assembly in the well.
(4) Replace the fuze well cover (never interchange the covers of the devices).
(5) Attach the tubes containing the detonating cord to the device and the mines.

e. Disarming Procedure.

(1) Check for and remove any antilift devices.
(2) Remove the tubes containing the detonating cord from the device.
(3) Remove the fuze well cover.
(4) Take out the fuze and detonator assembly.
(5) Separate the detonator from the fuze.
(6) Remove the device to a safe storage or disposal area.

f. Additional Precautions. If possible destroy in place.

Section II. PULL FUZES

395. Pull Fuze, MUV (U.S.S.R.)

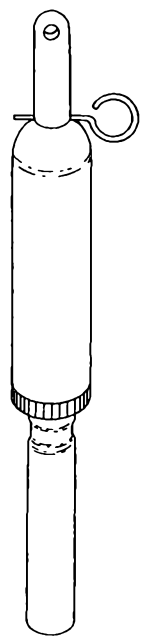


Figure 639

This is the most commonly used Soviet pull fuze. It functions at the withdrawal of a winged striker retaining-pin by a pull on a trip wire or pressure to meet the requirements of a particular mine or the most feasible method of actuation. This fuze, also used extensively in boobytraps, is available in four types of cases. The case measures approximately 5.5 centimeters in length and 3.7 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action
Tubular.....	Type I: steel tin-plated II: plastic III: ebonite IV: sheet steel	Mechanical; pin-retained, spring-loaded

Operating pressure	Diameter	Markings
2 lb or more..	0.5 in (approx)	Two groups of figures stamped on side near top ("583-47," "608-44") indicating factory number and year of fabrication.

b. Use. This fuze is especially adaptable for detonating the POMX-2, PMD series, and other antipersonnel mines and the YaM series antitank mines.

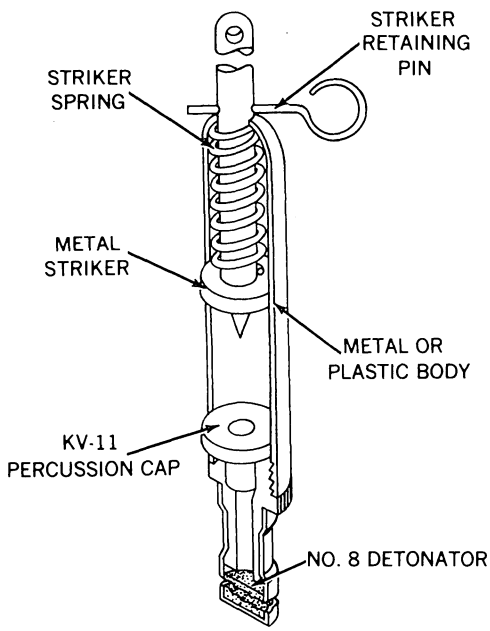


Figure 640

c. Functioning. Force applied on the tripwire removes the retaining pin from the striker, which, powered by the spring, actuates the detonator.

d. Installing and Arming. This fuze is generally fitted with a straight transit pin placed in the outer hole of the striker as a safety measure.

(1) Grasp this pin, pull out the striker revealing the inner hole.
(2) In this inner hole place a loop-ended or winged retaining pin and then remove the transit pin.
(3) Screw an MD–2 detonator into the base of the fuze and place in the mine or in the charge.
(4) If a trip wire is used, fasten it to an anchor and then to the loop-ended or winged retaining pin.

e. Disarming Procedure.

(1) Cut all loose tripwires attached to the retaining pin.
(2) Remove the fuze from the mine and unscrew the detonator from the fuze.
(3) Remove the fuze to a safe storage or disposal area.

f. Additional Precautions. If this fuze is set for tension release actuation in which the fuze striker is held in cocked position by a tripwire, a retaining pin or a substitute should be inserted before the tripwire is cut.

396. Pull Fuze, MUV-2 (U.S.S.R.)

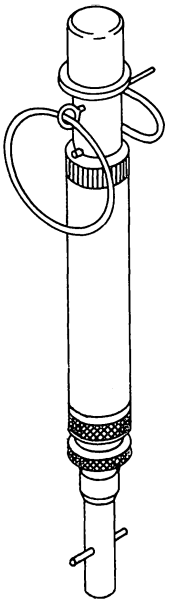


Figure 641

This is a modified MUV pull fuze with an arming time delay device that gives troops several minutes to lay and camouflage a mine and reach a safe distance before the fuze becomes fully armed. The end of the striker, which protrudes from the body of the fuze, has a deep groove across which is fitted a thin cutting wire. Beneath this wire is a soft metal plate, held in position by a sleeve fitted over the protruding end of the striker. When the safety pin is removed, the wire cuts through the soft metal. The striker is then held only by the retaining pin. The fuze is 12.5 centimeters long and 1.1 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Tubular.....	Metal.....	Mechanical with soft metal shear arming delay and pin-retained spring-loaded striker.	2 lb or more.

b. Use. This fuze is used in the PMD-6M antipersonnel mine.

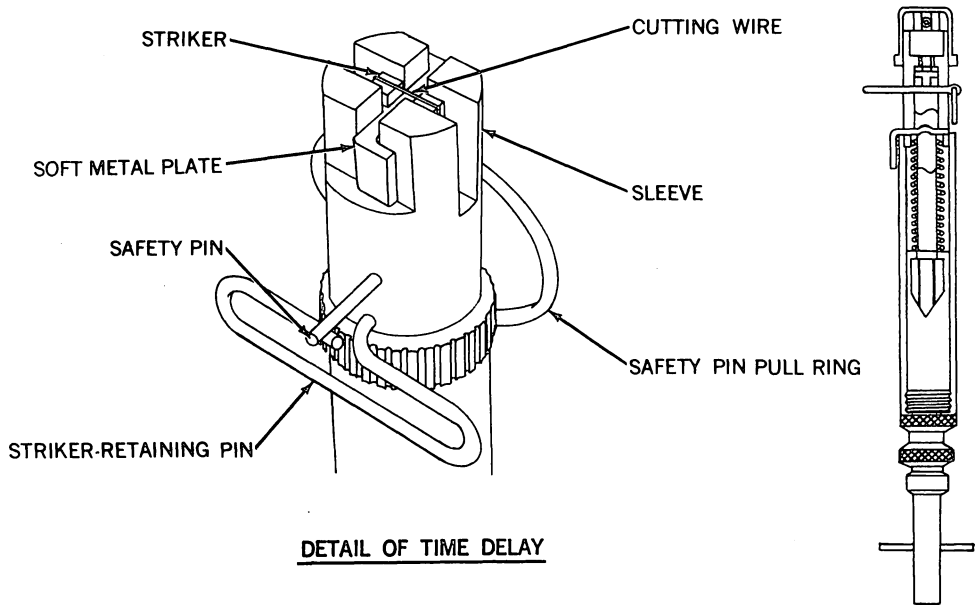


Figure 642

c. Functioning. Force applied on the winged retaining pin removes it from the fuze, releasing the striker to fire the percussion cap.

d. Installing and Arming.

(1) Attach a detonator to the fuze.
(2) Insert the fuze in the mine.
(3) Lay the mine.
(4) Remove the safety pin.

e. Disarming Procedure.

(1) Carefully remove the fuze from the mine, holding the striker retaining pin firmly in place.
(2) Separate the detonator from the fuze.
(3) Remove the fuze and detonator to a safe storage or disposal area.

397. Pull Fuze UV

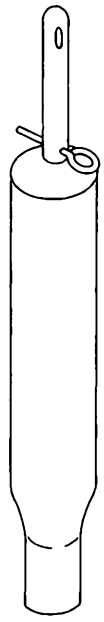


Figure 643

This is said to be the oldest Soviet fuze of its type. It has a spring-driven striker with a retaining-pin release enclosed in a metal tube about centimeters long and 1.2 centimeters in diameter. The end of the striker shaft, which extends through the top of the fuze housing, has two holes through it. The inner hole is for the striker retaining pin; it is exposed by pulling on the striker end. The percussion cap is built into the base of the fuze.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with pull pin release.	10 lb or more.

b. Use. The UV fuze was designed for pull action mines and boobytraps. It was replaced by the MUV pull fuze.

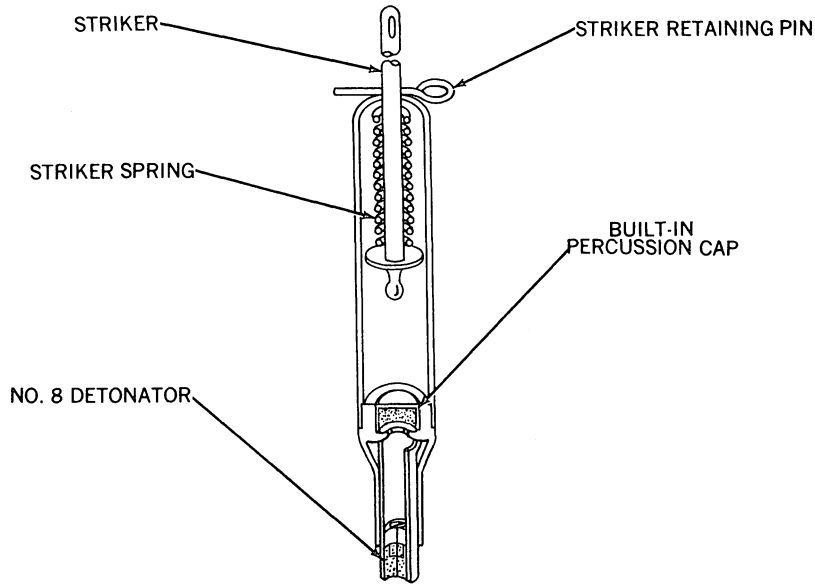


Figure 644

c. Functioning. A pull on the striker retaining pin pulls it out and releases the spring-driven striker against the percussion cap.

d. Installing and Arming.

(1) Pull the striker outward by means of the transit pin and insert the striker retaining pin in the lower hole.

(2) Remove the transit pin.

(3) Insert a detonator, open end first, into the base of the fuze, and place the fuze in the mine.

(4) Fasten the one end of a slack tripwire to the striker retaining pin and the other to an anchor.

e. Disarming Procedure.

(1) Cut any slack tripwires (Taut wires must be checked first).

(2) Pull the fuze out of the mine or charge and remove the detonator.

(3) Remove the fuze and mine to a safe storage or disposal area.

398. Fuze for Wooden Antipersonnel Mine, M49 (Hungary)

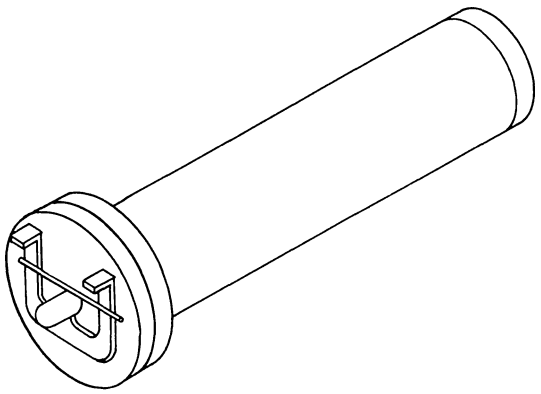


Figure 645

This fuze, similar to the Soviet MUV except for the striker retaining pin, has a spring-driven striker and detonator assembly—all contained in a cylindrical metal housing (see par. 389). The striker is retained in a W-shaped device, which also contains a safety pin. The fuze measures 1.5 centimeters in diameter and 6.2 centimeters in height.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical.	Metal.....	Mechanical, pull.	11.0 lb.

b. Use. This fuze is used in the standard model 49 wooden antipersonnel mine and probably in improvised antipersonnel mines.

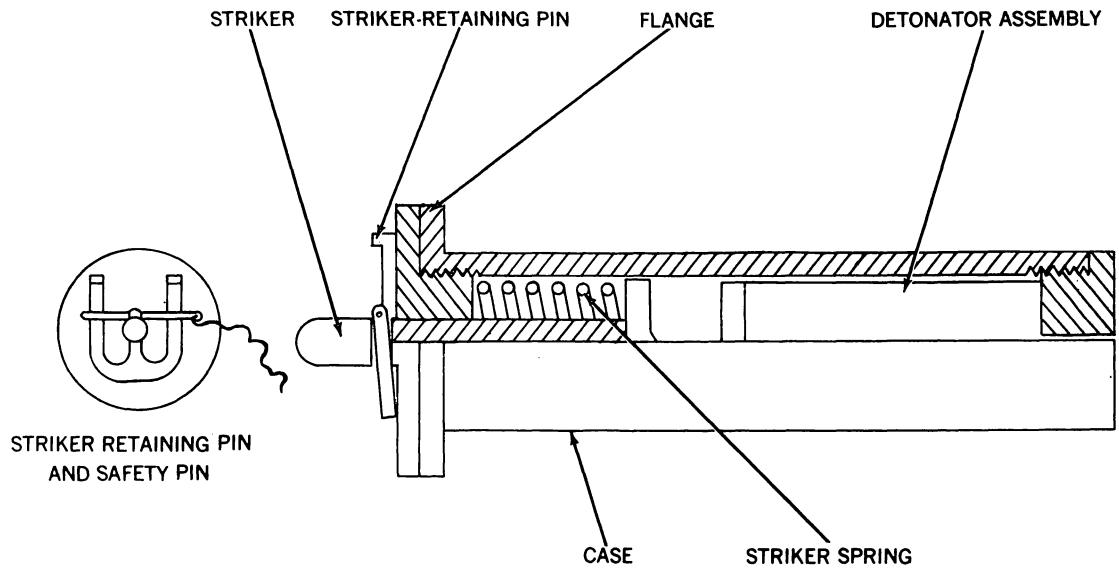


Figure 646

c. Functioning. Pressure on the wings of the striker retaining pin forces it out of the striker, which, driven by its spring, fires the detonator.

d. Installing and Arming.

(1) Screw a detonator assembly into the fuze.
(2) Place the fuze and detonator assembly in the mine.
(3) Lower the lid of the mine until it rests on the retaining pin.
(4) Remove the safety pin.

e. Disarming Procedure.

(1) Lift the lid of the mine.
(2) Insert a wire or safety pin.
(3) Remove the fuze from the mine.
(4) Unscrew the detonator assembly from the fuze.
(5) Remove the fuze to a safe storage or disposal area.

399. Mechanical Pull Fuze, RO–1 (Czechoslovakia)

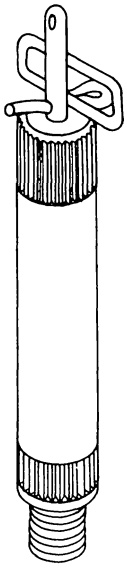


Figure 647

The plastic cased RO–1 fuze is identical to the World War II German Model Z.Z. 42. It measures 1.2 centimeters in diameter and 8.8 centimeters in length.

a. Characteristics.

Shape	Case	Operating force
Cylindrical...	Plastic.....	Varies, may be as little as 2 lb.

b. Use. This pull fuze is used with the PP–Mi–St antipersonnel and the PT–Mi–D antitank mines.

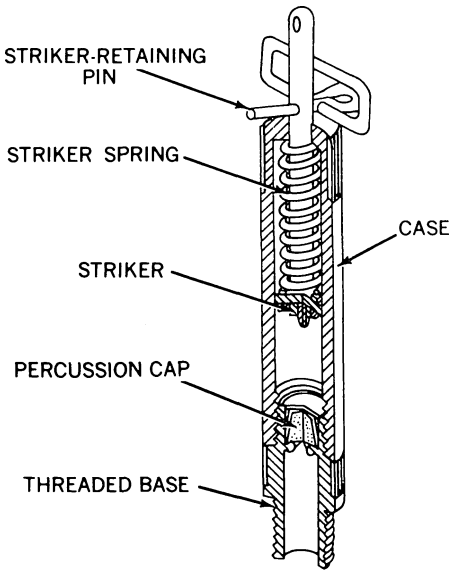


Figure 648

c. Functioning. A pull on the loop or pressure on the wings of the striker retaining pin frees the spring-loaded striker to fire the percussion cap.

d. Installing and Arming.

(1) Pull the striker upward and place the retaining pin in the lower hole.
(2) Screw a detonator holder in the base of the fuze and slide the detonator into the holder.
(3) Install the fuze in the mine.
(4) Attach a tripwire, if desired, to the loop of the retaining pin.

e. Disarming Procedure.

(1) Cut any slack tripwires. (Taut wires must be checked first.)
(2) Remove the fuze from the mine.
(3) Unscrew the detonator holder from the fuze.
(4) Slip the detonator from the holder.
(5) Remove the fuze to a safe storage or disposal area.

400. Pull Fuze 42 (Z.Z.42) (Germany)

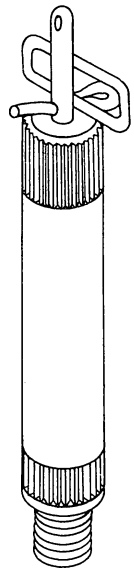


Figure 649

This fuze consists of a case, spring-loaded striker, and a winged striker retaining pin that passes through the striker shaft flush above the fuze case. A hole is provided at the top of the striker shaft for attaching a taut tripwire. The base of the fuze is threaded on the outside to receive the detonator holder, and detonator. The case is about 8.6 centimeters long and 1.2 centimeters in diameter.

a. Characteristics.

Shape	Case	Color	Internal action	Operating force
Cylindrical.	Bakelite, aluminum, or steel.	Black..	Mechanical with pin release by pull wire or pressure.	6 to 11 lb pressure or pull.

b. Use. This fuze is used primarily in the Schumine 42, the bar mine 43, and the wooden box mine 42. Others are the Sprengriegel 8 kilogram, the wooden box mine VB, the Schnellmine A, the Finnish ice mine, the clay mines, the shell mine, the concrete stake mine, and certain improvised mines and boobytraps. In most of these, the fuze operates by pressure on the mine lid or on a pressure board which pushes the winged retaining pin out of the striker shaft.

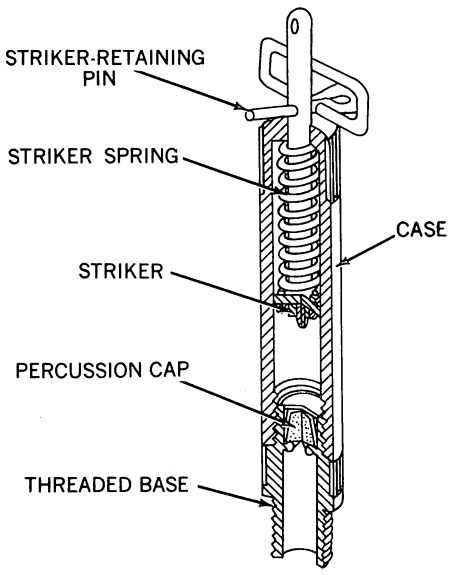


Figure 650

c. Functioning. Pressure on the wings of the retaining pin, pull from a loose tripwire on the loop of the retaining pin, or the cutting or breaking of a taut tripwire on the loop of the retaining pin, frees the striker to drive against the percussion cap.

d. Installing and Arming.

(1) *Pressure.* Screw the fuze with detonator into the mine or charge, and be sure that the wings of the retaining pin are horizontal and below the striker shaft.

(2) *Pull.* Screw the fuze with detonator into the mine or charge, and attach one end of a tripwire to a stake, bush, or some other suitable object and the other end to the loop of the retaining pin.

(3) *Tension-release.* Screw the fuze, with detonator into the mine or charge, and attach one end of a taut trip wire to a stake, bush, or other suitable object and the other end to the hole in the end of the striker shaft. Then remove the striker retaining pin from a sheltered position with a 46-meter length of wire or rope.

e. Disarming Procedure.

(1) *Pressure.* Unscrew the fuze from the mine and remove the detonator.

(2) *Pull.* Cut the slack tripwire, unscrew the fuze from the mine, and remove the detonator.

(3) *Tension-release.* Insert a nail or wire in the retaining pin hole, cut the taut tripwire, unscrew the fuze from the mine, and remove the detonator.

(4) Take the fuze to a safe storage or disposal area.

401. Pull Fuze 35 (Z.Z. 35) (Germany)

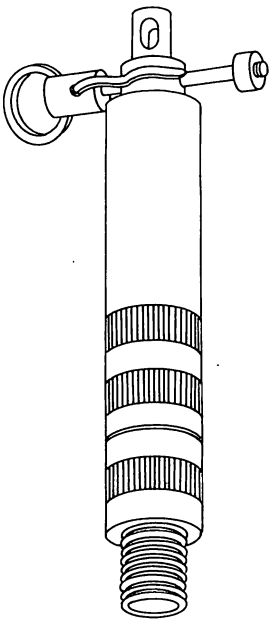


Figure 651

The body of this fuze is in four parts: the main housing; the guide piece, which is screwed to the main housing; the space piece, which is screwed to the guide piece; and the lower piece, which is screwed to the space piece. The main housing contains the sliding cylinder and the compression spring. Within the sliding cylinder are the striker spring, the striker, and the two retaining balls that hold the striker in place. The lower piece contains the percussion cap. The fuze measures 7.2 centimeters in length and 3.0 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Mechanical, with locking pin release.	15 to 20 lb.

b. Use. This fuze is the standard igniter for S-mine and prepared charges, boobytrapping Tellermine, and boobytraps with tripwires. The threaded base fits all standard charges, grenades, and mines.

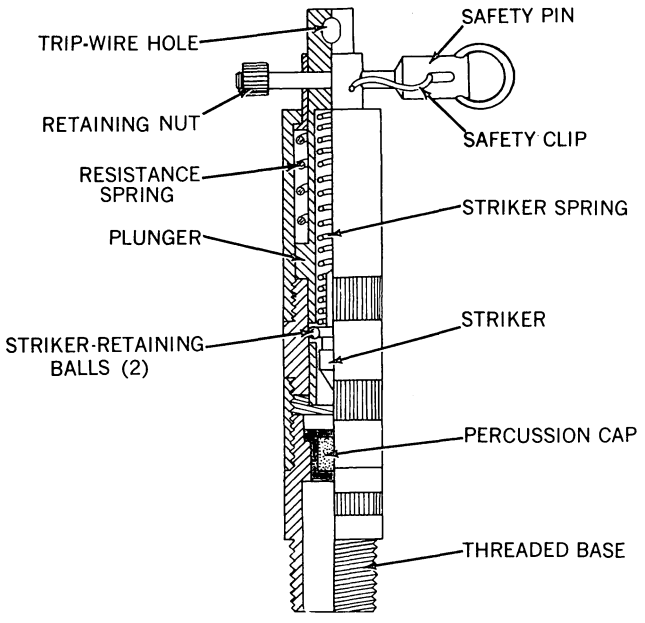


Figure 652

c. Functioning. A pull on the tripwire pulls the plunger upward against the resistance of the compression spring. The two locking balls are forced outward, when they come opposite to the open spaces, releasing the striker. The striker then, under the force of its spring, sets off the percussion cap.

d. Installing and Arming.

(1) Insert a standard detonator in the base of the fuze.

(2) Screw the fuze into the mine or charge.

(3) Attach a slack tripwire to an anchor and then to the hole in the top of the fuze.

(4) Unscrew the retaining nut from the end of the safety pin and remove the safety pin.

e. Disarming Procedure.

(1) Insert a wire or nail in the safety pin hole.

(2) Cut any slack tripwires and remove the fuze from the mine or charge. (Taut wires must be checked first.)

(3) Separate the percussion cap and detonator from the fuze.

(4) Take the fuze to a safe storage or disposal area.

402. Pull Fuze 35 (Modified)

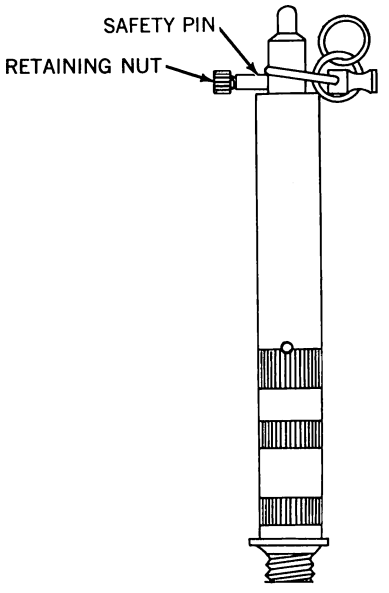


Figure 653

The modified fuze is identical with the pull-tension-release fuze 35 (par. 401) except that the tripwire hole at the end of the pull cylinder is cut off. This prevents the fuze from functioning by tension-release and permits functioning only by pull.

a. Characteristics.

Shape	Case	Internal action	Operating force	Marking
Cylindrical.	Metal..	Mechanical, with pull pin and retaining pin release.	40 lb (approx).	NUR ZUG-ZUNDER stamped on the case.

b. Use. This fuze has a variety of uses—in the stake mine, S-mines, side fuze wells of Tellermines, and boobytraps with pull wires.

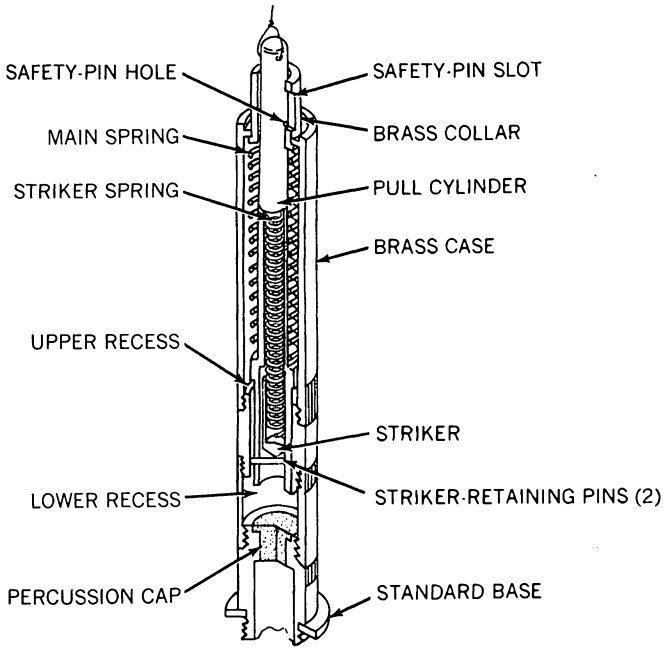


Figure 654

c. Functioning. A tug on the tripwire pulls out the safety pin. The pull cylinder, under pressure of the main spring, then moves downward until the striker retaining pins escape into the lower recesses, releasing the spring-loaded striker to fire the percussion cap and detonator.

d. Installing and Arming.

(1) Insert a detonator in the base of the fuze and screw the fuze into the mine or charge.
(2) Attach a slack tripwire to an anchor and to the safety pin ring.
(3) Unscrew the retaining nut from the end of the safety pin.

e. Disarming Procedure.

(1) Cut any slack tripwires.
(2) Wire or tape the safety pin securely in place.
(3) Unscrew the fuze from the mine.
(4) Separate the detonator from the fuze.
(5) Remove the fuze and mine to a safe storage or disposal area.

403. Boobytrap Pull Fuze (Finland)

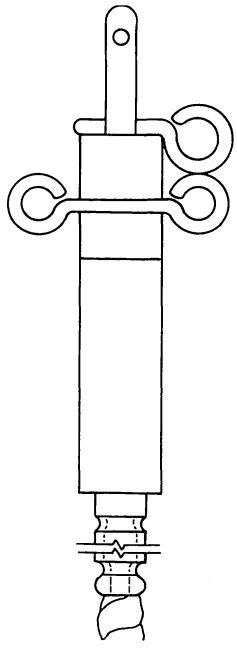


Figure 655

This is a simple mechanical fuze having a spring-loaded, pin-retained striker. The case is cylindrical—the lower part being smaller in diameter than the other or main part. The base is fitted with a knurled transit cap. Provision is made for crimping to the fuze a thin metal tube to accommodate a piece of time fuze or a No. 8 blasting cap. The main section of the case contains the percussion cap, spring, and striker. It also has a two-eyed fastening bracket. Two holes are drilled in the striker shaft—the upper for the transit safety pin, and the lower for the striker retaining pin.

a. Use. This device is used in improvised mines and boobytraps and as a fuze lighter.

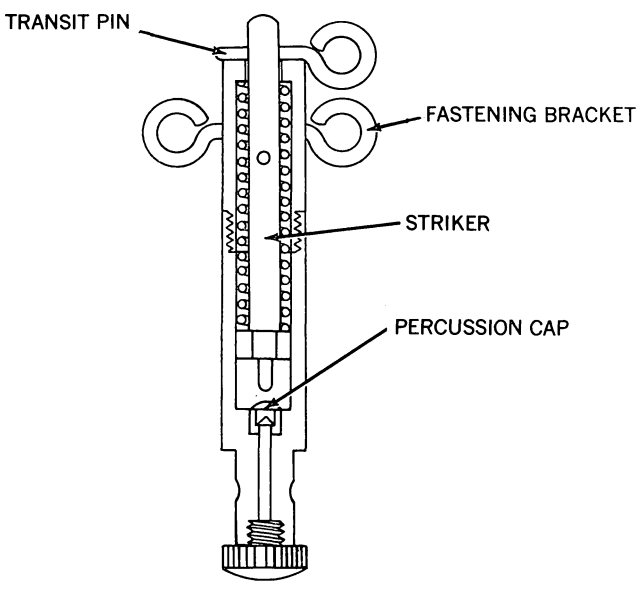


Figure 656

b. Functioning. The removal of the striker retaining pin by a pull frees the striker to hit and fire the percussion cap, initiating the firing chain.

c. Installing and Arming.

(1) Cock the striker and put in place the striker retaining pin.
(2) Crimp the thin metal tube to the base of the fuze.
(3) Insert a time fuze, or a No. 8 blasting cap and a detonating cord, in the tube and secure in place with tape.
(4) Anchor the fuze.
(5) Connect the fuze to the charge by means of the time fuze or detonating cord.
(6) Attach an anchored tripwire to the striker retaining pin.
(7) Remove the safety transit pin from the upper striker hole.

d. Disarming Procedure.

(1) Insert a safety pin in the upper striker hole.
(2) Cut the slack tripwire.
(3) Disconnect the fuze from the timer fuze or detonating cord.
(4) Remove the fuze to a safe storage or disposal area.

404. Pull Fuze (Finland)

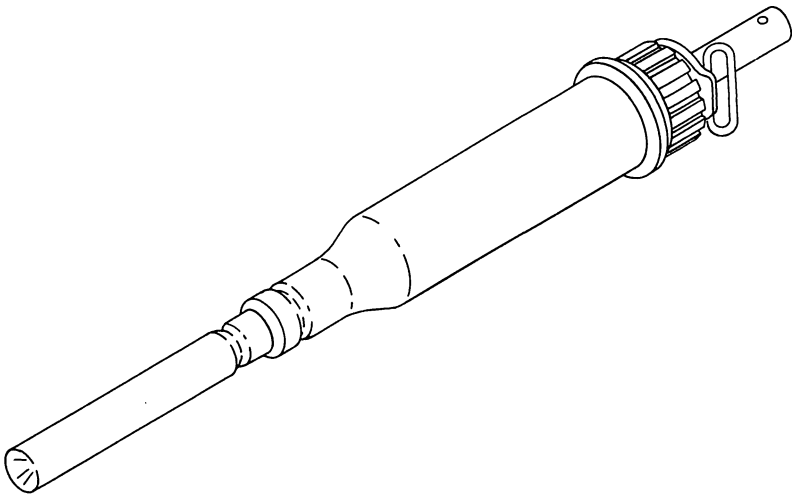


Figure 657

This fuze and the Soviet MUV are similar. It has a striker assembly, consisting of a striker, retaining pin, stiffening plate, and safety pin. The striker has two holes, the upper hole is for the safety pin; and the lower hole, for the striker retaining pin, eyed or winged. The top of the tubular case is internally threaded for the striker assembly. The lower portion, of smaller diameter than the top, contains the percussion cap. The detonator is crimped to the fuze case.

a. Characteristics.

Shape	Case	Internal action	Operating force
Tubular.....	Metal.....	Mechanical, with pull pin release.	22 lb or more (4.4 lb if stiffening plate is not used).

b. Use. This fuze is used with the model 43, tubular, and ski trail antipersonnel mines.

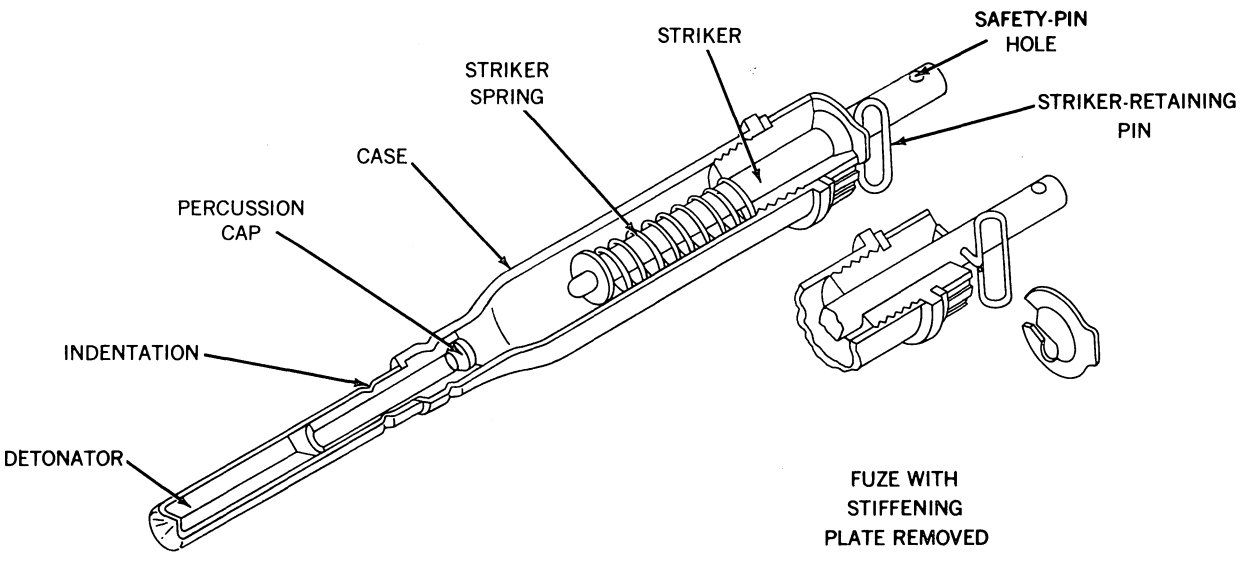


Figure 658

c. Functioning. Force applied removes the striker retaining pin, freeing the striker. It then slams against and fires the percussion cap.

d. Installing and Arming.

(1) Hold the striker retaining pin firmly in place, and screw the striker assembly into the case.

(2) Seat the fuze in the mine.

(3) Anchor and fasten a pull wire to the striker retaining pin, if required.

Note. A hole in the upper end of the striker retaining pin will accept a safety pin (nail or cotter pin). With reasonably careful handling to insure that the striker retaining pin stays in place, this safety is not necessary.

e. Disarming Procedure. Hold the striker retaining pin firmly in place and remove the striker assembly from the case. Do not try to remove the detonator.

405. Pull Fuzes, R and Rm (Italy)

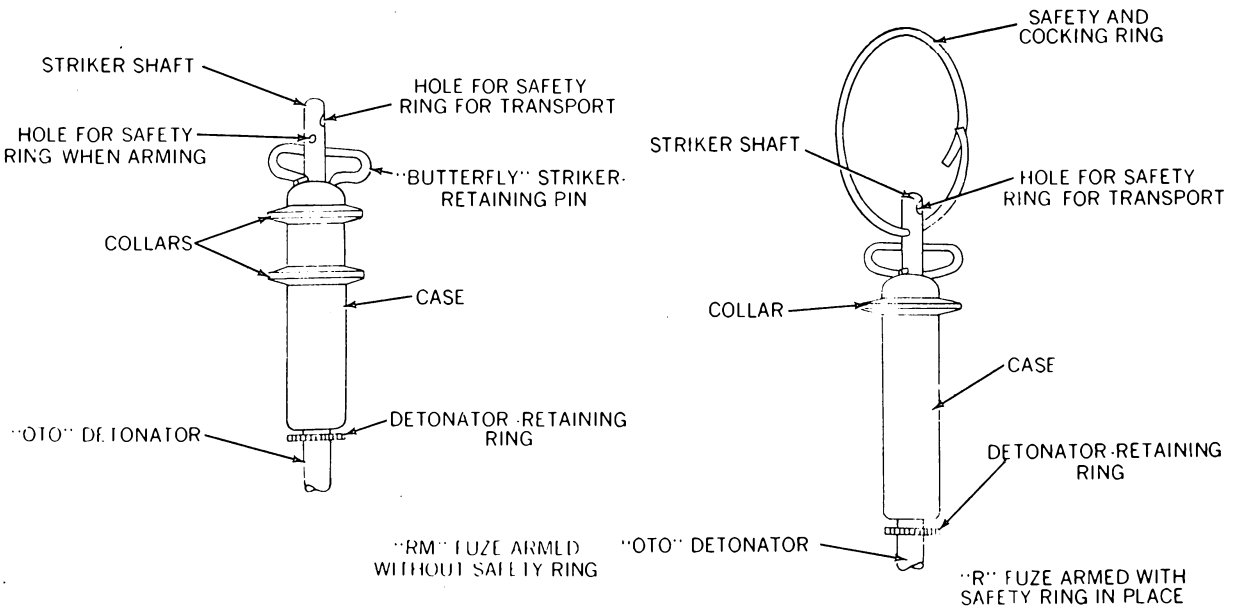


Figure 659

The R-fuze is a pin-retained, simple, device with a spring actuated striker used chiefly with the R-mine. The body has a knurled detonator retaining ring screwed to its lower end. A collar for positioning the fuze in the mine is placed slightly below the top end. The striker shaft has three drilled holes, the upper for the cocking-ring, the middle for the cocking ring if used as a safety, and the lower for the striker retaining pin.

The Rm fuze is like the R-fuze except that it has an additional collar around the body for positioning in the Rm mine and a ring on the striker retaining pin for attachng a trip wire. The fuze case is approximately 6.5 centimeters long and 1.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating pressure
Cylindrical...	Metal.....	Mechanical, pull, with pin release.	4.4 to 6.6 lb.

b. Use. The R-fuze is used with the R and V antipersonnel mines and the Rm with the R antipersonnel mine. Both are used in improvised mines and boobytraps.

(No drawing available.)

c. Functioning. When the striker retaining pin is removed, the spring-loaded striker is released, permitting it to slam on and fire the detonator.

d. Installing and Arming.

(1) Pull the cocking ring until the lowest hole in the striker shaft appears.
(2) Insert the striker retaining pin in this hole.
(3) Remove the cocking ring from the uppermost hole and insert it in the middle hole.
(4) Unscrew the detonator retaining ring.
(5) Insert the OTO detonator and screw the retaining ring back on the body of the fuze.
(6) Install the fuze in the mine or charge.
(7) Using caution, remove the cocking ring from the middle hole of the striker shaft.

e. Disarming Procedure.

(1) Insert the cocking ring (or other safety pin) in the middle hole of the striker shaft.
(2) Remove the fuze from the mine or charge.
(3) Remove the detonator retaining collar.
(4) Remove the detonator and place the collar on the fuze.
(5) Place the cocking ring in the uppermost hole of the striker shaft.
(6) Place the striker retaining pin in the middle hole.
(7) Release the tension on the striker spring.
(8) Forward the fuze to a safe storage or disposal area.

406. Pull Fuze M-1939 (France)

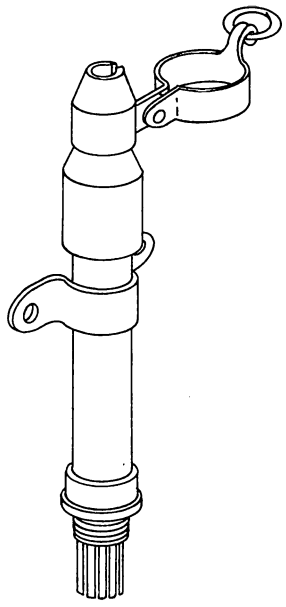


Figure 660

This fuze has a spring-loaded striker with a pull bar release. The pull bar extends through the fuze case and a slot in the striker shaft so that the retaining pin bears against the top of the pull bar. The lower end of the case is threaded to receive the detonator. The safety device, a ring attached to the pull bar, folds back over the head of the fuze, preventing the bar from being withdrawn. The fuze is 8.4 centimeters long and 12. centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with pull bar release.	5 to 10 lb.

b. Use. This fuze was designed for use with the bounding antipersonnel mine, M 1939. It may also be used with improvised grenade and shell mines or with standard demolition equipment.

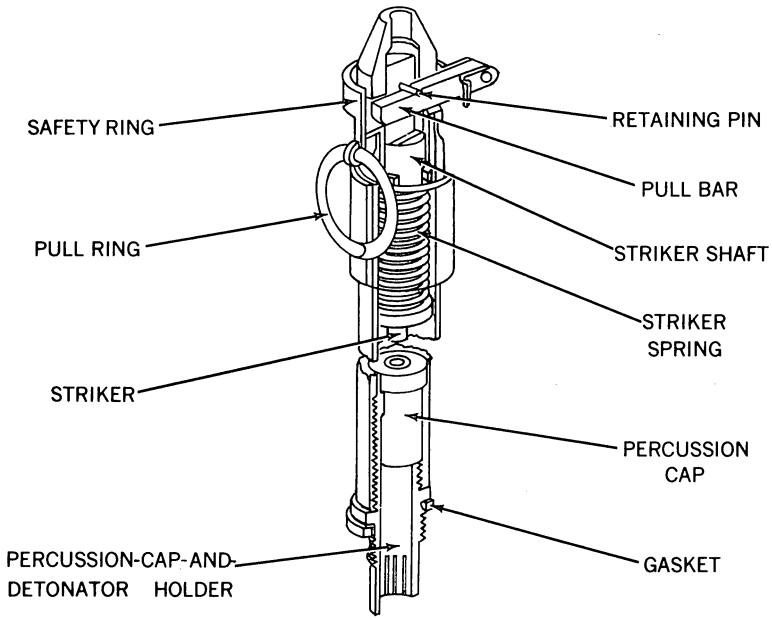


Figure 661

c. Functioning. With the safety ring folded back, a pull on the pull ring removes the pull bar, which releases the striker to drive against the percussion cap, firing it and then the detonator.

d. Installing and Arming.

(1) Fit the detonator into the percussion cap and detonator holder and screw the assembly into the base of the fuze.

(2) Screw the fuze into the charge or mine.

(3) Unfold the safety ring from the top of the fuze.

(4) Tie an anchored tripwire to the pull ring.

e. Disarming Procedure.

(1) Cut the slack tripwire and place the safety ring over the top of the fuze in safe position.

(2) Unscrew the fuze from the charge or mine. Unscrew the percussion cap and detonator holder from the base of the fuze; and remove the detonator.

(3) Remove the fuze to a safe storage or disposal area.

407. Pull and Tension-Release Fuze 35 (Z.u.Z.Z.35) (Germany)

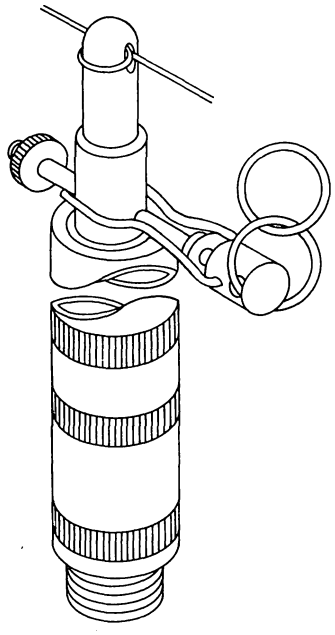


Figure 662

This fuze has a spring loaded striker with a pin release. It has four parts, the main housing with the sliding cylinder and compression spring, the guide piece, the spacer piece, and the lower piece, which contains the percussion cap. At the top of the sliding cylinder is a hole for tying the tripwire or tension wire. The length of the fuze is 11.0 centimeters; and the diameter, 1.2 centimeters.

a. Characteristics.

Shape	Case	Color	Internal action	Operating force
Cylindrical.	Brass. .	Field gray.	Mechanical with taut tripwire and locking pin release.	9 to 13 lb.

b. Use. This type of igniter is generally installed in mines and charges actuated by wires in tension.

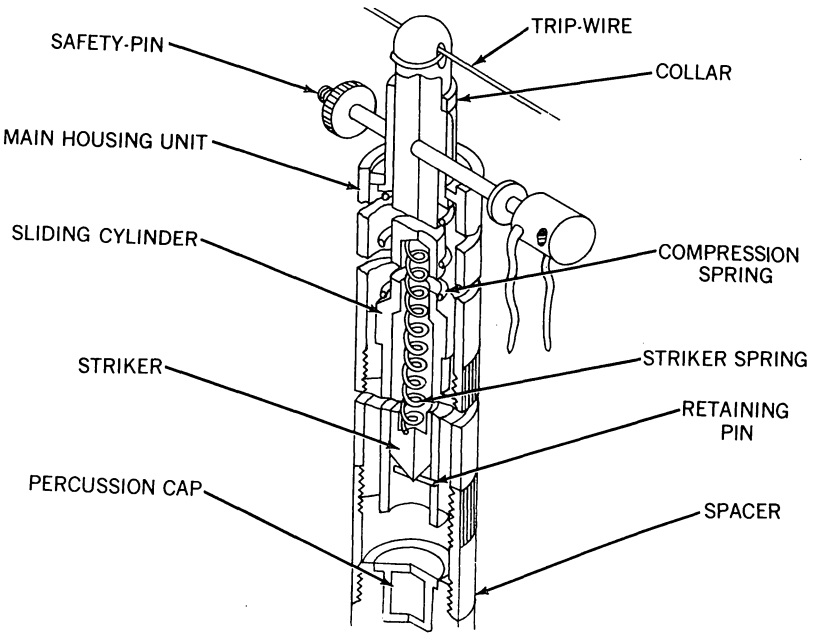


Figure 663

c. Functioning. A pull on the taut trip wire pulls out the sliding cylinder against the resistance of the compression spring. This also forces the retaining pins into the upper open space and frees the striker. Cutting or breaking the trip wire permits the compression spring to force the sliding cylinder downwards, freeing the retaining pins into the lower open space and releasing the striker. In both cases the freed striker hits and fires the percussion cap.

d. Installing and Arming.

(1) Insert a detonator into the base of the fuze.

(2) Screw the fuze into the mine or charge.

(3) Attach a taut tripwire to an anchor and to the safety pin hole.

(4) Unscrew the retaining nut from the end of the safety pin and remove the safety pin.

Note. This igniter proves so dangerous to use that a number were returned to the factory and modified. In these, the tension release feature was removed by cutting the trip wire slot from the end of the sliding cylinder and attaching the tripwire to the safety pin.

e. Disarming Procedure.

(1) Cut any slack trip wires and wire or tape the safety pin or nail or wire securely in place.

(2) Unscrew the fuze from the mine and remove the detonator.

(3) Take the fuze to a safe storage or disposal area.

408. Pull Fuze Kaveshnikov (U.S.S.R.)

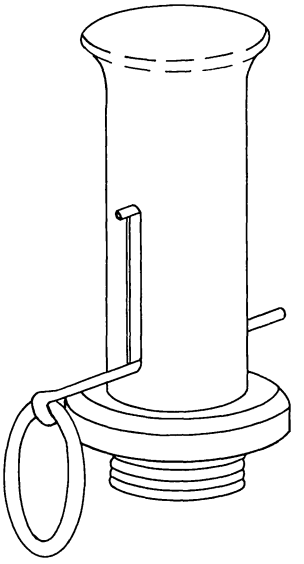


Figure 664

This fuze contains a compressed spring, located under a hood that slides over the striker housing. A pull pin holds the hood in position, keeping it from rising under pressure of the spring. A retaining pin projects out of the striker housing. A groove in the hood permits it to slide above the retaining pin.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with pull pin and ball release.	25 lb (approx).

b. Use. This pull fuze was used with tripwire actuated mines and with the pull pin removed as a pressure-release device placed under a weight.

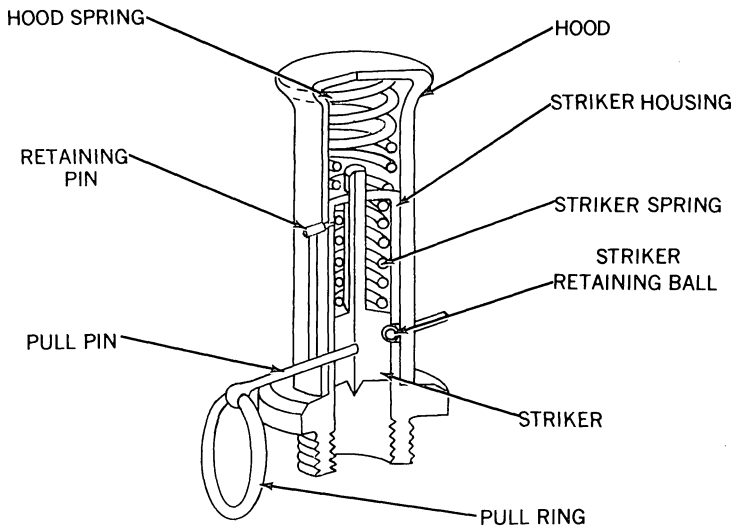


Figure 665

c. Functioning. A tug on the pull pin removes it and allows the hood to rise under pressure of its spring until the retaining ball is forced out, releasing the striker to fire the percussion cap. For pressure-release, the removal of the retaining weight on the top of the fuze (the pull pin has been removed) allows the hood to rise under pressure of its spring to force out the retaining ball, release the striker, and fire the mine.

d. Installing and Arming.

(1) *Tripwire.*

(*a*) Screw an MD–2 detonator assembly into the base of the fuze and screw the fuze into the mine or charge.

(*b*) Tie one end of a tripwire to the pull ring and the other to an anchor.

(2) *Pressure-release.*

(*a*) After the fuze has been placed in the mine, put an adequate retaining weight on top.

(*b*) Carefully remove the pull pin.

e. Disarming Procedure.

(1) *Tripwire release.*

(*a*) Cut any slack tripwires attached to the pull ring.

(*b*) Remove the fuze from the charge or mine.

(*c*) Unscrew the detonator assembly from the fuze.

(*d*) Remove the fuze and mine or charge to a safe storage or disposal area.

(2) *Pressure-release.*

(*a*) After the mine or charge has been uncovered, insert a nail, piece of wire, or pull pin in the pull pin hole.

(*b*) Remove the fuze from the mine or charge.

(*c*) Unscrew the detonator assembly from the fuze.

(*d*) Remove the fuze and mine or charge to a safe storage or disposal area.

409. Boobytrap Firing Device (Japan)

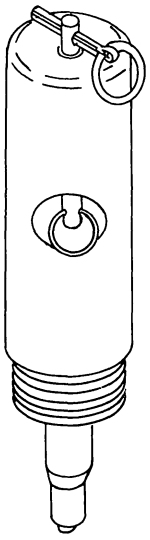


Figure 666

This fuze body is machined from a solid 3.7-centimeter cast iron bar. It has a spring-loaded striker held in position by a safety pin and a release pin. The explosive train consists of a 6.5-mm cartridge case into which is wedged a blasting cap with the open end facing the cartridge cap. The cartridge case is wedged into the base of the firing device. The overall length of the fuze is 13.7 centimeters.

a. Characteristics.

Shape	Internal action	Operating force
Cylindrical . . .	Mechanical, with pull pin release.	10 lb or more.

b. Use. The threaded base of this pull fuze fits the fuze cavity of the 20-pound British bomb. It is very easily adapted to booby-trapping.

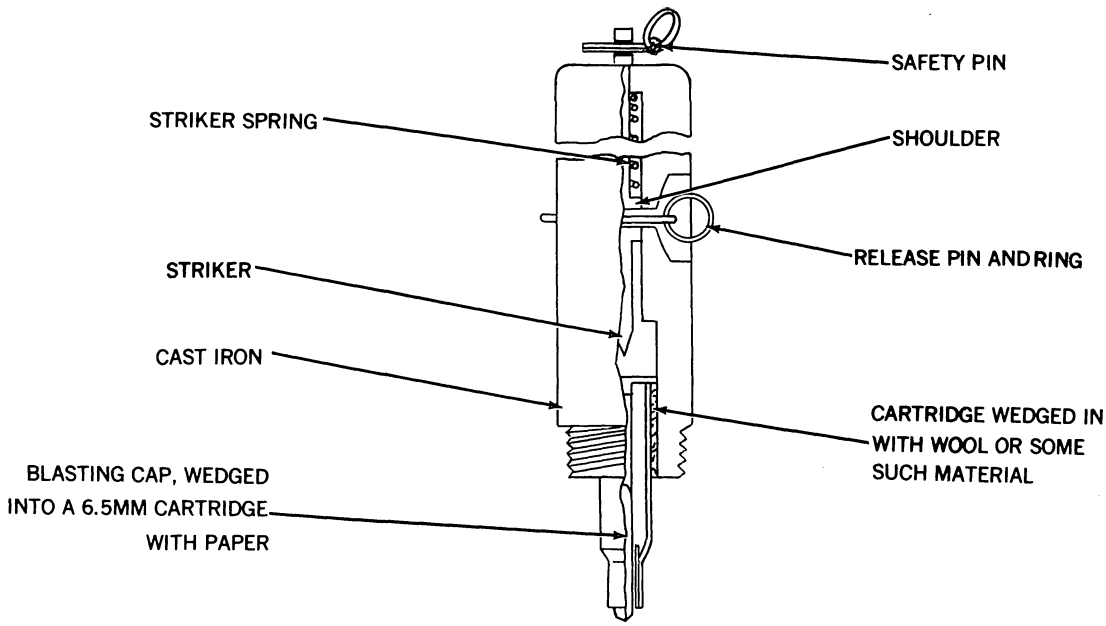


Figure 667

c. Functioning. A pull on the pull wire or tripwire removes the release pin, which frees the striker to fire the cartridge cap, blasting cap, and the main charge.

d. Installing and Arming.

(1) Screw the device into a charge or bomb.

(2) Attach pull wire to ring in release pin or attach tripwire to ring and anchor to stake in the ground or some other object.

(3) Remove the safety pin.

e. Disarming Procedure.

(1) Insert a pin, nail, or wire in the safety pin hole.

(2) Cut any slack tripwires and unscrew the fuze from the mine or charge.

(3) Remove the cartridge and blasting cap from the base of the fuze.

(4) Take the fuze to a safe storage or disposal area.

410. Pull Fuze, No. 1 Mark 1 (United Kingdom)

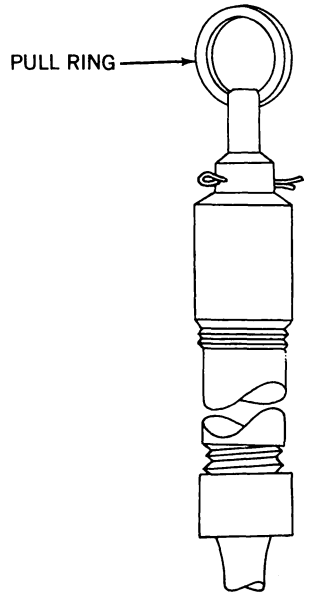


Figure 668

This igniter consists of a housing tube containing a release pin and spring, a plug, a split-headed striker, and a striker spring. An anchor bracket is slipped over the housing tube for anchoring the fuze in any convenient position, and a screwed collar is threaded over the open end of the tube for attaching the cap holder. The fuze is 10.1 centimeters long and 1.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Steel.....	Mechanical, with release pin and split-headed striker.	2 lb.

b. Use. This fuze is used to initiate booby-traps or demolition charges. It fires a percussion cap in a holder that may be connected either to instantaneous fuse or to a No. 8 detonator.

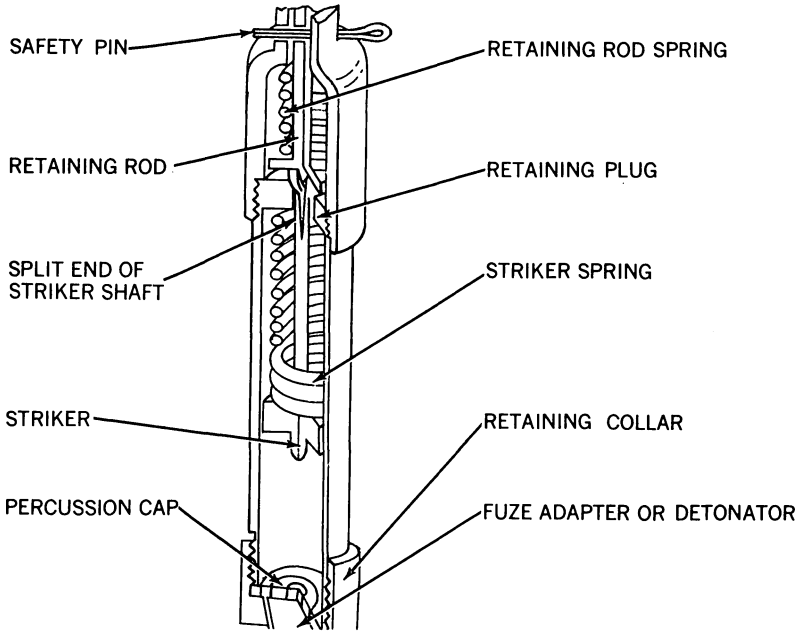


Figure 669

c. Functioning. A pull on the pull wire, removes the release pin wedged into the split head of the striker, which frees the striker to fire the percussion cap.

d. Installing and Arming.

(1) Remove the fuse adapter or detonator adapter by unscrewing the collar.
(2) Anchor the fuze by means of the bracket.
(3) Replace the collar without the fuse adapter.
(4) Install a loose trip wire.
(5) Connect the charge to the fuse adapter with detonating cord.
(6) Replace the fuze adapter by means of the collar.
(7) Gently withdraw the safety pin.

e. Disarming Procedure.

(1) Insert a safety pin on a nail or wire in the safety pin hole.
(2) Cut any slack tripwires and remove the fuze from the charge or mine (Taut wires must be checked first).
(3) Unscrew the retaining collar and separate the fuse adapter or detonator adapter from the fuze.
(4) Remove the fuze to a safe storage or disposal area.

411. Pull Fuze, VPF (U.S.S.R.)

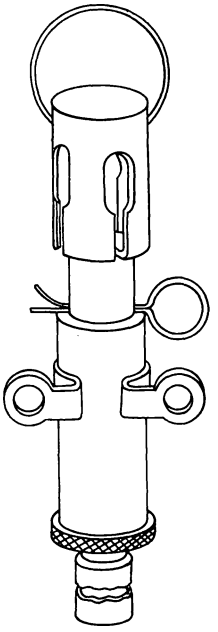


Figure 670

The VPF pull fuze is used widely in the Soviet Army for initiating trip-wire standard and improvised mines of all kinds. It generally functions by a pull on the pull ring; but it also may be fitted with a rod projecting from the clamp top for functioning by lateral pressure or pull. The top of the fuze is, in reality, a clamp that holds the spring driven striker under tension after the safety pin is removed. The fuze is composed of three parts, which are usually assembled only at the place of use. The fuze is 7.6 centimeters high without the detonator and 1.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Tubular.....	Metal.....	Pull, mechanical, clamp-retained, spring loaded striker.	Lateral pull, 2.5 to 3.5 lb; axial pull, 8-14 lb.

b. Use. This fuze is used in many wooden land mines and boobytraps.

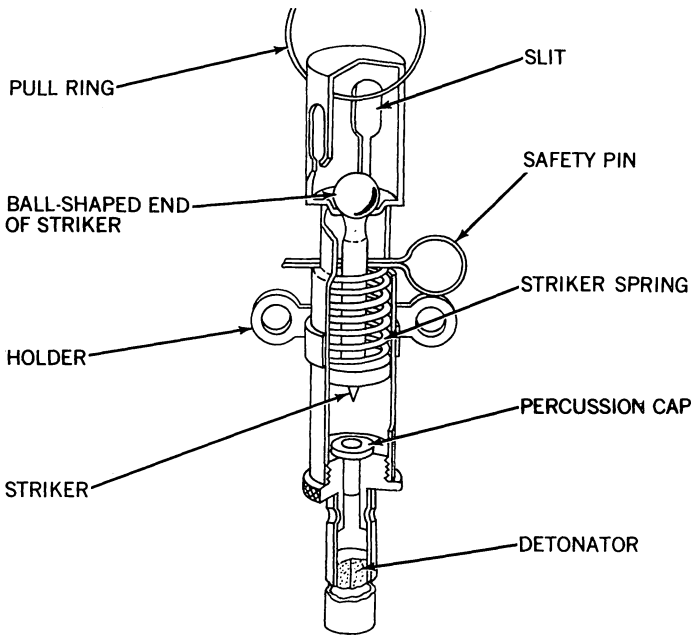


Figure 671

c. Functioning. Lateral force or axial pull on the clamp-top pulls the clawlike base from the ball-shaped end of the striker, releasing it.

d. Installing and Arming.

(1) Assemble the fuze by forcing the clamp-top onto the ball-shaped end of the striker.
(2) Screw on the detonator assembly.
(3) Insert the assembled fuze-and-detonator into the charge.
(4) Attach the trip wire to the pull ring.
(5) Remove the safety pin.

e. Disarming Procedure.

(1) Cut any slack tripwires attached to the fuze (Taut wires must be checked first).
(2) Insert a wire or nail in the safety pin hole (if this will not go through, the mine should be blown in place).
(3) Pull the fuze from the mine.
(4) Separate it from the detonator.
(5) Remove the fuze to a safe storage or disposal area.

f. Additional Precautions. In most cases mines or charges fitted with this fuze should be detonated in place.

412. Pull Fuze, No. 4, Mark 1 (United Kingdom)

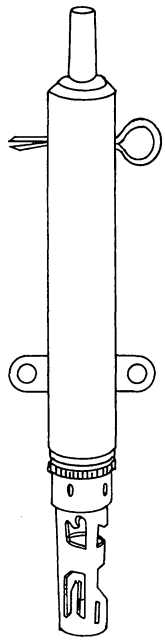


Figure 672

This is an instantaneous mechanical fuze. It has a spring-loaded striker with a retaining-clip release. The striker is held in place by a U-shaped, claw-ended retaining clip with claws gripping the ball-shaped end of the striker shaft. A bracket with holes for attaching the fuze to an object is brazed to the case. A standard adapting assembly with a percussion cap is screwed into the base. The safety pin extends through the top of the fuze case and the ball-shaped end of the striker shaft. The fuze measures 1.0 centimeter in diameter and 9.6 centimeters in height.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Pull instantaneous, mechanical, with retaining clip release.	6 to 8 lb.

b. Use. This fuze is especially adaptable for boobytrapping doors, windows, and objects that appeal as souvenirs. It is also used in mines, demolition charges, and light flares.

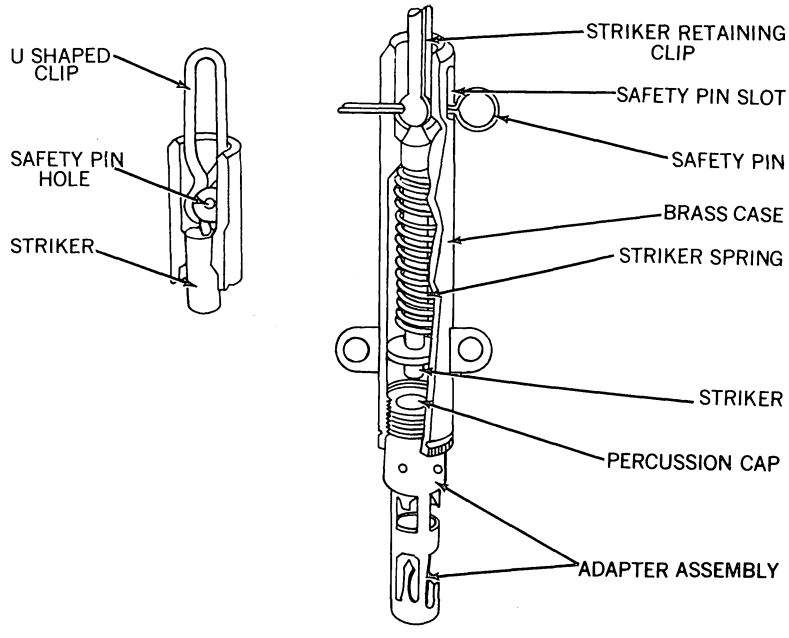


Figure 673

c. Functioning. A tug on the trip wire pulls the retaining clip off the ball-shaped end of the striker shaft, releasing the spring-driven striker to slam against the percussion cap.

d. Installing and Arming.

(1) Unscrew the adapter from the base.

(2) Secure the fuze to the object to be boobytrapped.

(3) Attach a tripwire to the U-shaped retaining clip and adjust the tension of the wire until the safety pin lies about half way along the slots in the fuze case.

(4) Insert a nonelectric blasting cap in the adapter assembly. (For delay, insert a length of time fuse in the adapter instead of a nonelectrical blasting cap.)

(5) Screw the adapter into the base of the fuze.

(6) Remove the safety pin.

e. Disarming Procedure.

(1) Insert a safety pin into the safety pin hole in the ball-shaped end of the striker shaft.

(2) Cut any slack tripwires. (Taut wires must be checked first.)

(3) Unscrew the adapter from the base of the fuze.

(4) Remove the fuze to a safe storage or disposal area.

413. Pull Fuze, Mark 3 (United Kingdom)

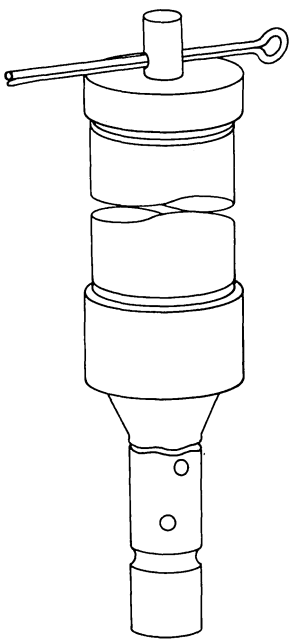


Figure 674

This is a very simple fuze with a spring-loaded striker and pin release in a tubular housing. A fuse adapter or a detonator adapter with a built-in percussion cap is attached to the base of the fuze by a threaded brass collar. The case is 7.6 centimeters long and 1.9 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Mechanical, with pull pin release.	2 lb (approx).

b. Use. This device is used as a fuse igniter in firing demolition charges and as a detonator for boobytraps and improvised mines.

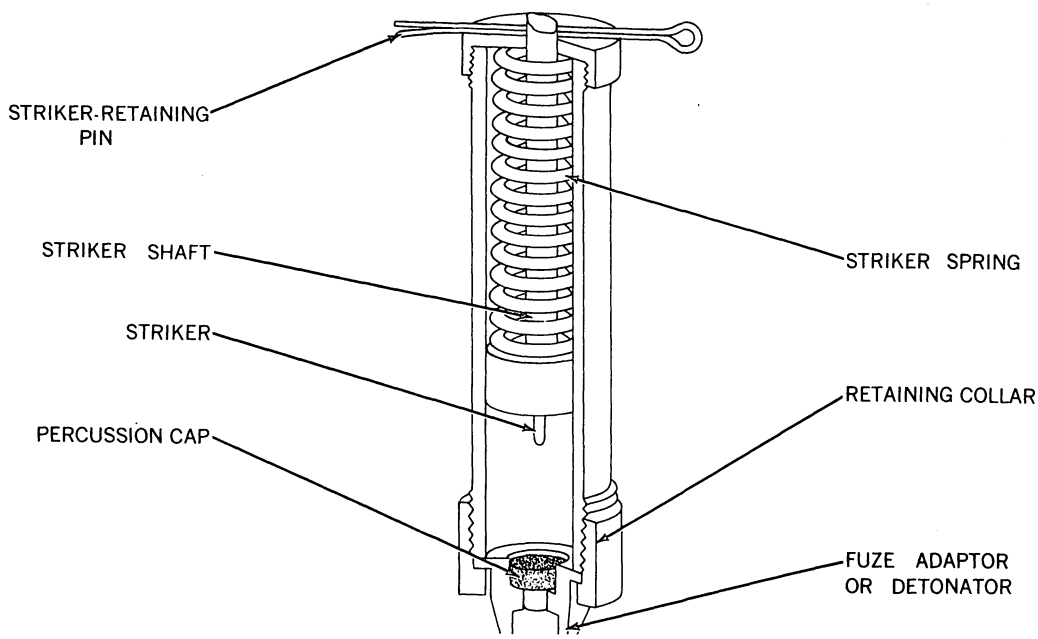


Figure 675

c. Functioning. The removal of the retaining-pin releases the spring-driven striker to fire the percussion cap.

d. Installing and Arming.

(1) Attach the fuze to an object.

(2) Insert a length of time fuse or detonating cord in the fuse adapter or insert a detonator in the detonator adapter.

(3) Tie an anchored tripwire to the eye of the striker retaining pin.

e. Disarming Procedure.

(1) Cut any slack tripwires. (Taut tripwires must be checked first.)

(2) Remove the fuze from the mine and remove the fuse or detonator adapter by unscrewing the retaining collar from the fuze case.

(3) Remove the fuze to a safe storage or disposal area.

f. Additional Precautions. If the retaining pin does not extend all the way through the striker shaft, the fuze should be destroyed in place.

414. Pull Fuze, Model 1951

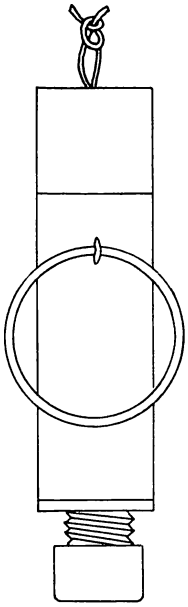


Figure 676

This spring-actuated ball-retained striker device is in a metal case, the lower end of which is threaded and protected by a transit cap. The two retaining balls are held in place by a pin fitted into the hollow upper end of the striker. This pin, with its pull cord, is held in position by a coiled spring and drilled to receive the safety pin that passes through it and the case. The mine measures 7.0 centimeters in height and 1.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with pin and ball release.	2.6 to 7.7 lb.

b. Use. It is used primarily for booby-trapping metallic antitank mines and for fuzing the Model 1950 trip flare.

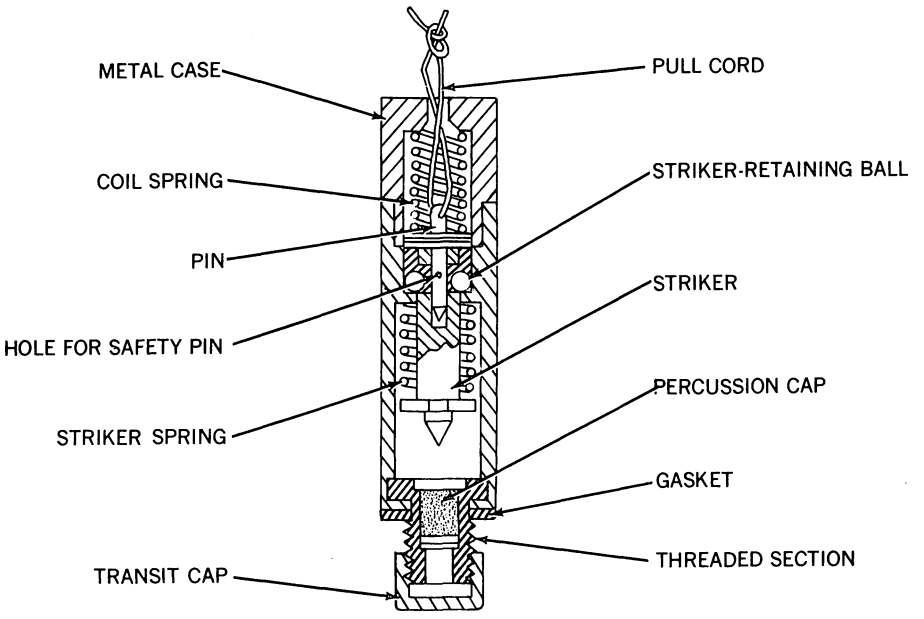


Figure 677

c. Functioning. When adequate traction is applied to the pull cord, it compresses the resistance spring and withdraws the pin from the interior of the striker, which permits the displacement of the retainer balls and the slamming down of the striker on the percussion cap.

d. Installing and Arming.

(1) Place the appropriate detonator in the boobytrapping well of the mine or in the fuze well of the flare.
(2) Remove the transit cap from the fuze.
(3) Screw the fuze into the mine or flare.
(4) Anchor the pull cord.
(5) Fasten the pull cord to the fuze.
(6) Remove the safety pin.

e. Disarming Procedure.

(1) Insert the safety pin.
(2) Cut the slack tripwire.
(3) Unscrew the fuze from the mine.
(4) Remove the detonator from the fuze well.
(5) Transport the fuze to a safe storage or disposal area.

415. Pull Fuze, 31 (Germany)

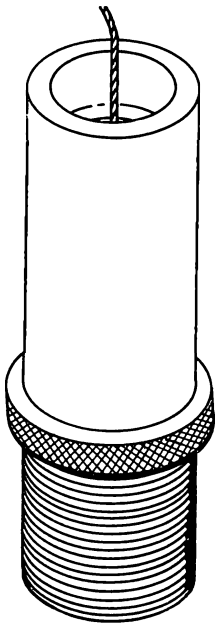


Figure 678

The components of this fuze are an outer body, a hollowed striker, a firing spring, four steel balls, a guide piece, and a hollowed ball to which the pull string is attached. The fuze measures 9.2 centimeters in length and 2.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Mechanical, with ball release.	5 lb.

b. Use. This fuze was designed for firing antipersonnel mines and boobytraps.

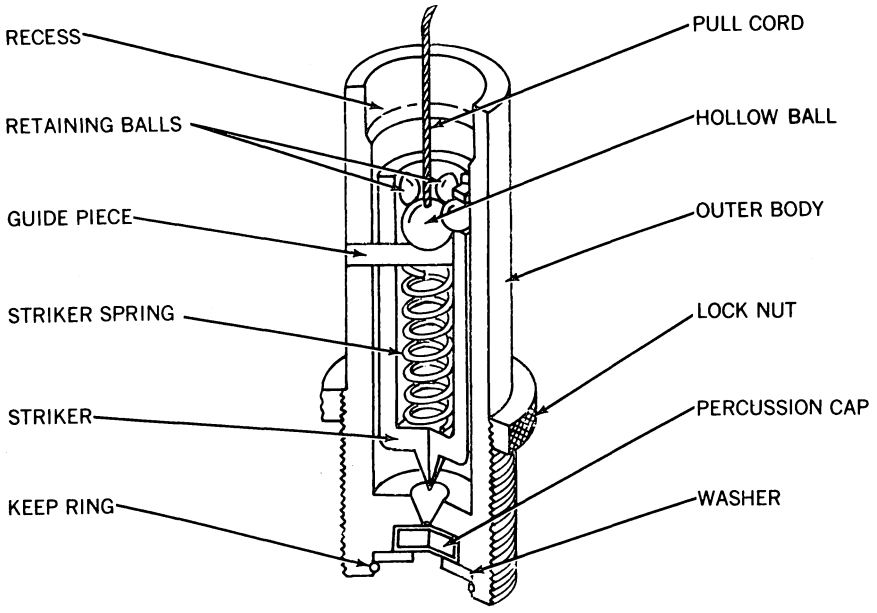


Figure 679

c. Functioning. A pull on the pull cord moves the striker up and compresses the striker spring. When the striker has moved up to a certain point, the steel balls move out into a recess, the hollow ball and pull cord pull free, and the tension of the firing spring drives the striker against the percussion cap.

d. Installing and Arming. As the fuze has no safety pin, the process of installing and arming is merely the placing or screwing the fuze into the mine and attaching a trip or pull wire to the pull cord.

e. Disarming Procedure.

(1) Cut any slack tripwire or pull cord. (Taut wires must be checked first.)
(2) Unscrew the fuze from the charge or mine.
(3) Remove the fuze to a safe storage or disposal area.

416. Wooden Pull Fuze (Norway)

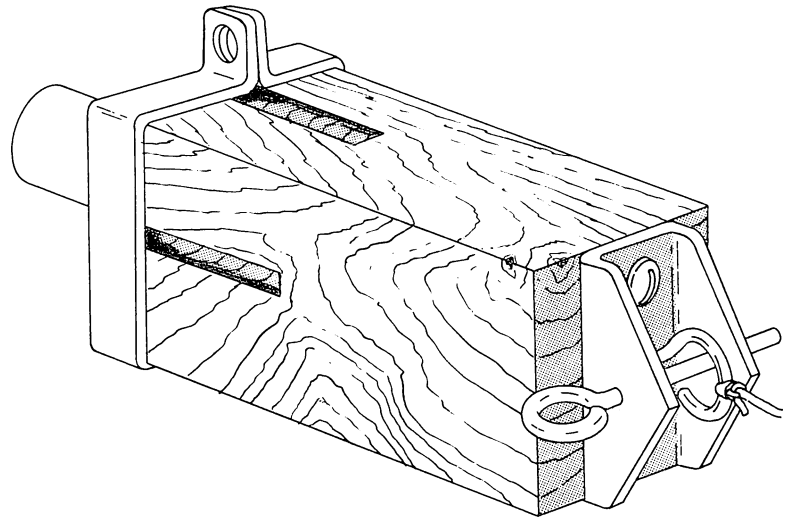


Figure 680

This wooden device is a hollowed-out timber body with a longitudinal groove cut halfway up each of the four sides, a metal safety pin holder, a spring-loaded striker, and a pull pin. The striker is held by a notch in its shaft that engages the rim of a hole in the metal safety pin holder. A metal clamp holds together the split ends of the fuze to keep the detonator in place.

a. Characteristics.

Shape	Case	Internal action	Operating force
Rectangular.	Wood and metal.	Mechanical, with pull pin release.	15 to 25 lb.

b. Use. This fuze is installed in improvised antitank and antipersonnel mines and booby-traps that may require pull or trip wire ignition.

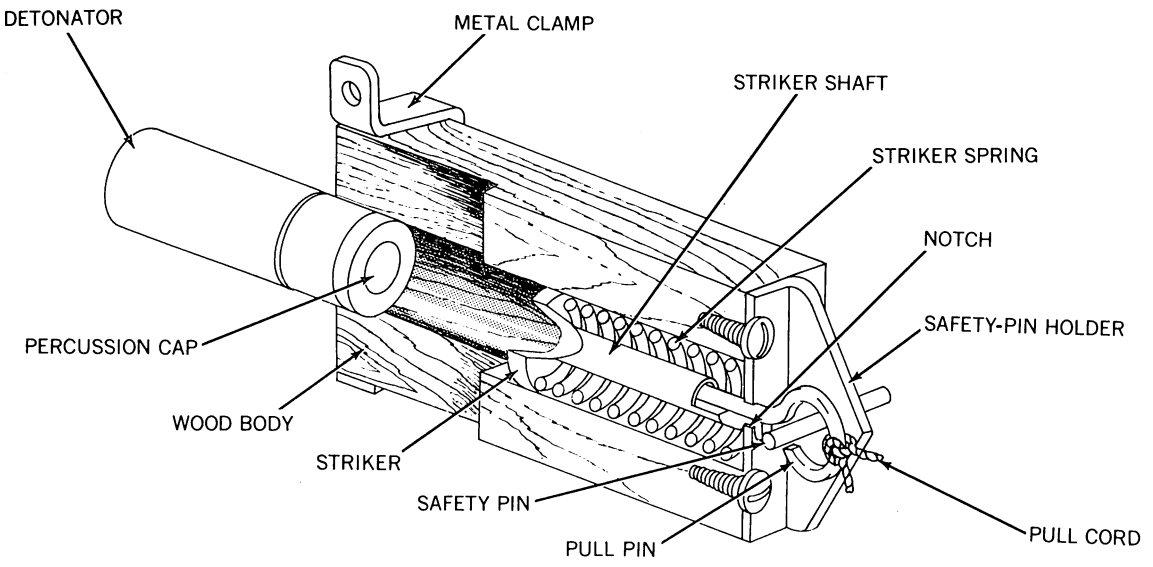


Figure 681

c. Functioning. A pull on the pull pin removes it, allowing the notch in the striker shaft to disengage from the safety pin holder. This releases the spring driven striker to fire the percussion cap and detonator.

d. Installing and Arming.

(1) Insert a percussion cap and detonator into the fuze.

(2) Tighten the metal clamp on the split end of the fuze to hold the detonator in place.

(3) Attach a pull cord or tripwire to the pull pin.

(4) Withdraw the safety pin.

e. Disarming Procedure.

(1) Insert a nail or wire in the safety pin hole and cut the pull cord or tripwire.

(2) Loosen the metal clamp and separate the percussion cap and detonator from the fuze.

(3) Take the fuze to a safe storage or disposal area.

417. Improvised Antilift Device for Antitank Mines (Germany)

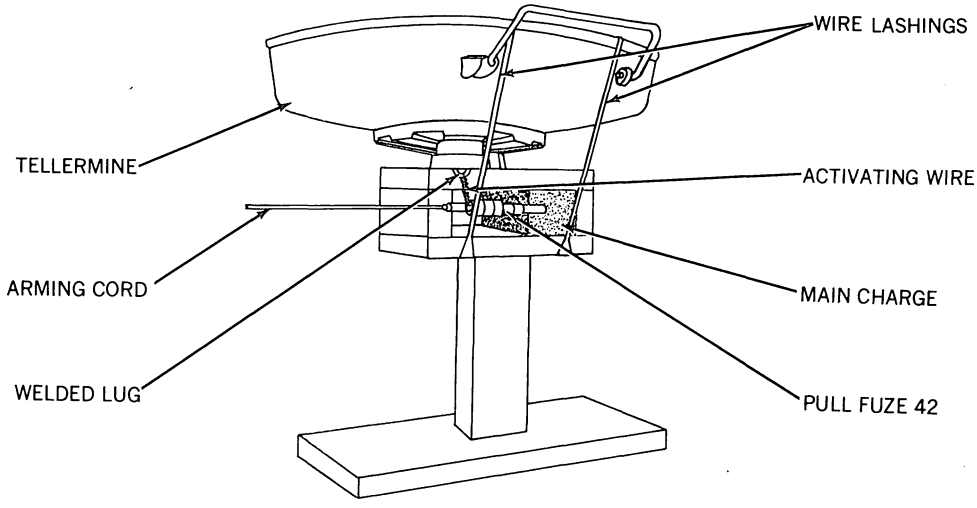


Figure 682

This antilift device consists of a wooden frame with a pull fuze 42 inserted in a ½-pound main charge. A mine with a small lug welded to its pressure plate is lashed to the wooden frame. One end of the activating wire is attached to the welded lug, the other end to the retaining pin of the fuze.

a. Use. This improvised antilifting device is used as an activator for antitank mines.

b. Functioning. When the mine is lifted, it pulls the striker retaining pin from the pull fuze, releasing the striker to fire in turn the percussion cap, the charge, and the mine.

c. Installing and Arming.

(1) Place the antilift device and the mine in a hole in the ground.

(2) Cut the wire lashings.

(3) Cover the mechanism with dirt, leaving most of the mine exposed.

d. Disarming Procedure.

(1) Cut the activating wire between the mine and pull fuze.

(2) Check the device for and remove any other tripwires or antilift rigging.

(3) Remove the mine.

(4) Remove the pull fuze from its charge.

(5) Remove the device to a safe storage or disposal area.

e. Additional Precautions. **The hand disarming of this device should not be attempted unless it is absolutely necessary,** as the possibility of unlocatable or imperceptible auxiliary antiremoval or antilift devices is too great to warrant the risk.

418. Wooden Antilifting Device

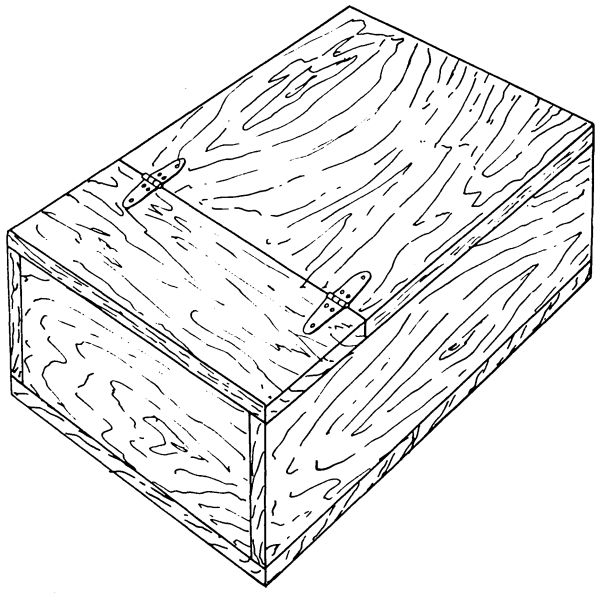


Figure 683

This assembly consists of a wooden case about 15.9 centimeters long, 12.0 centimeters wide, and 5.6 centimeters high, containing an 0.5-pound main charge and a pull fuze 42. A wooden block placed at the end opposite the main charge has a hole drilled part of the way into the center of the upper side to seat a strong actuating spring. The hinged lid has a small arming hole directly above the fuze retaining pin, and is held shut by an improvised latch, compressing the actuating spring. An actuating wire, attached to the striker retaining pin is threaded through the arming hole in the lid and tied to a nail laying across the arming hole.

a. Use. The wooden antilifting device is used to activate mines and as a boobytrap.

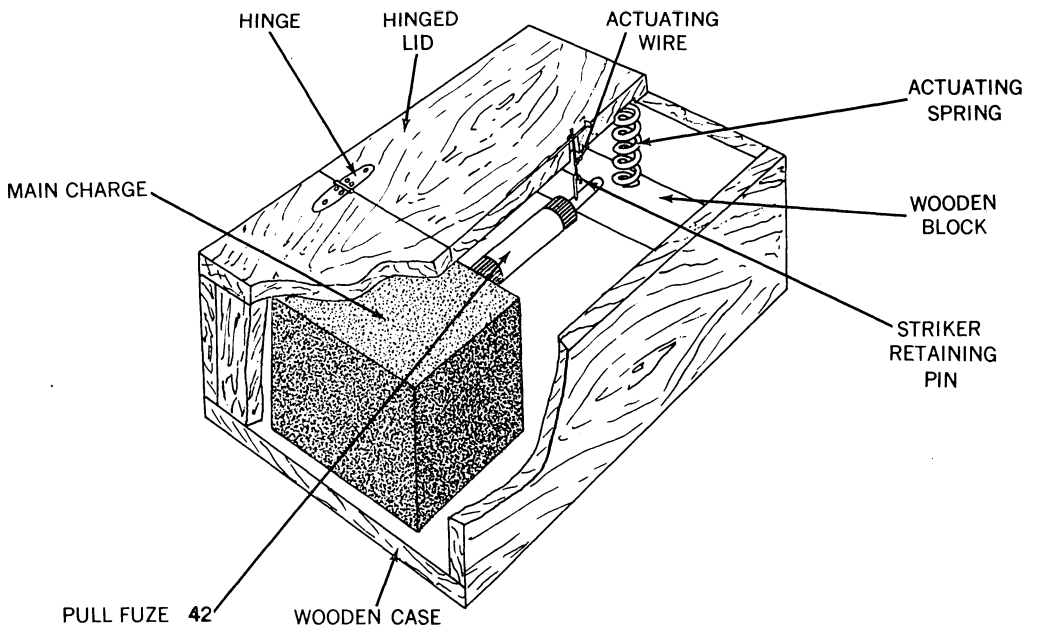


Figure 684

b. Functioning. When the retaining weight is removed from the top of the wooden case, the compressed actuating spring forces the hinged lid up. At the same time the actuating wire pulls the striker retaining pin out of the striker shaft, releasing the spring-loaded striker against the percussion cap.

c. Installing and Arming.

(1) Screw a pull fuze 42 with detonator into the main charge.

(2) Tie an actuating wire to the striker retaining pin and thread it through the arming hole.

(3) Close the hinged lid and fasten it with the improvised latch.

(4) Tie the actuating wire to a nail laid across the arming hole. Be careful not to put force on the actuating wire and unintentionally pull out the striker retaining pin.

(5) Lay the antilifting device in a hole and place the mine or charge on top of it. Be certain that the weight on the top is adequate to hold the hinged lid down against the force of the compressed actuating spring.

(6) Carefully disengage the improvised latch on the hinged lid.

d. Disarming Procedure. Mines activated with this device should be blown in place, as hand disarming is a tedious and dangerous operation. If hand disarming is imperative:

(1) Check for and remove any other antidisturbance or antilift devices.

(2) Secure the hinged lid tightly with the improvised latch or some other rigging.

(3) Carefully remove the mine and antilifting device from the hole.

(4) Cut or untie the actuating wire attached to the striker retaining pin of the fuze.

(5) Carefully raise the hinged lid.

(6) Unscrew the fuze and remove the detonator from it.

(7) Remove the fuze, device, and mine to a safe storage or disposal area.

419. Wooden Antilifting Device (U.S.S.R.)

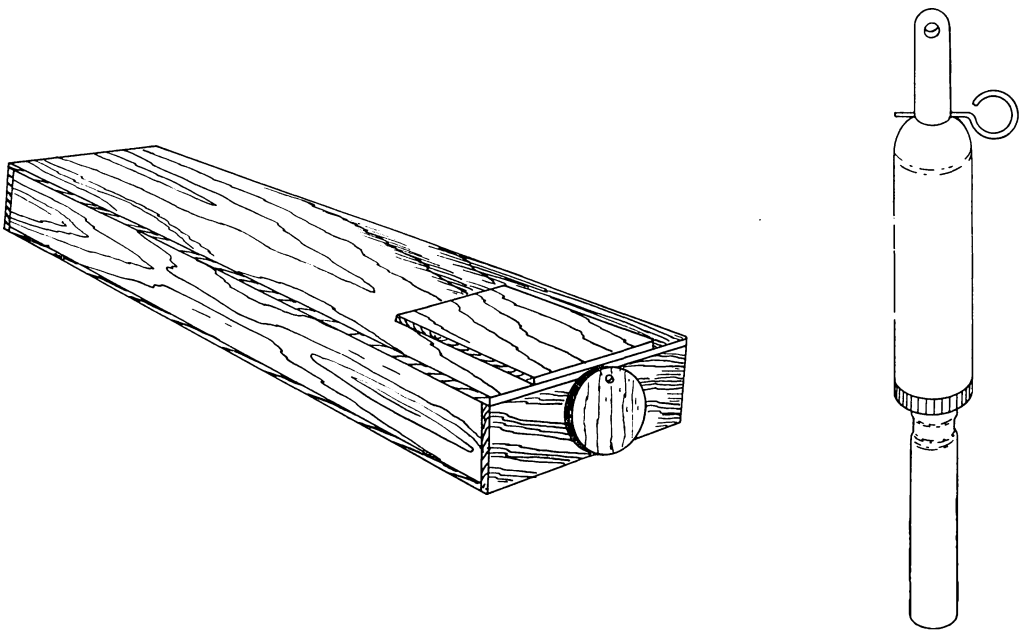


Figure 685

The Soviet wooden activator was rigged to mines and charges to make them difficult to lift or disarm. In World War II, the Russians marked such mines very carefully and restricted their use to specific conditions, purposes, or operations. The device consists of a wooden box 21.5 by 6.9 by 3.5 centimeters, an MUV pull fuze, a charge, and a square movable lid with a metal actuating hook screwed to the under side of the lid. The lid rests on two springs; and the hook engages in the eye of the striker retaining pin when the fuze is inserted.

a. Characteristics.

Shape	Fuze	Operating force	Explosive
Rectangular..	MUV pull..	10 lb (approx)	8 oz TNT (approx).

b. Use. The wooden antilifting device is used as a boobytrap or activator for antitank mines.

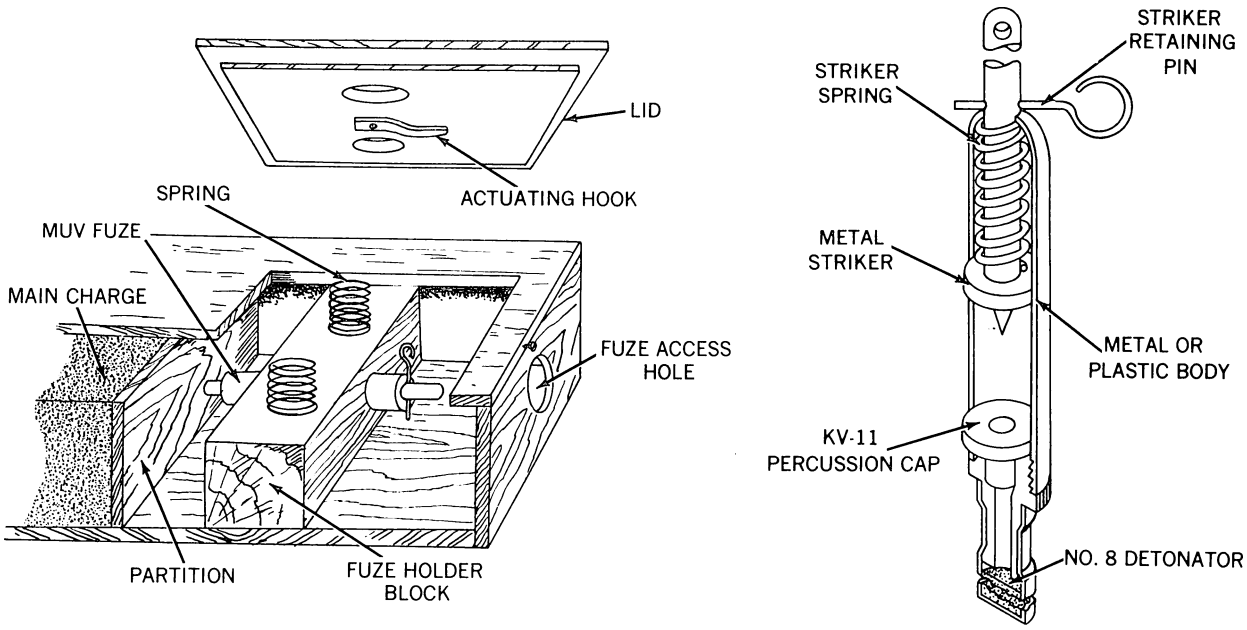


Figure 686

c. Functioning. The removal of the mine or heavy object from the top permits the two compressed springs, fastened to the fuze block in the interior, to push up the lid and by means of the hook underneath to pull out the striker retaining pin and actuate the fuze.

d. Installing and Arming.

(1) Prepare a hole or a location for the device.

(2) Place the lid on the springs and weigh it down with a mine or other object heavy enough to compress the springs.

(3) Insert an MUV pull fuze and detonator assembly through the hole in the end of the mine (exposed by rotating the fuze well cover) and through the fuze block into the charge. In the process, keep the eye of the striker retaining pin up so that it may be engaged in the hook projecting on the underside of the lid.

e. Disarming Procedure. Because of its design and construction, **mines fitted with this device should be detonated in place.** If hand disarming is mandatory:

(1) Check for and remove any additional antilift rigging.

(2) Carefully slide off the mine or object to expose enough of the lid to press it down with the hand.

(3) Carefully wrap a wire or cord around the lid and body to insure its remaining in the compressed state.

(4) Remove the device from the hole.

(5) Uncover the fuze access hole and check to see whether the open end of the actuating hook projects toward the hole. If so, pull out the fuze and detonator assembly and separate the detonator from the fuze. If the open end of the actuating hook projects in the direction of the charge, do not attempt to remove the fuze.

(6) Remove the disassembled device and fuzes, or the assembled device, whichever applies, to a safe storage or disposal area.

420. Safety Fuse Igniter, Percussion Type (Germany)

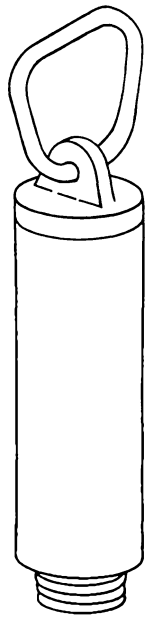


Figure 687

This fuze consists of an outer case, spring-loaded striker, striker release plate, and a percussion cap holder that screws into the bottom of the case.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with a two-section Z-type striker shaft release.	A strong pull on steel ring.

b. Use. This fuze is used to ignite safety fuse.

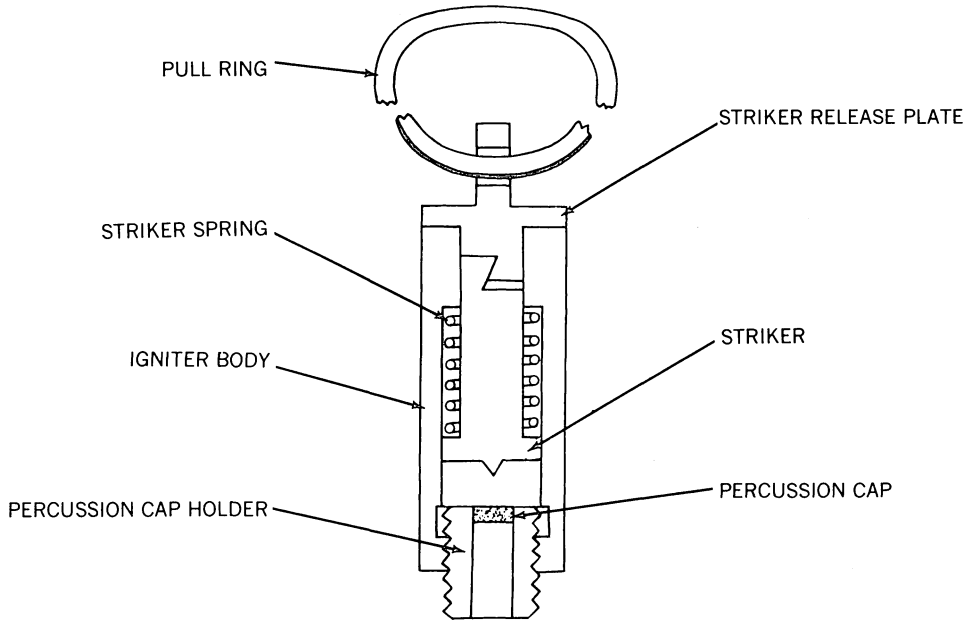


Figure 688

c. Functioning. A string pull on the steel ring detaches the striker release plate from the striker, permitting the spring to slam it against the percussion cap, igniting the fuze.

d. Installing and Arming.

(1) Screw the percussion cap holder into the fuze.

(2) Install one end of a length of safety fuse in the percussion cap holder and the other end in the detonator.

(3) Attach a tripwire to the pull ring and anchor it to a stake or some other fixed object, if installed for trip wire actuation.

e. Disarming Procedure.

(1) Cut the slack trip or pull wire attached to the pull ring.

(2) Unscrew the fuze from the mine or charge or unscrew the fuse adapter from the base of the fuze.

(3) Unscrew the percussion cap holder from the base of the fuze.

(4) Remove the fuze to a safe storage or disposal area.

421. Pull-Percussion Igniter, Type 2 (Germany)

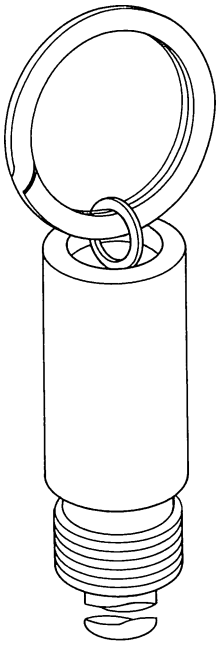


Figure 689

The body of the fuze is internally threaded at the base to accept the percussion cap housing and externally threaded to engage the mine or charge into which the fuze is fitted. A 0.4-centimeter hole is drilled from the base to a point 0.5 centimeters from the head, forming a housing for the striker assembly. The fuze body is drilled centrally at the head to give clearance to the striker release plate. The striker, constructed of .07-centimeter steel plate, has no point. The fuze is 5.0 centimeters long and .9 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass and steel.	Mechanical, with striker-release plate.	15 to 20 lb.

b. Use. This fuze was designed for the new type parachute antipersonnel bomb, but it is suitable for mines and boobytraps.

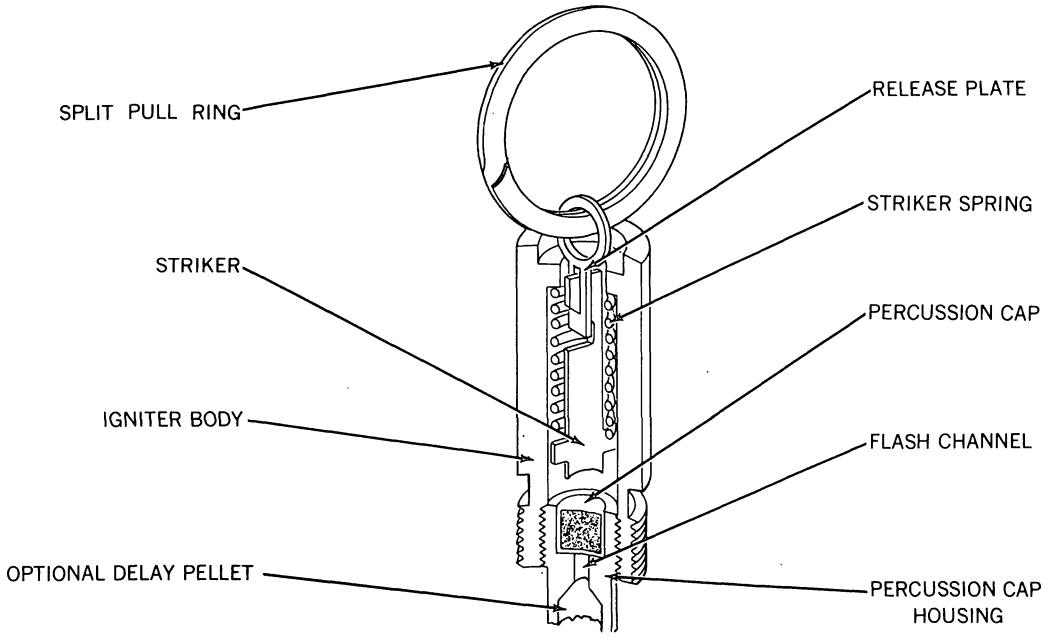


Figure 690

c. Functioning. A sharp pull on the split release plate ring withdraws the striker release plate, taking with it the striker and compressing the striker spring. When the release plate has been withdrawn fully from the fuze body, it disengages from the striker, releasing it to impinge on the percussion cap.

d. Installing and Arming. As this fuze has no safety pin, installing and arming is merely assembling the fuze and detonator, screwing the fuze into the mine or charge, and attaching a trip wire, if desired.

e. Disarming Procedure.

(1) Cut the tripwire.
(2) Unscrew the fuze from the mine or charge.
(3) Separate the percussion cap, delay pellet, and detonator from the base of the fuze.
(4) Remove the fuze to a safe storage or disposal area.

422. Waterproof Safety Fuse Igniter (Japan)

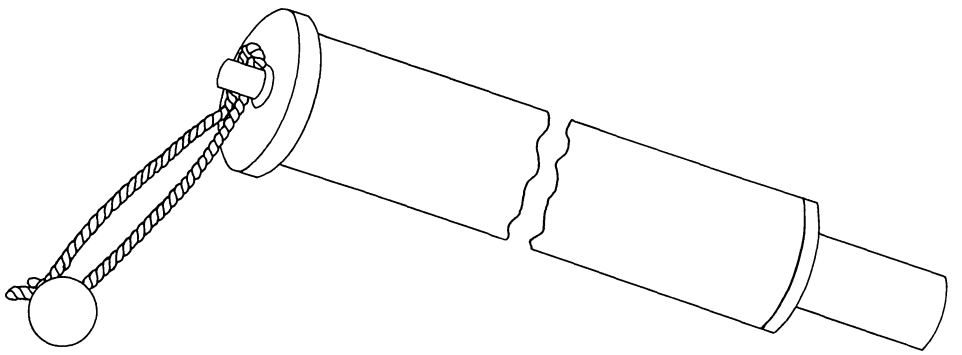


Figure 691

This fuze has a spring-loaded striker and a percussion cap. The bottom of the housing has a nipple to which a safety fuse or nonelectric blasting cap may be attached. The striker shaft is in two sections, connected by a notched joint. There is no safety pin, as the firing spring is not compressed until there is pull on the striker shaft. The igniter is 11.4 centimeters long and 0.9 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Mechanical with notched-joint striker shaft release.	Unknown.

b. Use. This fuze was used in smoke bombs and in improvised boobytraps.

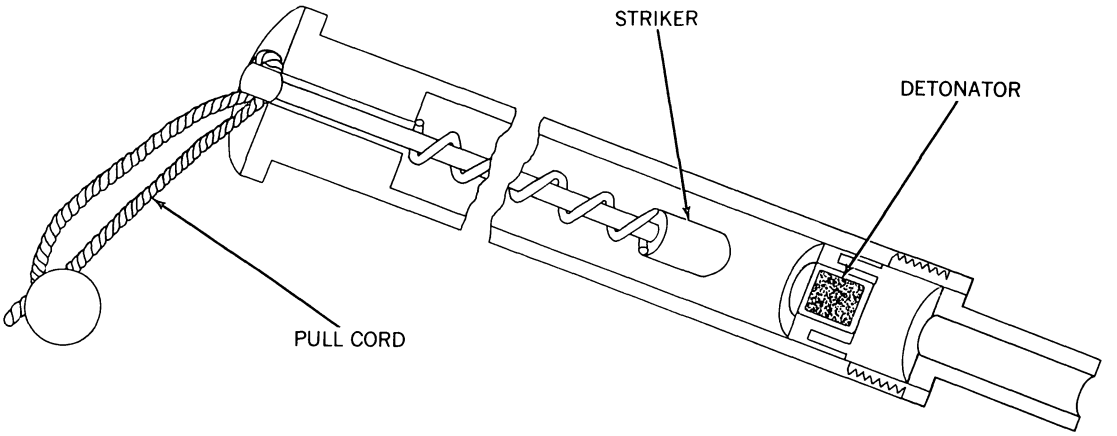


Figure 692

c. Functioning. Pull on the cord attached to the notch-joint striker shaft compresses the striker spring and draws the striker shaft out until the notch joint separates, releasing the firing pin to fire the percussion cap.

d. Installing and Arming.

(1) Install the fuze in the boobytrap or charge.

(2) Attach a pull wire to hole in the end of the striker shaft and anchor to a stake or some other object.

e. Disarming Procedure.

(1) Cut any slack pull wires.

(2) Remove the fuze from the mine or charge.

(3) Unscrew the detonator from the base of the fuze.

(4) Remove the fuze to a safe storage or disposal area.

423. Mechanical Pull Igniter (Japan)

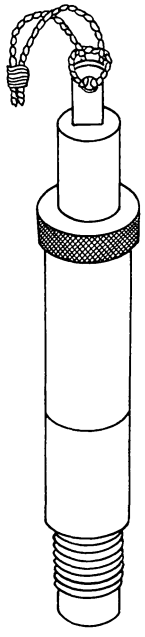


Figure 693

The case of this pull fuze is in two sections. The bottom section which contains the primer cap and a black powder relay, threads into the top section and screws into the mine or charge. The top section houses the firing assembly, a two-piece striker, striker pin, safety pin, and lanyard. The two sections of the striker shaft are held together by a notched joint and the striker flange.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Steel.....	Mechanical, with notched-jointed striker shaft release.	20 lb or more (not known).

b. Use. The use of this fuze is not known. It may, however, be used as well as any other pull fuze for firing boobytraps or mines exploded by tripwire.

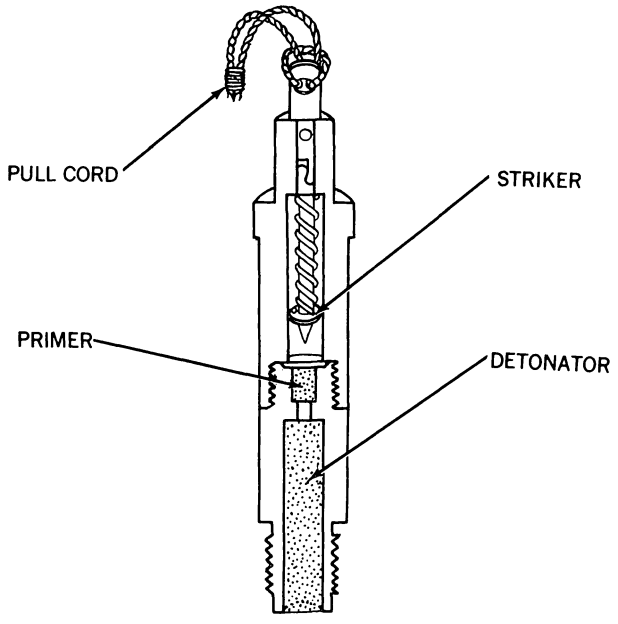


Figure 694

c. Functioning. A pull on the lanyard cord, pull wire, or trip wire pulls out the jointed striker shaft, compressing the striker spring until the notched joint extends above the housing, when the joint separates, releasing the striker against the percussion cap.

d. Installing and Arming.

(1) Attach the fuze to the boobytrap or screw into mine or charge.

(2) If a tripwire is used, attach it to the striker shaft and anchor to a stake in the ground or fasten to some other object.

(3) Remove the safety pin.

e. Disarming Procedure.

(1) Insert a nail or wire in the safety pin hole at the top of the fuze case and cut any slack tripwires, if present.

(2) Unscrew the fuze from the mine or charge and unscrew the detonator and primer from the fuze.

(3) Remove the fuze to a safe storage or disposal area.

424. Pull-Friction Fuzes, No. 1 and No. 2 (Japan)

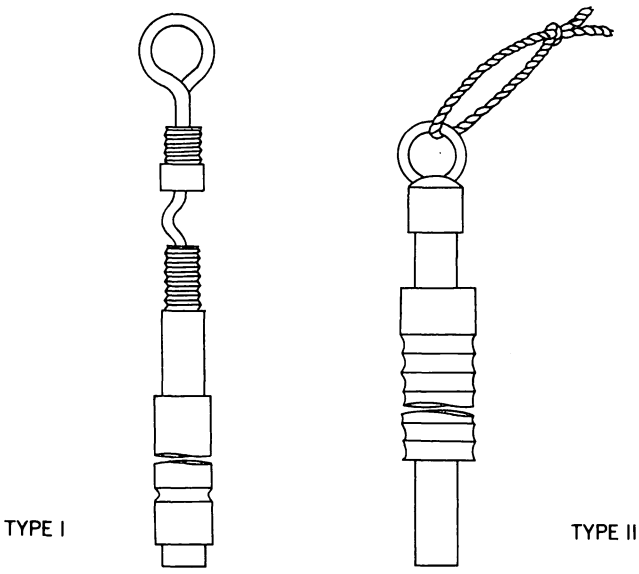


Figure 695

The red type fuze has a metal body and a red plastic outer sleeve. At one end a screw cap is fitted with an eye for attaching a pull or trip cord. Attached on the inside of this screw cap is a short sand impregnated pull string which extends through a small pellet of friction ignition composition. The end of the fuze, to which the safety fuze or detonator are crimped, is covered with tin foil to keep out moisture. The black type differs only slightly from the red; the case is slightly longer and the plastic sleeve slightly larger. The sleeve of the black type has fourteen rings around it to provide a firm hand grip; the red type has only one. The dimension of the red type are length of housing 6.9 centimeters, diameter 0.9 centimeters; length of sleeve, 3.9 centimeters, diameter 1.0 centimeters. The dimension of the black type are length of housing 9.2 centimeters, diameter 0.7 centimeters; length of sleeve 4.7 centimeters, diameter 1.0 centimeters.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass with plastic outer sleeve.	Pull-friction..	10 lb (approx).

b. Use. Although used primarily as a time fuse lighter, it is also effective as a pull fuze with boobytraps and improvised land mines.

(No drawing available.)

c. Functioning. When the sanded end of the pull string is drawn through the igniter composition, it causes a flame that initiates the mine or boobytrap or ignites the fuse.

d. Installing and Arming.

(1) Remove the tin foil from the fuse holder.

(2) Insert the end of a time fuse or detonator into the open end of the fuse holder and tape in place.

(3) Attach the fuse assembly to the charge.

(4) If the fuze is used as a pull fuze in an antipersonnel mine or boobytrap, unscrew the threaded pull cap and fasten an anchored pull wire to the pull ring.

e. Disarming Procedure.

(1) Cut the pull wire fastened to the pull ring.

(2) Cut the fuse or detonating cord.

(3) Remove the fuze to a safe storage or disposal area.

425. Friction-Pull Fuze BZ-39 (Germany)

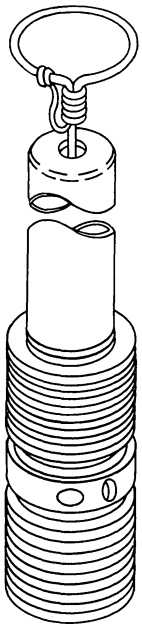


Figure 696

The body of this friction fuze has a wall of two thicknesses forming a shoulder on which rests the distance tube that prevents the longitudinal movement of the coated part of the pull wire. The 7-second delay composition is black powder covered with a small quantity of flash compound. The whole filling is protected by a cellophane disk held in place by a rubber washer. The fuze is 7.6 centimeters long and 0.6 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Aluminum..	Pull-friction..	20 lb (approx).

b. Use. The BZ-39 fuze is used primarily in hand grenades, but is adaptable to use as a pull fuze in Tellermines, S-mines and booby-traps.

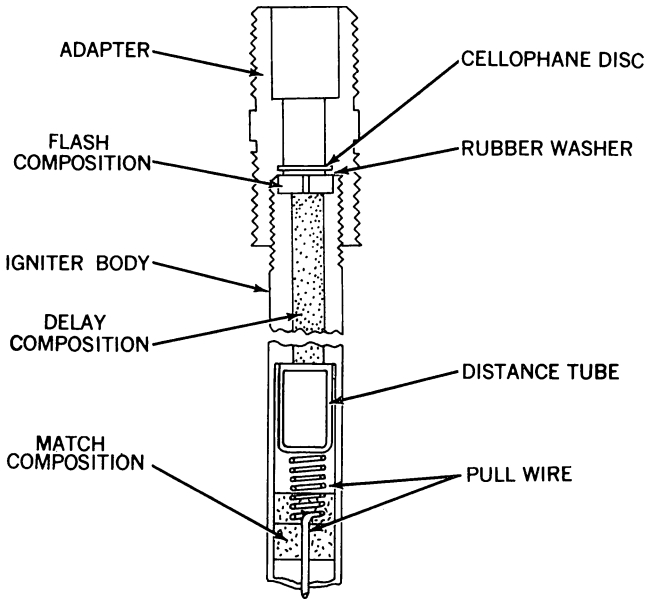


Figure 697

c. Functioning. The coiled part of the pull wire is drawn through the friction compound, producing a flash that ignites the delay composition, which after 7 seconds sets off the grenade or mine.

d. Installing and Arming.

(1) Attach a detonator to the base of the fuze.

(2) Place the fuze and detonator into the mine charge or boobytrap.

(3) Attach a pull wire.

e. Disarming Procedure.

(1) Remove the fuze from the mine, charge, or boobytrap.

(2) Separate the detonator and fuze.

(3) Remove the fuze and mine or charge to a safe storage or disposal area.

426. Pull-Friction Fuze 29 (ZDSCHN.ANZ. 29) (Germany)

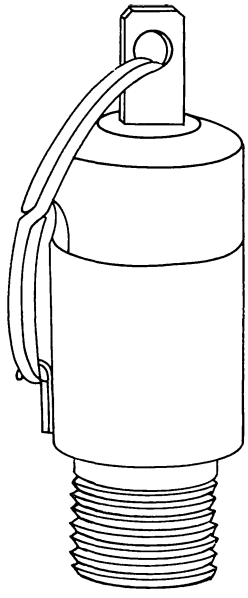


Figure 698

The ANZ 29 is a chemical, pull-friction type of fuze. The fuze body houses a copper capsule containing a friction-match composition closed by a copper cap. A friction pull wire, tightly coiled at the bottom and attached to a hook at the top, passes through the capsule and the chemical compound. The coiled wire forms a resistance to pulling. The fuze is approximately 3.7 centimeters long and 3.0 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Brass.....	Mechanical-chemical with friction wire actuation.	10 lb (approx).

b. Use. This igniter is used to light time fuse attached to a prepared charge or hollow charge. It may also be used to ignite a smoke candle; or with a tripwire attached to the pull ring, to actuate a boobytrap or to activate an antitank or improvised mine.

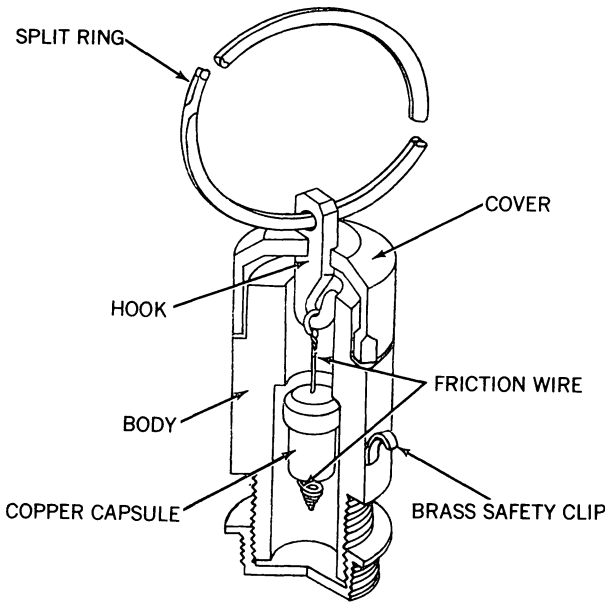


Figure 699

c. Functioning. A pull on a trip wire attached to the safety ring separates the cap and hook from the body, drawing the friction wire through the friction composition, igniting the friction composition and in turn the attached fuse and detonator.

d. Installing and Arming.

(1) Unscrew the shipping cap.
(2) Insert a length of time fuse into a fuse adapter and screw the fuse adapter onto the base of the igniter.
(3) Insert the other end of the time fuse into a detonator adapter.
(4) Insert the detonator into the detonator adapter.
(5) Screw the detonator adapter into the charge.
(6) Disengage the pull ring from the pull-ring catch.
(7) Tie one end of the slack tripwire to an anchor and the other end to the pull ring.

e. Disarming Procedure.

(1) Cut the time fuse near the base of the fuse adapter.
(2) Cut any slack tripwires and fasten the pull ring by means of the pull ring catch to the side of the case.
(3) Unscrew the fuse adapter from the fuze and remove the time fuse or remove the fuze from mine or charge and separate the detonator from the base of the fuze.
(4) Remove the fuze to a safe storage or disposal area.

427. Pull-Friction Fuze (ZDSCHN. ANZ. 39) (Germany)

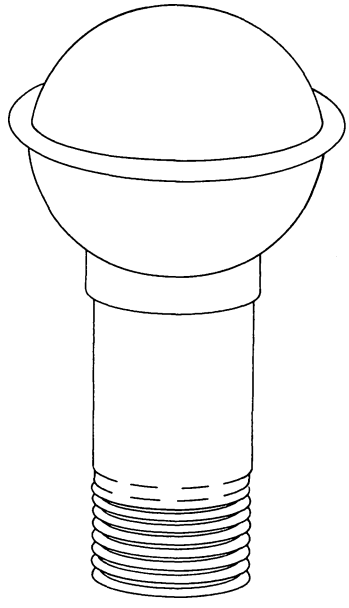


Figure 700

The main body of this fuze has a threaded top to receive a spherical cap that contains the pull disk attached to a short length of pull cord at one end and a coated friction pull wire at the other. Within the body is also a copper capsule containing a friction composition through which the pull wire passes. The fuze is 5.3 centimeters long, and the globular head, 2.2 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical with globular head.	Aluminum..	Mechanical, chemical friction.	Strong pull on pull cord.

b. Use. This fuze is used generally in demolition work for the ignition of safety fuse. It is also used to ignite smoke candles, boobytrap Tellermines and grenades, and set off improvised mines and boobytraps.

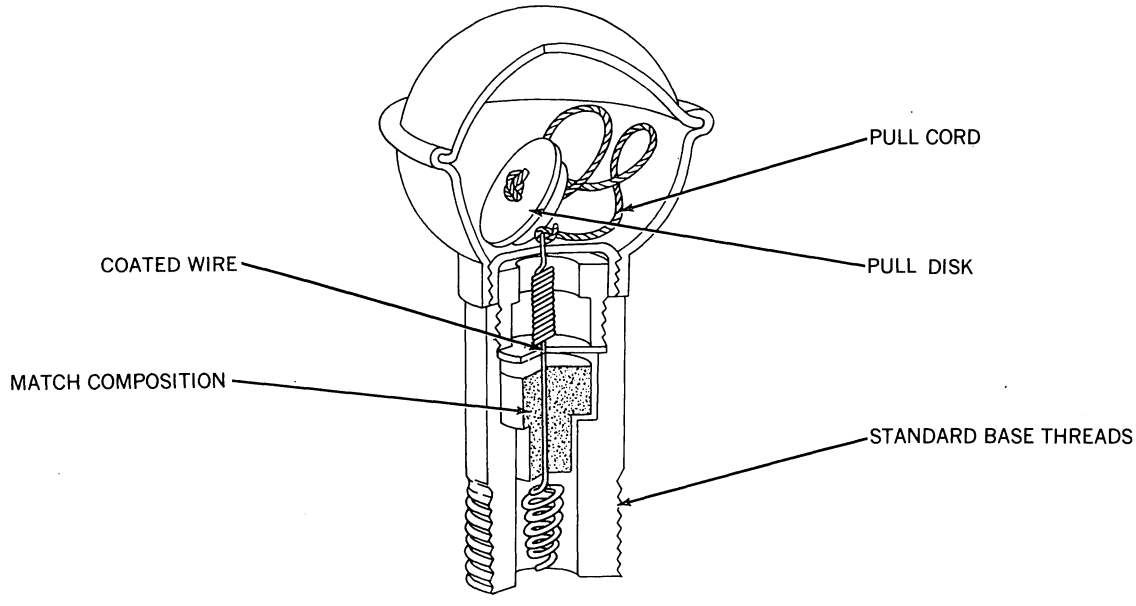


Figure 701

c. Functioning. The spherical cap is unscrewed from the top of the fuze, and the friction wire is pulled through the friction composition by means of the pull disk and cord to ignite the friction composition.

d. Installing and Arming.

(1) Insert a length of time fuse into an adapter and screw the adapter onto the base of the fuze.

(2) Insert the other end of the time fuse into a detonator adapter.

(3) Insert a detonator into the detonator adapter.

(4) Screw the detonator adapter into the charge.

e. Disarming Procedure.

(1) Cut the time fuse near the base of the fuze.

(2) Unscrew the fuse adapter from the fuze and remove the time fuse.

(3) Take the fuze to a safe storage or disposal area.

428. Pull-Friction Fuze (South Korea)

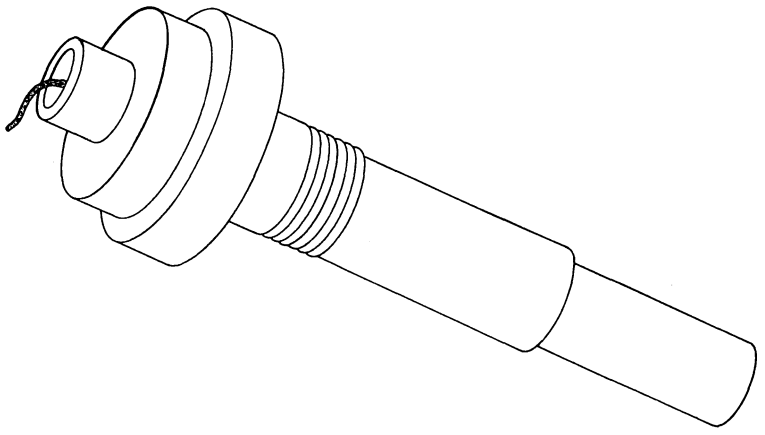


Figure 702

This fuze contains a chemical compound with a pull wire extending through it and coiled at the lower end. A 3- to 5-second delay charge lies between the chemical compound and the detonator. The housing has a threaded base.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Metal.....	Mechanical, with friction wire and chemical compound.	40 to 50 lb (approx).

b. Use. This fuze is used in both Type I and II dual purpose mines.

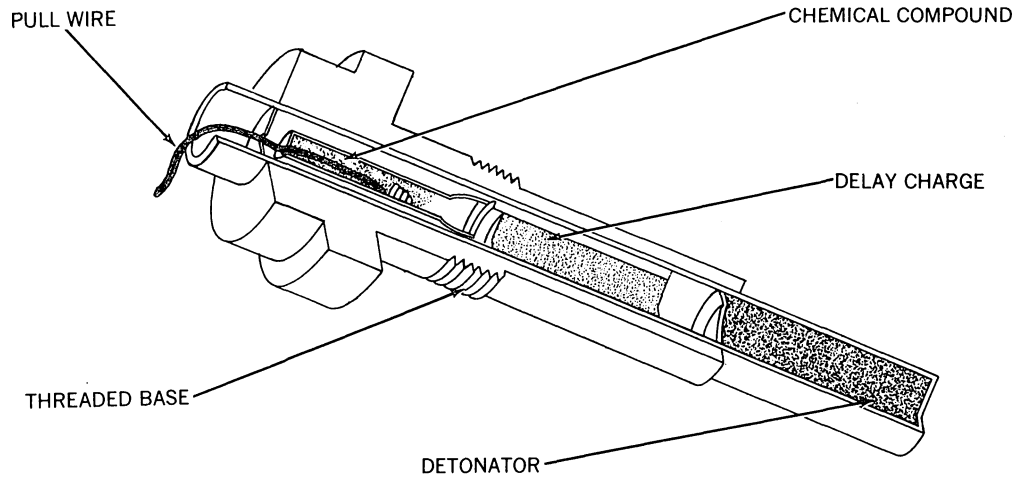


Figure 703

c. Functioning. A pull on the tripwire draws the friction wire through the chemical compound, igniting the delay charge. After the delay charge burns through, it fires the detonator.

d. Installing and Arming. This fuze is assembled and armed when manufactured. When ready for use, the tripwire is unwound from the top of the fuze and made fast to some object.

e. Disarming Procedure.

(1) Cut the pull wire near the top of the fuze or wrap it a few turns around the fuze and tie it to prevent unwinding.
(2) Unscrew the fuze from the mine.
(3) Remove the fuze to a safe storage or disposal area.

429. Pull-Friction Fuze, West (Germany)

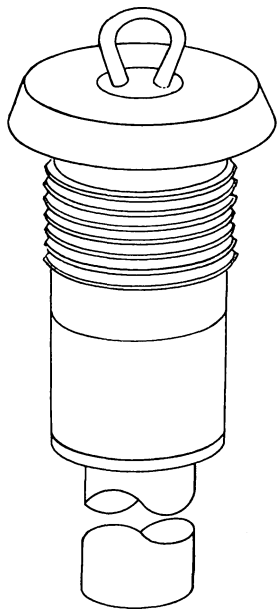


Figure 704

This is a chemical friction fuze 7.3 centimeters long and 3.1 centimeters in diameter. It contains a pellet of chemical compound fastened to the end of a pull wire. The space between the pull wire and the inner wall of the case is filled with a chemical compound and sealed at the lower end with a paper disk. The detonator is in a threaded holder.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical..	Brass.....	Mechanical, with pull wire and chemical compound.	75 to 100 lb.

b. Use. This fuze is designed to detonate improvised shell mines.

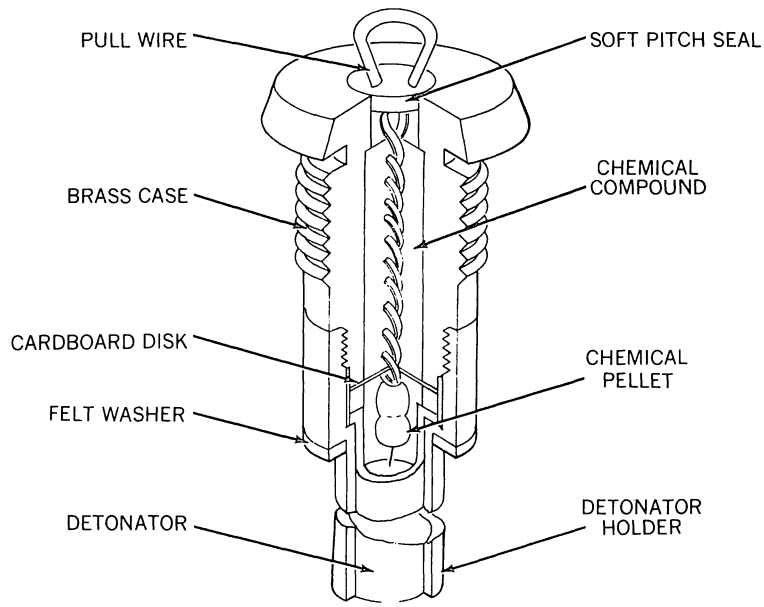


Figure 705

c. Functioning. A pull on the pull wire draws the pellet through the chemical compound and ignites the flash composition, which in turn fires the detonator.

d. Installing and Arming.

(1) Screw the fuze into the fuze well of the mine.

(2) Attach slack trip wire to the pull wire on the fuze.

e. Disarming Procedure.

(1) Cut the slack tripwire.

(2) Unscrew the fuze from the mine by gripping the top of the brass case.

(3) Remove the fuze to a safe storage or disposal area.

430. Pull-Friction Fuze, Model 1951 (France)

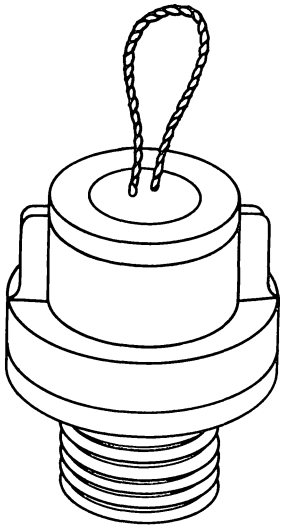


Figure 706

The lower portion of the case of this fuze is threaded, while the upper and larger portion is strengthened by four external vertical ribs. The charge is a match-head compound into which a pull cord is embedded. A loop of this cord extends above the case for the attachment of a pull wire. The joint between the case and the cord loop is sealed with a varnish compound. The case is approximately 2.0 centimeters high and 2.0 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical.	Plastic.....	Pull-friction..	2.2 to 7.7 lb.

b. Use. This fuze is designed to detonate improvised mines and boobytraps. It must be handled carefully; for it has no safety device.

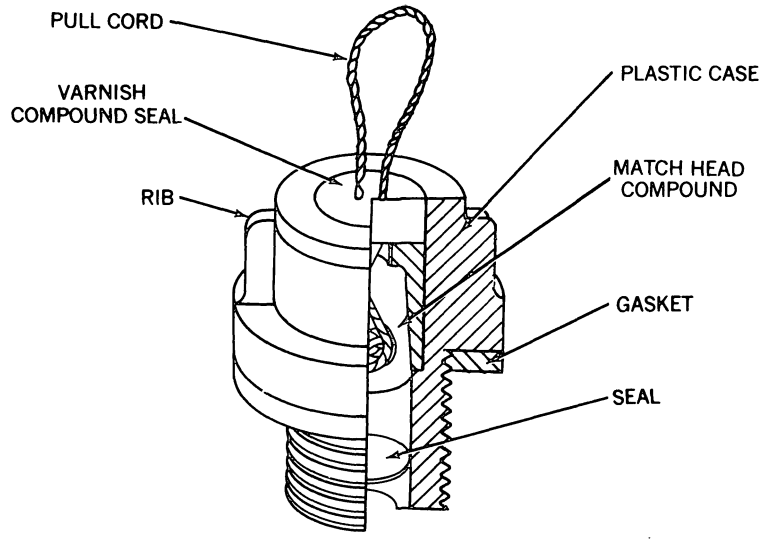


Figure 707

c. Functioning. A pull on the cord draws it through the friction compound producing heat adequate to ignite the compound.

d. Installing and Arming.

(1) Place the appropriate detonator in the boobytrapping well of the mine.
(2) Remove the transit cap from the fuze.
(3) Screw the fuze into the boobytrapping well.
(4) Attach an anchored trip cord to the pull loop.

e. Disarming Procedure.

(1) Cut any slack trip cords.
(2) Remove the fuze and the detonator from the mine.
(3) Remove the fuze to a safe storage or disposal area.

Section III. DELAY FUZES

431. Special Chemical Delay Fuze (Italy)

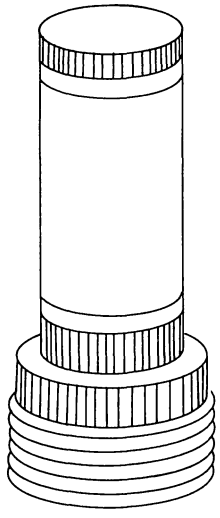


Figure 708

This fuze has a spring-loaded striker with a celluloid washer release. The top of the case contains a reaction chamber into which extends the top of the striker housing. On this rests the celluloid washer, which is attached to the striker shaft by a cap screw. The bottom of the case is threaded for attaching a retaining collar that contains the percussion cap. The retaining collar is externally threaded for screwing the fuze into the charge. The top of the fuze is 1.8 centimeters in diameter; the overall length, with the plug and retaining collar, is 5.6 centimeters. The chemical to dissolve the celluloid washer is carried in a small bottle separate from the fuze.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Metal.....	Chemical action to dissolve celluloid disk striker-retainer.

Remarks

Moving or jarring the fuze after arming may complete the deterioration of the partially dissolved celluloid washer.

b. Use. This fuze is employed for the delayed detonation of charges.

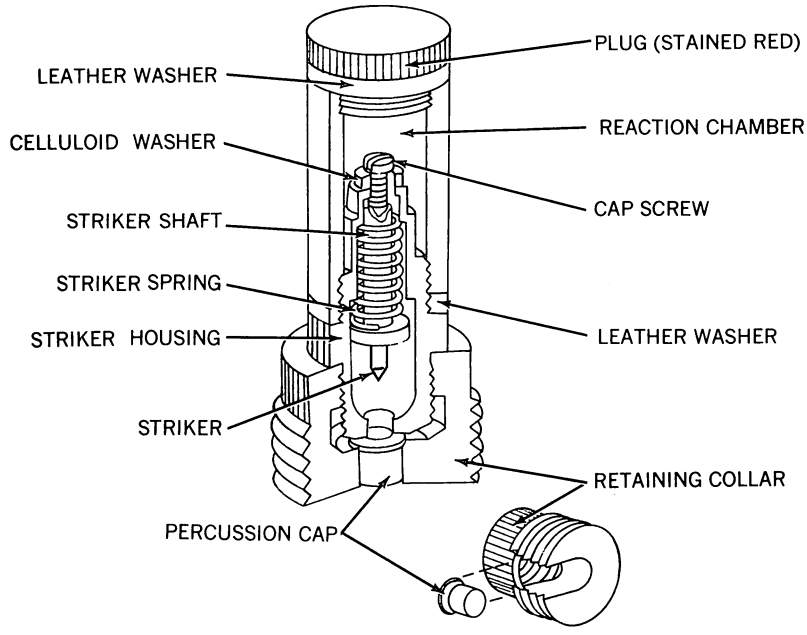


Figure 709

c. Functioning. With the reaction chamber filled with chemical, the celluloid washer dissolves until it releases the striker to initiate the percussion cap.

d. Installing and Arming.

(1) Screw the retaining-collar with percussion cap to the base of the fuze.

(2) Screw the fuze with detonator into the charge.

(3) Unscrew the plug on top of the fuze and fill the reaction chamber with the chemical provided.

(4) Replace the plug.

e. Disarming Procedure. As there is no way of stopping chemical action after the fuze is armed, it should be destroyed in place along with the charge.

432. Chemical Delay Fuze (Italy)

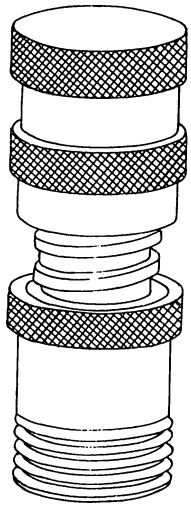


Figure 710

The body of the fuze contains a steel striker retained against the compression of a steel spring by a celluloid washer that projects into a cylindrical chamber at the upper end of the body. A detonator fitted with a flanged cap is secured to the lower end of the body by a washer and a screw-threaded adapter that is slotted laterally at the lower extremity to permit the insertion of the flanged detonator head beneath the detonator locating ring. The cap assembly with the acetone sealed-in is screwed on the top of the housing. The fuze measures 6.1 centimeters in length and 2.6 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Aluminum alloy.	Chemical action on celluloid disk retainer releases spring-loaded striker.

b. Use. This fuze is employed for the delayed detonation of charges.

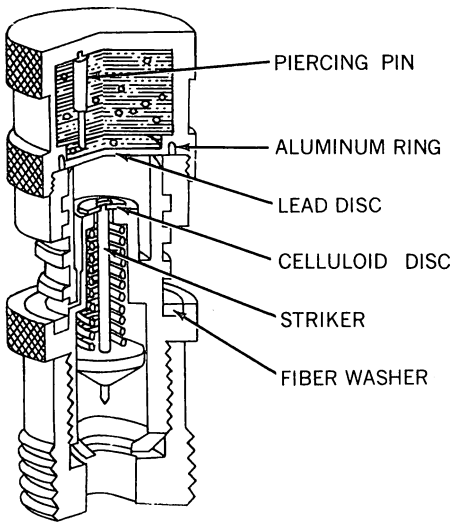


Figure 711

c. Functioning. The end cap assembly is screwed down. A lead closing disk, thus cut, permits acetone to enter the chamber, and surround and dissolve the celluloid washer. When this is dissolved, it releases the striker to initiate detonation. Time delay is regulated by the variation of the number of celluloid washers used. Fuzes with the screw threads on the upper part of the unpainted aluminum body have a delay of 1¾ hours; those painted steel gray, 2⅓ hours; and those painted red, 3 hours. The colors cannot be seen when the fuze is armed.

d. Installing and Arming.

(1) Withdraw the safety pin.

(2) Holding the fuze horizontally, with the air hole leading into the reaction chamber pointing up, screw the adapter collar with the acetone filled cap down against the fiber washer on the shoulder of the fuze case.

(3) Secure the percussion cap and detonator to the base of the fuze with the retaining collar.

(4) Screw the fuze into the charge.

e. Disarming Procedure. Once the fuze is armed, there is no way of stopping chemical action. **Both the fuze and charge should be destroyed in place.**

433. Chemical-Mechanical Time Delay Fuze, 41 W (Germany)

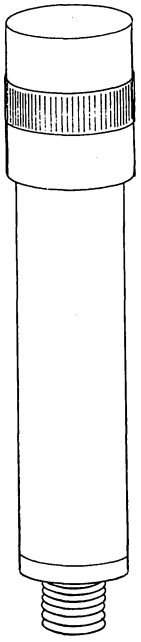


Figure 712

The fuze housing, 13.9 centimeters long by 3.1 centimeters in diameter, has a male thread at the top to take a deep arming cap and a female thread at the bottom for a metallic percussion cap and detonator assembly. Internally, a glass ampoule containing the liquid chemical agent rests on the bakelite striker retaining disk. Only a restricted portion of the striker shaft is exposed to corrosion. The striker spring is compressed between the shoulders of the striker head and the housing partition. The percussion cap and detonator assembly, threaded to fit any standard German charge, is fitted with a rubber washer and transit cap.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Bakelite.....	Mechanical—chemical, with corroded striker shaft release.

b. Use. This fuze is used in delayed-action demolitions.

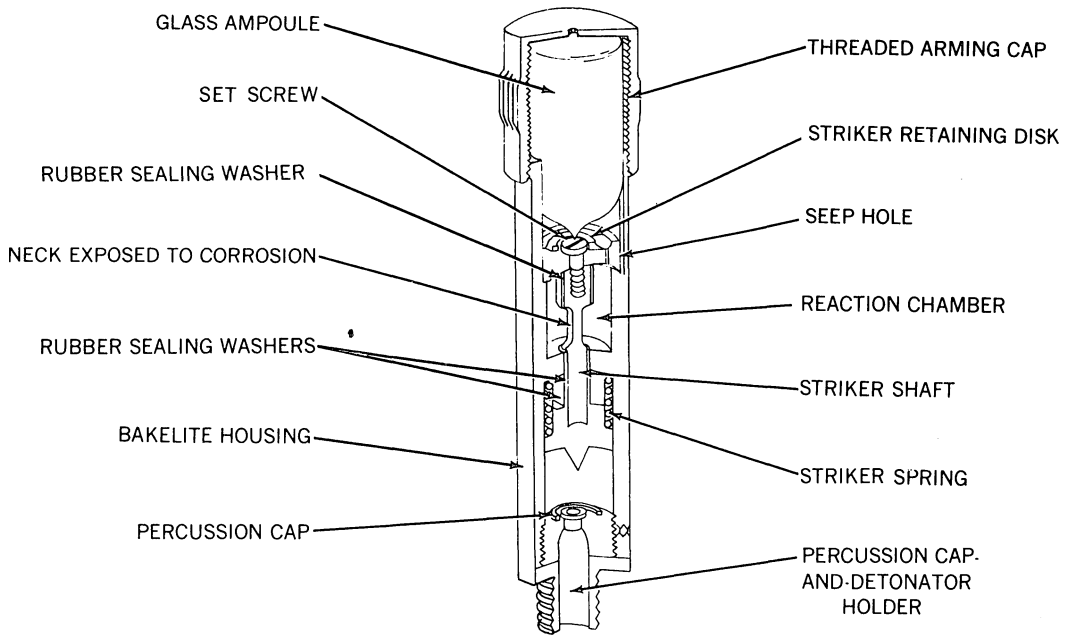


Figure 713

c. Functioning. The acid corrodes the striker shaft until it breaks, releasing it against the percussion cap. The higher the ambient temperatures, the more rapid the chemical action on the striker shaft. A table of temperatures and corresponding delay times is:

68° F.—3 to 5¼ days
32° F.—21 to 31 days
—31° F.—96 to 167 days
Chemical action ceases below —40° F.

d. Installing and Arming.

(1) Remove the threaded arming cap and insert the glass ampoule of chemical, neck down, into the top of the fuze.
(2) Screw on the arming cap until the top is felt to contact the top of the glass ampoule.
(3) Insert a detonator into the base of the fuze and screw the fuze into the charge.
(4) Screw the fuze arming cap on further until the glass ampoule breaks and the acid seeps down into the reaction chamber. The fuze is then functioning, but it is safe to handle for at least 5 hours.

e. Disarming Procedure. The disarming of this fuze is not recommended. This fuze has no safety device and it is impossible to know at what moment the striker shaft may break under the corrosive action of the acid. If at all possible, **charges with this fuze should be blown in place.**

434. Time Fuze, Mark I (Japan)

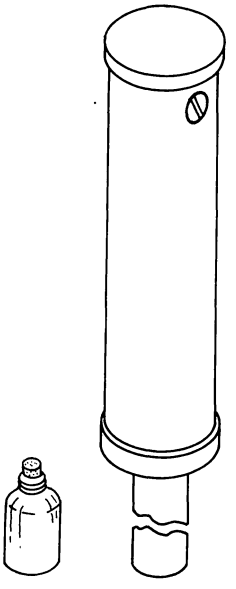


Figure 714

This fuze is contained in a housing 9.5 centimeters long and 2.5 centimeters in diameter, with a percussion cap and detonator holder 0.9 centimeters in diameter and extending 5.3 centimeters from the bottom. Two models have appeared, differing only in the color of their plastic cases and the diameter of the firing pin retaining wire (6.007-mm and 0.106-mm). The body is divided into three compartments. The upper section is a chemical tank; the center section contains the compressed spring which continues into the lower section. The lower section contains the firing pin, held in place by a retaining wire that extends up through the upper sections. A tight metal sleeve is inserted in the bottom section to prevent the firing pin from striking the detonator. A small bottle of the activating chemical, cupric chloride, is provided in a separate cardboard container.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Plastic.....	Chemical solution with corroded wire release.

Delay time with 0.106-mm retaining wire
- Tank ¼ full.....63 min.
- Tank ¾ full.....53 min.
- Tank full.....45 min.

(Time for 0.007-mm retaining wire unknown)

b. Use. Not known.

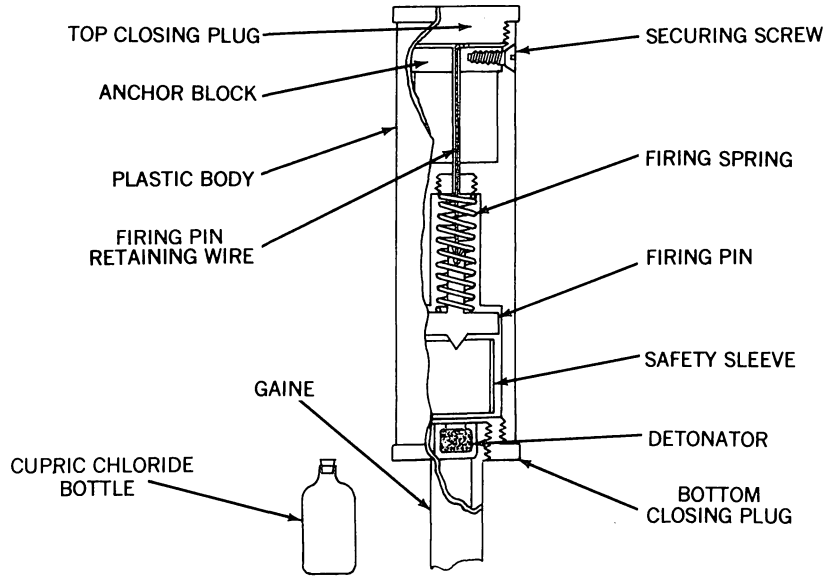


Figure 715

c. Functioning. The cupric chloride is poured into the top of the device and the plug is closed. After a period of 45 to 63 minutes, depending on the size of the wire and the amount of acid poured into the tank, the wire has become weakened until it snaps, freeing the striker to drive forward into the percussion cap.

d. Installing and Arming.

(1) Unscrew the bottom closing plug, remove the safety sleeve, and replace the bottom closing plug.

(2) Unscrew the top closing plug, pour the cupric chloride into the top of the fuze, and replace the top closing plug.

(3) Place the fuze in charge or mine.

e. Disarming Procedure. **This fuze cannot be disarmed; it must be destroyed in place.**

435. Chemical Delay Fuze (Japan)

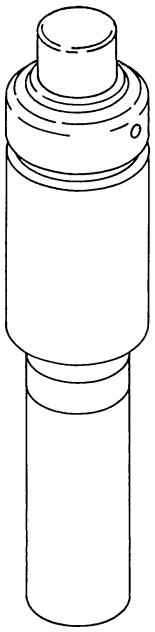


Figure 716

The top section of the fuze is the plunger, which has a locking detent in its side and is fitted on the bottom with two spikes to pierce the solvent tank. The safety fork, inserted through the outer casing and the plunger, prevents accidental depression of the plunger and the consequent initiation of the 6-second delay action. The central section has the solvent tank, striker spring, striker, striker detent and soluble plug, which holds the striker detent in contact with the grooved striker body. The lower section contains the firing train primer, pressed black powder delay train, a gaine from a 25-mm projectile fuze, and a tetryl booster. The length of the fuze is 25.4 centimeters and the maximum diameter, 6.2 centimeters.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Bakelite....	Chemical-pressure, with soluble plug.	10 lb (approx).

b. Use. Not known.

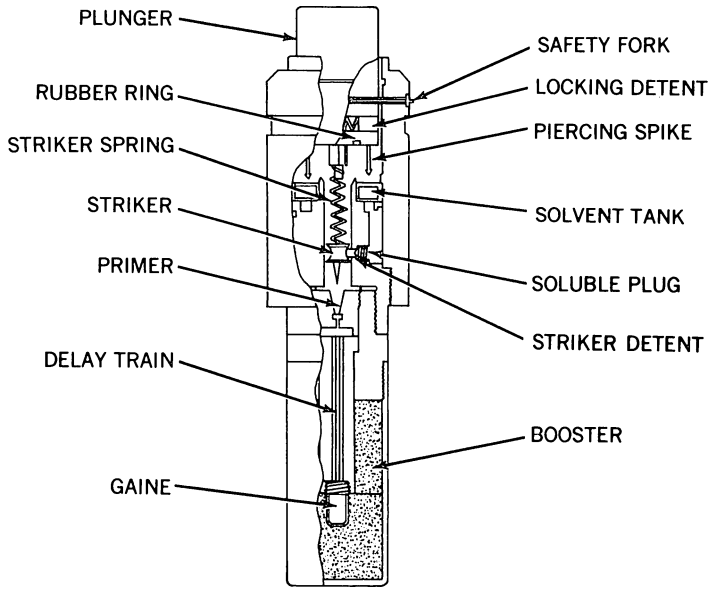


Figure 717

c. Functioning. Depression of the plunger causes the spikes to pierce the solvent tank and release the solvent to soften the soluble plug. The depression of the plunger compresses the striker spring. After the softened plug has permitted the striker detent to come out and free the striker, it is forced into the primer, initiating the firing train.

d. Installing and Arming.

(1) Install the fuze in the mine or charge.
(2) Remove the safety fork.
(3) Depress the plunger.

e. Disarming Procedure. This fuze should be destroyed in place, if possible, otherwise it should be removed from the charge and destroyed immediately.

436. Mercury Delay Electric Fuze EKhZ (U.S.S.R.)

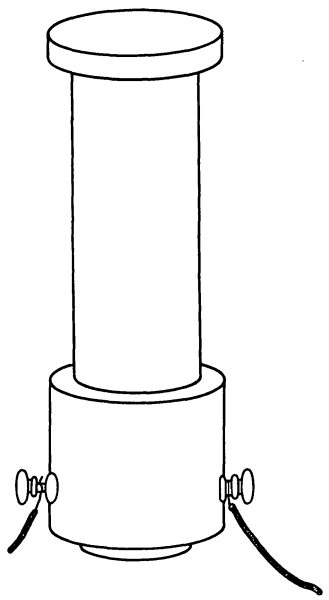


Figure 718

This fuze is an instantaneous, chemical, pressure type with chemical-reaction ignition. It consists of a brass tube 15.2 centimeters long and 3.4 centimeters in diameter, containing zinc and copper battery plates. These plates are separated from a glass ampoule filled with sulfuric acid by a stopper with seep holes. The ampoule is surrounded by a lead sheath. The wire leads may be connected to the base of the fuze or to an electric detonator.

a. Use. Although this fuze is standard for naval mines, it is also employed with improvised land mines, such as the oil-drum mine.

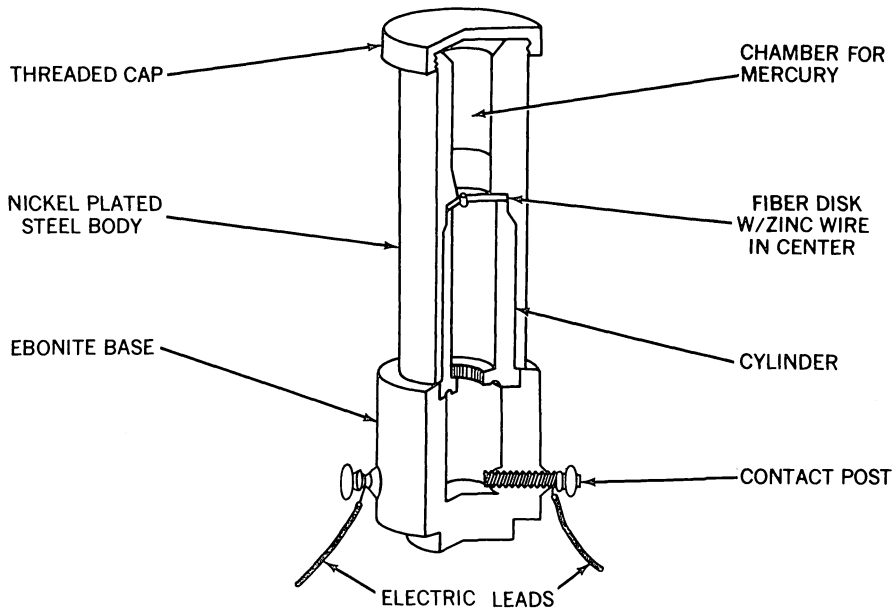


Figure 719

b. Functioning. Impact or pressure of 20 pounds or more on the lead sheath crushes the glass ampoule, allowing the sulfuric acid to seep down into the battery chamber. The acid acts as an electrolyte and closes the circuit, which detonates the electrical detonator.

c. Installing and Arming. The fuze comes armed and has no safeties. Connect the electric leads to a detonating circuit.

d. Disarming Procedure.

(1) Cut the electric lead wires one at a time below the brass tube and remove the fuze from the charge.

(2) Destroy the fuze.

437. VZDKh Mechanical-Chemical or Electrical Delay Fuze (U.S.S.R.)

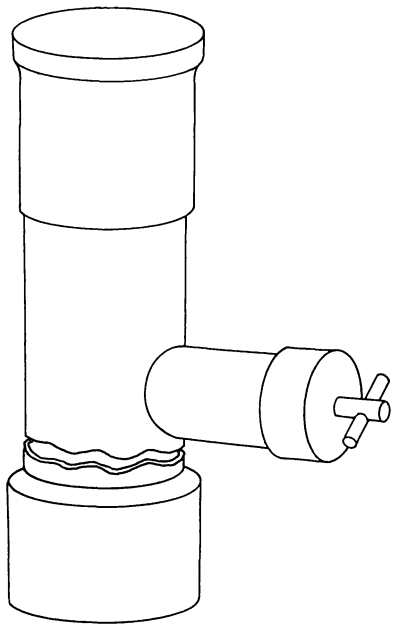


Figure 720

The VZDKh fuze is a hand-set type, 15.2 centimeters high and .3 centimeters in diameter with a spring-loaded striker and chemical action release. A threaded faucet-type safety screw is located in the side of the fuze. The striker is retained by a wire which is passed through the hollow striker shaft and attached to a metal disk at the top of the fuze. In this disk is a seep-hole leading to the hollow striker so that acid poured in at the top may surround the retaining wire. The chemical base consists of a metal nonelectric detonator holder with a small ampoule of acid fixed to a hollow metal shoulder above a chemical powder.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Metal.....	Mechanical, with chemically corroded retaining wire release.

b. Use. This fuze is designed for delayed detonation of mines and charges.

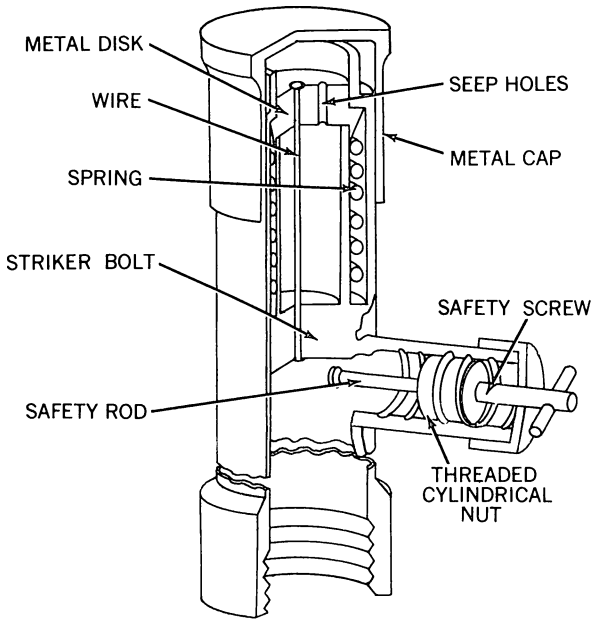


Figure 721

c. Functioning. Chemical action of the sulphuric acid poured into the hollow striker shaft corrodes the retaining-wire and releases the spring loaded striker against the electric or chemical base of the fuze.

(1) *Electric base.* When the striker hits the spring-loaded contact rod, the contact rod is pushed down until it strikes the metal screw contact in the metal base, completing the circuit.

(2) *Chemical base.* When the striker hits the glass ampoule, it breaks and the acid, mixing with the chemical powder, makes a flash that ignites the detonator.

d. Installing and Arming.

(1) Screw either an electrical or a chemical nonelectric base into the bottom of the fuze. If a chemical nonelectric base is used, a nonelectric detonator must be fitted into the detonator holder after the base is screwed to the fuze.

(2) Place the fuze in the charge, or attach it to an electrical detonating circuit.

(3) Unscrew the cap and pour sulfuric acid into the top of the fuze.

(4) Replace the cap and turn the safety screw to the left to *dangerous* (OTTACHO).

e. Disarming Procedure.

(1) Turn the safety screw to the right, to safe (6e3OTTACHO).

(2) Disconnect or remove the fuze from the charge.

(3) Destroy the fuze.

438. Chemical-Electrical Safety Delay Element EKhP (U.S.S.R.)

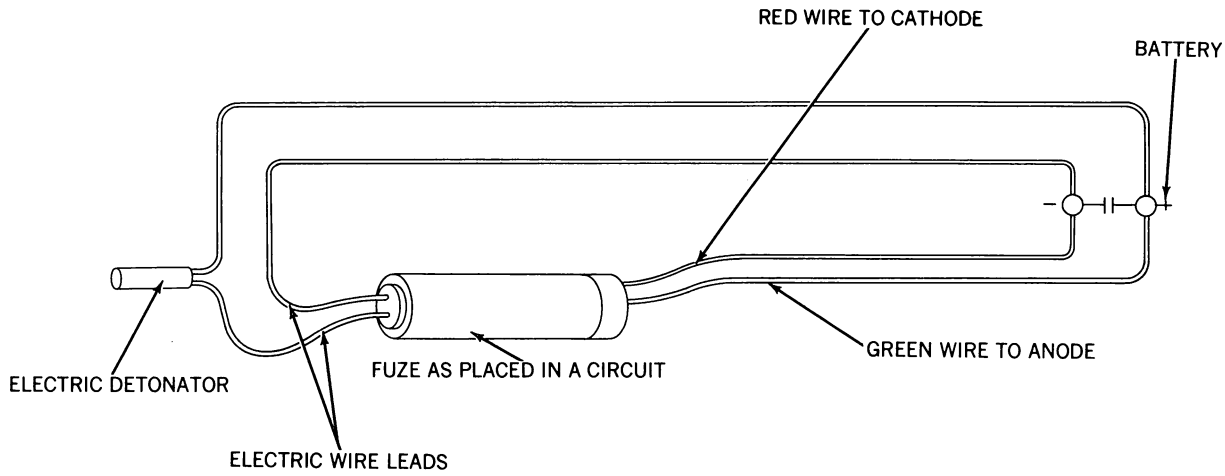


Figure 722

The EKhP fuze has a spring-loaded striker with a chemical release. Two electric lead wires project from one end of the fuze, and one green-covered wire and one red-covered wire project from the other end. This fuze is issued in two sizes, one 12.7 centimeters long and 3.4 centimeters in diameter and the other, 5.0 centimeters long and 1.5 centimeters in diameter. The fuze is housed in a cylindrical tar-impregnated cardboard container.

a. Use. This fuze may be installed as a safety delay element (10 min. to 4 hr. for the smaller fuze and up to 4 mo. for the larger) in any electric detonating circuit. The delay, however, is affected by temperature—the lower the temperature the longer the delay. This fuze is used primarily in the MZD–4 delayed action mine.

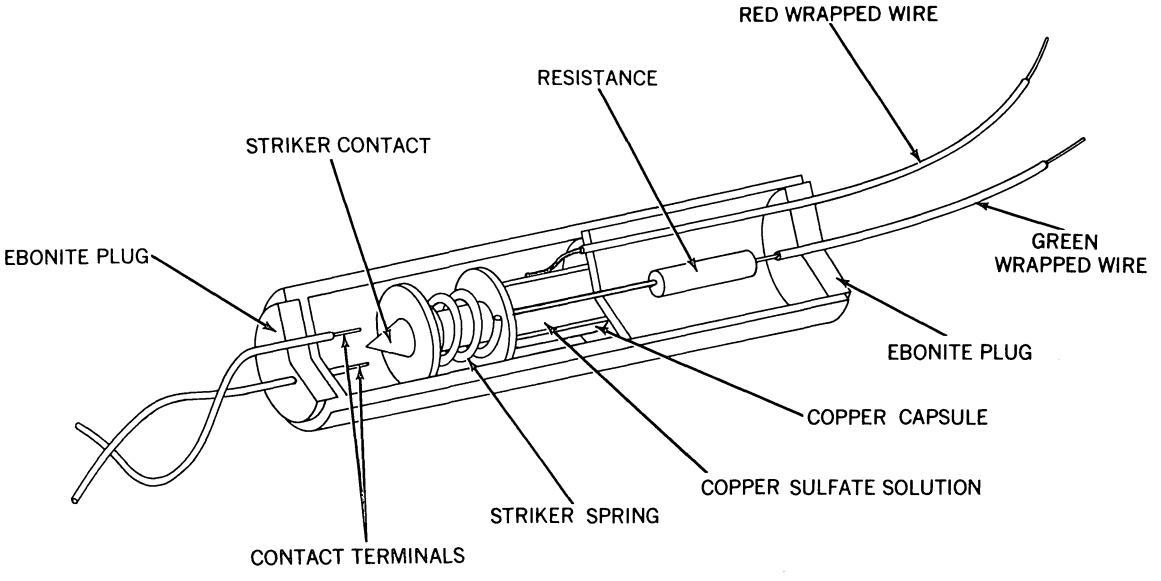


Figure 723

b. Functioning. When the fuze is connected to a battery in an electric detonating circuit, electrolysis begins. After a time lapse, the striker retaining wire is eroded to the point where it severs, releasing the striker to close the circuit.

c. Installing and Arming.

(1) Connect the red-covered wire and one of the leads from the other end of the fuze to the cathode of a battery.

(2) Connect the green-covered wire with the anode of the battery.

(3) Connect the other electric lead from the fuze to one of the leads from an electric detonator.

(4) Connect the other electric lead from the detonator to the anode of the battery.

d. Disarming Procedure.

(1) Cut the wire leads from the fuze, one at a time.

(2) Destroy the fuze.

439. Chemical-Electrical Fuze EKhZ (U.S.S.R.)

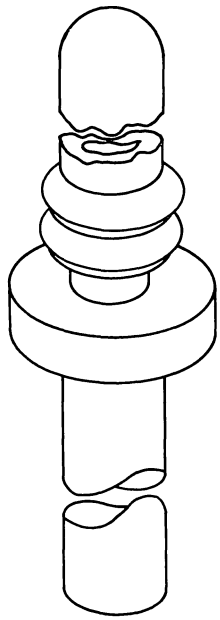


Figure 724

This fuze operates on the principle of chemical-reaction ignition. It consists of a brass tube containing zinc and copper battery plates, which are separated by a stopper, with seep holes, from a glass ampoule filled with sulfuric acid. The ampoule is surrounded by a lead sheath. Two wire leads extend from the base of the fuze for connection to an electric detonator. The fuze is approximately 35.4 centimeters long and 3.4 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Operating force
Cylindrical...	Lead, glass, and brass.	Chemical, with acid electrolyte closing the electrical circuit.	20 lb (approx).

b. Use. This fuze is used in the oil drum mines and other types of improvised land mines.

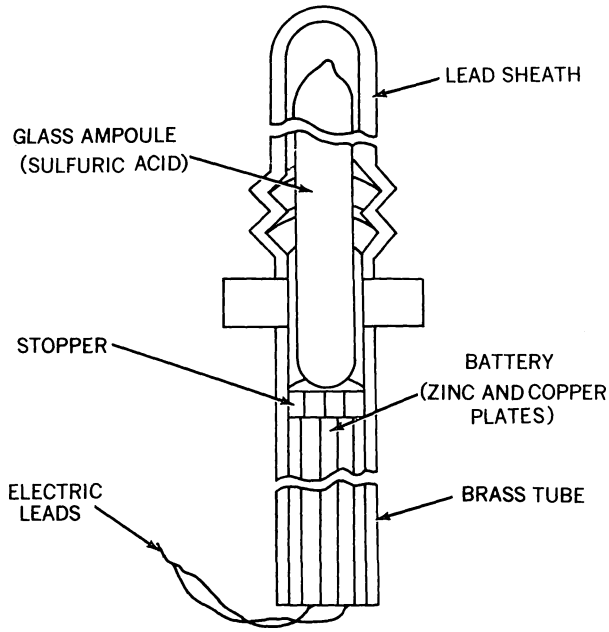


Figure 725

c. Functioning. Impact or pressure on the lead sheath crushes it and the glass ampoule, permitting the sulfuric acid to seep down into the battery chamber. The acid, acting as an electrolyte, closes the circuit, exploding the electrical detonator.

d. Installing and Arming. As the fuze has no safeties, arming is merely connecting the electric leads to a detonating circuit.

e. Disarming Procedure.

(1) Cut the electric lead wires one at a time, below the brass tube and remove the fuze from the charge.

(2) Destroy the fuze.

440. Chemical Delay Pencil Fuze No. 10, Mark I (United Kingdom)

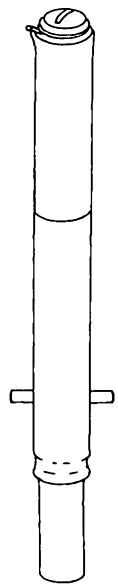


Figure 726

This fuze is a cylindrical housing of brass and aluminum containing a glass ampoule of chemical at the top and a striker retaining wire running from the top of the fuze to the striker in the bottom. The striker is spring loaded and held in place by a safety bar. An inspection hole at the bottom shows whether the fuze has been actuated or not. The percussion cup and holder, designed to accept a time fuse or a detonator adapter, screws into the bottom of the fuze. The fuze measures 0.7 centimeters in diameter and 12.7 centimeters in length. The color of the safety bar, as given in the table below, indicates the delay period.

a. Delay Record Table.

Temperature		Safety-bar colors indications					
F	C	Black*	Red	White	Green	Yellow	Blue
0	-18	.....	86 min	20.7 hr	50 hr	122 hr	
20	- 7	.....	54 min	8.0 hr	21 hr	46 hr	159 hr
40	4	18 min	34 min	3.3 hr	9.5 hr	20 hr	58 hr
60	16	12 min	23 min	100 min	4.5 hr	8.9 hr	24 hr
70	21	9 min	19 min	80 min	3.3 hr	6.1 hr	16.7 hr
80	27	8 min	15.5 min	64 min	2.4 hr	4.3 hr	11.5 hr
90	32	6.5 min	13 min	53 min	1.8 hr	3.2 hr	8.1 hr
100	38	5.5 min	11 min	43 min	1.3 hr	2.3 hr	5.9 hr
110	43	4.5 min	9.5 min	37 min	1.0 hr	1.7 hr	4.7 hr

*Issued for training only.

Note. Delay periods may vary 25 percent either way. Never use a fuze with a blue-colored safety bar if the temperature is likely to be below freezing when the explosion is to occur.

b. Use. This device is employed in delayed-action demolition work and in boobytrap installations.

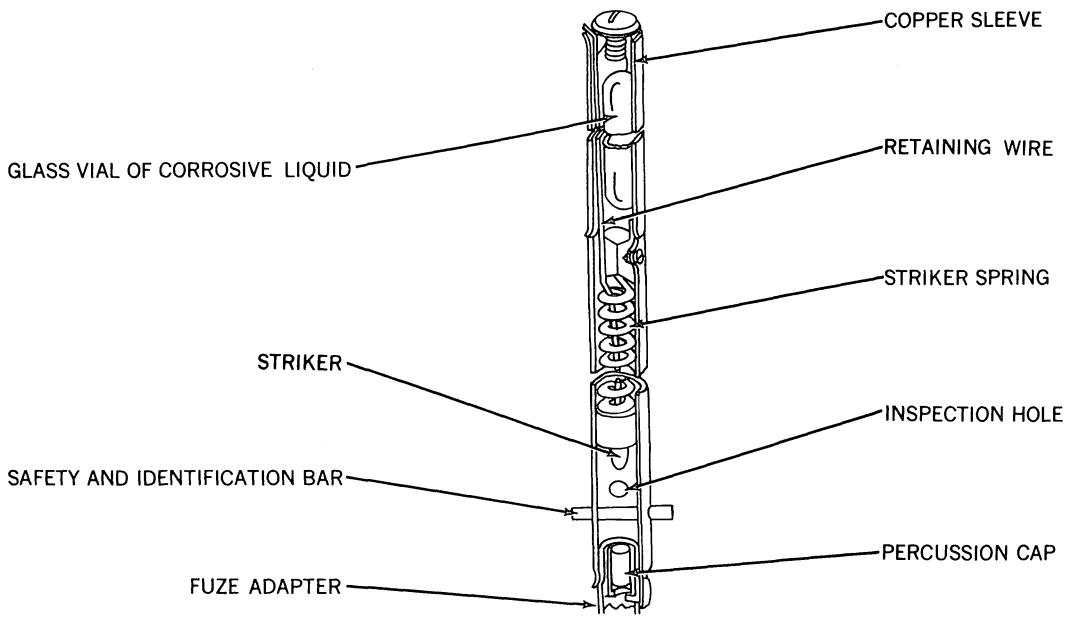


Figure 727

c. Functioning. When the copper upper part of the fuze is crushed, the glass ampoule of chemical breaks. The chemical then eats through the striker-retaining wire, releasing the spring tensioned striker against the percussion cap.

d. Installing and Arming.

(1) Refer to the table above and select the fuze that has the required delay period at the prevailing temperature.

(2) Look through or pass a nail through the inspection holes to make sure that the striker has not been released.

(3) Insert time fuse, detonating cord, or a detonator in the adapter.

(4) Crush the upper part of the fuze flat, being careful not to puncture or break it loose from the lower part of the fuze case. This breaks the glass ampoule of chemical and starts the chemical reaction that eats through the striker retaining wire.

(5) Withdraw the safety bar.

e. Disarming Procedure. **This fuze cannot be disarmed safely.** If disarming is essential, insert a safety bar or nail through the inspection holes, or cut the fuse connecting it to the explosive charge. After inserting the safety bar, remove the fuze and destroy it.

441. Lead-Break Delay Fuze, No. 9, Mark I (United Kingdom)

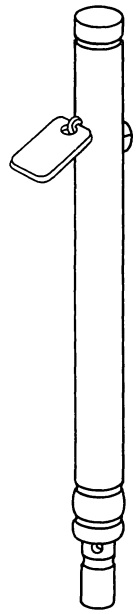


Figure 728

This delay fuze is designed on the principle that tellurium lead stretches uniformly with time and will eventually break. It consists of a tubular metal body with a striker, spring, and lead-break, which consists of a short lead rod ground in the center to form a neck of reduced diameter. A safety pin, complete with retaining clip and label showing the delay time at 65° F. in days or hours, is provided to retain the striker against the tension spring.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Metal.....	Mechanical, with lead-break release.

Remarks

Two fuzes are generally used for each important charge to minimize the risk of failure.

b. Use. This fuze explodes demolition charges by delayed action.

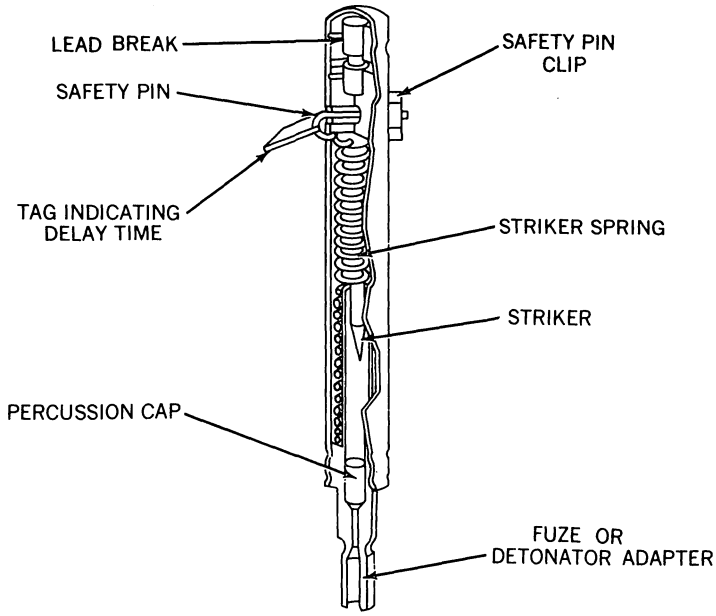


Figure 729

c. Functioning. When the safety pin is removed, the lead-break takes the pressure of the spring, and stretches until it eventually breaks. This frees the striker to be driven by its spring to fire the percussion cap.

d. Installing and Arming.

(1) Select the proper fuze by reference to the temperature-correction table provided with each box of fuzes.

(2) Connect the fuze to the explosive charge, either by fuse or detonator cord.

(3) Withdraw the safety pin.

e. Disarming Procedure. This fuze cannot be neutralized as the stretching of the lead makes the insertion of a safety pin or wire impossible, bringing the holes out of line. If the fuze is connected to the charge by time fuse or detonating cord, cut the fuse or cord.

442. Shear-Type Delay Fuze (Italy)

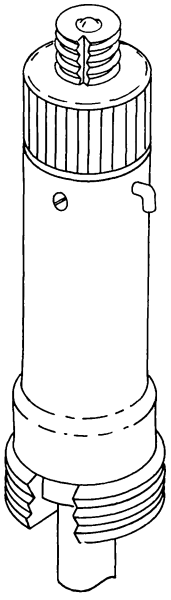


Figure 730

This fuze operates on the metal fatigue principle. It has a hollow tube striker, with a steel firing pin projecting through one end of the fuze casing. The striker is surrounded by a spring which applies compression to the striker when the fuze is armed. The armed fuze also has a 0.1 centimeter diameter lead shear pin. On the bottom of the fuze casing is screwed an aluminum adapter threaded for insertion into the charge. A detonator with a flanged percussion cap pressed into its open end is fitted into the base adapter. The fuze is 8.8 centimeters long and 1.5 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Steel.....	Mechanical with lead shear pin delay.

b. Use. This fuze is employed for the detonation of charges or mines in areas being abandoned to the enemy.

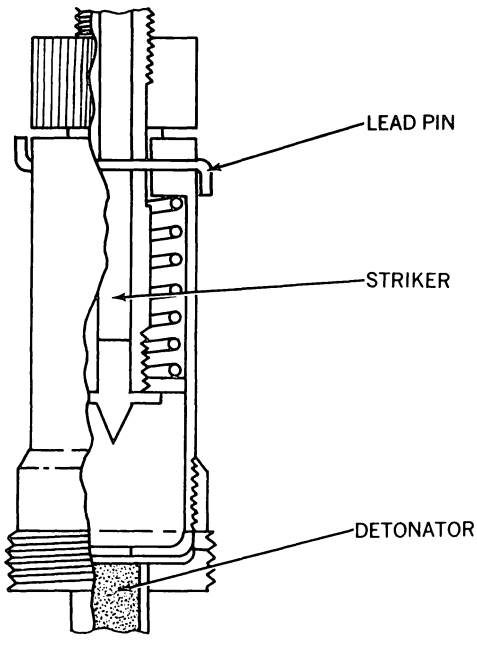


Figure 731

c. Functioning. The corrugated safety nut is removed, leaving the tension of the striker spring pressing the striker against the lead shear pin. After a period of 7 to 25 hours, the lead pin fails in shear due to fatigue from the action of the compressed striker spring, releasing the striker to fire the percussion cap.

d. Installing and Arming.

(1) Secure the percussion cap—detonator assembly into the base of the fuze with the threaded retaining collar.

(2) Unscrew the corrugated safety nut and remove it. This puts all the force of the compressed striker spring on the lead shear pin.

e. Disarming Procedure.

(1) Firmly grasp the threaded end of the striker shaft that protrudes from the top of the case with a pair of pliers so that the striker shaft cannot move downward.

(2) Grasp the fuze with the free hand and remove it from the mine or charge.

(3) Separate the detonator from the fuze by unscrewing the retaining collar.

(4) Destroy the fuze.

f. Additional Precautions. Once the striker shaft is grasped by the pliers, do not loosen the hold on the pliers until the fuze has been disarmed.

443. Friction-Delay Igniters, Micca DA 40 and 60 (Italy)

Figure 732

The Micca Da 40 is 9.3 centimeters long, is 0.6 centimeters in diameter, and has a 10-second delay. The Micca Da 60 is 11.4 centimeters long, is 0.6 centimeters in diameter, and has a 15-second delay. These fuzes are essentially a short length of safety fuse placed in aluminum tube between a detonator and a friction igniter. Resistance to pull is provided by a flange on the aluminum tube.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Aluminum.....	Mechanical, pull-friction.

b. Use. This fuze is used in detonation of mines and demolitions that require a few seconds delay.

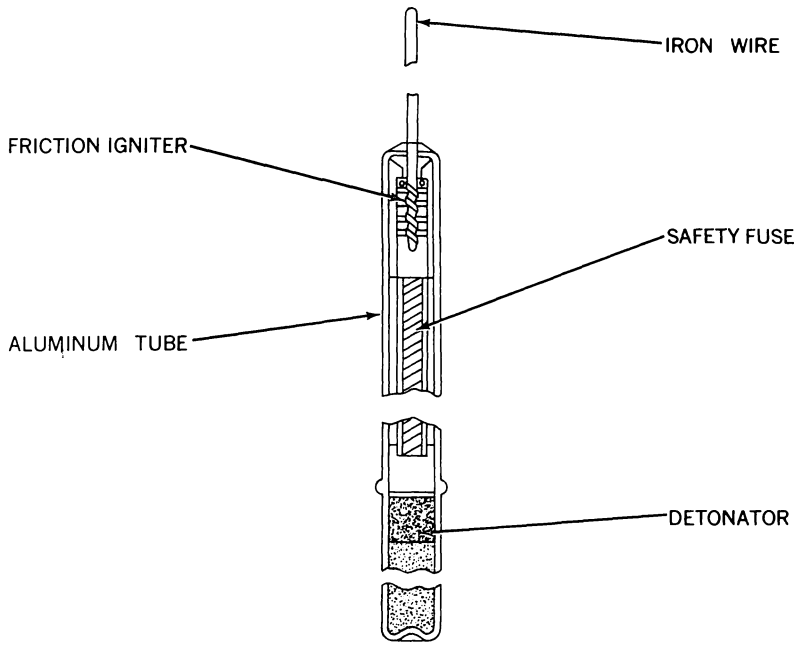


Figure 733

c. Functioning. A pull on the galvanized friction wire, ignites the friction mix, starting the safety fuse burning. After 10 or 15 seconds delay, the fuse burns to the end and ignites the detonator.

d. Installing and Arming.

(1) Install the fuze in the charge or mine.

(2) Attach a trip wire to the friction wire or pull the friction wire from a safe distance.

e. Disarming Procedure.

(1) Cut any slack trip wires.

(2) Grasp the aluminum tube and remove the fuze from the charge.

(3) Destroy the fuze.

444. Chemical-Electrical Delay Fuze, EKhV (U.S.S.R.)

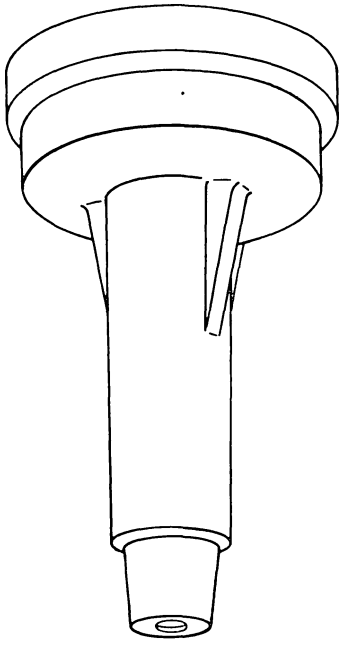


Figure 734

This handset delay fuze contains a spring-loaded striker with a chemical-action release. In appearance it resembles the ChMV models 10 and 16. The various components are housed in a bakelite case with a threaded cap that is 15.2 centimeters high and 6.2 centimeters in diameter. An MD–2 detonator is generally used. The fuze has a 1.4-volt dry-cell battery, a copper capsule filled with a copper sulfate solution, and a spring loaded striker held in place by a copper retaining wire that passes through but is insulated from the capsule and connected to one of the battery terminals. The other battery terminal is wired to one arming terminal, and the copper capsule, to the other arming terminal. A resistance coil, marked with two numbers, is located between the arming terminals. The upper number indicates the delay in days, and the lower, the delay in hours. The maximum life of the fuze is 6 months, being limited by the life of the battery. It is effective in a temperature range of −4° to 140° F.

a. Use. The fuze is used for delayed actuation of mines and charges.

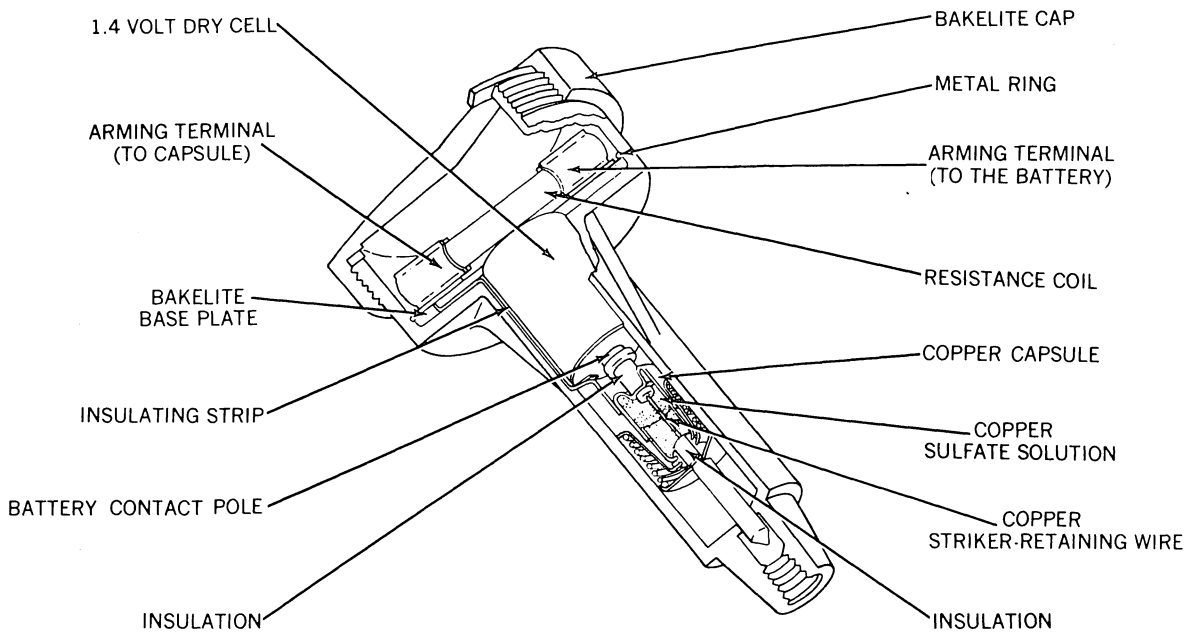


Figure 735

b. Functioning. The circuit is closed when the resistance coil is inserted between the arming terminals. The copper capsule acts as an anode, the copper striker retaining-wire as a cathode, and the copper sulfate solution as an electrolyte. Electrolysis begins at the insertion of the resistance coil, which corrodes the copper wire and thus releases the spring-driven striker against the percussion cap. The resistance coil determines the amount of current or amperage that in turn governs the time (between 12 hr. and 120 days) required for the electrolyte to corrode the copper wire.

Note. This fuze may also be fitted with an electric contact plug that screws into the base instead of an MD-2 detonator.

c. Installing and Arming.

(1) Test the voltage between the terminals (it should be no less than 1.25v).

(2) Insert the fuze into the explosive charge or mine (or into an electric detonating circuit).

(3) Insert a resistance coil between the two arming terminals. One of ten different resistances may be used, depending on the length of the delay required.

d. Disarming Procedure. As the fuze has no safety device, hand disarming is not recommended.

445. Clockwork Delay Fuze, 8-Day (Finland)

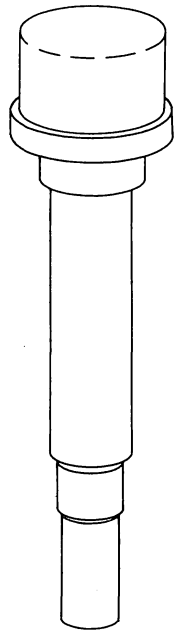


Figure 736

This delay fuze has a spring-loaded striker released by a clockwork device. The clockwork mechanism, placed in the upper chamber of the fuze, is completely closed in by a threaded cover. Underneath the clockwork is the striker assembly: striker, striker-release lever, cam, and trigger. The booster charge is screwed onto the percussion cap and detonator assembly. This may be replaced by an electric contact cap for wiring into an electric circuit.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Metal.....	Clockwork lever-release.

b. Use. This fuze is installed in mines and demolition charges in areas to be abandoned to the opposing forces.

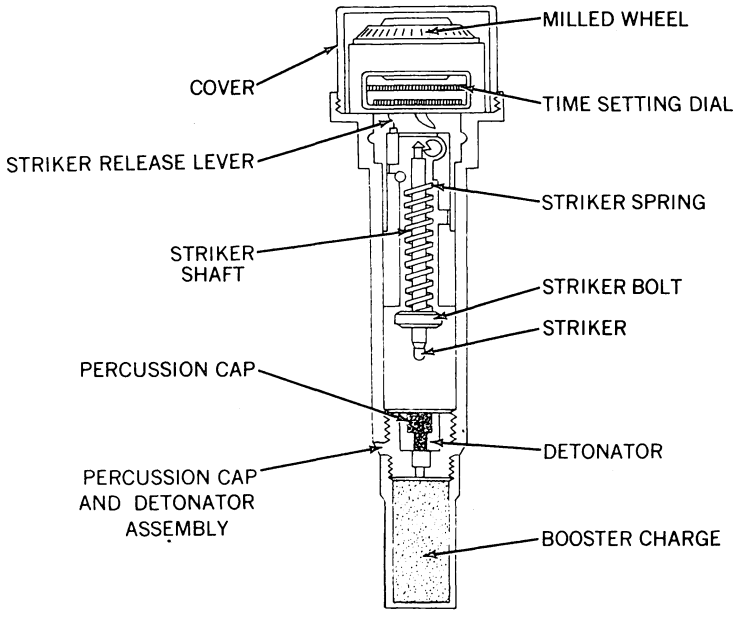


Figure 737

c. Functioning. After the lapse of preset delay period, a shaft extending from the clockwork engages the striker-release lever which rotates the cam on the end of the striker-release trigger-shaft. This disengages the striker shaft, after which the striker hits the percussion cap and sets off the detonator, booster, and main charge.

d. Installing and Arming.

(1) Unscrew the lid from the fuze.

(2) Wind the clockwork by turning the pulled wheel clockwise until the desired time on the dial coincides with the indicator mark.

Caution: **Do not set the clock for a period less than 6 hours.**

(3) Replace the lid.

(4) For direct insertion into a charge, screw a percussion cap and detonator assembly and booster charge into the base of the fuze. Insert the fuze in the charge.

(5) For wiring into an electrical circuit, screw an electric-contact cap into the base of the fuze and wire the cap terminals into an electrical demolition circuit.

e. Disarming Procedure. Gently unscrew the fuze from the detonator assembly or from the electric contact cap. Destroy the fuze.

446. Delay Fuzes, ChMV-10 and ChMV-16 (U.S.S.R.)

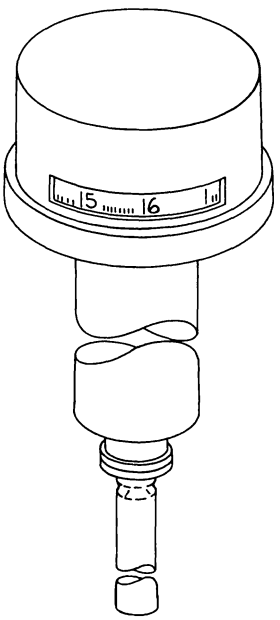


Figure 738

These are of the mechanical or electrical spring-loaded striker type with a clockwork mechanism. The ChMV-10 has a 10-day delay, and the other a 16-day delay. The only difference in appearance in the two is the numerals on the dial. The numerals indicate days and the divisions between the numerals, 2 hours each. The clockwork is housed in the mushroom-shaped head of the fuze. A strike-release lever, geared to the clockwork, holds the spring-loaded striker under tension in the narrow base of the fuze. A standard MD-2 detonator or an electric contact cap with leads for wiring into an electric circuit is screwed into the bottom of the fuze—the joint made watertight by a rubber washer. Some World War II models, measuring about 9.8 centimeters in height (without the detonator) and 5.0 centimeters in diameter, had a cardboard body. Recent models, some of which were found in Korea, have a steel clock housed in a bakelite body 11.4 centimeters in height and 5.3 centimeters in diameter.

a. Use. This fuze is effective in setting off delayed-action charges in areas given over to an opposing force.

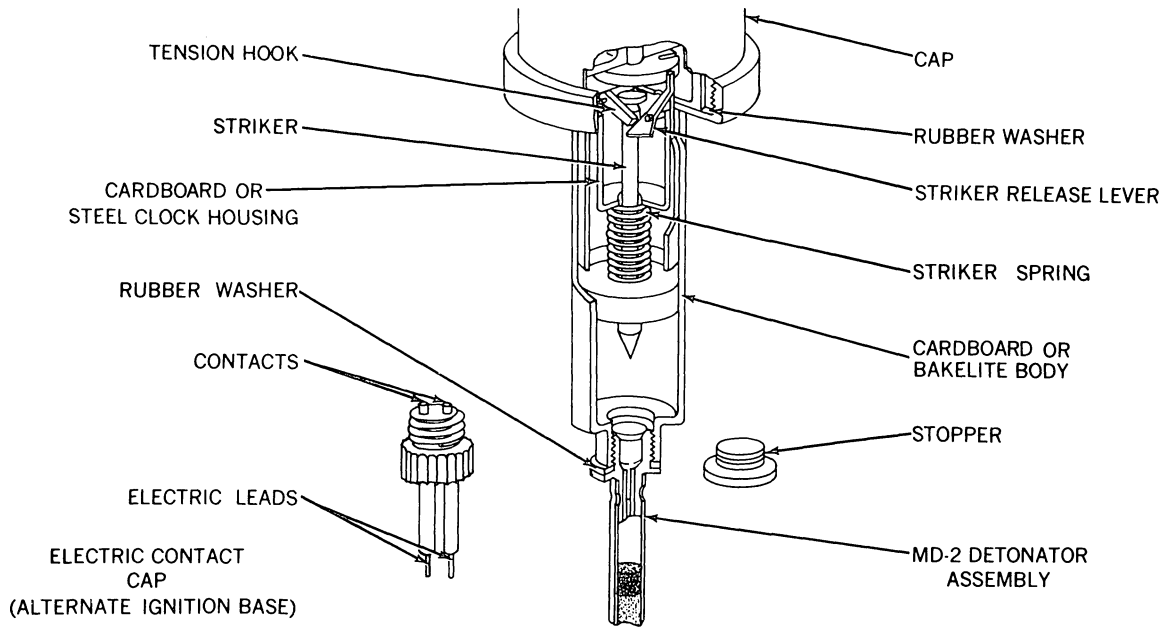


Figure 739

b. Functioning. At the end of the delay period, the striker release lever trips the spring-loaded striker, which either fires the MD–2 detonator or closes the electric circuit between the two contacts on top of the contact cap.

c. Installing and Arming.

(1) Unscrew the fuze cap and wind the clock by turning the milled wheel clockwise until the predetermined time setting on the dial coincides with the indicator mark.

Note. Do not set the clock for periods less than 6 hours, as the mechanism is designed for longer periods and is then unreliable.

(2) Replace the cap.

(3) For mechanical firing, screw an MD–2 detonator into the base of the fuze and insert it into the charge. For electric firing, screw an electric contact cap into the base of the fuze and then wire the terminals of the cap into an electrical detonating circuit.

d. Disarming Procedure.

(1) Remove the fuze and detonator assembly from the charge.

(2) Gently unscrew the detonator or electric contact cap. If wired, cut each wire separately before removing the fuze-detonator assembly from the charge.

(3) Destroy the fuze.

447. Clockwork Electrical Long-Delay Fuze (Germany)

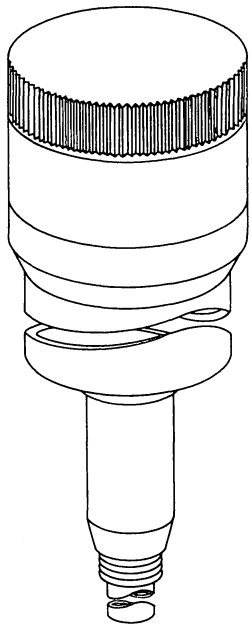


Figure 740

In the body of the fuze is a rotating disk, a clockwork mechanism, a battery, and an electric circuit with a match composition bridge. The rotating disk has 21 graduations corresponding to the number of days of delay required. The clock, geared to the rotating disk, is wound by to-and-fro movements of the winding ring. A bakelite cover is threaded to the body over the time disk, and a detonator is screwed into the bottom of the igniter. This fuze measures 9.2 centimeters in length and 3.1 centimeters in diameter.

a. Characteristics.

Shape	Case	Internal action	Delay
Cylindrical...	Bakelite....	Clockwork, electrical.	Up to 21 days.

b. Use. This fuze is used in conjunction with large-scale demolitions that require a long delay. Several units may be used on each charge. Although the charges are usually cast blocks, these fuzes may be imbedded in plastic explosive in contact with the mine charge.

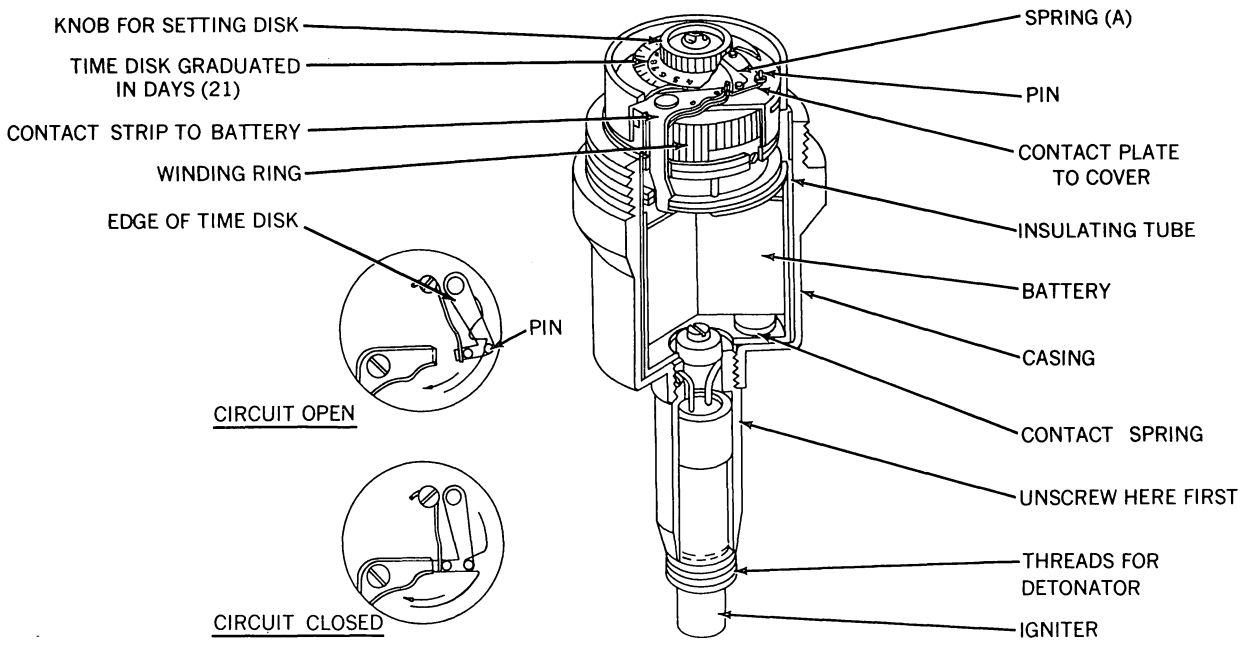


Figure 741

c. Functioning. When the slot in the time disk comes opposite the pin, the pin is forced into the slot by the spring (*A*). This closes the electrical circuit between the casing and the battery and fires the match composition.

d. Installing and Arming.

(1) Remove the bakelite cover.

(2) Wind the clockwork by the winding ring, and set the dial at the desired delay.

(3) Replace the bakelite cover.

(4) Install a detonator in the bottom of the fuze.

(5) Place the fuze in the mine or charge.

e. Disarming Procedure.

(1) Remove the fuze from the mine or charge.

(2) Unscrew the detonator from the base of the fuze.

(3) Destroy the fuze.

448. Clockwork Long-Delay Fuze, J-Feder 504 (Germany)

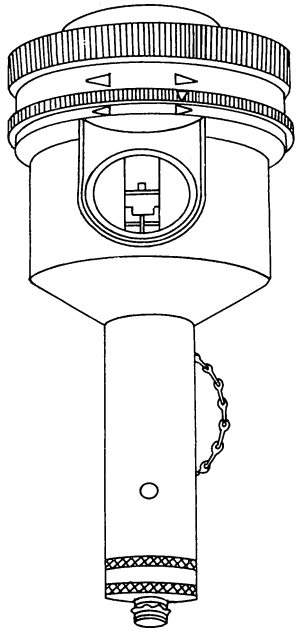


Figure 742

The case of this fuze is in two parts. The upper part houses the clock, and the lower, the striker mechanism. The top is closed by a screwed cap. A knurled cylinder is provided for winding the clock, while the center knob stamped Z is for setting the clock for any delay from a minimum of ¼ of an hour to as much as 21 days. The setting is visible through the window and is indicated by the pin. At the 24-hour marking on the black-inscribed disk and the 21-day marking on the red-inscribed disk are slots that allow the pin to move into the channel. The slot in the disk is covered by a tightly-sprung steel strip, which is pushed back by the pin as the clock approaches the zero setting. Two screws are provided. The screw marked scharf (armed), is the arming screw, and the screw marked *blind* merely closes the hole, allowing the safety spring to push the safety block under the shoulder of the striker shaft. The length of this fuze is 19.3 centimeters and the diameter (at the top) is 8.4 centimeters.

a. Characteristics.

Shape	Case	Internal action
Cylindrical, with narrow cylindrical extension at the base.	Aluminum or bakelite.	Clockwork with trip lever release.

b. Use. This fuze is used for large-scale delayed demolitions.

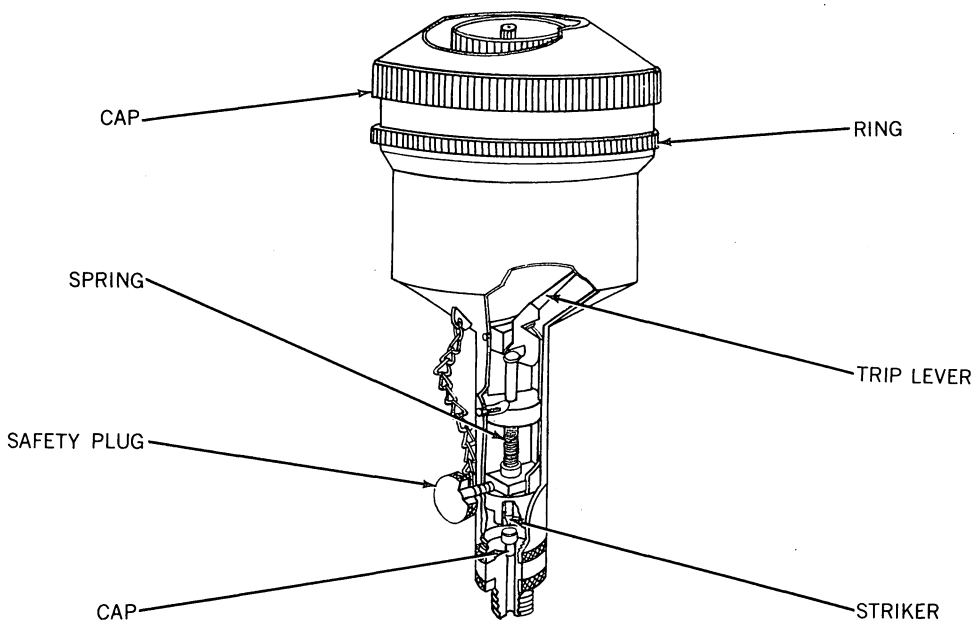


Figure 743

c. Functioning. At the end of the delay period, the lever arm on the rotating control disk bears against the trip lever, releasing the striker. The spring driven striker then is forced into the percussion cap, firing it, the detonator, and the main charge.

d. Installing and Arming.

(1) Test the fuze by setting it for 15 minutes to see that it is functioning correctly. Recock the fuze with the cocking device.

(2) Unscrew the cover and wind the clock by turning the knurled winding knob clockwise.

(3) Turn the knurled time-setting knob in the top of the fuze to the desired delay.

(4) Attach the detonator to the percussion-cap-holder and insert the fuze in the charge.

(5) Remove the screw marked *blind* and screw in the arming screw marked *scharf* (armed).

(6) Turn the release ring above the setting indicator window so that the red mark is opposite *geht* (go).

e. Disarming Procedure.

(1) Remove the arming screw marked *scharf,* which makes it impossible for the striker to hit the percussion cap.

(2) Turn the red mark on the release ring from *geht* (go) to *steht* (stop).

(3) Remove the fuze and detonator from the charge.

(4) Destroy the fuze.

449. Clockwork Delay Fuzes, 5-Minute, Types I, II, and III (Germany)

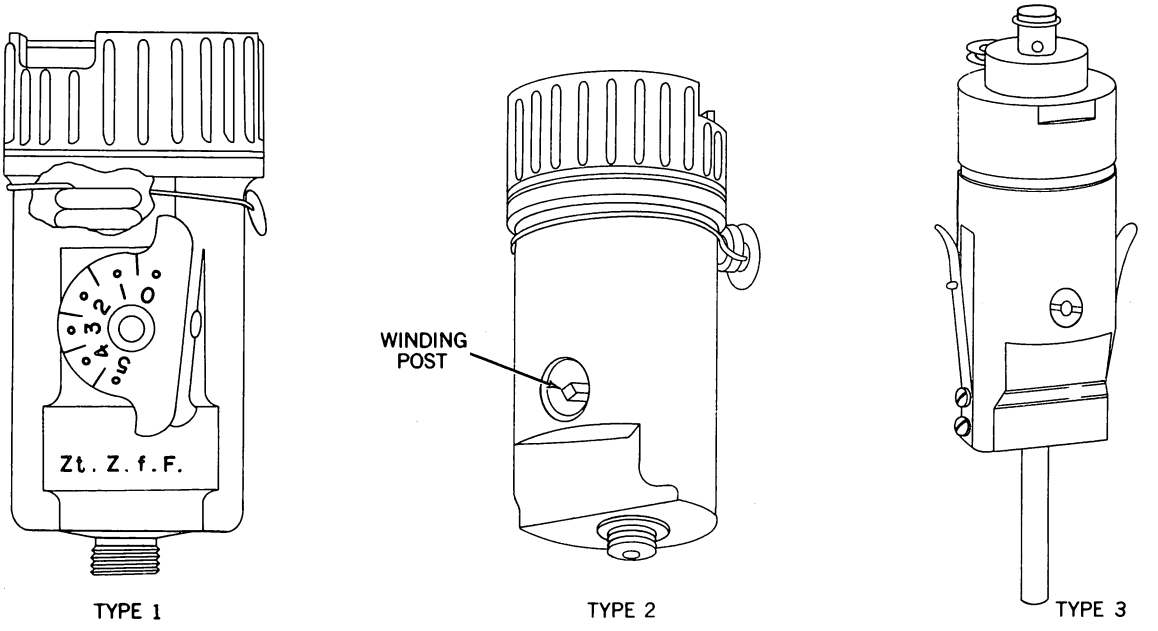


Figure 744

The three types of 5-minute delay fuzes are similar, all having a spring-loaded striker with clockwork release with a time indicator graduated in minutes on the front and a winding post in the back. A safety pin, when in place, keeps the mechanism from running. Types I and II are 7.6 centimeters long and 3.7 centimeters in diameter. Both have a winding key. The only differences between the two are that on type I the setting dial is on the ouside of the case and it has a double-looped safety pin. Type II has a setting dial inside the case, a circular glass window for viewing the dial, and a single-looped safety pin. Type I has the letters Zt.Z.f.F. on the front below the dial; type II has the letters Zt.Z.f.sp.Bu. 37 below the glass setting window. Type III is longer than the other two, measuring 11.4 centimeters in length and 4.0 centimeters in diameter. It has an arming knob in the top which can be turned either to *scharf* (armed) or *sicher* (safe). An aluminum detonator holder screws into the base of the fuze. The winding key is not attached to the fuze as in types I and II.

a. Characteristics.

Shape	Case	Internal action
Cylindrical...	Bakelite.....	Mechanical, with clockwork release.

b. Use. These fuzes are used in the bounding gas mine 37 and in sabotage work.

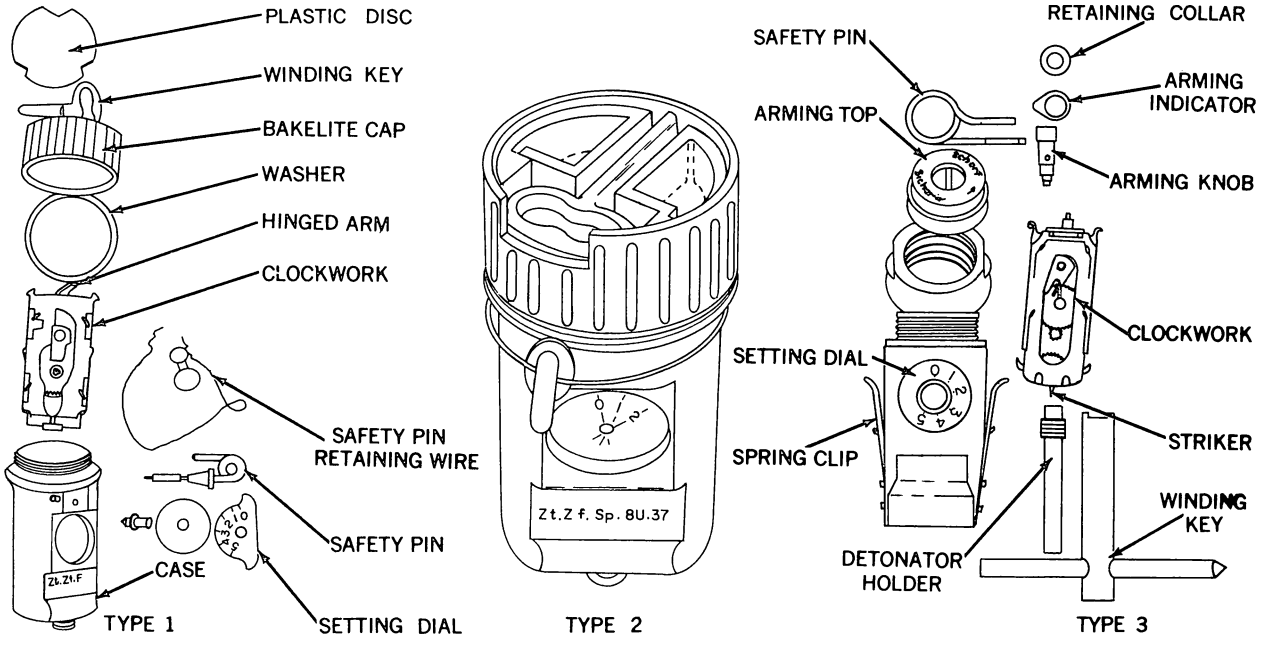


Figure 745

c. Functioning. As the clockwork unwinds, the hinged arm, which holds the spring-loaded striker in position, is pushed aside by a slowly revolving cam. At the end of the delay, the striker is released, firing the detonator.

d. Installing and Arming.

(1) Wind the clockwork with the winding key and set the dial at the desired delay in minutes.

(2) Insert the fuze into the charge.

(3) Remove the safety pin retaining-wire and pull the safety pin from the fuze. This starts the clockwork mechanism. In type III, set the arming knob at *scharf*.

e. Disarming Procedure.

(1) Types I and II: insert a wire or nail in the safety pin hole. Type III: turn the arming dial to *sicher*, and then insert a wire or nail in the safety pin hole.

(2) Remove the fuze from the charge.

(3) Destroy the fuze.

450. Demolition Clock, Long Delay, Type 99 (Japan)

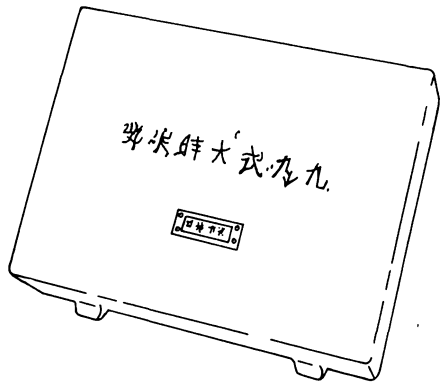


Figure 746

This clock is wound electrically and fires its charge electrically. The maximum delay time is 10½ days. The clock winds itself every 4¾ minutes. Setting is done by rotating the graduated dial to the desired delay time, at the completion of which, a spring-loaded contact arm drops into an aperture on the outer rim of the dial and closes the firing circuit. The delay may be extended to 30 or 60 days, however, by the use of additional gear trains and setting dials. The power for operating the clock and firing the charge is obtained from a battery in the clock's wooden protective case.

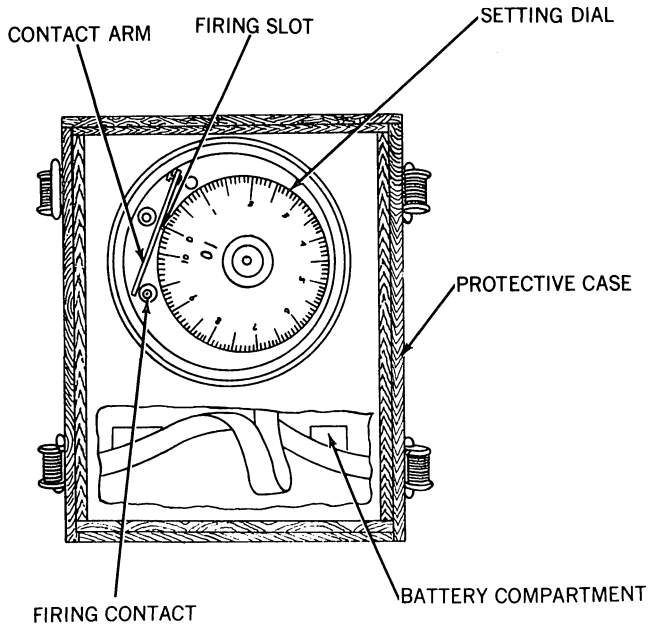


Figure 747

451. Demolition Clock, 7½-Day Delay (Japan)

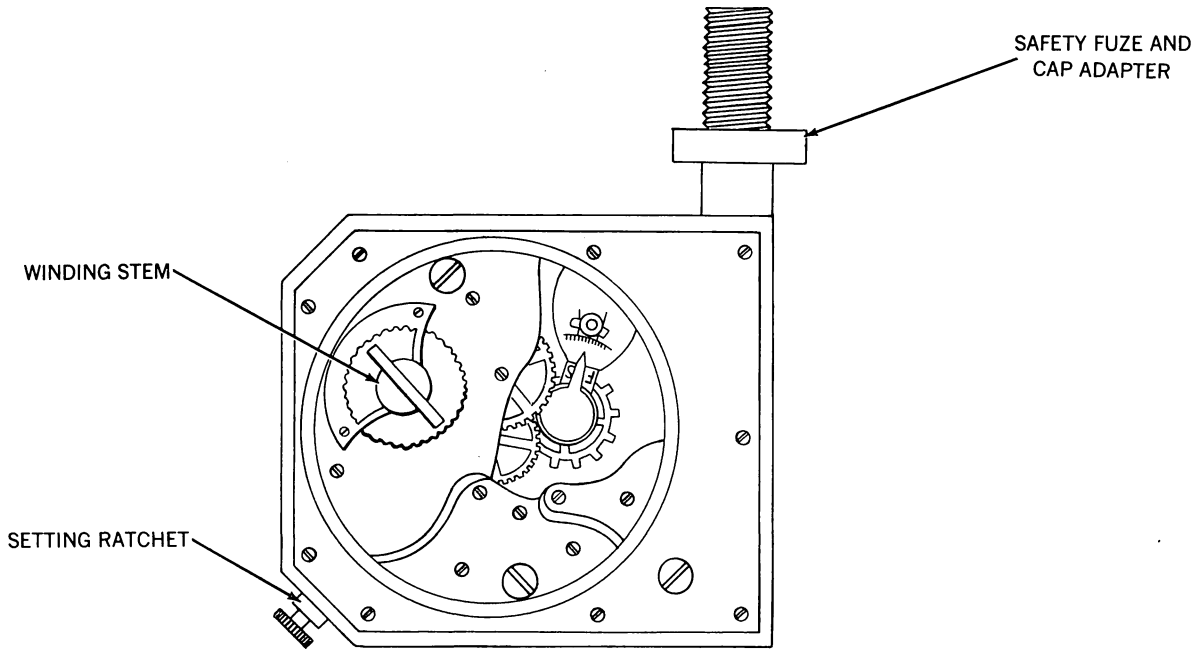


Figure 748

This clock, which is apparently of European design, is smaller and more finely made than the other Japanese delay clocks. It is hand-wound by an attached key and set by a rachet bearing against the outer edge of the dial. The dial is graduated in 1-hour intervals to 7½ days. The clock fires when a trigger arm falls into an aperture on the circumference of the dial, releasing the spring-loaded striker. The striker aperture is threaded inside to take a blasting cap and on the outside to take a demolition block.

452. Demolition Clock, 24-Hour (Japan)

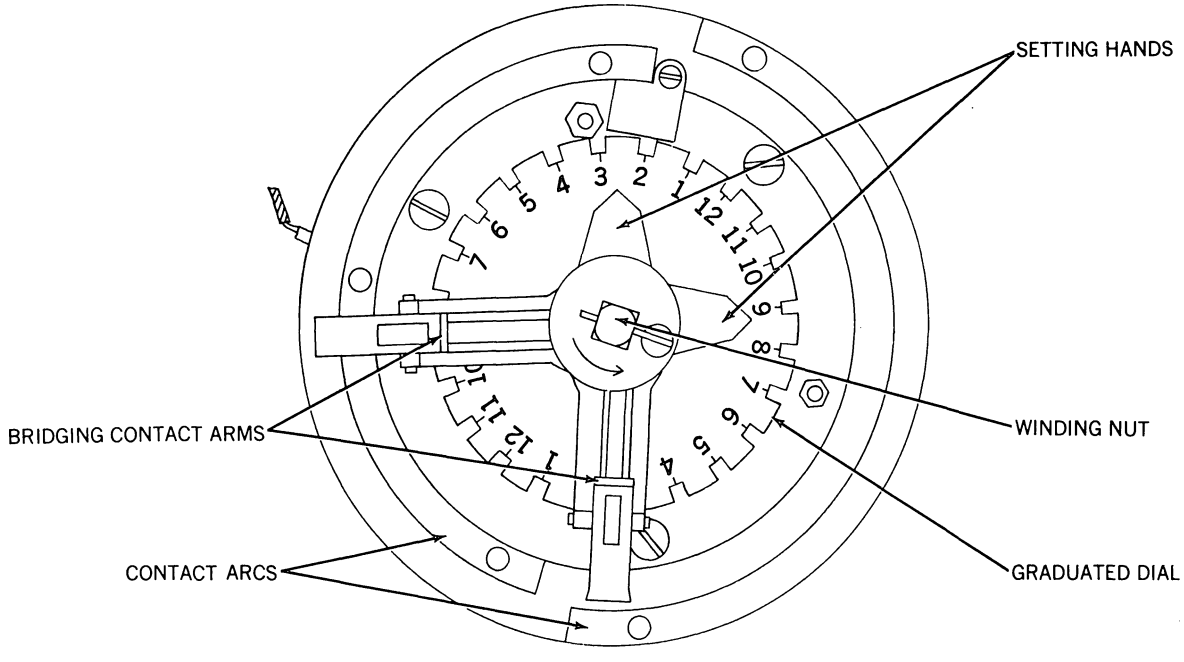


Figure 749

This device fires a charge electrically after a delay up to 24 hours. It has two bridging contact arms which ride on two semicircular electrical contacts connected to the charge by leads through a battery. The relation of the contact arms to each other governs the length of the delay. They are set in 1-hour increments. No outer case is provided for the working parts of the clock.

453. Seven-Day Demolition Clock, Type 92 (Japan)

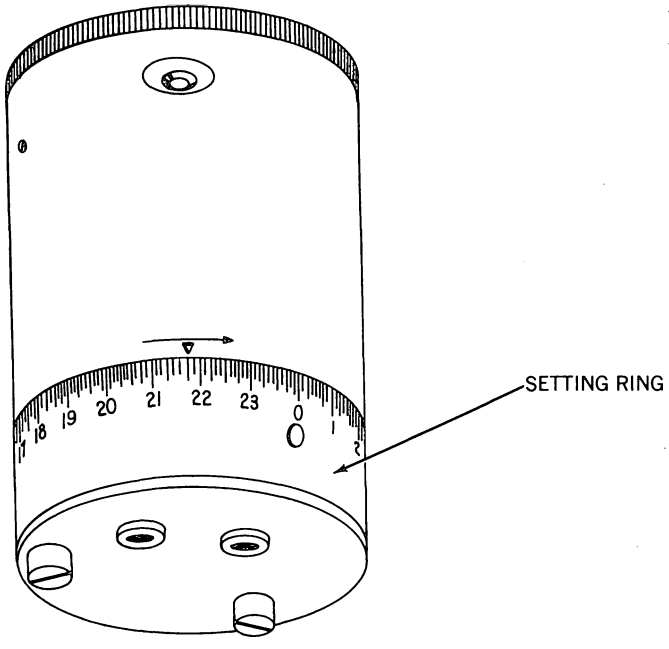


Figure 750

This is a spring-driven clock with settings up to 7 days. It will fire a charge either electrically or mechanically. Electric leads connect the contacts on the clock to the charge through a battery. At the base of the clock is a receptacle for safety fuse, which is used if the clock fires the charge mechanically. A graduated ring at the base of the clock is used to set the delay time.

454. Electrical Delay Fuze ChZ-10 (U.S.S.R.)

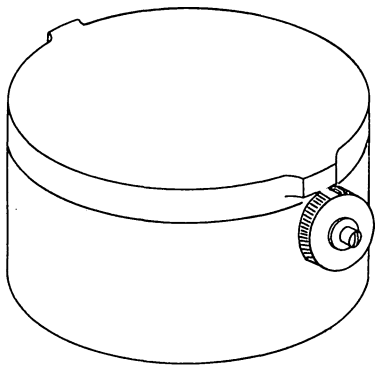


Figure 751

This is a delay, mechanical, handset fuze wherein a clockwork release lever closes an electric circuit. It is enclosed in a cylindrical steel case with a hinged lid. In the top of the case is a dial with a setting indicator and arrows showing the direction to turn the indicator. A knurled knob on the side of the case locks the lid in closed position, while a knob in the center of the clock face, attached to the setting indicator dial, sets the clock at the required time delay. On the face of the dial inscribed in the Russian language is "To set, use only knob on face of dial." A winding post is located on the bottom of the case, and a winding key is provided. Two electric wire leads project from the base of the case. The fuze is about 12.7 centimeters in diameter and more than 8.8 centimeters high. It is accurate to within 4 hours at a 10-day delay setting.

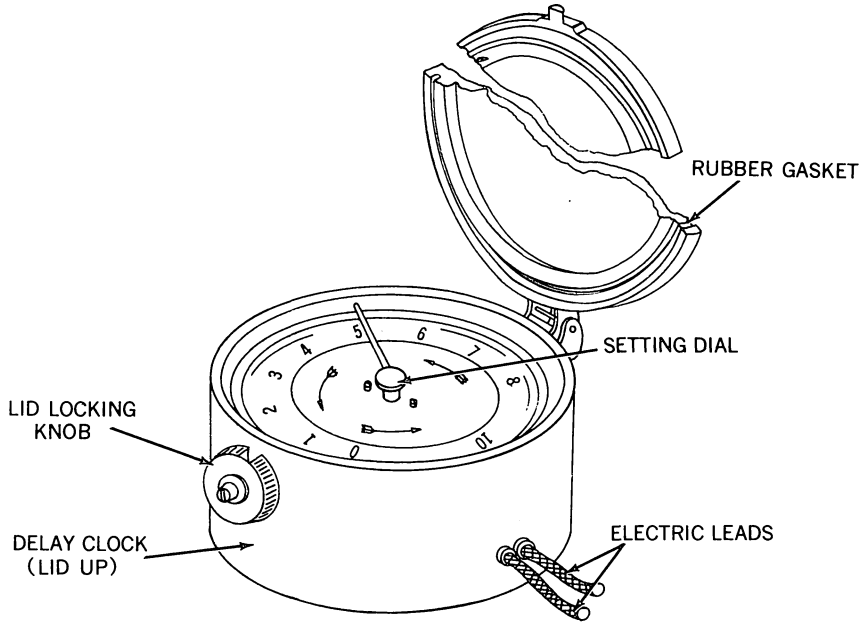


Figure 752

a. Use. This fuze is used for the electrical detonation of mines and charges at any preset time within 10 days.

b. Functioning. At the end of the delay period, the clockwork release lever trips the spring-loaded striker, which closes the circuit between the two electric leads in the bottom of the fuze.

c. Installing and Arming.

(1) Test the fuze by setting the indicator at zero and connecting a pocket ohmeter to the electric leads. The needle should swing to the right. Set the indicator on any number and reconnect the ohmeter. The needle should swing to the left.

(2) Wind the clock with the key.

(3) Move the setting dial to the setting for the desired time delay.

(4) Close and lock the lid.

(5) Tie the fuze into an electrical circuit.

d. Disarming Procedure.

(1) Cut the electric leads, one at a time.

(2) Destroy the fuze.

455. Electric Delay Fuze ChZ–35, Cylindrical (U.S.S.R.)

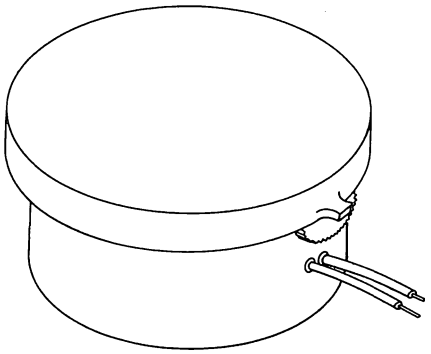


Figure 753

This cylindrically-shaped fuze can be set for a delay up to 35 days. It is about 19.0 centimeters in diameter, 8.8 centimeters high, and weighs about 7½ pounds. The winding key and winding post are located on the top instead of the bottom as in the ChZ–10 fuze. It is accurate within 6 hours. Disarming is merely the cutting of the two electric lead wires, one at a time.

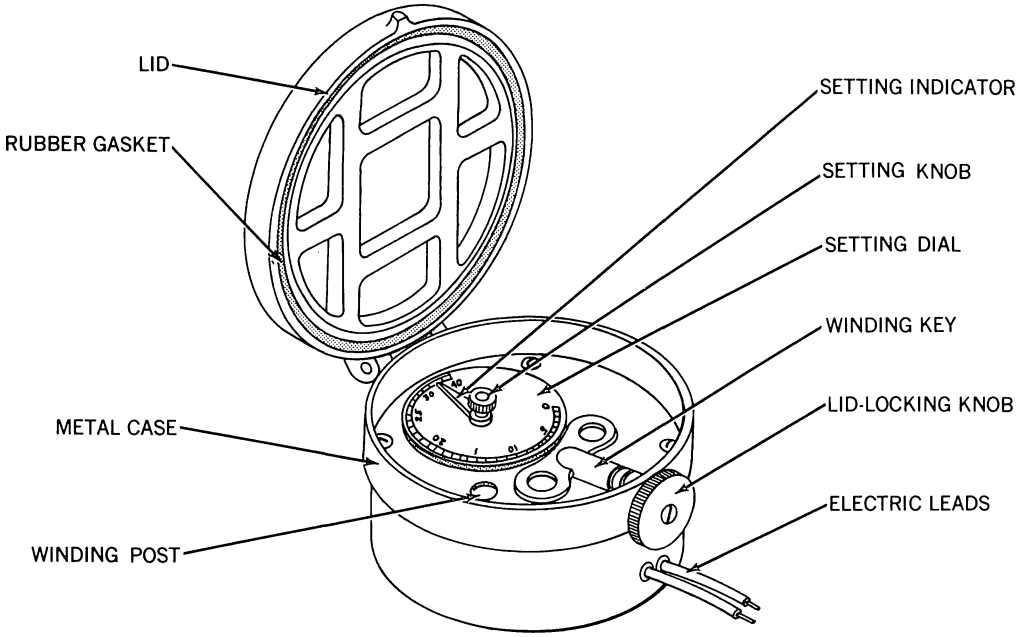


Figure 754

456. Electric Delay Fuze ChZ–35, Rectangular (U.S.S.R.)

This is a delay clock fuze similar to the cylindrical model (par. 445), except that it is rectangular in shape. It is about 16.5 centimeters long, 8.8 centimeters wide, and 8.8 centimeters high. The fuze weighs about 4.5 pounds. Disarming is merely the cutting of the electric leads, one at a time.

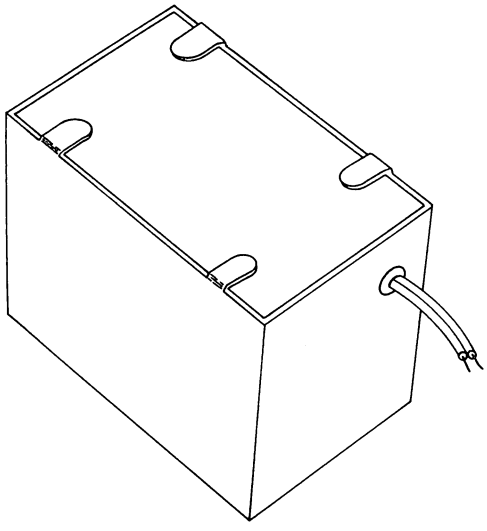


Figure 755

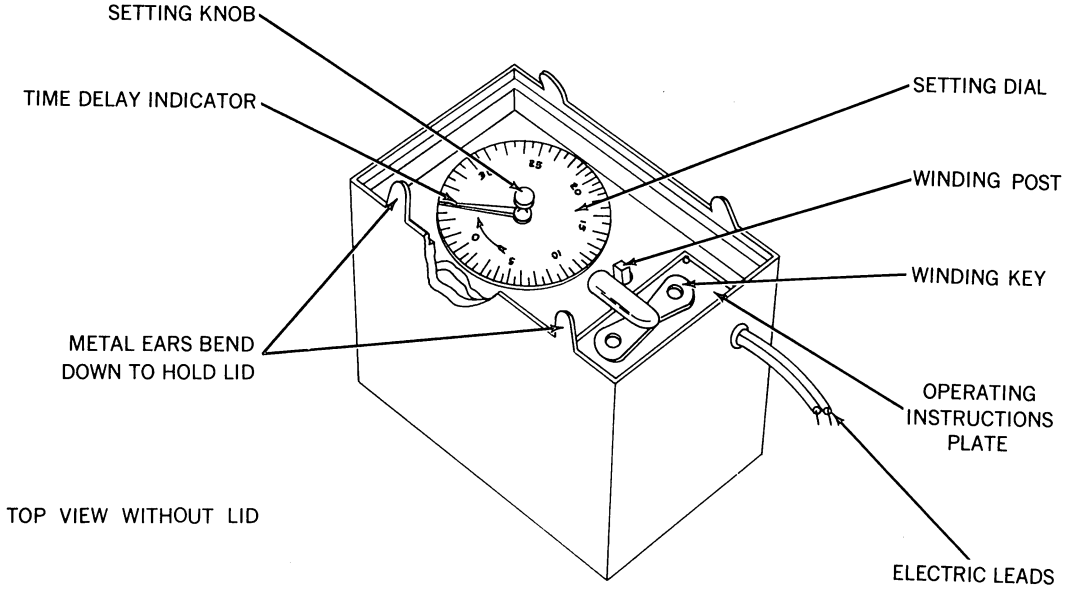


Figure 756

457. Naval Clock Work Delay Fuze

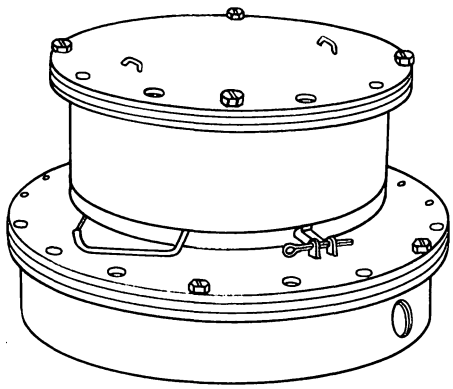


Figure 757

This delay fuze contains an electric contact circuit closer, an integral booster, and a main charge. The case is divided into two compartments. The upper one, 29.2 centimeters in diameter, contains the electric clockwork mechanism, which may be set for a delay up to 5 days, and the actuating mechanism, which consists of a time-setting disk with a recess at the 50 mark. The upper compartment also contains a lever arm with a metal pointer along one side and two contacts wired into a series circuit with the batteries and an electric detonator. The lower compartment, 37.4 centimeters in diameter, contains the electric detonator, booster charge, and the 28-pound main charge.

a. Use. This fuze, with its integral main charge is used chiefly in the destruction of harbor facilities as a detonator for depth charges laid in the water near shipping berths. One fuze contains enough explosive to detonate a group of depth charges.

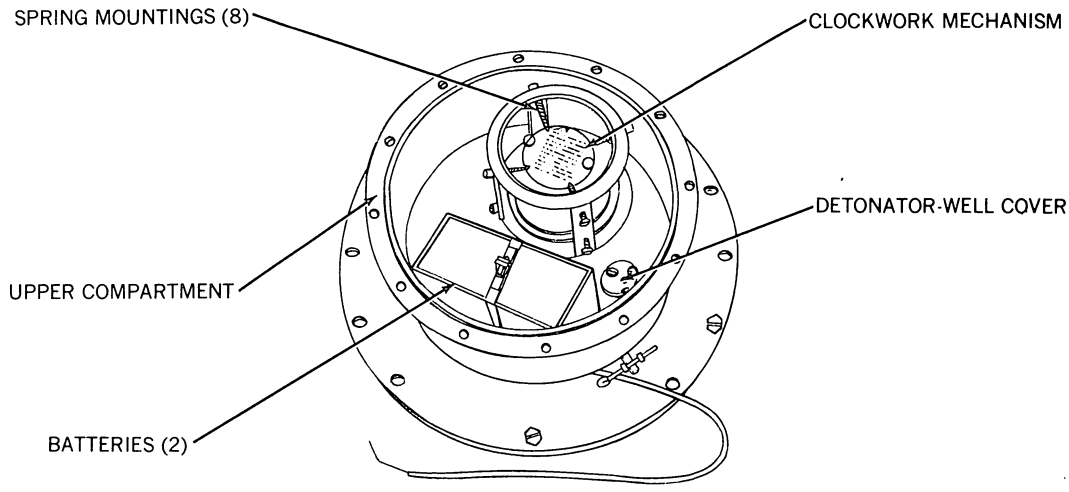


Figure 758

b. Functioning. The time-setting disk rotates with the clockwork mechanism in a counterclockwise direction. When the recess at the 50 mark reaches the metal pointer, the actuating spring pulls the pointer into the recess, pivoting the lever arm about the hinged end and bringing the contacts together. This closes the circuit and fires the electric detonator, booster charge, and main charge.

c. Installing and Arming.

(1) Remove the upper compartment cover and insert the two batteries and the electric detonator.

(2) Set the clockwork mechanism for the desired delay by turning the time-setting disk until the metal pointer is opposite the proper mark.

(3) Be sure that the contacts are apart. Connect the terminals of the clockwork mechanism in series with the batteries and the electric detonator.

(4) Replace the cover. (Accurate settings will require a trial run of the clock prior to actual use.)

d. Disarming Procedure.

(1) Remove the upper compartment cover.

(2) Disconnect all electric leads.

(3) Remove the electric detonator and the batteries.

(4) Replace the cover.

(5) Destroy the fuze.

Section IV. MISCELLANEOUS FUZES

458. Clockwork Vibration Fuze, ChVZ (U.S.S.R.)

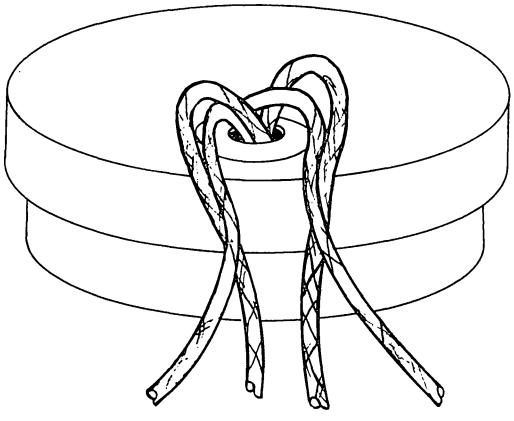


Figure 759

The Soviets devised this fuze for use in the DM highway mine, which they used against the Germans in World War II. It is versatile enough, however, to detonate any charge or improvised mine, especially if it is placed in bridges or rough terrain where passing vehicles cause much vibration. A 4-volt dry-cell pocket-flash-light battery circuit is interrupted at the clockwork mechanism and at the vibration contact. As the Soviets produced several types of vibration fuzes for mines for areas abandoned to the enemy, it is possible that many of these models will be used in a future war. The fuze is approximately 11.4 centimeters in diameter and 4.5 centimeters high.

a. Characteristics.

Shape	Case	Internal action	Arming current	Length of delay before fully armed
Circular.	Metal..	Vibration contact.	16-v for 5 to 10 sec.	4 min. (approx).

b. Use. This fuze is usable in any type of charge or mine in nuisance mining.

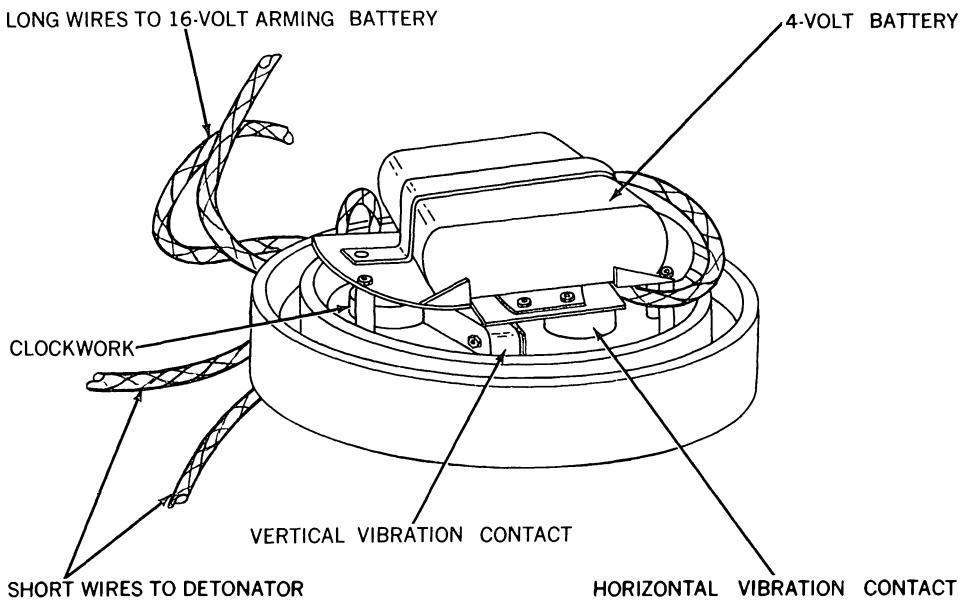


Figure 760

c. Functioning. Vibrations from a moving vehicle cause the copper spiral springs to vibrate until one makes a contact inside the aluminum housing, completing the electric circuit and firing the detonator.

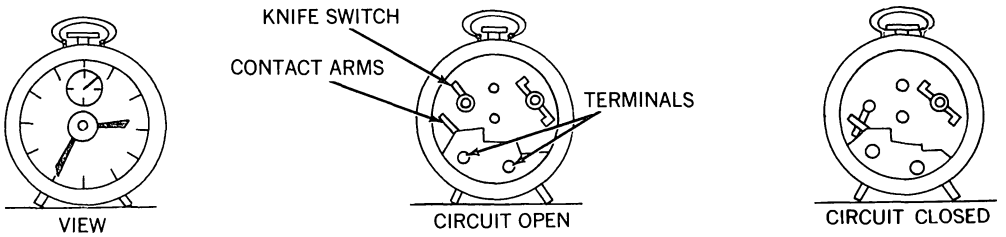
d. Installing and Arming.

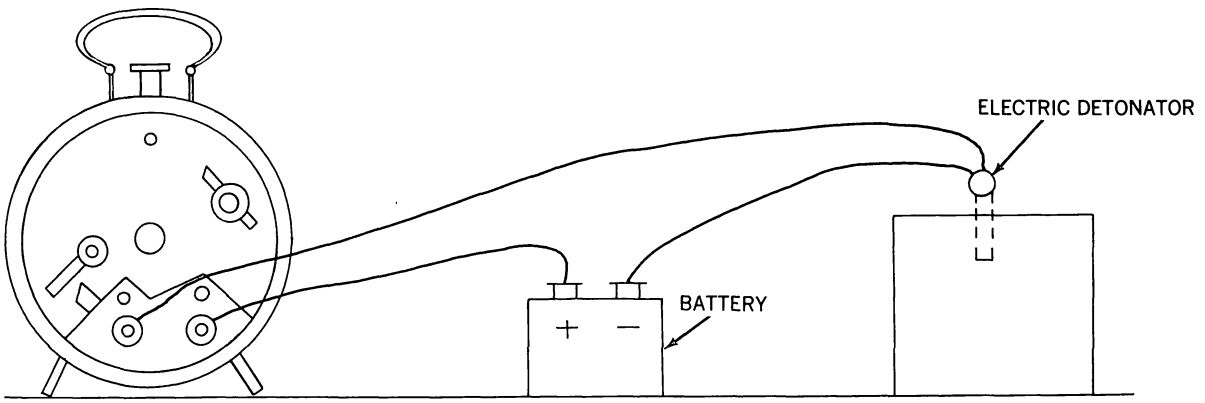
(1) Attach the short fuze wires to an electric detonator and insert in the explosive charge.

(2) Connect the two long fuze wires to the poles of the battery of at least 16 volts for 5 to 10 seconds. This current melts a wire holding the cog wheel of the clockwork safety mechanism, permitting the clockwork to run. Approximately 4 minutes later the clockwork closes a switch, completing the circuit to the vibrator contact.

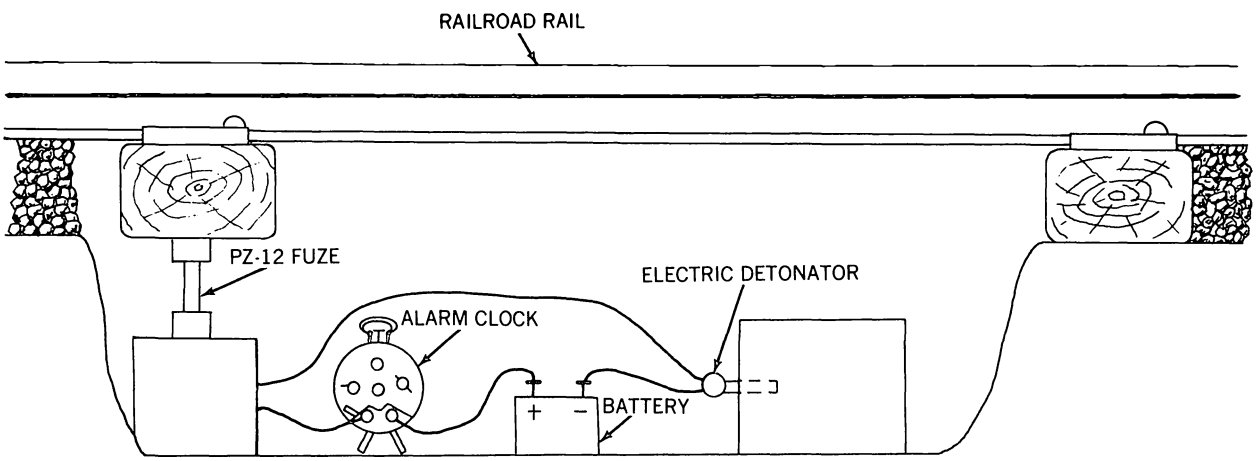
e. Disarming Procedure. When the fuze is armed, it becomes extremely sensitive. It may be possible, however, to cut the short wires attached to the detonator without moving or jiggling the fuze; but this is not recommended. The Germans, who had much experience with the fuze during the invasion of Russia, destroyed the mine in place by hand grenades or a separate charge.

459. Alarmclock Fuze ChZ-B (U.S.S.R.)





CLOCK WIRED TO BATTERY AND ELECTRIC DETONATOR



CLOCK AS AN INTERMEDIATE FUZE WIRED INTO AN ELECTRIC CIRCUIT WITH A PZ-12 PRESSURE CONTACT FUZE, BATTERY, AND ELECTRIC DETONATOR.

Figure 761

In this fuze a mechanically driven handset clockwork release lever closes an electric circuit. The fuze consists of an alarm clock with a knife switch on the back attached to the alarm mechanism. A housing with two contact arms, each insulated from the other, is attached also to the back of the clock. Two terminals, each wired to one of the contact arms, project from the housing. They are used to wire the clock into a detonating circuit.

a. Use. The alarm clock may be used as a separate fuze in an electric circuit or with an instantaneous electric fuze, such as the PZ–12 railroad fuze.

(No drawing available.)

b. Functioning. At the expiration of the preset time, the alarm mechanism trips the knife switch, which closes the circuit between the two contact arms and explodes the detonator.

c. Installing and Arming.

(1) Set the hour and minute hands at 12 on the large dial.
(2) Set the hand on the small dial (alarm) at the number indicating the hours of delay desired.
(3) Set the knife switch so that the circuit is interrupted.
(4) Wind the clock.
(5) Connect one terminal of the alarm clock with a terminal of the battery and the other with one of the wires of the electric detonator.
(6) Connect the second wire of the detonator with the second terminal of the battery.

d. Disarming Procedure.

(1) Cut the wire leads.
(2) Destroy the fuze.

460. Radio Mine Detonating Device, F-10 (U.S.S.R.)

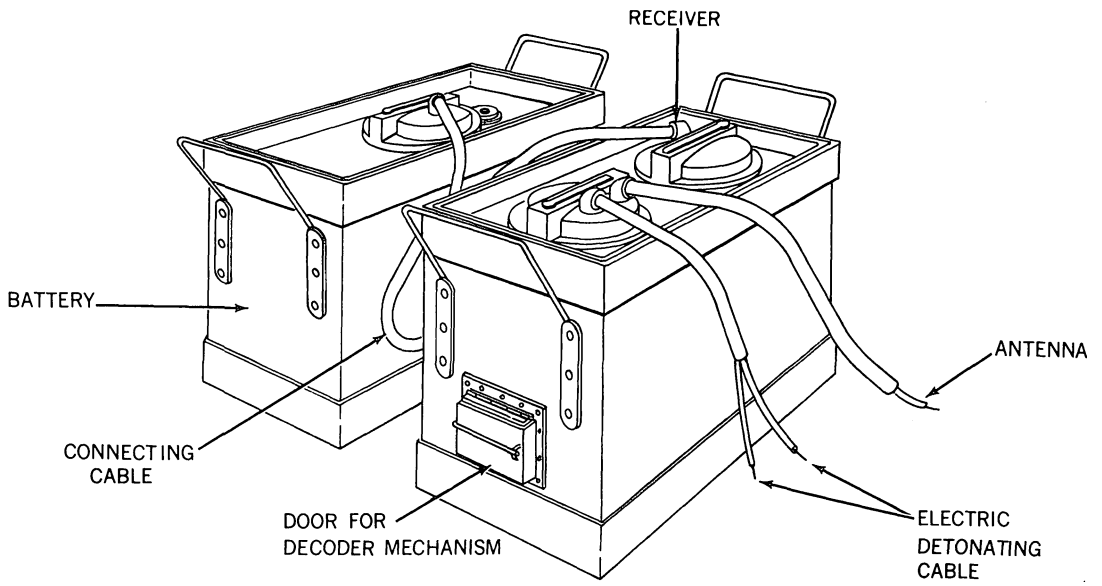


Figure 762

This is a radio receiver, 45.7 by 35.4 by 17.7 centimeters, that closes the mine-firing relay upon the reception of a radio signal of a specific wave length sent out by a controlling transmitter. One device can detonate 3 separate charges wired to it at any distance up to 50.0 centimeters and within a period of 60 days. The Germans spent much time and effort to devise techniques and equipment to counteract its effectiveness, developing the fuze detecting set 41 and the mine searching set 42. Finally, in the latter part of 1942 the Germans organized a new type of engineer unit, the Engineer Listening Platoon, for the sole purpose of detecting radio-controlled, acoustic, and clockwork mines. The antenna is either a straight or spiral wire. Telephone or building wire is acceptable. Ordinarily the straight wire antenna is about 30 meters long. It has a greater range than the other. The set uses a battery with a 4-day life, if it operates continuously; a 60-day life may be obtained by the use of a clockwork time switch in the receiver that turns on the set for a 12- to 15-second period every 2½ to 5 minutes.

a. Characteristics.

Shape	Case	Overall measurements		
		V	W	Ht
Rectangular.	Metal....	45.7 cm	35.4 cm	43.1 cm

Antenna lengths	Components	
	Battery case	Receiver case
100 ft.....	Battery.....	Receiver, amplifier, decoding device, clockwork mechanism, antenna socket, circuit closer.

b. Use. The F-10 radio detonator is used to destroy bridges, buildings, and other installations in areas captured by the enemy at any time chosen by the expelled defenders. It is actuated by radio signals transmitted from distances up to 500 kilometers.

(No drawing available.)

c. Functioning. Coded radio signals of a specific wave length are transmitted and picked up by the antenna, amplified by the receiver, and transmitted to the decoding device. Signals received corresponding to the specific code close the circuit and detonate the charge or charges.

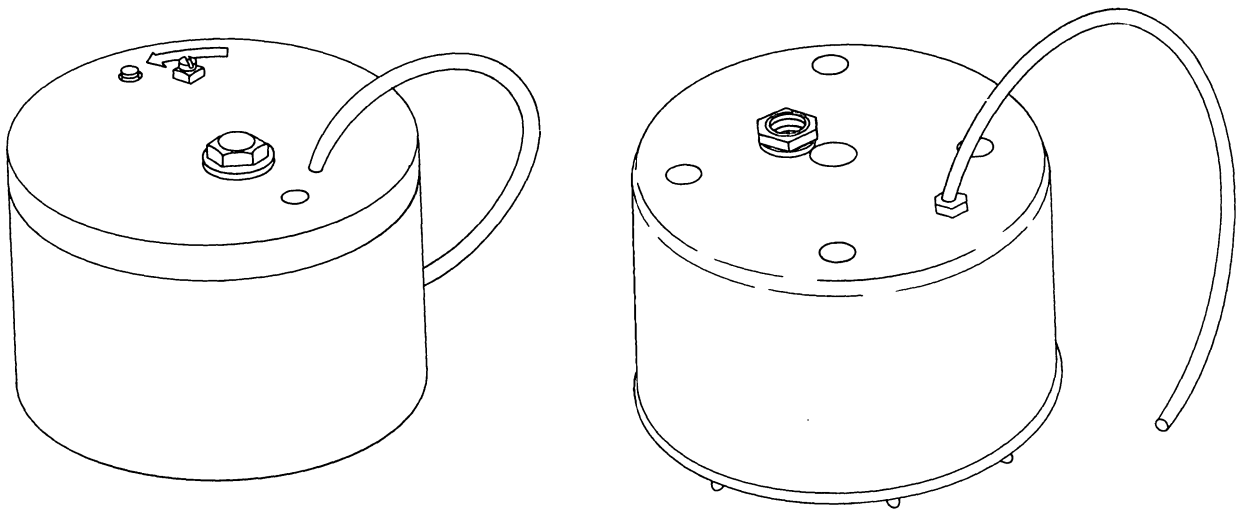
d. Installing and Arming. The F–10 detonator, fired by a coded signal, may be buried, unburied, and laid directly on the charge, or wired to as many as three separate charges up to a distance of 50.0 meters. It is operated by a coded signal. The detonator may be laid with a "BIS" apparatus that permits the detonation of as many as 36 separate charges, twelve fired at one time. Another device, the "Beredo," may be attached between the F–10 and the charge that detonates it. This is set off by vibration from passing vehicles, tanks, or trains. The F–10 is usually laid in a rubber waterproofing case. The antenna is usually buried 1 to 1.5 meters underground, .3 to .5 meters under water, and from 5 to 10 centimeters under building foundations.

e. Disarming Procedure.

(1) Cut off the antenna as close to the F–10 case as possible.

(2) Cut the wires connecting the F–10 with the charge. (The Germans in World War II found almost all of these to be boobytrapped.) The device may also be disarmed by jamming or detonated prematurely by other than the parent transmitter; but that requires the exact knowledge of the signals and operating frequency.

461. Frequency Induction Fuze, SM-12 (Germany)



WOODEN-CASED FUZE

BAKELITE-CASED FUZE

Figure 763

This fuze is an electrical device in which frequency induction closes a circuit. Two models were made. The earlier model had a black, cylindrical, laminated wood case, while the later model has black cylindrical, bakelite case. Both models measure 17.1 centimeters in diameter and 9.5 centimeters in height. The contents are a sensitive relay (3 in the early model), a dry-disk rectifier, a pickup coil, 2 condensers, 2 resistors, 2 leaf-type arming delay switches, (one in the later model) an electrolytic delay arming switch (none in early model), and two 1.5-volt dry cell batteries. The internal elements are mount on sponge rubber pads and bolted to the case.

a. Use. This is an actuating fuze, as it is designed to explode the mine by picking up the signal given by an electronic mine detector sweeping minefields and roads.

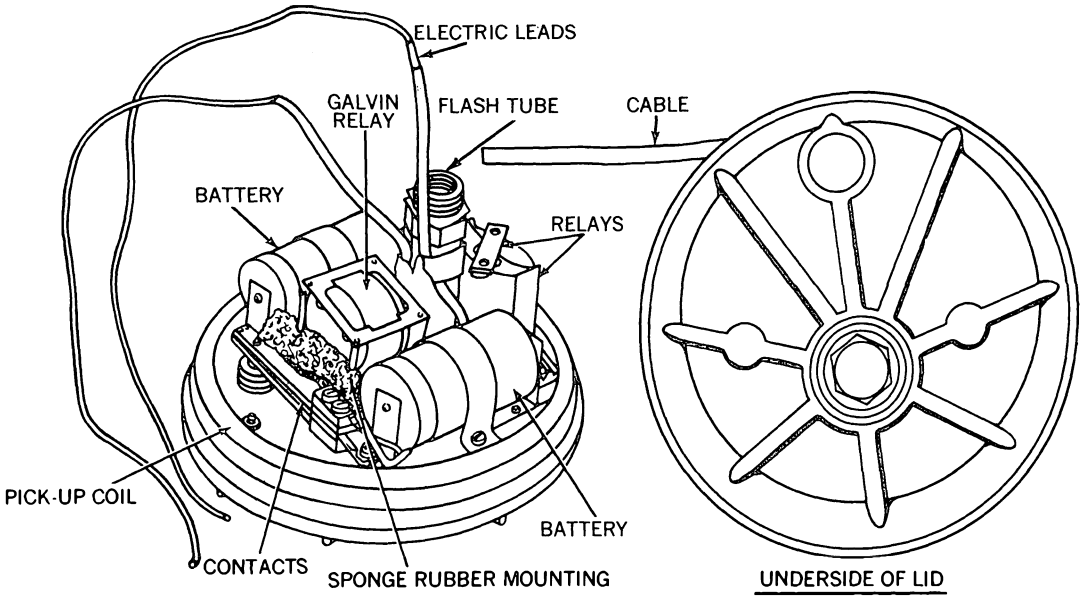


Figure 764

b. Functioning. When a search coil mine detector of a frequency range of between 800 and 2,000 cycles is passed over an armed fuze within a maximum distance of 43 centimeters, the signal is picked up in the pickup coil in the fuze. This closes the secondary or safety arming switch, completing the circuit and firing the electric detonator.

c. Installing and Arming. Turn the arming nut in the top of the case in the direction of the arrow. This closes the leaf-type initial arming switch and completes the circuit to the delay switch, which becomes armed after a 1½- to 2-hour delay.

d. Disarming Procedure.

(1) *Method 1.*

(*a*) Remove the cover leading to the mine or charge, and without shaking or jamming the fuze carefully pull out the cable with the detonator attached.

(*b*) Bury the end of the cable, with the detonator, in the ground and then cut the cable. This is a safeguard against the explosion of the detonator.

(2) *Method 2.* Unscrew the fuze from the mine, if it is screwed to the mine by the flash tube, and pull the cable and detonator out of the mine.

(3) *Method 3.* Push a wood plug through the arming screw hole and force open the arming switch.

e. Additional Precautions. Recent developments may have made the disarming of this fuze impossible. It may also have been rigged for electrical detonation, actuated by tampering with the wires or by the insertion of the stick. It is safer to assume that the fuze cannot be disarmed.

462. Frequency Induction Fuze (German SM-12) (U.S.S.R.)

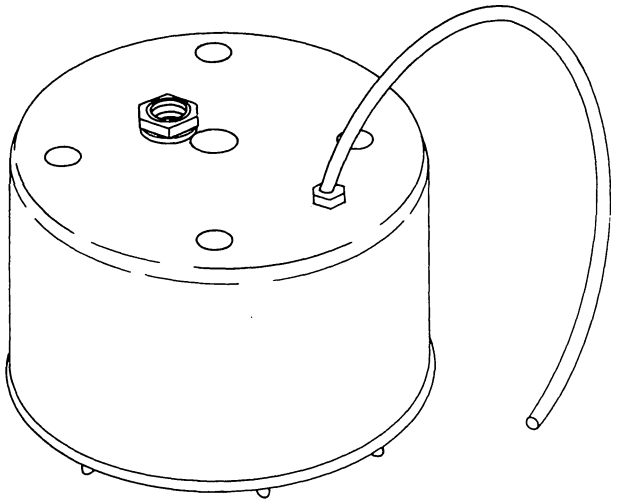


Figure 765

Although the Soviets designed this fuze, the Germans, by working on captured models, perfected it. Two models were designed and produced. The first was housed in a black cylindrical laminated wood case; the later one, in a brown cylindrical bakelite case. Both are 17.1 centimeters in diameter and 9.5 centimeters high. A tube for the detonator cable extends through the fuze and out at the top and the bottom of the case. On the top are the arming nut and a white arrow that indicates the direction to turn the arming screw. A cable connects the fuze with the electric detonator. Power for operating the fuze is provided from a 1.5-volt dry cell battery inside the case.

a. Use. This fuze was designed to explode a mine or charge by actuation initiated by a signal emitted from an electric mine detector sweeping over it.

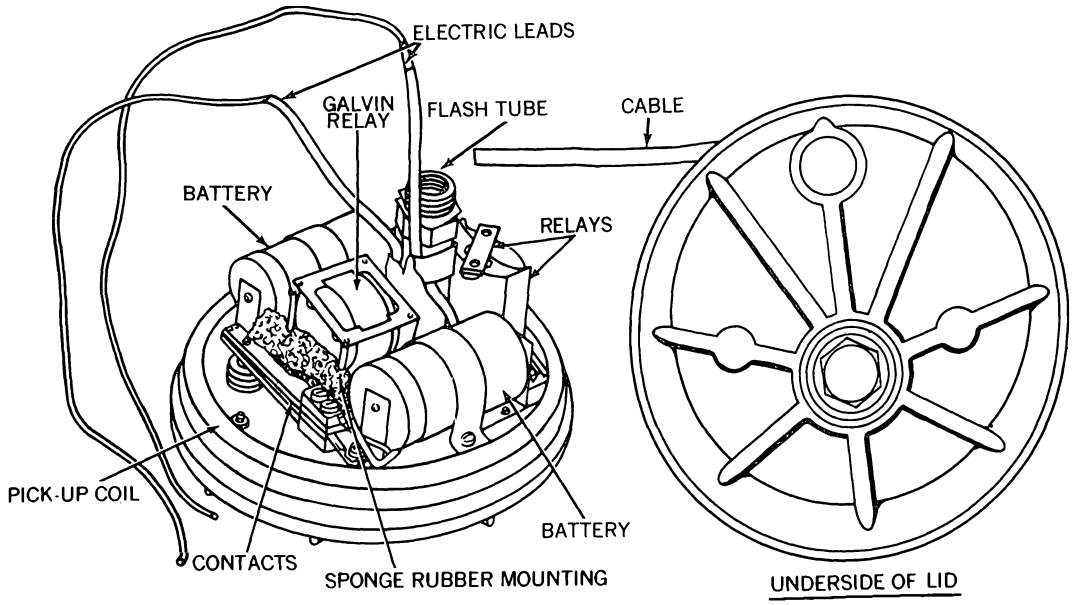


Figure 766

b. Functioning. When the search coil of a frequency-bridge mine detector (800—2,000-cycle range) is passed over a fuze within a distance of 17 inches, a signal is picked up by the pickup coil. This closes the secondary or "safety" arming switch, completing the electric circuit and firing the detonator.

c. Installing and Arming. Turn the arming screw in the top of the case in the direction indicated by the white arrow. This completes the circuit to the safety delay switch, which becomes armed after a period of 1½ to 2 hours.

d. Disarming Procedure. Recent improvements have made this fuze impossible to disarm by hand. The mine or charge to which it is fitted, should be detonated in place.

463. Vibration-Inertia Fuze IZER-2 (U.S.S.R.)

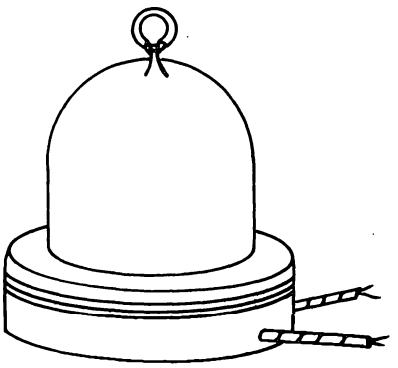


Figure 767

This device consists of an electromagnetic arming contact and a vibratory circuit-closing mechanism mounted on a cylindrical metal base. The brass bell-shaped hood is bolted to the base. The fuze, which measures 10.1 centimeters in diameter and 20.6 centimeters in height, is sealed and may be used under water. Two electric leads protrude from the base.

a. Use. This fuze is used in arming railway charges and laid along with a chemical delay or clockwork delay fuze. It is buried approximately 1 meter below the railroad bed.

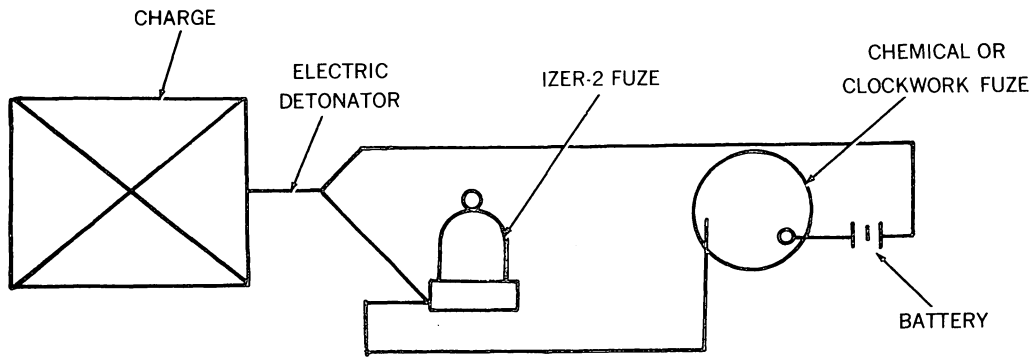


Figure 768

b. Functioning. Vibrations from a moving train cause the spring-suspended weight in the fuze to move downward, forcing down the actuating contact lever and closing the contact to complete the electric circuit. This remains closed until broken by the explosion of the charge or by breaking or cutting the electric wires, after which all parts of the fuze return to their original position.

c. Installing and Arming. Connect the fuze to an electric detonating circuit. The current from the battery then magnetizes the electromagnet and closes the arming contact.

d. Disarming Procedure. Cut the wire leads from the fuze, one at a time, and remove the device and disassembled mine to a safe storage or disposal area.

464. Vibration Fuze VZ-1 (U.S.S.R.)

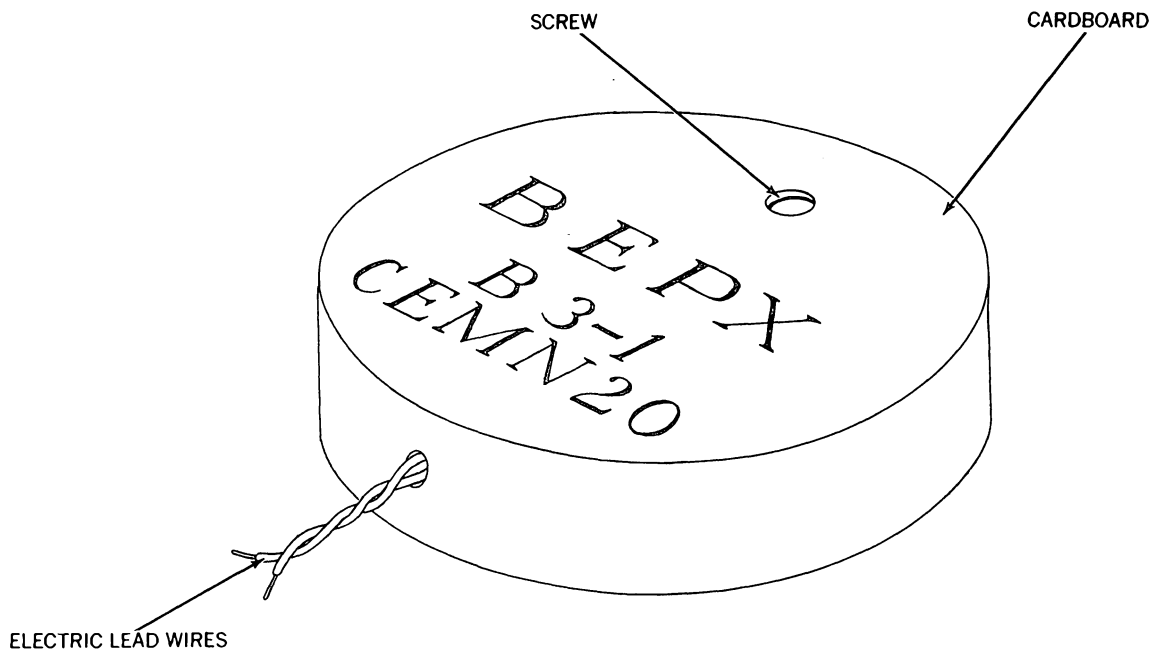


Figure 769

This fuze is actuated by vibration, which closes an electric circuit. In the interior of the circular cardboard case is a thick, rubber, hollowed-out disk, in the center of which a Y-shaped metal vibrator is suspended by three fine spiral springs. On the top is a contact screw that is attached to one of the electric wire leads. The other wire lead is attached to one of the springs, so that the circuit is broken by only a short space between the vibrator and the contact screw. The wire leads are tied into an electric circuit for the ignition of the charge.

a. Use. This fuze is used on some MZD delayed-action mines and improvised mines.

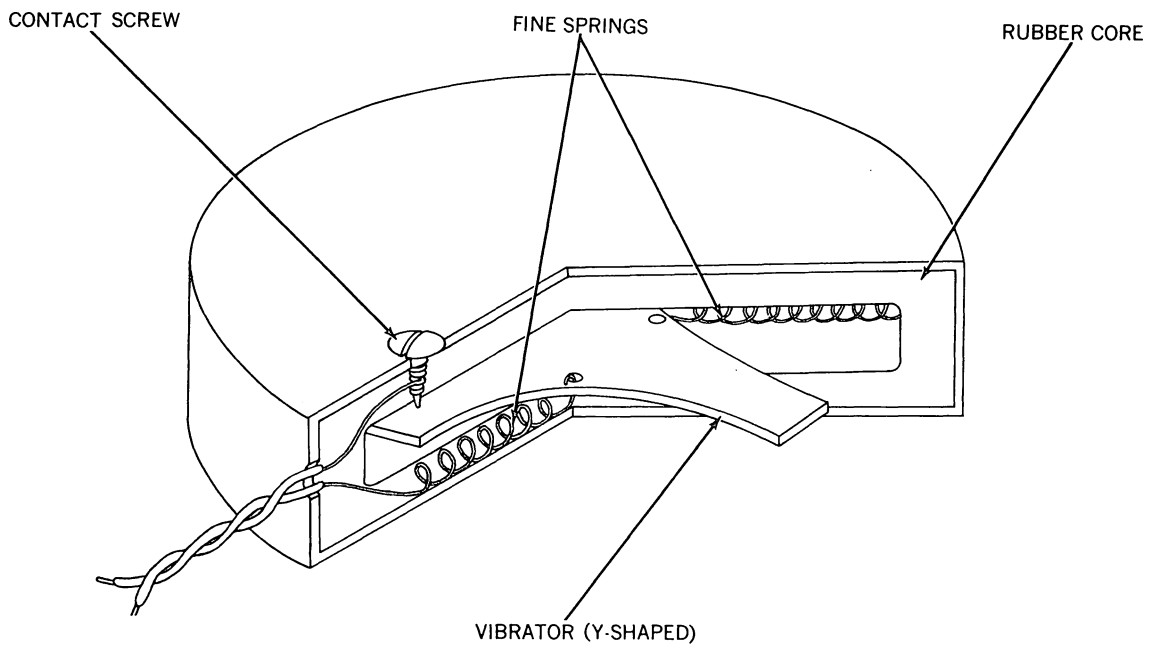


Figure 770

b. Functioning. Traffic rumbling over the ground or a bridge causes action in the fuze vibrator until it touches the contact screw. This closes the circuit and fires the charge.

c. Installing and Arming. The fuze has no safety device, being merely wired to the detonating circuit. Usually some type of delayed action fuze is also wired to the circuit to give security to the man installing the mine.

d. Disarming Procedure. As the fuze has no safety device and because of its construction and method of actuation, **it cannot be hand neutralized with even the slightest chance of avoiding the detonation of the mine.**

PART FOUR

AUXILIARY MINE WARFARE EQUIPMENT OF FOREIGN WORLD POWERS

CHAPTER 12

MINE DETECTORS AND PROBES

Section I. MINE DETECTORS

465. Mine Detector, VISF, M46 (Bulgaria)

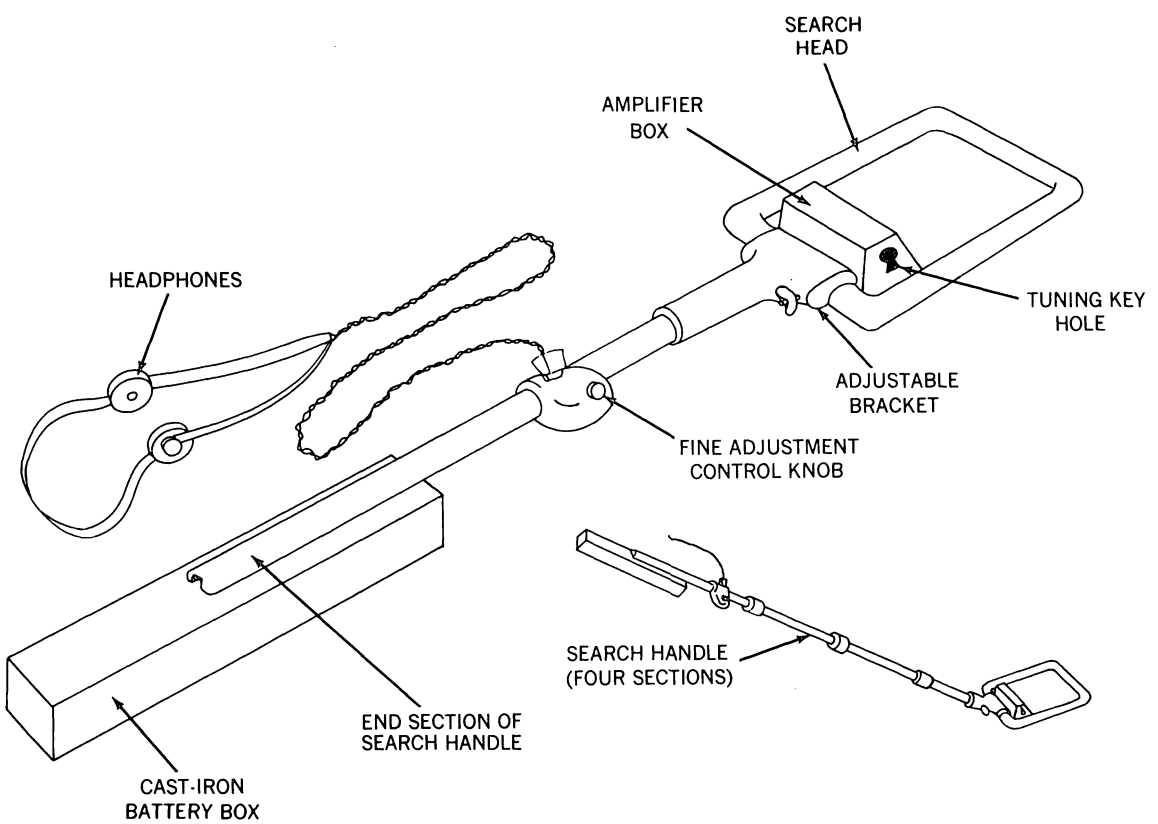


Figure 771

This detector, an improved version of the Soviety VIM–203 model, has a rectangular search coil. All the components except the headphones are attached to the search handle. It is grasped near the center of gravity of the set so that the weight of the power supply box at the upper end of the handle will nearly balance the search head assembly, including the amplifier box. This feature reduces arm fatigue so prevalent in detector operators. The VISF 1946 may be used as a short handled set by removing 3 sections of the search handle and plugging the last section into the search assembly. The unit operates on the heat-frequency oscillator (heterodyne) principle.

The physical characteristics of the VISF model 1946 mine detector are—

Element	Description
Search head.	Rectangular, metal-covered, hollow wood frame containing two inductively-couple coils. An adjustable bracket for mounting the amplifier box and search-handle sockets is attached to the frame.
Search handle.	Four, jointed, hollow-wood rods that contain the power cable; usable as a short handled set.
Amplifier box.	Aluminum; contains two pentode oscillators, one pentode amplifier, circuit components, and a cloth-covered opening to receive a key for tuning the amplifier.
Power supply.	Located in cast-iron box attached to last section of search handle. The 1.5-V/A battery has 9 Leclanche dry cells in parallel, rated at 10 ampere-hours. Has a 60-v wet cell B battery.
Controls.	Broad tuning adjusted by inserting key in amplifier box, tuning for low-pitched sound. Fine tuning control knob located in middle of last rod from search coil.
Aural indicator.	Headphones, plugged into socket next to fine tuning knob, reveal presence of mine by increased pitch of sound.
Carrying case.	Canvas haversack for transportation of entire detector set. Total weight.....13.7 lb.

The A batteries have a continuous operating life of 40 to 50 hours; the B batteries, 150 to 200 hours. The instrument has a detection range of 20.0 to 30.0 centimeters for buried metallic mines.

466. Mine Detector, VISF, M43 and M44 (Bulgaria)

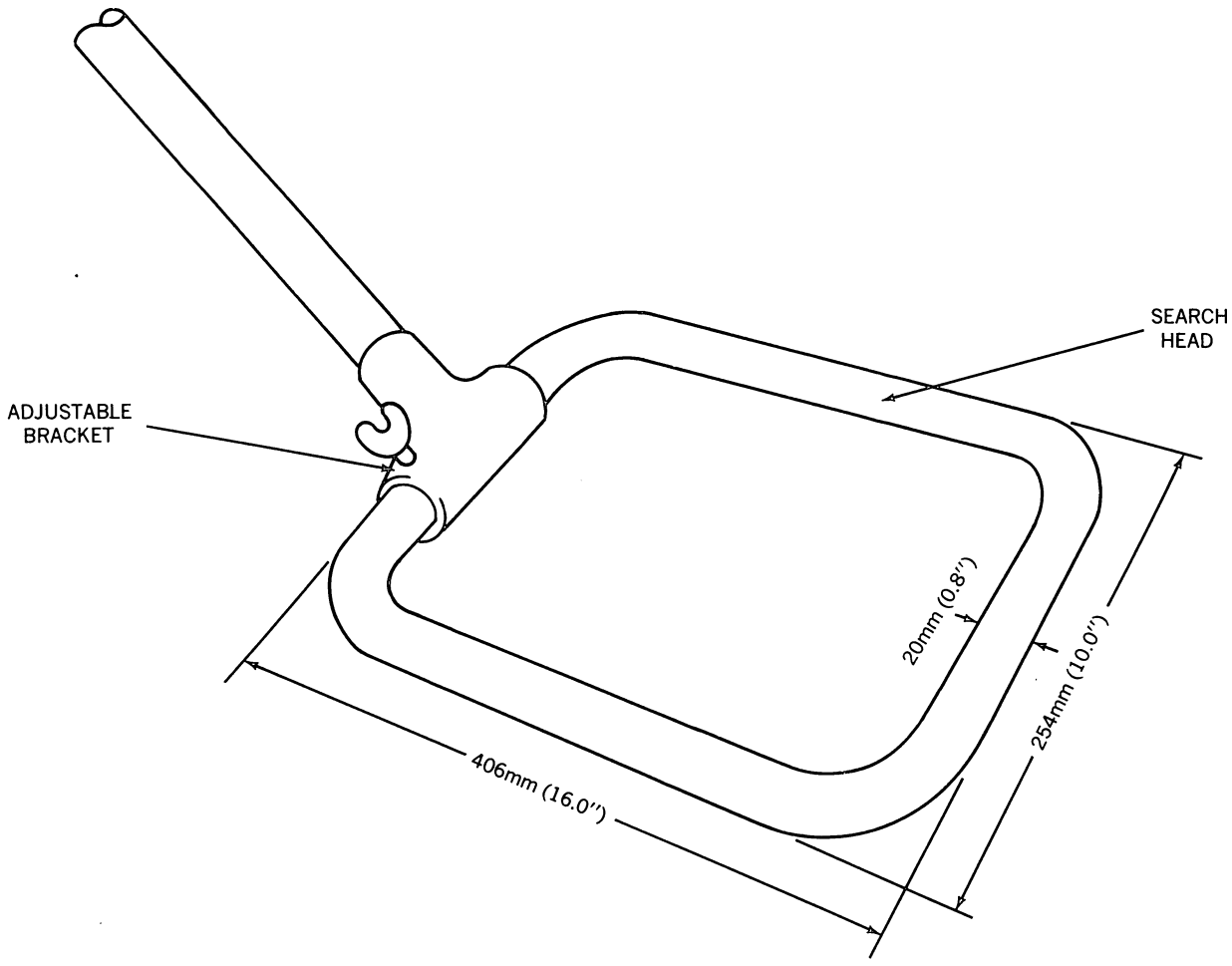


Figure 772

These Bulgarian models are patterned after the German Berlin 40, type B. The M44 model differs from the M43 only in a minor change in the circuit that permits the use of readily available tubes instead of the 8-element type. Both models operate on the heat-frequency oscillator (heterodyne) principle.

The physical characteristics of these detectors are shown below.

Element	Description	Weight (lb)
Search head assembly.	Rectangular, 2.2 cm in diameter, fiber conduit, about 25.5 x 46.6 cm with a hinged joint, mounted on the rear of the frame.	
Search handle.	Two hollow wooden rods, each 80.0 cm long, that conceal the power cable. The lower rod has a 4-pin electric plug for connecting to the search head. The head of the upper rod has a 4-pin receptacle for the detector box cable.	11.8
Detector box.	Wood, about 24.1 x 30.4 x 104.1 cm, containing the detector chassis-two oscillator tubes, circuit components, and tuning controls at the open end-and two battery compartments.	
Controls.....	Broad-and-fine tuning-knobs mounted on panel of detector chassis.	7.0
Aural indicator.	Headphones plugged into panel of detector chassis reveal presence of mine by increased pitch of sound.	
Carrying case.	Haversack for detector box with straps for back and side mounting.	1.0
	Total weight.....	19.8

Under continuous operation, the A battery probably has a life of 40 to 50 hours. For buried metallic mines, the detection range 10.0 to 20.0 centimeters.

467. Mine Detector, M-10 and M-11 (Czechoslovakia)

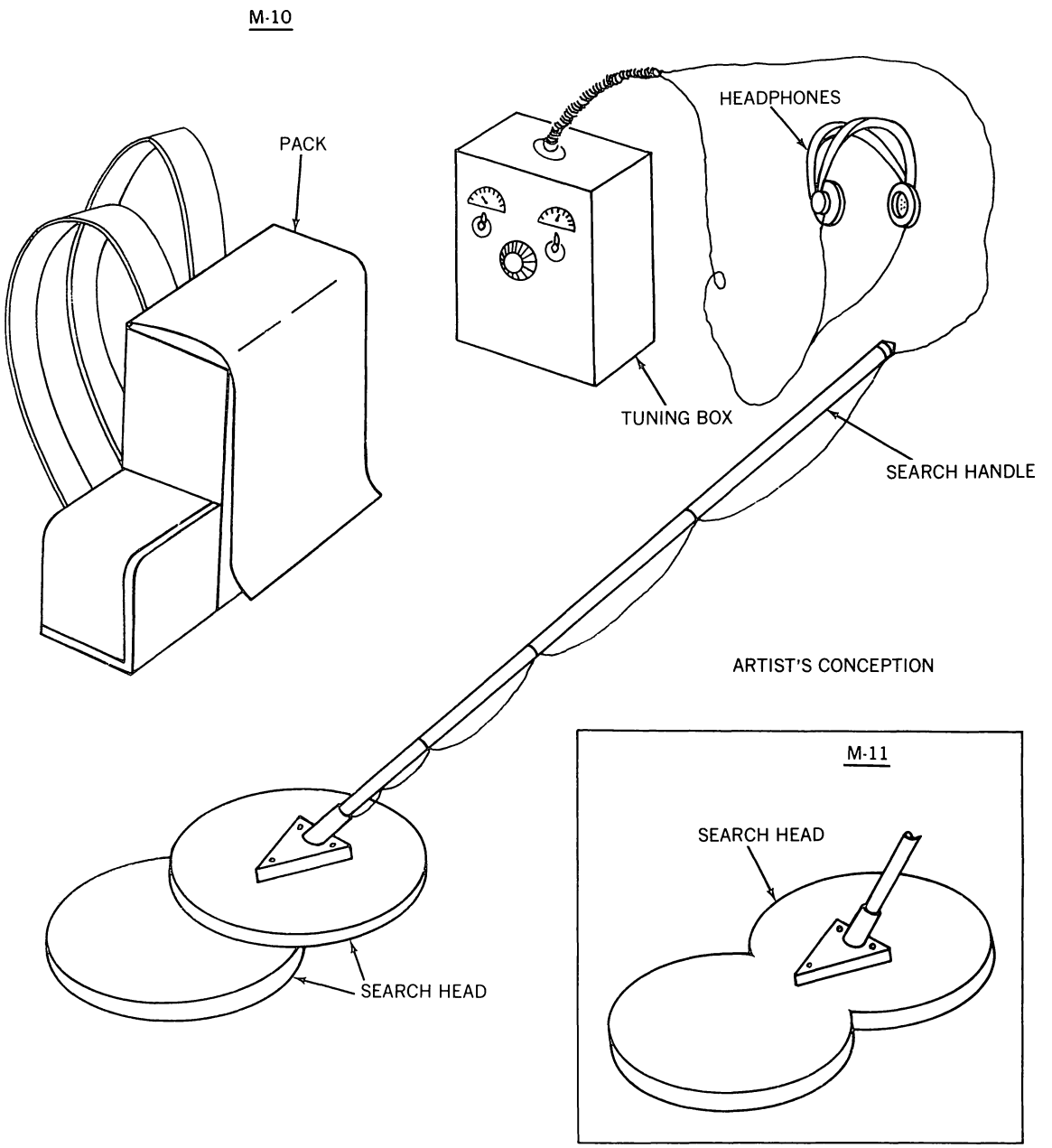


Figure 773

The M-10 and the improved version M-11 are probably the only detectors in use in the Czechoslovak Army. They operate on the heat-frequency oscillation principle, and differ only in the construction of the search head. The M-11, though of the same shape as the other,

consists of a single continuous plate. A detection range of approximately 1.5 meters is claimed.

a. Detector Head Assembly. The M–10 search head consists of two detachable circular plates 30.0 centimeters in diameter and 3.0 centimeters thick. The top plate, which holds the search handle, overlaps the bottom plate by 10.0 centimeters. The M–11 search head consists of a single continuous plate of the same shape and dimensions of that of the M–10.

b. Search Handle. This generally consists of four jointed aluminum alloy sections, each 50.0 centimeters long. Two additional sections, however, are stored in the back pack for use if necessary.

c. Tuning Box. The dimensions are 11.8 by 7.8 by 5.0 centimeters. It is rectangular in shape.

d. Power Supply. Three 20- to 25-volt dry cell batteries are contained in this back pack, along with a spare set.

e. Weight. The total weight of the detector is approximately 26.4 pounds.

468. Mine Detector, Model NEC, Type 3 (Japan)

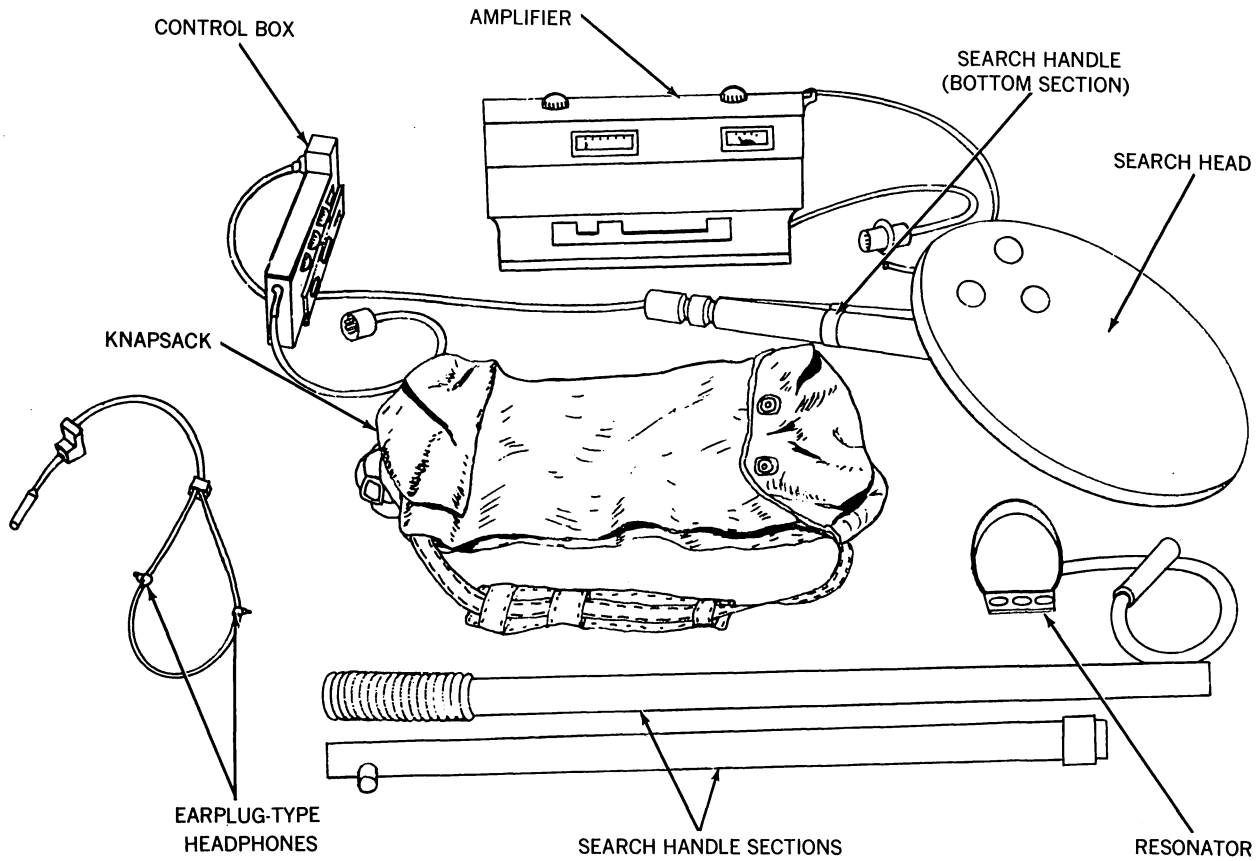


Figure 774

This relatively recently developed detector resembles the United States Model SCR–625H in appearance and operation. The Japanese version, however, is fitted with an A battery of three 1.5-volt dry cells instead of two and has an additional small search head with a short handle for use by the operator in crawling position. If the large disk is held 15.0 centimeters above the ground, this detector will locate metallic mines buried 35.0 centimeters deep. This model was adopted by the Japanese National Self-defense Forces in 1957.

a. Detector Head Assembly. This unit has two separate hollow disk-shaped search heads, similar in appearance but different in size. Both contain three concentric coils. Both are 2.7 centimeters thick; the larger is 38.6 centimeters in diameter and the smaller, 30.48 centimeters.

b. Amplifier. The oscillator-amplifier and batteries are contained in a single unit and enclosed in a metal case 24.8 by 13.9 by 10.8 centimeters. A waterproof knapsack is provided for carrying the unit.

c. Power Supply. The power supply is an A battery of three 1.5-volt dry cells, and a B battery of one 103.5-volt dry cell.

d. Controls. These are a press-button switch, power switch, and balancing adjustment.

e. Indicators. The aural type indicators consist of ear plug type headphones and a separate resonator.

f. Weight. The unit with the large search head weighs 32 pounds; and with the small search head, 30.3 pounds.

469. Mine Detector, Model 55 (Japan)

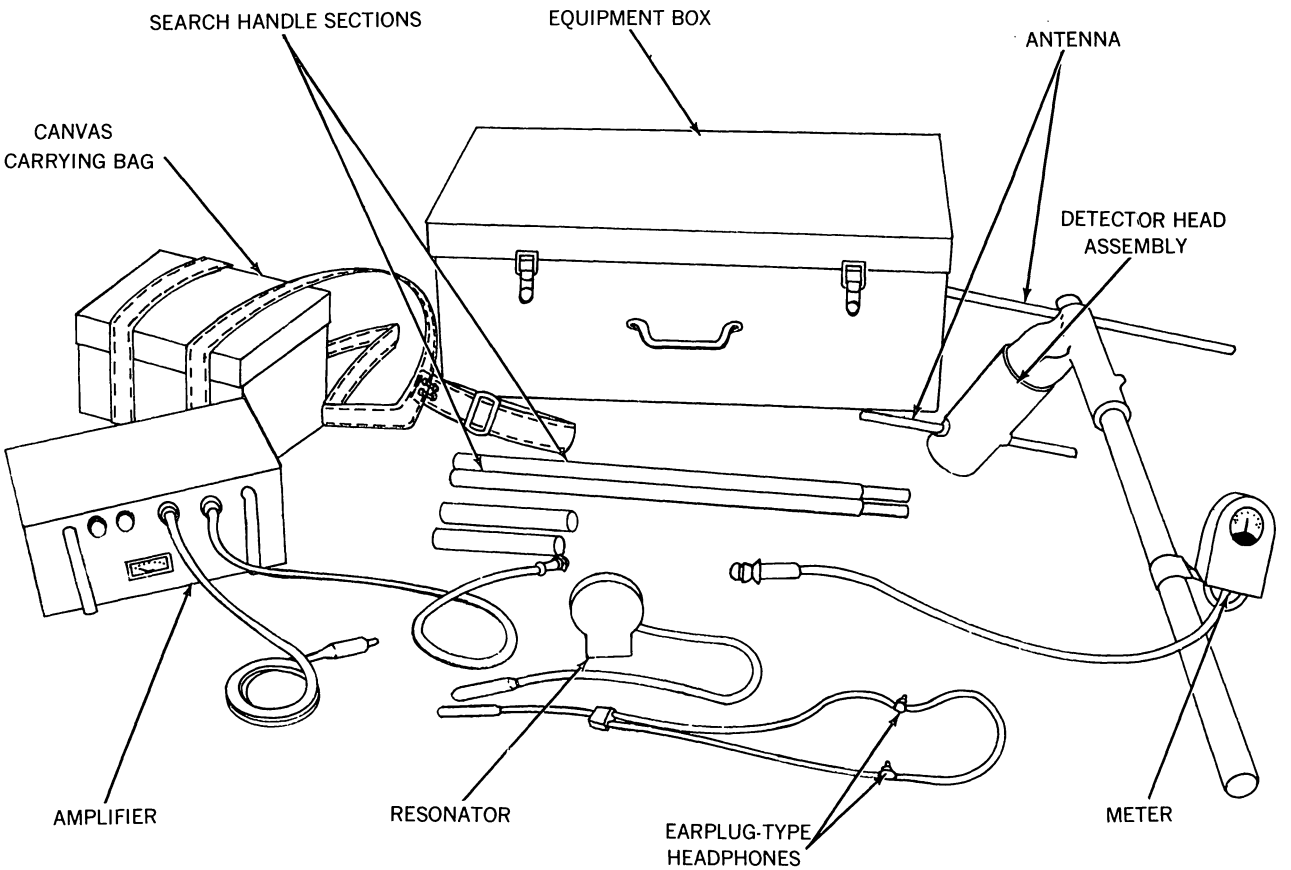


Figure 775

The Model 55 mine detector was developed as an improvement over the United States Army Model AN/PRS–1. They are similar in appearance and performance. Both locate standard metallic and nonmetallic antitank mines buried 15.2 centimeters deep in loamy ground. When these and antipersonnel mines are buried in slightly moist sandy soil, however, detection is difficult. An equipment box is provided for transporting the entire detector.

a. Detector Head Assembly. The search head consists of a cylindrical housing 3.2 centimeters long and 7.8 centimeters in diameter with an encased oscillator tube and an attached antenna.

b. Search Handle. This is divided into four telescopic sections.

c. Amplifier. The oscillator-amplifier circuits and batteries are carried in a canvas bag 27.9 by 18.7 by 13.9 centimeters.

d. Power Supply. One 6-volt dry cell A battery and three 45-volt, dry cell B batteries compose the power plant.

e. Indicators. The aural indicators are the ear plug type headphones and a separate resonator.

f. Controls. The controls are a frequency adjusting knob and a power switch.

g. Weight. The complete unit weighs 18.9 pounds.

470. Mine Detector, Model IV (Japan)

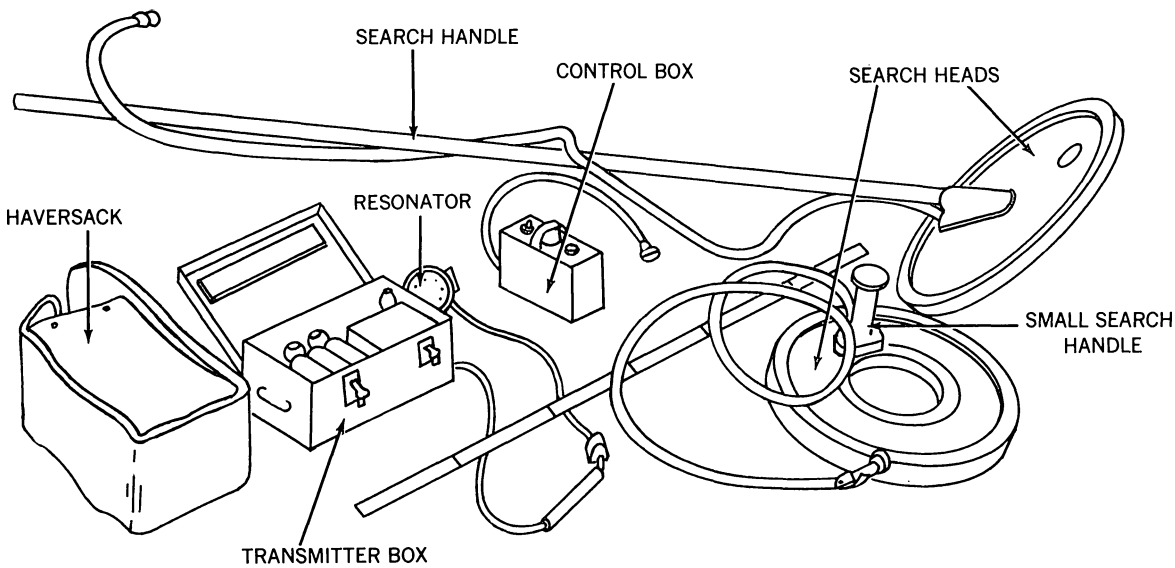


Figure 776

This is a post World War II mine detector that operates on the "best frequency" principle. It consists of a search coil, 3-section search handle, control box, oscillator amplifier, batteries, headphone, and tuner. The detector locates mines 29.9 centimeters in diameter when buried 20.0 centimeters in the ground from a distance of 15 centimeters above the surface.

a. Detector Head Assembly. The search head, in addition to coils, consists of two similar concentric wooden ring-shaped plates 38.1 centimeters in diameter and 0.2 centimeters thick. The plates are held in position 2.5 centimeters apart by a wooden ring spacer and firmly secured with adhesive.

b. Search Handle. The detector is equipped with a 3-section wooden handle 3.0 centimeters in diameter and in varying lengths of 44.4, 49.0, and 72.8 centimeters.

c. Transmitter. The transmitter case contains an oscillator-amplifier and batteries. One part of the transmitter case holds a voltmeter with switch, power button, and battery supports. The headphone cord and search coil connecting socket are located on the outside of the box, which measures 24.8 by 14.2 by 10.8 centimeters.

d. Power Supply. This consists of three 1.5-volt dry cell A batteries and one 67.5-volt B battery.

e. Indicator. This is a single headphone.

f. Controls. The controls are principally a timer, precision adjustment dial spot check button, and power switches.

g. Weight. The detector alone weighs 22.9 pounds; but with travel case and spare parts, 55.9 pounds.

471. Mine Detector, Model M-1 (Japan)

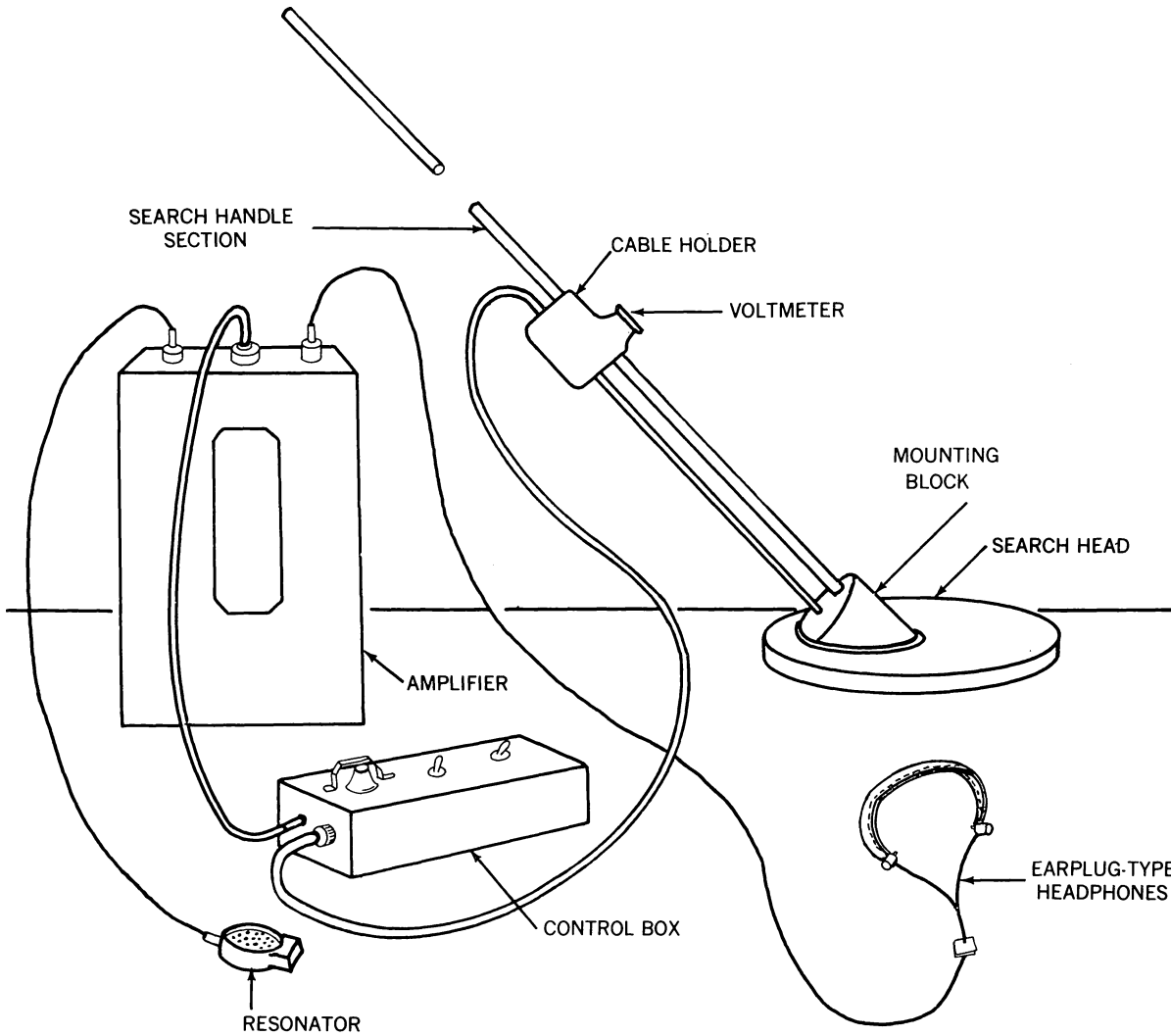


Figure 777

This is a post World War II instrument developed to locate metallic mines. It functions on the induction principle but differs from similar United States detectors by having different circuit frequency and the fine and coarse adjustment dials installed coaxially. During test, a unit held 15.0 centimeters above the surface detected an 30.0-centimeter cast-iron disk 0.5 centimeters thick buried 19.8 centimeters underground.

a. Search Head. This consists of coils and two similar concentric wooden plates 40.6 centimeters in diameter, held in position 2.5 centimeters apart by a wooden ring spacer. All parts are firmly secured and waterproofed with bonding *materials* and rubber.

b. Search Handle. The wooden search handle is in three sections of these lengths and diameters—43.1 by 2.0 centimeters, 48.2 by 2.28 centimeters, and 71.1 by 3.2 centimeters. The

bottom section, which is permanently joined to the search head, is fitted with a wooden block-like cable fastener and a voltmeter.

c. Amplifier. This has a box type light-alloy chassis, 36.7 by 16.2 by 11.8 centimeters that contains an oscillator-amplifier, batteries, and cable outlets for headphones, resonator, and control box.

d. Power Supply. The unit is powered by two 1.5-volt A batteries and one 103.5-volt B battery. Battery life is approximately 1 week, if the device is used 3 hours per day.

e. Controls. The voltmeter with cutover switch, power switch, and voltmeter regulator dial are located on one panel of the amplifier box. The fine and coarse adjustment dials, switch, and testing button are located on the control box.

f. Aerial Indicators. These include the ear plug type headphones and a separate resonator.

472. Mine Detector Three-Search-Coil Type (U.S.S.R.)

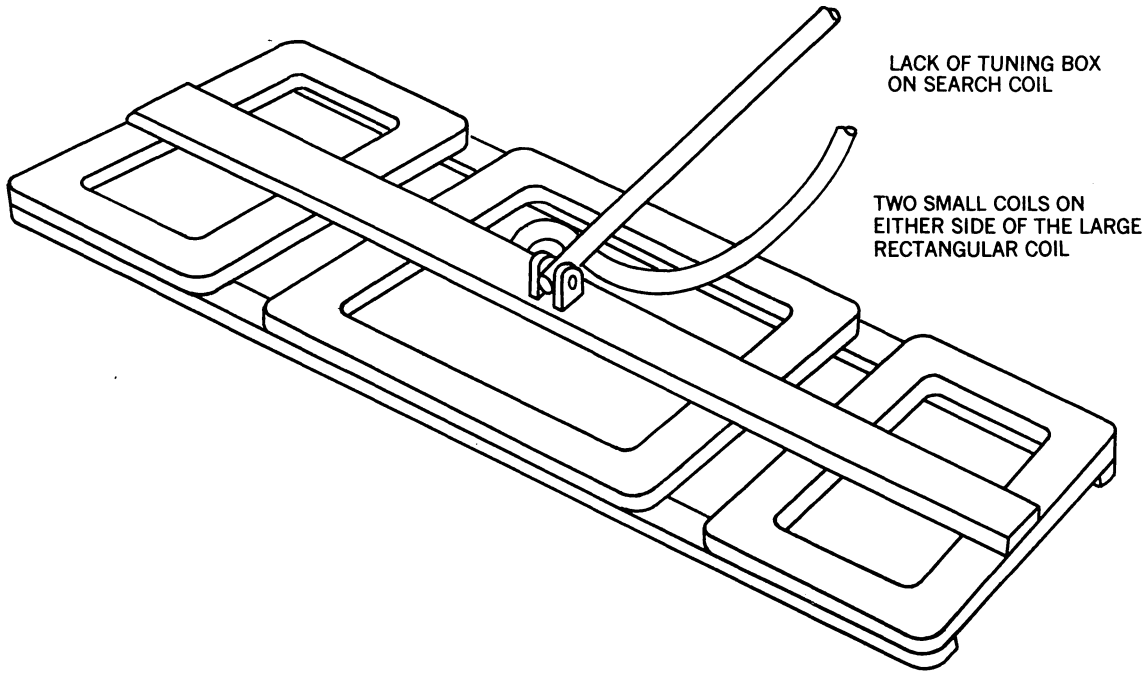


Figure 778

The Russian Army probably used this unit first in 1945. It differs from the other units in that the tuning box is not located on the search coil. The detector head assembly consists of three separate rectangular search coils mounted to form an unusually large searching device. The unit requires a search pole and earphones. The power supply and oscillator tuning box are located in the haversack.

473. Electrical Mine Detector With "Search Spade" (U.S.S.R.)

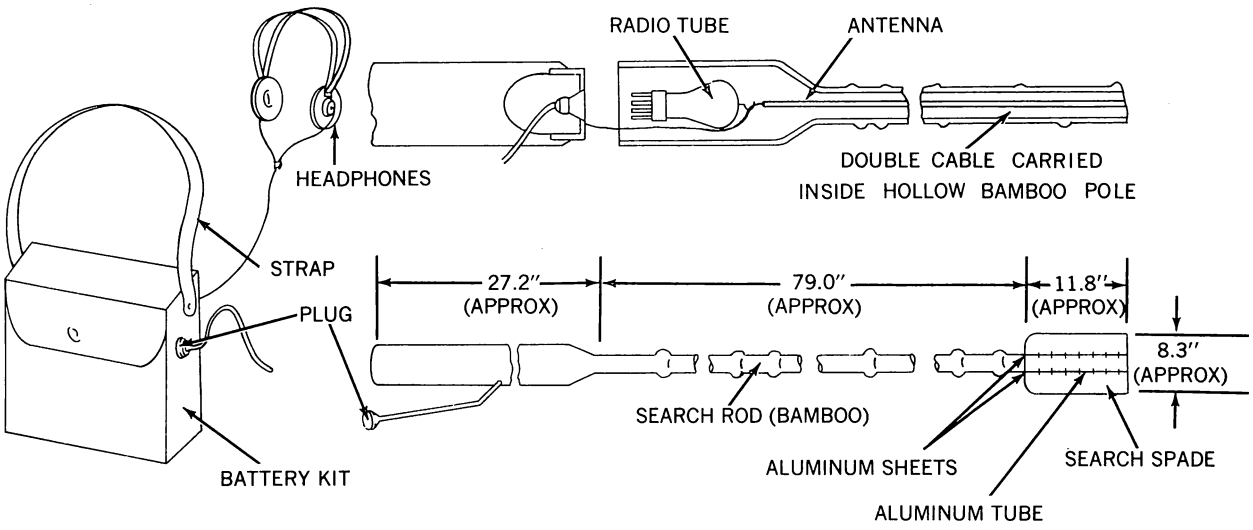


Figure 779

This model differs from the others by having a spade-shaped search head and a greater detection range.

The detector head assembly, approximately 30.0 centimeters by 21.0 centimeters in overall dimension, consists of a perforated aluminum tube 29.9 centimeters long and 3.7 centimeters in diameter and two folding aluminum plates. The neon tube control lamp is mounted in the perforated aluminum tube. The search handle is a 2 meters, 2-section, hollow bamboo pole. The amplifier, located at the top of the search handle, is 70.0 centimeters long and 10.1 centimeters in diameter. It contains a radio tube and other parts of the electrical circuit. The power supply is a kit with carrying straps containing a 90-volt dry cell and a 6-volt wet cell. The controls with plugs for attaching the headphones and search rod are located on the side of the battery kit.

474. Mine Detectors, VIM–625, Model 1942 and VIM–695, Model 1942 (U.S.S.R.)

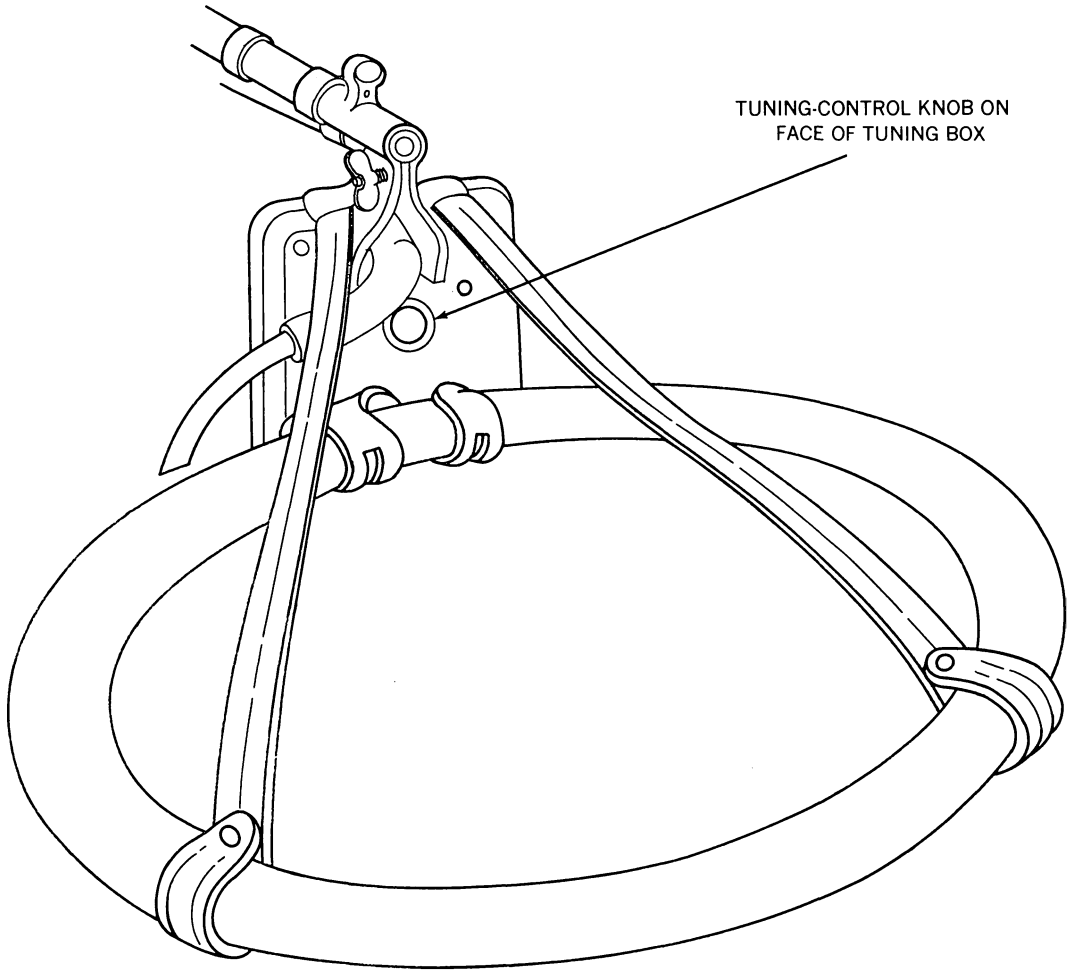


Figure 780

On the basis of meager information both models appear to be identical. They look and operate similar to the model VIM–203, except that the tuning control knob is located approximately in the center of the face of the tuning box on the side opposite the operator. These detectors have a 10-hour continuous operating life. Their physical features are as follows:

Element	Physical data	Weight (lb)
Head assembly	Either a rectangular or a 38.0 cm circular rubber-insulated search coil.	13.2
Search handle	Rifle may be used.	
Amplifier	Oscillator tuning box mounted on head assembly; has one tube.	
Power supply	2.8-v wet cell(s); 60-v dry cell—all carried in haversack.	11.2
Controls	Tone regulator in center of tuning box on opposite side from operating side.	
Aural indicators	Headphones.	
Carrying case	At least 1 haversack containing the power supply.	
	Total	24.4

475. Mine Detector, Vim–203M (U.S.S.R.)

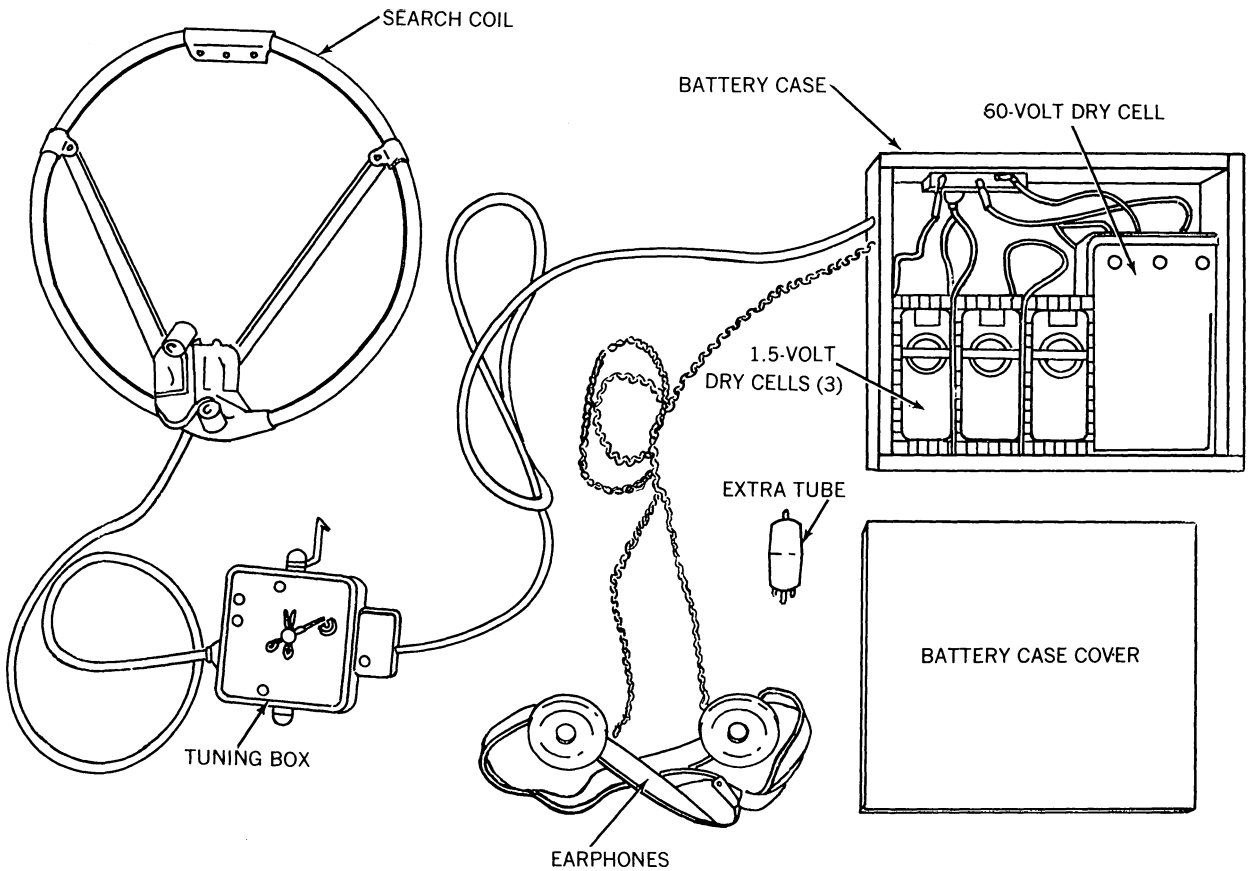


Figure 781

The Russians used this model extensively in World War II. Two different units appeared—one with a rectangular search coil and the other with a circular search coil. They varied slightly in the weight of components and the voltage of the A-battery. The circular coil model, which is described here, is the heavier of the two and has the higher battery voltage. This model may be used on a search pole or on the end of the rifle barrel.

a. Physical Features.

Element	Physical data	Weight (lb)
Head assembly	38.0-cm diameter search coil	14.5
Search handle	1.8-m, 3-section metal or wooden pole, or rifle.	
Amplifier	2-tube oscillator tuning-box mounted on the search handle.	
Power supply	Battery case containing extra tubes; an A-battery consisting of four 1.5-v dry cells (3 in use, the 4th used as a booster); 60-v B-battery; and battery case carried in haversack.	11.9
Controls	Tone regulator located on tuning box.	
Aural indicators	Headphones.	
Carrying case	Disassembled apparatus packed into the one haversack containing the power supply.	
	Total	26.4

b. Functioning. The VIM–203M detector operates on the "heat frequency" principle. The tone in the earphones changes in pitch rather than in volume; a buzzing sound occurs only when the search coil is held over a metallic object.

c. Operating Life and Range. The continuous operating life of this unit is about 30 hours. The detection range for buried metallic mines is from 20.3 to 30.4 centimeters.

476. Mine Detector, No. 6A (United Kingdom)

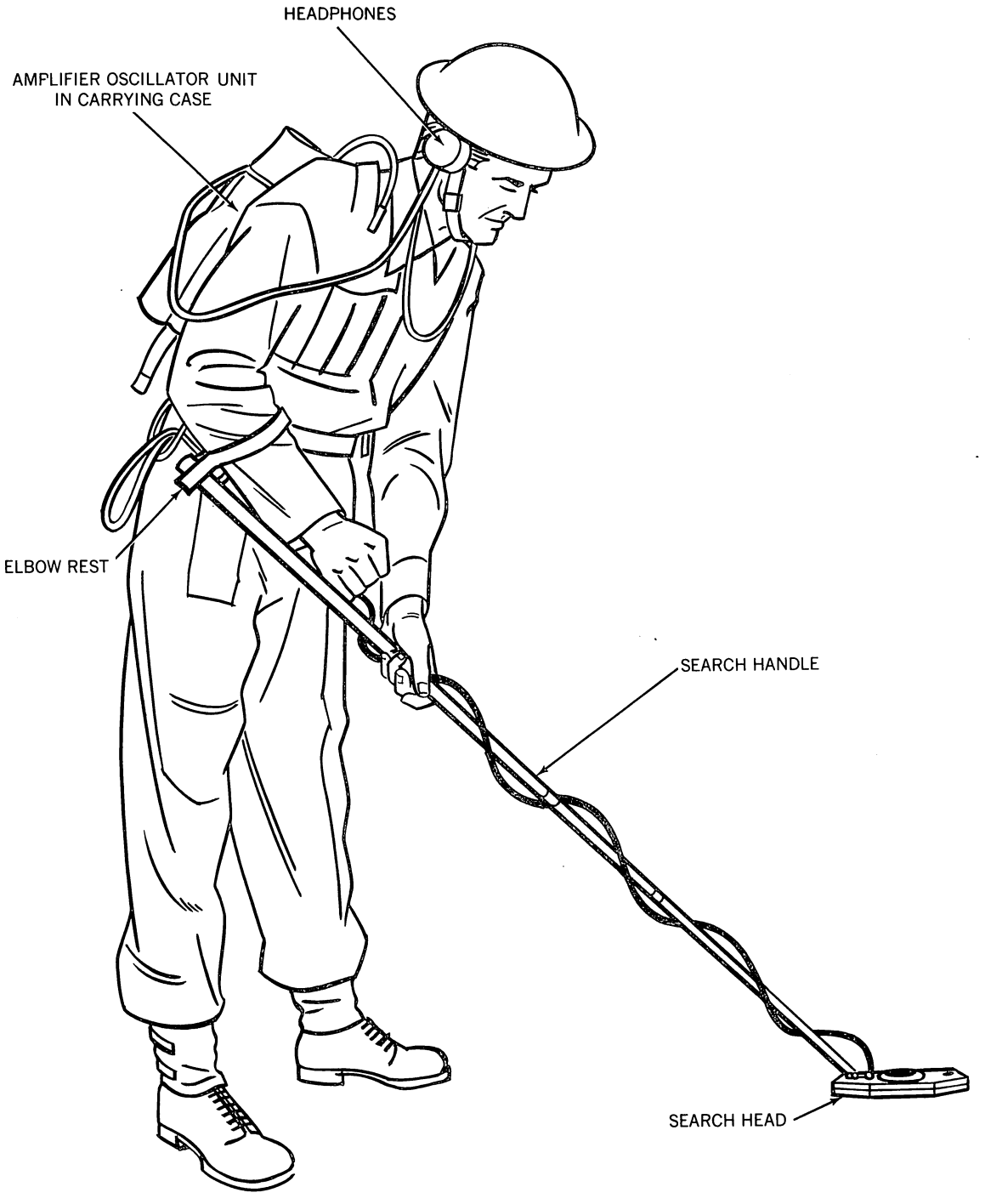


Figure 782

This unit and the No. 4 are the present British standard detectors. The No. 6A detects small metal parts at greater ranges than the other and is comparable with the No. 3 detector with the 3B attachment. The final design of the No. 6A incorporates the best features of both the No. 4A and the No. 6. In comparison with the No. 4A, the No. 6A is lighter, smaller, and immersion proof. The one serious disadvantage in this unit is the short life of the batteries—approximately 16 hours. It operates on the regeneration principle.

a. Detector-Head Assembly. The search head consists of a rectangular, round-covered, machined-plastic flat box in two pieces. The dimensions are 19.7 by 12.7 by 3.1 centimeters.

b. Search Handle. The tubular metal handle is telescopic, being divided into five sections. The length extended is 129.5 centimeters; and collapsed, 32.2 centimeters. The lowest section is made of nonmagnetic metal to eliminate any effect on the balance of the search coils.

c. Amplifier. This and its batteries are enclosed in a cast aluminum box 17.7 by 12.7 by 5.0 centimeters. The lowest section is made of nonmagnetic box and headphones enter through holes in the top of the case. The amplifier is the 3-stage resistive-capacity coupled type using 3 tubes. The oscillation frequency is about 1,100 cps.

d. Power Supply. The unit has one miniature type battery, one 60-volt battery and an unknown number of 1.5-volt batteries.

e. Controls. The small aluminum control box containing all the miniature components is 6.8 by 6.2 by 3.7 centimeters. The off, normal, and pave and regeneration controls are on the front of the box. A test button is set on one end. Cables from the search head and the amplifier enter through the ends of the box.

f. Aural Indicators. The fully-waterproof headphones have a simplified harness of a single headband and an elastic chin strap.

g. Carrying Case and Transit Case. The complete detector is carried in a 38.0 by 10.0 by 14.0-centimeter webbing haversack worn on the operator's back. Normally the detector is carried by two shoulder straps. An alternate harness fastens over the chest to allow greater freedom of movement. A wooden waterproof transit case, 55.8 by 30.4 by 22.8 centimeters, holds the complete unit in the haversack and a voltmeter, 2 spare batteries, 2 spare tubes, and various spare parts.

h. Performance. The operating life of the batteries is approximately 16 hours. Mines covered in excess of 22.8 centimeters are likely to escape detection.

477. Mine Detector, VIM-210, Models 1939 and 1940 (U.S.S.R.)

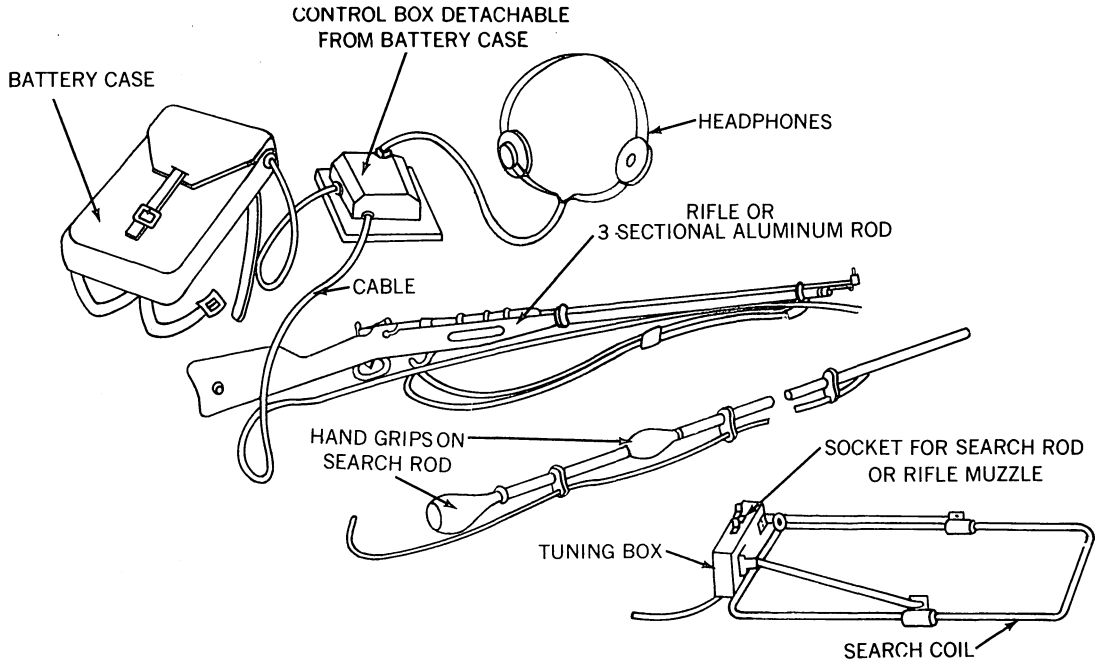


Figure 783

The Soviets in World War II used two models of this unit, the M1939 and M1940. The chief differences between the two are in the weight of the detector head assembly and power supply and in the location of the timing box. A socket on the search coil permits its use on the muzzle of a rifle or on a special search pole. The unit operates on the heterodyne oscillation principle.

a. Physical Features. The detector assembly includes a 45.0- by 25.0-centimeter rectangular search coil, weighing approximately 16.8 pounds in the M1939, and 15.2 pounds in the M1940; a search handle, which may be a 3-section aluminum rod or a rifle; a power supply; and one 1.2-v wet cell in a case and a 6-v dry cell in a haversack, weighing 9.4 pounds in the M1939 and 11.4 pounds in the M1940. It also has a control system, which is an on-and-off switch located on the side of the battery case, a tone regulator located on the tuning box, headphones plugged in on the side of the control box and carried in a haversack when not in use, and a carrying case. The M1940 detector unit is packed in one haversack.

b. Functioning. After the detector is assembled, the switch is turned to the connected position and several seconds are allowed for the tubes to heat. The tuning regulator is then tuned until a continuous buzz is heard in the headphones. The buzzing sound diminishes as the coil approaches a metal object and stops when the coil is directly over it. The unit operates continuously for a period of approximately 24 hours. With the air as a medium, it will detect an MUV igniter from a height of 5.0 centimeters, an S-mine from 24.1 to 29.2 centimeters, and a Tellermine from 44.4 to 49.5 centimeters. Both models of the detector perform identically.

478. Mine Detector, No. 4A (United Kingdom)

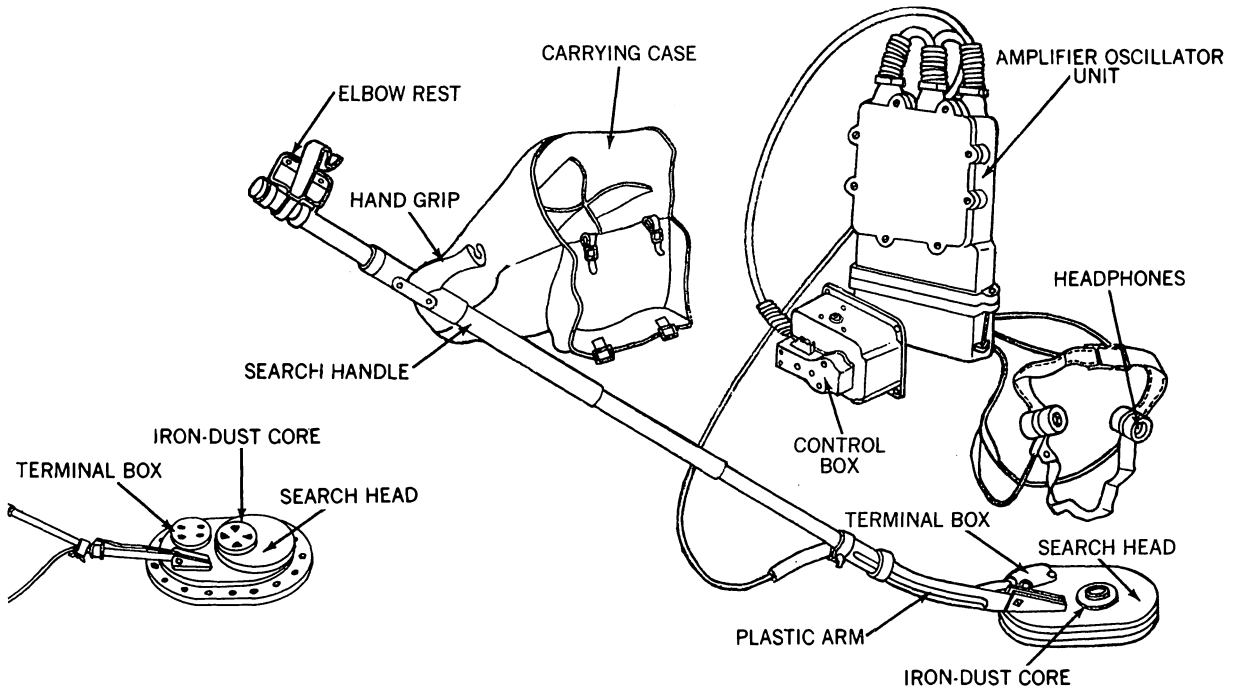


Figure 784

This is standard equipment in the British Army. It is intended as an improvement on the miniature, waterproofed No. 4 model by making changes in the control box and on-and-off switch. It is identical to the No. 4, however, in other respects. This detector is designed on the regenerative amplifier principle. The advantages of this are that it requires only one control knob, has quick response to oscillation, produces no residual signal in the headphones, has a reduced number of components, and is easy to produce.

a. Detector-Head Assembly. The oval-shaped search coil head that houses the two overlapping coils is 27.9 by 17.2 by 3.7 centimeters. It consists of top and bottom plastic plates cemented together and sealed with linen tape. Later models have search heads made of upper and lower molded plastic sections held together by a riveted flange.

b. Search Handle. This is a telescopic steel pole in four sections. The collapsed length is 38.1 centimeters; the expanded length is 129.5 centimeters.

c. Amplifier. This two-part cast aluminum case measures 30.48 by 19.0 by 6.3 centimeters. The upper compartment contains the amplifier unit with its three miniature pentode tubes; the lower holds the batteries. The cables to the headphones, control box, and search head emerge through the top of the case. The oscillator is tuned to a resonant frequency of 1,300 cps.

d. Power Supply. One type of power supply has a 1½-volt battery and a 60-volt battery in a common unit. The other type, for tropical use, has a 72-volt instead of a 60-volt battery.

e. Controls. The control box is made of cast aluminum 12.7 by 7.62 by 6.27 centimeters. It is clipped to the shoulder strap of the webbed haversack. The switch has three positions, off, normal, and pave.

f. Aural Indicators. The headphones, completely enclosed in rubber, are connected with a webbing harness and permanently attached to the amplifier.

g. Carrying Case and Transit Case. The complete detector is contained in a webbed haversack 38.1 by 17.7 by 27.94 centimeters. When the detector is used, the haversack containing the amplifier is worn on the back. A wooden transit case is provided to carry the complete equipment, including spare tubes, batteries, and an iron-dust core cover. It measures 60.9 by 35.4 by 27.9 centimeters. The total weight of the apparatus in the haversack is 24.0 pounds and in the transit case, 54.0 pounds. The average operating life of batteries under temperat conditions is 60 to 100 hours.

479. Mine Detector, No. 5 (United Kingdom)

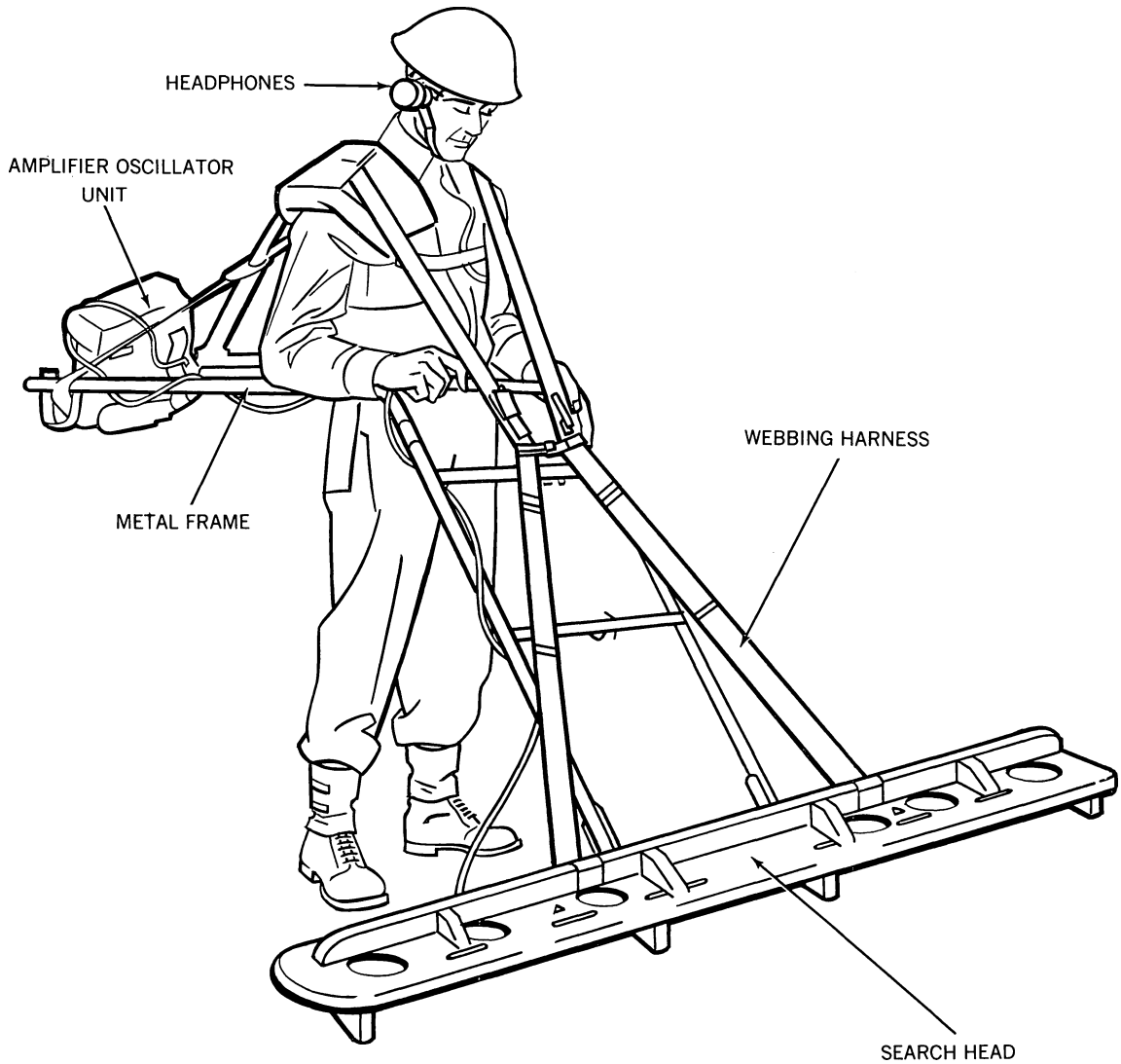


Figure 785

This is a 2-meter wide-sweep apparatus carried on a metal framework that is supported on the operator's shoulders by harness webbing. The heavy search head is counterweighted by the oscillator-amplifier unit. This detector will clear borders or edges of mined areas and stray mines, and locate minefields. It is inadequate, however, for detecting Schü type mines and antitank and antipersonnel wooden mines.

a. Detector-Head Assembly. This is a flat wooden inclosure, perforated to decrease weight, 16.5 centimeters long and 27.9 centimeters wide. It houses eight coils, each with an outside diameter of 21.5 centimeters, arranged in two sets of four coils each.

b. Search Handle (carrying frame and harness). The search handle is made of 2.2 centimeters tubular steel of folding construction. It

consists of a short front section and a long rear section. The detector is carried by a harness of two main webbing straps worn over the operator's shoulders and attached to the frame. The total length of the frame, when open, is 2.3 meters.

c. Amplifier Oscillator. It is an oscillator and a two-stage audio amplifier. The frequency of oscillation is 1,300 cps. The unit and batteries are contained in a sheet iron case carried in a webbing haversack.

d. Power Supply. This includes one 60-volt battery and four 1.5-volt batteries.

e. Controls. The metal control box, 7.6 by 6.2 by 6.2 centimeters, clamps onto the cross member of the frame in front of the operator. It has an off-on-switch and two control knobs.

f. Aural Indicators. The high-impedance type headphones are not waterproof.

g. Transit Case. A transit case is provided for the complete equipment.

h. Performance. During operation, the search head is kept 7.6 to 10.1 centimeters above the ground. The presence of a mine is indicated by a loud signal in the headphones. The exact location of the mine under the search head, however, is often difficult to ascertain.

Section II. MINE PROBES (UNITED KINGDOM)

480. Mine Probe, No. 4

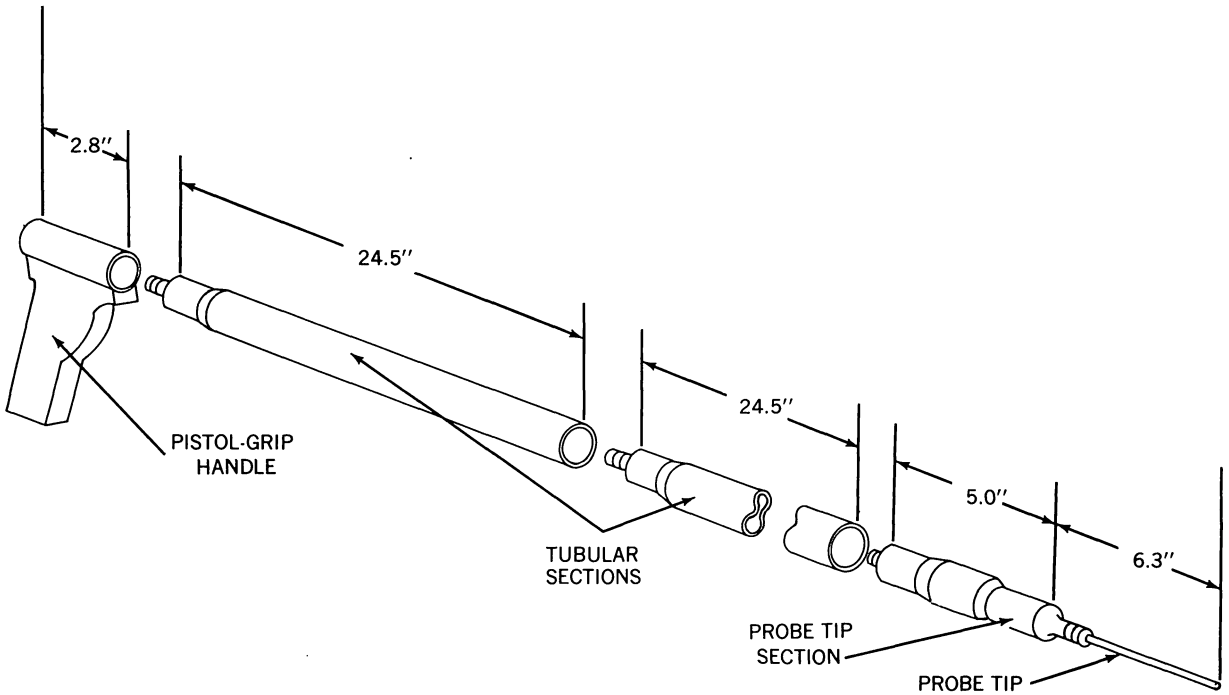


Figure 786

The device has a pistol grip handle, two light metal tubular sections, and a stainless steel probe tip. The four parts are assembled for operation in the standing position. It may be shortened by assembly with only one tubular section, or by screwing the probe tip directly to the pistol grip handle for use from a kneeling or a prone position. The device is carried with the probe tip screwed inside one of the tubular sections. The overall length is 1.6 meters, and the weight, approximately 2 pounds. When not in use, it is disassembled and placed in a canvas carrying bag attached to the left shoulder strap of the field web equipment.

481. Mine Probe (Switzerland)

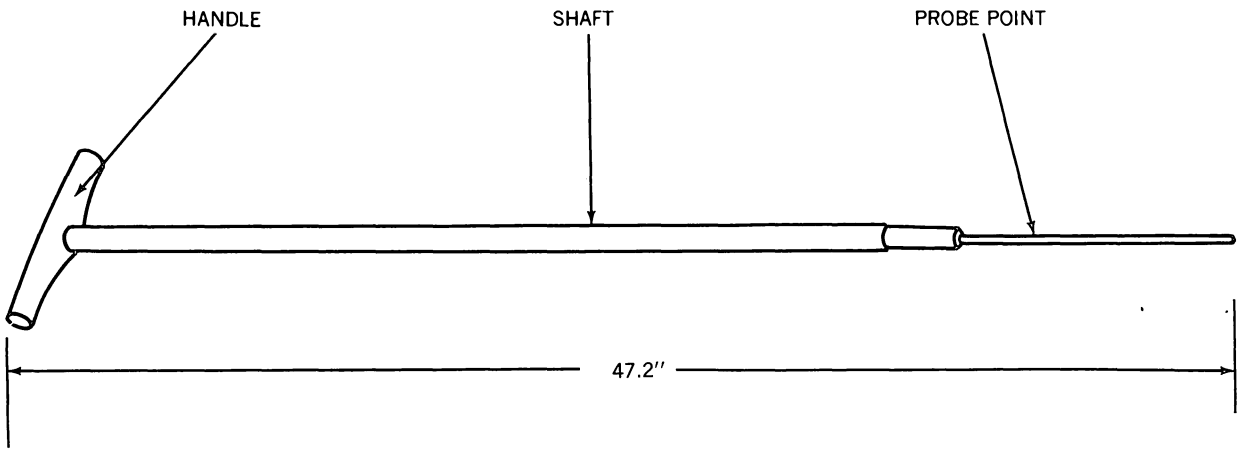
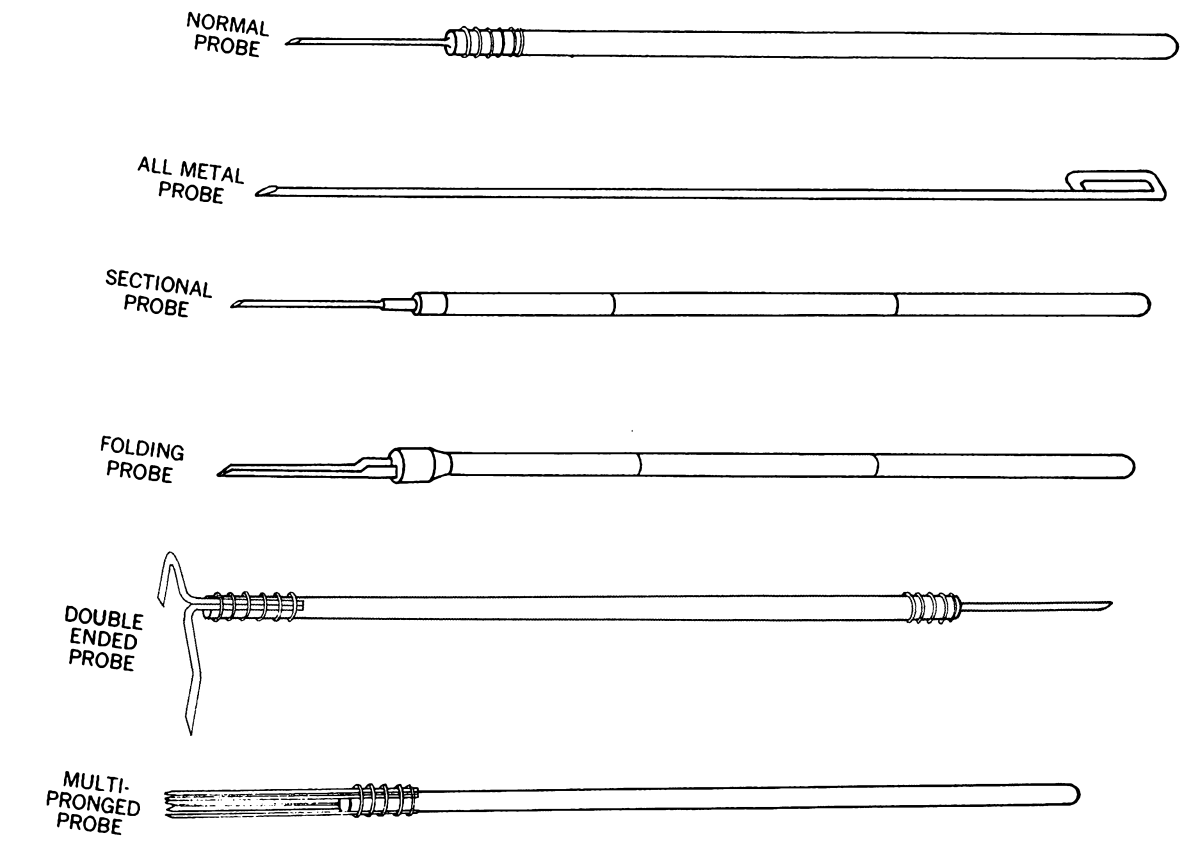
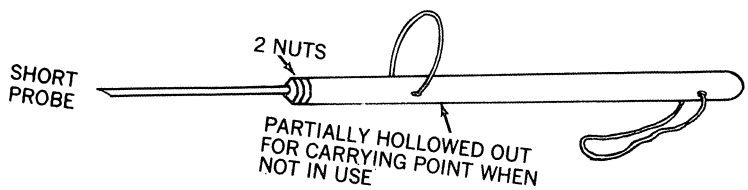


Figure 787

This is a simple metal probe point mounted on a wooden shaft with a cross handle on the top. It is used in the conventional manner to locate shallowly buried mines.

482. Mine Probes (U.S.S.R.)





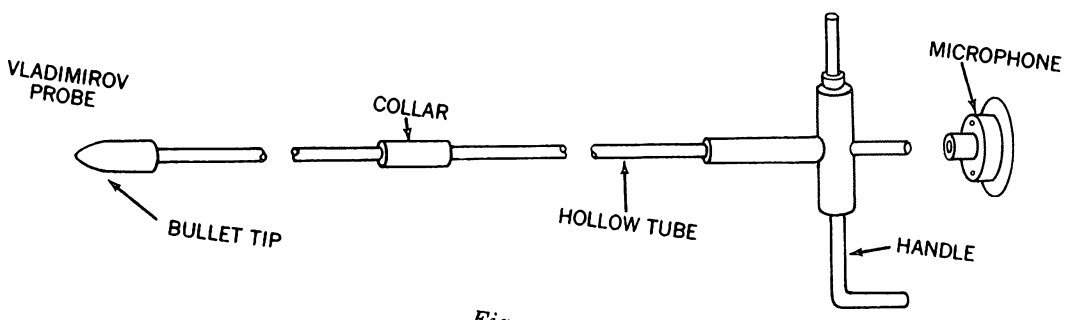


Figure 788

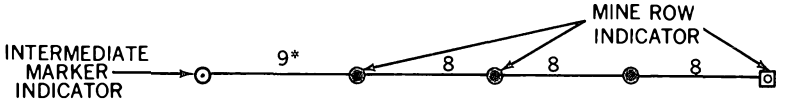
Mine probes were among the most important Soviet means of locating land mines in World War II. In many instances they were used when electronic instruments failed. Many of the Soviet probes were improvised bayonets, long knives, sharp wooden poles, stiff wires, or thin metal rods that were wired or otherwise fastened to a wooden or metal pole. The Soviets provided eight types of standard probes, generally made of metal or wood. They were designated as normal, all-metal, sectional, folding, double-ended, multipronged, short, and Vladimirov. The Vladimirov probe, the most complex of all, was used to detect clockwork delay fuzes and aerial bombs. It was made in six 1.5-meter, 0.8-centimeter diameter hollow sections joined together with metal collars. The tip was bullet-shaped, and on the other end were a microphone and a cross-handle. Upon contact with the mine, the ticking of clockwork devices could be heard through the microphone and felt through the length of the probe. The Vladimirov probe, however, was suitable only for mine location in holes or soft loose ground.

CHAPTER 13

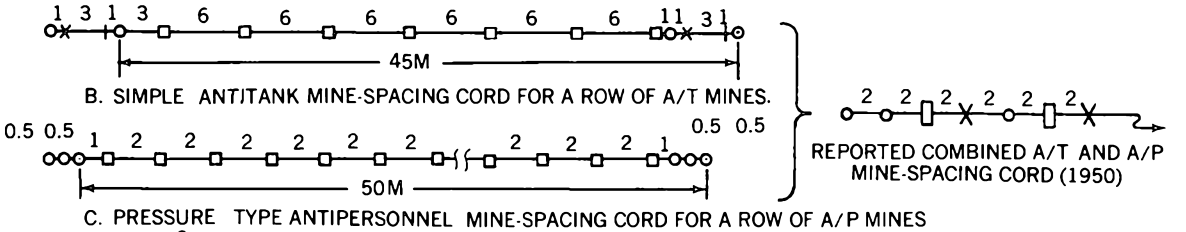
LAYING AND SPACING CORDS, DISTRIBUTORS, AND CLEARING ROLLERS

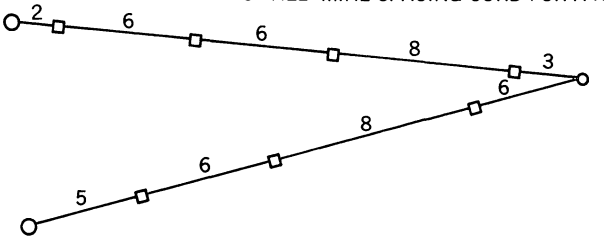
Section I. MINELAYING AND SPACING CORDS

483. Mine Laying and Spacing Cords (Czechoslovakia)



A. BOUNDARY TAPE FOR A 4-ROW ANTITANK MINE BELT





D. TRIANGULAR MARKING CORD (trojuhelnikovy vytycovaci provazec) FOR ROAD MINING.

* ALL NUMBERS INDICATE METERS (1 METER = 3.3 FEET)

Figure 789

Four types of these are used in the Czechoslovakian Army in laying antitank and antipersonnel minefields and road-mine barriers. Around 1950, the antitank and antipersonnel spacing cords were combined into one with alternating X, O, and □ markers spaced 2 meters apart in that order over the length of the cord.

a. Boundary Tape for Four-Row Antitank Mine Belt. This consists of a cord 33 meters long with an indicator at each end and three rings spaced 8 meters apart from one end. It is used to establish the boundary of a section of a hasty antitank minefield (A in illustration above). The indicator, spaced 9 meters from the first ring, is placed at the intermediate marker or reference stake and the cord is stretched out toward the enemy. The rings and the other indicator mark the location of the beginning of each row of mines.

b. Simple Antitank Mine-Spacing Cord. This cord is 50 meters long with black markers (for locating the position of antitank mines). These are spaced 6 meters apart, other markers are spaced at varying distances from each end of the cord (B in illustration above). When used, the O, X, □, or O is placed on the row marker of the boundary tape and the cord is stretched out perpendicular to it. Mines are laid at the 6-meter interval markers. A staggered pattern may be made by placing a different indicator in succeeding boundary tape row markers.

c. Antipersonnel Mine-Spacing Cord. This device is used for laying belts of pressure type antipersonnel mines (PP–Mi–D) in the same manner as that of the cord discussed in subparagraph *b* above (C in illustration above).

d. Combined Antitank—Antipersonnel Mine Spacing Cord. This seems to be an attempt to eliminate the need for two cords by combining two into one. In this respect, the combined cord resembles the German minespacing cord, but has fewer markers. It has two Os and one □ spaced 2 meters apart from one end for staggering the position of succeeding rows of mines from the boundary tape. The mine-spacing markers—X, O, and □—are spaced 2 meters apart throughout the length of the cord so that antitank mines as well as antipersonnel mines may be spaced correctly and accurately.

e. Trianguler Marking Cord for Road Mining. This device is used for the rapid irregular spacing of mines in a road during withdrawal operation (D in illustration above). It permits quick relocation of the mines if the area is retaken. The apex of the angle is laid in the roadway toward the enemy and the two legs are stretched out to either side of the road. Succeeding triangles of mines are laid away from the enemy with the apex either within the preceding triangle or somewhere along its base. Road-mine barriers laid with the cord are mostly 100 to 500 meters in depth.

484. Mine Spacing Cord (France)

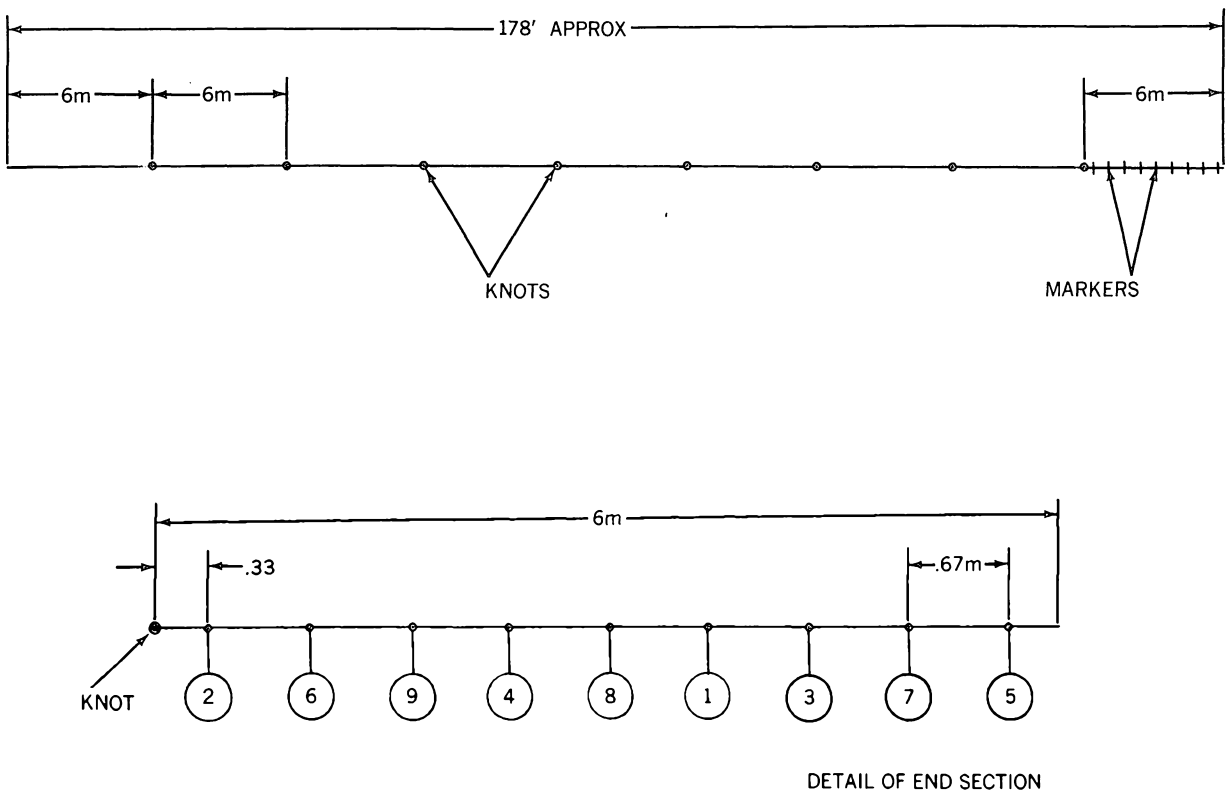


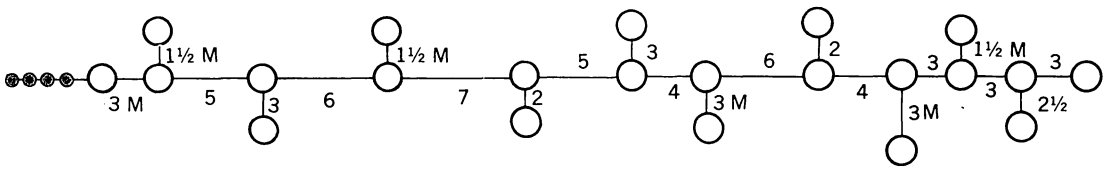
Figure 790

Two types of mine spacing cords are available to the French Army—one for laying antitank mines and one for antipersonnel mines. The first is approximately 54 meters long with knots tied at about 6-meter intervals. One end section has nine, equidistant, numbered markers. The antipersonnel mine cord is approximately 56 meters long and divided into seven equal parts by knots; each end section is divided into two parts by a marker.

a. Antitank Mine Spacing Cord. The purpose of this device is to establish the position of antitank mines in the rows of a minefield. For the first row, the number one marker is placed on the row picket, the cord is stretched out, and a mine set at each knot. For the second row, marker number two is placed on the row picket, and so on. As the numbered markers are not positioned in numerical order, the cord is shifted laterally for each row so that the mines are staggered in depth.

b. Antipersonnel Mine Spacing Cord. This cord is used to establish the position of antipersonnel mines (pressure and pull types) in the rows of a mixed (antitank and antipersonnel) or antipersonnel minefield. It is used in essentially the same way as the antitank cord. The markers, however, placed on the starting pickets are not numbered; the one to be used is designated by the chief of the laying party.

485. Mine-Spacing Cord (U.S.S.R.)



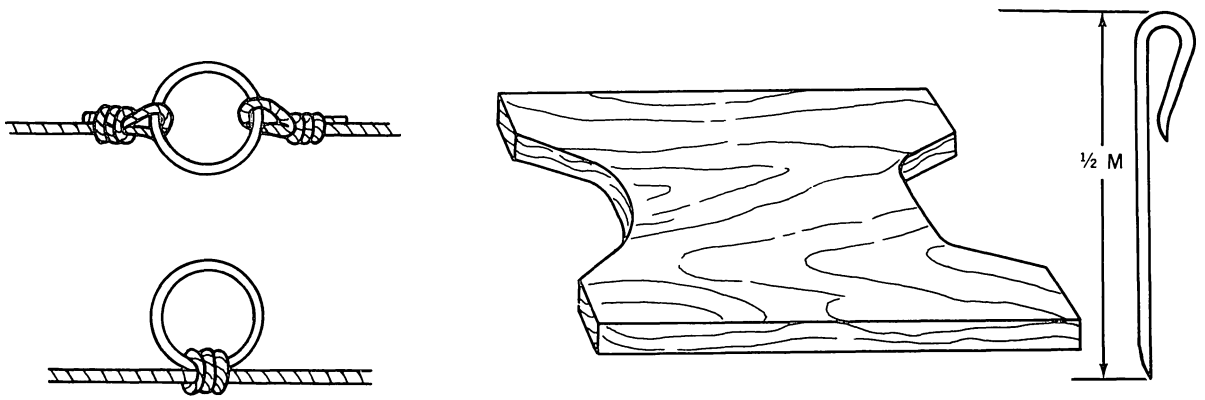


Figure 791

a. Physical Features. This device consists of a main cord with branch lines to which metal rings are attached. The rings indicate the spot for the emplacement of a mine. The main cord, with markers at the end to control lateral shifting, has no standard length (it may be 20 meters or more) ; and the lengths of the branch cord and the distances between them may vary. This device is a means of quick and accurate spacing that may follow a straight line or change direction several times within its length. All changes in direction are indicated on the minefield record.

b. Employment. In minelaying, the cord is laid out to the right, beginning at the forward end of the left boundary line. It is then stretched and pinned down at both ends with metal pins or wooden stakes. Mines are placed at the rings tied to the ends of the short cords, which are laid out at right angles to the main cord. After the first row has been laid, the device is shifted laterally from the second row, thus staggering in depth the mines within the panel. This procedure is repeated until the required number of rows is laid. The location of these mines is posted on the field record card.

Section II. MINE DISTRIBUTORS AND MINE CLEARING ROLLERS

486. Mine Distributor, Vehicle-Mounted (Poland)

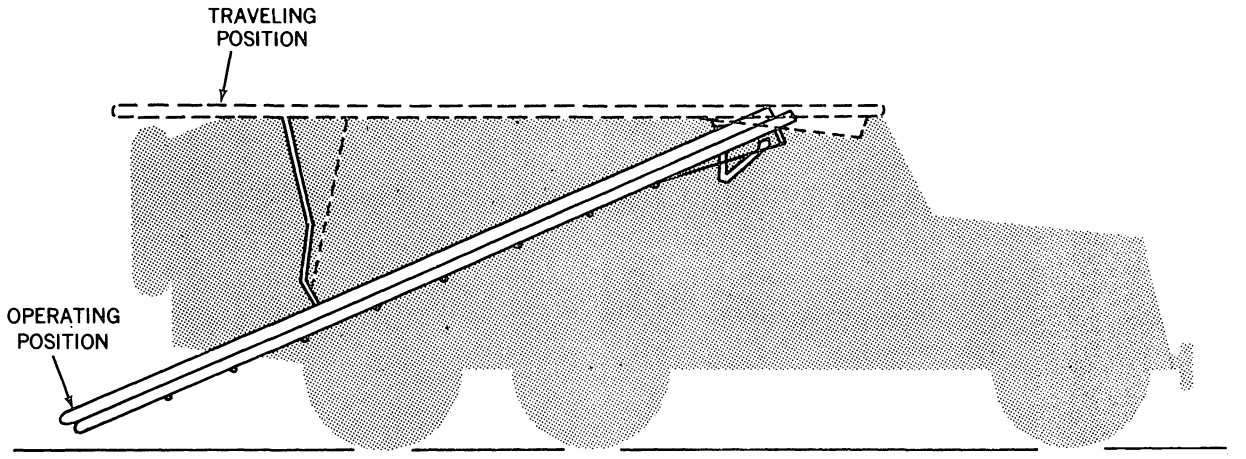
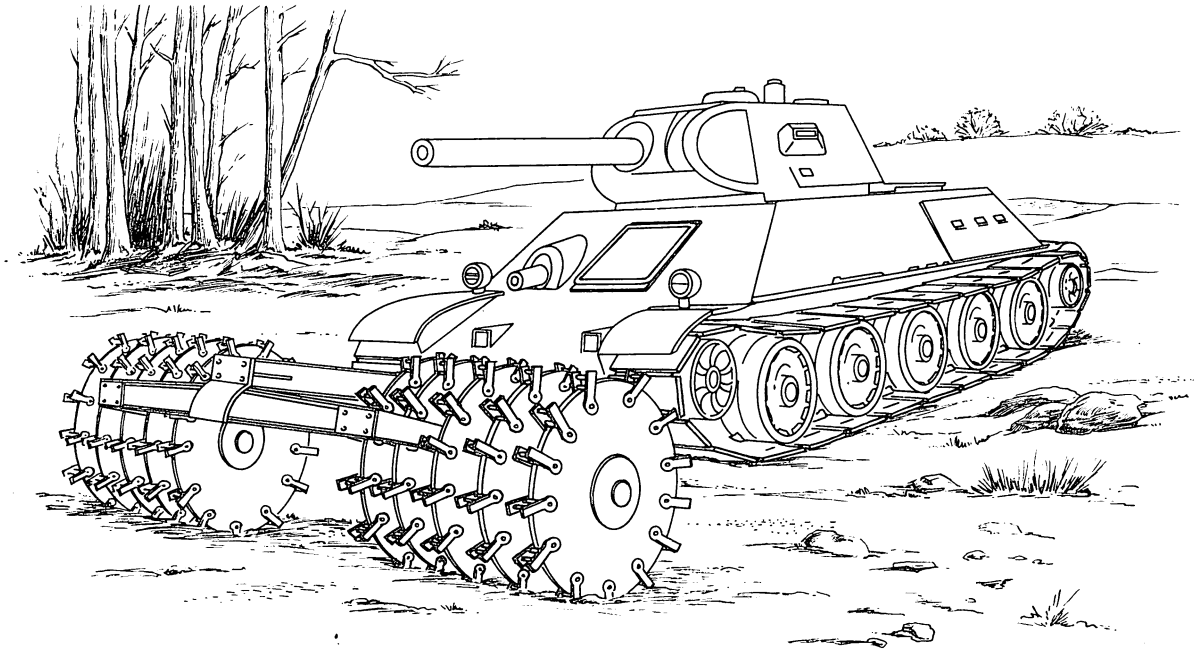
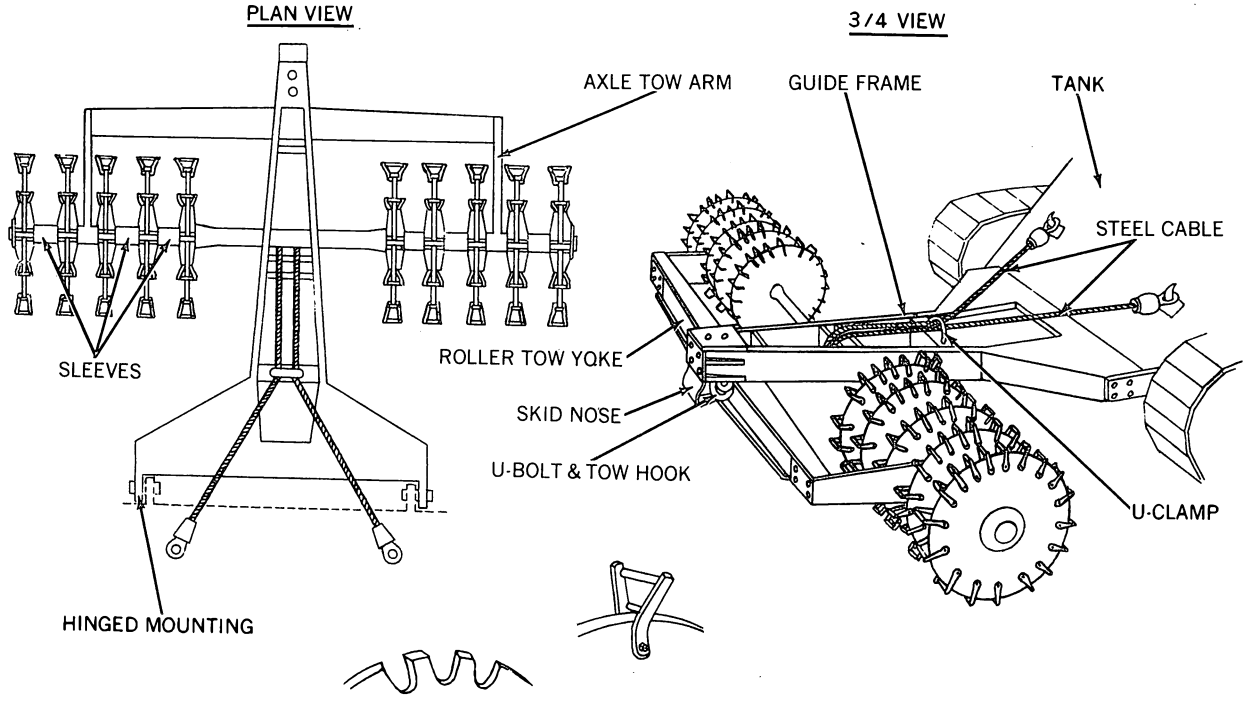


Figure 792

This device is composed of a single chute hung over each side of the vehicle that carries the mines. The spacing is determined by the speed of the vehicle and the agility of the crew in placing them in the chutes. This distributor is intended primarily for hastily placing mine barriers by retreating troops in light scrub land where undergrowth hides the mines from observation. The chutes are 4.6 meters long, 40.6 centimeters wide, and 12.7 centimeters high.

487. Tank-Mounted Mine Clearing Roller (U.S.S.R.)





TWO DIFFERENT DISK FEATURES

Figure 793

The Soviets have spent much effort recently to the development of the cumbersome tank-mounted rollers and flails for mine clearing. The most recent models of rollers clear two wide tracks (each about 2 meters wide) for the passage of tanks and other vehicles. One of these consists of two groups of five disklike plates mounted on a common axle and secured to the front of a tank. A-shaped studs are bolted around the circumference of each disk. Another type of disk has 18 deep notches cut in at the circumference.

APPENDIX

REFERENCES

DA Pam 108-1	Index of Army Motion Pictures, Television Recordings, and Film Strips.
(S) TB 381-1A	Combat Technical Intelligence Bulletin (CETIB Supplement) (U)
(S) TB 381-2	Combat Equipment Technical Intelligence Bulletin (CETIB), non-Bloc (U)
AR 320-5	Dictionary of United States Army Terms.
FM 5-25	Explosive and Demolitions.
FM 5-31	Use and Installation of Boobytraps.
FM 20-32	Land Mine Warfare.
FM 21-5	Military Training.
FM 21-6	Techniques of Military Instruction.
FM 21-11	First Aid.
FM 21-30	Military Symbols.
(C) TM 5-280A	Foreign Mine Warfare Equipment (U).

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For explanation of abbreviations used, see AR 320-50.

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