DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TM 5–223B

This manual supersedes chapters 9, 11, and 13 of FM 5–31, 1 November 1943.

ORIENTAL & EUROPEAN

(EXCEPT BRITISH, FRENCH

GERMAN, ITALIAN

AND SOVIET)

MINE WARFARE EQUIPMENT

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CONTENTS

This manual supersedes chapters 9, 11, and 13 of FM 5–31, 1 November 1943.

PART ONE
INTRODUCTION TO FOREIGN MINE WARFARE EQUIPMENT

CHAPTER 1
GENERAL

1. Scope and Purpose

a. This manual is the second in a series of manuals containing detailed technical information on foreign mine warfare equipment. This manual covers mine warfare equipment of the Oriental countries, and of the various European nations, except Great Britain, France, Germany, Italy, and Soviet Russia. The various types of fuzes; mines; antilifting devices; booby traps; mine laying, marking, and recording equipment and supplies; and mine detecting and clearing equipment are described and illustrated. TM 5–223A, Soviet Mine Warfare Equipment, has been published; other manuals in the series are presently in preparation.

b. The series of manuals on foreign mine war fare equipment is a basic guide to be used in the identification and employment of foreign mine warfare equipment and for the neutralization of foreign mines and fuzes.

c. Information on foreign mine warfare policies and tactics is contained in FM 5–32.

2. Development of Mine Warfare

Originally, mine warfare consisted of tunneling beneath the enemy and using explosives to destroy otherwise impenetrable positions. This type of mine warfare continued through World War I. During the later part of World War I, when tanks made their appearance, both the Germans and the

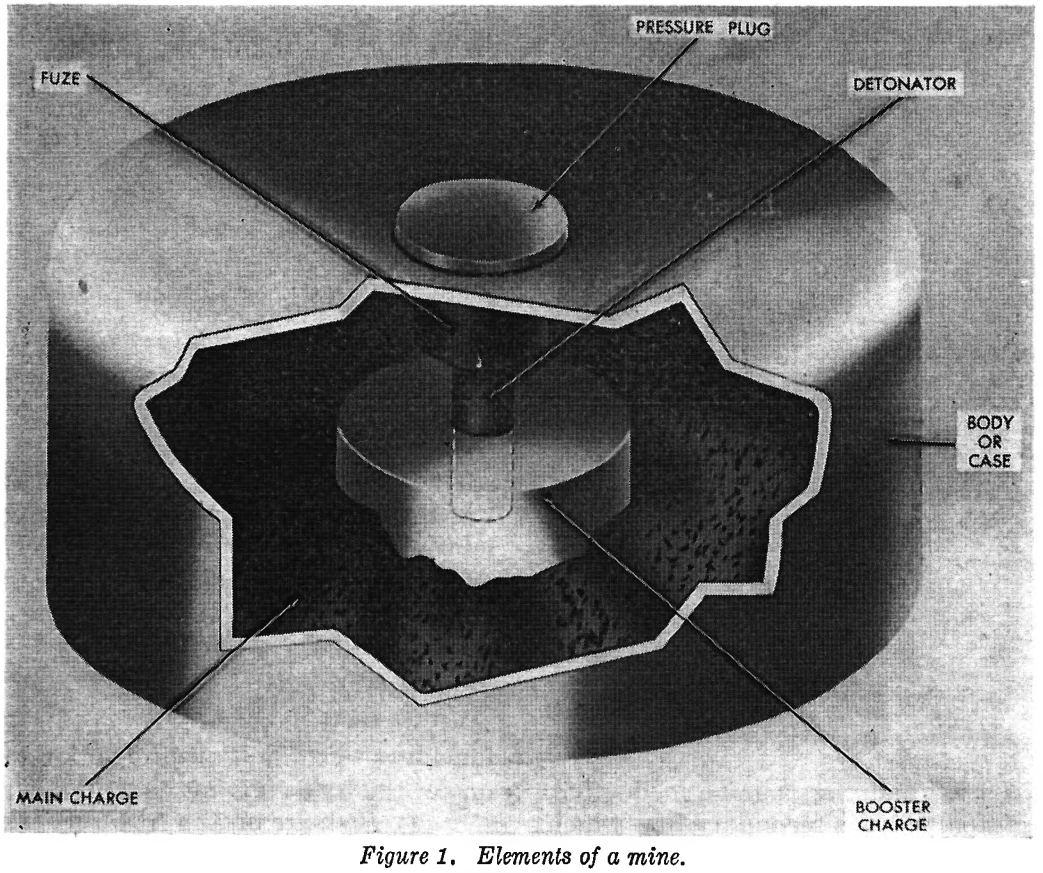


Figure 1. Elements of a mine.

Allies began to use land mines constructed of artillery shells. The importance of mine warfare was not definitely established until World War II. Large mine fields placed in key locations helped the British hold back the Germans in North Africa. Extensive use of mines by the Soviet Army contributed materially to delaying the German advance into Russia. Mines were also extensively used in the fighting in Italy and during campaigns in France and Germany. In Korea mines have been employed extensively.

3. Mine Terminology

a. A *mine* is an encased charge of explosive placed under water, laid on the ground, or buried. To detonate the mine, it is necessary to provide one or more detonating devices. The elements of a mine are shown in figure 1. The types of mines used in foreign mine warfare are discussed in paragraph 5.

b. A *fuze* is a mechanical, chemical, or electrical device which starts the firing chain of a mine (par. 4). Fuzes are classified according to use (instantaneous or delayed-action), the type of initiating action required to start the fuze functioning (par. 4*a*), and the internal action which produces the flame or spark (par. 4*b*).

c. Installing the fuze is the insertion of the detonator and fuze assemblies into a mine.

d. Arming is the removal of all safety devices so the mine is ready to function (fig. 2).

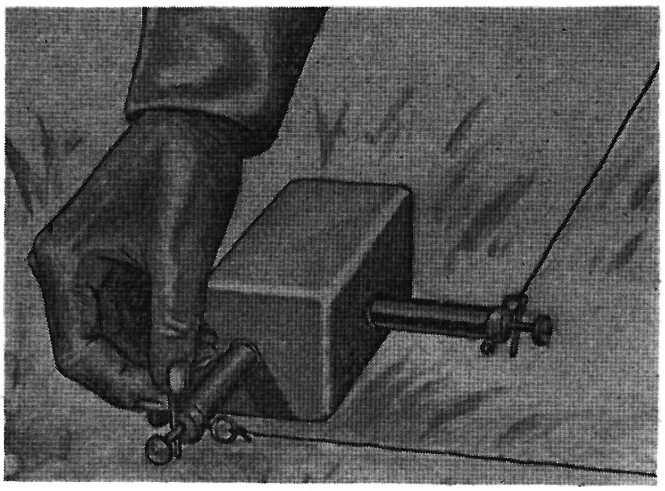


Figure 2. Arming a mine.

e. Neutralizing is rendering a mine ineffective.

f. An *activated mine* has a secondary fuze which will cause detonation when the mine is moved. The device can be attached either to the mine itself or to a second mine or auxiliary charge beneath or beside the mine (fig. 3).

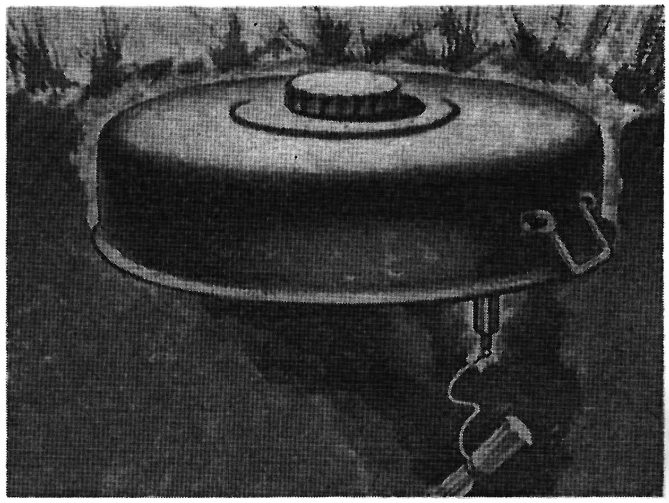


Figure 3. Activated mine.

g. Sympathetic detonation is the detonation of one or more charges induced by the explosion of another charge (fig. 4).

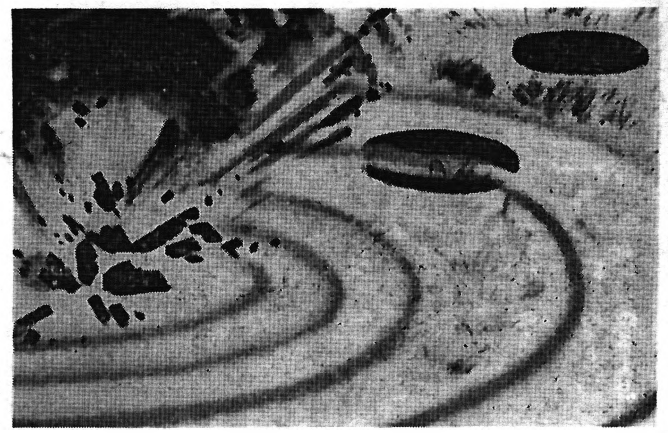


Figure 4. Sympathetic detonation of mines.

h. The *effective casualty radius of a mine* is that radius within which 50 percent of all personnel will become casualties when a mine is detonated. It is expressed in yards.

i. The *danger area of a mine* is that area within which fragments of a mine may produce casualties; however, personnel in this area, but outside the effective casualty radius, are relatively safe.

4. Firing Chain of a Mine
(fig. 5)

a. INITIATING ACTION. Personnel or vehicles, including tanks, initiate the action in the fuze by one of the following methods (fig. 6):

(1) *Pressure* on the fuze (fig. 6).

(2) *Pull* on a pin or pull ring attached to the fuze by means of a trip wire (fig. 6).

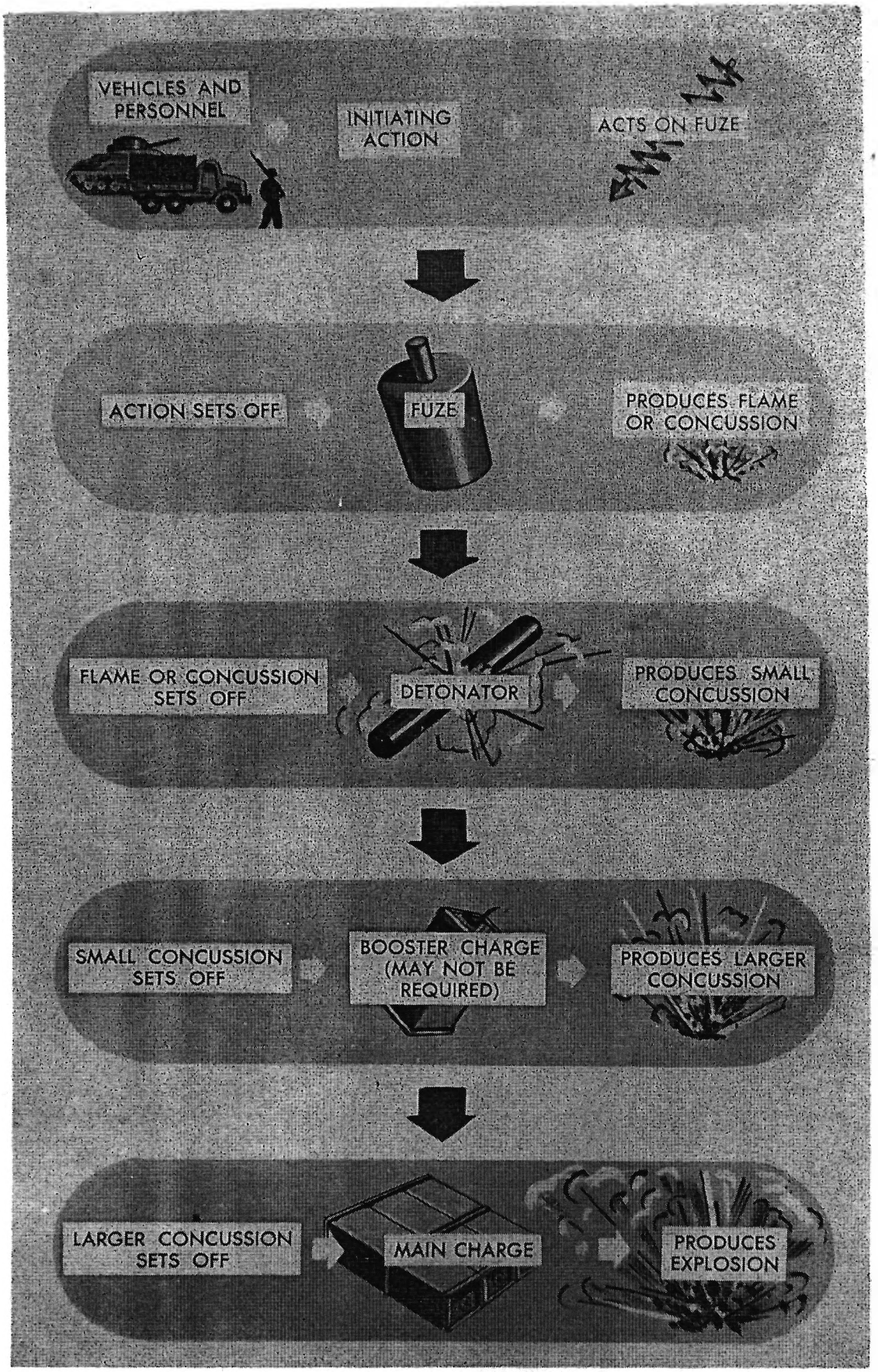


Figure 5. Firing chain of a mine.

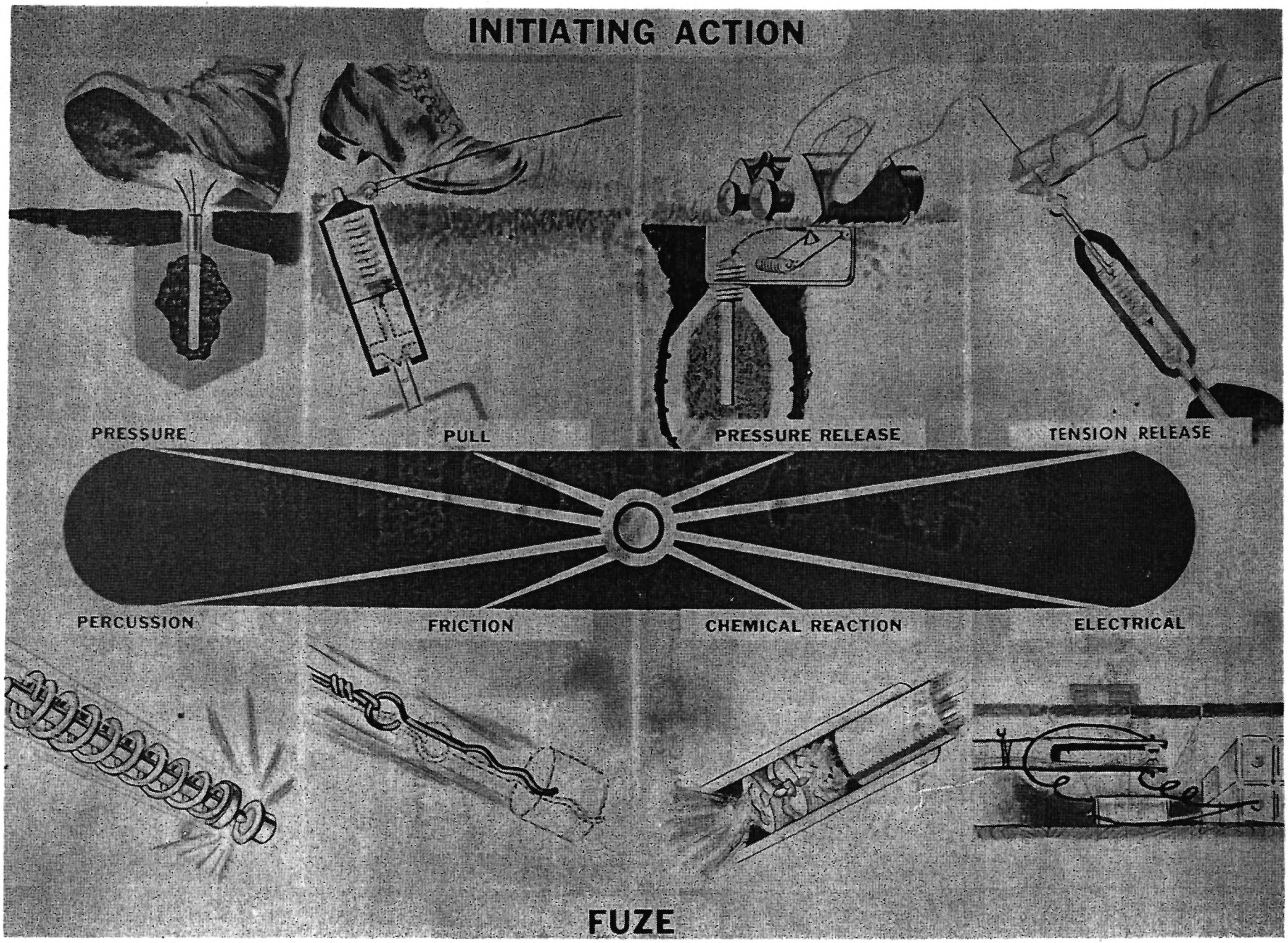


Figure 6. Various initiating actions and fuzes.

(3) *Pressure release* by removing an object from a compressed spring-actuated lever or plunger (fig. 6).

(4) *Tension release* by cutting a taut wire tied to a compressed spring-actuated striker (fig. 6).

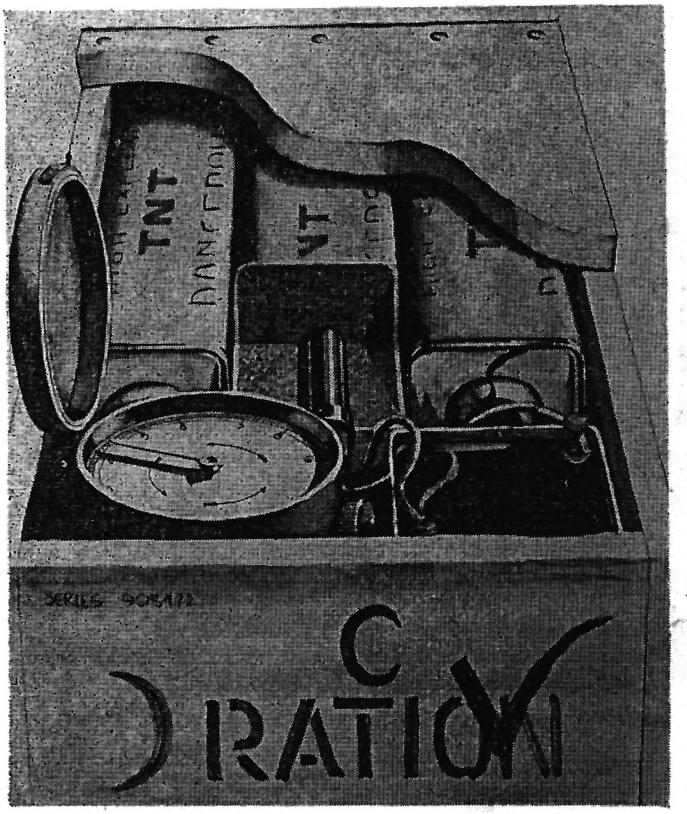


Figure 7. Clockwork delay mechanism.

(5) *Setting delayed-action mechanism* to actuate a fuze. This is normally accomplished by setting a clock mechanism for a desired time delay in the actuation of a fuze (fig. 7). Sometimes this delayed action mechanism consists of a vial containing a chemical which upon being released corrodes a striker-retaining pin or wire. Another way of obtaining a delayed action is to provide a chemical vial within the fuze. An application of any of the previously mentioned initiating actions will result in the chemical vial being broken. The desired time delay is the time required for the chemical to corrode the striker-retaining pin or wire.

(6) *Vibrations* induced by movement in water, air, ground, or structure, where a vibration-contact fuze is laid (fig. 8).

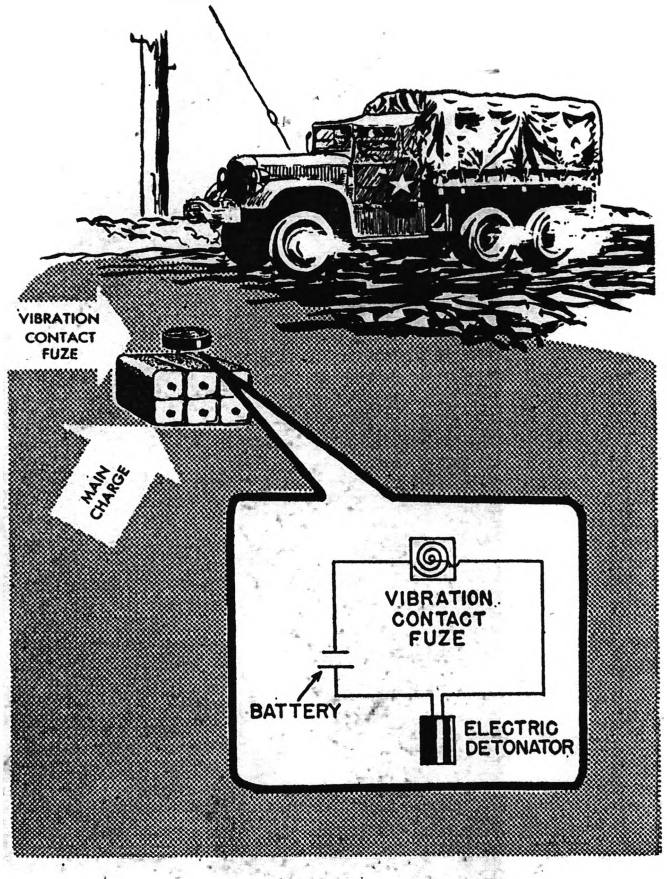


Figure 8. Vibration-contact fuze closes an electrical circuit.

(7) *Frequency induction* by—

(*a*) Operating an electric mine detector over a pick-up coil of an induction fuze.

(*b*) Sending radio signals on the same frequency as that of the induction fuze (fig. 9).

(8) *Magnetic induction* by moving a metallic mass over a magnetic type fuze (fig. 10).

(9) *Breaking a light beam*, or otherwise completing an electric circuit (fig. 11).

b. FUZE. The initiating action starts the fuze functioning. The fuze, in turn, ignites the detonator by one of the following means:

(1) *Mechanical.* A percussion cap within the fuze is fired by a mechanically released striker (fig. 6). The percussion cap in turn ignites a detonator. Ignition by friction, as shown in figure 6, is another mechanical method.

(2) *Chemical.* A small vial containing acid is broken. The chemical reaction of the acid with the explosive generates heat which sets off the explosion (fig. 6).

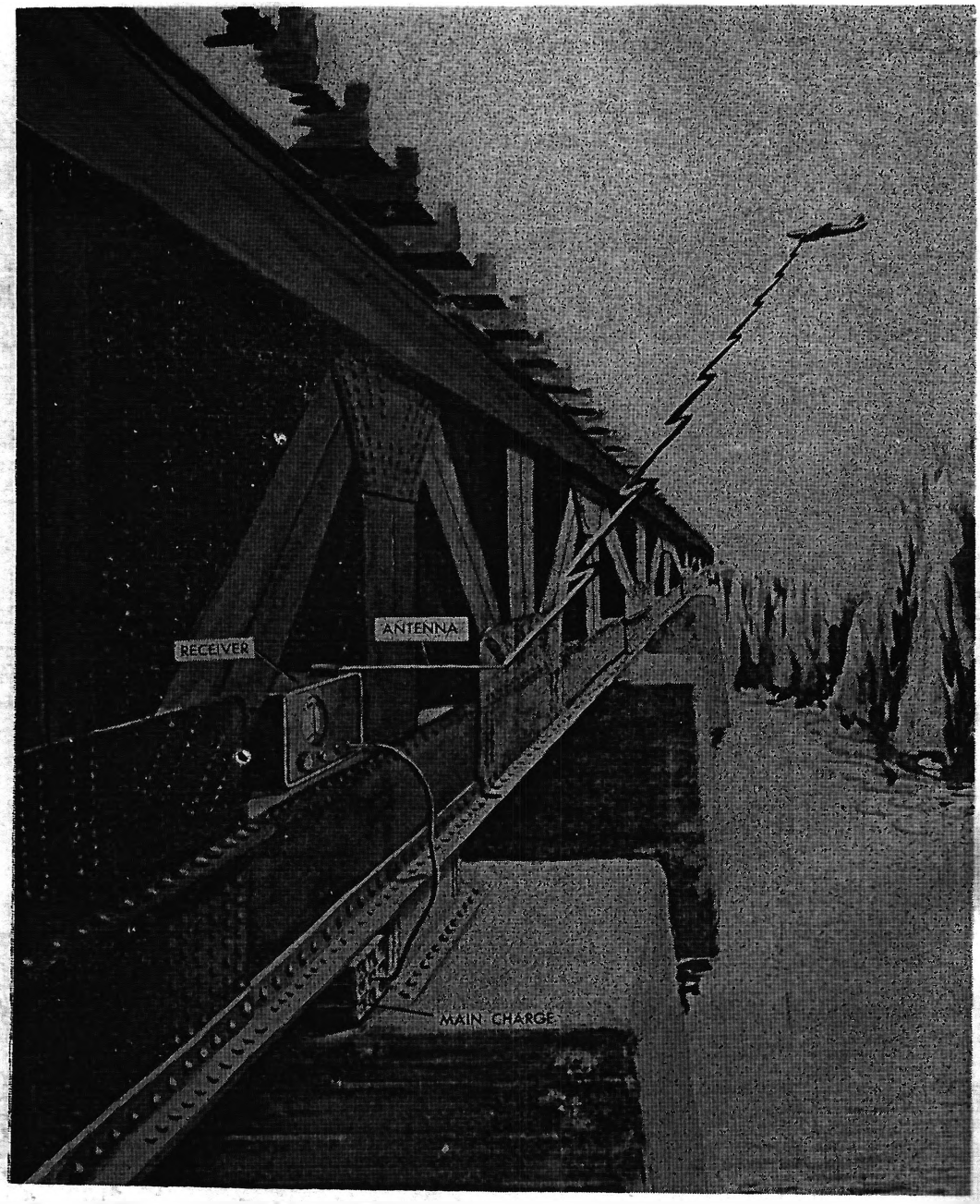


Figure 9. Radio receives signal from transmitter and relays impulse to detonator.

(3) *Electrical.* The closing of a circuit fires an electric detonator (figs. 6 and 12).

(4) *Chemical-electrical.* A chemical reaction causes an electric circuit to close.

(5) *Mechanical-chemical.* A chemical is used to corrode a pin holding a spring-loaded striker. When the pin is sufficiently corroded to break, it releases the spring-loaded striker.

c. DETONATOR. The detonator, a highly sensitive explosive, is set off by the flame or concussion of the fuze (fig. 5).

d. BOOSTER CHARGE. The booster charge consists of a less sensitive but more powerful explosive than that in the detonator and produces an intermediate explosion (fig. 5). A booster charge is not necessary in some mines.

e. MAIN CHARGE. The main charge, a relatively insensitive explosive surrounding and detonated by the booster charge or detonator, provides the destructive power of the mine (fig. 5).

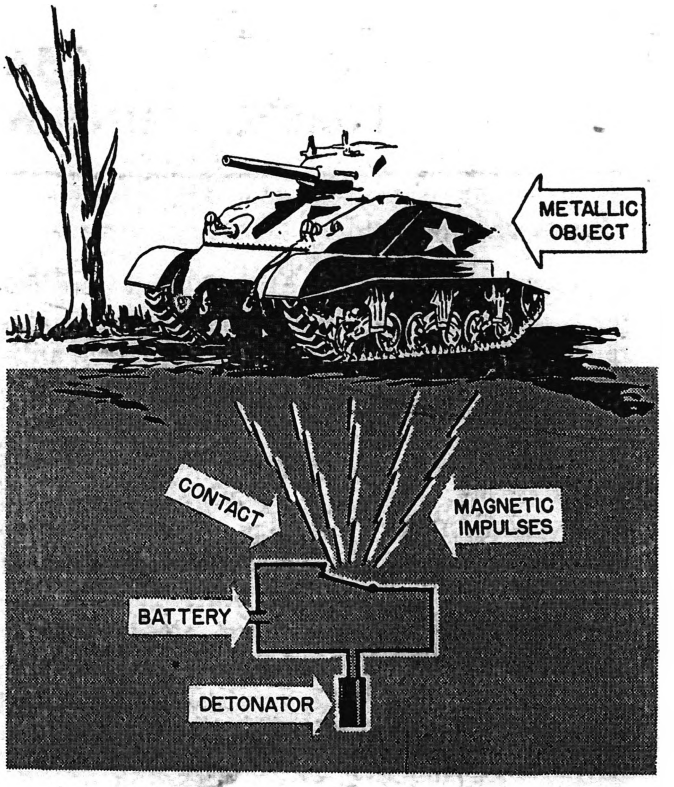


Figure 10. A metallic mass swings a magnetized lever to close a circuit.

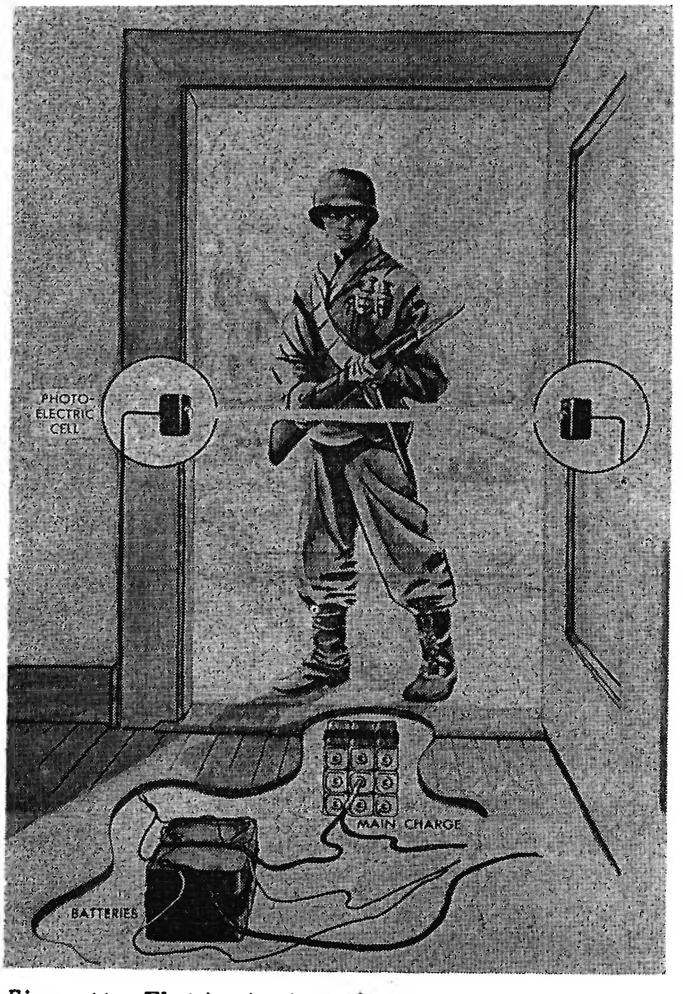


Figure 11. Electric circuit is completed when light beam is broken.

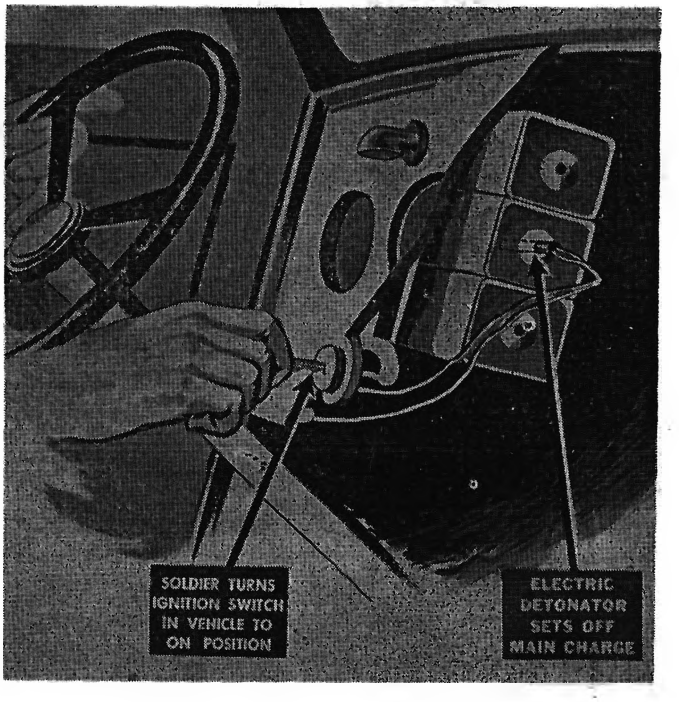


Figure 12. Ignition by electrical means.

CHAPTER 2
FOREIGN MINE WARFARE EQUIPMENT

5. Types of Mines

a. ANTITANK MINES. Antitank mines are designed primarily for immobilizing tanks. Although all of the major foreign armies have antitank mines, the amount of explosive in one mine is not sufficient in most cases to immobilize a tank. To accomplish the mission two or more mines are placed together.

b. ANTIVEHICULAR MINES. Antivehicular mines are designed primarily for immobilizing tracked or wheeled vehicles other than tanks. However, two or more of these mines are often placed together to immobilize tanks. All of the major foreign armies employ antivehicular mines. They are referred to as antitransport mines in the Soviet Army.

c. DUAL-PURPOSE MINES. Dual-purpose mines are designed both to immobilize vehicles and to produce casualties among personnel. Normally, these mines can be distinguished by the pressure-pull fuze used in them. The fuze is designed to be detonated by vehicles (pressure) and by personnel (pull). Many of the foreign armies use dual-purpose mines.

d. ANTIPERSONNEL MINES. Antipersonnel mines are used primarily to produce casualties to personnel. They may be placed to protect antitank mine fields and other obstacles, to give local security and warning, or as nuisance mines to harass and delay the enemy. Normally, they are not effective against armored vehicles but may inflict some damage on other vehicles. Antipersonnel mines found in foreign armies are of two general types: shrapnel mines which are designed to injure or kill more than one person and concussion mines designed to kill or injure only the person who steps on or actuates the mine. Antilifting devices and booby traps are classified as antipersonnel mines since they are primarily designed to inflict injuries upon personnel. All of the major foreign armies employ antipersonnel mines.

(1) *Antilifting devices.* An antilifting device is a mechanical or a combination mechanical and explosive device designed specifically to cause a mine to detonate when an attempt is made to lift or move the mine (fig. 13). Antilifting devices are primarily designed for an antipersonnel role. Certain types of fuzes, particularly pressure-release fuzes, are in effect antilifting devices as well as booby-trap mechanisms. Some armies, notably the German and Soviet, have produced antilifting devices for the specific purpose of placing them under antitank and antivehicular mines to prevent safe removal of the mines.

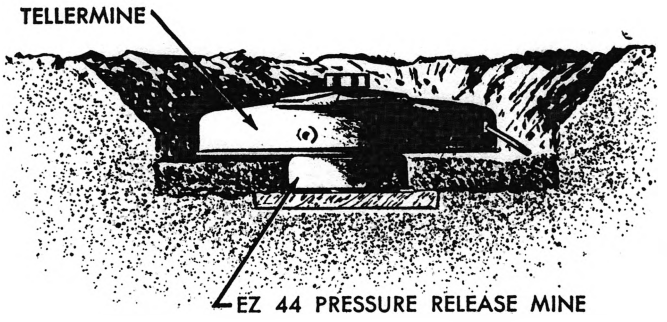


Figure 13. Antilifting device placed under a mine.

(2) *Booby traps.*

(*a*) A booby trap is a hidden mine or charge with its firing mechanism placed in such a way that an unsuspecting person disturbing an apparently harmless object causes the mine or charge to detonate (fig. 14).

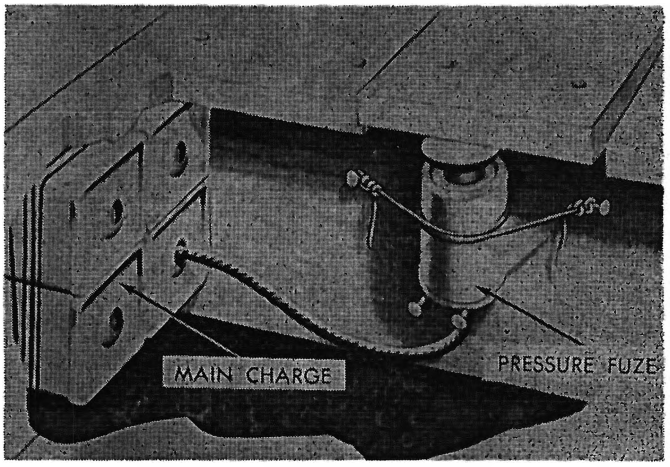


Figure 14. Booby-trap installation.

(*b*) Booby traps are especially intended to inflict casualties on and to destroy the morale of opposing forces. They are normally installed during a retrograde movement or during raids or patrols into the positions of the opposing forces. Booby traps may be encountered under any circumstances. They may be found attached to equipment, dead soldiers, and supplies. They may also be installed in abandoned buildings. Ingenuity of installation largely determines their effectiveness.

e. RAILROAD MINES. Railroad mines are designed specifically to wreck trains. In most instances, railroad mines incorporate a delay rather than an instantaneous type of fuze and are used as initiating mines to detonate large charges buried in railroad beds. Germany, Italy, and Russia employed railroad mines in World War II.

f. BEACH MINES. Beach mines are primarily designed to destroy landing craft and amphibious vehicles, to hinder the landing of an opposing force, and to disable landed vehicles. They vary greatly in size, explosive content, and type of fuze used. The Japanese, in particular, employed beach type mines in World War II.

g. RIVER MINES. River mines are used to destroy floating bridges fixed bridge piers, and river shipping. They vary considerably in size and explosive content. The usual method of functioning is by the use of pressure or pull fuzes. Germany and Russia employed river mines in World War II.

h. IMPROVISED MINES. Improvised mines are used when standard mines are unsuitable or unavailable for a particular mission. They are made by filling with an explosive any type of container, such as bottles, crates, sacks, barrels, and tin cans. Improvised mines may also be made of bombs, shells, or grenades fitted usually with a pressure or pull fuze. They are extremely dangerous to handle. The Soviet Army places much emphasis on improvised mines.

i. DUMMY MINES. Dummy mines can be made of any material available. They may be installed in dummy mine fields or may be used to supplement real mines in a live mine field to delay and confuse the enemy by making it necessary for him to consume time in investigating and removing them.

j. TRAINING MINES. Mines used in training contain no explosive charges but are similar in construction to standard mines. Various means are available for simulating detonation of the training mines. Training mines are called practice mines in US mine warfare terminology.

k. OTHERS. A number of other types of mines are found in some of the foreign armies but the types listed above are common in most foreign armies and are employed in the greatest numbers.

6. Mine Laying, Marking, and Recording Equipment and Supplies

a. MINE LAYING DEVICES. Most armies today rely upon manpower to fuze mines, to prepare holes for them in the ground, and to arm and conceal them. Mine spacing cords and special tools are used by many armies to aid in spacing mines within a minefield and in actually preparing holes for individual mines. Some countries are experimenting with mechanical mine laying devices. The Germans developed a mine laying vehicle in the early part of World War II, but the device proved impracticable.

b. MINE MARKING EQUIPMENT. Mine marking equipment includes all items, such as special tags, flags, and tracing tape, used to mark mine fields and individual mines.

c. MINE RECORDING SUPPLIES. This type of material usually includes special reports, forms, maps, and other pictorial aids used to record the location of mine fields and individual mines.

7. Mine Detecting Equipment

Mine detecting equipment includes all devices, such as probes and electronic mine detectors, designed specifically for locating mines. Some countries experimented with substituting trained dogs for equipment to detect mines, but such practices proved impracticable.

8. Mine Clearing Equipment

Mine clearing equipment includes vehicle-mounted devices, such as tank-mounted flails, rollers, and drags, and propelled explosive devices. Manually operated mine clearing devices include grapnels, rollers, and explosive charges.

CHAPTER 3
NEUTRALIZATION AND REMOVAL OPERATIONS

9. Hand Neutralization of Mines and Fuzes

Troops must know how to neutralize foreign mines and fuzes. Although normally a mine field contains only a few activated mines, during a clearing operation it must be assumed that all mines are activated. Furthermore, troops must be familiar with the types and location of safeties on mines and fuzes. They must also know how to cut the firing chain of a mine to render the mine harmless.

a. SAFETIES. Organic safeties are built into practically all mines and fuzes (fig. 15). They are designed to nullify the initiating action.

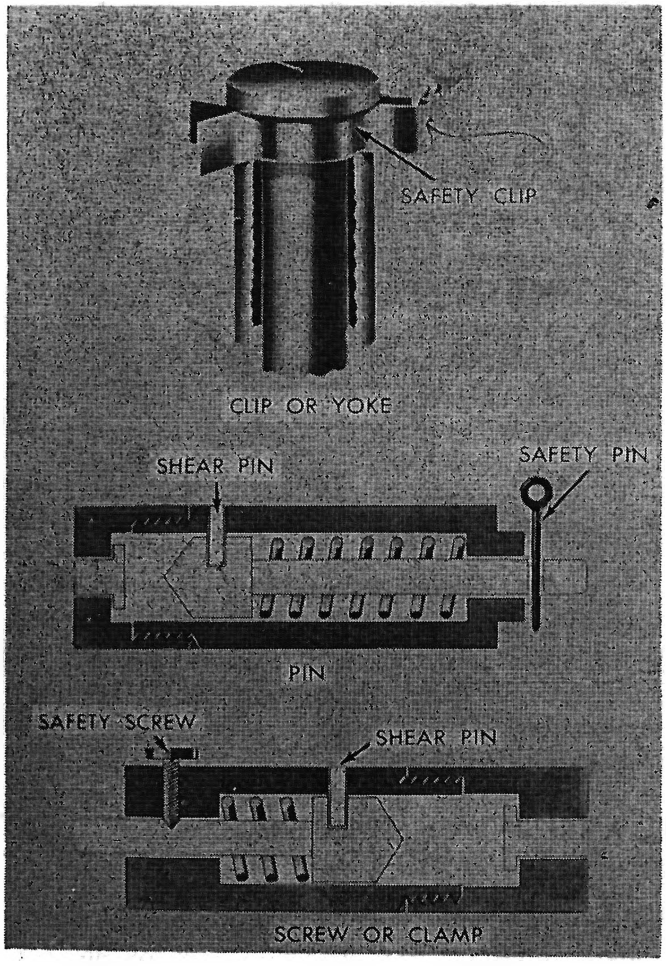


Figure 15. Types of safeties on different fuzes.

b. CUTTING THE FIRING CHAIN. A mine is harmless if the firing chain is cut. This is done by cutting any link in the chain, that is, by separating any two of its elements (fig. 16).

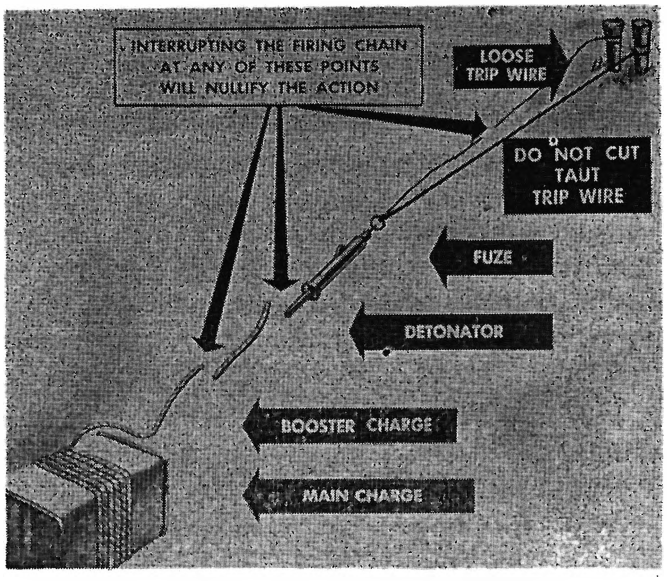


Figure 16. Interrupting the firing chain of a mine.

c. STEPS IN HAND-NEUTRALIZING. The steps in hand-neutralizing a buried mine are as follows:

(1) Carefully probe to locate the mine exactly.
(2) Carefully search around and under the mine, locating and neutralizing all secondary fuzes.
(3) Neutralize the mine by making the main fuze safe. Some foreign mines contain fuzes that cannot be made safe in any way. These mines should be neutralized either by destroying them in place with a prepared charge or by carefully lifting and carrying them to a safe place, where they are destroyed.

10. Removal of Mines

a. The following general rules should be applied when removing foreign mines.

(1) Handle all mines and fuzes with care at all times.
(2) Use only one man to work on a mine.
(3) Carefully examine the ground around a mine before starting to work on it.

(4) Constantly be on the lookout for booby traps.
(5) Prior to lifting a mine, neutralize all fuzes and cut any *slack* trip wires.
(6) Never cut a taut wire; never pull a slack one. Look at *both* ends of a wire before you touch it.
(7) When detonation of a mine in place is objectionable pull the mine clear with 50 yards of rope or signal cable.
(8) Take cover before you pull 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 booby traps before occupying it.
(9) Never use force on a mine or booby trap. If a part cannot be removed without applying an undue amount of force, discontinue further attempts to remove the part.
(10) If you must leave a mine or booby trap unlifted, mark the location prominently.
(11) Neutralize antipersonnel mines by replacing all safety pins before you lift them.
(12) Keep your eyes on the ground in front of you when walking in a mine infested area.
(13) When cutting the wires of an electrical detonator cut them one at a time.

b. Mines can be removed by pulling them out from defilade with a long rope (fig. 17) or signal wire.¶ If no defilade is at hand, a safe pulling distance is at least 50 yards. With this method, always remain in a prone position. Activated mines are normally detonated in this manner.

c. Mines can be neutralized by destroying them in place with hand-placed charges. The charges are placed on or beside the mines to be destroyed (fig. 18). The mines themselves are not handled.

d. Improvised grapnels can be used to actuate charges fastened to trip wires. The grapnel is thrown out over the field and then pulled back. As it comes back, it trips the wires or cords, setting off the charges.

e. Mechanical and blast methods have been developed to neutralize mines by exploding them. Such mechanical and explosive devices are the scorpion or flail, various pressure-roller devices, the various demolition snakes, bangalore torpedoes, and explosive mats or carpet rolls.

f. In World War II, both the Germans and the Soviets employed artillery to clear gaps through known mine fields. Some countries have experimented with area bombing by aircraft to clear gaps through mine fields.

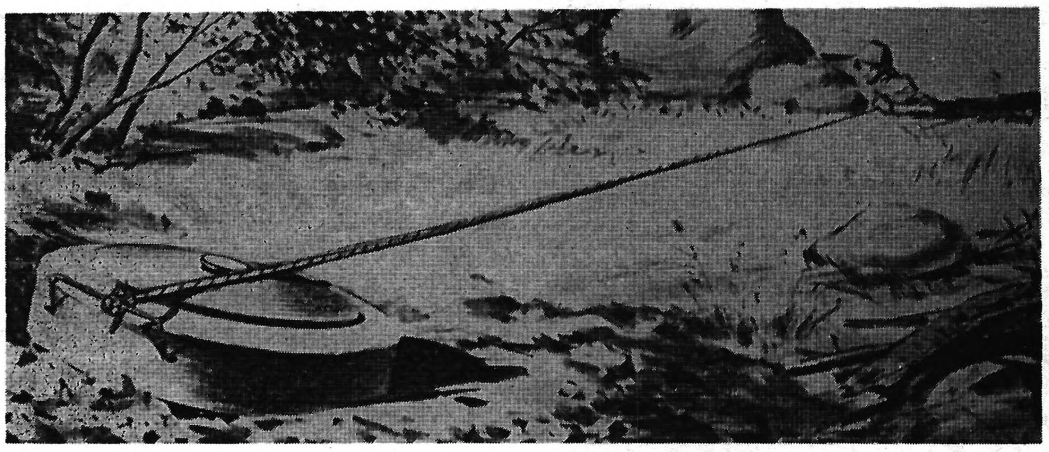


Figure 17. Removing a mine by rope from a safe distance of 50 yards.

g. Wooden and cardboard mines that have been buried for long periods are dangerous to remove. Experience has shown that mines composed of wood or cardboard will deteriorate rapidly under humid or damp-soil conditions. If a wooden mine is subjected to alternate periods of dampness and dryness, the mine will undergo serious deformations resulting in large cracks which will permit the entrance of soil moisture into the explosive chamber. In some wooden and cardboard mines the explosive filler hole is sealed with tar. This tar will develop cracks after continuous exposure. Wooden pressure lids that contain grooves to assist detonation will rot in the grooves and will detonate readily when pressure is brought to bear on the pressure lid with a mine probe. Mine field clearing

Figure 18. Placement of charge on mines to be destroyed in place.

personnel must be cautioned in the use of the mine probe when the mines are known to be in an advanced state of deterioration. The mine probe should be held at the smallest practicable angle to the ground so as to come into contact with the side of the mine instead of the pressure lid. In many cases the only practicable method of mine removal will be the use of demolition charges. Care must be taken to see that all personnel are removed from the area before any demolition charges are detonated. Entire mine fields have been known to explode from sympathetic detonation. Mine fields composed of wooden and cardboard mines which are deteriorated are particularly susceptible to sympathetic detonation.

h. Metallic mines that have been buried for long periods of time are dangerous to remove. They will rust to such an extent that it becomes almost impossible to detect their location with the mine detector. In general, mines of metallic construction which use waterproof seals will withstand the action of soil moisture better than wooden or cardboard mines. Eventually, however, the mine body will rust and the explosive will become contaminated.

i. Some types of fuzes become extremely sensitive when they are exposed to soil moisture. These types should be removed by placing demolition charges or using tank rollers and other devices which will permit the removal of the mines without undue exposure of personnel.

PART TWO
ORIENTAL AND EUROPEAN (EXCEPT BRITISH, FRENCH, GERMAN, ITALIAN, AND SOVIET) MINE WARFARE EQUIPMENT

CHAPTER 4
JAPANESE MINE WARFARE EQUIPMENT

Section I. INTRODUCTION

11. General

In World War II, standard Japanese mine warfare equipment included only four antivehicular mines, two antiamphibious (beach) mines, a different fuze for each of the four antivehicular mines, and a special fuze for the two antiamphibious mines. One antipersonnel mine and two antiamphibious mines were developed late in the war but were never issued to troops. Four improvised antivehicular mines and three improvised antipersonnel mines were used. Three models of mine detectors were developed but were seldom used in the field. During World War II, the Japanese Army had no mine laying, marking, recording, or clearing equipment.

12. Scope

This chapter covers the description, employment, functioning, installing, arming, and neutralizing of individual Japanese fuzes and mines. It also describes Japanese booby traps and mine detectors. Although the camouflage operation is not outlined in installing and arming procedures it will be accomplished at all times.

13. Japanese Mine Warfare Doctrine

So far as is known no comprehensive directive regarding the employment of mines has ever been published for the entire Japanese Army. The Japanese studied Russian mine laying tactics and certain Russian principles were reproduced in a Japanese manual. This manual contains examples of the tactical use of mine fields, fortified zones, and laying of mines on roads. The Japanese Army utilized improvisations to the fullest extent. Because of the vulnerability of the supply routes for mine warfare equipment and the nature of the war in the Pacific area, improvisations in most cases were a necessity. As the stocks of metal became depleted in Japan, the Japanese resorted to substitute materials such as ceramics.

14. Data Presented

The major portion of the data presented here on Oriental and European (except British, French, German, Italian, and Soviet) mine warfare equipment is based on captured documents, intelligence reports, and information obtained through liaison with other allied forces during World War II. Wherever possible, information in this manual is based on actual pieces of equipment. It is requested that any reader possessing information that modifies the data contained in this manual or who encounters mine warfare equipment not discussed herein, forward such information to: Office of Assistant C/S, G–2, Department of the Army, Washington, 25, D. C., or the Office, Chief of Engineers, Department of the Army. ATTN: Engineer Intelligence Division, Washington 25, D. C.

Section II. FUZES

15. General

Each standard Japanese antivehicular mine had its own special fuze. Since the Japanese Army used no single-purpose antipersonnel mine, fuzes were designed for the type 93 and type 3 ceramic antivehicular mines in order to use these mines as antipersonnel mines. All standard fuzes were of the pressure type, although the fuze for the type 3 ceramic mine could also be set to function by pull.

Pull type fuse lighters were used in improvised antipersonnel mines and booby traps. Several types of bomb, grenade, and shell fuzes were used in improvised mines.

16. Japanese Pressure Fuze For Type 93 Mine

a. DESCRIPTION. The pressure fuze (fig. 19) for the type 93 mine (par. 28) consists of a cylindrical metal case which contains a spring-loaded striker, a shear wire for retaining the striker, a striker guide, a percussion cap, a primary detonator and a main detonator. These components may be separated from each other in disassembling. A knurled safety cap prevents the striker from being depressed. The cap is attached by a fixed bolt which screws into the striker shaft. Two models of this fuze exist. The antivehicular fuze has a heavy shear wire; the top of the fuze is unpainted. The antipersonnel fuze has a thin shear wire and a longer safety cap; the top of the fuze is painted black.

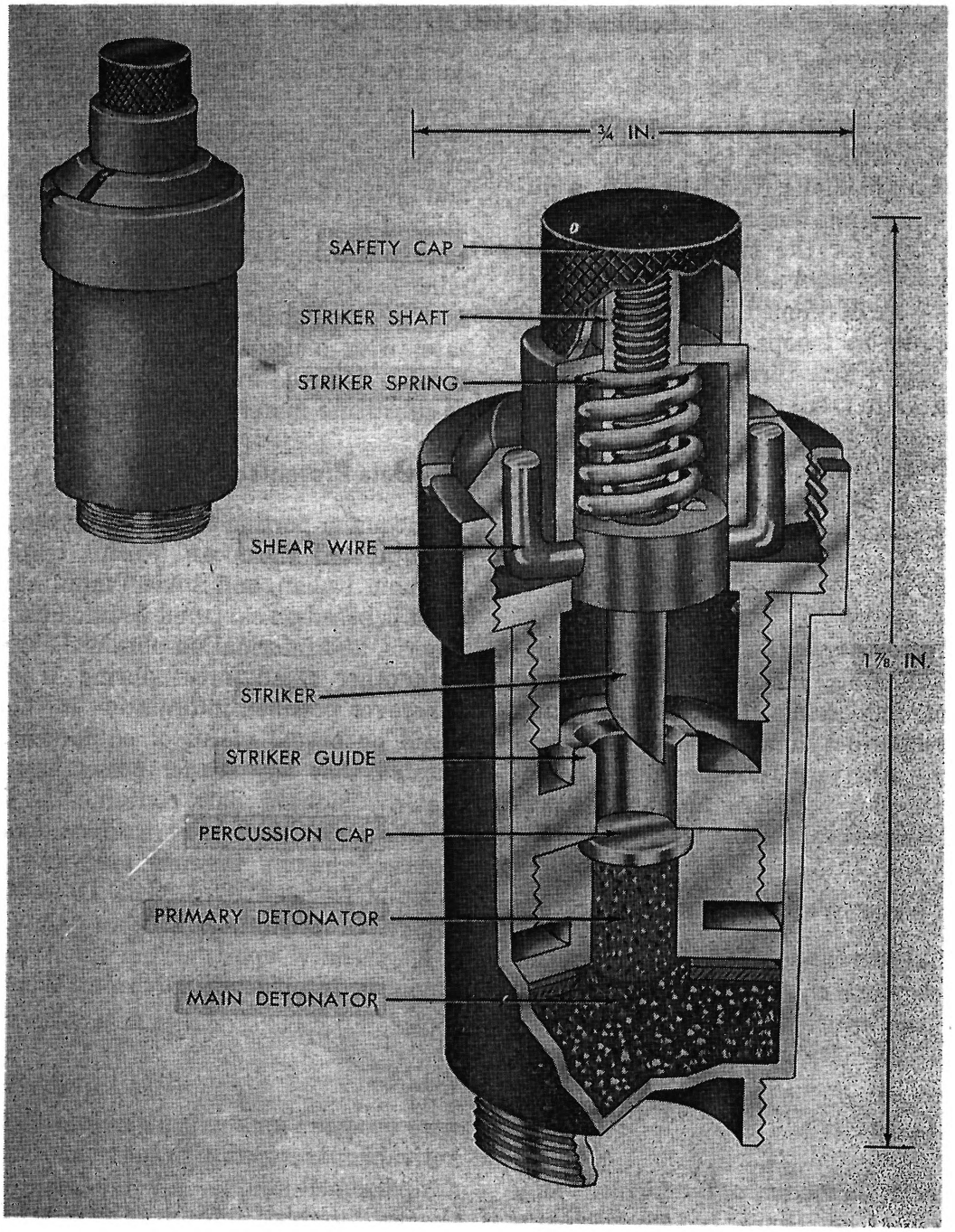
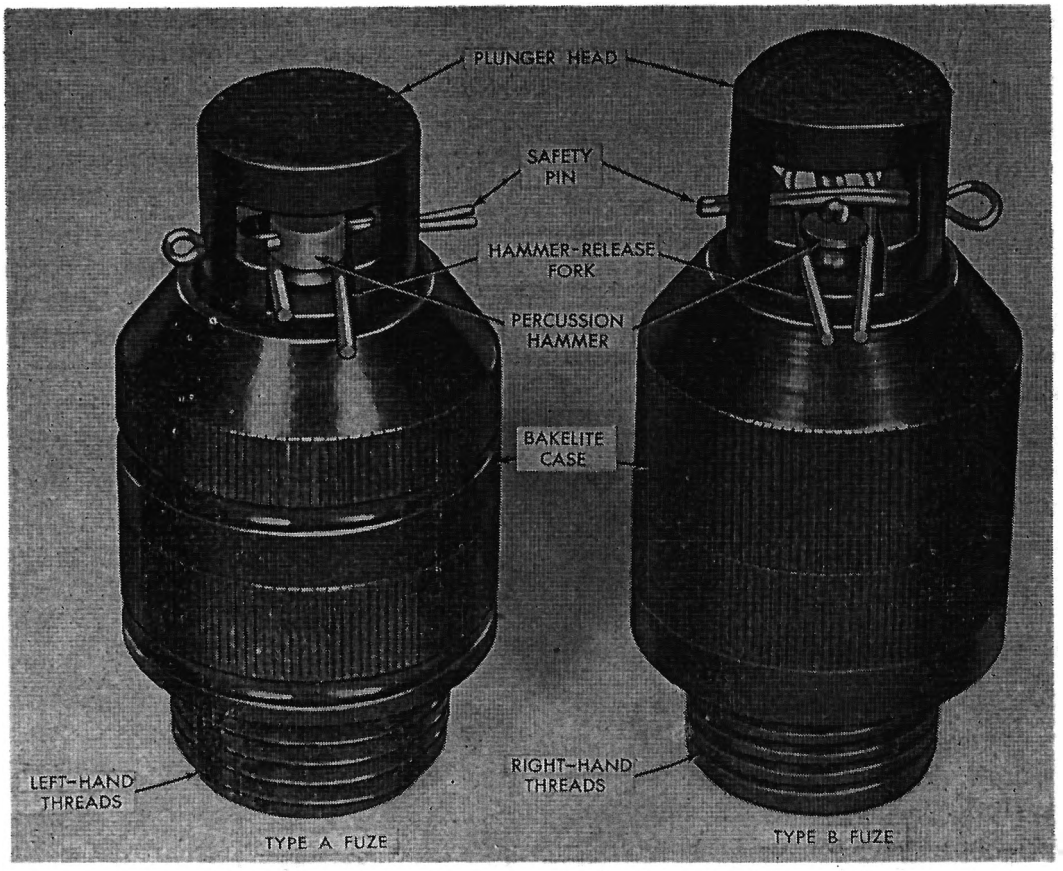


Figure 19. Japanese pressure fuze for type 93 mine.



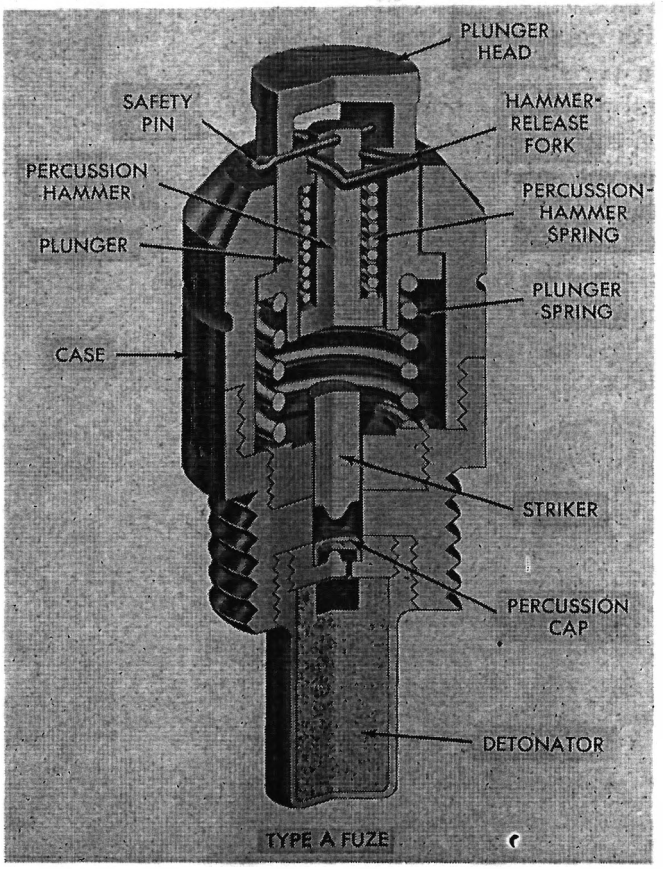


Figure 20. Japanese bakelite pressure-pull fuze, type A and type B.

b. EMPLOYMENT. The two models of this fuze were designed for use in the type 93 antivehicular mine and in improvised mines.

c. FUNCTIONING. When the safety cap is removed, pressure of 250 pounds (antivehicular fuze) or 25 pounds (antipersonnel fuze) on the striker shaft shears the shear wire and releases the spring-loaded striker against the percussion cap.

d. INSTALLING AND ARMING.

(1) Screw the detonator into the fuze (fig. 19).

(2) Unscrew the safety cap.

e. NEUTRALIZING.

(1) Unscrew the outer case of the fuze and remove the main detonator.

(2) Unscrew the percussion cap and primary detonator assembly.

17. Japanese Bakelite Pressure-Pull Fuze

a. DESCRIPTION. The pressure-pull fuze (fig. 20) 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 consists of a cylindrical bakelite case containing a percussion-hammer spring, a percussion hammer held in place by a hammer-release fork, a plunger spring, a striker, a percussion cap, and detonator. In the type A fuze, a cotter type safety pin projects through the plunger head and the top of the hammer. In the type B fuze, the safety pin passes through the plunger head only, but it prevents the hammer-release fork from moving because of the turned-up central part of the fork which bears against the center of the safety pin.

b. EMPLOYMENT. This fuze was designed for use in the type 3 ceramic mine (par. 27). It was also to be used in the ceramic bounding antipersonnel mine, which was never issued to troops.

c. FUNCTIONING.

(1) *Pressure.* When the safety pin is removed, a pressure of about 4.5 pounds on the plunger head depresses the plunger until the hammer-release fork bears against the top of the fuze case. This pressure causes the hammer-release fork to spread, releasing the spring-loaded percussion hammer against the striker which is driven against the percussion cap.

(2) *Pull.* With a pull wire tied to the hammer-release fork and with the safety pin removed, a pull of about 22 pounds 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, remove the safety pin. For pull, tie an anchored pull wire to the hammer-release fork and then remove the safety pin.

e. NEUTRALIZING.

(1) Without pressing on the plunger, cut any pull wires attached to the hammer-release fork.

(2) Unscrew the fuze from the mine.

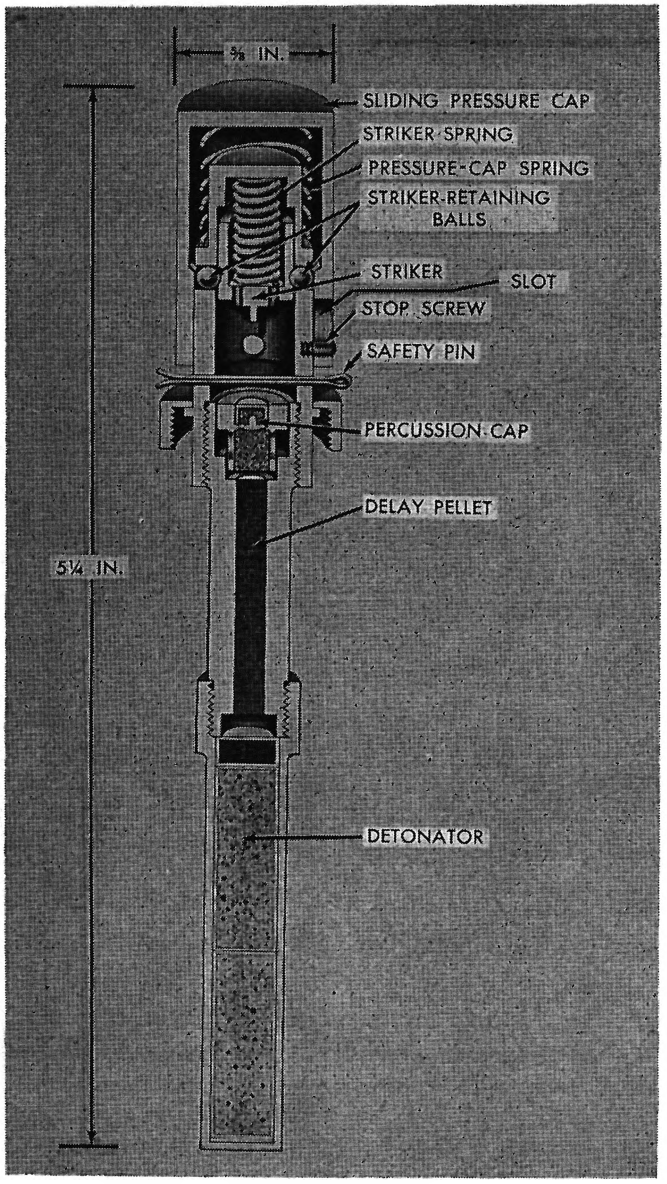


Figure 21. Japanese ball-release pressure fuze.

(3) Unscrew the detonator and percussion cap from the fuze.

18. Japanese Ball-Release Pressure Fuze

a. DESCRIPTION. The ball-release pressure fuze (fig. 21) consists of a cylindrical brass case containing a spring-loaded sliding pressure cap, a spring-loaded striker held by two striker-retaining balls, a cotter type safety pin, a percussion cap, a 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. A slot in the pressure cap for the stop screw permits the cap to slide down over the striker housing.

b. EMPLOYMENT. This fuze was designed for use in the antivehicular magnetic mine, type 99 (par. 29) and was used in improvised mines.

c. FUNCTIONING. When the safety pin is removed, pressure on the sliding pressure cap causes it to slide downward until the striker-retaining balls escape into the recess in the upper part of the sliding pressure cap. The released striker sets off the percussion cap, the delay pellet, and the 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.

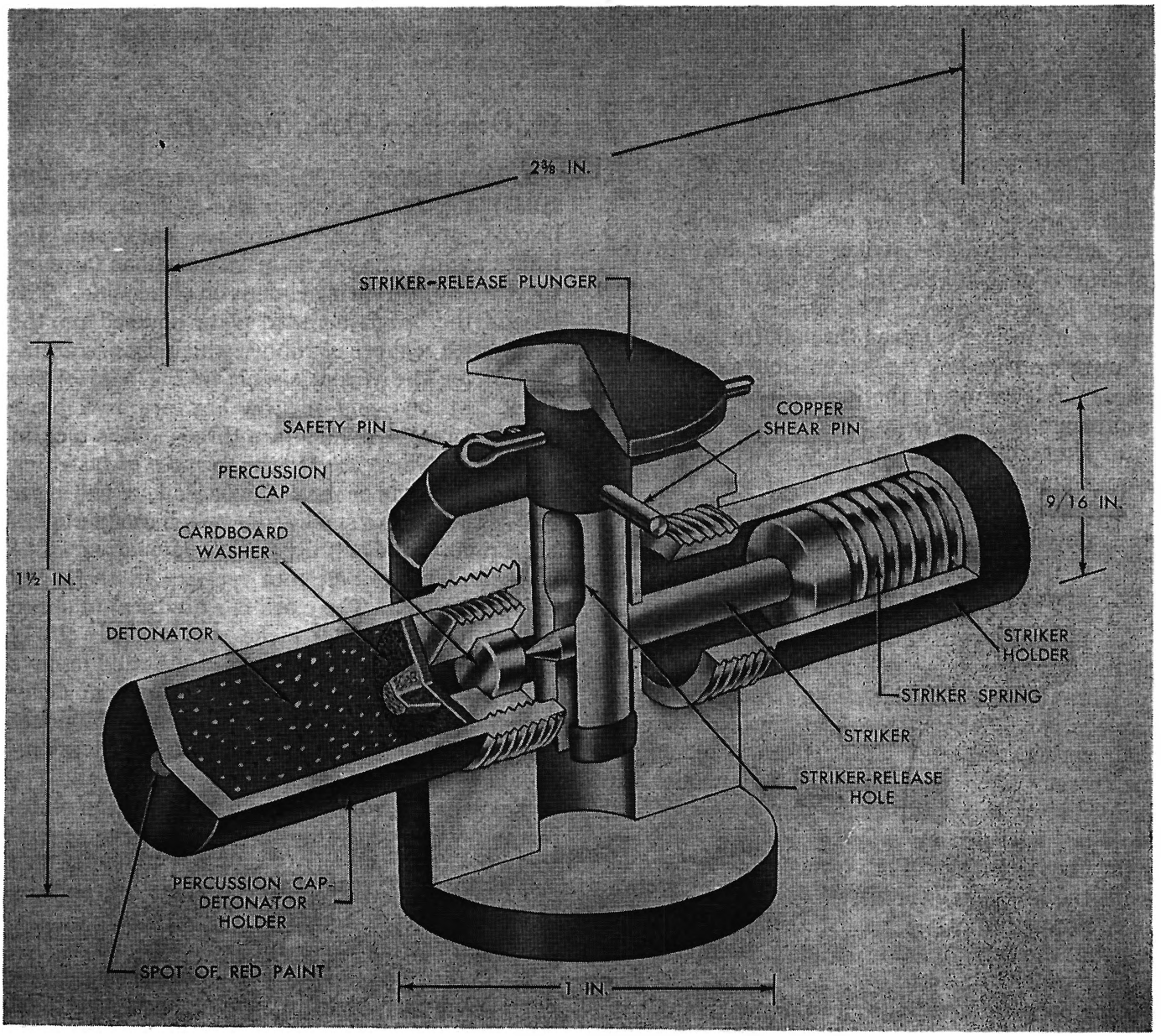


Figure 22. Japanese pressure fuze for the yardstick mine.

e. NEUTRALIZING.

(1) Insert a nail or safety pin into the fuze and unscrew the fuze from the mine.

(2) Unscrew the detonator and the percussion cap and delay pellet assembly.

19. Japanese Pressure Fuze for the Yardstick Mine

a. DESCRIPTION. This pressure fuze (fig. 22) consists of a cylindrical steel case, containing 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 holders for the striker and percussion cap and detonator assembly are screwed into opposite sides of the fuze case. The detonator holder is marked with a spot of red paint.

b. EMPLOYMENT. This fuze was designed for use in the yardstick mine (par. 30). Usually four fuzes were used in each mine.

c. FUNCTIONING. Pressure of about 300 pounds on the striker-release plunger shears the shear pin. This depresses the plunger over the narrow end of the striker until the striker-release hole in the plunger is opposite the thicker central part of the spring-loaded striker. The striker, under pressure of its spring, is forced through the hole in the plunger and strikes the percussion cap. If the shear pin is removed, the fuze will function under a pressure of about 6 pounds.

d. INSTALLING AND ARMING. Withdraw the safety pin from the fuze.

e. NEUTRALIZING. Insert a nail or wire through the safety pin hole in the plunger.

20. Japanese Percussion Fuze

a. DESCRIPTION. The percussion fuze (fig. 23) is an instantaneous, mechanical type consisting of a brass case which contains a striker and a percussion cap. When the safety pin is removed a hair spring keeps the striker from touching the percussion cap. The striker-and-percussion-cap holder rests in a well above the detonator and does not fasten in any way to the brass case.

b. EMPLOYMENT. This fuze is normally used with the Molotov cocktail.

c. FUNCTIONING. When the safety pin is removed, the fuze functions when a sudden jar or shock causes the striker, retained by the hair spring only, to strike and fire the percussion cap. The flame from the percussion cap fires the detonator.

d. INSTALLING AND ARMING.

(1) Screw the detonator into the base of the fuze.

(2) Remove the safety pin.

e. NEUTRALIZING. Once the safety pin has been pulled, it is usually impossible to replace it through the safety-pin hole. When a mine or charge is found equipped with this fuze it is best to destroy it in place with hand-placed charges. If removal intact is necessary do the following:

(1) Carefully unscrew the brass cover cap and lift out the holder for the striker and percussion cap.

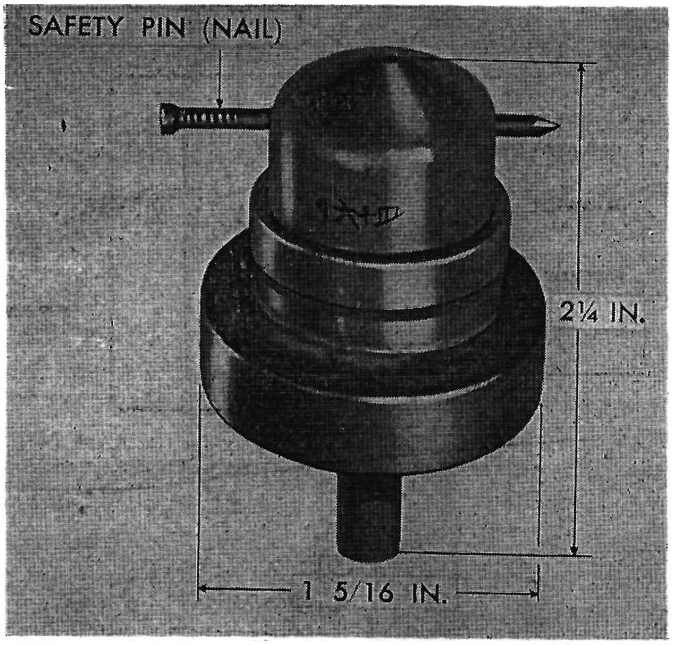
(2) Unscrew the detonator from the fuze.

f. PACKING. Each fuze is packed in a separate cylindrical container which is 2 7/16 inches high and 1 3/8 inches in diameter. The container is sealed with gummed paper.

21. Demolition Clock, Type 99 (1939)

a. DESCRIPTION. The demolition clock, type 99 (1939) (fig. 24) is contained in a sturdy wooden box 6 3/4 inches long, 5 1/4 inches wide, and 4 5/8 inches high. The box is in two sections fastened together by two spring clamps on either side. The base of the box is a metal plate covered on the inside with a sheet of rubber which acts as an insulator for the wiring circuit in the base of the clock. At one end of the box are two brass threaded recesses which are three-eighths inch in diameter. These are for the purpose of fastening lead wires to the charge. On one side of the lower half of the box is a small knife switch used to break the circuit to prevent premature detonation. The clock and battery fit into recesses in the lower half of the box. The clock is cylindrical in shape with a diameter of 3 3/8 inches and a height of 3 3/4 inches. The dial of the clock is calibrated in days with 2-hour increments with a maximum delay period of 10 1/2 days. A celluloid window fits over the dial of the clock to protect it. The battery recess is 4 1/8 inches long, 1 1/2 inches wide, and 1 1/2 inches deep. Two 1/2-inch-square aluminum plates in the bottom of the battery recess serve as contacts for the battery. A 4 1/2-volt Japanese dry cell flashlight battery operates the clock and explodes the detonator. Heavy felt insulates the clock and battery against sound and shock.

b. EMPLOYMENT. The clock is used mainly for demolition purposes, but the Japanese have used this type of clock as a land mine in areas from which they have withdrawn. It also can be used



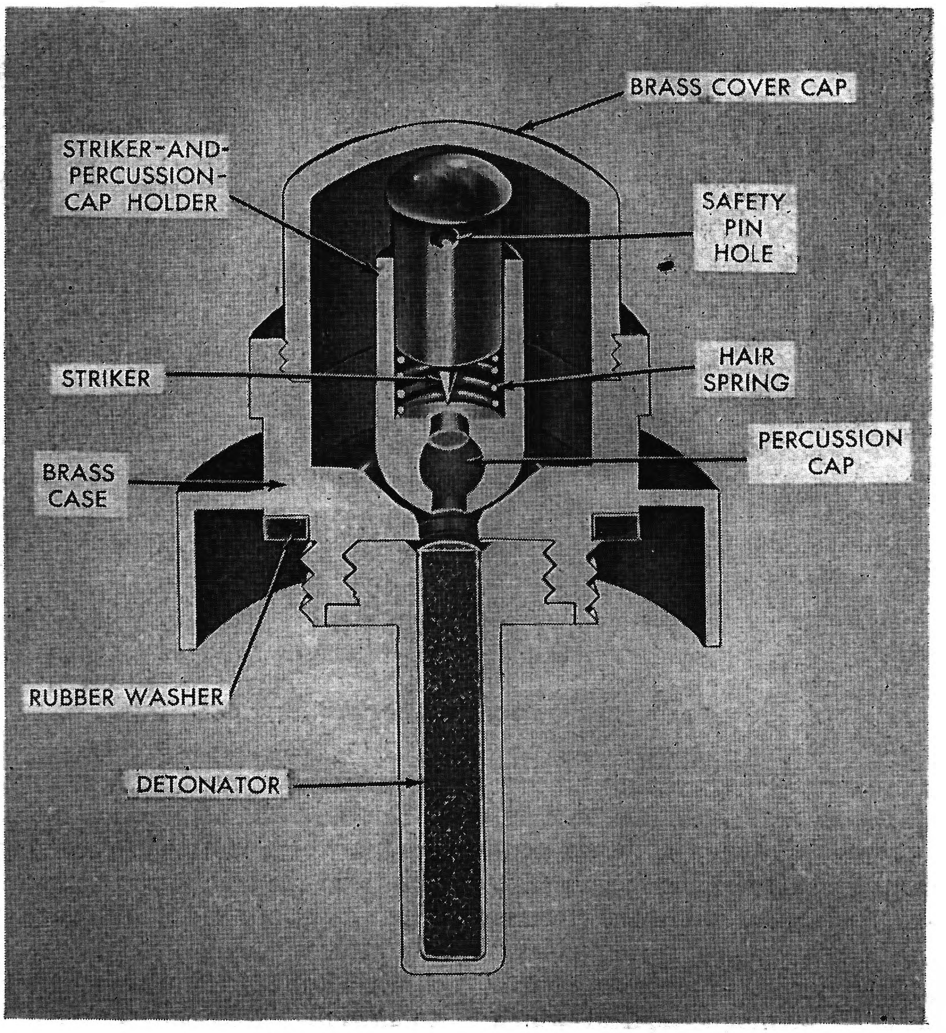
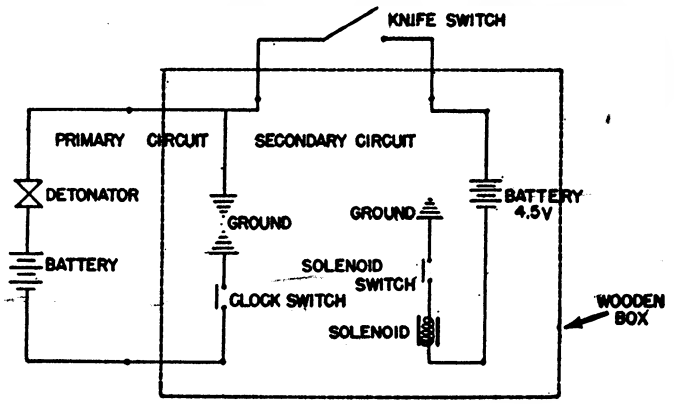


Figure 23. Japanese percussion fuze.



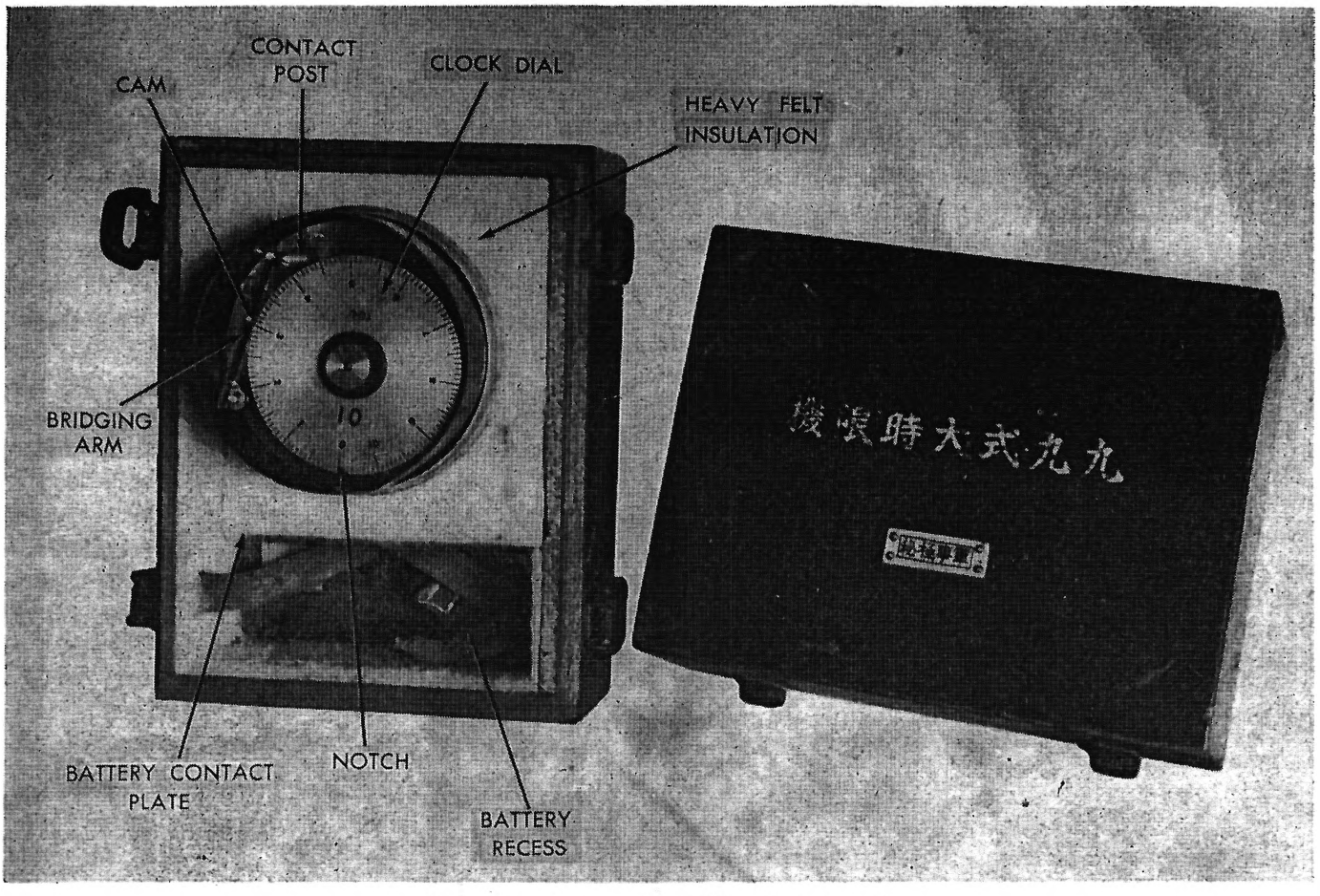


Figure 24. Japanese demolition clock, type 99.

to operate at a predetermined time, any kind of electrical apparatus such as light bulbs, motors, and generators. It was also found with the nonstandard antipersonnel ceramic mine (par. 38).

c. FUNCTIONING. The operation of the clock is similar to that of all battery-operated clocks. The battery supplies current to activate a small coil. This coil sets up a magnetic field which attracts a weighted bridging arm. The bridging arm is attached to a ratchet spring which, in turn, is attached directly to the clock mechanism. When the bridging arm is attracted, a lever action occurs which automatically opens two contact points on the coil, and the current ceases to flow. The weight of the bridging arm and the action of the ratchet spring operates the clock mechanism. A period of 4¾ minutes is required for the spring to unwind. After this period of time, the bridging arm reaches a position where the electrical contact points on the coil touch. This again causes the

current to flow which activates the coil, attracts the arm, and rewinds the spring. At the termination of its set run, the clock allows a cam on the bridging arm to drop into a notch cut into the dial. This causes the bridging arm to make contact with a small metal contact post which closes the circuit and detonates the mine.

d. INSTALLING AND ARMING.

(1) Open the knife switch to prevent a possible premature detonation.

(2) Set the charge and fasten the electric detonator lead wires to the threaded recess on the end of the box.

(3) Loosen the knurled nut holding the clock dial to the main shaft and turn the dial to the desired delay period.

(4) Close the knife switch.

e. NEUTRALIZING. Cut or disconnect the external leads, which connect the clock to the main charge, one at a time.

22. Japanese Instantaneous Artillery Fuze, Type 88

a. DESCRIPTION. The instantaneous artillery fuze, type 88 (fig. 25) is cone-shaped and is made of brass or steel. An aluminum plunger protrudes from the upper end and is held in a forward position under spring pressure against a shoulder of the fuze body. A steel striker is attached to the base of the aluminum plunger. A stirrup spring, which consists of four leaf springs projecting downward and at an angle, is crimped around the striker housing. Surrounding this stirrup spring is the arming collar. This collar is circular in shape and has a groove machined around its inner surface to engage the stirrup spring. The arming collar also retains four small safety wedges below the striker shoulder. These safety wedges prevent the striker from reaching the percussion cap. Around the outside of the arming collar is ma-

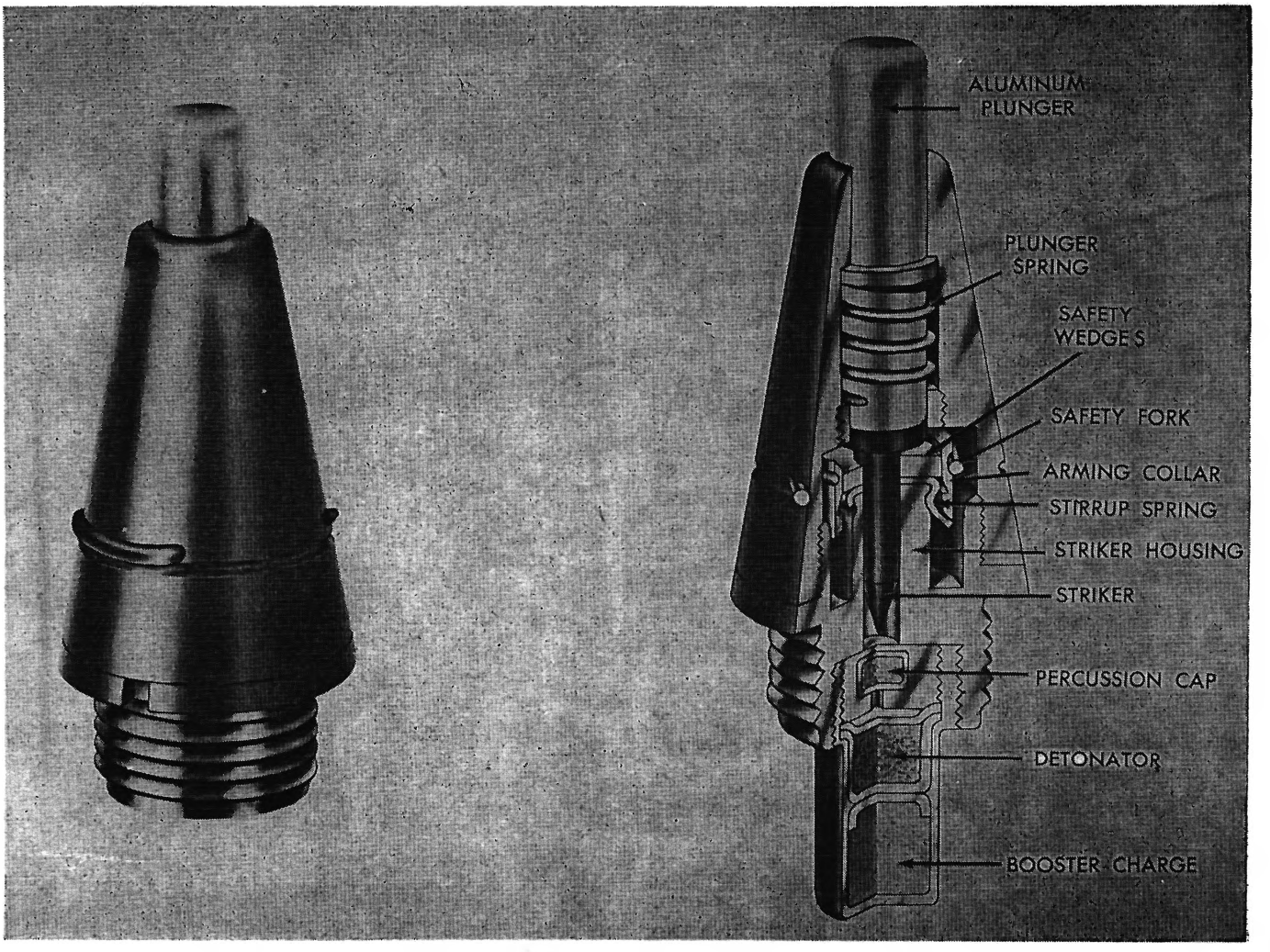


Figure 25. Instantaneous artillery fuze, type 88.

chined a ringlike groove. A safety fork inserted through transverse holes in the fuze body engages this groove and locks the arming collar until the safety fork is withdrawn.

b. EMPLOYMENT. This fuze was the most frequently recovered Japanese projectile fuze. It was used also in some mines such as the nonstandard antipersonnel fragmentation mine (par. 40).

c. FUNCTIONING. The Japanese had two designs of the instantaneous artillery fuze, type 88. One was used in howitzers and the other used in field guns. The fuze designed for use in howitzers requires much less "setback" for arming than do the field guns. That is the initial impact of the explosion of the propellant charge must drive the fuze body forward rapidly causing the arming collar to move back until the groove on the inner surface of the arming collar catches on the stirrup spring. Because of the lower "setback" value, the stirrup spring is made of a thinner metal in fuzes designed for use in howitzers. Since the fuze requires "setback," it will not dependably detonate from pressure of personnel or vehicles. To insure detonation, the Japanese disassemble the fuze and remove the arming collar and safety wedges. Thus modified, the striker is held up only by the plunger spring. A very slight impact about 20 pounds, on the aluminum plunger then drives the striker down, compresses the plunger spring and forces the striker into the percussion cap which fires the detonator, the booster and the main charge.

d. INSTALLING AND ARMING.

(1) Disassemble the fuze and remove the arming collar and safety wedges.
(2) Reassemble the fuze and screw the assembly of the percussion cap, detonator, and booster charge into the bottom of fuze.
(3) Screw the fuze into the mine.
(4) Remove the safety fork.

e. NEUTRALIZING.

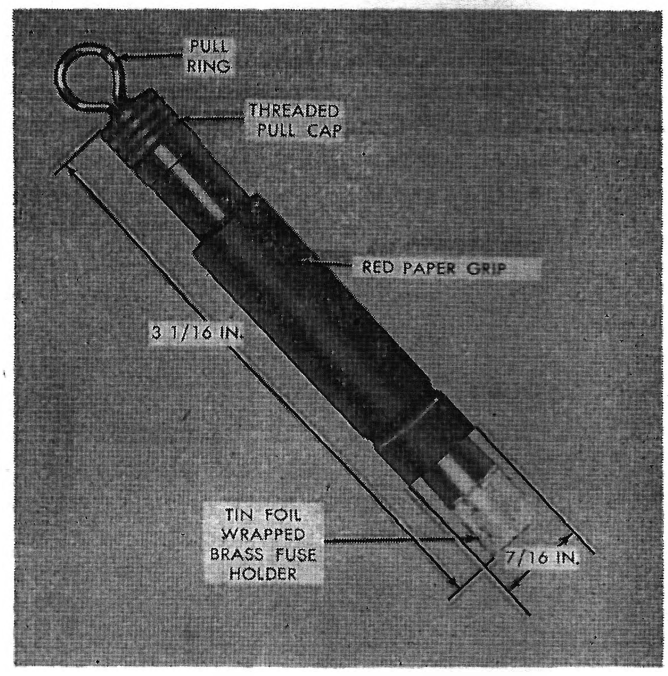
(1) Insert the safety fork, or a piece of wire, into the transverse holes in the fuze case. In all probability insertion of the safety fork, or wire, will not effectively neutralize the fuze since the safety wedges and arming collar usually are not present when it is employed with a mine.
(2) Unscrew the fuze from the mine.
(3) Unscrew the assembly (percussion cap, detonator, and booster charge) from the bottom of the fuze.

Note. Under no circumstances during the neutralizing operation should the aluminum plunger be touched or depressed.

f. PACKING. One hundred of these fuzes are packed in a wooden case.

23. Japanese Friction Fuse Lighter No. 1

a. DESCRIPTION. The friction fuse lighter No. 1 (fig. 26) is an instantaneous, chemical type. It consists of a cylindrical brass case with an outer wrapping or grip of red paper, a paper capsule containing a chemical compound, a coated silk pull cord imbedded in the chemical compound, and a brass fuse holder. One end of the silk pull cord is



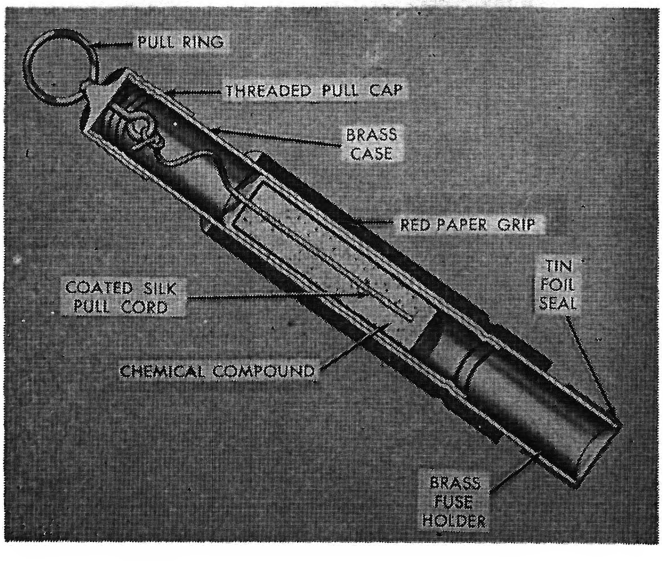


Figure 26. Japanese friction fuse lighter No. 1.

threaded through and tied to an eye on the under side of the pull cap. The brass fuse holder is wrapped with tin foil to keep out moisture and dirt.

b. EMPLOYMENT. Although primarily used as a time-fuse lighter, the friction fuse lighter No. 1 can also be used as a pull type fuze with booby traps and improvised land mines.

c. FUNCTIONING. When the threaded pull cap is unscrewed, a pull of about 10 pounds on the pull ring draws the silk cord coated with a chemical through the chemical compound. The friction ignites the chemical compound, lighting the time fuse or exploding the detonator.

d. INSTALLING AND ARMING.

(1) Remove the tin foil from the fuse holder.
(2) Insert the end of a time fuse or a detonator into the open end of the fuse holder and tape in place.
(3) Attach the fuze assembly to the charge.
(4) If the fuze is used as a pull fuze on an antipersonnel mine, unscrew the threaded pull cap and fasten a pull wire to the pull ring.

e. NEUTRALIZING.

(1) Cut the pull wire fastened to the pull ring.
(2) Replace the threaded pull cap, screwing it on securely.

f. PACKING. Because this fuse lighter is easily damaged by moisture, it must be packed and transported in a waterproof container.

24. Japanese Friction Fuse Lighter No. 2

The friction fuse lighter No. 2 (fig. 27) is smaller than the No. 1 but similar internally. The component parts are the same except that the No. 2 has a grooved black bakelite grip and a pull cord attached to the pull ring. When being transported, the pull cord is fastened to the case by a small piece of scotch tape. Its employment, functioning, installing, arming, and neutralizing are the same as for the No. 1 fuse lighter.

25. Japanese Waterproof Fuse Lighter

a. DESCRIPTION. The waterproof fuse lighter (fig. 28) is an instantaneous, mechanical type. It consists of a waterproof brass case containing a spring-loaded striker, a percussion cap, and a striker-release pin with a pull cord attached.

b. EMPLOYMENT. This fuse lighter is used primarily in the Japanese signal smoke bomb to ignite the delay fuse before the bomb is dropped. It has been used with antipersonnel mines with a detonator crimped directly over the end.

c. FUNCTIONING.

(1) A strong pull (over 15 pounds) on the pull cord draws the striker-release pin and the striker through the release-pin hole, compressing the striker spring.
(2) When the notched joint connecting the striker release pin and the striker shaft passes through the release-pin hole, the

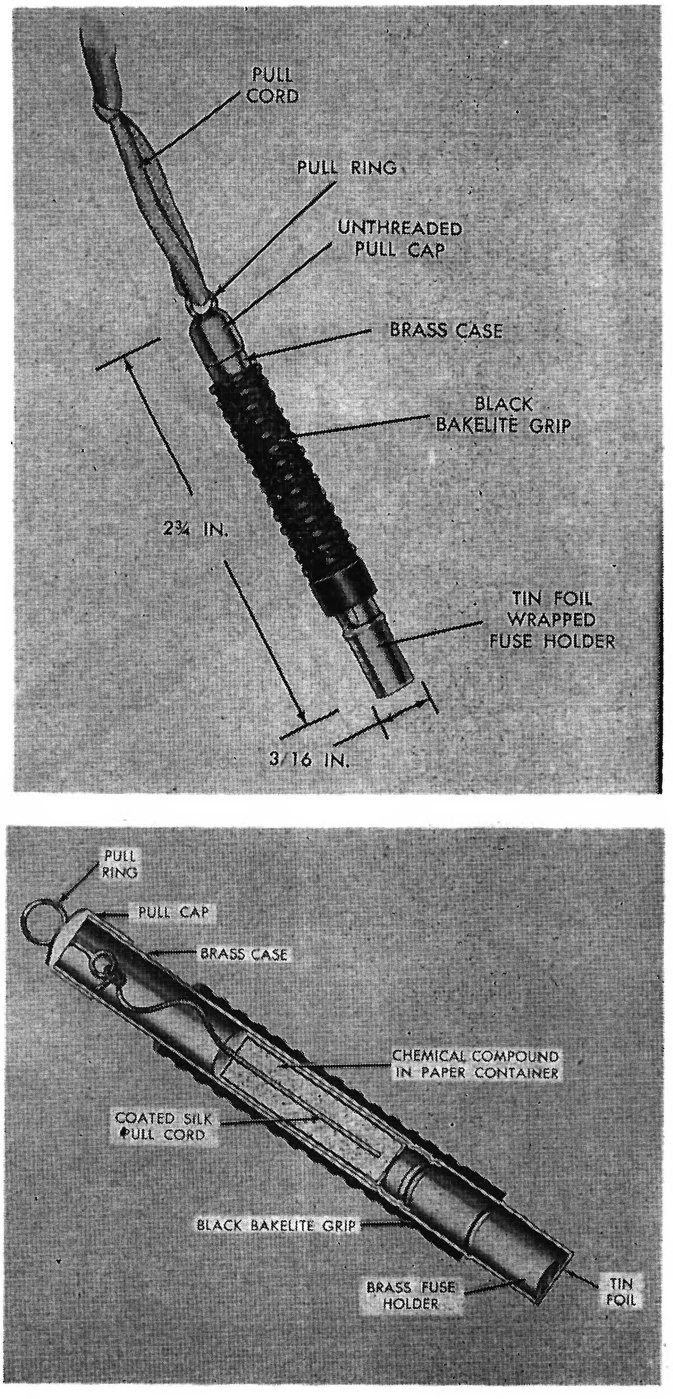


Figure 27. Japanese friction fuse lighter No. 2.

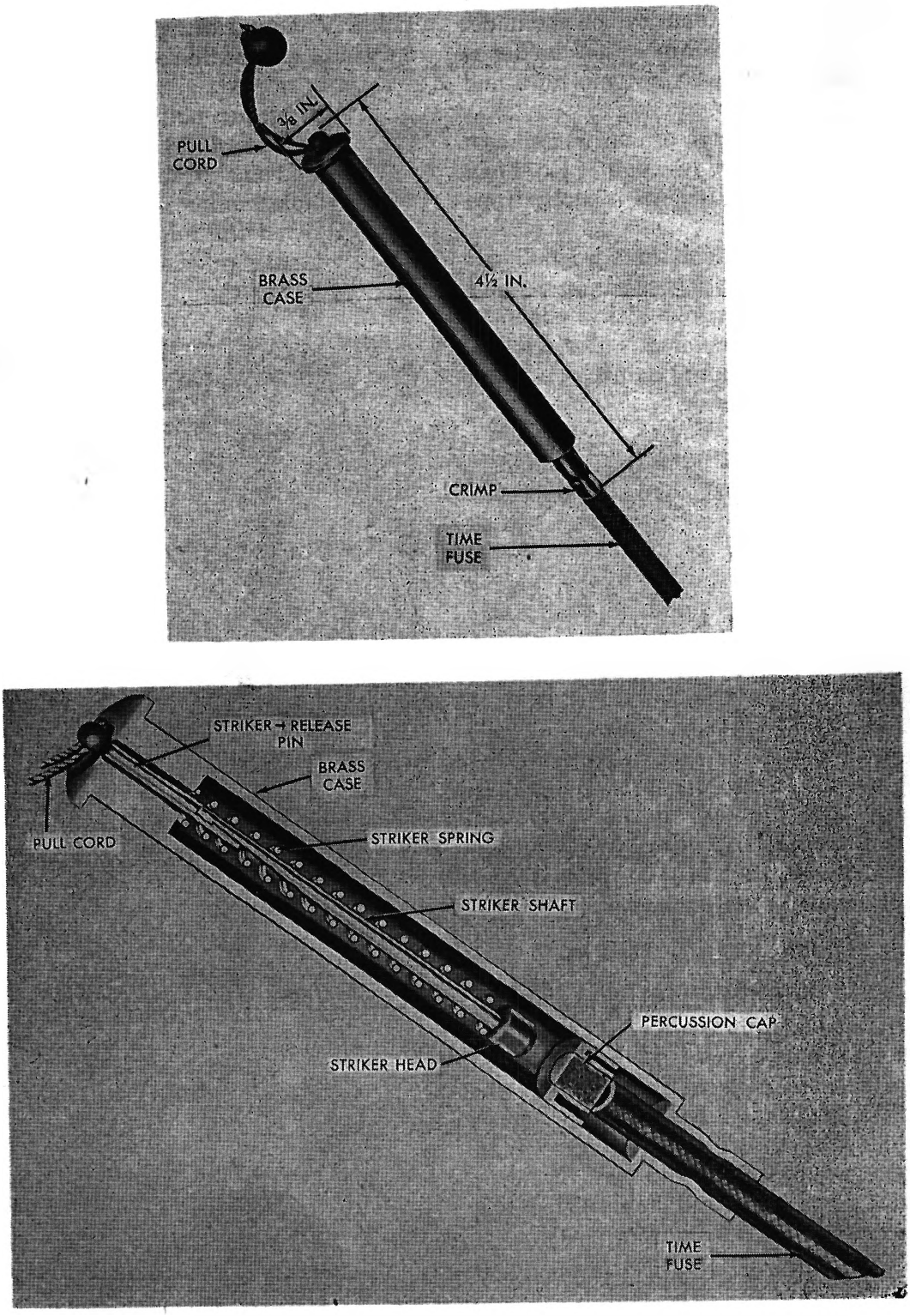


Figure 28. Japanese waterproof fuse lighter.

striker is disengaged and is driven forward by the compressed striker spring.

(3) The striker fires the percussion cap.

(4) The flash from the percussion cap either lights the end of the fuse or fires the detonator, whichever is used.

d. INSTALLING AND ARMING.

(1) This fuze is assembled by inserting one end of a time fuse into the base and then crimping, or by crimping a nonelectric detonator to the base of the fuze. Tape or tie the fuze to the charge.

(2) Connect the pull wire or cord.

(3) There is no safety pin. The striker spring is not compressed until a pull is exerted on the pull cord.

e. NEUTRALIZING.

(1) Cut the pull wire or cord.

(2) Untie the fuze from the charge.

(3) Cut the time fuse or, if a detonator is used, remove it from the base of the fuze.

Section III. ANTIVEHICULAR MINES

26. General

The Japanese Army was severely limited in its development of mines by a shortage of metals. Consequently, the type 3 ceramic mine (par. 27) was produced and used. It was the only standard nonmetallic mine produced and also the only mine which was effective against light tanks. Only three other standard antivehicular mines were produced and employed by the Japanese Army in World War II (pars. 28, 29, and 30).

27. Japanese Antivehicular Ceramic Mine, Type 3

a. DESCRIPTION. The type 3 antivehicular ceramic mine (fig. 29) consists of a circular terra-cotta pottery case, slightly concave at the bottom and convex at the top, with a centrally located fuze well in the top. A threaded hard rubber fuze adapter is located in the fuze well for insertion of the fuze. The ammonium nitrate explosive charge is contained in a rubber bag. Two models of the antivehicular ceramic mine were produced. The large model is 10½ inches in diameter and 3½ inches high. It contains 6.5 pounds of ammonium nitrate. The smaller model is 8½ inches in diameter and 3½ inches high. It contains 4.5 pounds of ammonium nitrate. The bakelite pressure-pull fuze (par. 17) is used in this mine. This mine was sometimes found with a pressure board on the top of the fuze to increase the pressure area.

b. EMPLOYMENT. These mines are installed on roads and airfields. Although normally used as antivehicular mines, they have been occasionally used as antipersonnel mines with a trip wire attached to the hammer-release fork of the bakelite pressure-pull fuze.

c. FUNCTIONING. When a pressure of 4.5 pounds or more is applied to the pressure board, or to the plunger head of the fuze, the plunger is depressed until the hammer-release fork bears

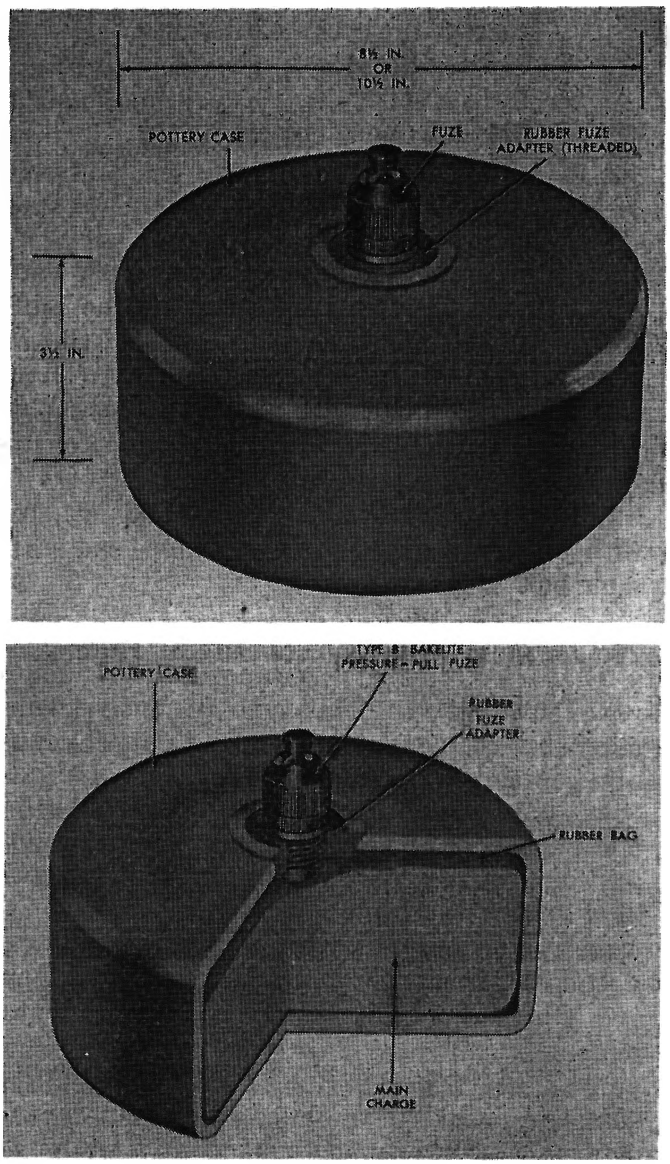


Figure 29. Japanese antivehicular ceramic mine, type 3.

against the top of the fuze case. The hammer-release fork then spreads and releases the spring-loaded percussion hammer against the striker. The striker is then driven against the percussion cap, firing the detonator and the main charge. If a pull wire is used, a pull of about 22 pounds pulls out the hammer-release fork, and the spring-loaded percussion hammer hits the striker, firing the percussion cap, the detonator, and the main charge.

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.
(3) Tie a pull wire to the hammer-release fork, if setting for antipersonnel use.
(4) Remove the safety pin.

e. NEUTRALIZING.

(1) Insert a safety pin or nail into the fuze.
(2) Cut the pull wire.
(3) With the safety pin in and the trip wires out, unscrew the fuze from the mine. (The type A fuze has left hand threads and the type B fuze has right hand threads.)
(4) Remove the percussion cap and detonator from the fuze.

f. PACKING. Five mines are packed in a box with the fuzes and the pull wires in one end of the same box.

28. Japanese Antivehicular Mine, Type 93

a. DESCRIPTION. The type 93 antivehicular mine (fig. 30) consists of a round copper or tin case containing 2 pounds of picric-acid explosive. It has a total weight of 3 pounds. The top portion of the mine consists of a pressure plug, safety collar, and a pressure plate. The case consists of two parts joined by corrugations. A safety collar for protection in transit and storage fits between the pressure plug and pressure fuze (par. 16).

b. EMPLOYMENT. Because of the low explosive content of this mine detonation does not always produce the desired result of disabling vehicles. This has resulted in the mine being used in pairs or with a supplementary charge to produce the desired results. The Japanese also placed boards above and below the two mines to give a larger and more stable pressure surface. In nearly all instances, the Japanese laid the mines so the pressure plug or the board covering the mine was at

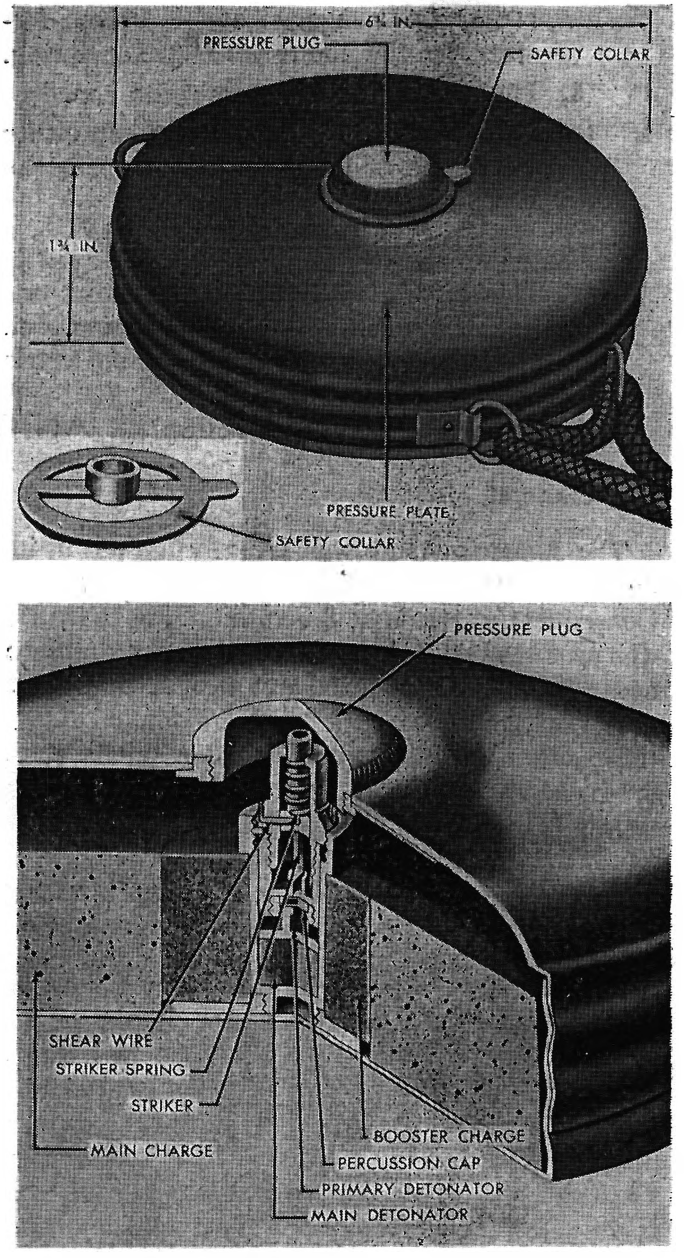


Figure 30. Japanese antivehicular mine, type 93.

ground level or one-half inch below the ground level. Figure 31 shows methods of employment.

c. FUNCTIONING. A pressure of 250 pounds or more on the pressure plate or pressure plug of the mine shears the shear wire in the fuze which holds the striker in a cocked position. The released striker is forced downward by the compressed striker spring firing the percussion cap, the primary and secondary detonators, booster charge, 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.

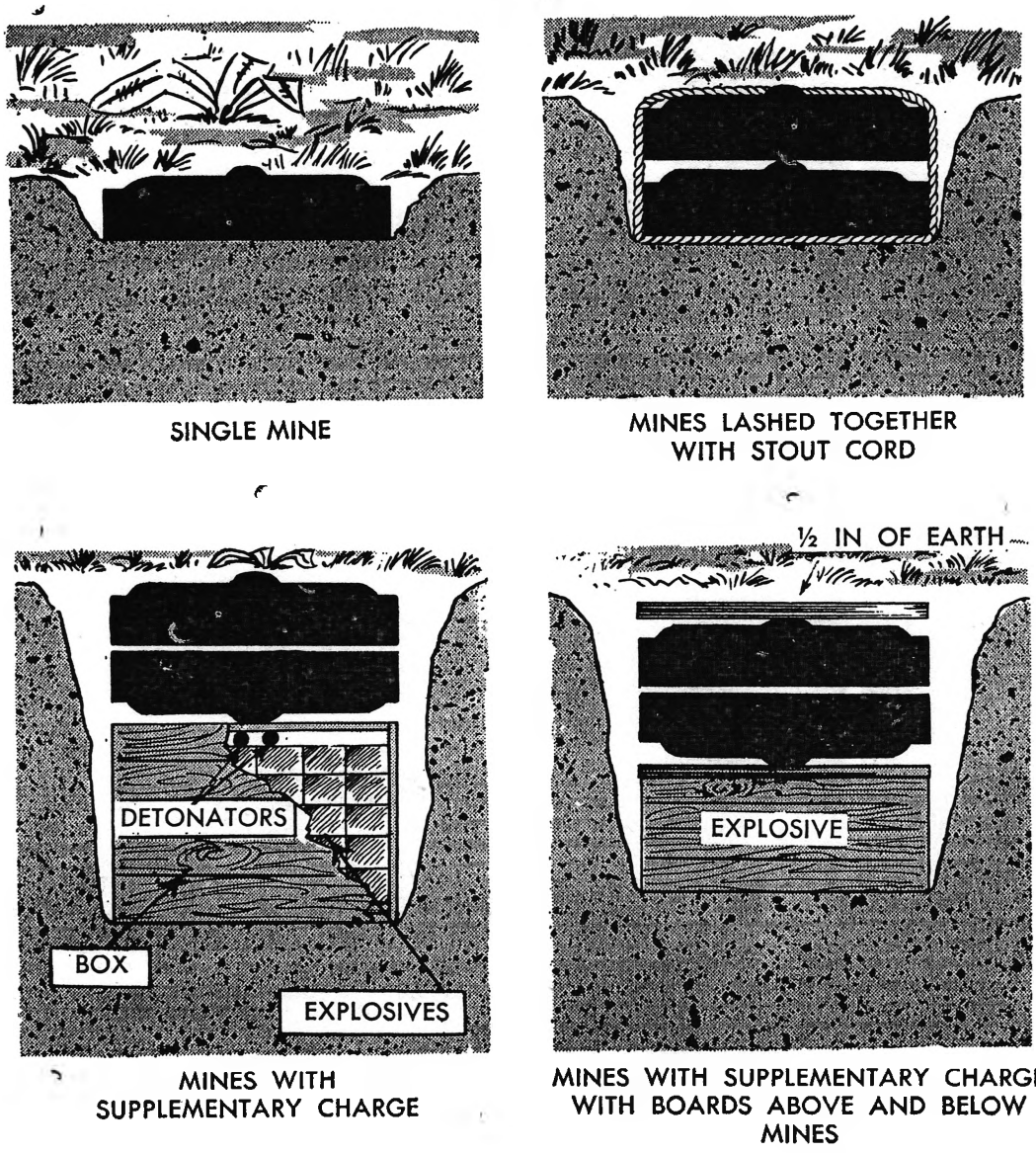


Figure 31. Methods of employment of the Japanese antivehicular mine, type 93.

(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. NEUTRALIZING. Without moving the mine or exerting any pressure on the pressure plate, unscrew the pressure plug and fuze from the mine.

f. PACKING. One mine is packed in a small wooden crate with one fuze (fig. 32).

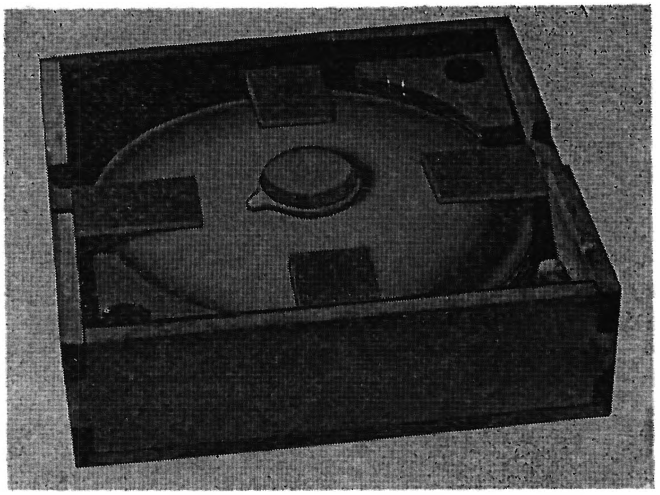


Figure 32. Type 93 mine packed in its crate.

29. Japanese Antivehicular Magnetic Mine, Type 99

a. DESCRIPTION. The type 99 antivehicular magnetic mine (fig. 33) consists of a round 1.5-pound charge encased in a canvas cover. Four

magnets are mounted in pockets sewn to the sides of the cover. The mine is 4¾ inches in diameter and weighs 2.5 pounds. The ball-release pressure fuze (par. 18) is used in this mine.

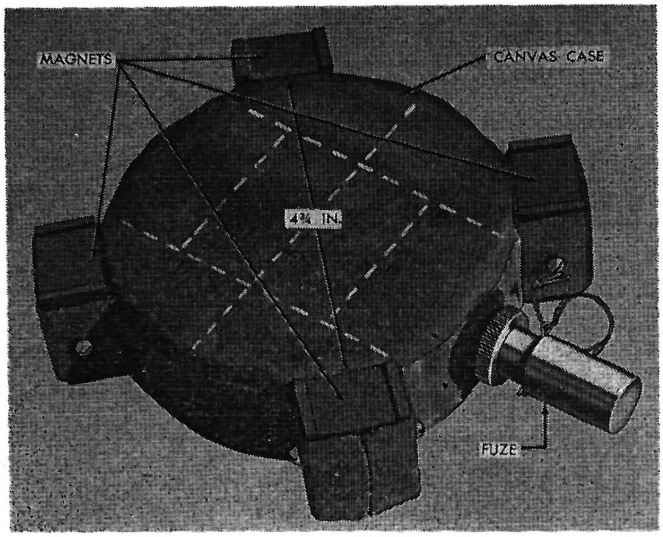


Figure 33. Japanese antivehicular magnetic mine, type 99.

b. EMPLOYMENT. This mine was designed for direct use against armored vehicles, doors of pillboxes, and similar targets. The mine is placed in contact with iron or steel objects and held against them by the four magnets.

c. FUNCTIONING.

(1) Hand pressure on the top of the sliding pressure cap depresses the sliding cap, permitting the striker-retaining balls to release the spring-loaded striker (fig. 21).

(2) The striker, driven by the striker spring, fires the percussion cap, the delay pellet, the detonator, and the main charge.

d. INSTALLNG AND ARMING. The usual practice is to place two mines together, one on top of the other.

(1) Remove the wooden shipping plug from the fuze well.

(2) Insert the percussion cap into the delay pellet, and screw the delay pellet into the fuze body (fig. 21).

(3) Screw the detonator onto the delay pellet.

Figure 34. Carrying pouch for the type 99 mine.

(4) Screw the fuze body onto the mine.
(5) Pull out the safety pin.
(6) Depress the sliding pressure cap.

e. NEUTRALIZING. Since 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 the mine. If the mine does not explode, then neutralize as follows:

(1) Insert the small stop screw and the safety pin.
(2) Unscrew the fuze from the mine.

f. PACKING. This mine is carried in a canvas pouch (fig. 34) which can be attached to the soldier's belt. The fuze is carried in a cylindrical metal container inside the pouch.

30. Japanese Antivehicular Yardstick Mine

a. DESCRIPTION. The Japanese yardstick mine (fig. 35) consists of a tubular steel case containing 6 pounds of picric acid explosive in the form of eight 0.75-pound blocks and four pressure fuzes (par. 19). The mine is 36 inches long, 3⅜ inches wide, and 1¾ inches high. One end of each picric acid block is indented to fit a fuze. Two blocks, with indented ends together, completely inclose one fuze with the exception of the striker-release plunger, which protrudes from the upper surface. Four two-block units placed end to end fill the steel case. One safety wire through an end of the mine case passes through all four fuzes. The total weight of the mine is 10.5 pounds.

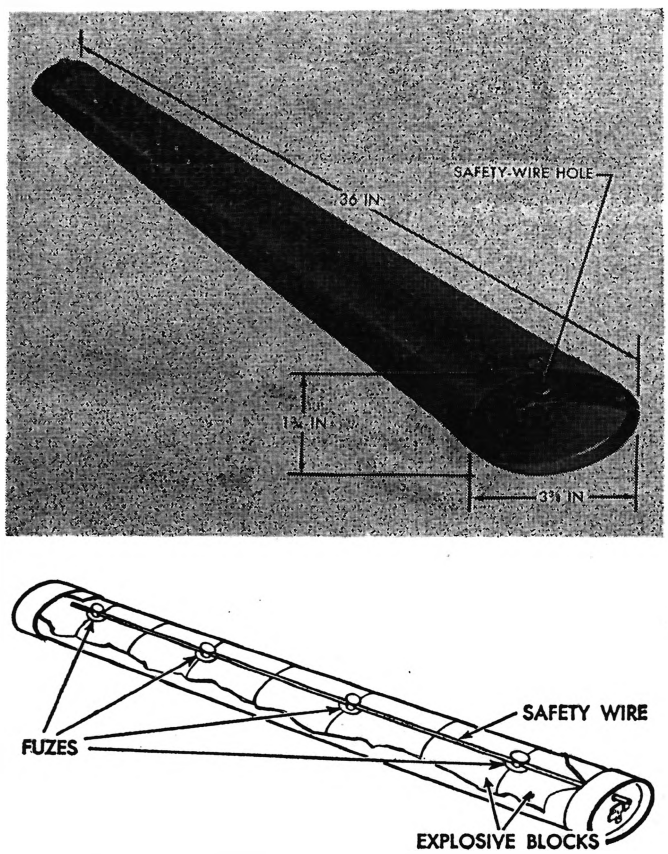


Figure 35. Japanese antivehicular yardstick mine.

b. EMPLOYMENT. This mine is used at road junctions, in road blocks, and on landing fields because of its large area of coverage. The effect of this mine on a tank depends on the portion of the mine under the track at the time of detonation. In many instances, the effect is only a little more than that of the type 93 antivehicular mine (par. 28), since only one-third of the yardstick mine is normally under the track. The effect on other vehicles is greater than that of the type 93 mine. Although this mine was designed to use four fuzes, usually only three were found installed. Some mines were found buried with fuze heads down to prevent insertion of the safety wire.

c. FUNCTIONING.

(1) Pressure of at least 300 pounds on the mine case (fig. 36) forces the case against the head of the striker-release plunger of one or more fuzes, shears the shear pin, and forces the release plunger down.
(2) The enlarged portion of the slot in the striker-release plunger moves down, and the striker passes through the opening, firing the percussion cap, detonator, and the main charge.

Note. If the shear pins are removed from the fuzes, approximately 6 pounds of pressure causes the fuzes to function. However, the strength of the mine case keeps the mine from detonating at this low pressure.

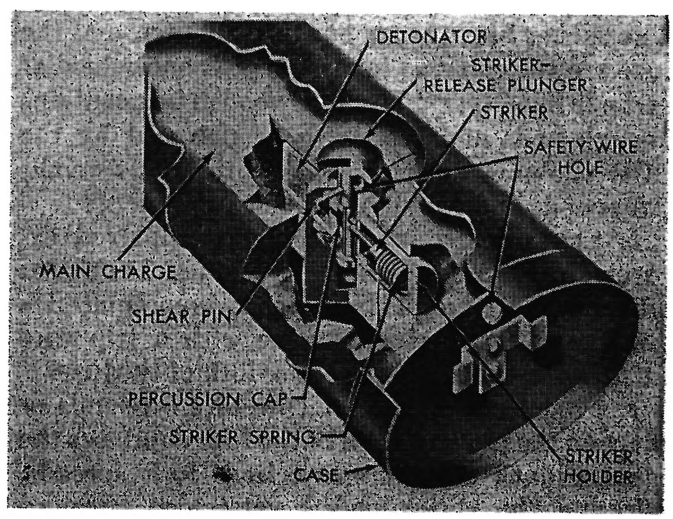


Figure 36. Cutaway view of one end of the yardstick mine.

d. INSTALLING AND ARMING. To arm the mine, remove the safety wire.

Note. When the Japanese used these mines in mine fields, the mines were waterproofed and buried not more than 2 inches below the surface. A small envelope, marked *Burying Plug*, was found tied to the safety wire on one of the mines. This envelope contained a threaded plug which screwed into the safety-wire hole in the end of the mine case to aid in making the assembly moisture-proof. Also, a thick tarlike compound was applied to the seams around the ends of the mine case.

e. NEUTRALIZING.

(1) Examine the mine carefully for activation fuzes and neutralize any that are found by removing trip wires or other devices.

(2) Lift the mine. (If the case is bent, or disassembling difficult, destroy the mine in place with explosives.)

(3) Remove the screws from the ends of the mine and remove the ends.

(4) Remove the blocks of explosive and the fuzes from the mine case.

(5) Insert an improvised safety pin into the safety-wire hole of each fuze. If a safety pin is not available, unscrew and remove either the detonator or the striker holder.

Section IV. IMPROVISED ANTIVEHICULAR MINES

31. General

Because the Japanese had few standard mines in World War II, they were forced to depend on field improvisation. They used hand grenades, mortar and artillery shells, bombs, bangalore torpedoes, and many other types of containers filled with explosives as land mines. Field improvisation and employment of mines were the responsibility of Japanese Army field commanders whose techniques varied considerably. Only those mines considered to be standard improvisations are discussed in this section.

32. Japanese Improvised Antivehicular Wooden Mine, Type 3

a. DESCRIPTION. The improvised type 3 antivehicular wooden mine (fig. 37) consists of a wooden box containing 4.5 pounds of explosive enclosed in a rubber bag, a threaded rubber fuze adapter, and a bakelite pressure-pull fuze (par. 17). The rubber bag, the rubber fuze adapter, and the fuze are the same as for the type 3 antivehicular ceramic mine (par. 27). The wooden box contains enough nails and screws to be detected by the SCR–625 mine detector. The entire mine weighs 5.5 pounds and will disable vehicles.

b. EMPLOYMENT. This mine is employed extensively on roads and airfields and in other places where vehicles are likely to pass. Sometimes it is used as an antipersonnel mine with a trip wire attached to the hammer-release fork of the fuze.

c. FUNCTIONING. A pressure of 4.5 pounds or more on the plunger head of the fuze depresses the plunger until the hammer-release fork spreads, releasing the spring-loaded percussion hammer against the striker. The striker then fires the percussion cap, the detonator, and the main charge. If a pull wire is used, a pull of about 22 pounds pulls out the hammer-release fork, and the spring-loaded percussion hammer hits the striker firing

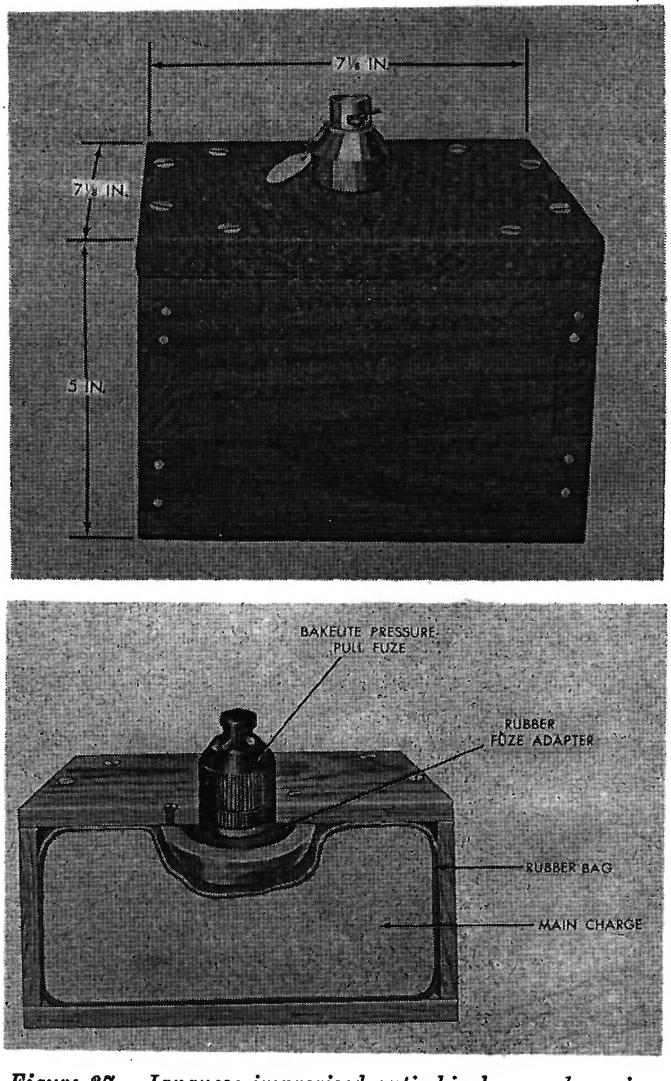


Figure 37. Japanese improvised antivehicular wooden mine, type 3.

the percussion cap, the detonator, and the main charge.

d. INSTALLING AND ARMING.

(1) Insert the detonator in the fuze.
(2) Screw the fuze and detonator into the threaded rubber fuze adapter.
(3) Tie a pull wire to the hammer-release fork if the mine is to be used as an antipersonnel mine.
(4) Remove the safety pin.

e. NEUTRALIZING.

(1) Unscrew the fuze from the mine.
(2) Remove the percussion cap and detonator from the fuze.

f. PACKING. Ten mines are packed in a wooden case (fig. 38). The fuzes and detonators are packed separately.

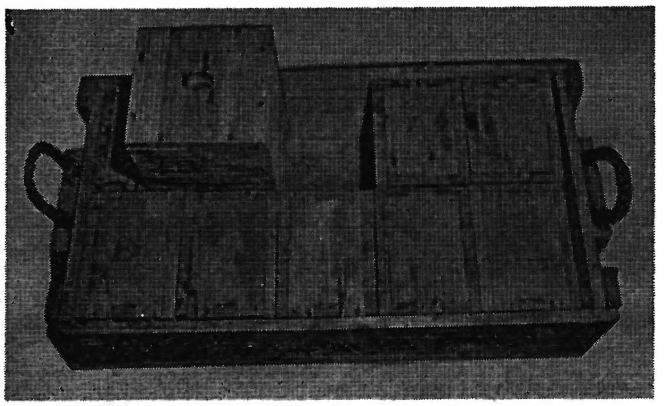


Figure 38. Packing of improvised antivehicular wooden mines, type 3.

33. Japanese Improvised Antivehicular Friction-Fuze Mine

a. DESCRIPTION. The improvised antivehicular friction-fuze mine (fig. 39) consists of a wooden box containing 3.5 pounds of picric acid or TNT (trinitrotolulene) and a pull type friction fuze. The mine weighs 5.5 pounds.

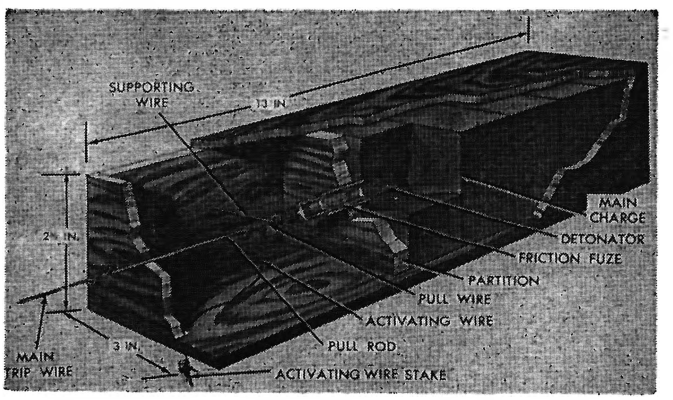


Figure 39. Japanese improvised antivehicular friction-fuze mine.

b. EMPLOYMENT. This mine was primarily used in road blocks and on the shoulders of roads. It was also used for unit security when other mines were not available.

c. FUNCTIONING. A pull on the main pull wire, or on the activating wire when attempting to lift the mine, causes the friction fuze to function, firing the detonator and the main charge.

d. INSTALLING AND ARMING.

(1) Drive a stake into a prepared hole.
(2) Tie the activating wire to the stake.
(3) Lay the mine in place in the hole and open the lid.
(4) Thread the activating wire into the box.
(5) Attach one end of the main pull wire to the pull rod, and the other end to a tree or other object.
(6) Insert the fuze through the hole in the partition.
(7) Thread the pull wire through the loop of the supporting wire and tie it to the loop of the pull rod.
(8) Fasten the activating wire to the pull wire and close the lid.

e. NEUTRALIZING.

(1) Examine the mine closely for booby traps or trip wires. Neutralize any booby traps and cut any slack trip wires that may be present.
(2) Cut the main pull 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. If present, cut the activating wire.
(5) Remove the lid and cut the pull wire.
(6) Withdraw the fuze.

34. Japanese Improvised Antivehicular Pressure and Pull Mine

a. DESCRIPTION. The improvised antivehicular pressure and pull mine (fig. 40) consists of a wooden box containing 2 or more pounds of picric acid or TNT and a friction fuze. It has an effective casualty radius of from 3 to 5 yards. The lid is supported by four springs and is fitted with a pressure block. There is also a hole in the lid to permit access of this trip wire to the friction fuze. The hole in the bottom of the mine is for the activating wire.

b. EMPLOYMENT. This mine was used against troops and all types of vehicles. The size of the

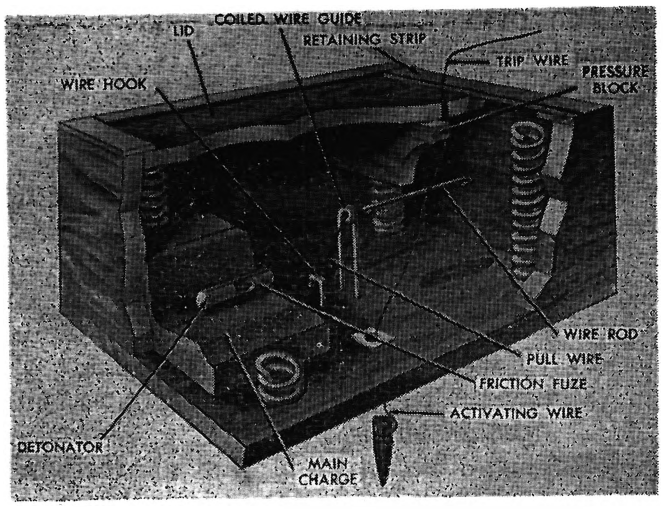


Figure 40. Japanese improvised antivehicular pressure and pull mine.

box and the mine charge varied according to the intended use of the mine.

c. FUNCTIONING. Any movement of the wire rod by either pull or pressure causes the pull wire to actuate the fuze by one or more of the following methods:

(1) By pulling on the trip wire, the free end of which is attached to a tree or to a stake.

(2) By lifting the mine and exerting a pull on the activating wire fastened to a stake in the hole.

(3) By pressing on the lid, causing the pressure block to depress the wire rod.

d. INSTALLING AND ARMING.

(1) Drive a stake into the prepared hole. Tie a wire to the stake.

(2) Lay the mine in the hole so the stake is just under the hole in the bottom of the mine.

(3) Pass the activating wire from the stake through the hole in the mine and tie it to the wire rod.

(4) Tie the trip wire to the wire rod.

(5) Insert a friction fuze and a detonator in the hole provided in the charge.

(6) Pass the pull wire under the wire hook and through the coiled wire guide and tie it to the wire rod.

(7) Thread the trip wire through the hole in the lid.

(8) Set the lid in place on the springs and fasten the retaining strips in place.

(9) Cover the mine.

(10) Make the end of the trip wire fast and see that the wire is slack.

e. NEUTRALIZING.

(1) Closely examine the mine for booby traps or wires. Neutralize any booby traps and cut any slack trip wires that may be found.

(2) Remove the retaining strips and lift off the lid.

(3) Remove the friction fuze and the detonator and, if possible, separate the friction-fuze tube from the detonator tube.

35. Japanese Improvised Antivehicular Grenade-Fuzed Mine

a. DESCRIPTION. The improvised antivehicular grenade-fuzed mine (fig. 41) consists of a rectangular case of light metal, wood, or plastic with a cover securely fastened by friction tape. A carrying cord may be taped to the mine. If a carrying cord is used it is passed through the safety-pin hole of the grenade. If the carrying cord is not used the safety pin will be in the grenade. The case contains 3 pounds of explosive in the form of 12 blocks each wrapped in black wax paper. A type 91 or 97 hand grenade acts as the fuze and booster charge with the pressure cap of the grenade extending about one-half inch through a hole punched in the top of the mine case.

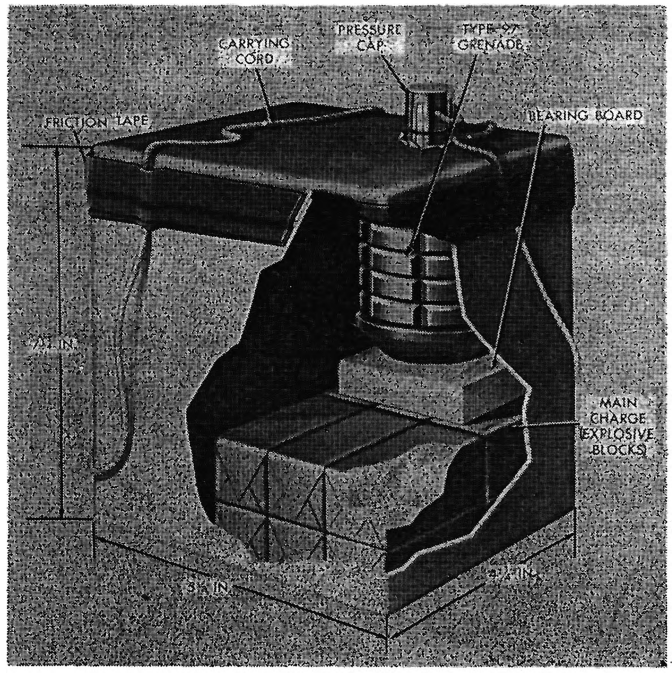


Figure 41. Japanese improvised antivehicular grenade-fuzed mine.

b. EMPLOYMENT. This mine was designed primarily for use as an antivehicular mine. It can a'so be used as an antipersonnel mine or as a booby trap.

c. FUNCTIONING.

(1) When the safety pin is removed, a sharp blow or pressure on the grenade pressure cap drives the striker into the percussion cap, setting off the grenade. Heavier pressure is required if there is a carrying cord passing through the safety-pin hole.

(2) The grenade explodes the main charge.

d. INSTALLING AND ARMING.

(1) Place the mine in a hole deep enough for the top of the grenade to protrude 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 to be used as an antipersonnel mine.

e. NEUTRALIZING.

(1) Carefuly search for activating fuzes and neutralize any that are found by removing trip wires or other devices.

(2) Place the safety pin in the safety-pin hole in the top of the grenade if the carrying cord is not passed through the safety-pin hole.

(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.

Section V. ANTIPERSONNEL MINES

36. General

The Japanese developed only one antipersonnel mine, which was made of pottery. It was never used, although 900 mine cases were made for test purposes. The Japanese did, however, employ several types of nonstandard antipersonnel mines which were considered standard improvisations. All these mines are discussed in this section.

37. Japanese Antipersonnel Ceramic Bounding Mine

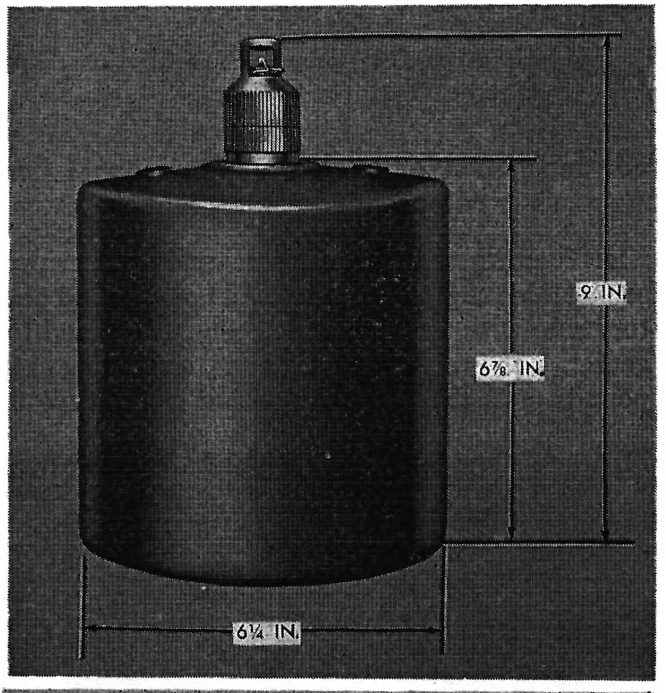
a. DESCRIPTION. The ceramic bounding mine (fig. 42) consists of a cylindrical pottery case 6⅞ inches high and 6¼ inches in diameter. It contains about 4.5 pounds of explosive, a central fuze well, a firing tube surrounded by a detonator, and a tube in the center of the mine case for the delay charge and propelling charge, closed at the bottom by a wooden plug. The mine weighs a total of 7 pounds. It was designed to use the bakelite pressure-pull fuze (par. 17).

b. EMPLOYMENT. Although never employed, this mine was intended to be used as a trip-wire or pressure-operated bounding shrapnel mine against foot troops.

c. FUNCTIONING.

(1) If operated by pull, a pull of 22 pounds or more removes the hammer-release fork and frees the spring-loaded percussion hammer against the striker.

(2) If operated by pressure, a pressure of 4.5 pounds or more on the head of the plunger frees the spring-loaded percussion hammer against the striker.



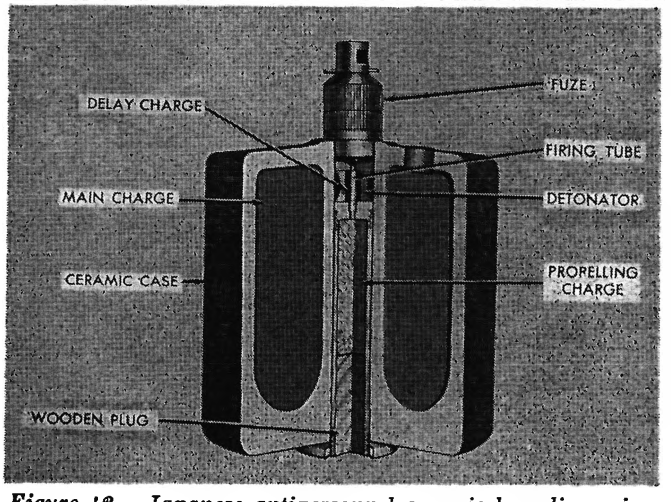


Figure 42. Japanese antipersonnel ceramic bounding mine.

(3) The striker fires the percussion cap
(4) The percussion cap fires into the central firing tube, which ignites the propelling charge and the 3/5-second delay charge.
(5) The propelling charge propels the mine upward.
(6) The delay charge fires the detonator and the main charge when the mine reaches a height of approximately 3 feet above the ground.

d. INSTALLING AND ARMING.
(1) Insert the detonator in the delay charge.
(2) Install the fuze.
(3) Install one or more trip wires as desired.
(4) Remove the safety pin.

e. NEUTRALIZING.
(1) Insert the safety pin.
(2) Cut any trip wires.
(3) Remove the fuze.
(4) Remove the detonator and the delay charge.

38. Japanese Nonstandard Antipersonnel Ceramic Mine (Headquarters Mine)

a. DESCRIPTION. This nonstandard antipersonnel mine (fig. 43) consists of a large, round pottery case with two halves permanently joined together. It weighs 180 pounds, including 140 pounds of TNT. The demolition clock, type 99 (1939) (par. 21) is used with this mine and is contained in a wooden box 6¾ inches long, 5¼ inches wide, and 4⅝ inches high. The demolition clock is connected to the pottery mine case by electric leads to the detonator in the main charge.

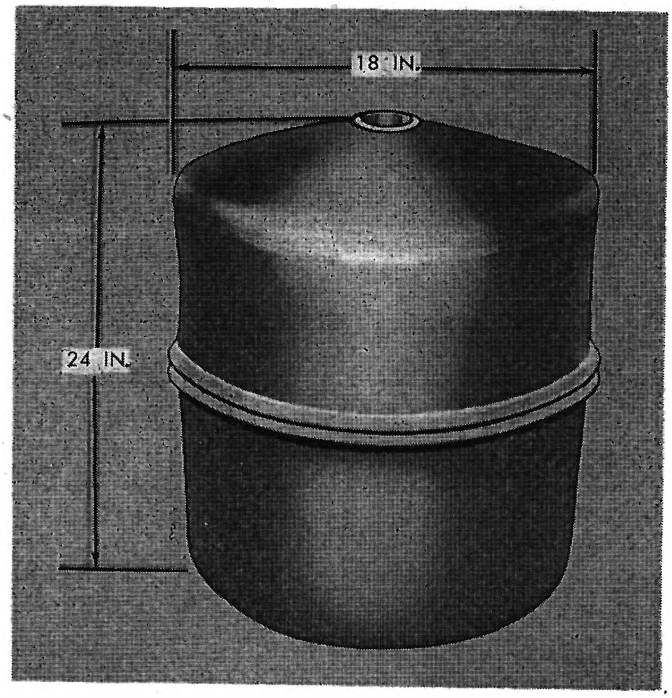


Figure 43. Japanese nonstandard antipersonnel ceramic mine (headquarters mine).

b. EMPLOYMENT. This mine was designed as a large delayed-action charge for use in buildings which had been abandoned to the enemy. The buildings chosen were those which would be suitable for housing higher headquarters.

c. FUNCTIONING. Settings on the demolition clock, type 99, are possible up to 10½ days in 2-hour increments. Electrically wound and spring-driven, the clockwork runs down approximately every 4 minutes and 45 seconds, closing a solenoid circuit which rewinds the clockwork spring. The dial, calibrated in days and 2-hour increments, rotates in a clockwise direction. At the end of the delay clock's set run, the action of the bridging arm closes the primary circuit and explodes the mine.

d. INSTALLING AND ARMING.
(1) Insert an electric detonator in the well provided in the mine case.
(2) Connect electric lead wires to the demolition clock. Test the mechanism by setting it for a 5-minute delay period. If electricity flows into the primary and secondary circuits, the clock is functioning 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. NEUTRALIZING. To neutralize the mine, cut the leads connecting the demolition clock to the mine, one at a time.

39. Japanese Bangalore Torpedo, Type 99

a. DESCRIPTION. The type 99 bangalore torpedo (figs. 44 and 45) consists of an iron pipe containing 3.2 pounds of picric acid and a fuze assembly. The fuze assembly consists of two pull type friction fuzes, two 7-second delay pellets, two detonators, a safety pin, and a pull cord. The entire section, without fuze assembly and nose,

weighs 10 pounds. The fuze assembly is screwed into the nose section for transport. A threaded metal cap closes the fuze-assembly end of the torpedo.

b. EMPLOYMENT. The bangalore torpedo is installed with trip wires along trails and avenues of approach to unit positions. It is also employed as a prepared charge for booby traps.

c. FUNCTIONING. When the safety pin is removed and the pull-cord plug unscrewed, a pull on the pull cord actuates the two friction fuzes which ignite the 7-second delay pellets. The pellets 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 trip wire to the pull cord of the fuze assembly.
(6) Remove the safety pin.
(7) Unscrew the pull-cord plug.

e. NEUTRALIZING.

(1) Screw in the pull-cord plug.
(2) Insert a wire or a nail in the safety-pin hole.

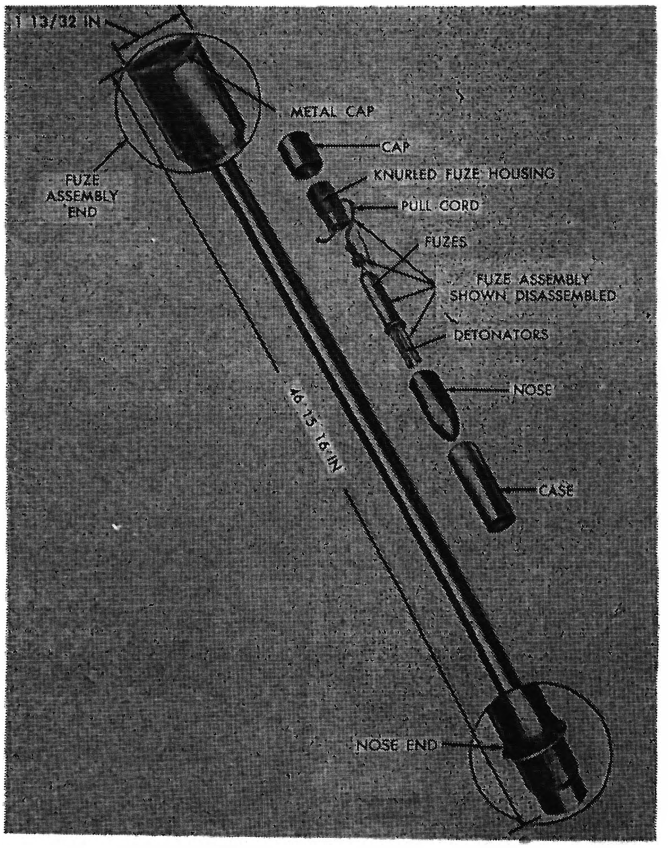


Figure 44. Japanese bangalore torpedo, type 99.

(3) Cut the trip wire.
(4) Unscrew the fuze assembly and the nose piece from the torpedo.
(5) Screw the fuze assembly into the nose piece.

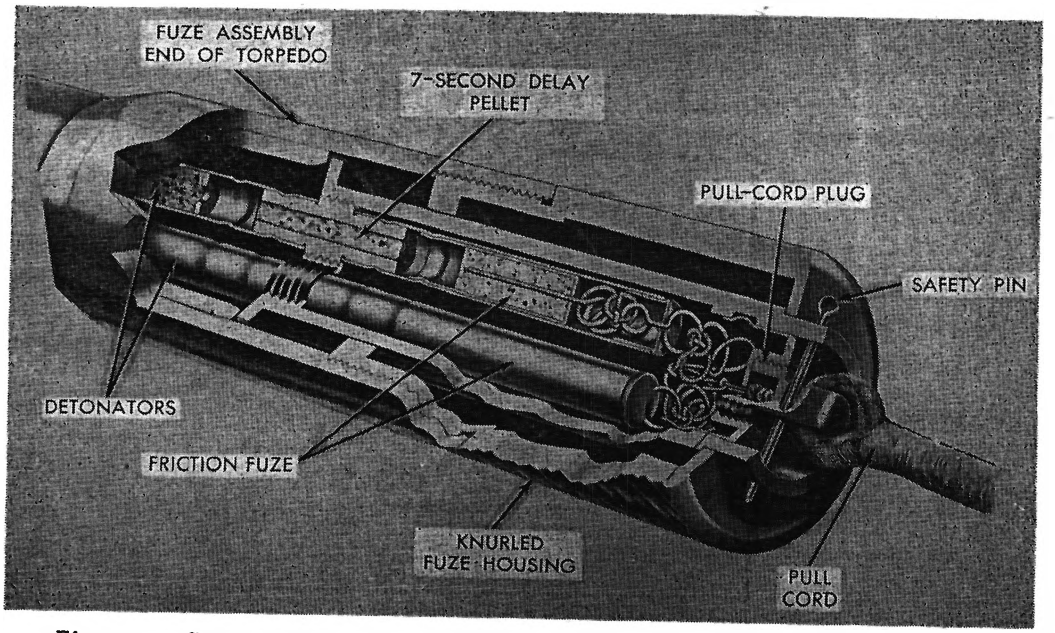


Figure 45. Cutaway view of the fuze assembly of the Japanese bangalore torpedo, type 99.

f. PACKING. Three cylindrical metal fuze cases, each with a fuze assembly and a nose piece, and six torpedo sections are shipped together in a wooden box.

40. Japanese Nonstandard Antipersonnel Fragmentation Mine

a. DESCRIPTION. This nonstandard antipersonnel fragmentation mine (fig. 46) consists of a black, hemispherical cast-iron case, 8 inches in diameter at the base and 4½ inches high. The exterior has serrations, which vary in number from 114 to 134. The mine weighs a total of 16.5 pounds, including a picric-acid explosive charge of from 4 to 5 pounds. It will produce casualties

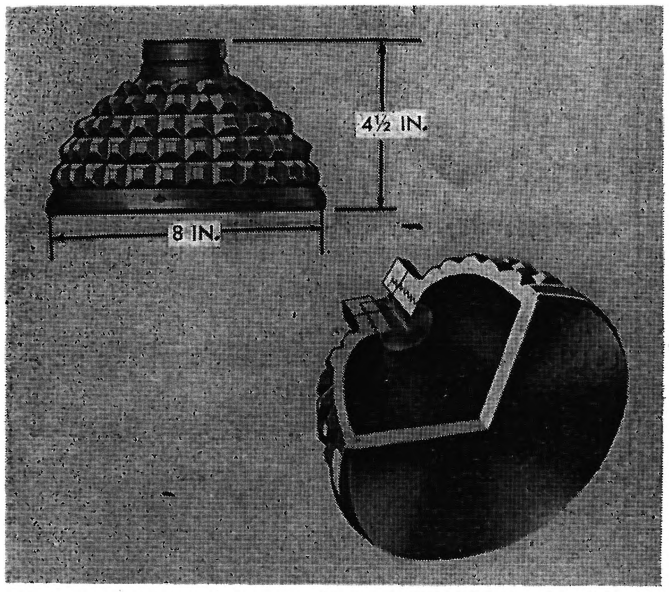


Figure 46. Japanese nonstandard antipersonnel fragmentation mine.

to all personnel within 25 yards and has a danger area radius of 150 yards.

b. EMPLOYMENT. This mine is used almost exclusively for antipersonnel use.

c. FUNCTIONING. Two types of fuzes were used with this mine, the type 88 instantaneous artillery fuze (par. 22) and a bakelite pressure-pull fuze (par. 17).

(1) When the type 88 artillery fuze is used, a direct pressure of 20 pounds actuates the fuze and explodes the mine.

(2) When the bakelite pressure-pull fuze is used, a pressure of 4.5 pounds or more 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 which explodes the main charge. Pull of 22 pounds on the pull wire removes the hammer-release fork and frees the spring-loaded percussion hammer against the striker.

d. INSTALLING AND ARMING.

(1) Screw a suitable fuze adapter into 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. NEUTRALIZING.

(1) Insert a safety pin or a wire into the safety-pin hole of the fuze.

(2) Cut any pull wires attached to the fuze.

(3) Unscrew the fuze from the mine.

(4) Remove the percussion cap and detonator from the fuze.

f. PACKING. The mines are packed six to a wooden case with the tops turned upward. Each of the mines is provided with a wooden plug within the fuze well.

Section VI. BOOBY TRAPS

41. Japanese Electrical Booby Traps

Before abandoning an area, the Japanese booby-trapped any piece of equipment containing an electrical circuit (vehicles, searchlights, generators) by inserting an electric detonator and an explosive charge into the electric circuit. For this reason, any piece of abandoned equipment containing an electrical circuit has to be carefully searched and all booby traps neutralized before the equipment is moved.

42. Japanese Magnetic Mine Type 99, Used as Booby Trap

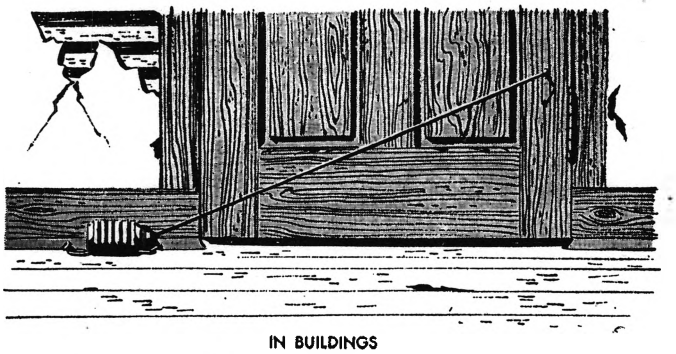
This type 99 magnetic mine (par. 29) was used occasionally as a pressure-operated booby trap. It was installed beneath a loose board with the fuze upright and the safety pin removed. It could be set for instantaneous detonation by removing the delay pellet and replacing it with the detonator.

43. Japanese Friction Fuse Lighters Used as Booby Traps

Fuse lighters (pars. 23–25) were often used to set off trip-wire-operated booby traps. They were used in many types of improvised mines. These devices are neutralized by cutting the trip wire and removing the fuze and the detonator from the charge.

44. Grenade Booby Traps

Hand grenades of all types were often used as booby traps. Some of the many grenade booby traps laid by the Japanese in World War II are shown in figure 47.



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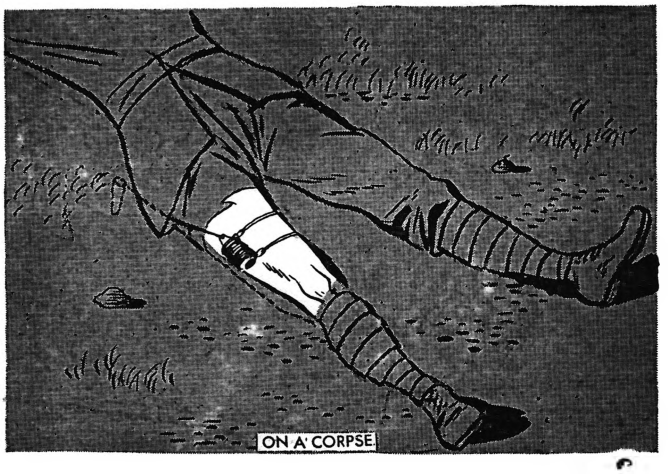
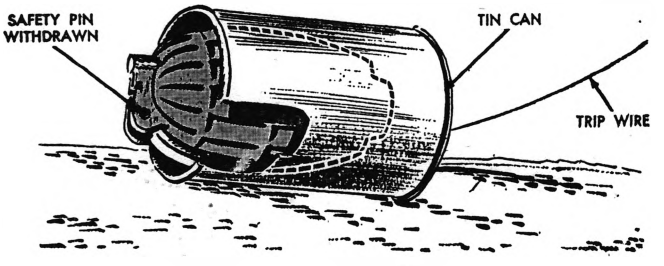
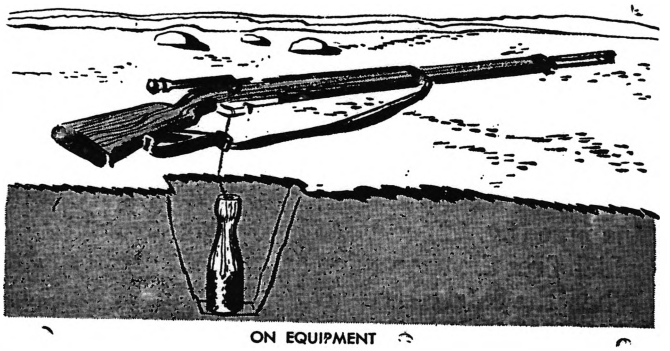
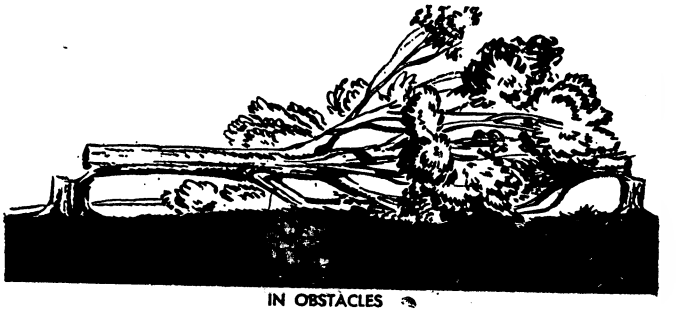




IN OBJECTS IN BATTLE-STREWN DEBRIS



ON EQUIPMENT



IN OBSTACLES

Figure 47. Typical examples of Japanese grenade booby traps.

45. Japanese Improvised Electrical-Pressure Booby Trap

The electrical-pressure booby trap (fig. 48) consists of a piece of bamboo split and cut to appear like a two-pronged fork. Two bolts are screwed into the ends of the prongs and a wire lead is fastened to each bolt. The wires are connected to a dry-cell battery and to a main charge. The Japanese sometimes used bottles filled with loose picric acid placed inside a shell case for the main charge. Electric caps were used as detonators.

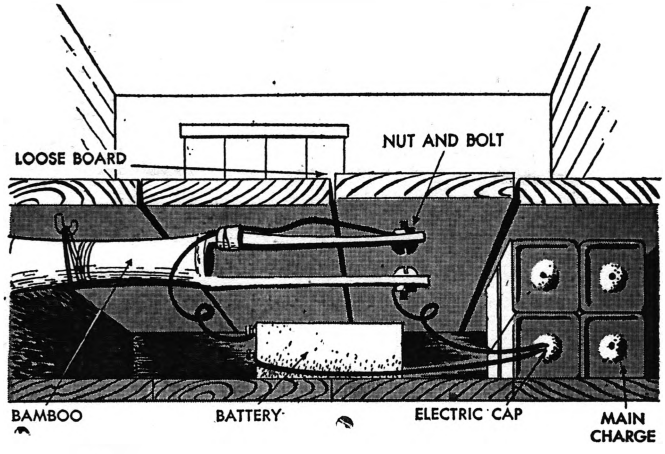


Figure 48. Japanese improvised electrical-pressure booby trap.

46. Miscellaneous Japanese Booby Traps

a. PHONOGRAPH. The Japanese booby-trapped a phonograph (fig. 49) by arranging an electrical contact on the pick-up assembly. Moving the phonograph arm to play the record (about one-half inch at the contact points) would complete the circuit and set off the main charge. Both the main charge and the battery were under the floor boards.

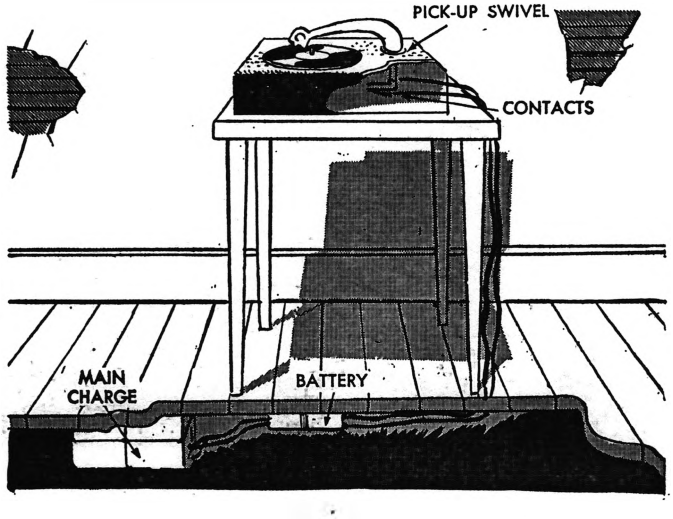


Figure 49. Japanese phonograph booby trap.

b. PARASOL BOOBY TRAP. The parasol booby trap (fig. 50) was a combined explosive and incendiary device. Opening the parasol broke an acid vial which fired the explosive and incendiary charge. The explosives consisted of sulfuric acid, detonating fluid, a mixture of detonating and ignition fluid, ignition fluid, and a heat-producing acid.

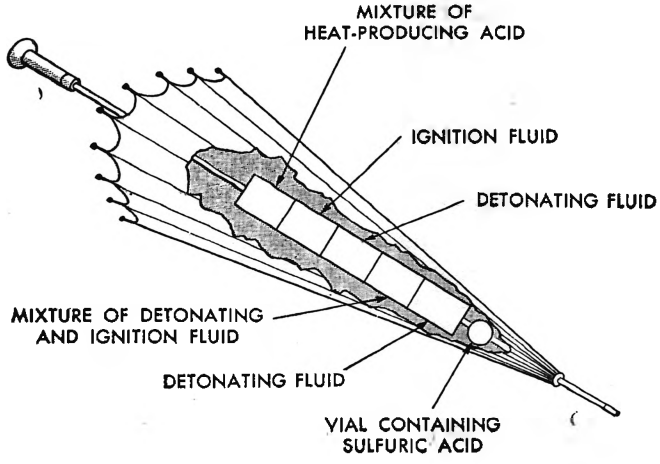


Figure 50. Japanese parasol booby trap.

c. FLASHLIGHT BOOBY TRAP. In the flashlight booby trap (fig. 51), the switch is used to connect a circuit through an electric detonator. When the switch is pressed, the explosive detonates, scattering bicycle ball bearings used as shrapnel.

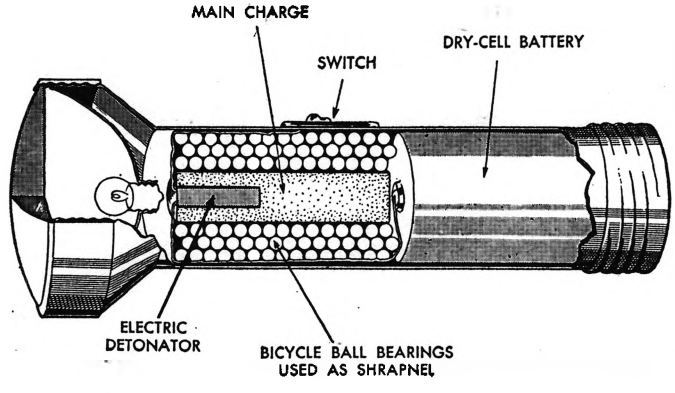


Figure 51. Japanese flashlight booby trap.

d. PIPE BOOBY TRAP. Unscrewing the stem of the pipe (fig. 52) releases the spring-loaded striker which fires the percussion cap and the main charge. When the safety screw is in place, it prevents the pipe stem from being unscrewed.

e. BOTTLE BOOBY TRAP. The bottle booby trap (fig. 53) is primarily designed for its incendiary

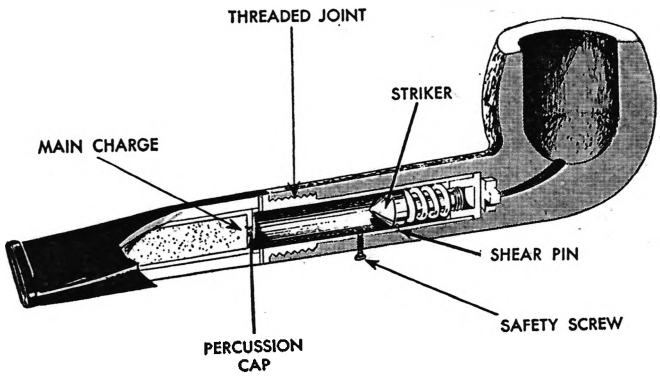


Figure 52. Japanese pipe booby trap.

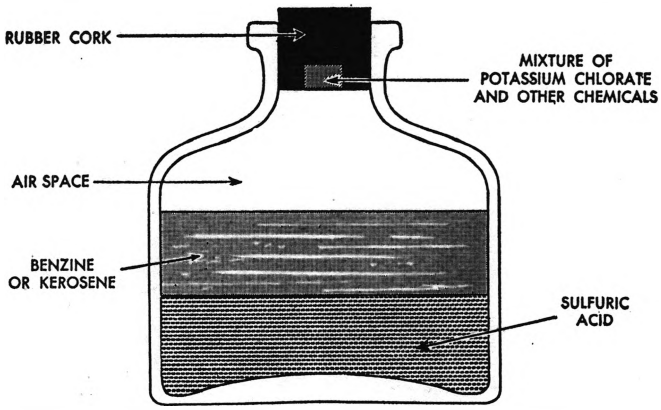


Figure 53. Japanese bottle booby trap.

effect. If the bottle is picked up and shaken, or if it is tipped over, the mixture in the cork causes the sulfuric acid to explode and ignite the benzine or other inflammable fluid.

Section VII. ANTIAMPHIBIOUS MINES

47. General

The Japanese Navy developed and produced the first mines specifically designed for use on beaches to hinder amphibious assault landings. Two models of such mines were produced and used by the Japanese in World War II. These were the model 1 double-horn and the model 2 single-horn beach mines, so-called because the fuzes, when installed, resemble horns. Two other antiamphibous mines were developed but never employed in combat. These were the mark 4 amphibious mine and the rocket antiboat mine.

48. Japanese Model 2 Beach Mine, Single Horn

a. GENERAL. A total of 62,000 of these cone-shaped mines were manufactured in 1944, the only year in which they were made.

b. DESCRIPTION. The Japanese single-horn beach mine (figs. 54 and 55) consists of a 3/16-inch steel conical case containing 22 pounds of explosive. It weighs a total of 68 pounds. The fuze itself is identical to the fuzes used in the model 1 double horn beach mine (par. 49).

c. EMPLOYMENT. 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 can therefore better withstand surf action. It was employed in the same way as the double-horn beach mine and is effective against light landing craft, tanks, and

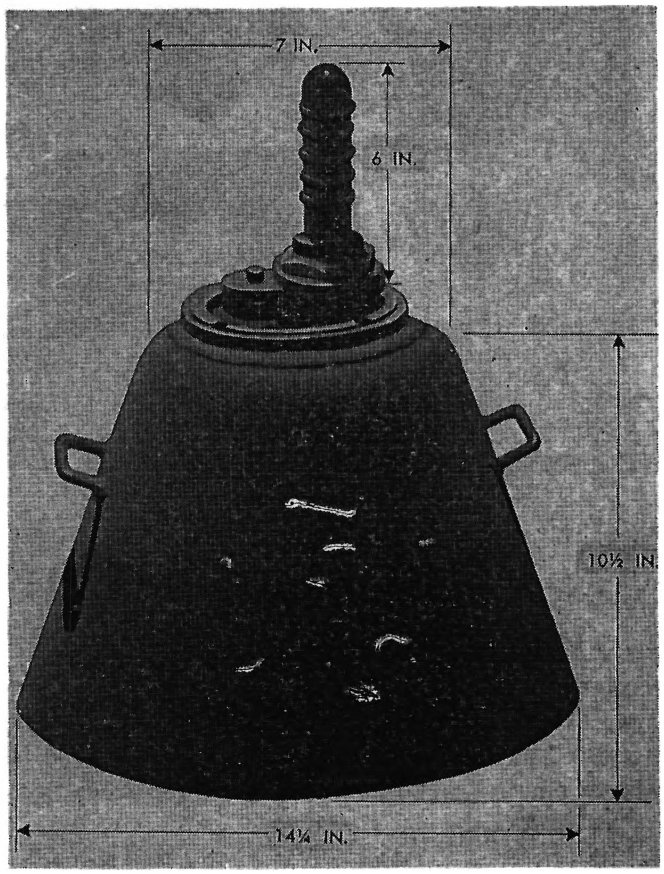


Figure 54. Japanese model 2 beach mine, single horn.

vehicles. It was more often used in buildings, on roads, bridges, and airstrips, and in large mine fields to protect strong points than it was used on beaches. This mine was found planted in patterns, sometimes with wires, cables, or steel bars

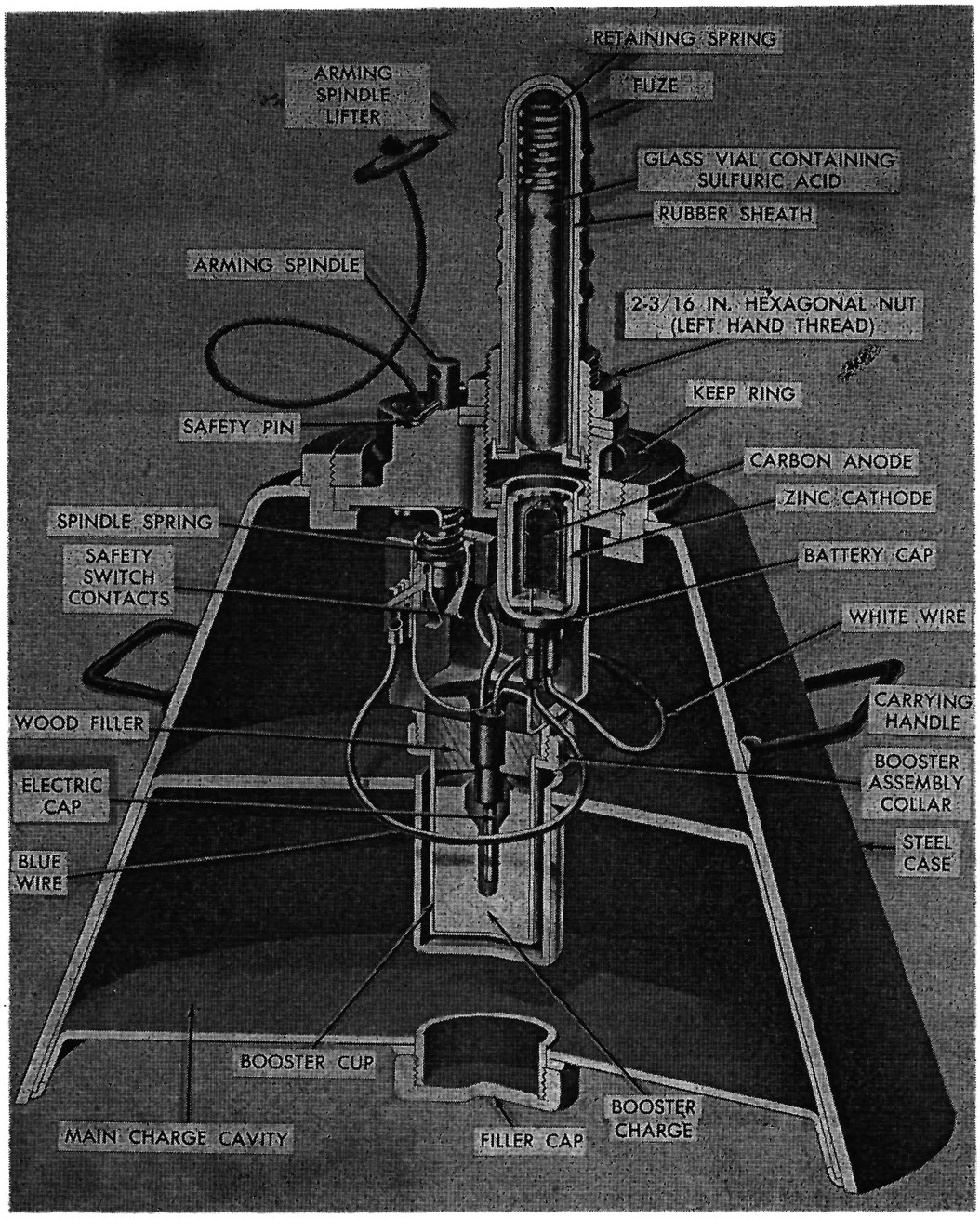


Figure 55. Cutaway view of the Japanese model 2 beach mine, single horn.

connecting the fuzes to give a larger area of coverage. Occasionally, this mine, together with the model 1 beach mine, was found placed next to larger charges, such as bombs and depth charges.

d. 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 fuze is omitted. Also, several mines can be connected to form an electrically controlled mine field.

e. INSTALLING AND ARMING.

(1) Uncrate the mine and 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.

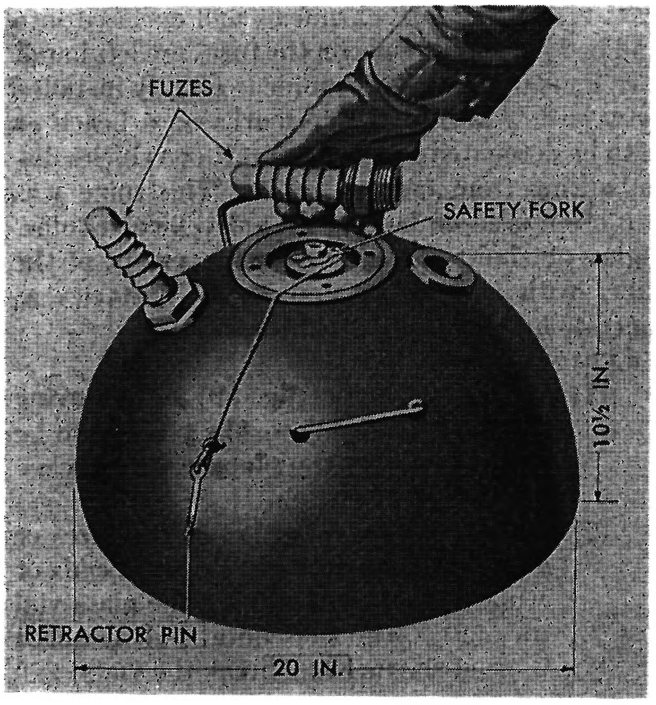


Figure 56. Japanese model 1 beach mine, double horn.

Figure 57. Components of the Japanese beach mine, double horn.

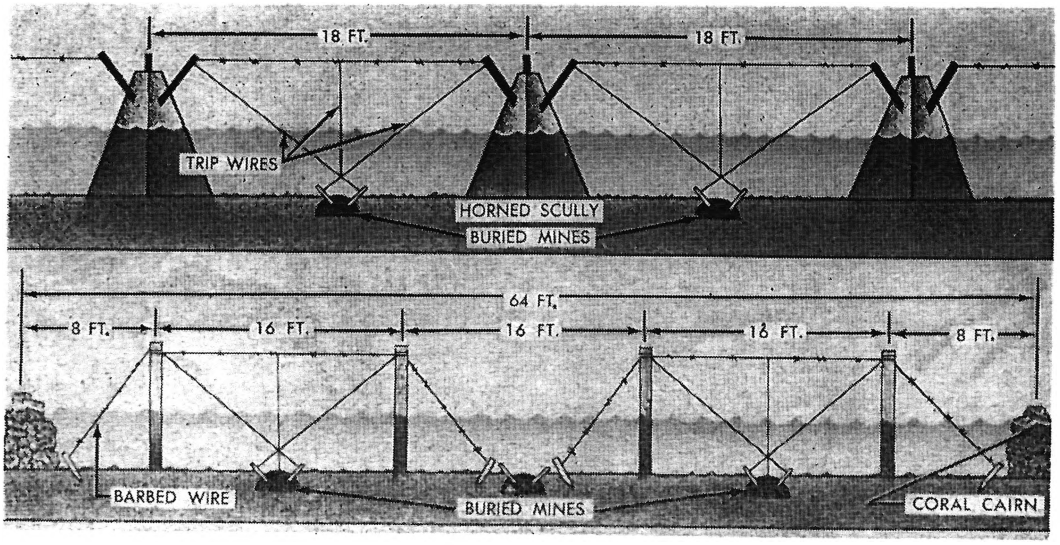


Figure 58. Japanese double-horn beach mines employed with underwater obstacles.

(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.

f. NEUTRALIZING. This mine is neutralized in the same manner as the double-horn mine (par. 49).

Note. Removing the fuze under water will permit salt water to get into the battery cap and perhaps create enough current to detonate the mine. Therefore, when neutralizing the mine under water, remove the entire arming mechanism, including the battery cap, as a unit.

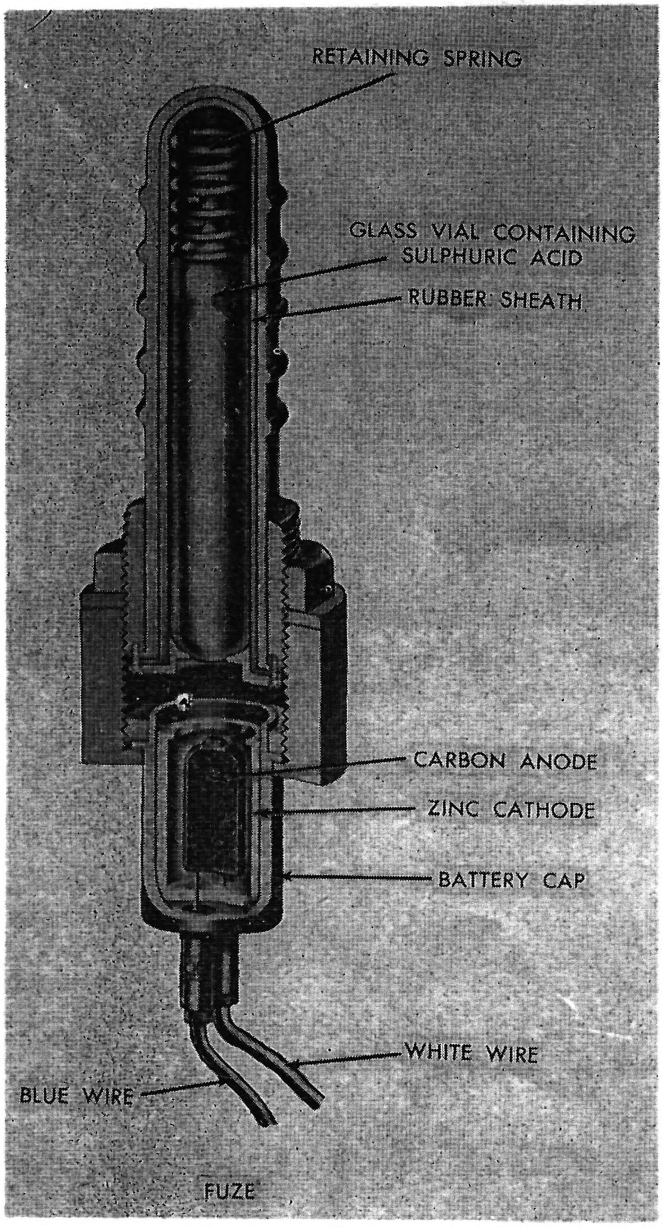
49. Japanese Model 1 Beach Mine, Double Horn

a. GENERAL. A total of 8,000 model 1 beach mines, double horn, were manufactured in 1943, the only year in which they were made.

b. DESCRIPTION. The double-horn beach mine (figs. 56 and 57) consists of a 3/16-inch steel hemispherical case containing 46.5 pounds of trinitroanisol explosive. The mine weighs 107 pounds, not including the fuzes (horns). The fuzes are glass vials filled with chemicals and enclosed in a lead body. The threads on the fuzes are left hand.

c. EMPLOYMENT. This mine is usually installed between low and high tide marks on a beach so as to be detonated by landing craft or vehicles disembarking from landing craft. This mine was also often used on land as an antivehicular mine. Figure 58 shows the use and arrangement of the mines with such other underwater obstacles as concrete horned scullies and coral cairns.

d. FUNCTIONING.
(1) Arming the mine (fig. 59) by removing the safety fork allows the plunger to be forced down by the plunger spring, closing the safety switch.
(2) Direct pressure on either of the fuzes or a pull on the trip wire (fig. 58) bends or crushes the fuze, breaking the glass vial (fig. 59). The horizontal pull required to bend the fuze and break the vial is 200 pounds at the outermost ring; 275 pounds



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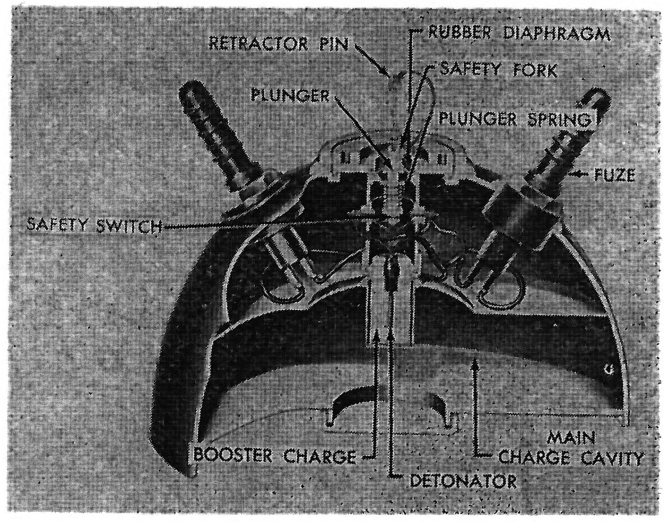

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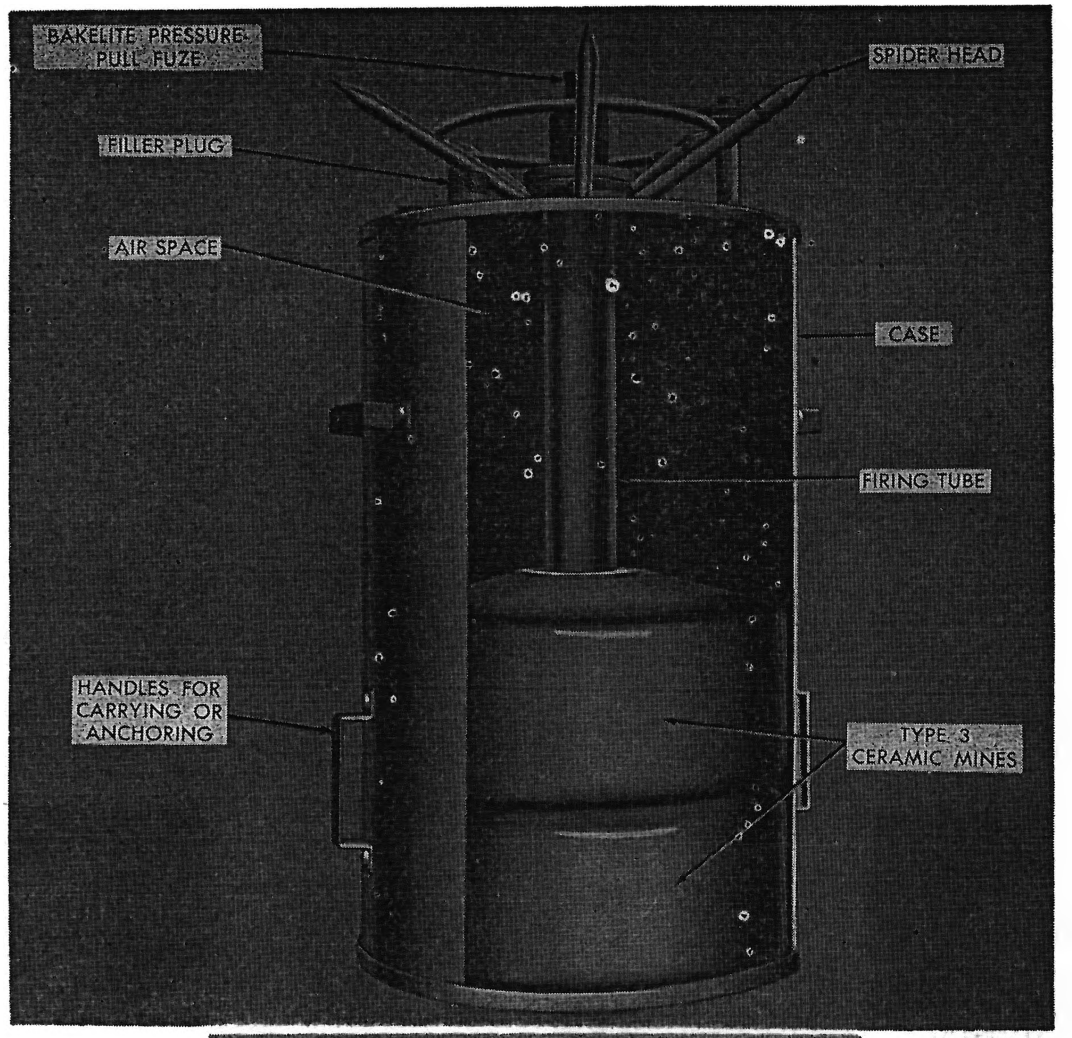
Figure 59. Cutaway view of the Japanese model 1 beach mine, double horn.



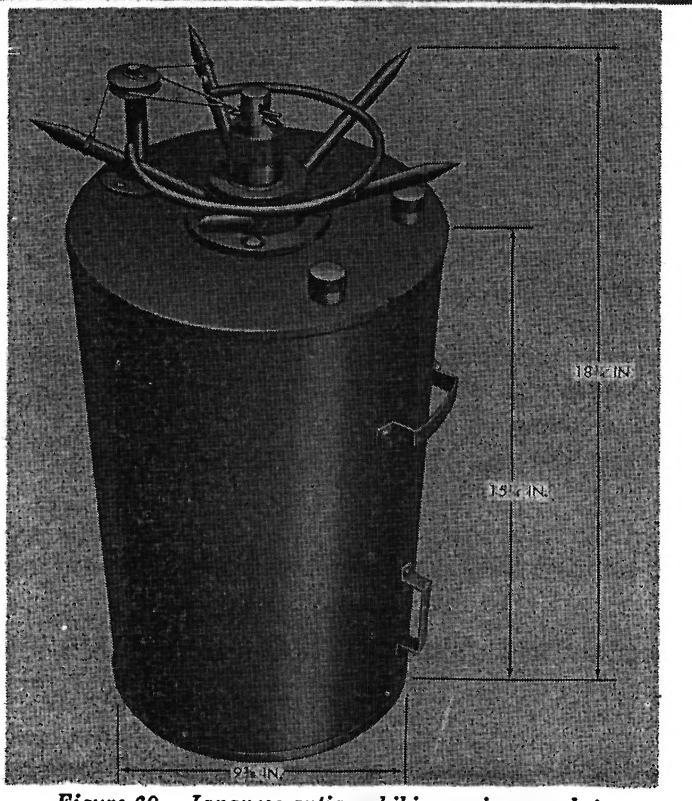


Figure 60. Japanese antiamphibious mine, mark 4.

at the third ring down; 430 at the bottom ring.

(3) Acid from the vial comes in contact with the battery plates, causing them to generate the electricity which fires the detonator, the booster, and the main charge.

e. INSTALLING AND ARMING. With the arming mechanism and the fuzes installed, arm the mine as follows:

(1) If trip wires are to be installed, use heavy wires and attach them first to the anchor and then to the fuzes.

(2) Remove the safety fork.

f. NEUTRALIZING.

(1) If the mine is to be destroyed in place from a safe distance use one of the following methods:

(*a*) Detonate a special nonelectric or a special electric cap attached to each fuze with string or tape.

(*b*) Explode a detonating cord wrapped around each fuze.

(*c*) Fire a charge placed near the mine.

(2) If removing the mine intact is essential, make the mine safe as follows:

(*a*) Check the area about the mine for activation fuzes and carefully remove any wires or devices that may be connected to the fuzes.

(*b*) Screw the retractor pin into the head of the plunger.

(*c*) Pull up the plunger and replace the safety fork.

(*d*) With a spanner wrench, or a driftpin and a hammer, remove the keep ring over the arming mechanism.

(*e*) Pull out the arming mechanism far enough to expose the wires.

(*f*) Cut the white or the yellow leads to the detonator and tape the ends of the wires.

(3) The following is an alternate method of making the mine safe.

(*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.

Note. Removing the fuze under water will permit salt water to get into the battery cap and perhaps create enough current to detonate the mine. Therefore, when neutralizing the mine under water, remove the entire arming mechanism, including the battery cap, as a unit.

50. Japanese Antiamphibious Mine, Mark 4

a. GENERAL. The mark 4 antiamphibious mine (fig. 60) was never produced although it had been accepted for production in August 1945. It was intended that this mine would become the standard Japanese Army general-purpose mine and that it and the antipersonnel ceramic bounding mine (par. 37) would reduce the number of mine models needed. Installing, arming, and neutralizing procedures for this mine are not known.

b. DESCRIPTION. The mark 4 antiamphibious mine (fig. 60) is a sheet-metal cylinder containing two type 3 ceramic mines (par. 27). Space is provided above the ceramic mines as an air chamber if the mine is to be floated in the water or as a water chamber if the mine is to rest under the water. The space can be used as a chamber for shrapnel or additional explosive, if the mine is to be used on land against tanks and personnel. A firing spider with radiating spokes is placed over the fuze on top of the mine to increase the contact area of the fuze. The fuze is the standard bakelite pressure-pull fuze (par. 17). All fittings are waterproofed with shellac.

c. INTENDED EMPLOYMENT. This mine was designed for intended use as a land mine, a beach mine, or as an antiamphibious shallow-water mine.

d. FUNCTIONING. The mine was designed to function either when the spider was turned, which would pull out the hammer-release fork of the fuze, or when pressure was exerted on the spider, which would cause the fuze to function (par. 17*c*).

Section VIII. MINE DETECTING EQUIPMENT

51. General

The Japanese Army started development of electronic mine detectors in 1932. The period of greatest activity in this field was between 1939 and 1941. Three metallic-mine detectors, models 98, 100, and 2 were constructed by the Japanese. All three were inferior to the SCR–625 detector.

Field use of mine detectors by the Japanese Army was negligible. The model 98 was used in China but was unsatisfactory because of a lack of sensitivity. The Japanese had little or no need for mine detectors during the advance through the South Pacific Islands or in the defensive campaigns from 1943 through the end of World War II. The basis of issue was two detectors per engineer regiment and four per infantry regiment.

52. Japanese Mine Detector, Model 98

The model 98 (fig. 61) was the earliest Japanese mine detector. It was developed in 1937–1938, but less than 100 detectors were made and only a few were used in China. It is of the beat-frequency type. The circuit comprises two oscillators and an amplifier with the signal presentation by a single earphone. Total weight of the detector and accessories is 45 pounds. In test, this detector would not detect a 17-pound metal object buried 1 foot under the ground.

53. Japanese Mine Detector, Model 100

The model 100 metallic mine detector was developed in 1939–1940 and 300 of them were produced. This is an induction-balance type detector with a circuit consisting of a single oscillator in which the regenerative feed-back is balanced. It resembles the model 2 shown in figure 62. The signal presentation is visual, not audible as in the model 98, and for this purpose a galvonometer is located on the handle of the search coil. Two coils were provided with one set, one for searching while in the prone position and one for searching while in the standing position. The total weight of the detector and accessories is about 35 pounds. A set of spare parts consisting of 2 vacuum tubes, 1 galvanometer, and 1 connecting cord was supplied with the models 100 and 2 (par. 54).

54. Japanese Mine Detector, Model 2

The Japanese model 2 metallic mine detector (fig. 62) was developed in 1941–1942 and a total of 900 were built, until production stopped in 1943. The model 2 employs the same operating principles and the same circuit as the model 100. It differs from the model 100 only in that it uses standard batteries and has only 1 search coil, with an extendable handle. Total weight of the model 2 is about 30 pounds. In test this detector would detect a 12-pound metal object buried 1 foot under the ground.

Figure 61. Japanese mine detector, model 98.

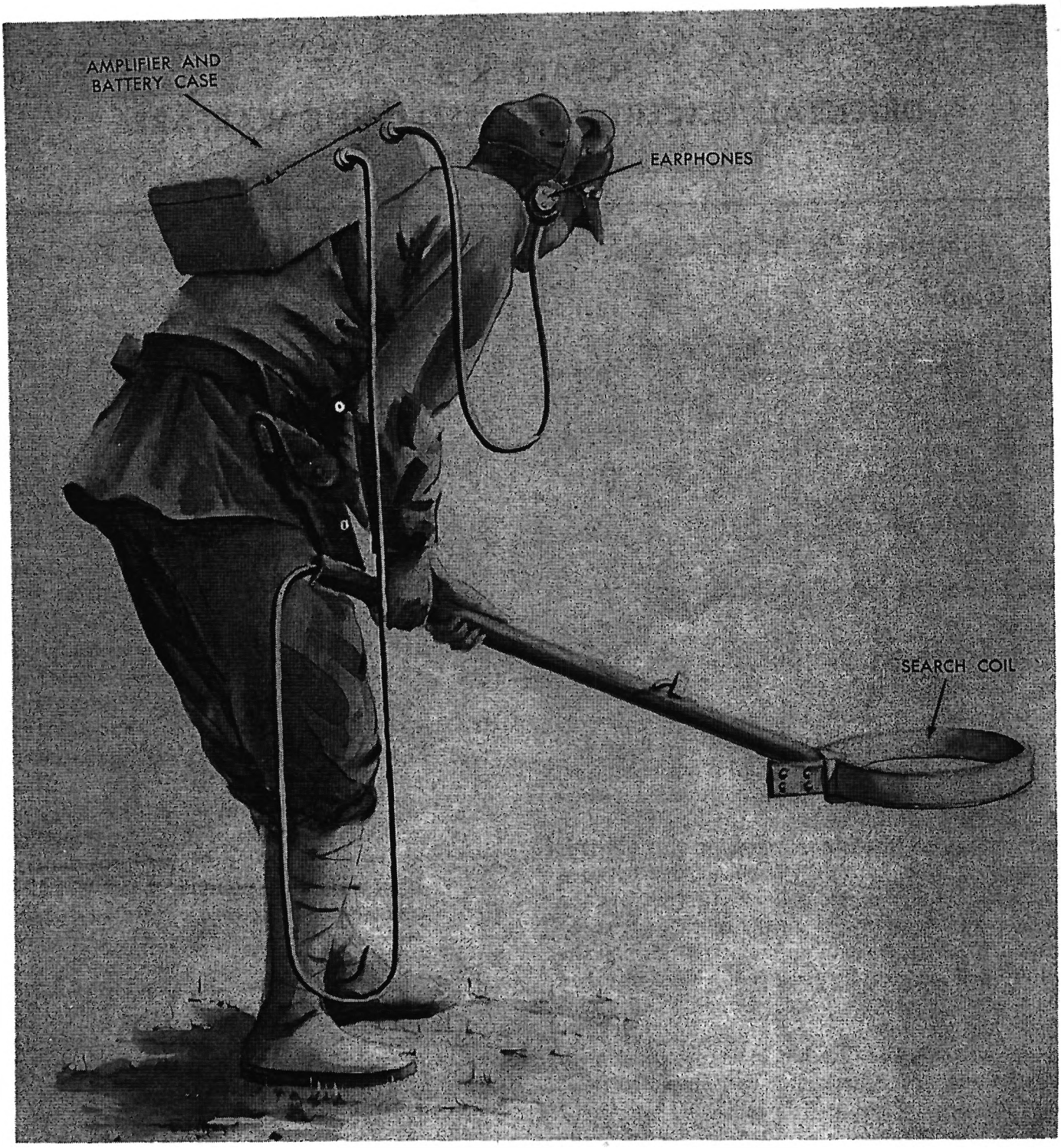


Figure 62. Japanese mine detector, model 2.

CHAPTER 5
ORIENTAL (EXCEPT JAPANESE) MINE WARFARE EQUIPMENT

Section I. CHINESE PEOPLE'S REPUBLIC MINE WARFARE EQUIPMENT

55. General

Most of the mines used by the Chinese People's Republic Army are improvised. The Chinese have stocks of captured Japanese type 93 (par. 28) and type 99 magnetic (par. 29) antivehicular mines, some United States mines, and some Soviet mines. The Chinese People's Republic has designed and manufactured at least two types of dual-purpose mines, Nos. 4 and 8 (pars. 58 and 57).

56. Chinese Pressure-Pull Fuze

a. DESCRIPTION. The pressure-pull fuze (fig. 63) is an instantaneous, mechanical type containing a spring-loaded striker held in place by a striker-retaining pin which can either be pulled out or sheared. This fuze consists of a brass cylinder with a diameter of about 1¾ inches and an overall height of 2½ inches. A threaded spring-tensioning screw in the top of the fuze is used to increase or decrease the compression of the striker spring. A wide, flat safety bar is located between the striker and the percussion cap to prevent the striker from accidentally setting off the percussion cap. If the striker is in an uncocked position the safety bar cannot be removed. The threaded base is provided with a brass shipping cap. This fuze closely resembles the German ZDZ 29 fuze. 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.

b. EMPLOYMENT. This fuze is used in the Chinese dual-purpose mine, No. 8 (par. 57). The variation with the setting collar is used in the dual-purpose mine, No. 4 (par. 58).

c. FUNCTIONING.

(1) *Pressure.* A pressure of from 300 to 500 pounds on the top of the fuze shears the striker-retaining pin, releasing the spring-loaded striker against the percussion cap which sets off the detonator.

(2) *Pull.* A pull of from approximately 10 to 50 pounds, on the pull ring of the striker-retaining pin releases the spring-loaded striker against the percussion cap which sets off the detonator.

d. INSTALLING AND ARMING.

(1) Insert the detonator in the percussion-cap-and-detonator holder and screw the holder into the base of the fuze. Tighten the screw provided in the fuze to lock the percussion-cap-and-detonator holder to the base of the fuze.

(2) For pressure, screw the fuze in the mine and remove the safety bar. If the striker is in the fired position, the safety bar cannot be removed.

(3) For pull, position the fuze in the mine and adjust the tensioning screw for the desired pull. The amount of pull required to remove the striker-retaining pin can be adjusted from approximately 10 pounds to 50 pounds by screwing the spring-tensioning screw for greater pull and unscrewing it for less pull. A pull of 10 pounds is obtained by unscrewing the spring-tensioning screw as far as possible and then screwing it down four full turns. Anchor one end of the trip wire and attach the other end to the pull ring of the striker - retaining pin. Remove the safety bar.

e. NEUTRALIZING.

(1) Cut any slack trip wires.

(2) Insert the safety bar in the slot on the side of the fuze.

(3) Loosen the screw in the base of the fuze that locks the percussion-cap-and-detonator holder to the fuze.

(4) Unscrew the percussion-cap-and-detonator holder from the base of the fuze.

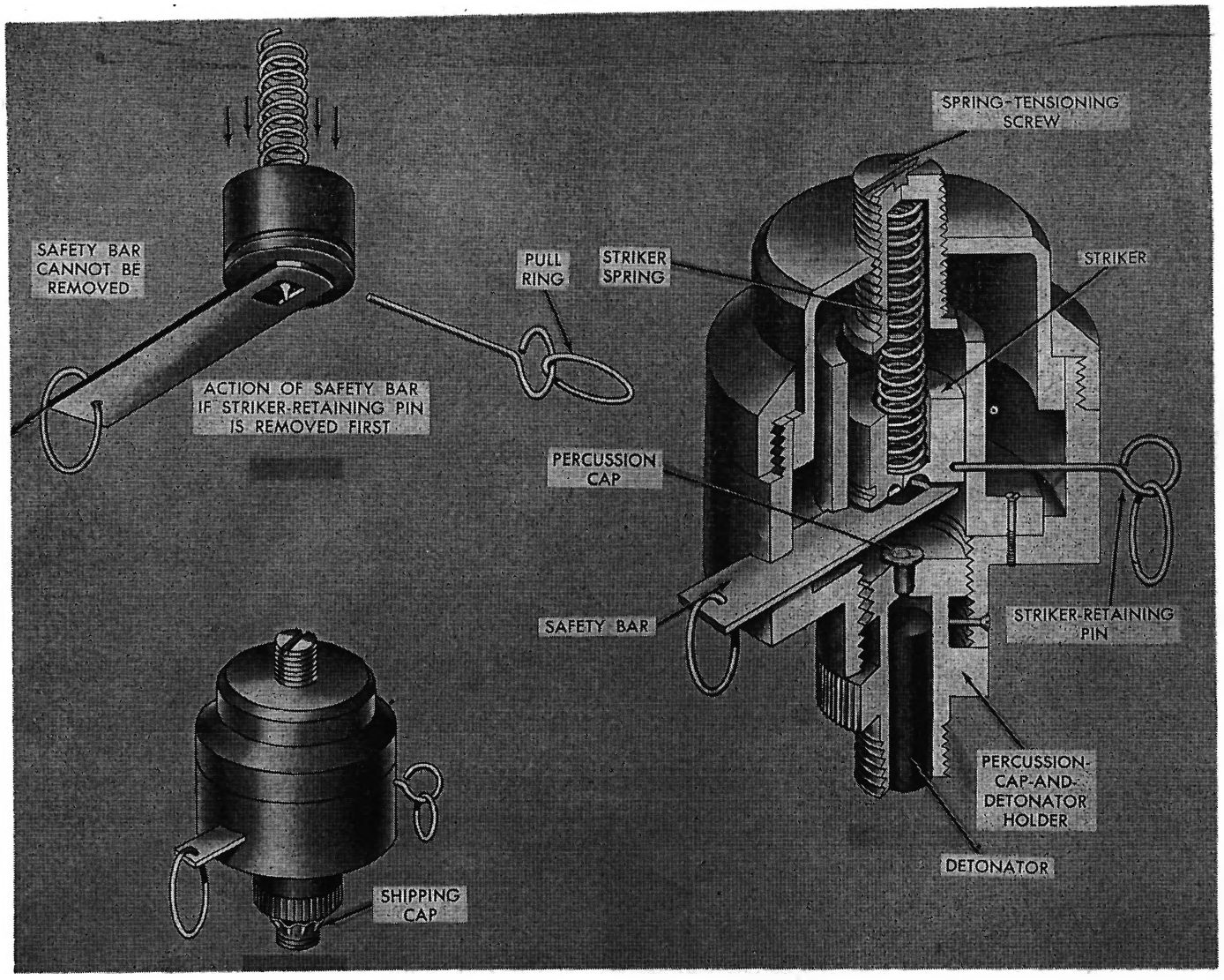


Figure 63. Chinese pressure-pull fuze.

57. Chinese Dual-Purpose Mine, No. 8

a. DESCRIPTION. The dual-purpose mine, No. 8 (fig. 64) is a round cast-iron mine similar in appearance to the obsolete United States antitank mine M1. The overall dimensions, with the spider in place, are 9 inches in diameter and 4 inches in height. The mine is painted a dull black and has an explosive charge of approximately 5 pounds. When assembled, it weighs a total of approximately 12 pounds. A threaded recess is provided in the center of the mine for the pressure-pull fuze (par. 56). A metal case, 10¼ inches square and 3¾ inches deep, is provided for carrying the mine and the spider.

b. EMPLOYMENT. This mine may be used either as an antivehicular or as an antipersonnel mine. There are no provisions for activating the mine itself; however, this mine would normally have trip wires connected to the pull ring of the striker-retaining pin, making removal of the mine or fuze extremely hazardous.

c. FUNCTIONING.

(1) *Pressure.* A pressure of 300 to 500 pounds exerted on the center of the spider (less pressure is needed if applied on the edge of spider) shears the striker-retaining pin, releasing the striker and firing the mine.

(2) *Pull.* The fuze may also be fired by pulling out the striker-retaining pin. The amount of pull needed to remove this pin will vary from approximately 10 to 50 pounds.

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, the

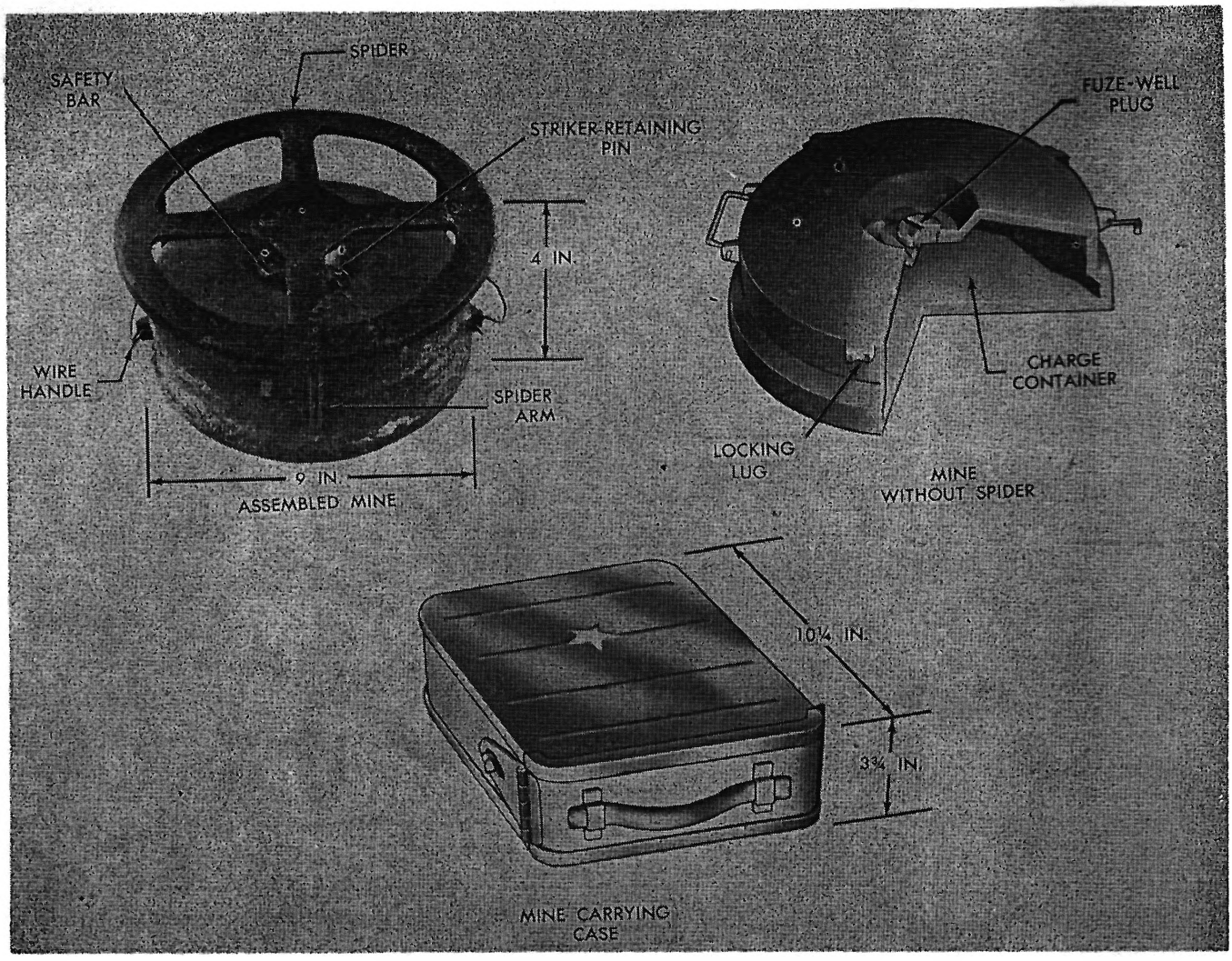


Figure 64. Chinese dual-purpose mine, No. 8.

striker will engage the slot in the center of the safety bar, preventing its removal.

(3) If the safety bar is free, insert the detonator in the fuze and screw the fuze (detonator end) into the fuze well. 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 (more if additional pull is desired for removing the striker-retaining pin) (par. 56*d*).

(4) 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.

(5) Attach a trip wire to the striker-retaining pin of the fuze if it is desired to operate the fuze by pull.

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

e. NEUTRALIZING.

(1) Find and cut any slack trip wires.

(2) Insert the safety bar into the slot on the side of the fuze. If the bar is not available, carefully remove the spider.

(3) Unscrew the fuze. If the detonator does not come out with the fuze, turn the mine upside down and catch the detonator in the palm of one hand.

58. Chinese Dual-Purpose Mine, No. 4

The dual-purpose mine, No. 4 (fig. 65) has a cylindrical metal case with a flat top and bottom. It closely resembles the Soviet TM–41 mine (TM 5–223A) and has a total weight of 16 pounds, including 12 pounds of explosive. The fuze well, centrally located in the top, is closed by a threaded waterproof cap. The mine can be utilized either as an antipersonnel or as an antivehicular mine. It may be issued with steel fragments or shrapnel glued to the outside of the top for antipersonnel use.

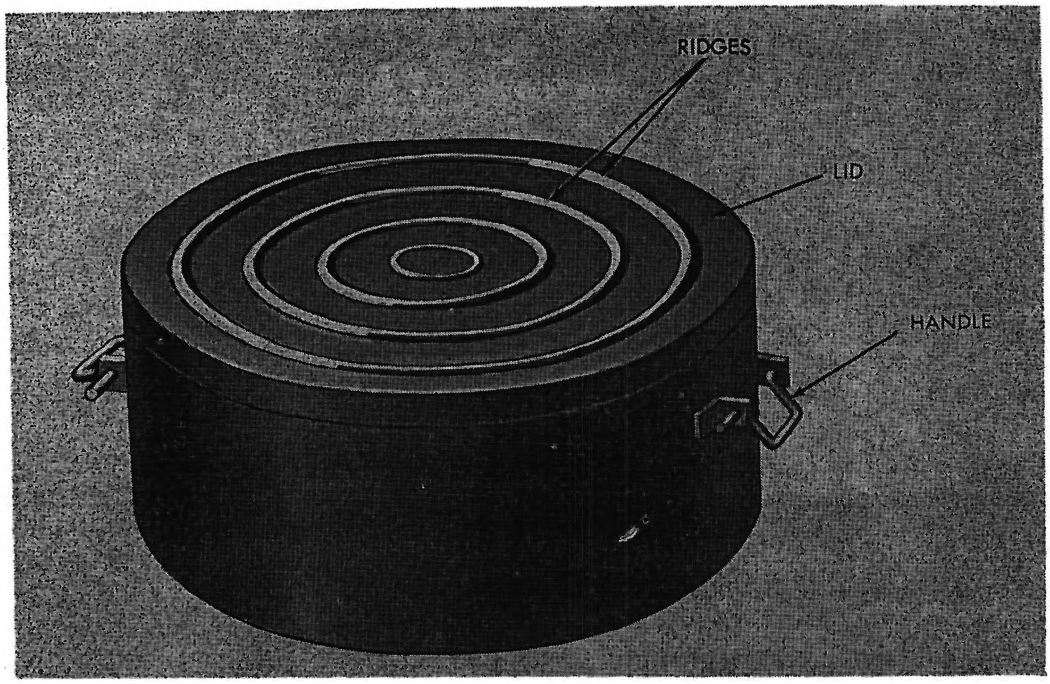


Figure 65. Chinese dual-purpose mine, No. 4.

Section II. NORTH KOREAN PEOPLE'S REPUBLIC MINE WARFARE EQUIPMENT

59. General

a. MINES AND FUZES. The North Korean People's Republic Army has field-improvised the two mine models described in paragraphs 60 and 61 as well as a crude copy of the Soviet POMZ–2 mine (TM 5–223A). The North Koreans employed the following Soviet mines: TMD–B, YAM–5, TM–38, and TM–41 antitank mines; the PMZ–40 dual-purpose mine; and the POMZ–2, PMD–6, PMD–7, and PMD–7ts antipersonnel mines. The fuzes used are chiefly the Soviet MUV pull type and the MV–5 pressure type. See TM 5–223A for a discussion of these Soviet mines and fuzes. In the early phases of the Korean conflict, the North Koreans employed captured United States M6 and M7 antitank mines, United States M3 and M2A3 antipersonnel mines, and Japanese types 93 and 99 antivehicular mines (pars. 28 and 29). They also employed the South Korean dual-purpose mines (pars. 66 and 67) and the Chinese dual-purpose mine, No. 8 (par. 57).

b. MINE DETECTORS. The North Korean People's Republic Army is equipped with Soviet VIM–203 mine detectors and some mine probes.

c. BOOBY TRAPS. The North Koreans generally made extensive use of booby traps, particularly in abandoned fox holes, on field telephones, and on the bodies of the dead of both sides, as evidenced in the Korean conflict. Buildings will most likely be booby-trapped by attaching wires to the doors and connecting the wires to pull fuzes in explosive charges. The charges ranged in weight from a few pounds to 300 pounds.

60. North Korean Sheet-Metal Antitank Mine

a. DESCRIPTION. This circular, sheet-metal antitank mine (fig. 66) is very similar to the Soviet TM–41 (TM 5–223A) but of simpler construction. It is 10 inches in diameter and 5 inches high. Unlike the TM–41, the North Korean mine has no raised ridges in the top for rigidity and does not have the corrugated portion of the lid to aid in crushing the lid under pressure. The Soviet MV–5 pressure fuze (TM 5–223A) is used with this mine. A pressure-fuze well is located in the center of the top of the mine, and a filler hole (which could be used for booby-trapping) is located off-center in the bottom of the mine. Both wells are closed by a flange-lock type plug.

b. EMPLOYMENT. This mine is employed as an antivehicular mine in mine fields and road blocks.

c. FUNCTIONING.

(1) Pressure of at least 350 pounds on the lid crushes the lid.

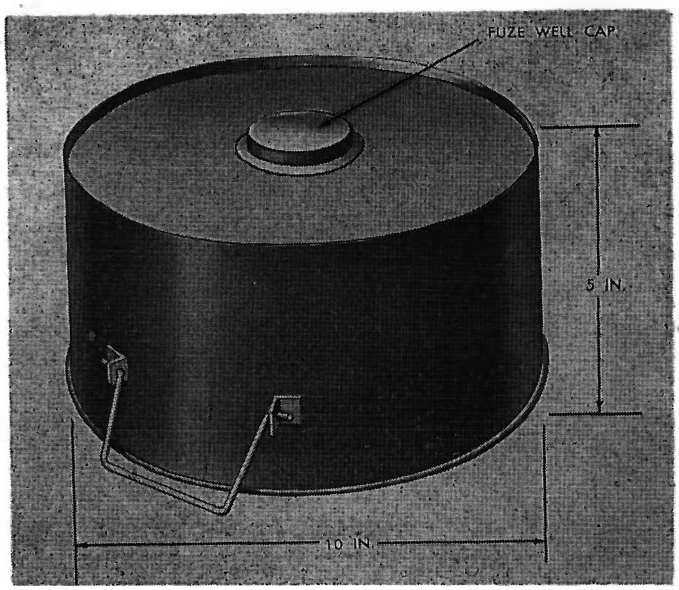


Figure 66. North Korean sheet-metal antitank mine.

(2) The crushed lid depresses the pressure cap of the fuze, actuating the fuze and exploding the mine.

d. INSTALLING AND ARMING.

(1) Rotate the pressure cap in 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 assembly attached, in the fuze well.
(4) Replace the pressure cap of the mine.

e. NEUTRALIZING.

(1) Rotate the pressure cap in the lid until it can be lifted. (If the pressure cap cannot be removed, blow the mine in place or pull it out with a long rope or wire to a safe place and then destroy it.)
(2) Pull out the fuze and detonator assembly.

61. North Korean Wooden Antipersonnel Mine

a. DESCRIPTION. This wooden antipersonnel mine (fig. 67) is a typical mine of the German "Schu" type or the Soviet PMD–7 type (TM 5–223A). The overall dimensions are 7¾ by 3½ by 1¾ inches. The mine is constructed of wood one-fourth inch thick. The explosive charge is about 0.5 pound, and the fuze used is a Soviet MUV pull fuze (TM 5–223A) modified by replacing the loop-ended striker-retaining pin with a T-shaped pin.

b. EMPLOYMENT. This mine is laid as security against foot troops in mine fields, paths, and trails.

c. FUNCTIONING. Pressure on the lid forces the striker-retaining pin out of the MUV pull fuze, releasing the spring-loaded striker, which sets off the percussion cap, the detonator, and the 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 in an MUV pull fuze, and insert the fuze into the charge with the "T" end of the striker-retaining pin down.
(4) Connect a trip wire to the striker-retaining pin of the fuze if desired.
(5) Close the lid of the mine.

e. NEUTRALIZING.

(1) Search for and cut all slack trip wires connected to the fuze.
(2) Carefully lift the lid of the mine and remove the fuze and detonator assembly.

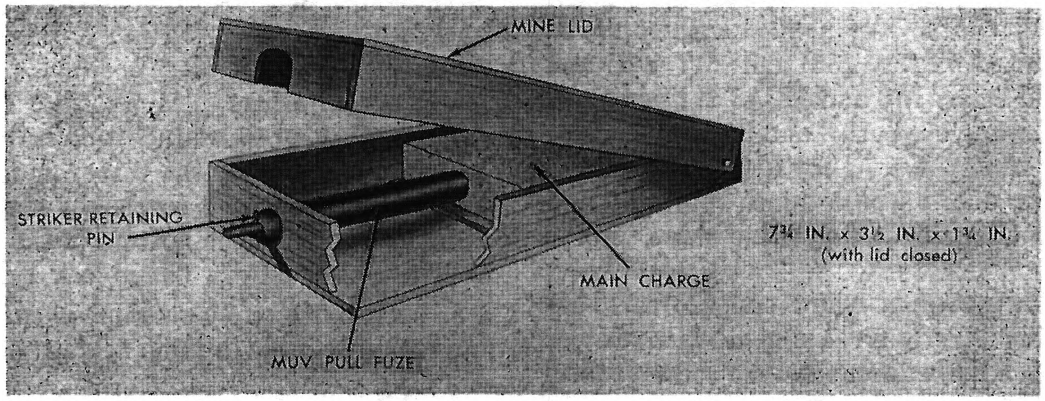


Figure 67. North Korean wooden antipersonnel mine.

Section III. SOUTH KOREAN REPUBLIC MINE WARFARE EQUIPMENT

62. South Korean Pressure-Pull Fuze

a. DESCRIPTION. This pressure-pull fuze (fig. 68) consists of a spring-loaded striker held in position by three pins. 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. A removable shear pin is positioned through the lowermost hole of the striker shaft and the lower hole in the top of the fuze. For identification of each of the three pins, 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 held in the base of the fuze by a threaded collar. The fuze has no external threads but merely rests in the fuze well of the mine.

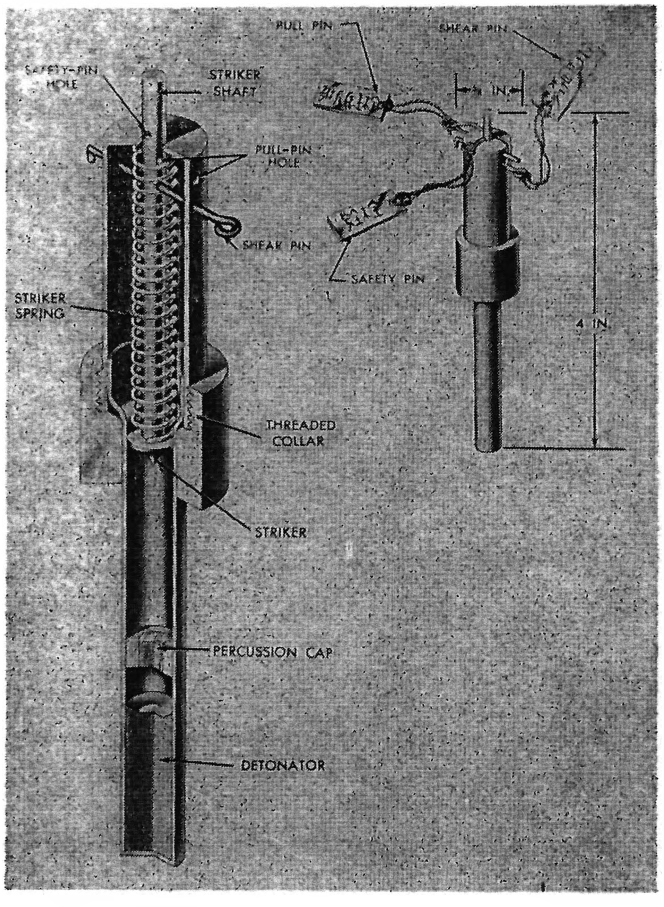


Figure 68. South Korean pressure-pull fuze.

b. EMPLOYMENT. This fuze is used in both models of the South Korean dual-purpose mine (pars. 66 and 67).

c. FUNCTIONING.

(1) *Pressure.* With the safety pin removed, a pressure of approximately 300 pounds on the end of the striker shaft shears both the pull pin and the shear pin, releasing the spring-loaded striker against the percussion cap. For antipersonnel use, the shear pin is unbent and removed, and a pressure of only 20 pounds is necessary to shear the pull pin and fire the fuze.

(2) *Pull.* With both the safety pin and shear pin removed, a pull of about 10 pounds is necessary to remove the pull pin and release the spring-loaded striker.

d. INSTALLING AND ARMING.

(1) *Assembling.*

(*a*) Unscrew the threaded collar from the base of the fuze.

(*b*) Insert a detonator with built-in percussion cap into the base of the fuze.

(*c*) Screw the threaded collar back on the base of the fuze.

(2) *For pressure.* If the fuze is to be actuated by the greatest amount of pressure, remove only the safety pin. If it is to be actuated by only 20 pounds, remove both the safety pin and the shear pin.

(3) *For pull.*

(*a*) Anchor a trip wire.

(*b*) Tie the trip wire to the eye in the pull pin.

(*c*) Remove both the safety pin and the shear pin.

e. NEUTRALIZING.

(1) Insert a nail or piece of wire through the safety-pin hole.

(2) Unscrew the threaded collar and remove the detonator.

63. South Korean Modified Pressure-Pull Fuze

a. DESCRIPTION. This modified pressure-pull fuze (fig. 69) is the pressure-pull fuze described in paragraph 62, enclosed 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 in this fuze.

b. EMPLOYMENT. This fuze was designed for use in the South Korean heavy antitank mine (par. 65).

c. FUNCTIONING. A pressure of 300 to 400 pounds on the end of the striker shaft shears both shear pins and releases the spring-loaded striker against the percussion cap.

d. INSTALLING AND ARMING.

(1) Insert a detonator into the base of the modified pressure-pull fuze.

(2) Insert the fuze into the metal housing, and screw on the threaded base. Once assembled, the fuze is armed.

e. NEUTRALIZING. To neutralize, disassemble the fuze, reversing the steps given in *d* above.

64. South Korean Friction Pull Fuze

a. DESCRIPTION. This friction pull fuze (fig. 70) consists of a chemical compound with a pull wire coiled below it. The pull wire extends through the chemical compound and emerges through a hole in the top of the fuze. A three- to five-second delay charge is positioned between the chemical compound and the detonator. The chemical compound, delay charge, and detonator are in a metal housing with a threaded base.

b. EMPLOYMENT. This fuze is used in both the

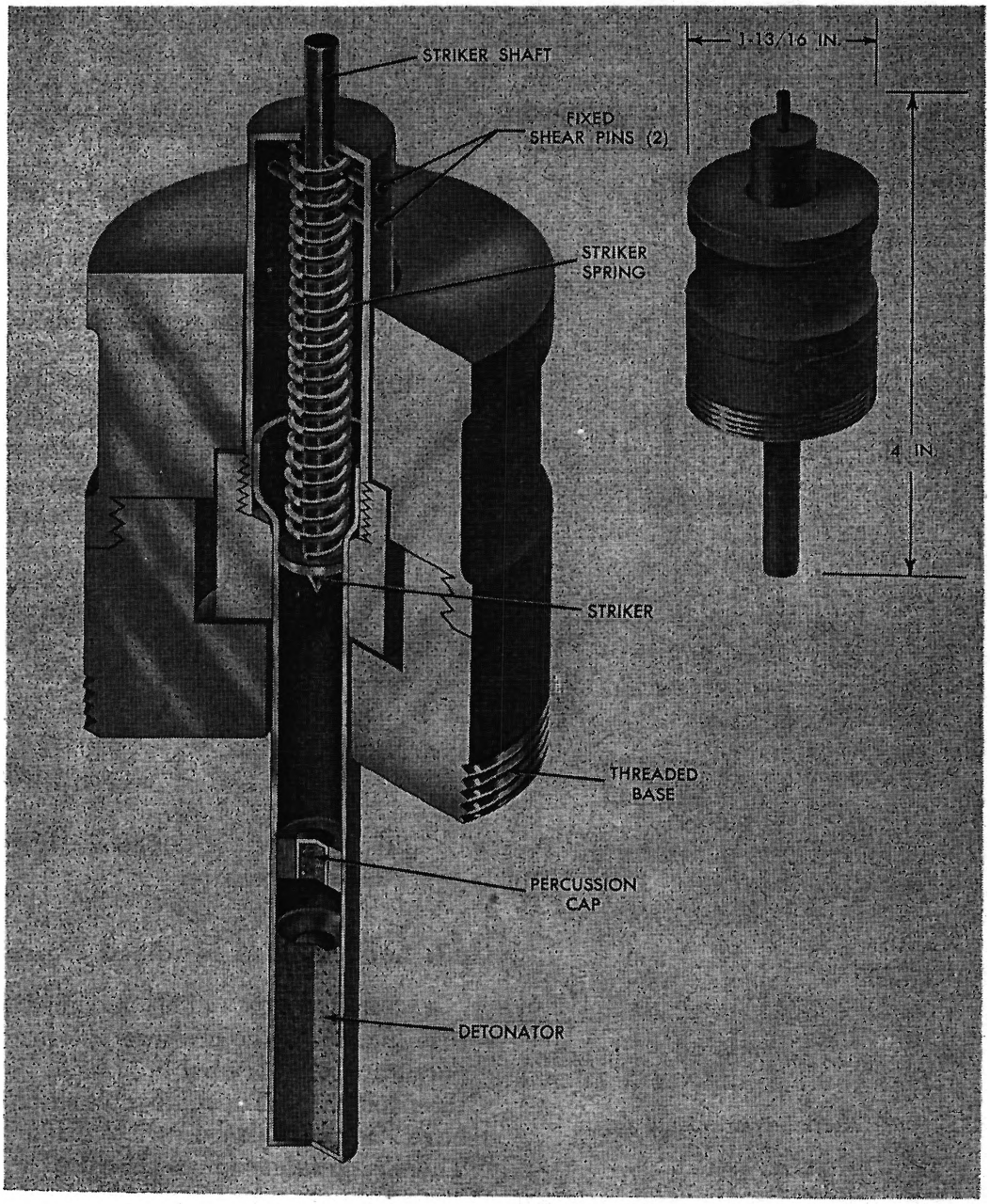


Figure 69. South Korean modified pressure-pull fuze.

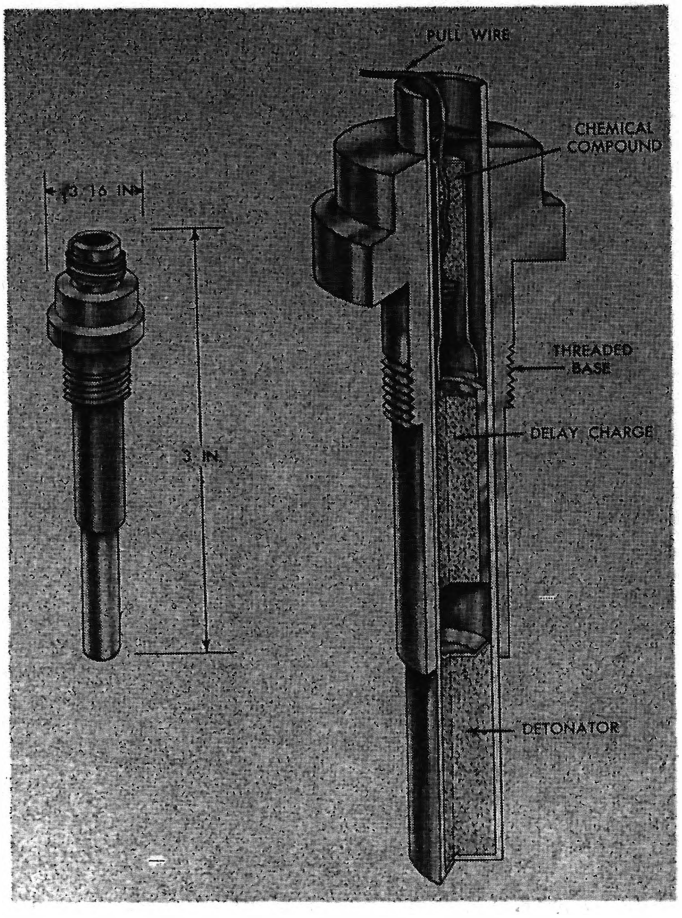


Figure 70. South Korean friction pull fuze.

type I and type II South Korean dual-purpose mines (pars. 66 and 67).

c. FUNCTIONING. Pull on the pull wire draws the coiled wire through the chemical compound which ignites and, in turn, ignites the delay charge. After a delay of from 3 to 5 seconds, the delay charge burns through and fires the detonator.

d. INSTALLING AND ARMING. The fuze is assembled and armed when manufactured. When ready for use, the pull wire is unwound from the top of the fuze and made fast to some object.

e. NEUTRALIZING. Cut the trip wire near the top of the fuze, or wrap the wire a few turns around the top of the fuze and tie it to prevent unwinding.

65. South Korean Heavy Antitank Mine

a. DESCRIPTION. This heavy antitank mine (fig. 71) is circular, 15 inches in diameter, and when assembled, 8 inches in height. The mine is made of light-gage metal with all seams welded. The mine is dark gray and weighs 29 pounds, including an explosive charge of 22 pounds. Three fuze wells are spaced in line on 3½ inch centers across the top of the charge container to accommodate modified pressure-pull fuzes (par. 63). No activating fuze well is provided in the mine.

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

c. FUNCTIONING. When a pressure of at least 300 to 400 pounds is exerted on the pressure lid of the mine, the resistance offered by the three coil springs in the two shear pins in each of the modified pressure-pull fuzes (par. 63) is overcome. The pins shear, and the spring-loaded striker moves forward, firing the percussion cap, the detonator, and the main charge.

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. NEUTRALIZING.

(1) Lift the pressure lid straight up and off the mine.
(2) Unscrew and remove the three fuzes. The mine is now unarmed.

f. PACKING. The three fuzes and the assembled mine are packed as a unit in a wooden box for shipping. The total weight of the mine, the fuzes, and the shipping box is approximately 34 pounds.

66. South Korean Dual-Purpose Mine, Type I

a. DESCRIPTION. This type I dual-purpose mine (fig. 72) is about 10 inches in diameter and 5⅜ inches high. It has a cylindrical, unpainted, cast-iron case which contains a pressure-spring housing, a pressure lid, and a flat collar. These three components are circular and made of cast iron. The collar is bolted to the case and holds the pressure-spring housing and pressure lid in place. The total weight of the mine is 30 pounds, including only 5.75 pounds of explosive (flaked TNT). The pressure-pull fuze (par. 62) is inserted into the main fuze well in the center of the pressure-spring housing. The main fuze well is closed by a threaded fuze-well plug in the center of the pressure lid. The friction pull fuze (par. 64) is inserted into the side fuze well, directly opposite from the wire carrying handle. The pressure spring may be located as shown in figure 72 or it may be replaced by a pressure spring of the size of the one shown in figure 73 for the type II, depending on the size spring desired.

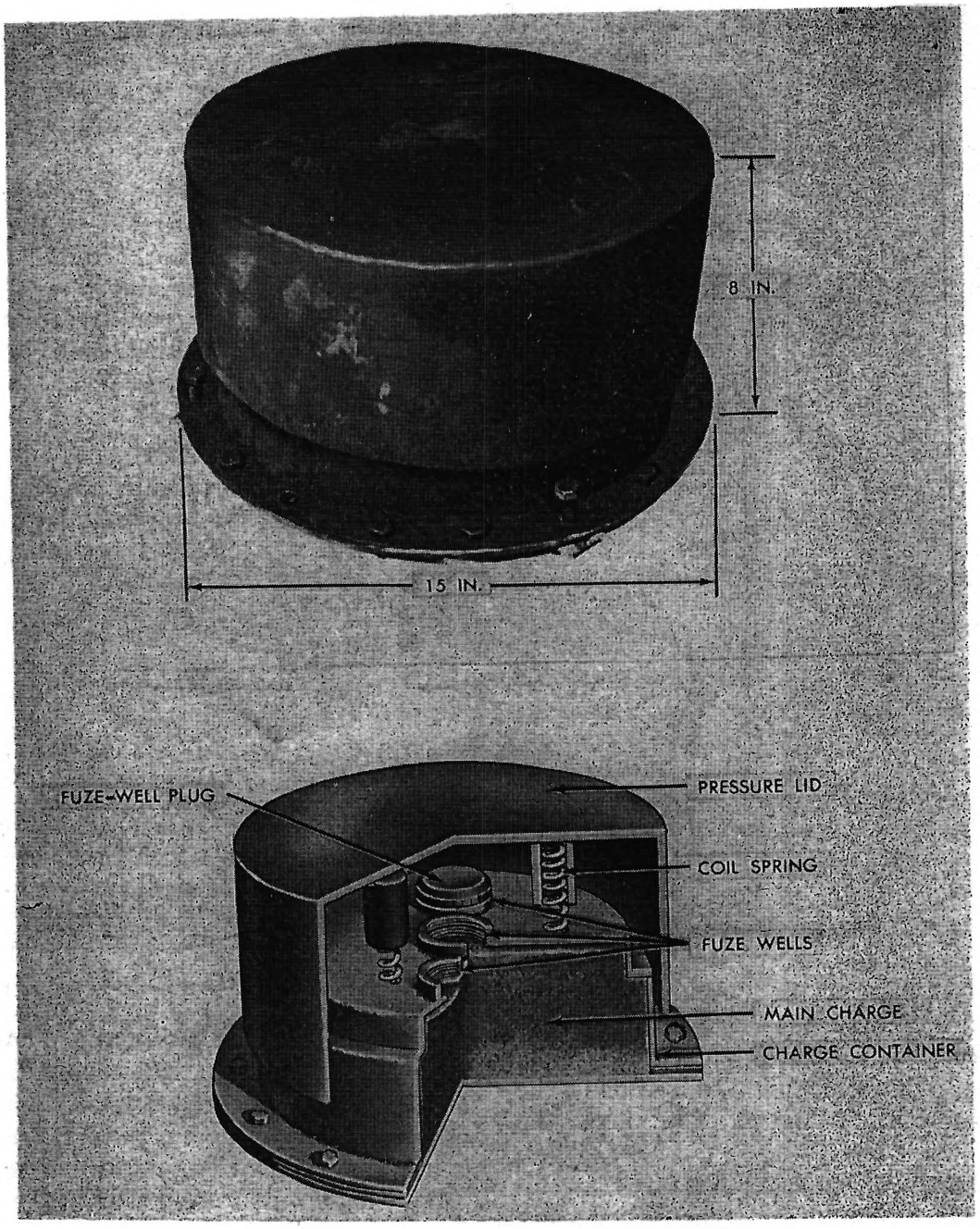


Figure 71. South Korean heavy antitank mine.

b. EMPLOYMENT. This mine is employed both for antivehicular and antipersonnel use.

c. FUNCTIONING.

(1) *Pressure* (*antivehicular*). A pressure of about 300 pounds on the pressure lid depresses the pressure spring and forces the pressure lid down on the top of the pressure-pull fuze, actuating the fuze, and exploding the mine.

(2) *Pull* (*antipersonnel*). A pull of about 15 pounds on the trip wire attached to the friction pull fuze actuates the fuze and fires 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 so the detonators may be inserted.

(4) Insert a pressure fuze with detonator attached 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 attached into the side fuze well.

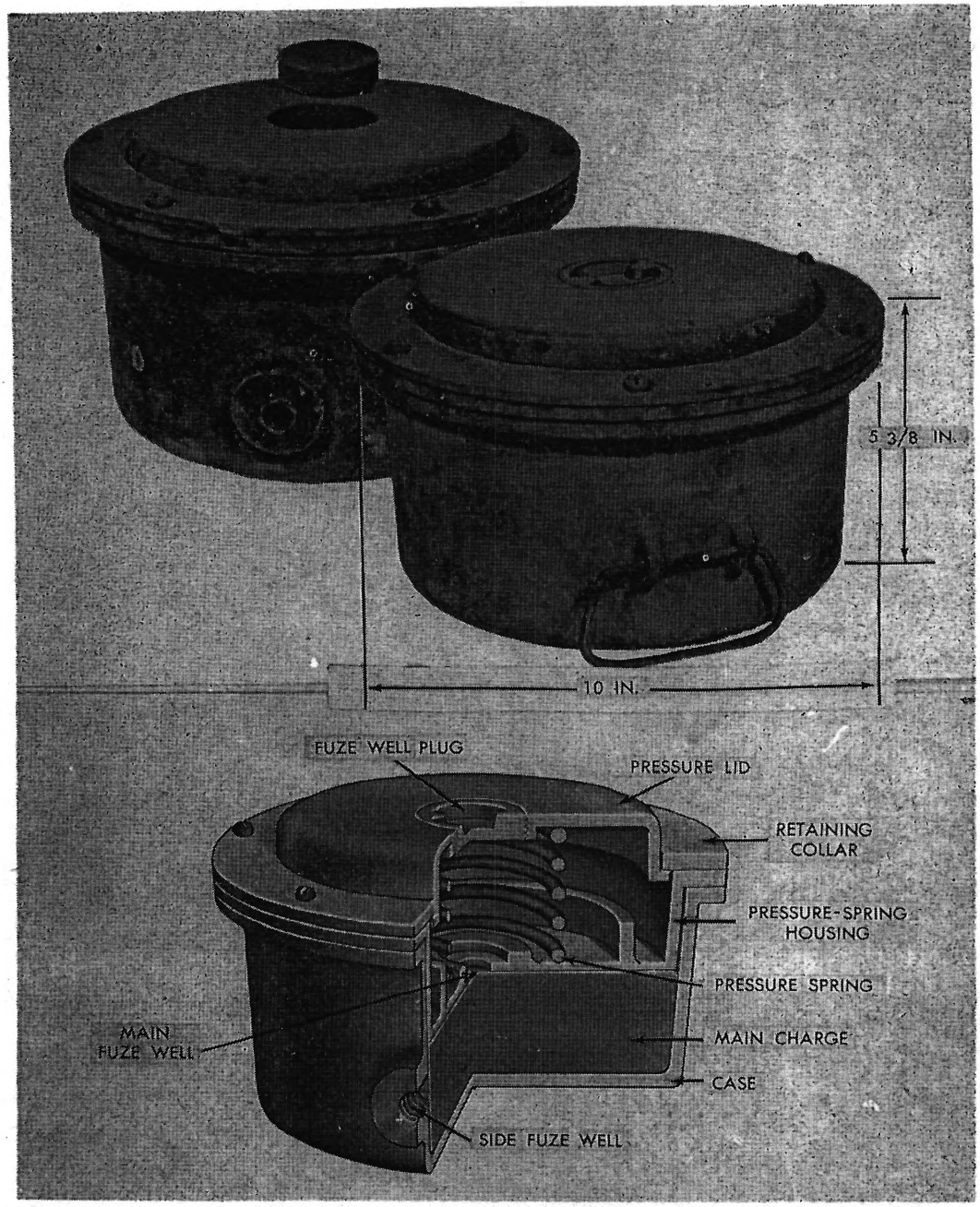


Figure 72. South Korean dual-purpose mine, type I.

e. NEUTRALIZING.

(1) Cut the trip wire to the friction pull fuze and unscrew the fuze.

(2) Unscrew the fuze-well plug in the pressure lid and remove the pressure-pull fuze with attached detonator.

67. South Korean Dual-Purpose Mine, Type II

a. DESCRIPTION. The type II, dual-purpose mine (fig. 73) is about 10 inches in diameter and 8⅜ inches high. It weighs a total of about 17 pounds, including 4.5 pounds of TNT. The body of the mine lacks the flange around the top, and it does not have a side fuze well as does the type I (par. 66). The pressure lid has two fuze wells, one for a pressure-pull fuze (par. 62) which is closed by a threaded plug. The other well is threaded for a friction pull fuze (par. 64) which is covered by a threaded plug. This plug has a hole for insertion of the trip wire and also has a pivoted cover. The pressure-spring housing is similar to that in the type I mine, but it has two fuze wells instead of one. The pressure spring is located in the circular slot in the pressure-spring housing. The spring cannot be replaced by a smaller pressure spring,

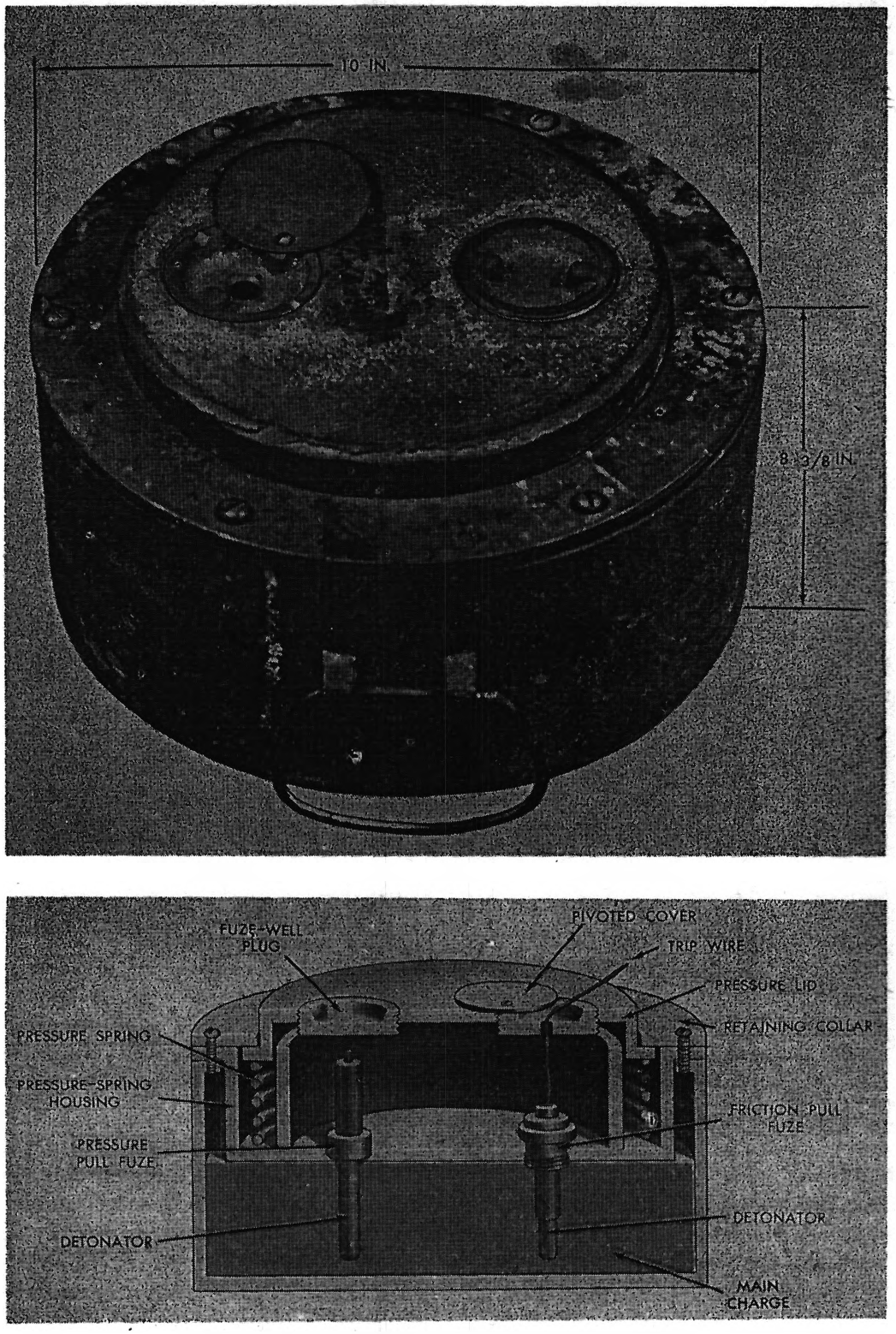


Figure 73. South Korean dual-purpose mine, type II.

as is possible in the type I mine, because of the two fuze wells. The fuzes used with this mine are the same as those used in the type I.

b. EMPLOYMENT. This mine is normally used with one fuze well fitted with a pressure-pull fuze for antitank use and the other fuze well fitted with a friction pull fuze and trip wire for antipersonnel use.

c. FUNCTIONING.

(1) *Antitank.* A pressure of about 350 pounds overcomes the resistance of the pressure spring and the shear and pull pins in the fuze. The two pins shear, releasing the spring-loaded striker which moves forward and fires the percussion cap, detonator, and main charge.

(2) *Antipersonnel.* The shear pin and safety pin are removed before the pressure-pull fuze is installed in the mine. Twenty pounds of pressure shears the pull pin of the pressure-pull fuze, or pull on the trip wire of the friction pull fuze ignites the chemical compound and, in turn, ignites the delay pellet. After a delay of from 3 to 5 seconds, the delay pellet burns through and fires the detonator which sets off the main charge.

d. INSTALLING AND ARMING.

(1) *Antitank.* Insert the pressure-pull fuze, with safety pin removed, into the unthreaded fuze well.

(2) *Antipersonnel.* Remove the shear pin and safety pin from the pressure-pull fuze and install the fuze in the mines. Screw the friction pull fuze into the pull-fuze well, leading the trip wire up through the hole in the pull-fuze-well plug. Screw on the fuze-well plugs and anchor the trip wire from the friction pull fuze.

e. NEUTRALIZING.

(1) *Antitank.*

(*a*) Unscrew the plug without the pivoted cover from the pressure lid.

(*b*) Place a wire or safety pin in the safety-pin hole.

(*c*) Lift out the pressure-pull fuze from the fuze well.

(*d*) Remove the detonator from the fuze.

(2) *Antipersonnel.*

(*a*) Insert a wire or safety pin in the safety-pin hole.

(*b*) Cut the slack trip wire.

(*c*) Unscrew the friction pull fuze and remove it.

(*d*) Remove the detonator from the fuze.

CHAPTER 6
EUROPEAN (EXCEPT BRITISH, FRENCH, GERMAN, ITALIAN, AND SOVIET) MINE WARFARE EQUIPMENT

Section I. AUSTRIAN MINES AND FUZES

68. Fuze and Tilt Adapter for the Barrier Mine

a. DESCRIPTION.

(1) *Fuze.* The fuze (fig. 74) used with the barrier mine (par. 69) has a spring-loaded striker retained by a shear or pull pin. The end of the striker shaft, which projects above the brass housing, has two holes. The pull-ring hole is provided with a wire pull ring used to retract the striker, exposing the shear or pull-pin hole, through which the shear or pull pin is inserted. The percussion-cap-and-detonator assembly is screwed onto the base of the fuze. When the fuze is placed into the fuze well of the mine, the pull ring is removed and the pressure cover of the mine rests on the end of the striker shaft.

(2) *Tilt adapter.* The tilt adapter (fig. 75) is designed to make the barrier mine fuze function by pull or pressure against a tilt rod. It is a heavy brass tube about 4¾ inches long and 1¼ inches in diameter. In the top of the adapter is screwed a threaded swivel housing containing a ball swivel. A threaded bolt, 1 inch long and with a longitudinal groove cut through the threads, is welded to the ball swivel. A knurled safety nut and an internally threaded knurled cap screw onto opposite ends of the bolt. The bolt and the ball swivel have a hole through the center. Through this hole is inserted a shear wire, 4 inches long, with a small metal knob on one end.

b. EMPLOYMENT. The fuze is employed in the barrier mine. The tilt adapter is used to facilitate detonation in snow or tall grass.

c. FUNCTIONING.

(1) *Fuze.* Pressure on the striker shaft depresses the striker, shearing the shear pin and releasing the spring-loaded striker against the percussion cap.

(2) *Tilt adapter.* Pressure of 20 pounds or more in any direction against the tilt

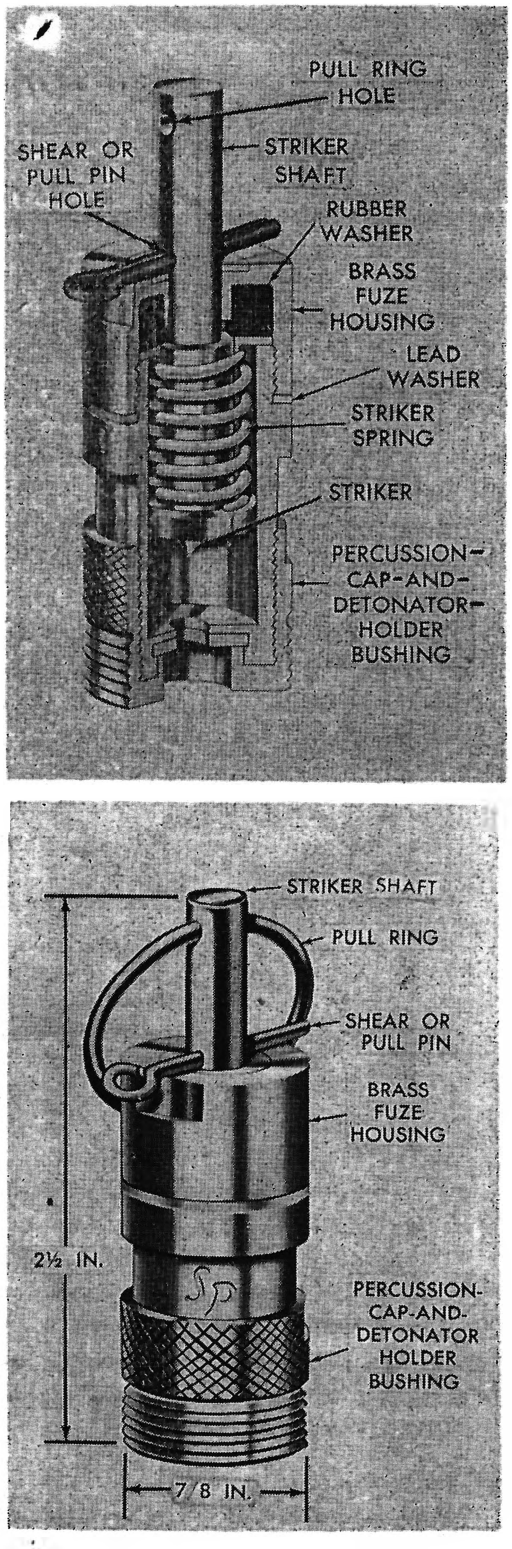


Figure 74. Austrian barrier mine fuze.

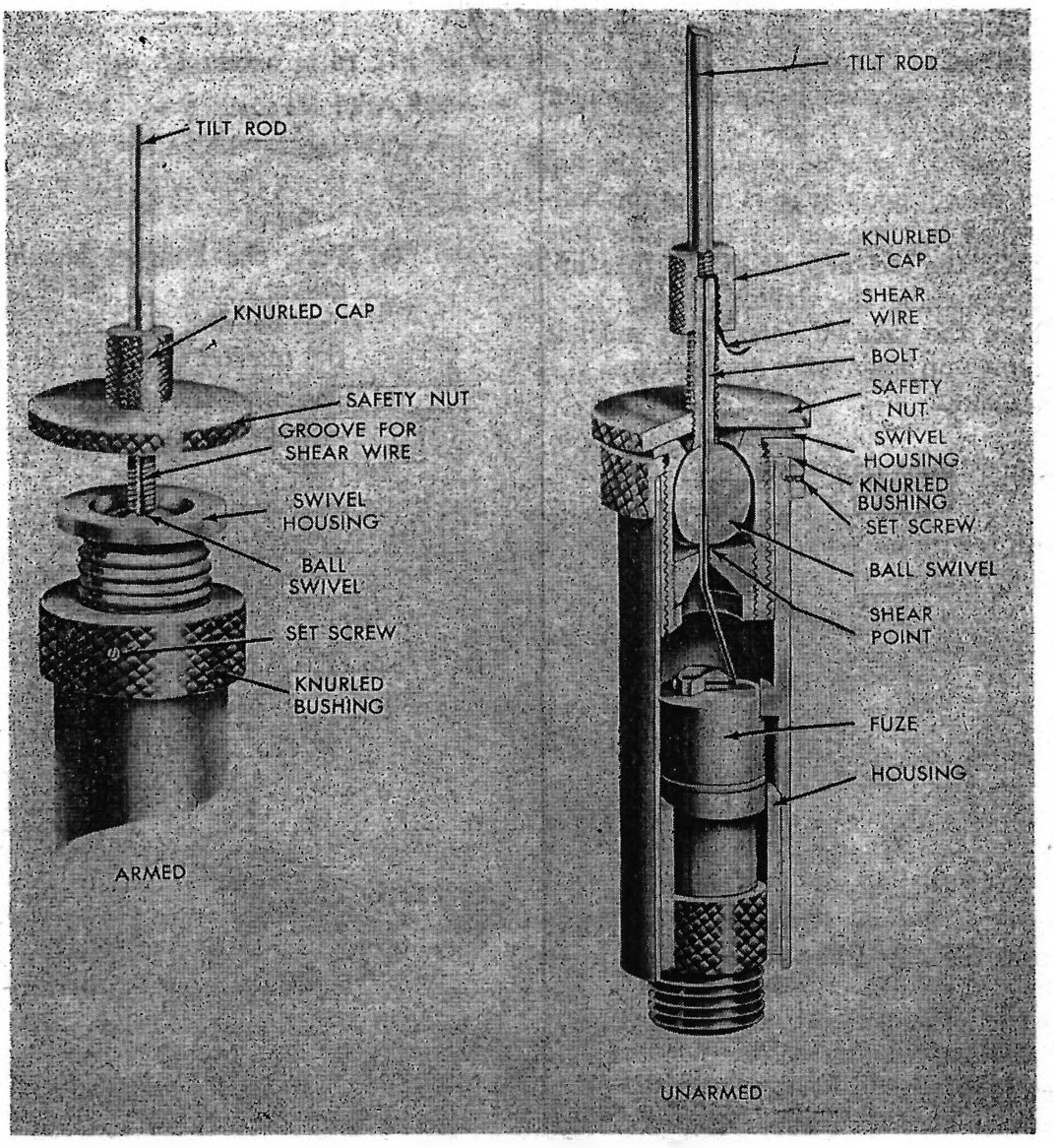


Figure 75. Tilt adapter for the barrier mine fuze.

rod causes the ball swivel to rotate and shear off the shear wire, releasing the striker.

d. INSTALLING AND ARMING.

(1) *Fuze.*

(*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.

(*d*) If set for pull, fasten a pull wire to the shear or pull pin.

(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 attached to the end of the shear wire.

(*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 it fits in the longitudinal groove in the bolt.

(*d*) Screw the knurled cap onto the bolt and screw a 20-inch long metal tilt

rod, contained in the mine crate, into the end of the cap.

(*e*) Screw a percussion-cap-and-detonator assembly into the base of the fuze.

(*f*) Rotate the knurled bushing at the top of the tilt adapter so 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. NEUTRALIZING.

(1) *Fuze.*

(*a*) Cut all slack trip wires.

(*b*) Unscrew the percussion-cap-and-detonator assembly.

(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.

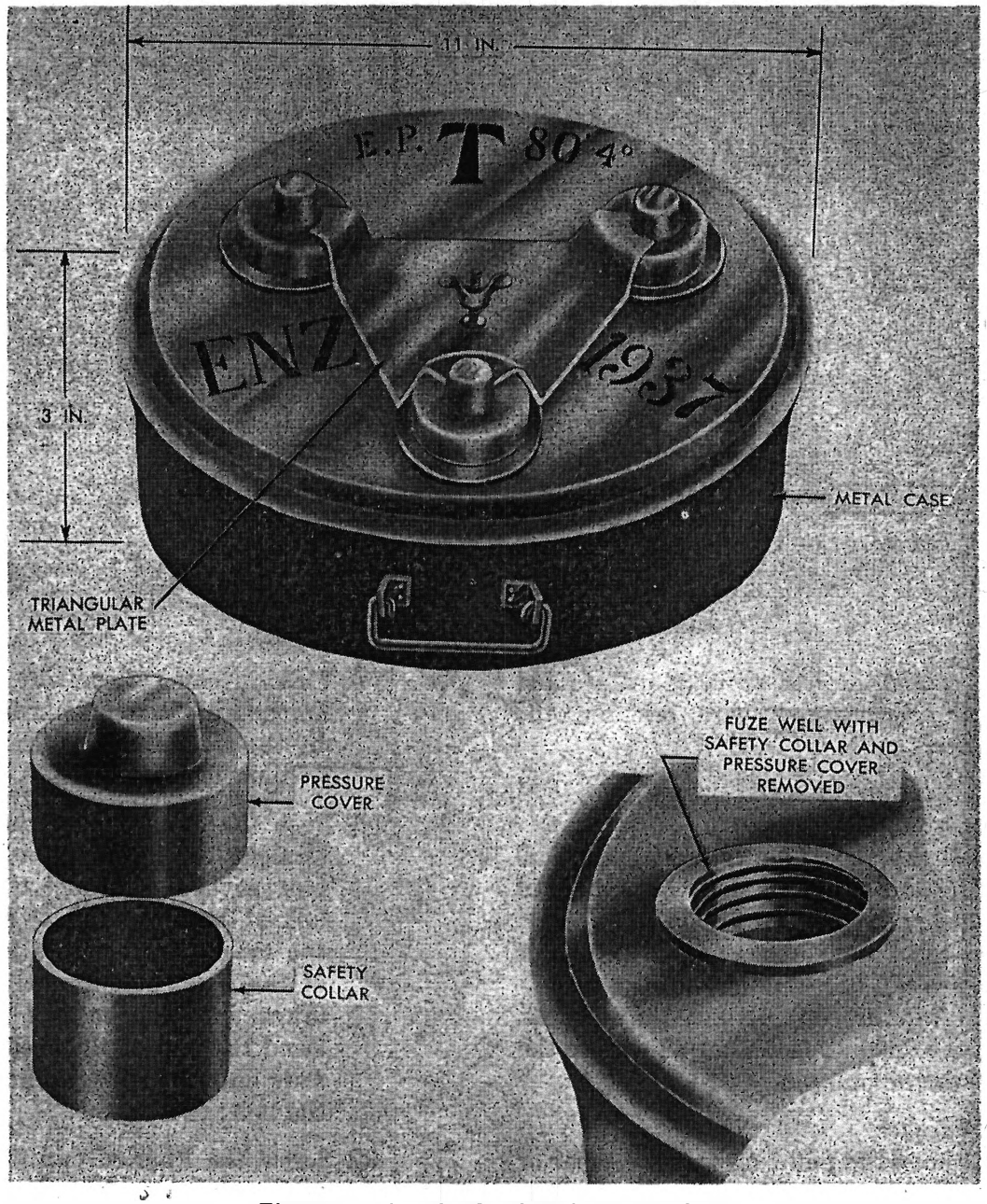


Figure 76. Austrian barrier mine (sperrmine).

69. Austrian Barrier Mine (Sperrmine)

a. DESCRIPTION. This barrier mine (fig. 76) is similar in appearance to the German Tellermine 29. It is 11 inches in diameter and 3 inches high, and it weighs about 14 pounds, including 10 pounds of explosive. The sheet-metal case of the mine is painted olive green over an undercoating of red lead. Three fuze wells, each 2¾ inches in diameter, are located in the top of the mine for insertion of the barrier mine fuze (par. 68). A pressure cover of metal fits into each fuze well and rests on a loose, cylindrical safety collar which is used for shipping the mine with the fuzes in place. When the mine is laid, these safety collars (fig. 76) are removed. The pressure covers are held in place by a triangular metal plate. The plate, in turn, is bolted to the mine case. There are no activating fuze wells in the mine.

b. EMPLOYMENT. The Austrian barrier mine was used as an antitank mine in hasty road blocks.

c. FUNCTIONING.

(1) A pressure of 400 pounds or more on any one of the pressure covers forces the striker shaft down, shearing the shear or pull pin and releasing the striker. The released striker sets off the percussion cap which, in turn, fires the detonator.

(2) Pull on the wire tied to the eye of the shear or pull pin of the fuze pulls out the pin and releases the striker. The released striker sets off the percussion cap which, in turn, fires the detonator.

d. INSTALLING AND ARMING.

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

(2) Remove the metal pressure covers and the metal safety collars and install the fuzes. If fitted with the tilt adapter, see paragraph 68*d*(2). If laid for pressure action only, remove the pull rings from the fuzes, screw the fuzes into the mine, place the pressure covers over each fuze, and replace the triangular metal plate and wing nut. If the mine is to be used against personnel, a pull wire may be tied to the eye of the shear or pull pin. In this case the pressure cover is left off the fuze.

e. NEUTRALIZING.

(1) *If the mine is armed for pressure action only.*

(*a*) Cut all slack trip wires.

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

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

(*d*) Unscrew the fuzes from the mine.

(*e*) Unscrew the percussion-cap-and-detonator assembly from the fuze.

(2) *If the mine is armed with the 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 fuze from the mine.

(*d*) Unscrew the percussion-cap-and-detonator assembly from the fuze.

f. PACKING. These mines were packed 5 to a crate with 2 boxes of fuzes, packed 15 to a box, and a box of 5 tilt adapters.

Section II. BELGIAN MINES AND FUZES

70. Belgian Antitank Mine, Type H

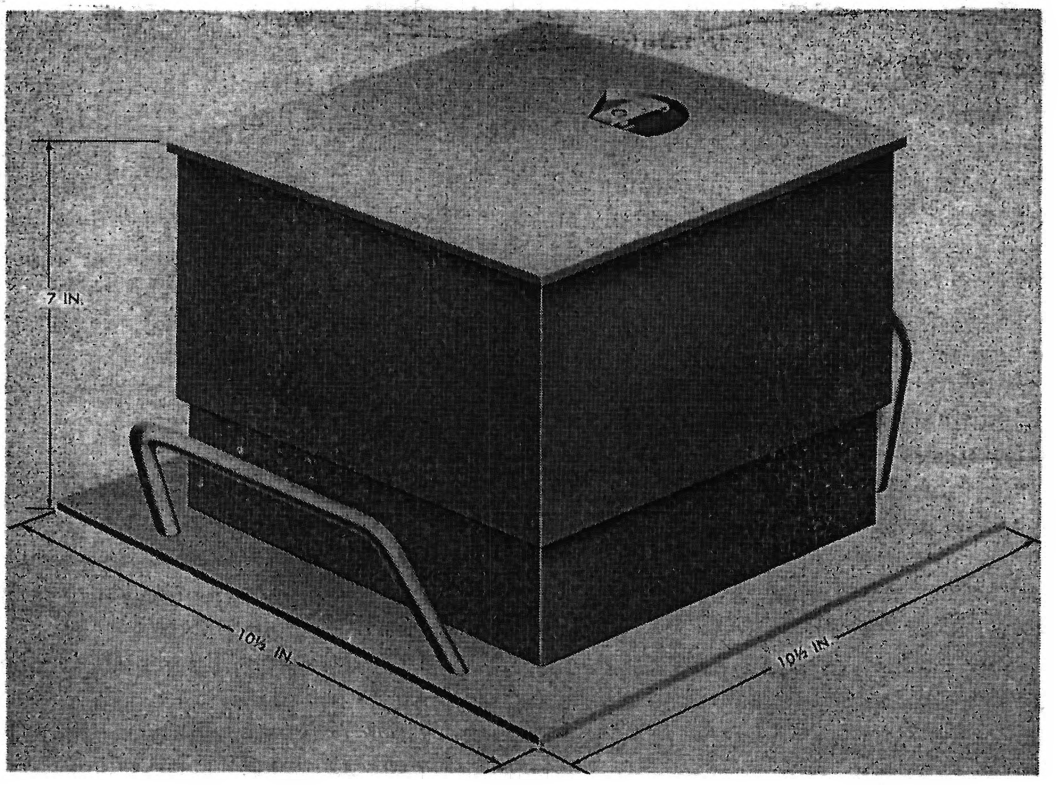
a. DESCRIPTION. The Belgian antitank mine, type H (fig. 77) consists of a square case and lid made of sheet steel one-eighth inch thick. It is about 10½ inches square and 7 inches high. It weighs 44 pounds, including 12.75 pounds of TNT blocks. A safety catch is located in the top of the lid and has an arm which engages in the safety cap of the fuze. The fuze, although removable, is designed especially for this mine.

b. EMPLOYMENT. This mine was designed for employment as an antitank mine in large mine fields and in border-defense barrier systems.

c. FUNCTIONING.

(1) A pressure of 400 pounds or more on the lid depresses the fuze sleeve and shears the shear pin, releasing the striker.

(2) The striker, driven by the striker spring, fires the percussion cap, the detonator, the booster, and the main charge.



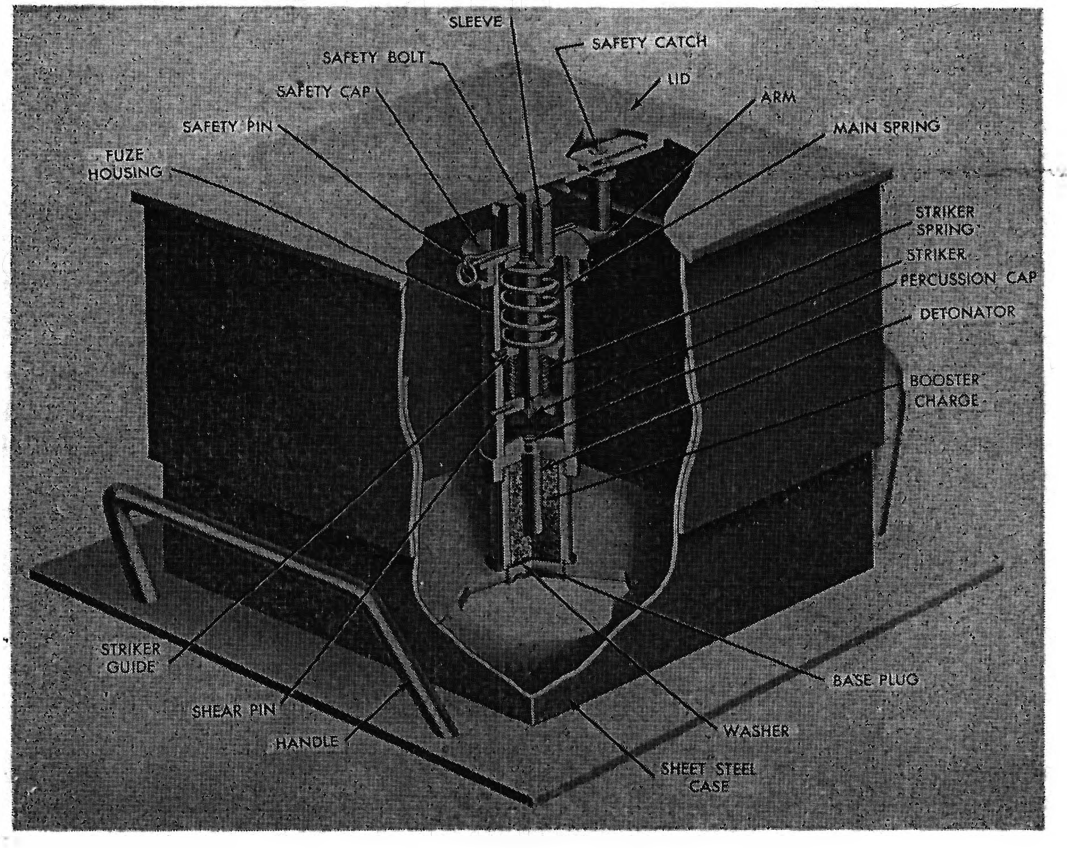


Figure 77. Belgian antitank mine, type H.

d. INSTALLING AND ARMING.

(1) Remove the lid and insert the percussion cap, the detonator, and the 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 its arm engages in the groove of the safety cap of the fuze. To arm the mine turn the safety catch, freeing the arm from the safety cap.

e. NEUTRALIZING.

(1) Free the safety catch if it is engaged in the groove of the safety cap and left off the lid.

(2) Insert a nail or a wire into the safety-pin hole in the fuze.

(3) Unscrew the fuze assembly and remove the percussion cap, the detonator, and the booster charge.

71. Belgian Antitank Mine, Type HA

a. DESCRIPTION.

(1) The Belgian antitank mine, type HA (fig. 78) is almost identical to, but is a later, simplified version of the type H mine. It is 10½ inches square and 7 inches high. The lid of the type HA mine has no safety catch and a different fuze is used in the type HA (fig. 79). The total weight of the mine is 44 pounds, including 12.75 pounds of explosive. The fuze is described with the mine, since it was designed especially for this mine.

(2) The HA mine fuze (fig. 79) consists of a cylindrical metal case containing a plunger, a plunger spring, a percussion-cap, a spring-loaded striker located in a central hole in the plunger, and a safety nut. The striker is held in position by two striker-retaining arms which are held together by a split collar spring.

b. EMPLOYMENT. This mine was designed to

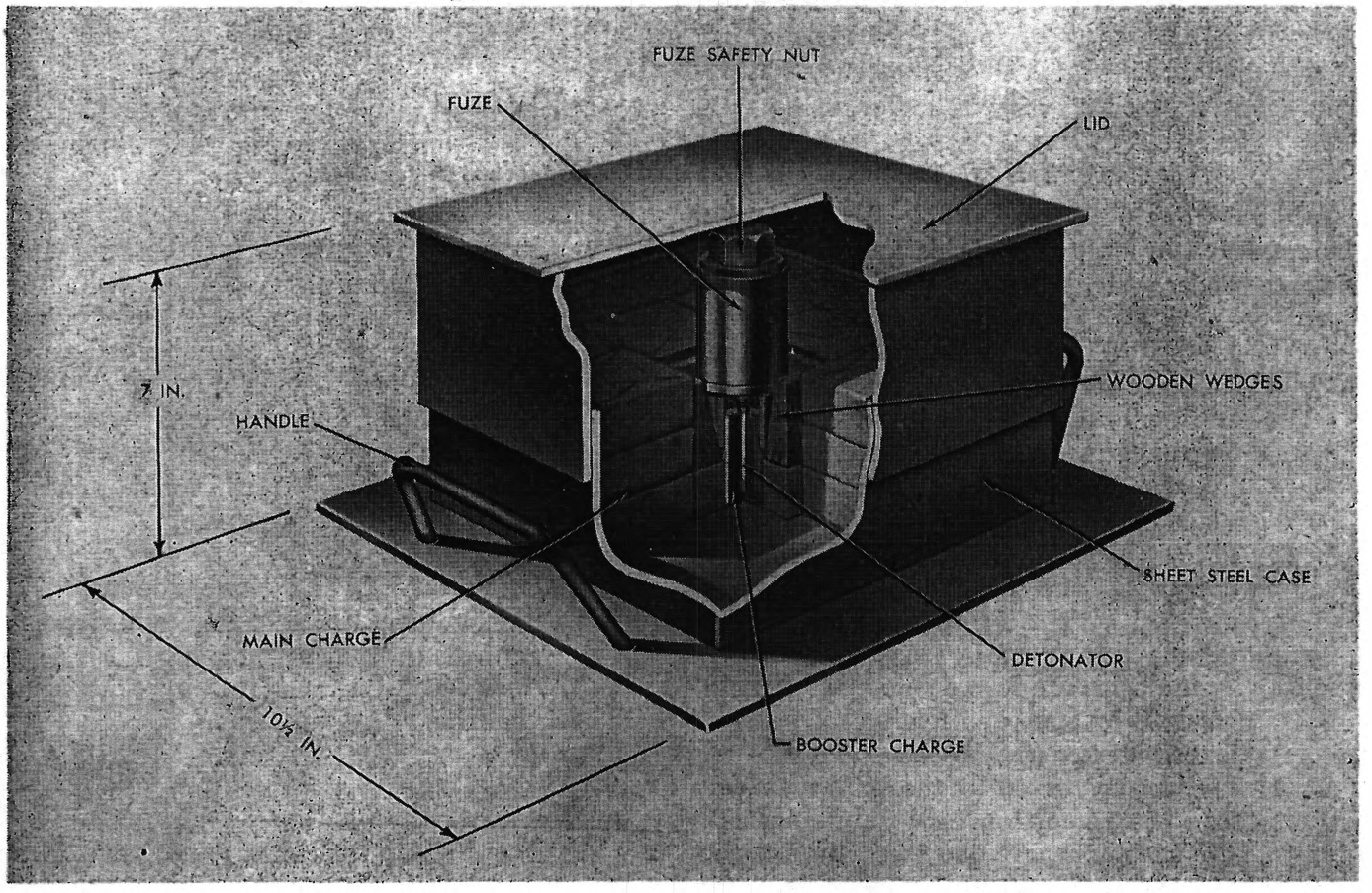


Figure 78. Belgian antitank mine, type HA.

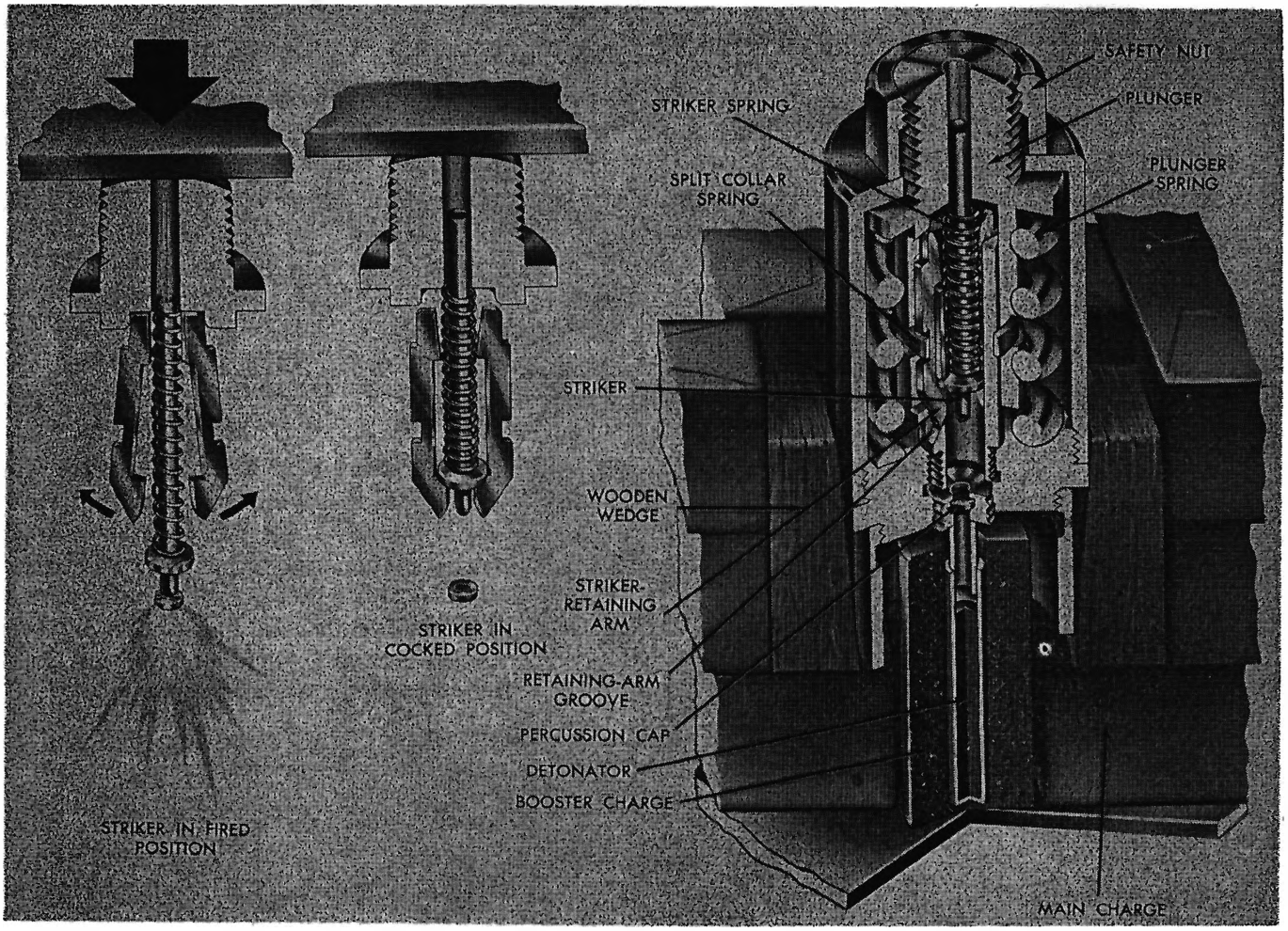


Figure 79. The Belgian type HA antitank mine fuze and its functioning.

be employed in large mine fields and in border-defense barrier systems.

c. FUNCTIONING.

(1) A pressure of 400 pounds or more on the lid depresses the plunger, forcing it downward onto the top of each retaining arm. The uppermost ends of the striker-retaining arms are forced into the recess provided in the base of the plunger.

(2) The striker-retaining arms are forced downward and their bases are forced outward by the sloped edges of the retaining-arm grooves.

(3) As the arms are forced outward at their bases, they open and release the spring-loaded striker (fig. 79).

(4) The striker, driven by the striker spring, fires the percussion cap, the detonator, the booster charge and the main charge.

d. INSTALLING AND ARMING.

(1) Fill the mine with TNT blocks, leaving a space in the center for the fuze and booster charge.

(2) Insert a detonator into the booster charge; place the charge in the mine and insert the fuze.

(3) Force 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. NEUTRALIZING.

(1) Remove the lid and lift out the fuze.

(2) Remove the booster charge and detonator from the mine.

(3) Unscrew the percussion-cap holder from the fuze.

72. Belgian Antitank Mine, Type BSB

a. DESCRIPTION.

(1) The Belgian antitank mine, type BSB (fig. 80) consists of a square sheet-steel case and lid. It resembles the type H

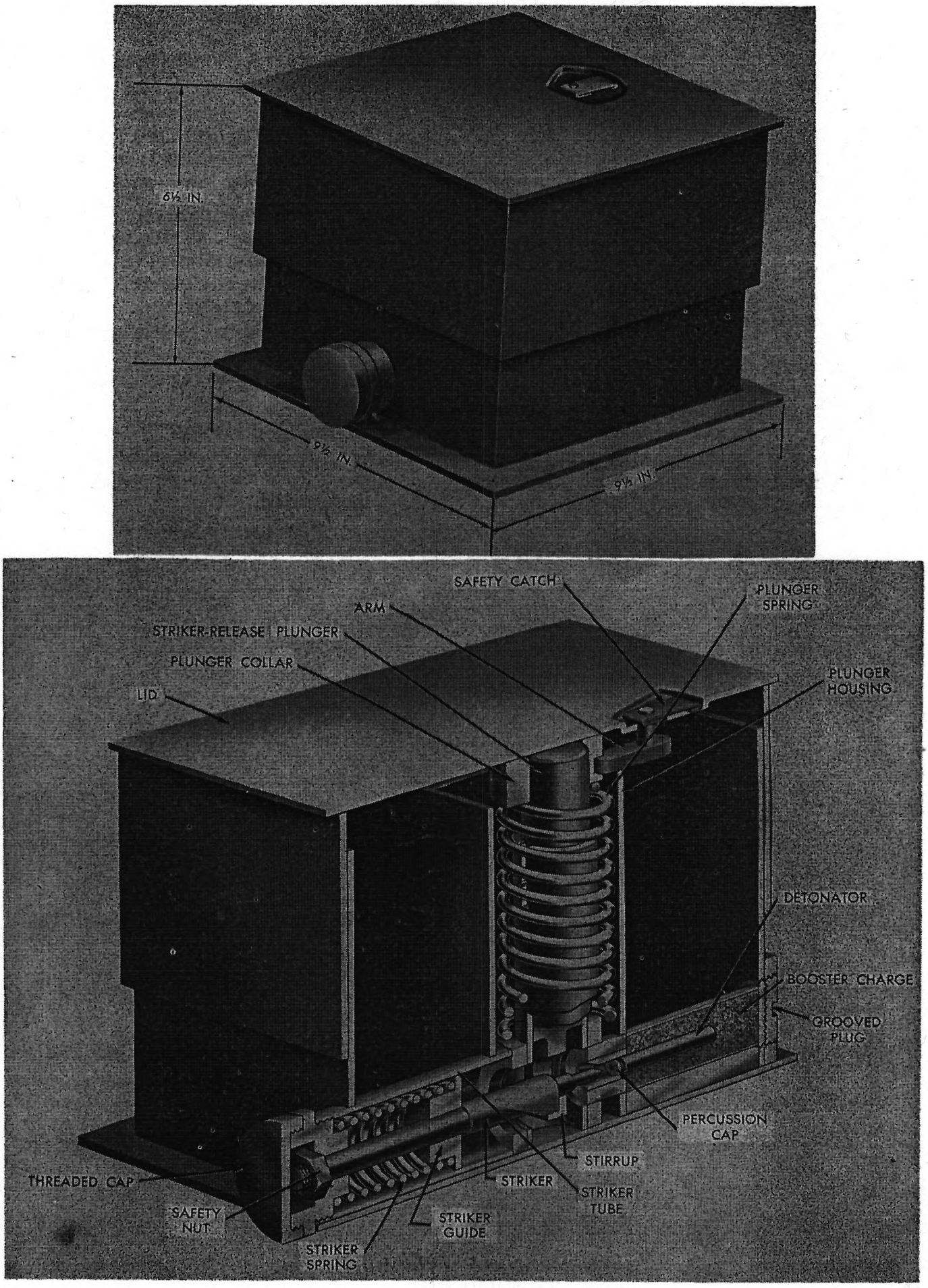


Figure 80. Belgian antitank mine, type BSB.

mine (par. 70) but has a different fuze. The mine weighs about 44 pounds, including 7.75 pounds of pressed TNT. The overall dimensions are 9½ inches square by 6½ inches high.

(2) The fuze consists of a spring-loaded striker contained in a cylindrical striker tube with a percussion cap, detonator, and booster charge, horizontally positioned in the bottom of the mine. One end of the cylindrical striker tube is closed by a threaded cap with the opposite end closed by a grooved plug. A fuze-actuating assembly, consisting of a spring-loaded striker-release plunger, is vertically positioned over the striker tube. The lower end of the plunger has a hole in it and retains the spring-loaded striker as shown in figure 80. A safety catch in the lid of the mine prevents the striker-release plunger from releasing the striker.

b. EMPLOYMENT. This mine was designed for employment in large tactical mine fields and in border-defense barrier systems.

c. FUNCTIONING.

(1) A pressure of 400 pounds or more on the lid of the mine depresses the striker-release plunger and plunger spring until the striker is freed from the stirrup in the bottom of the plunger.

(2) The released striker, driven by the striker spring, fires the percussion cap, the detonator, the booster charge, and the main charge.

d. INSTALLING AND ARMING.

(1) Turn the safety catch so the arm disengages from the plunger collar, and remove the lid.

Figure 81. Belgian antitank VI mine (bottle mine).

(2) Unscrew the grooved plug from the striker tube and insert the percussion cap, detonator, and booster charge into the tube.
(3) Install the TNT blocks and replace the lid.
(4) Turn the safety catch so 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 the arm is freed from the plunger collar.

e. NEUTRALIZING.

(1) Turn the safety catch so the arm engages in the groove in the plunger collar.
(2) Unscrew the grooved plug from the booster end of the striker tube and gently extract the booster charge, detonator, and percussion cap.

73. Belgian Antitank V1 Mine (Bottle Mine)

a. DESCRIPTION.

(1) The Belgian antitank V1 mine or bottle mine (fig. 81) consists of a cone-shaped cast-iron body, 8 inches in diameter and 4¾ inches high. It weighs 12 pounds, including 6 pounds of explosive. The year of manufacture and the letters "V1" are stenciled in white on the black body.
(2) The fuze used with the V1 mine is the model 800–B. It is a cylindrical fuze containing a spring-loaded plunger, a safety screw, a safety collar, a pressure cap, and a spring-loaded striker held by two striker-retaining balls.

b. EMPLOYMENT. This mine is laid in large, tactical antitank mine fields.

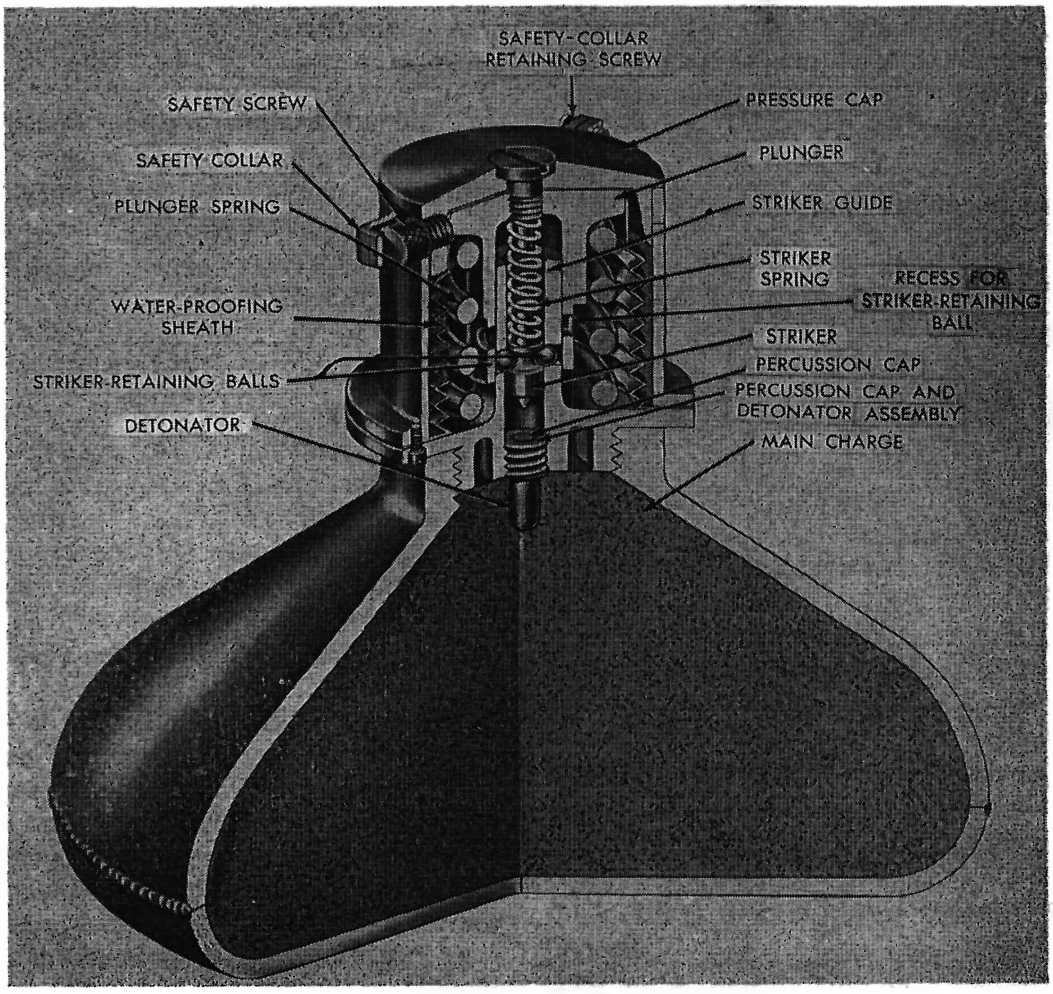


Figure 81—Continued.

c. FUNCTIONING.

(1) A pressure of 400 pounds or more on the pressure cap depresses the plunger and allows the retaining balls to escape into the recesses, releasing the striker.

(2) The striker, driven by the striker spring, fires the percussion cap, the detonator, and the main charge.

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. NEUTRALIZING.

(1) Insert the safety screw if available.

(2) If a safety screw is not available, unscrew the fuze from the mine.

(3) Unscrew the percussion-cap-and-detonator assembly from the fuze.

f. PACKING. Six of these mines, without fuzes, are packed in a crate. A shipping plug protects the fuze well during shipping.

Section III. BULGARIAN MINE WARFARE EQUIPMENT

74. General

a. MINES. Bulgaria has two antipersonnel mines and one antitank mine, all of very simple construction. One of the antipersonnel mines is of glass; the other, wood. The antitank mine is metallic.

b. MINE DETECTING EQUIPMENT. Bulgaria is known to produce at least one electronic mine detector, the VISF–43–44. Soviet influence and equipment are predominant.

75. Bulgarian Magnet Mine

This mine is a triangular flat-bottomed, magnetic grenade or hand mine with a handle in the center. It weighs approximately 3 pounds. It can be thrown from 60 to 75 feet.

76. Bulgarian Match-Box Antipersonnel Mine

This small antipersonnel mine is a wooden, match-box size container with several ounces of explosives. It is fitted with a pressure type fuze which functions under at least 90 pounds of pressure.

77. Bulgarian Glass Antipersonnel Mine

This mine is reported to be a pencil-shaped glass container, about 4 inches long and ½ inch in diameter, painted for camouflage purposes. The fuze used is either a chemical or a friction type. Eighty mines are rolled together in tarred tape.

Section IV. CZECHOSLOVAKIAN MINE WARFARE EQUIPMENT

78. General

Most mines used in the Czechoslovakian Army are of German or Soviet origin. Soviet mine warfare doctrine is followed rather closely through all its phases. The Czechoslovakian Army teaches both the British pace method and the Soviet mine-spacing-cord method of laying mine fields. For marking gaps through mine fields, the Czechoslovakians use yellow lights toward the mine field and green lights toward the gap. They follow United States Army practice for marking mine fields for daylight use, by using red triangles and red and white signs.

79. Czechoslovakian Dual-Purpose Mine, PT–Mi–D

a. DESCRIPTION. The dual-purpose mine, PT–Mi–D (fig. 82) is a wooden box mine, 13 inches long, 8½ inches wide, and 5½ inches high. It contains 6 pounds of explosive and two RO–1 fuzes. The RO–1 fuzes are identical to the German Z.Z. 42. This mine operates on the same principle as the Soviet Ovtsinnikov mine (TM 5–223A), except that it has two fuzes instead of one. Two wooden pressure pieces are fixed, one at each end of the box, by two wooden shear dowels. A pressure board, with a pressure block, is located in the center of the mine lid and is held in place during shipment by a cotter pin at each end. For antitank use the mine is filled with explosive blocks. For antipersonnel use, part of it is filled with explosive and the rest with metal fragments.

b. EMPLOYMENT. This mine is employed as an antitank or as an antipersonnel mine.

c. FUNCTIONING. A pressure of at least 100 pounds on the pressure block and pressure board shears the wooden shear dowels holding the pres-

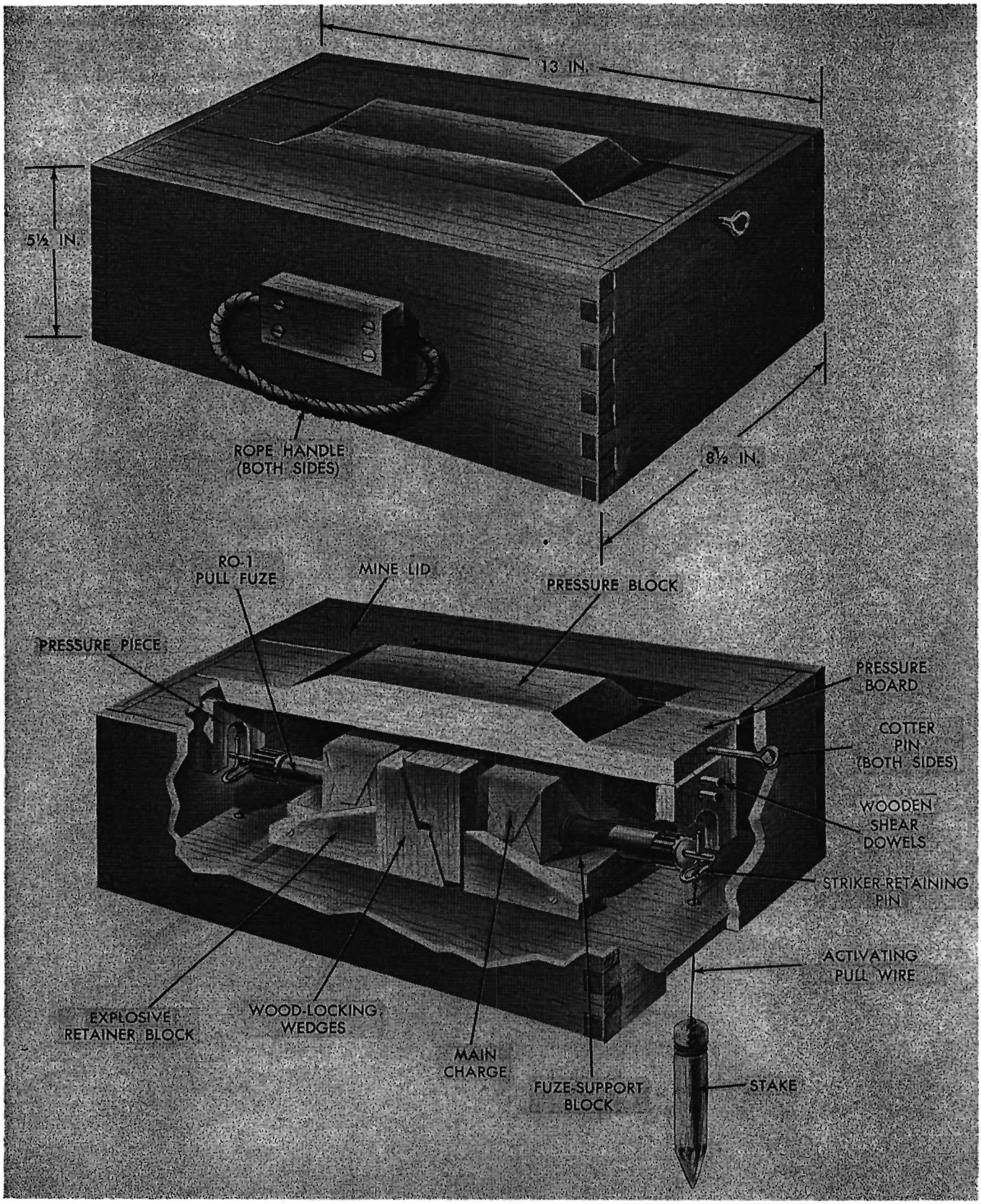


Figure 82. Czechoslovakian dual-purpose mine, PT-Mi-D.

sure piece at one or both ends of the mine. The pressure piece forces the striker-retaining pin out of the fuze, releasing the spring-loaded striker.

d. INSTALLING AND ARMING.

(1) Remove the pressure board from the mine.

(2) Insert the fuzes into the mine so the wings of the striker-retaining pin point downward. The mine can also be activated by tying a wire to the striker-retaining pin and running it through a hole in the bottom of the box to a stake (fig. 82).

(3) Replace the pressure board and place the mine in a prepared position.

e. NEUTRALIZING.

(1) Remove the pressure board and cut all the pull wires.

(2) Without disturbing the striker-retaining pin, remove the fuzes.

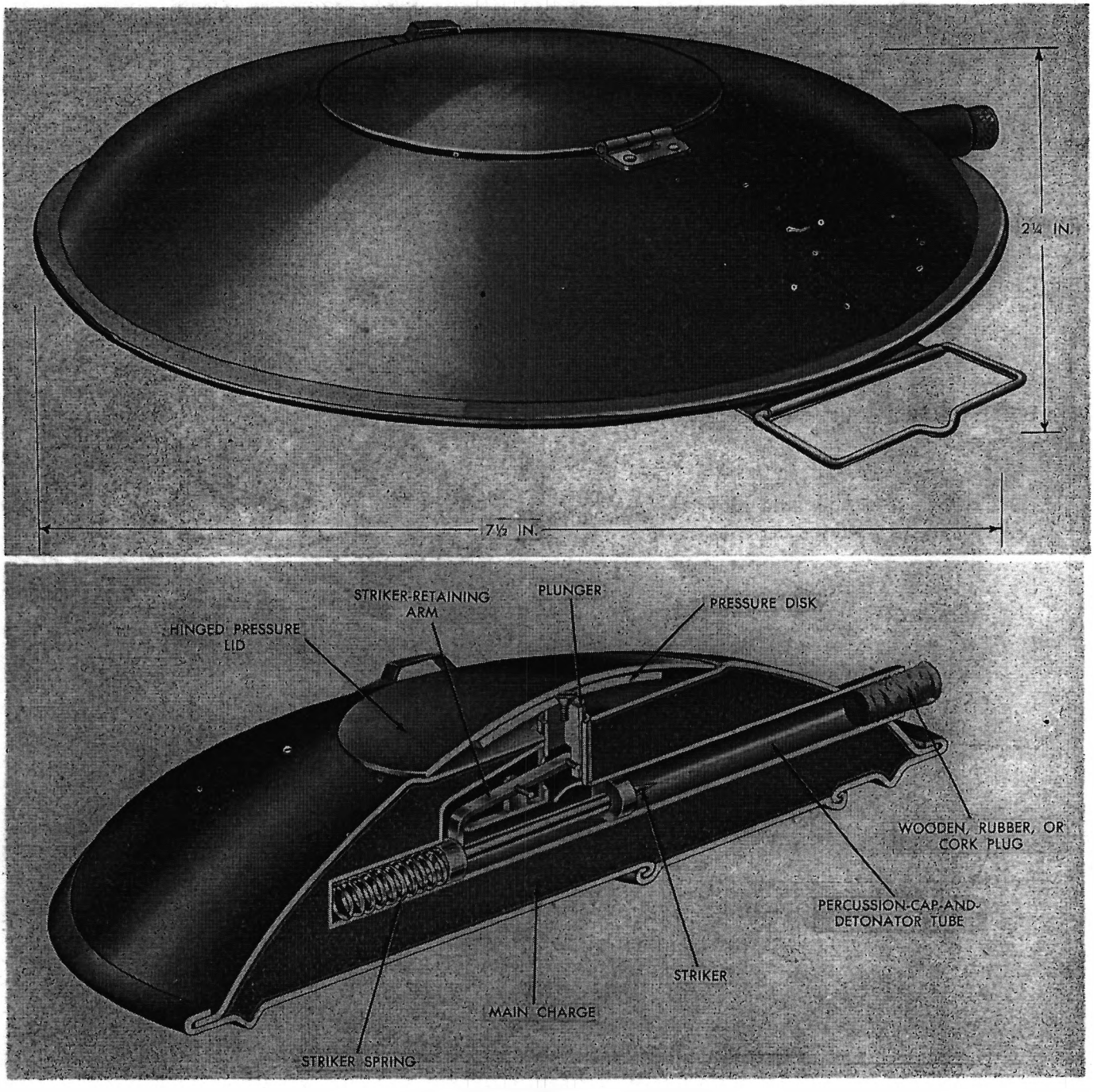


Figure 83. Estonian antivehicular mine.

Section V. ESTONIAN AND LATVIAN MINES

80. Estonian Antivehicular Mine

a. DESCRIPTION. This antivehicular mine (fig. 83) is circular, flat-bottomed, and has a dome-shaped pressure lid. Made of sheet metal, it weighs 3.2 pounds, including about 2 pounds of explosive. The mine is 7½ inches in diameter and 2¼ inches in height. The mine has a fixed wire handle on the side. A horizontal percussion-cap-and-detonator tube projects out of the side of the mine. The well is closed with a wooden, rubber, or cork plug. A hinged, rounded metal pressure lid in the top of the mine covers the central fuze well and the circular pressure disk. The spring-loaded striker is built into the mine. The striker is held in the cocked position by a hinged striker-retaining arm connected to the plunger and the pressure disk. The mine is painted olive green.

b. EMPLOYMENT. This mine is employed against vehicles.

c. FUNCTIONING. Pressure of at least 200 pounds 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 spring-loaded striker against the percussion cap.

d. INSTALLING AND ARMING.

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

(2) Close the tube with the plug.

e. NEUTRALIZING.

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

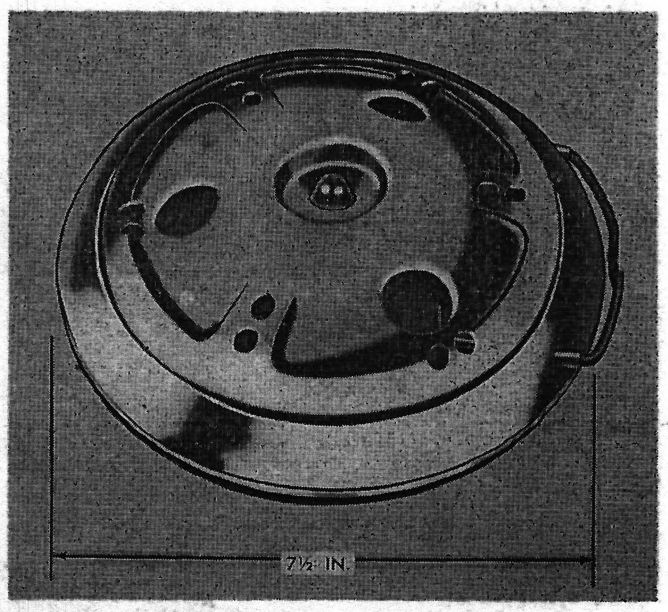
(2) Gently tilt the mine and slide out the percussion-cap-and-detonator assembly.

Caution: There is no safety device on this mine.

81. Latvian Antivehicular Mine

a. DESCRIPTION.

(1) *Mine.* This antivehicular mine (fig. 84) consists of a flat, circular sheet-metal charge case. The case has a hole in the bottom, closed by a metal plug, for access to the charge cavity. A centrally located fuze well is located in the top of the case. A thin, metal pressure plate fits inside the charge case and may be locked in place by turning it one-half inch in a counter-clockwise direction. The mine



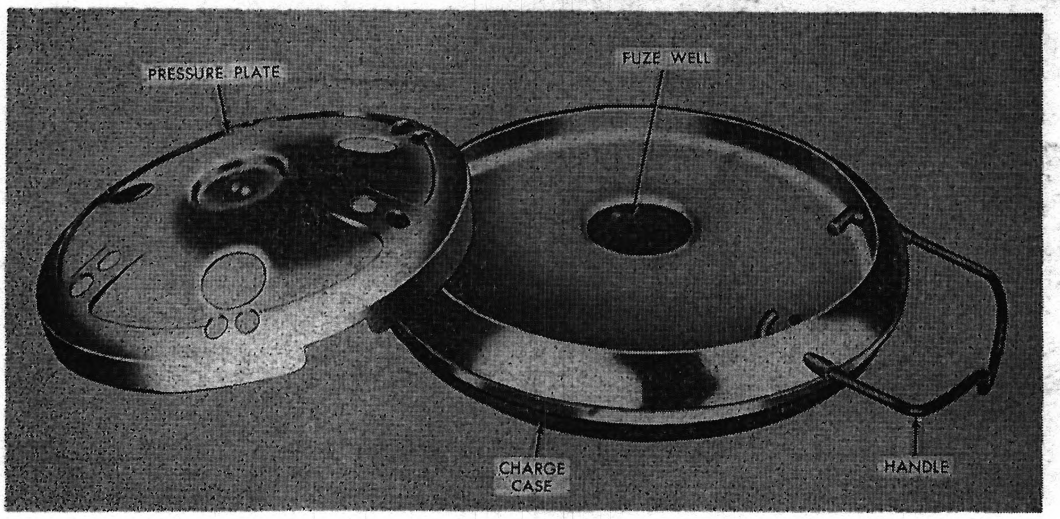


Figure 84. Latvian antivehicular mine.

has a wire handle which slides into the charge case. The mine is about 7½ inches in diameter and 2¼ inches high. It weighs 3 pounds, including 1.5 pounds of explosive. A doughnut-shaped booster charge surrounds the fuze. The mine is painted olive green.

(2) *Fuze.* The fuze (fig. 85) is especially designed for this antivehicular mine. It consists of a cylindrical metal body containing a hollow striker with two striker tips, a striker spring, a fluted fuze cap, and two percussion caps. The striker is held in place by a metal shear ridge inside an inner sleeve which also acts as the striker guide. Two flash holes at the base of the fuze are provided to fire the surrounding booster charge when the percussion caps are ignited.

b. EMPLOYMENT. This mine is employed against vehicles.

c. FUNCTIONING.

(1) A pressure of at least 650 pounds on the center of the pressure plate crushes it and the fluted fuze cap.

(2) The main spring of the fuze is compressed until the pressure shears the shear ridge which retains the striker.

(3) The spring-loaded striker is released, setting off the two percussion caps, the booster charge, 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. NEUTRALIZING.

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

(2) Remove the fuze and the booster charge from the fuze well.

(3) Remove the fuze from the booster charge.

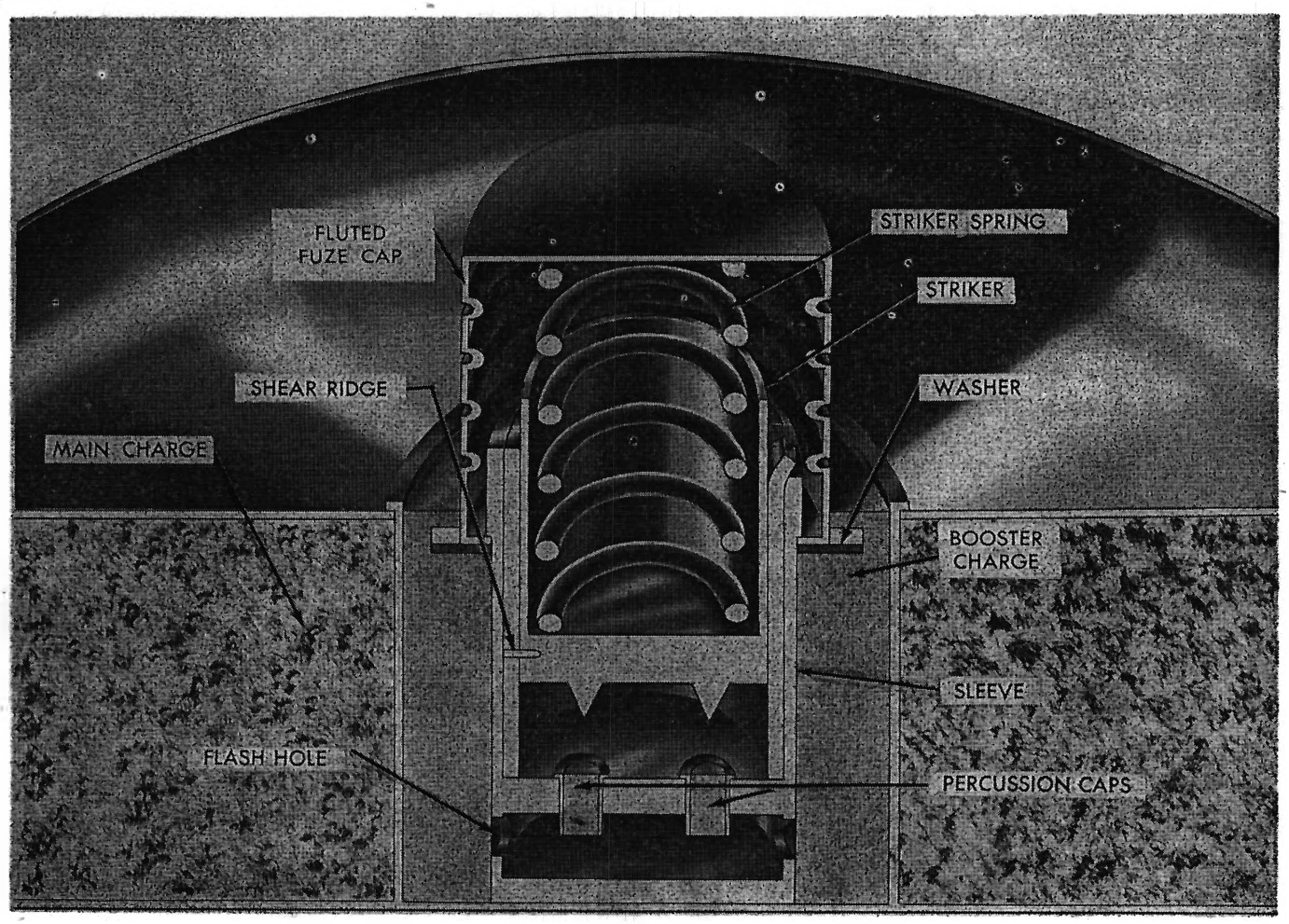


Figure 85. Latvian antivehicular mine fuze.

Section VI. FINNISH MINE WARFARE EQUIPMENT

82. General

The Finnish Army produced several models of antivehicular and antipersonnel mines. The Soviets copied the Finnish metal tank mine, HV.M. M/36 (par. 88) when they produced the PMZ–40 dual-purpose mine (TM 5–223A). The Finnish ice mine (par. 92) was copied exactly by the Germans. Many features of other Finnish mines and fuzes were incorporated into certain German and Soviet mines and fuzes. The M/44 antitank mine, the ice mine, and the M/43 antipersonnel mine remain as standard equipment. The Finns are also using the Swedish M/45, the Soviet VIM–203, the US SCR–625, and the British No. 4 mine detectors, besides two post-World War II models of their own.

83. Impact Fuze For Finnish Ice Mine

a. DESCRIPTION. The impact fuze for the Finnish ice mine is an instantaneous type, containing a striker with a shear-pin release. The fuze body is of brass, measuring 1½ inches in length and 9/16 inch in diameter (fig. 86). An aluminum striker is held in place by a shear wire (fig. 95). The base of the fuze is grooved so a detonator may be crimped onto it. This fuze was designed for use with the ice mine (par. 92) and functions only on impact; a steady pressure will not set it off. The fuze fits into a recess in a wooden plug in the top of the mine.

b. EMPLOYMENT. This fuze is used with the ice mine against personnel.

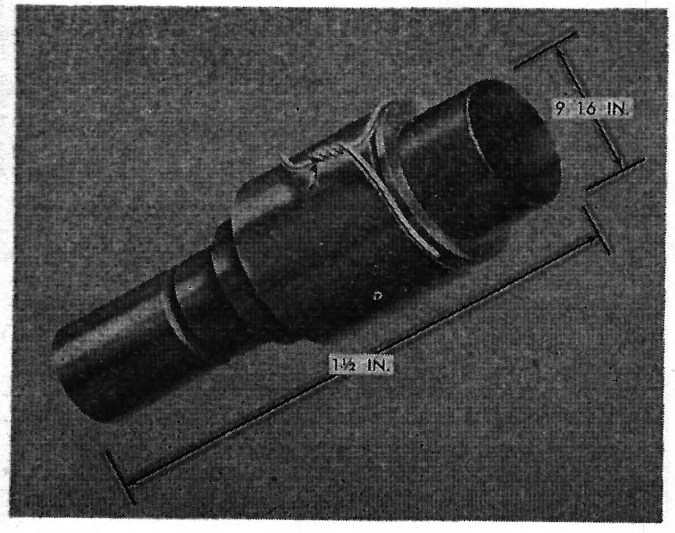


Figure 86. Impact fuze for Finnish ice mine.

c. FUNCTIONING. Impact on the aluminum striker shears the shear wire and drives the striker against the percussion cap.

d. INSTALLING AND ARMING. Crimp the percussion cap and detonator to the base of the fuze.

e. NEUTRALIZING. There is no safety on this fuze. Separate the fuze from the percussion cap and detonator.

84. Fuze For Finnish Antitank Mine, M/36

a. DESCRIPTION. This fuze (fig. 87) is an instantaneous, pressure type. It is cylindrical in shape and consists of a metal body containing a spring-loaded striker. The striker spring is held under compression by a shear pin passed through the fuze body, the inner plunger, and the striker shaft. A percussion cap, a detonator, and a booster charge are screwed into the base of the fuze.

b. EMPLOYMENT. This fuze is used in the M/36 antitank mine (par. 88).

c. FUNCTIONING. Pressure directly on the pressure plug (fig. 87) transmitted through the pressure bolt to the inner plunger shears the shear pin and releases the spring-loaded striker.

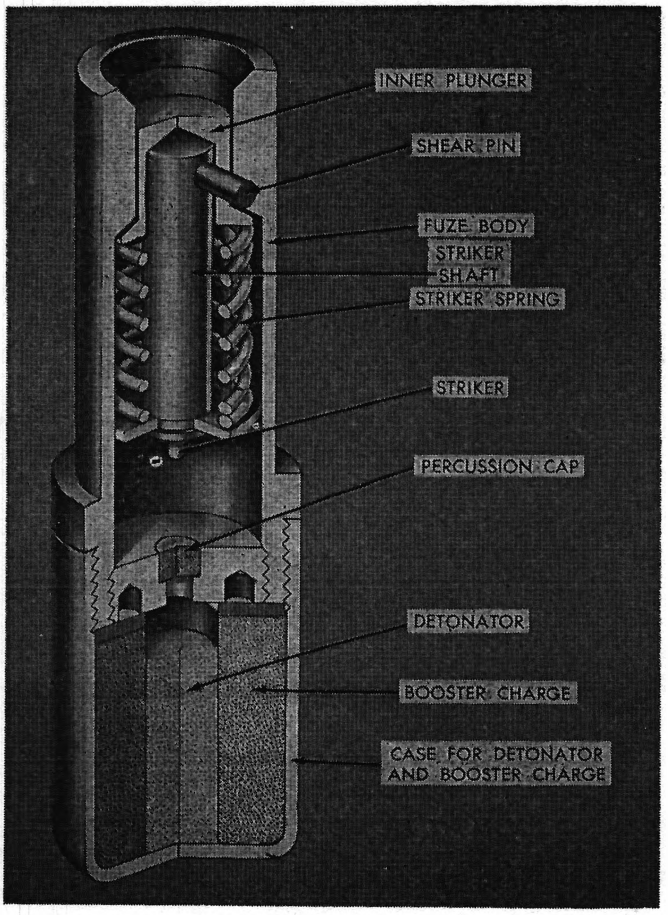


Figure 87. Fuze for Finnish antitank mine, M/36.

d. INSTALLING AND ARMING.

(1) Screw the percussion cap into the base of the fuze.

(2) Screw the case containing the detonator and booster onto the base of the fuze.

e. NEUTRALIZING.

(1) Unscrew the detonator and booster case from the base of the fuze.

(2) Unscrew the percussion cap from the base of the fuze.

85. Fuze For Finnish Antitank Mine, M/39

a. DESCRIPTION. This antitank-mine fuze (fig. 88) is an instantaneous, pressure type having a spring-loaded striker with shear-pin release. The striker is held in a cocked position by a shear pin. The fuze case has a threaded joint dividing it in half and a percussion cap is screwed into the base of the fuze. The detonator holder is crimped onto the percussion cap holder.

b. EMPLOYMENT. This pressure fuze is used with the Finnish metallic antitank mine M/39 (par. 89) and the Finnish antitank mine M/44 (par. 91).

c. FUNCTIONING. Pressure on the striker shears the shear pin and releases the spring-loaded striker.

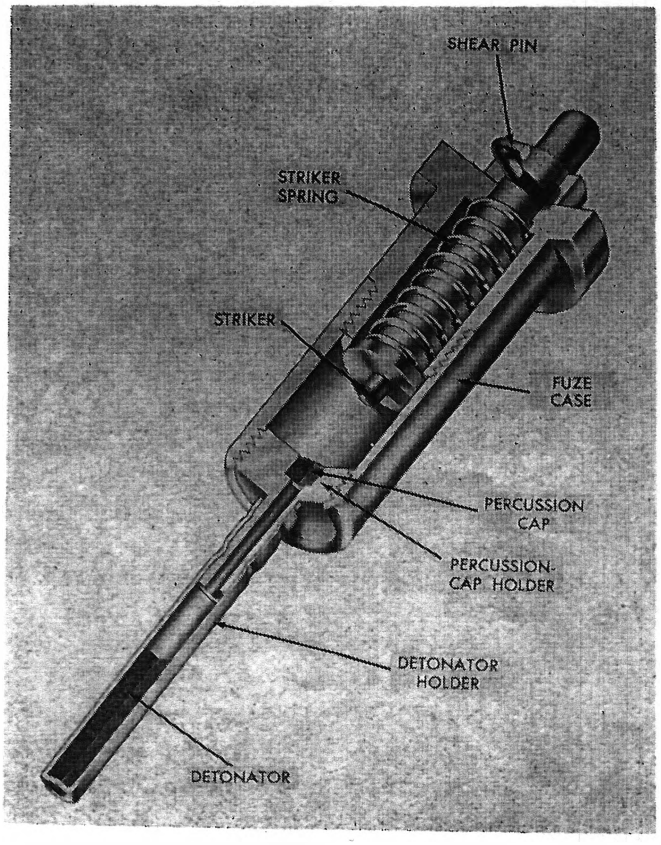


Figure 88. Fuze for Finnish antitank mine, M/39.

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. NEUTRALIZING. There is no safety on the fuze. Unscrew the detonator and percussion cap holder from the base of the fuze.

86. Finnish Pull Fuze

a. DESCRIPTION. This pull fuze (fig. 89) is an instantaneous, pull type containing a spring-loaded striker held in the cocked position by a striker-retaining pin. It is almost identical to the Soviet MUV pull fuze (TM 5–223A). A built-in percussion-cap-and-detonator holder is crimped in the base of the fuze. In the top hole of the striker shaft is a cocking ring for cocking the fuze. A round, slotted stiffening plate is provided to increase the force necessary to extract the striker-retaining pin. When used, the plate is positioned between the striker-retaining pin and the top of the fuze case.

b. EMPLOYMENT. The pull fuze is used in antipersonnel mines.

c. FUNCTIONING. Pull on the trip wire attached to the striker-retaining pin removes it from the striker, releasing the striker against the percussion cap. With the stiffening plate in place, the force required to remove the pin is at least 22 pounds. Without the plate, the force needed is only 5 pounds.

d. INSTALLING AND ARMING.

(1) Pull the striker upward with the cocking ring and insert the striker-retaining pin in the lower hole. Position the stiffening plate between the pin and the top of the fuze, if desired.

(2) Attach a slack trip wire to the striker-retaining pin if desired.

(3) Remove the cocking ring.

e. NEUTRALIZING.

(1) Cut all slack trip wires.

(2) Pull the fuze out of the mine or charge and tie the retaining pin in place.

Note. This fuze may be installed with a taut trip wire attached to the top hole at the end of the striker and with the striker-retaining-pin removed so that the fuze will function when the wire is cut. In this case insert a nail or wire in the exposed lower hole and then cut the taut wire.

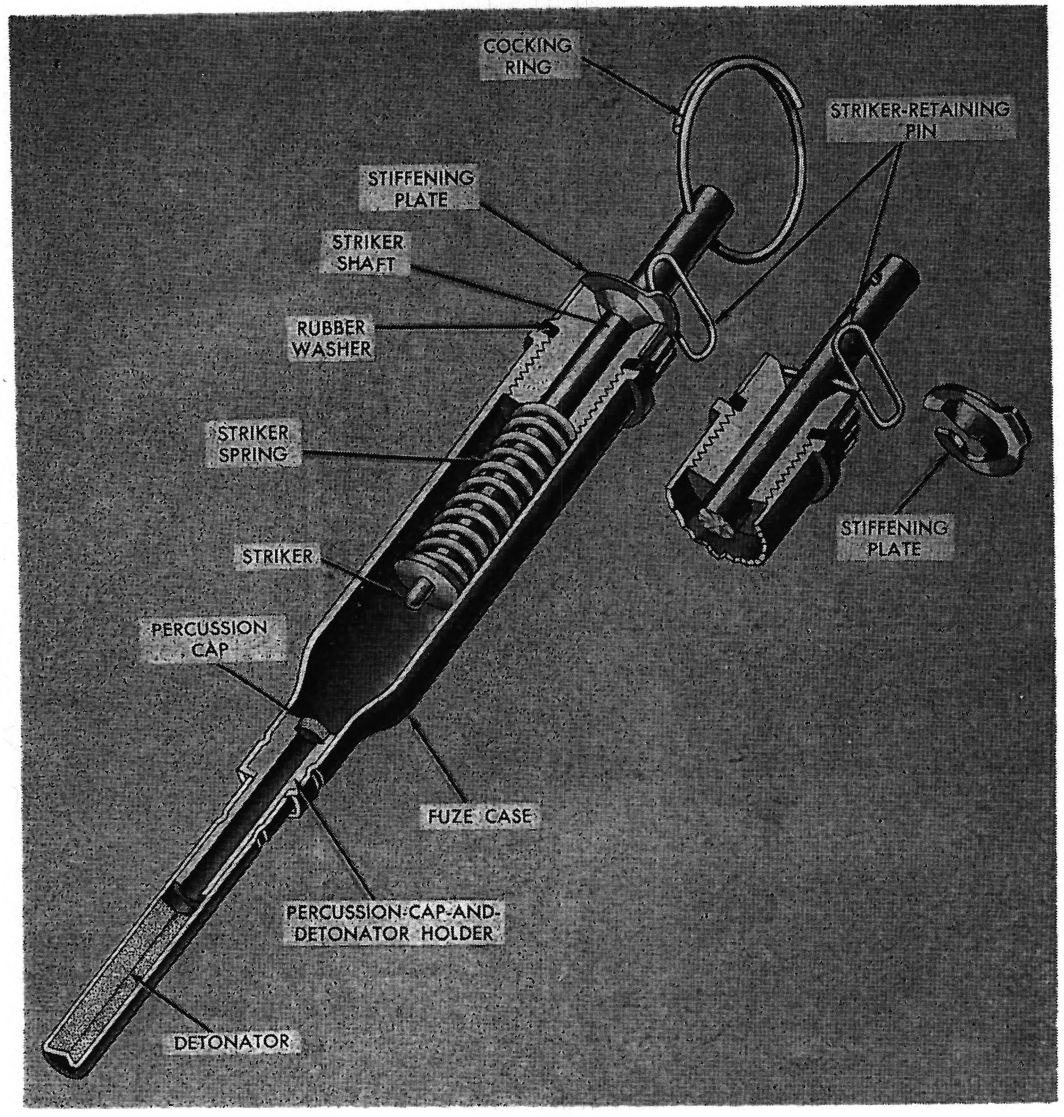


Figure 89. Finnish pull fuze.

87. Finnish 8-Day Clockwork Fuze

a. DESCRIPTION. The 8-day clockwork fuze (fig. 90) is a mechanical type containing a spring-loaded striker with a clockwork release. The clockwork mechanism is contained in the uppermost portion of the fuze and is completely inclosed by a threaded cover. Located immediately beneath the clockwork is the striker bolt containing the spring-loaded striker, the striker-release lever, cam, and trigger. The percussion cap and detonator are contained together in an assembly below the striker. The booster charge is screwed onto the percussion-cap-and-detonator assembly. The percussion-cap-and-detonator assembly may be replaced by a electrical-contact cap for wiring into an electric circuit.

b. EMPLOYMENT. This fuze is used in areas that are to be abandoned to the opposing force.

c. FUNCTIONING.

(1) After the lapse of a 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.

(2) The striker-release trigger disengages the striker shaft.

(3) The released striker hits the percussion cap and sets off the detonator, the booster, and the main charge.

Note. If the electrical-contact cap is used, the striker will complete the circuit in the cap.

d. INSTALLING AND ARMING.

(1) Unscrew the lid from the fuze.

(2) Wind the clockwork by turning the milled wheel clockwise until the desired time setting on the dial coincides with the indicator mark.

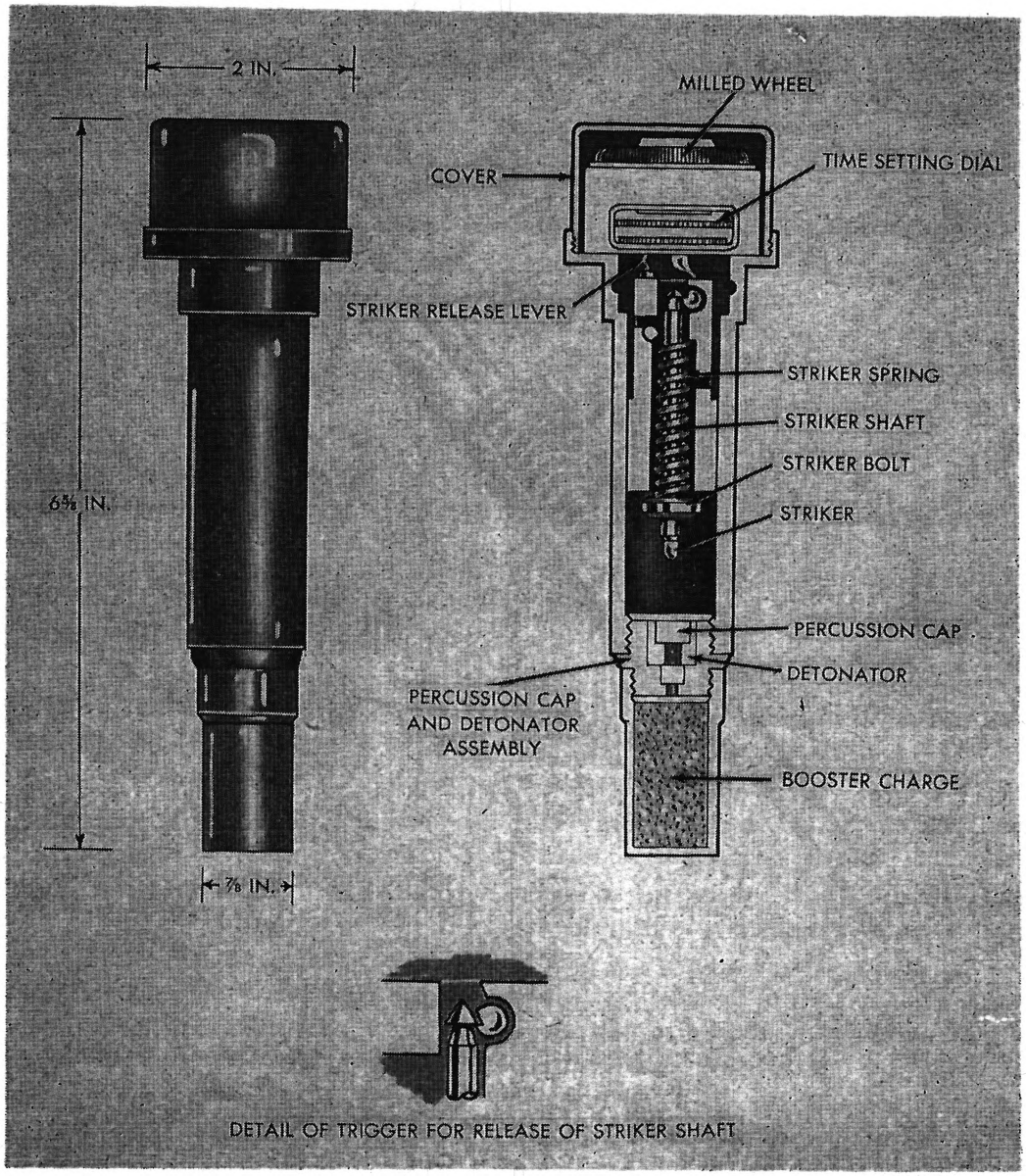


Figure 90. Finnish 8-day clockwork fuze.

Caution: Do not set the clock for a period of less than 6 hours.

(3) Replace the lid.

(4) For direct insertion into a charge, screw a percussion-cap-and-detonator assembly into the base of the fuze and also a booster charge. Insert the fuze in a charge. For wiring into an electrical circuit, screw an electric-contact cap into the base of the fuze and wire the terminals of the cap into an electrical demolition circuit.

e. NEUTRALIZING. Gently unscrew the fuze from the detonator assembly or from the electric-contact cap.

88. Finnish Antitank Mine, M/36

a. DESCRIPTION. This early Finnish mine (fig. 91) is also called the "F–1" by the Soviets and the "round-loaf" mine or HV.M. M/36 (tank mine, model 1936) by the Finns. It is a cylindrical steel mine 12 inches in diameter and 5 inches in height. It weighs 15.5 pounds, including about 8 pounds of TNT. The explosive is contained in an internal case. A plate-shaped pressure lid is held off the explosive case by a strong pressure-lid spring and is locked to the case by a metal locking ring. A pressure fuze (par. 84) is inserted through the spring in a central fuze well. It is covered by a metal pressure plug and its attached pressure bolt which rests on the plunger of the fuze. The base

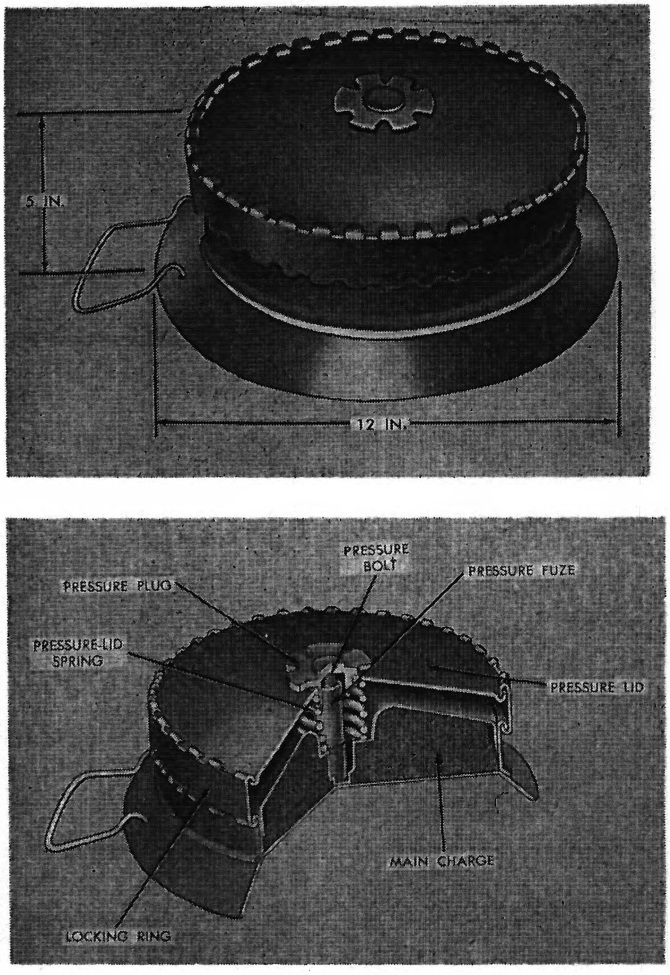


Figure 91. Finnish antitank mine, M/36.

of the mine is flared and scalloped to assure a firm seating in the soil. The mine has one wire carrying handle.

b. EMPLOYMENT. This mine was used against tanks.

c. FUNCTIONING. A minimum pressure of 400 pounds on at least one-fifth of the surface of the pressure cover overcomes the resistance of the pressure-lid spring. The pressure bolt depresses the plunger in the fuze, actuating it and firing the mine.

d. INSTALLING AND ARMING.

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

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

e. NEUTRALIZING. Unscrew the pressure plug and pull out the fuze.

89. Finnish Metallic Antitank Mine, M/39

a. DESCRIPTION. This antitank mine (fig. 92), except for outward appearance, is identical in components to the M/36 (par. 88). It is a cast-iron mine about 9 inches in diameter and 4¼ inches in height. It weighs a total of 16.5 pounds, including 8.8 pounds of TNT. The pressure fuze used with this mine is described in paragraph 85.

b. EMPLOYMENT. This mine was used against tanks.

c. FUNCTIONING. A minimum pressure of 220 pounds on at least one-fourth of the area of the pressure lid detonates the mine.

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 the pressure lid-retaining pins are over the vertical slots in the pressure lid.

e. NEUTRALIZING.

(1) Rotate the pressure lid until the lid-retaining pins are in the horizontal slots.

(2) Unscrew the pressure plug and remove the fuze.

90. Finnish Wooden Antitank Mine, M/S–39

a. DESCRIPTION. This wooden antitank mine (fig. 93) consists of an internal wooden explosive container on a flat wooden base. Metal plates for positioning the wooden pressure cover are provided along the edges of the base. Two metal safety bars are inserted through the pressure cover. They rest on the wooden explosive container and prevent the cover from prematurely actuating the fuze mechanism. The center board of the pressure cover is hinged to provide access to the fuze. A flat leaf spring with a striker point is held up by a pivoted trigger fastened over the well for the percussion cap and detonator. A metal shear pin holds the trigger in a cocked position.

b. EMPLOYMENT. This mine was used against tanks.

c. FUNCTIONING.

(1) Pressure on the pressure cover is transmitted through the pressure plate to the trigger.

(2) The shear pin in the trigger bears against the shear block and is sheared.

(3) The trigger is depressed further releasing the leaf spring with attached striker.

(4) The striker hits the percussion cap, setting off the detonator and main charge.

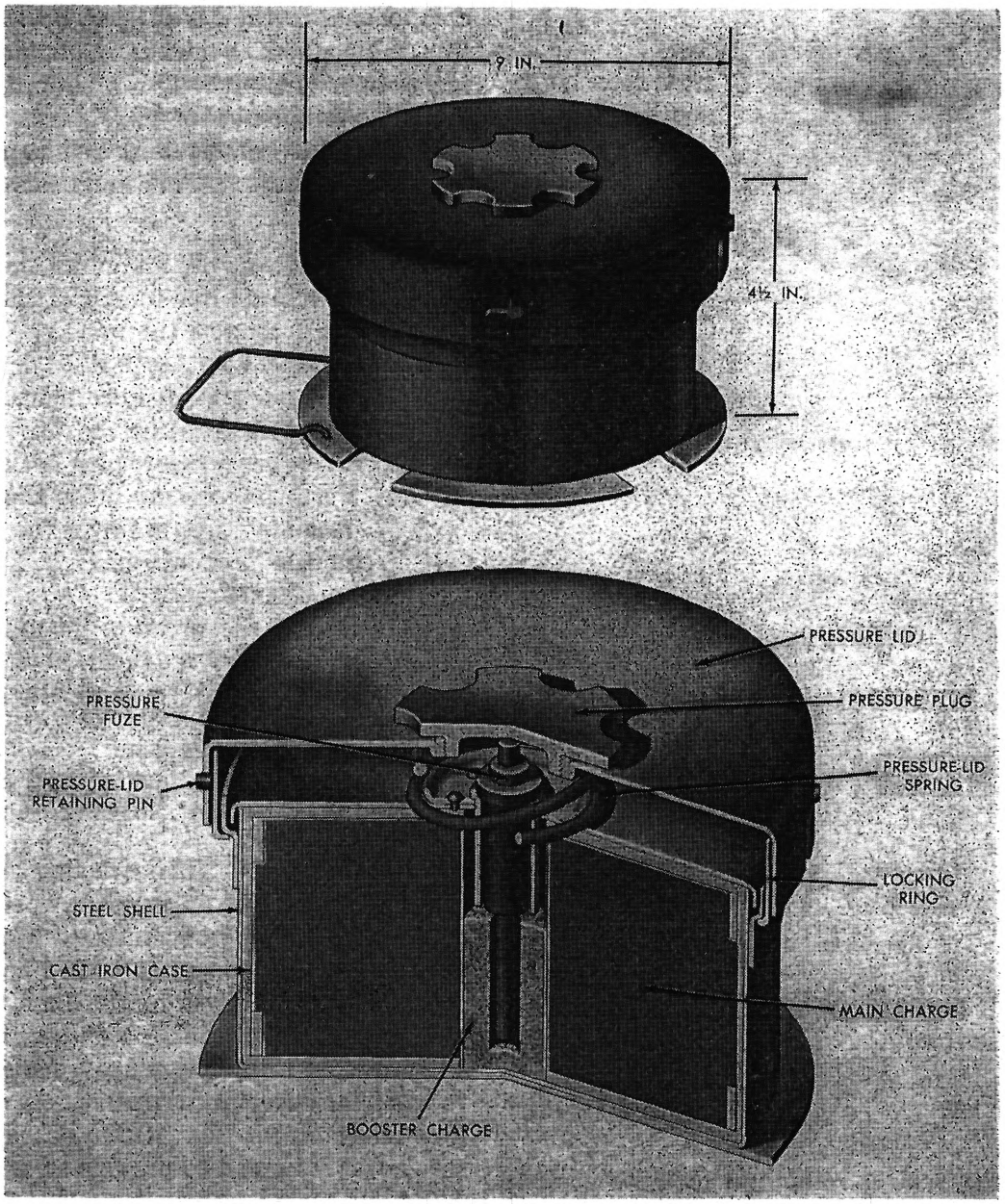


Figure 92. Finnish metallic antitank mine, M/39.

d. INSTALLING AND ARMING.

(1) Open the fuze access door and lift up the leaf spring.
(2) Insert the detonator and percussion cap.
(3) Close the fuze access door and remove the safety bars.

e. NEUTRALIZING.

(1) Replace safety bars if available.
(2) Open the fuze access door and carefully lift up the leaf spring.
(3) Remove the percussion cap and detonator.

91. Finnish Antitank Mine, M/44

a. DESCRIPTION. This antitank mine (fig. 94) consists of a wooden explosive container with a hinged pressure cover. The mine is 12 inches square and 4½ inches high. It weighs a total of 18.5 pounds, including 11 pounds of explosive. A wire handle is located at one end of the mine. The pressure fuze (par. 85) used is identical to the German T.MI.Z. 42. The pressure cover and the explosive container are held together by 8 wooden shear pins.

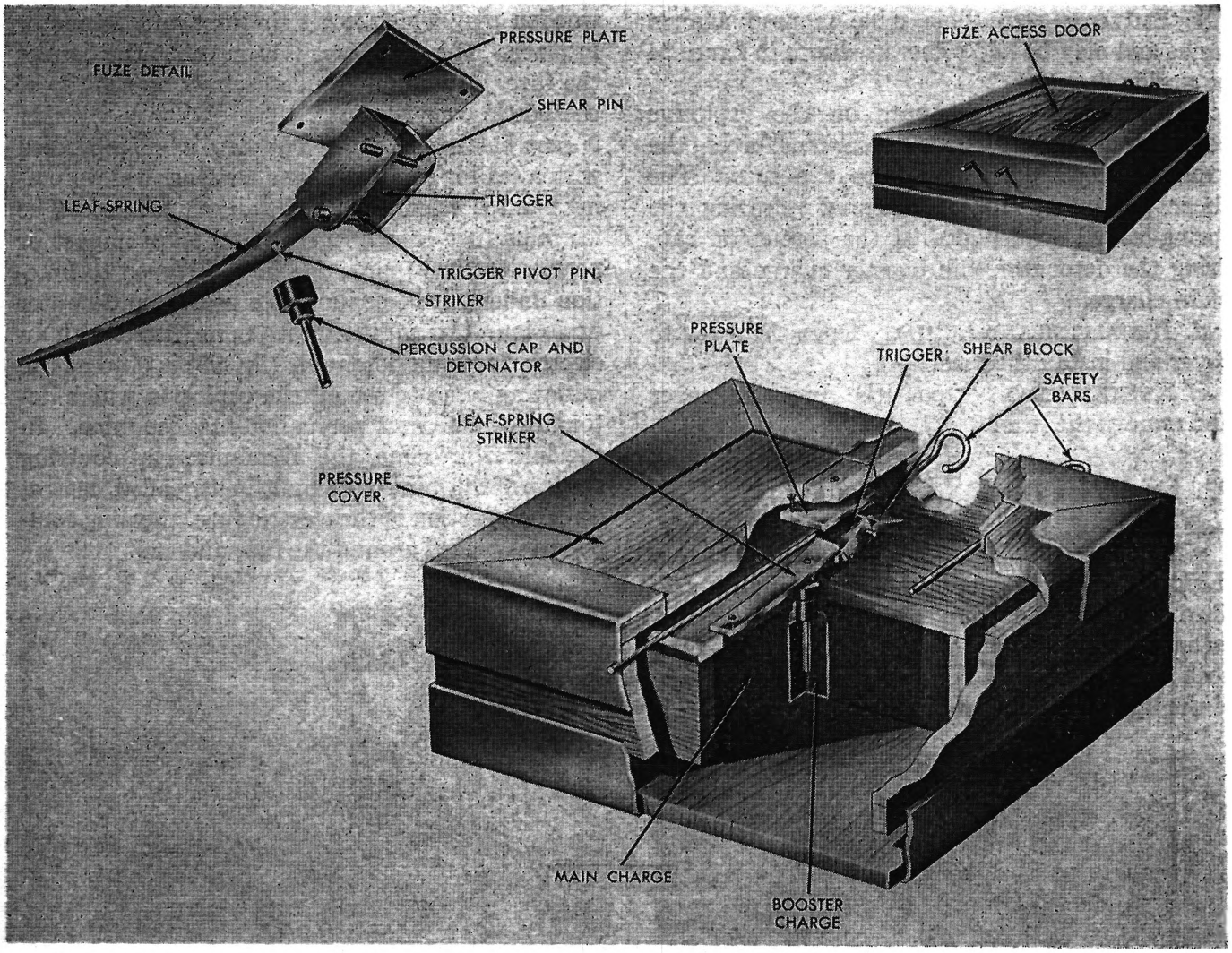


Figure 93. Finnish wooden antitank mine, M/S–39.

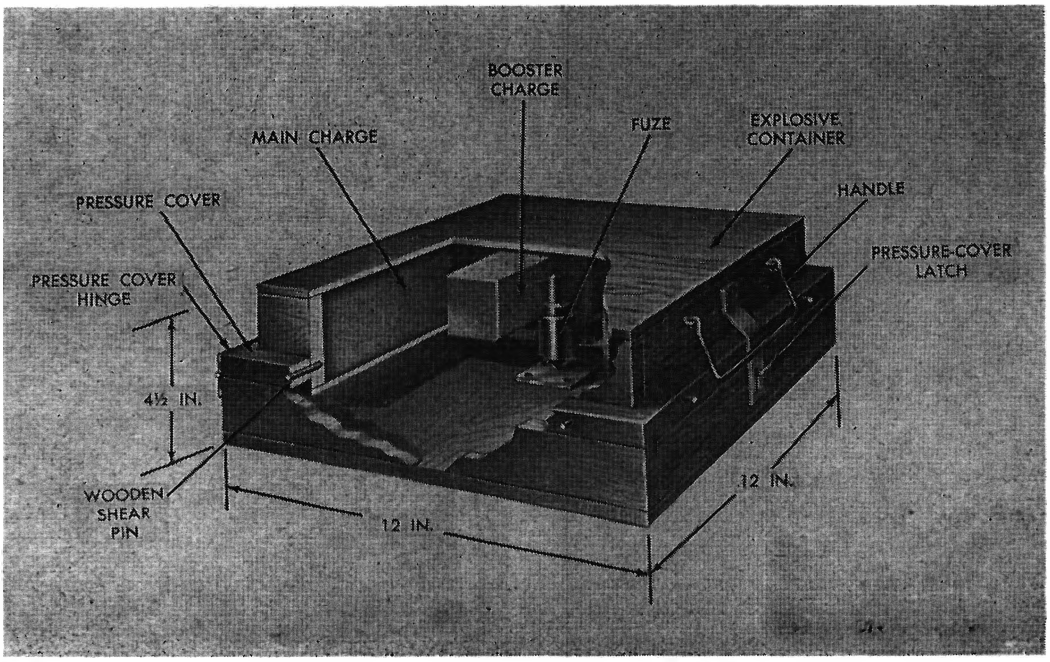


Figure 94. Finnish antitank mine, M/44.

b. EMPLOYMENT. This mine is used against tanks and may be laid either as shown in figure 94 or upside down.

c. FUNCTIONING. Pressure on the explosive container shears the wooden shear pins forcing the explosive container down onto the fuze. The shear pin in the fuze is sheared releasing the spring-loaded striker against the percussion cap, firing the detonator, the booster charge and the main charge.

d. INSTALLING AND ARMING. Open the pressure cover and install the fuze.

e. NEUTRALIZING. Open the pressure cover and remove the fuze.

92. Finnish Ice Mine

a. DESCRIPTION. The ice mine (fig. 95) has a thick-glass body, resembling a quart milk bottle filled with about 4 pounds of explosive. It is 4 inches in diameter and 10½ inches high. In the neck of the bottle is a booster charge. The inside of the lip of the bottle mouth is recessed to take a wooden plug which holds the fuze and detonator in place. The detonator is crimped to the base of the fuze. An aluminum cap screws on the top of the bottle over the fuze. The end of the striker is just below the cap. The cap is waterproofed with a sealing compound and a rubber waterproofing band is fitted around the aluminum cap. The ice mine fuze shown in figure 95 is an impact or percussion fuze (par. 83) and is designed to function under the percussion of a nearby underwater explosion. An additional ice mine, fitted with an electric fuze and detonator (fig. 96) is used as the initiating mine to set off the explosion which detonates the nearest percussion-fuze ice mine. In the initiating mine, the aluminum cap covering the top of the mine has a built-in, threaded, central well for insertion of the electric fuze. Sealing compound is placed around the fuze and cap.

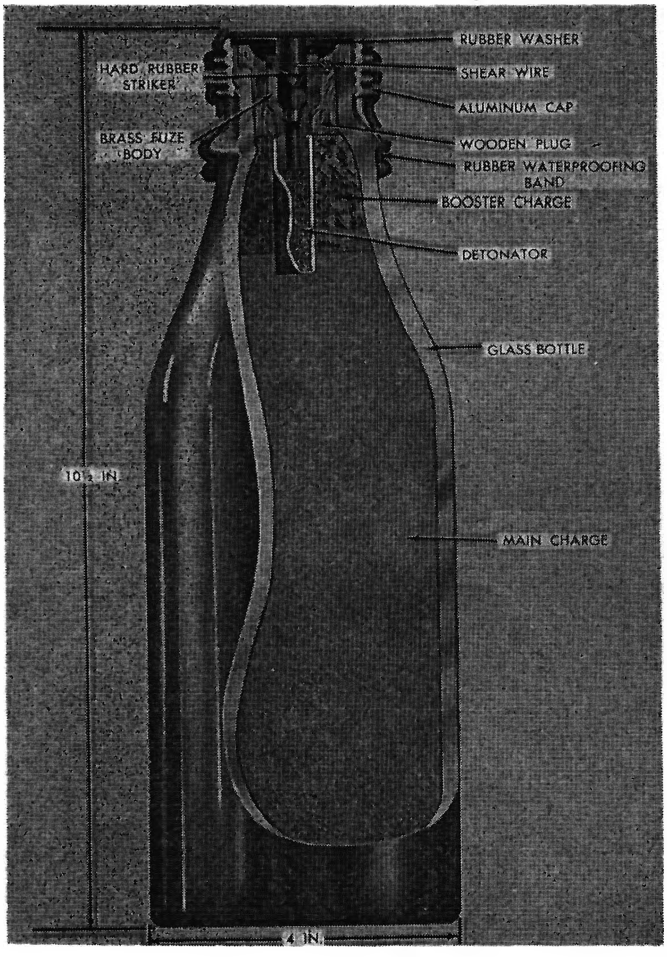


Figure 95. Finnish ice mine fitted with a percussion fuze.

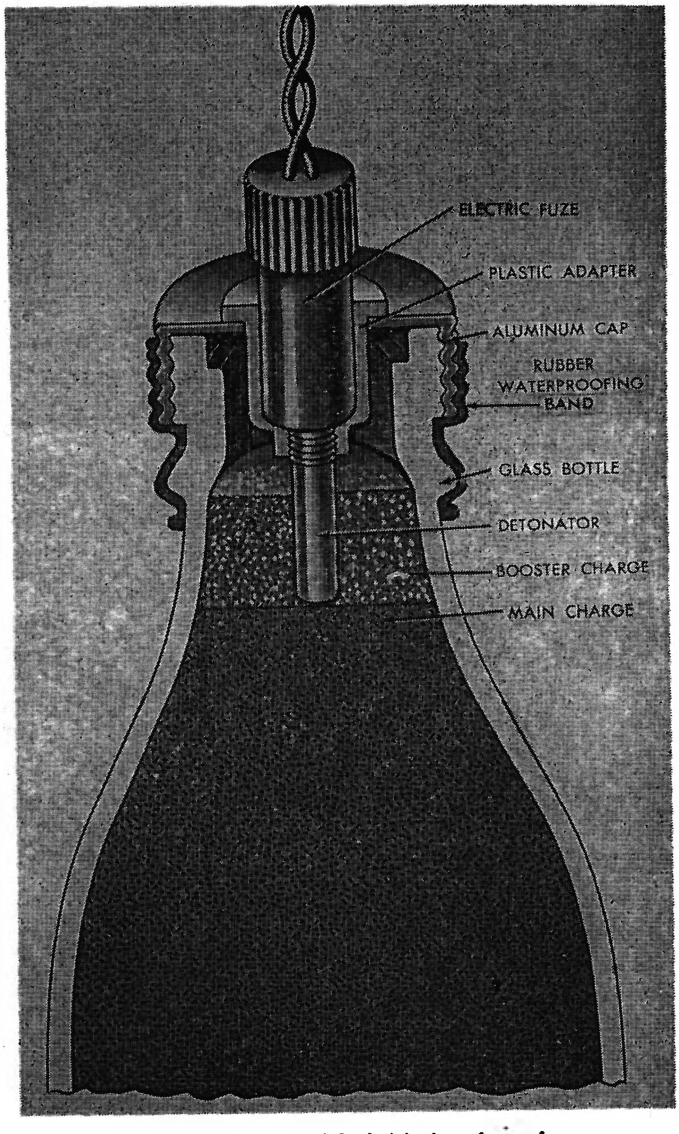


Figure 96. Finnish initiating ice mine.

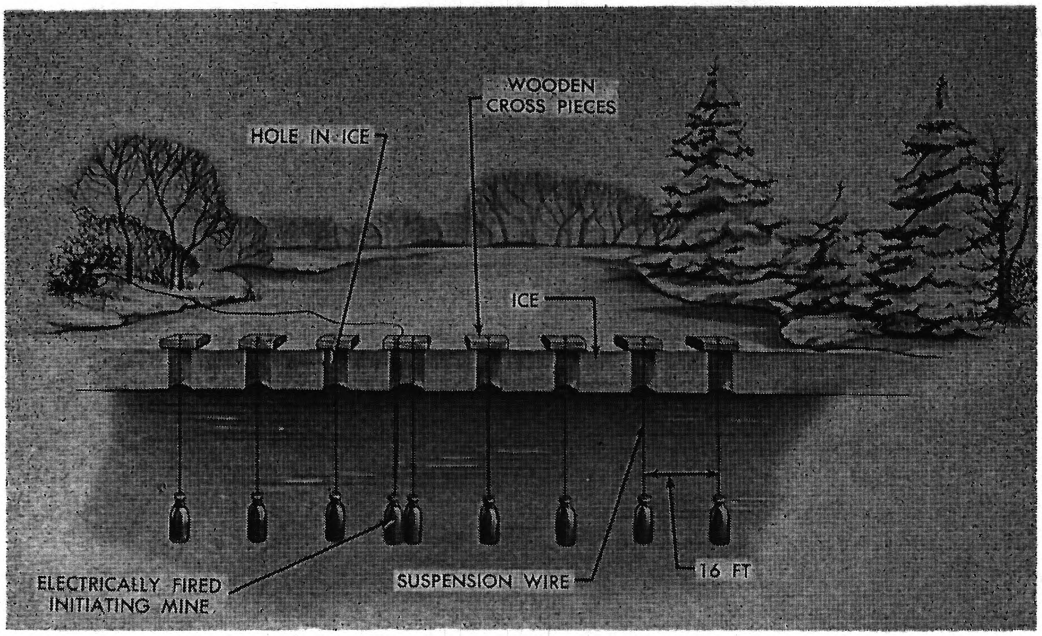


Figure 97. Row of ice mines under ice.

b. EMPLOYMENT.

(1) The ice mine was designed for use in winter warfare to blow gaps in ice on rivers or lakes to create water obstacles in front of opposing troops. The mine is so designed that it can be left in the water under the ice and can be detonated by remote electrical control at the approach of the opposing force. Ice mines are normally laid in frozen rivers or lakes in rows or "fields." They are suspended through holes in the ice, 6 feet below the surface by means of wire attached to wooden cross pieces placed over the holes (fig. 97) and are normally spaced about 16 feet apart. One or two initiating mines are used in a field to initiate the detonation of the field. The ice mine is also used as an antipersonnel mine and fitted with a pressure type fuze (fig. 98) or a pull type fuze as shown in figure 99.

(2) The ice mine may also be encased in a block of concrete (fig. 100) to add shrapnel effect for antipersonnel use. In this case, it may be fitted with fuzes as shown in figures 98 and 99 or it may be rigged with trip wires and placed on the top of an antiglider or antiparatroop pole.

c. FUNCTIONING. When the initiating mine with the electric fuze detonates, the concussion travels through the water to the nearest percussion-fuze mine and fires the mine. The explosion of this mine explodes the next mine and so on.

Note. In ice 1 foot thick, an ice mine row will create a breach from 30 to 60 feet wide. In ice more than 2 feet thick, two ice mines should be employed in each hole.

d. INSTALLING AND ARMING.

(1) Place the fuze and the attached detonator into the fuze well.

(2) Screw on the aluminum cap and cover it with the rubber waterproofing cap.

(3) Attach a cord or rope to the mine and to the wooden cross piece.

(4) Lower the mine into position through a hole in the ice.

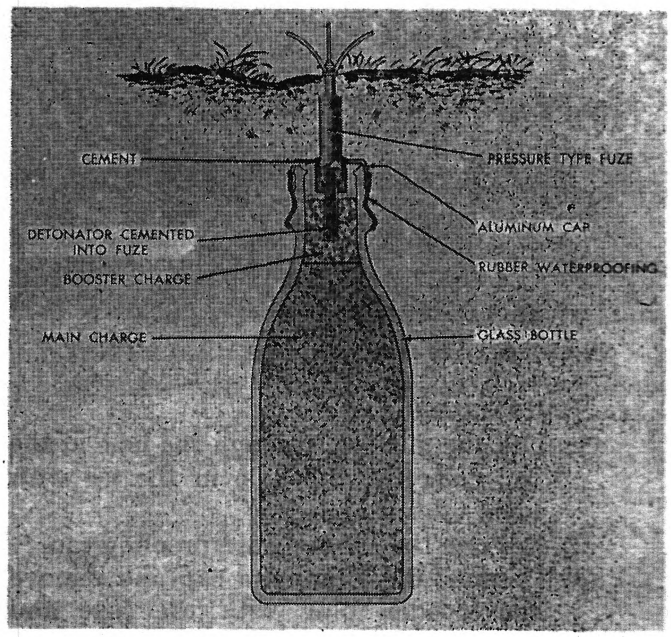


Figure 98. Ice mine fitted with a pressure type fuze.

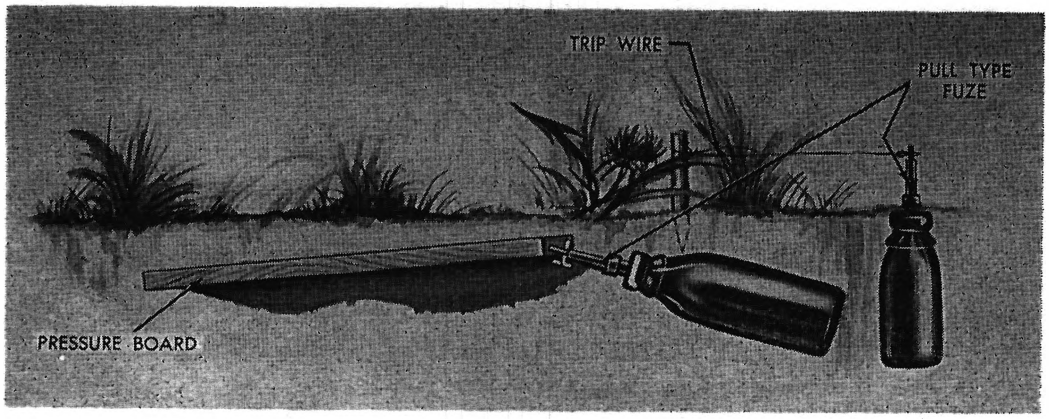


Figure 99. Two methods of laying the ice mine fitted with a pull type fuze.

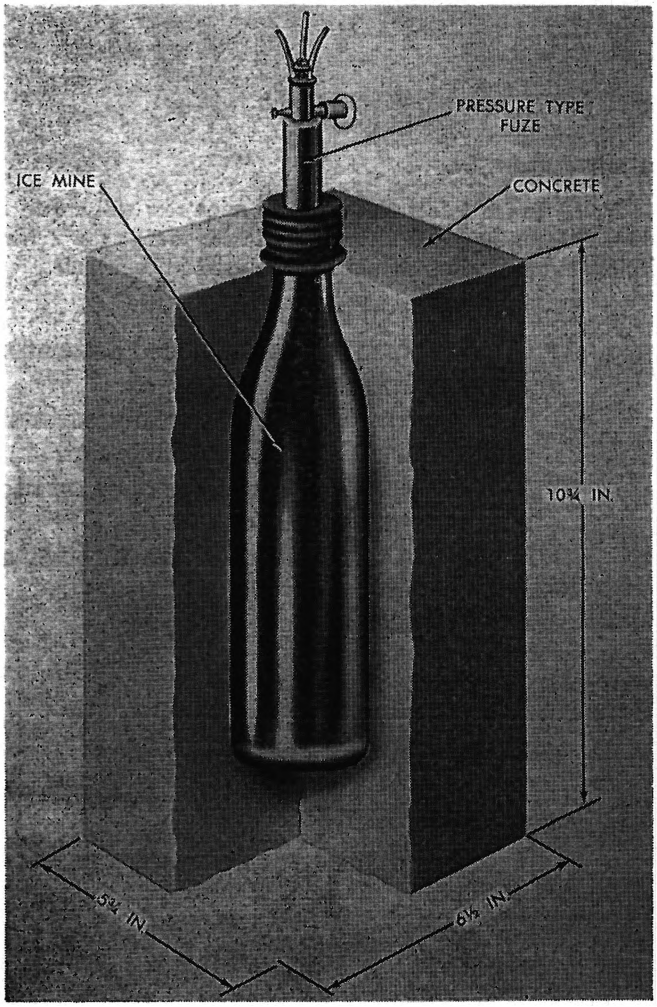


Figure 100. Ice mine encased in a concrete block.

e. NEUTRALIZING.

(1) Pull the mine up through the hole in the ice, enlarging the hole in the ice with hand tools if necessary.

(2) Remove the rubber waterproofing cap.

(3) Unscrew the aluminum cap and remove the wooden plug with the fuze and detonator.

93. Finnish Antipersonnel Mine, M/43

a. DESCRIPTION. The M/43 antipersonnel mine (fig. 101) is identical to the Soviet PMD–6 mine (TM 5–223A) and differs from the German Schü mine 42 only in that it is slightly longer. The mine is 8 inches long, 3¼ inches wide, and 2 inches high. It consists of a wooden box with a hinged lid which fits part way down over the main charge container. The mine is divided in half by a wooden partition. The half nearest the hinge of the lid contains the 0.5-pound main charge; the front half contains the pull fuze which is inserted, detonator end first, into the main charge through a hole in the end of the mine and the partition. The top of the fuze, with the striker-retaining pin, remains outside the end of the mine. A slot in the lid rests on the striker-retaining pin of the fuze. Some mines are provided with a thin metal rod which is passed through holes in the sides of the mine near the front. This rod acts as a safety bar, preventing the lid from actuating the fuze prematurely.

b. EMPLOYMENT. This mine is normally laid as security against opposing foot troops in mine fields, paths and trails, road shoulders, and grassy areas.

c. FUNCTIONING. Pressure on the lid forces the pin out of the pull fuze, releasing the spring-loaded striker against the percussion cap, which explodes the detonator and the main charge.

d. INSTALLING AND ARMING.

(1) Lay the mine.

(2) Lift the lid and insert the main charge.

(3) Attach a percussion-cap-and-detonator assembly to a pull fuze and insert the fuze into the main charge with the loop of the striker-retaining pin down.

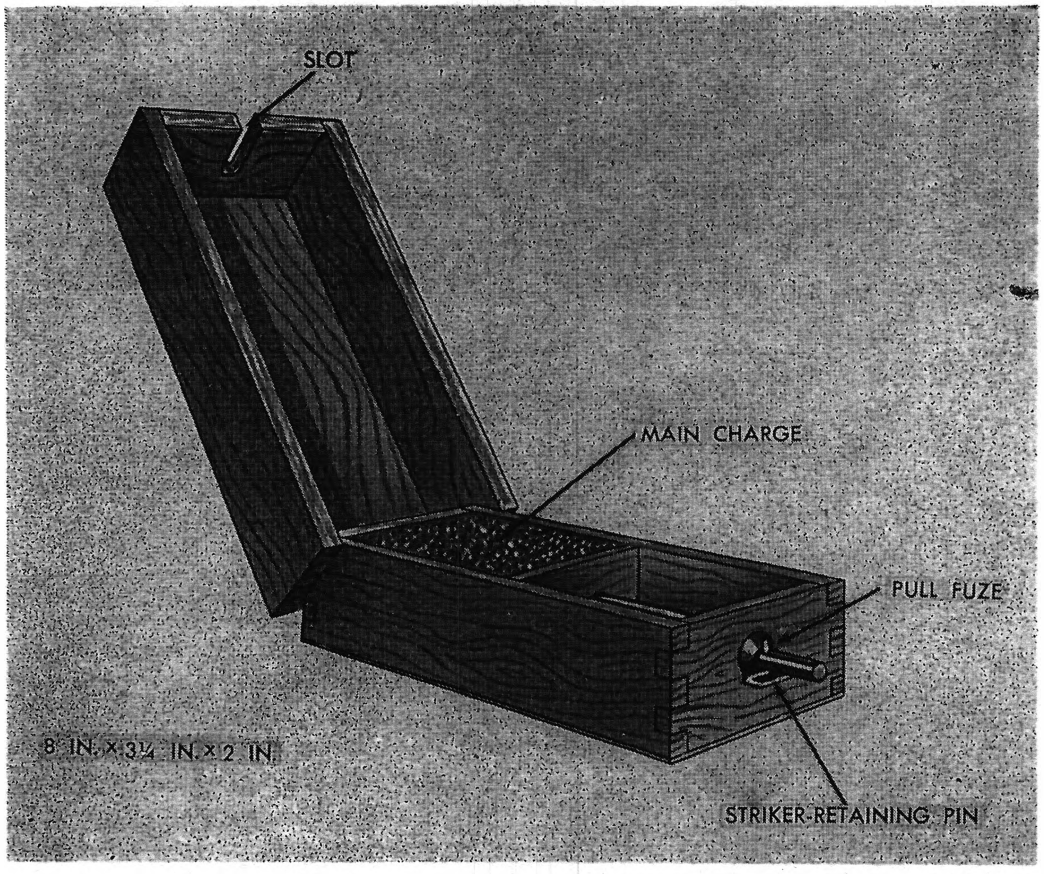


Figure 101. Finnish antipersonnel mine, M/48.

(4) Close the lid and camouflage the mine.
(5) Pull the safety bar from the mine with a cord or wire.

e. NEUTRALIZING.
(1) Search for and cut all slack wires connected to the fuze.
(2) Lift the lid carefully and slide the fuze out.
(3) Detach the detonator from the fuze.

94. Finnish Shrapnel Tube Antipersonnel Mine

a. DESCRIPTION. The shrapnel tube antipersonnel mine (fig. 102) is almost identical to the Italian picket mine but is longer, measuring 14½ inches. It has a wooden fuze-holder plug at the top and a similar wooden plug in the bottom, which is removed when the mine is placed on a stake. This mine uses the Finnish pull fuze (par. 86) and has an explosive content of 0.5-pound.

b. EMPLOYMENT. This mine is used in unit security against infantry, and in antitank mine fields to hinder reconnaissance parties.

c. FUNCTIONING.
(1) A pull on the striker-retaining pin, which holds the striker in a cocked position, releases the striker. With this mine, the Finnish pull fuze uses a striker-retaining pin with an eye at one end.
(2) The striker, driven by the striker spring, sets off the percussion cap, the detonator, the booster charge, and the main charge.

d. INSTALLING AND ARMING.
(1) Drive a metal picket into the ground to form a hole for the mine. Remove the picket.
(2) Place the mine upright in the hole with at least 7½ inches extending above the ground or place a wooden picket in the hole and place the mine, with the wooden base plug removed, on the wooden picket.
(3) Crimp a detonator to the fuze.
(4) Insert the fuze, detonator end first, into the wooden fuze-holder plug. Turn the fuze gently so that it will seat firmly.
(5) Anchor one end of the trip wire and attach the other end to the striker-retaining pin.

e. NEUTRALIZING.
(1) Cut all slack trip wires.

(2) Remove the fuze from the wooden fuze-holder plug.

(3) Tie the striker-retaining pin firmly in place.

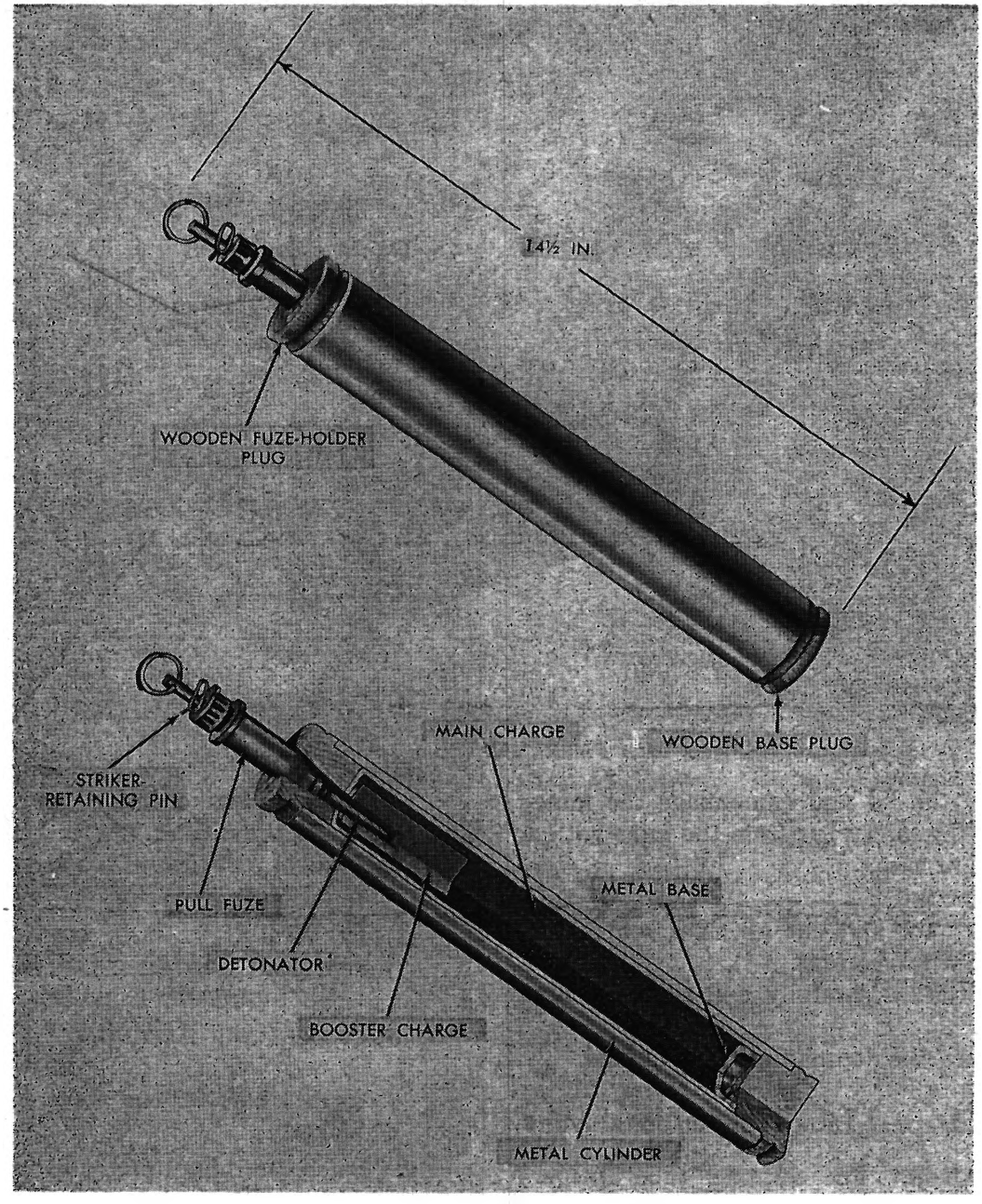


Figure 102. Finnish shrapnel tube antipersonnel mine.

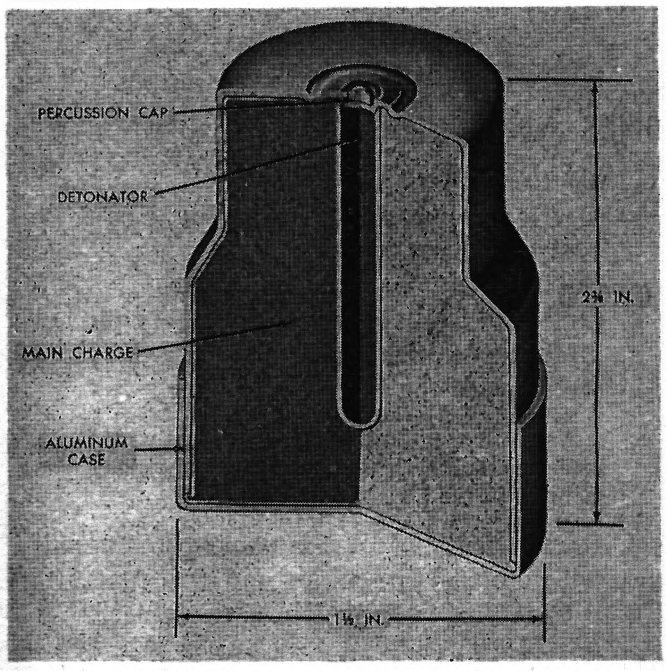
Section VII. GREEK MINE WARFARE EQUIPMENT

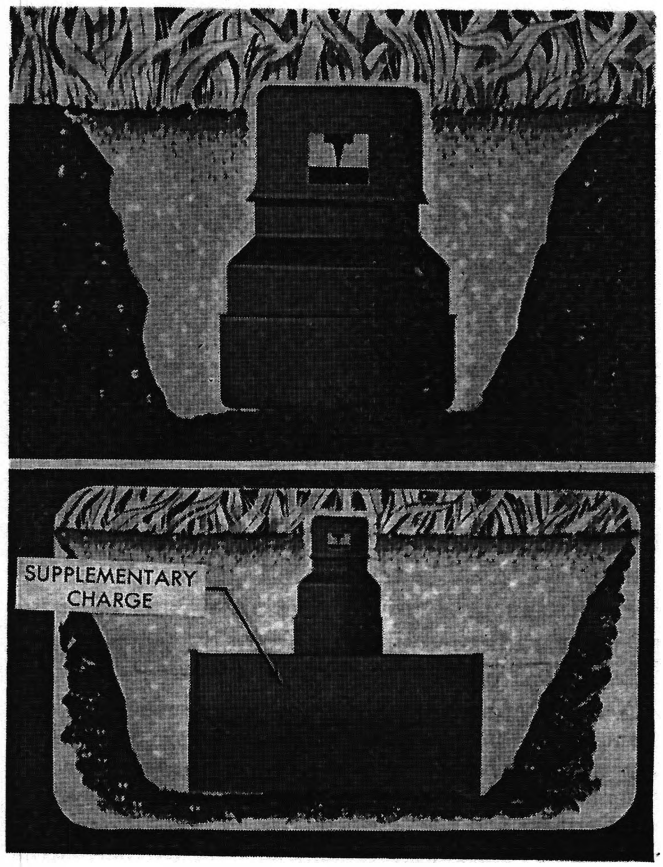
95. General

During the post-World War II civil war in Greece, the Greek guerillas used a variety of mines and fuzes as well as many types of improvised mines. The mines used included the British clam mine (antitank mine with magnets attached and fuzed with a chemical delay fuze), German Tellermines 35, 42, and 43 and Schu mines 42, French light and heavy antitank mines, Hungarian CVP–1 (variable pressure) mine and ramp mine. They also had a small aluminum antipersonnel mine (par. 96) of their own. The Greek Nationalist Army was provided mainly with US M6 antitank mines and M2A3 shrapnel antipersonnel mines. Electronic mine detectors used included the US SCR–625, the British No. 4, and the Polish No. 3. Except for the aluminum antipersonnel mine, the Greeks have no standard mine warfare equipment of their own.

96. Greek Aluminum Antipersonnel Mine

a. DESCRIPTION. This aluminum antipersonnel mine (fig. 103) is about 2⅜ inches high and 1½ inches in diameter. It consists of an aluminum case with a deep pressure lid containing a needle-like striker firmly fixed to the under side of the lid. A slot in the side of the pressure lid is for viewing the striker. A percussion cap and a detonator are fixed in the center of the mine case. A striker-protector cover fits inside the lid and acts as a safety device to keep the striker from accidently hitting and setting off the percussion cap. The main charge consists of approximately 2 ounces of explosive.





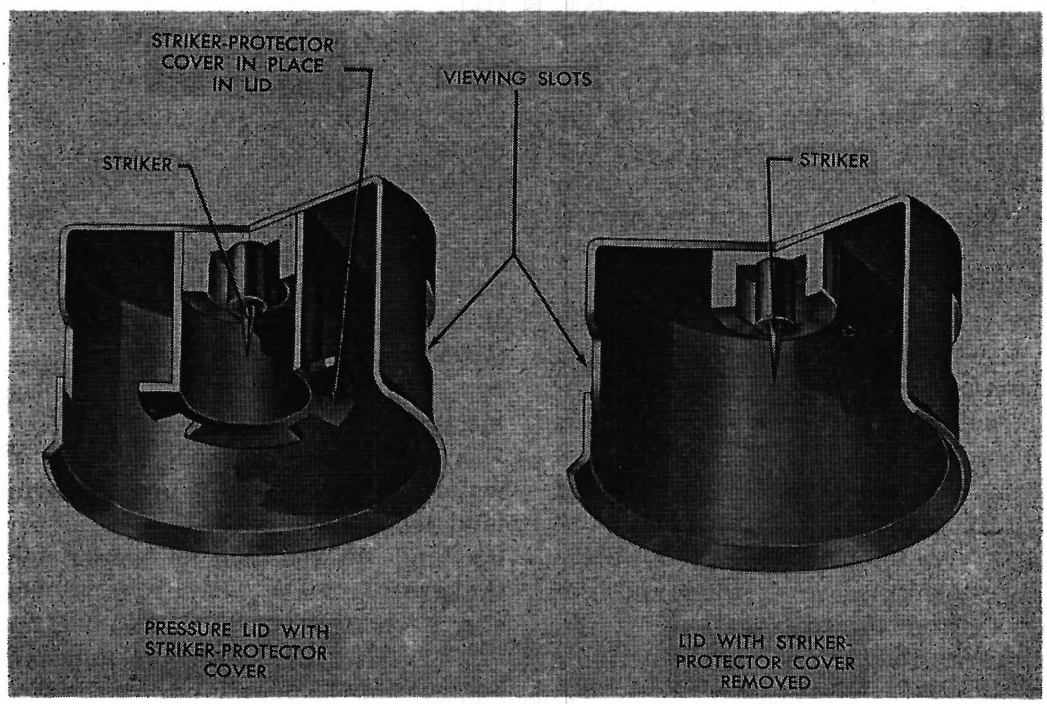


Figure 103. Greek aluminum antipersonnel mine.

b. EMPLOYMENT. This mine is normally used against personnel but may also be used against vehicles when laid in or on a supplementary charge.

c. FUNCTIONING. Pressure on the pressure lid forces the lid down so the needle-like striker hits the percussion cap, setting it off. The percussion cap, in turn, fires the detonator which sets off the main charge.

d. INSTALLING AND ARMING.

(1) Place the mine in the ground so the pressure lid is just slightly above the ground.

(2) Remove the striker-protector cover from the pressure lid.

(3) Looking through the viewing slots, place the pressure lid on the mine so the striker is just over the percussion cap.

e. NEUTRALIZING.

(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.

Section VIII. DUTCH MINES AND FUZES

97. Dutch Dual-Purpose Mushroom-Top Mine

a. DESCRIPTION. The dual-purpose mushroom-top mine (fig. 104) consists of a pressed-steel case containing 5.25 pounds of TNT. Total weight of the mine is 9.5 pounds. When set for antitank use, it will disable trucks and tanks. When set for antipersonnel use, it has a 10-yard effective casualty radius. When the mine is shipped the fuze well is plugged with a wax cork.

Note. The mine described here is the model that was manufactured in the United States. It was marked on the top with the letters "A2." A slightly different model, manufactured in both Holland and Java and used by both the Germans and the Japanese, has an operating pressure of only 50 pounds, no safety pin, and a booster charge as an integral part of the fuze. It functions and is treated in the same way as the American model but has letters "P.W.2" on the top of the mine, signifying manufacture at the pyrotechnic works in Java.

b. EMPLOYMENT. This mine can be set for either antitank or antipersonnel use. It was laid in narrow trails, on beaches, and at entrances to bivouac areas. Normally, the mine is laid on top of the ground.

c. FUNCTIONING.

(1) A pressure of 180 to 240 pounds on the pressure cover shears the copper shear pin, releasing the striker.

(2) The striker, driven by the spring, ignites the percussion cap which fires the detonator, booster charge, and the main charge.

d. INSTALLING AND ARMING.

(1) Remove the brass cover 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 safety pin.

(5) Replace the brass cover plug.

e. NEUTRALIZING.

(1) Unscrew the brass cover plug.

(2) Insert a nail or wire in the safety-pin hole.

(3) Unscrew and remove the fuze.

(4) Replace the brass cover plug.

Note. Steps *d*(4) and *e*(2) above apply only to the model marked with the letters "A2," the model manufactured in the United States.

f. PACKING. This mine is packed in a wooden case which holds five mines and five fuzes (fig. 105). Each fuze is sealed in a container.

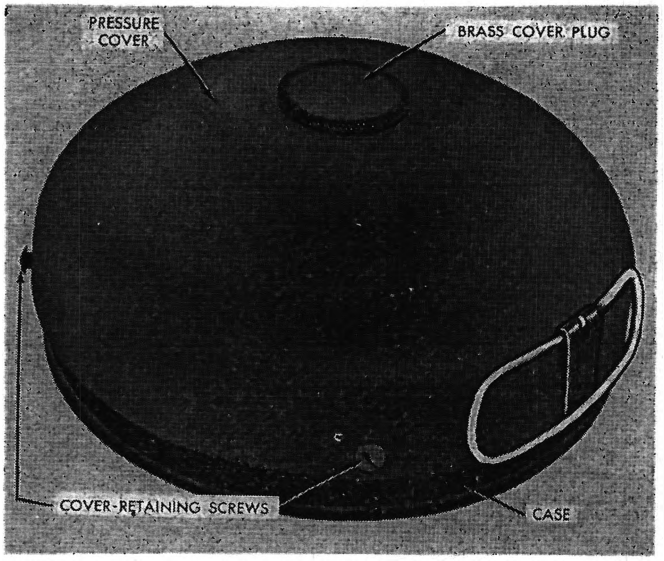
98. Dutch Antitank Mine, Type 2 (T–39 or T–40)

a. DESCRIPTION. The type 2 antitank mine (fig. 106) also called the T–39 or T–40, consists of a flat, circular pressed-steel body containing about 9 pounds of explosive. The mine body is marked with a white ring on the top. Total weight of the mine is 15 pounds. There are two filler plugs in the top of the mine case. The fuze used in this mine is the No. 44 NM (fig. 107). It has a spring-loaded striker retained by two steel striker-release balls. The fuze is covered by a copper waterproofing sheath which is permanently installed in manufacture.

b. EMPLOYMENT. This mine was designed and waterproofed especially for employment in Holland where it may be subjected to water from flooding. It was used for border defense against tanks.

c. FUNCTIONING.

(1) With the safety pin removed, a pressure of 165 pounds or more on the fuze crushes the copper waterproofing sheath, depres-



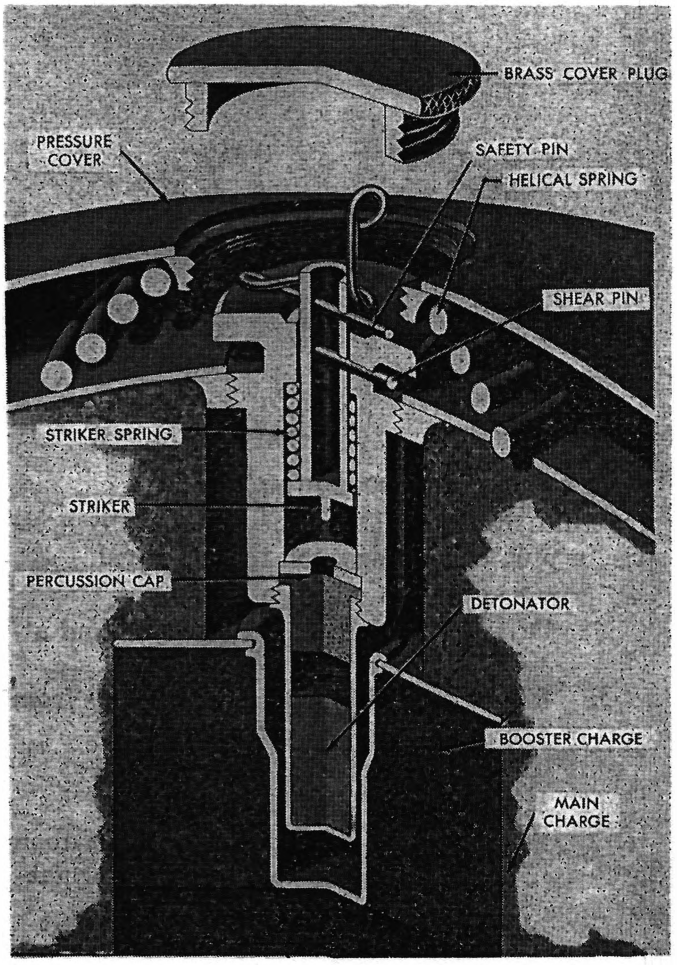


Figure 104. Dutch dual-purpose mushroom-top mine.

sing the plunger and plunger housing, and compressing the striker spring.

(2) When the recess in the plunger housing is opposite the striker-release balls, the balls escape into the recess, releasing the spring-loaded striker.

Figure 105. Dutch dual-purpose mushroom-top mines packed in wooden case.

(3) The striker, driven by the spring, fires the precussion cap, the detonator, and the 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. NEUTRALIZING.

(1) Insert the safety pin or a nail into safety-pin hole.

(2) Unscrew the fuze.

(3) Unscrew the detonator from the fuze.

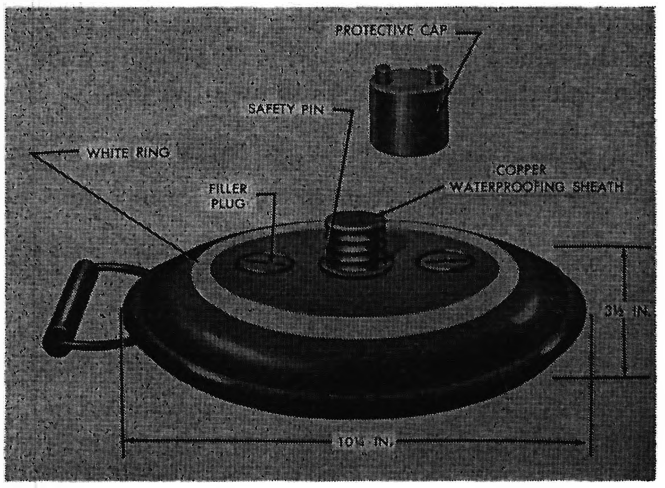
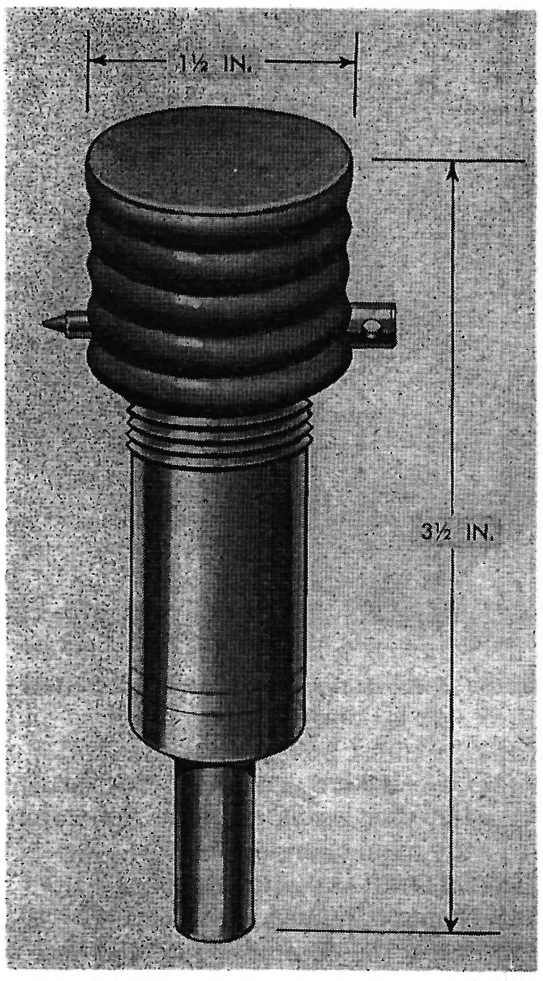


Figure 106. Dutch antitank mine, type 2, (T–39 or T–40)



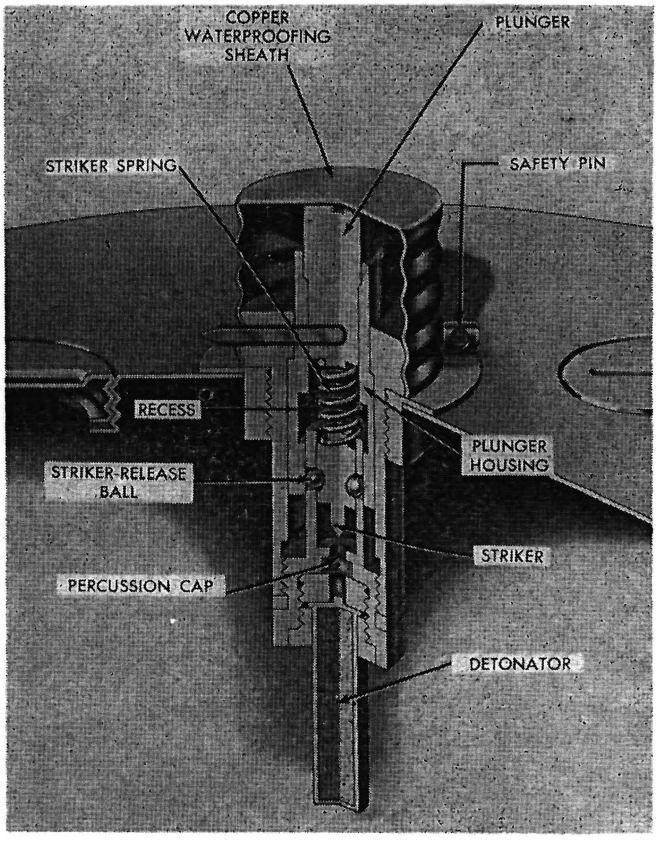


Figure 107. Dutch No. 44 NM fuze.

99. Dutch Picket-Ball Mine

a. DESCRIPTION. The picket-ball mine (fig. 108) consists of a round cast-iron case containing 10 pounds of pressed TNT. Total weight of the mine is 18 pounds. The cast-iron body is 8 inches in diameter and is 10 inches high including the threaded fuze well. The steel picket is 11 inches long. A threaded fuze well is provided at the top of the mine for the fuze and is closed with a shipping plug; a steel picket fits into the base of the mine.

b. EMPLOYMENT. This mine was designed for employment as an antipersonnel shrapnel mine in high grass and thick undergrowth.

c. FUNCTIONING. This mine functions by pressure, or pull, depending upon the fuze used.

d. INSTALLING AND ARMING.

(1) Drive the picket into the ground and attach the mine to it.
(2) Remove the shipping and felt plugs from the fuze well.
(3) Insert the fuze.
(4) Arm the fuze.

e. NEUTRALIZING. Neutralization depends upon the type of fuze used. See paragraph 9*c* for general steps to be followed.

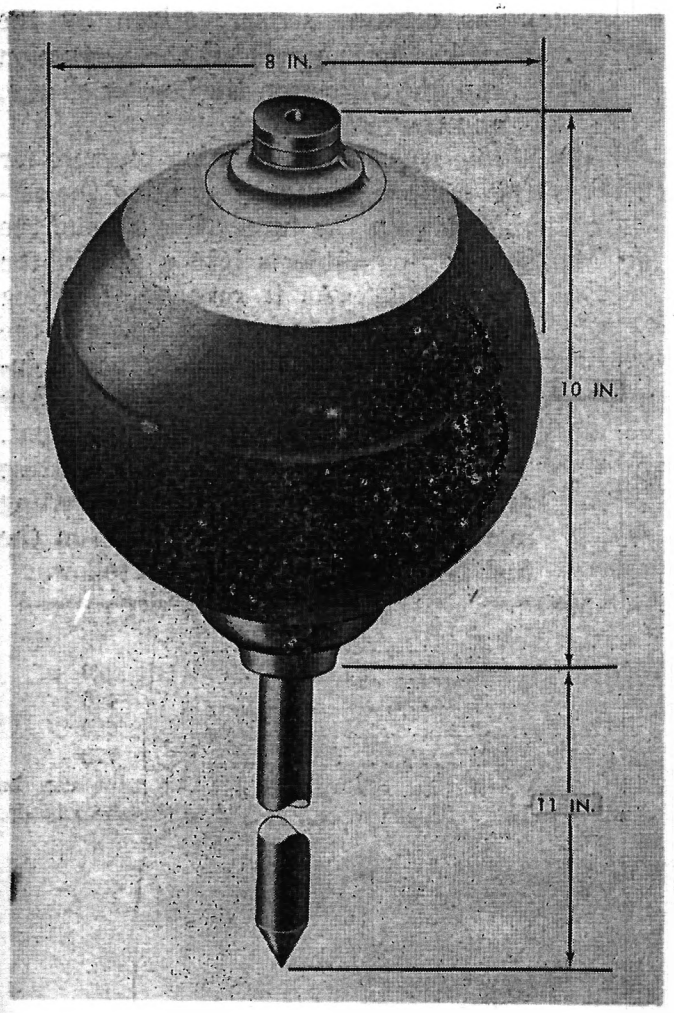
Section IX. HUNGARIAN MINES

100. General

Hungary produced only two types of mines in World War II, the CVP–1 dual-purpose mine (par. 101) and the 3-pound or ramp mine (par. 102). Hungary now has a nonmetallic shaped-charge antitank mine, an electrically detonated type 36 picket or stake antipersonnel mine superficially resembling the Finnish shrapnel tube antipersonnel mine (par. 94*a*) and the Italian picket mine.

101. Hungarian Dual-Purpose Mine, CVP–1

a. DESCRIPTION. The CVP–1 dual-purpose mine (fig. 109) consists of a circular steel case con-



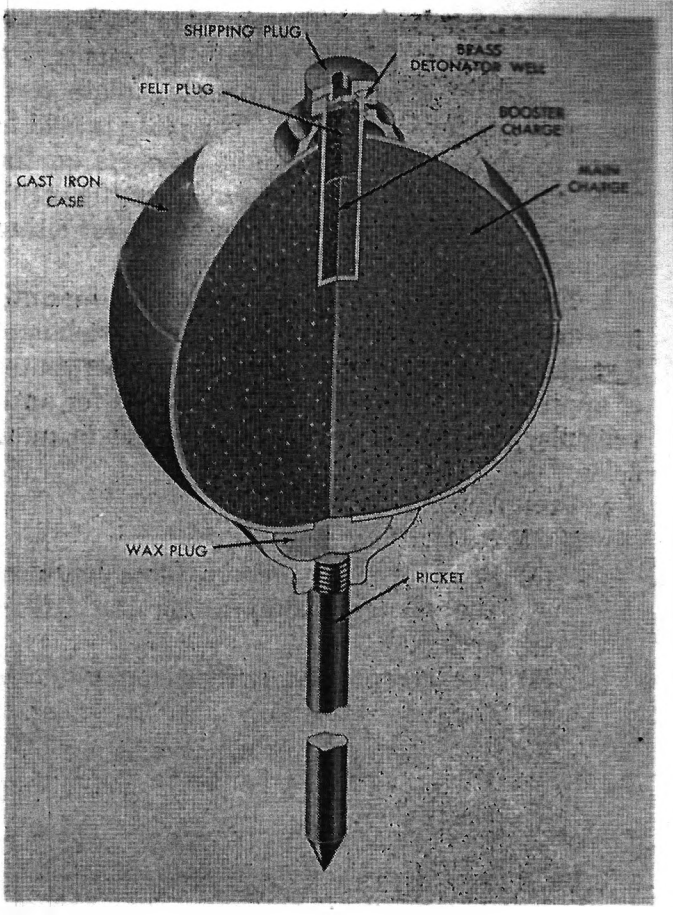


Figure 108. Dutch picket-ball mine.

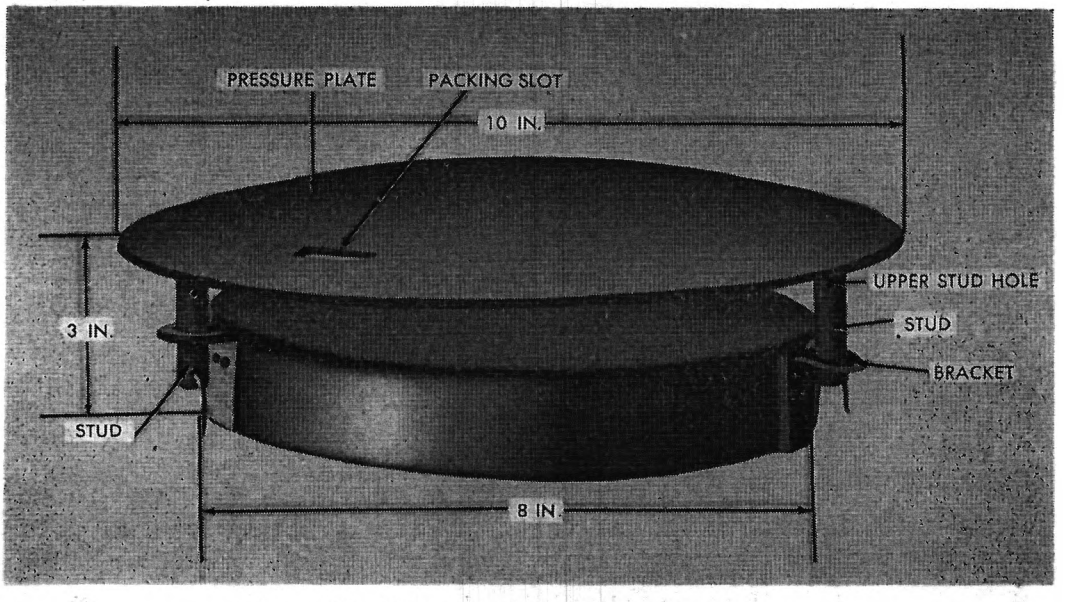


Figure 109. Hungarian dual-purpose mine, CVP–1.

taining 3.5 pounds of TNT wrapped in black paper. The total weight of the mine is 8 pounds. A round, slightly domed steel pressure plate rests on top of the fuze assembly. The plate is held in place by three studs fitted into brackets on the mine case. The variable-pressure fuze (fig. 110), a spring-loaded striker type, can be set for either antipersonnel or antivehicular use.

b. EMPLOYMENT. This mine, when set for antipersonnel use, has an effective casualty radius of 5 yards. It is placed along trails and other routes of approach to unit positions. When set for antivehicular use, it is buried in roads and in mine fields.

c. FUNCTIONING.

(1) *Mine and fuze.*

(*a*) Pressure on the pressure plate depresses the plunger, compressing the striker spring.

(*b*) The compressed striker spring forces the striker assembly downward against the shear blade, which cuts through the triangular brass flange on the side of the striker.

(*c*) The released striker, driven by the striker spring, sets off the percussion cap, the detonator, the booster charge, and the main charge.

(2) *Setting ring.* The operating pressure for this mine is varied by rotating the setting ring on the fuze. The base of the setting ring projects into a slot in the shear blade. As it revolves, the ring moves the blade in or out, varying the amount and the thickness of the triangular brass flange on the side of the striker through which the shear blade must cut. This amount determines the operating pressure of the mine. The red setting mark on the ring and the scale on the fuze body indicate settings as follows:

Scale setting	*Operating pressure (pounds)*
K	70
1	220
2	440
3	660
N	770
H	The mine can be fired by pulling on a trip wire attached to the shear blade.

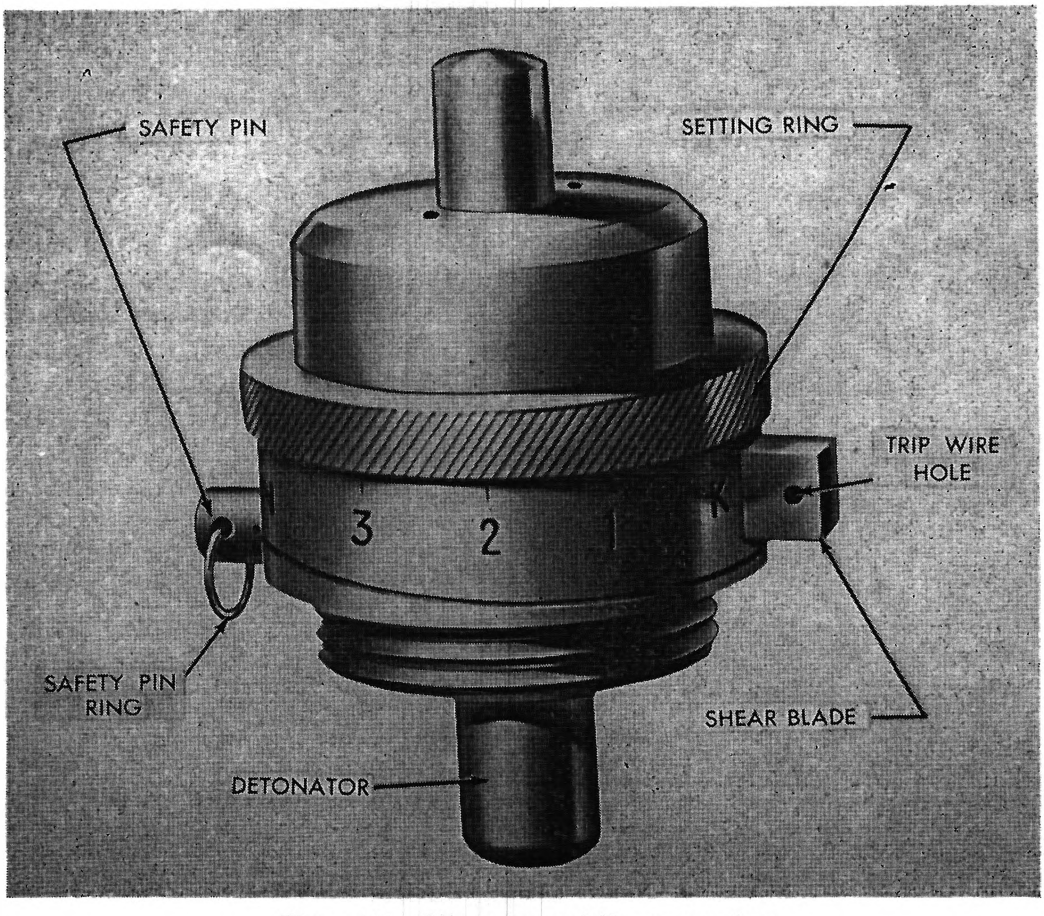


Figure 110. Hungarian variable-pressure fuze.

d. INSTALLING AND ARMING.

(1) Turn the setting ring for the desired pressure.
(2) Screw the detonator in the fuze.
(3) Screw the fuze into the mine; plant the mine so that the pressure plate is flush with the ground.
(4) Attach a trip wire if ring setting *H* is used.
(5) Place the pressure plate on the mine with the studs in holes provided in the brackets. Insert a piece of wire in the hole provided in each of the studs as illustrated in figure 109. This prevents the studs from moving out of the brackets when pressure is applied to the edge of the pressure plate. If the wire were not attached the fuze might fail to operate at high-pressure settings.
(6) Withdraw the safety pin by a string attached to the ring.

e. NEUTRALIZING.

(1) Cut the slack trip wire, if any, without exerting any pull on the shear blade.
(2) Remove the wire from the studs.
(3) Remove the pressure plate by lifting it from the brackets.
(4) Insert a piece of heavy wire or a 16-penny nail into the safety-pin hole.
(5) If the setting ring is at *H*, press in the shear blade.
(6) Unscrew the fuze and remove it.
(7) Unscrew the detonator from the fuze.
(8) Replace the pressure plate, using pins or pieces of wire in the upper stud holes to hold it in place.

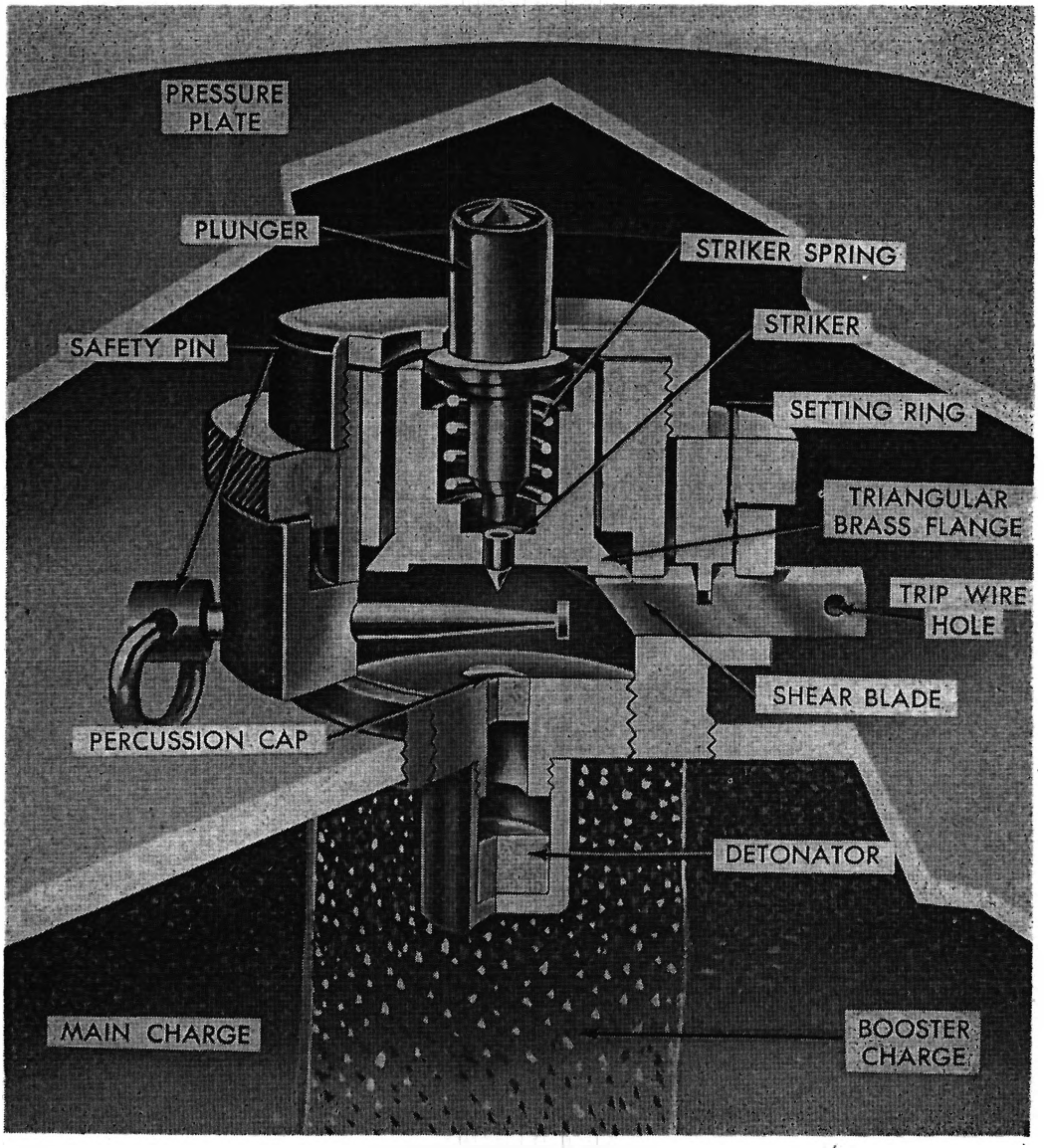


Figure 110—Continued.

f. PACKING. This mine is shipped with a wooden plug in the fuze well. The plug has a threaded aluminum cap. The pressure plate is held in place above this by placing cotter pins in the upper holes in the studs. Six fuzes are carried in a separate, circular, steel carrying case. Six mines and one case of fuzes are strapped together in a long cylinder by slots in the pressure plates. The total weight of the cylinder is about 55 pounds.

102. Hungarian Ramp Mine (3-Pound Mine)

a. DESCRIPTION. This ramp mine (figs. 111, 112), or 3-pound mine, consists of a long, rectangular, sheet-steel case which weighs 3 pounds, including 1.5 pounds of explosive. The case contains a wood block into which is fitted a fuze with a spring-loaded striker. One end of the assembled mine is held 1¼ inches off the ground by a metal arming stand. The friction between the striker shaft and the arming tongue holds the mine up. The fuze assembly consists of a cylindrical case with a threaded fuze-holder cap welded to the top of the case for screwing the fuze to the mine. There are three holes in the end of the striker shaft which projects out of the end of the fuze. The outer hole is for the cocking pin, the center hole for the safety pin, and the inner hole for the arming tongue of the arming stand. The mine will blow the wheel from a truck and has an effective casualty radius of from 3 to 5 yards.

b. EMPLOYMENT. This mine is used for security of gun positions against infantry infiltration. It is normally laid in a shallow trench and covered lightly with soil.

c. FUNCTIONING. This mine can be fired by pressure, pull, or tension release.

(1) When the mine is set for firing by pressure, the striker is held in the cocked position by the tongue of the arming stand, which projects downward through the inner hole in the striker shaft.

(*a*) Pressure on the mine cover presses the whole mine downward, freeing the arming tongue and releasing the striker.

(*b*) The released striker, driven by the striker spring, sets off the percussion cap, the detonator, and the main charge.

(2) When the mine is set for firing by pull, the striker is held in the cocked position by a safety pin, or a loop-ended pin, having a trip wire attached. The arming stand is not used.

(*a*) A pull on the trip wire withdraws the safety pin, or loop-ended pin, releasing the striker.

(*b*) The released striker, driven by the striker spring, sets off the mine.

(3) When the mine is set for firing by tension release, cutting or breaking the taut trip wire tied to the striker shaft releases it and fires the mine.

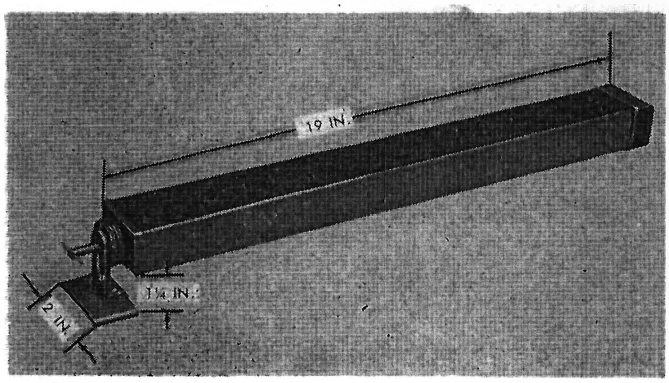


Figure 111. Hungarian ramp mine, (3-pound mine).

d. INSTALLING AND ARMING.

(1) *For pressure.*

(*a*) Insert the striker shaft through the hole in the fuze-holder cap.

(*b*) Insert the striker through the hole in the arming stand.

(*c*) Cock the striker with the cocking pin and insert the tongue of the arming stand in the inner hole of the striker shaft.

(*d*) Insert a safety pin in the center hole of the striker shaft.

(*e*) Screw a percussion-cap-and-detonator assembly into the base of the fuze.

(*f*) Carefully screw the fuze-holder cap, with the assembled fuze and arming stand, onto the end of the mine.

(*g*) Lay the mine.

(*h*) Withdraw the cocking and safety pins.

(2) *For pull.* The arming stand is not used.

(*a*) Cock the fuze and insert a safety pin, or a pin with an eye at one end, into the inner hole in the striker shaft.

(*b*) Screw a percussion-cap-and-detonator assembly into the base of the fuze.

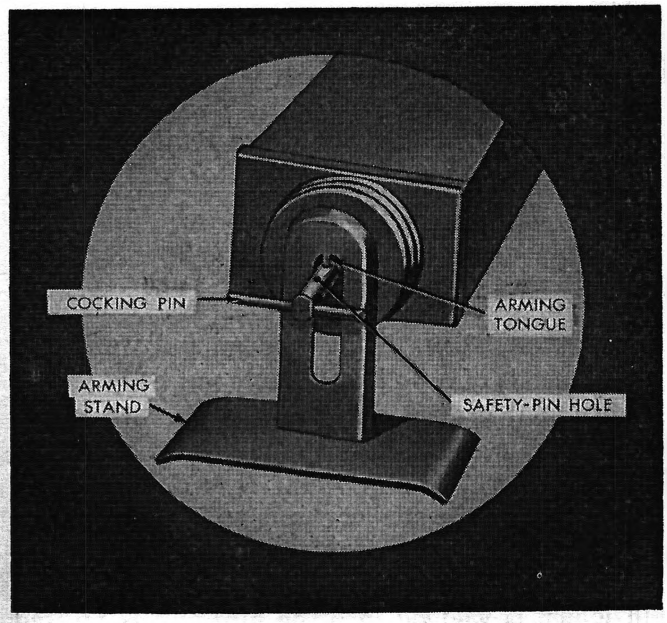
(*c*) Screw the fuze onto the threaded end of the mine.

(*d*) Place the mine in position, being sure that it is firmly anchored.

(*e*) Attach an anchored trip wire to the eye of the safety pin.

(3) *For tension release.*

(*a*) Cock the fuze and insert a safety pin, or a pin with an eye at one end, into the inner hole in the striker shaft.



(*b*) Screw a percussion-cap-and-detonator assembly into the base of the fuze.

(*c*) Screw the fuze onto the threaded end of the mine.

(*d*) Place the mine in position, being sure that it is firmly anchored.

(*e*) Fasten a trip wire to the cocking pin of the striker shaft.

(*f*) Anchor the trip wire to a stake or similar object, drawing it taut.

(*g*) Remove the safety pin.

Note. In installing and arming for pull or tension release, the safety pin, or loop-ended pin, may be inserted in the safety-pin hole. However, this is not good practice since neutralization is difficult. Similarly, the arming tongue may be inserted in the safety-pin hole instead of the inner hole.

e. NEUTRALIZING.

(1) If the mine has been set for pressure, insert a safety pin in the free hole of the striker shaft. If the mine has been set with the free hole inside the mine,

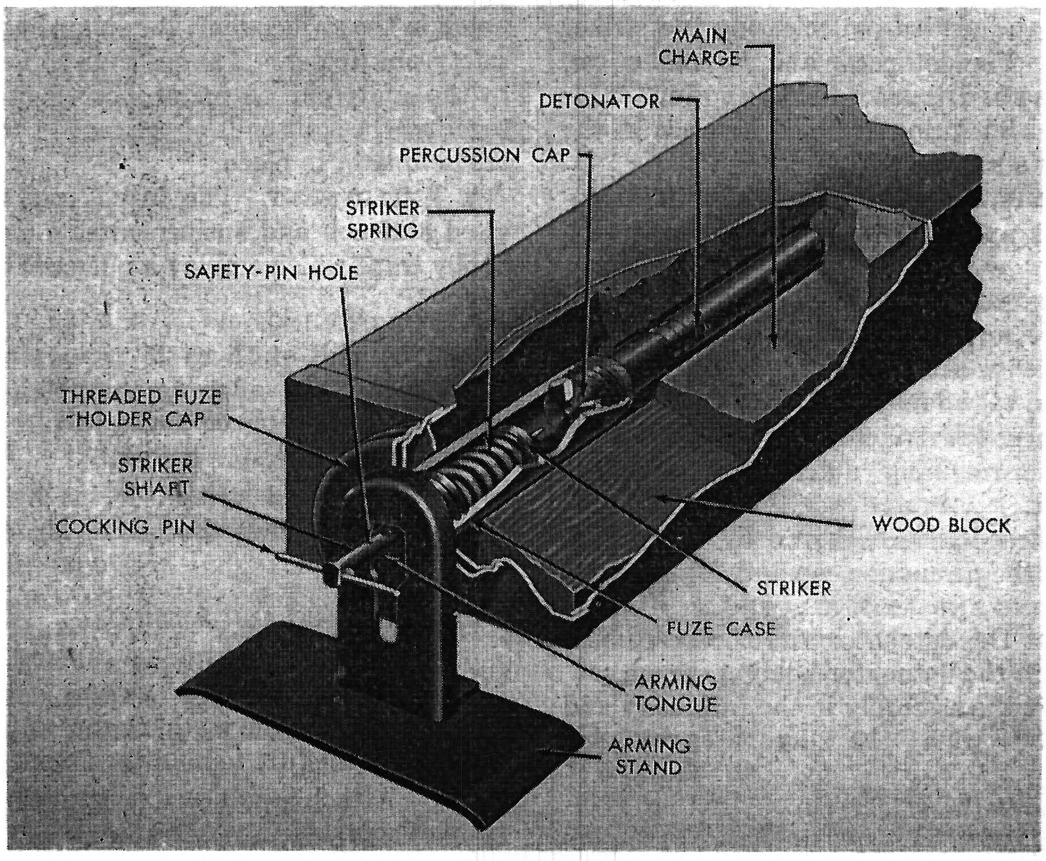


Figure 112. Fuze end of Hungarian ramp mine.

grasp the cocking pin firmly and pull the striker shaft out until the free hole is visible. Insert a safety pin.

(2) If the mine has been set for firing by pull, cut the wire and insert a safety pin in the free hole of the striker shaft.

(3) If the mine has been set for tension-release, do not cut the taut wire until a safety pin has been inserted in the center or inner hole of the striker shaft.

(4) Unscrew the fuze assembly from the mine.

(5) Unscrew the percussion-cap-and-detonator assembly from the fuze.

Section X. NORWEGIAN MINES AND FUZES

103. General

Norway has none of its own mine warfare equipment except two simple wooden fuzes and two wooden antipersonnel mines.

104. Norwegian Wooden Pressure Fuze

a. DESCRIPTION. This wooden pressure fuze (fig. 113) consists of a wooden body waterproofed with lacquer or wax, a hinged spring-loaded metal striker-release plate, a spring-loaded striker, a safety pin, and a detonator-holding spring. The end of the striker shaft has a striker-retaining notch in it which engages the rim of a hole in the bent-over end of the striker-release plate. The striker-release plate retains the striker and a safety pin prevents the plate from releasing the striker prematurely. The detonator and percussion cap are inserted in the detonator-holding spring. This detonator and its spring are held in place in the fuze body by a screw.

b. EMPLOYMENT. This fuze is used with improvised antitank and antipersonnel mines and with booby traps.

c. FUNCTIONING.

(1) A pressure of at least 20 pounds on the striker-release plate overcomes the resistance of the release-plate spring and disengages the striker-release plate from the striker-retaining notch in the striker shaft.

(2) The freed striker, driven by the spring, fires the percussion cap and detonator.

d. INSTALLING AND ARMING.

(1) Insert the detonator and the 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. NEUTRALIZING.

(1) Insert a nail or wire in the safety-pin hole.

(2) Unscrew the detonator-retaining screw and remove the detonator and the percussion cap.

105. Norwegian Wooden Pull Fuze

a. DESCRIPTION. This wooden pull fuze (fig. 114) consists of a hollowed-out wood 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 the striker shaft, which engages the rim of a hole in the metal safety-pin holder. The striker shaft is kept from disengaging by the pull pin which is wedged into the hole and is pressed against the end of the striker shaft causing the notch in the striker shaft to remain engaged in the safety-pin holder. The pull pin is kept in place by the safety pin. A metal clamp is used to clamp together the split ends of the fuze in order to hold the detonator in place.

b. EMPLOYMENT. This fuze is used with improvised antitank and antipersonnel mines and with booby traps which employ a pull cord or trip wire.

c. FUNCTIONING.

(1) A pull of 15 to 25 pounds removes the pull pin, allowing the notch in the end of the striker shaft to disengage from the safety-pin holder.

(2) The freed striker, driven by the striker spring, fires the percussion cap and detonator.

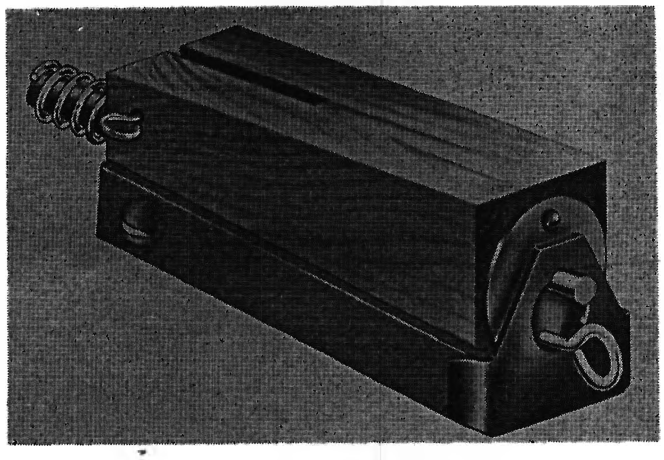
d. INSTALLING AND ARMING.

(1) Insert the percussion cap and the detonator in 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 trip wire to the pull pin.

(4) Withdraw the safety pin.



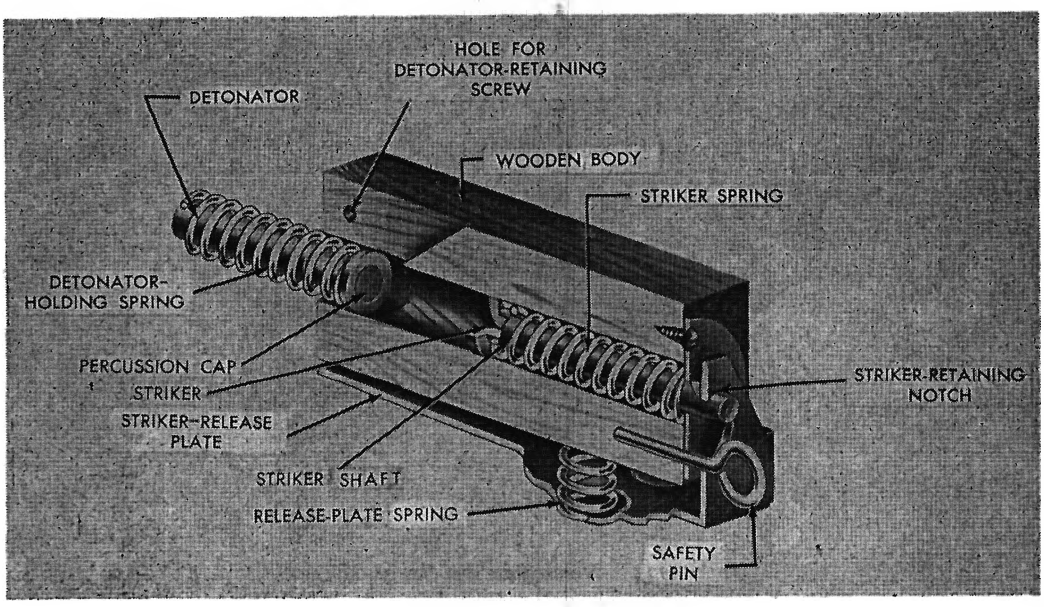


Figure 113. Norwegian wooden pressure fuze.

e. NEUTRALIZING.

(1) Insert a nail or wire in the safety-pin hole.
(2) Cut the pull cord or trip wire.
(3) Loosen the metal clamp and remove the detonator and the percussion cap.

106. Norwegian Wooden Antipersonnel Mine

a. DESCRIPTION. The wooden antipersonnel mine (fig. 115) is a square, wooden-box mine constructed of 7/16-inch thick impregnated wood. It is 6¼ inches square by 2¾ inches high. The charge consists of approximately 3 pounds of cast TNT with a booster charge of pressed TNT. A zinc detonator holder is screwed into a hole in the center of the top of the mine and is internally threaded at the top to take a German D.Z. 35 type pressure fuze. A wooden block is fastened to the top of the mine with a hole drilled in the center to hold the fuze.

b. EMPLOYMENT. This type of mine is used in unit security against infantry and in antitank mine fields to hinder reconnaissance parties.

c. FUNCTIONING. Pressure of at least 65 pounds on the top of the fuze releases the striker which fires the percussion cap, the detonator, the booster charge, and the main charge.

d. INSTALLING AND ARMING.

(1) Screw the fuze with detonator attached into the threaded detonator holder in the wooden block.
(2) Remove the safety pin.

e. NEUTRALIZING.

(1) Insert a nail or stiff wire through the safety-pin hole just below the pressure head of the fuze.
(2) Unscrew the fuze and remove the detonator.

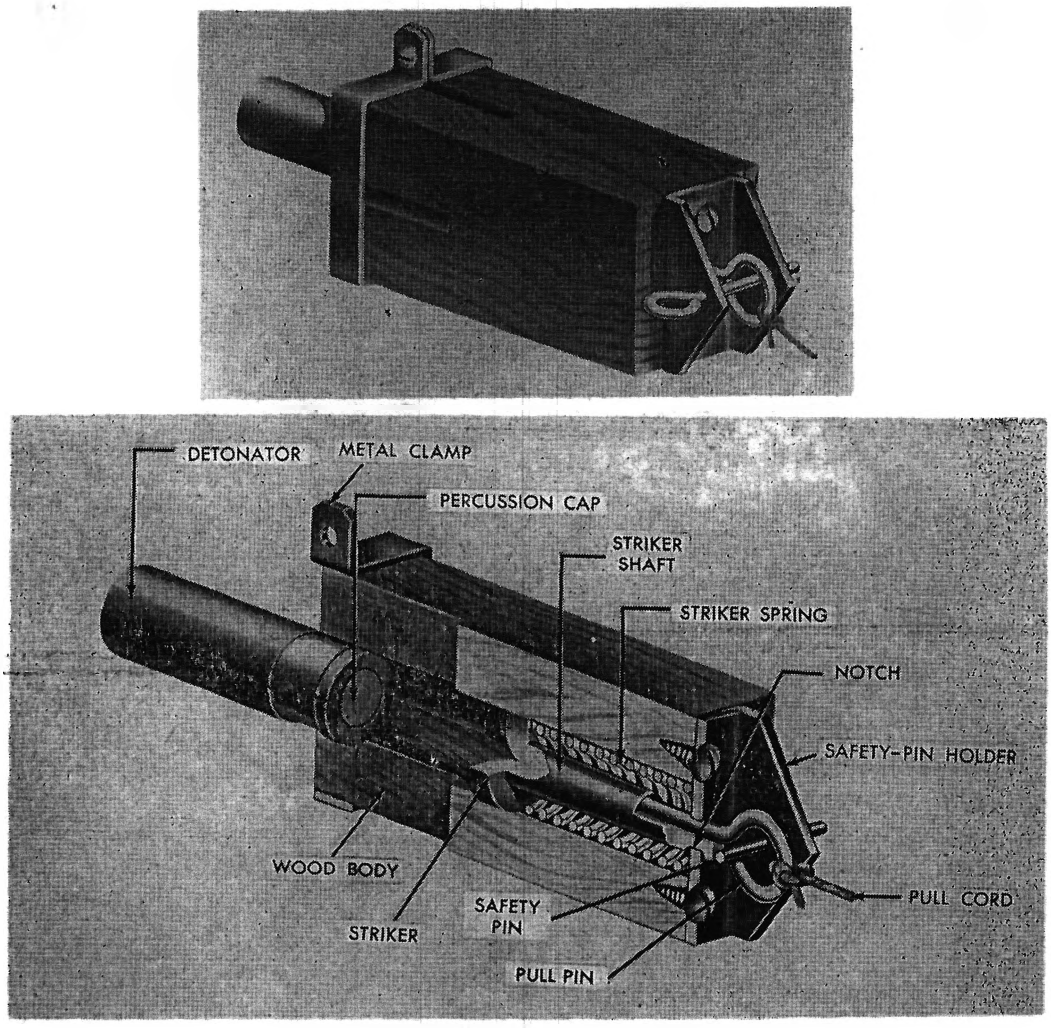


Figure 114. Norwegian wooden pull fuze.

107. Norwegian Wooden Antipersonnel Mine, Model 1943

a. DESCRIPTION. This model 1943 wooden antipersonnel mine (fig. 116) is very similar to the German Schü mine 42 in its functioning. The case is wooden; however, later models have cases of cement, glass fibers, and cellulose. The lid is hinged to the back of the case. The front of the lid is fitted with a metal plate which, in the armed position, rests on two wooden shear dowels, one on either side of the fuze well. The lid is further secured by a safety pin. The metal plate is slotted so it may rest on the striker-retaining pin. The main charge consists of about 3 pounds of cast TNT with a small charge of pressed TNT as a booster charge. The mine is 7 by 6½ by 3¼ inches with the lid in the closed position.

b. EMPLOYMENT. This mine was designed for employment against personnel and for its nuisance value in mine fields. It is also used in the defense of strong points.

c. FUNCTIONING. A pressure of approximately 75 pounds on the lid shears the wooden dowels allowing the metal plate to push out the striker-retaining pin, releasing the spring-loaded striker.

d. INSTALLING AND ARMING.

(1) Place the main charge and the booster charge in the mine.
(2) Screw a percussion cap and detonator into the base of the fuze and insert the fuze 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 striker-retaining pin are under the striker shaft.
(5) Lay the mine.
(6) Remove the safety pin.

e. NEUTRALIZING.

(1) Replace the safety pin, or insert a piece of wire, in the metal plate.

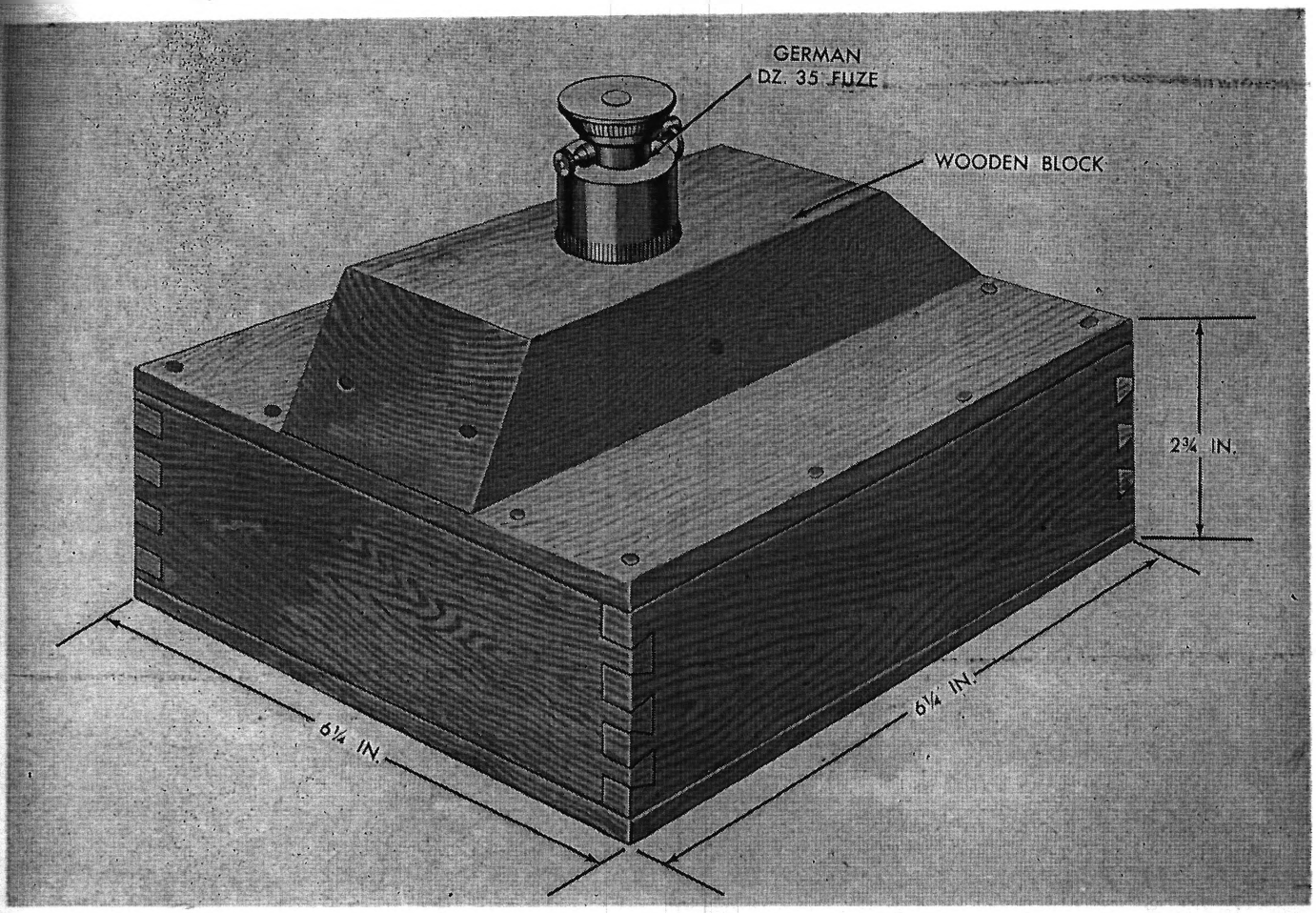


Figure 115. Norwegian wooden antipersonnel mine.

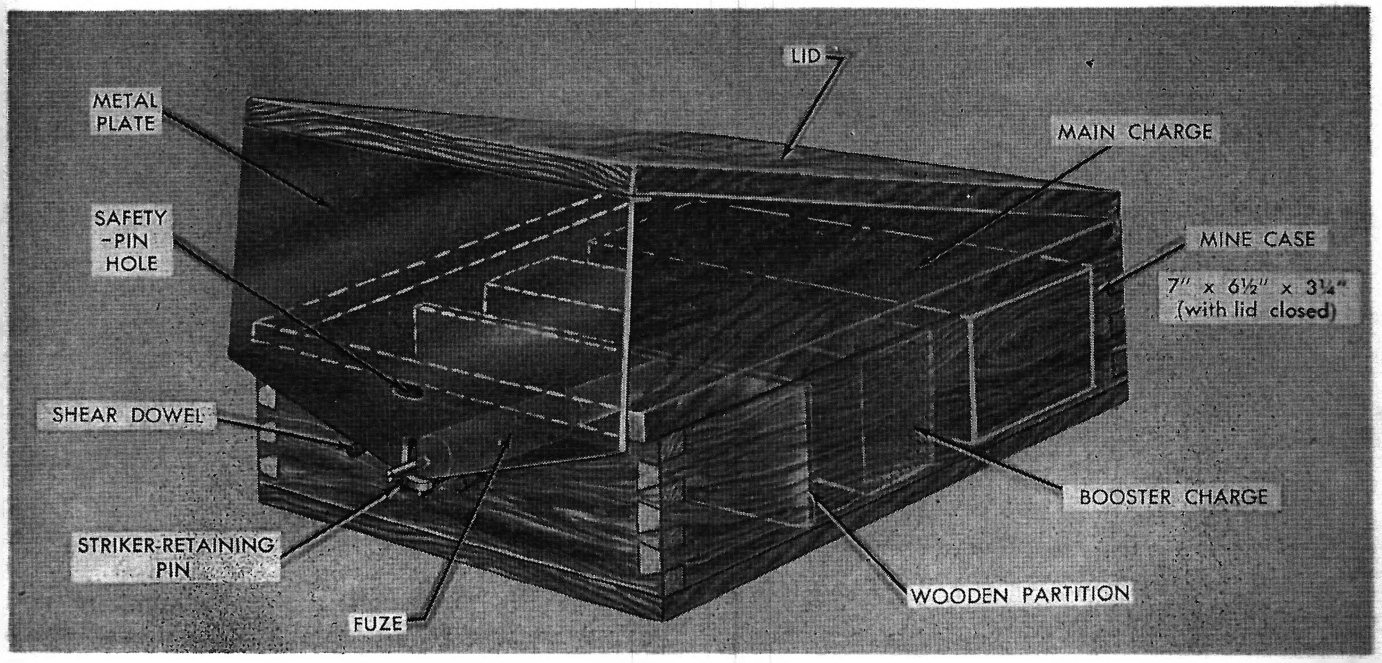


Figure 116. Norwegian wooden antipersonnel mine, model 1943.

(2) Raise the lid, being very careful not to exert any downward pressure.

(3) Remove the fuze with attached detonator and percussion cap.

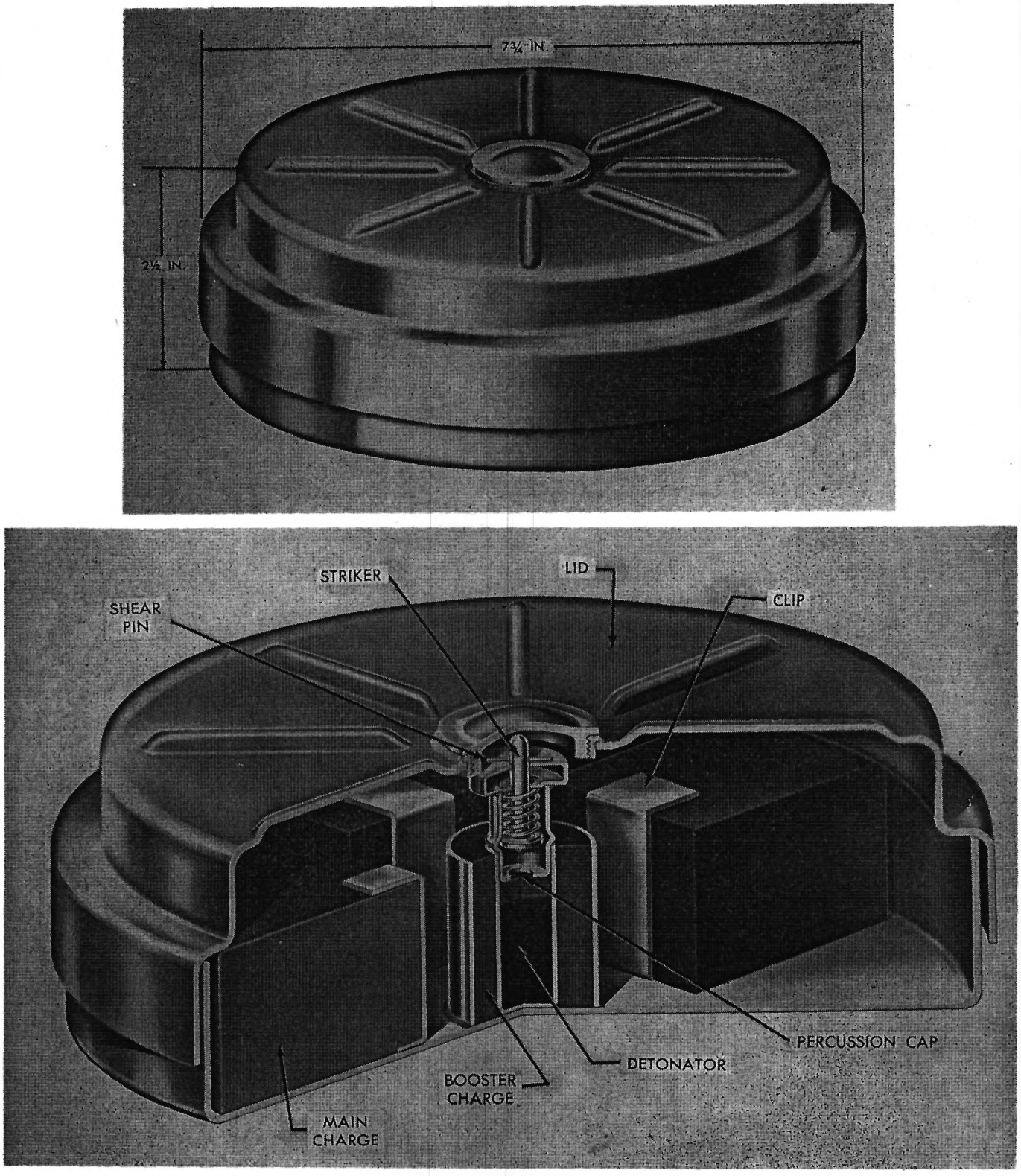


Figure 117. Polish antitank mine.

Section XI. POLISH MINES

108. General

The Poles had only one mine (par. 109) in the early phase of World War II. Most of the Polish mine warfare equipment is of Soviet origin.

109. Polish Antitank Mine

a. DESCRIPTION. This Polish antitank mine (fig. 117) consists of two round, pressed-metal sections which fit together to form the case. The mine is 7¾ inches in diameter and 2½ inches high. The bottom section contains four 200-gram blocks (about 2 pounds) of TNT which are held in place by metal clips. The lid or upper section contains a centrally located fuze well. The fuze contains a spring-loaded striker held in a cocked position by a shear pin. *There is no safety device.*

b. EMPLOYMENT. This mine is used in road blocks and mine fields against light tanks. It will break the tread of a light tank.

c. FUNCTIONING. Pressure of about 88 pounds crushes the lid of the mine and shears the shear pin in the fuze, releasing the striker. The striker, driven by the striker spring, fires the percussion cap, the detonator, the booster charge, and the 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. NEUTRALIZING.

(1) Since there is no safety device on either the fuze or the mine, simply unscrew the plug from the center of the lid.

(2) Carefully remove the fuze and booster charge.

(3) Without applying any pressure on the striker, separate the fuze from the booster charge.

Section XII. SPANISH MINES

110. General

The Spanish had only one antitank mine (par. 111) up until the end of the World War II. The major part of Spanish mine warfare equipment was obtained from other countries.

111. Spanish Antitank Mine, B–2

a. DESCRIPTION. The B–2 antitank mine (fig 118) is very similar to the Italian B–2 mine. It consists of a rectangular sheet-steel case 42 inches long, 5 inches wide, and 5 inches high, containing approximately 6 pounds of explosive, divided into 16 separate charges. The charges are placed at each end of the mine and the fuze is located in the space between the charges. The mine case is covered by a detachable cover which contains two hinged lids. The detachable cover rests on two compression springs. The fuze and the main charge are connected by detonating cord.

b. EMPLOYMENT. This mine is employed, like the Italian B–2 mine, against tanks. It is subject to sympathetic detonation and must be installed with at least a 2-yard interval between mines.

c. FUNCTIONING.

(1) A pressure of 300 pounds, or more, moves

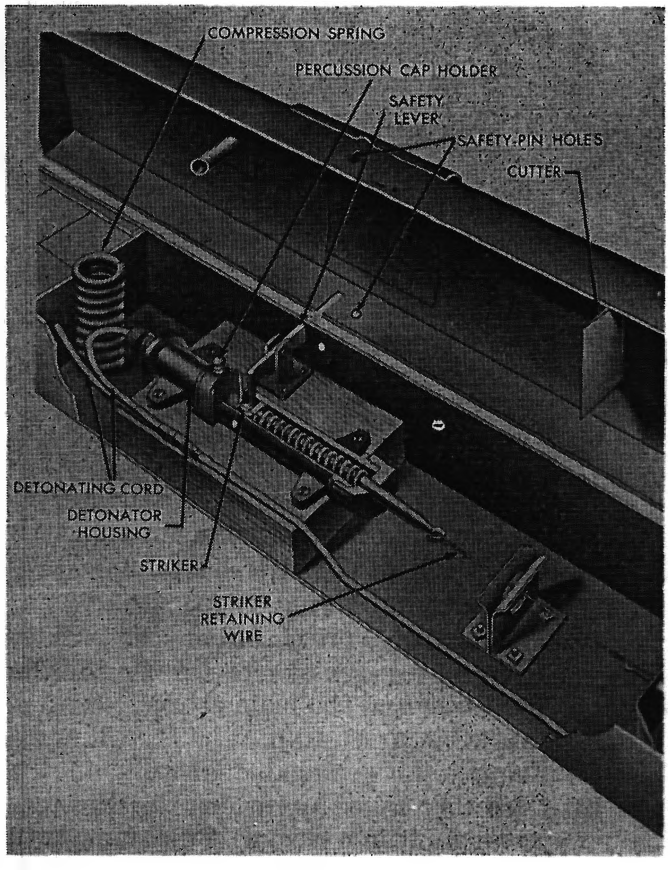


Figure 118. Spanish antitank mine, B–2.

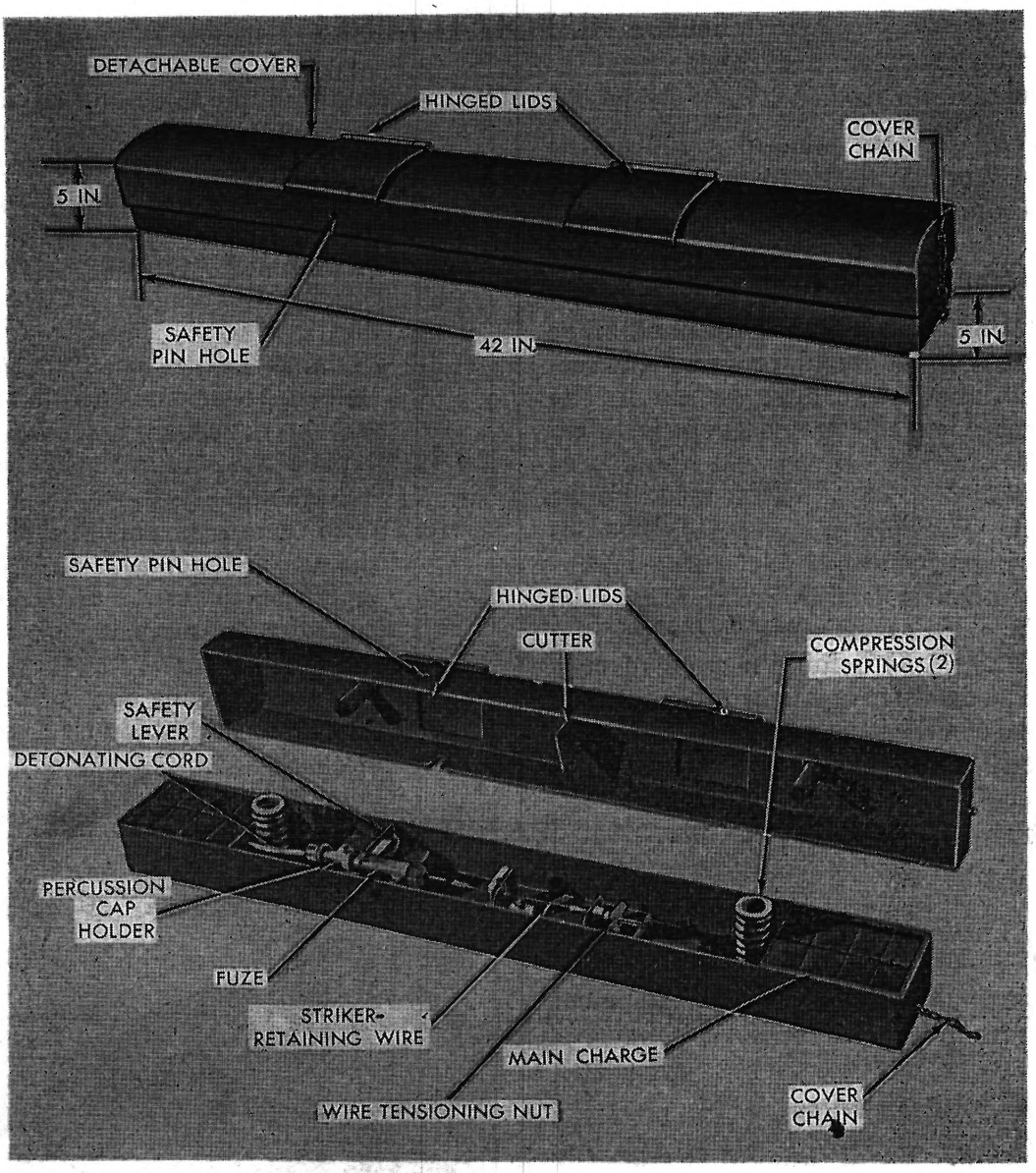


Figure 118—Continued

the detachable cover downward against the compression springs.

(2) The edge of the cover presses down on the end of the safety lever and lifts the other end of the lever clear of the spring-loaded striker. At the same time the cutter shears the striker-retaining wire, releasing the spring-loaded striker.

(3) The striker spring forces the striker against the percussion cap, setting off the detonator and the main charge.

d. INSTALLING AND ARMING.

(1) Remove the detachable cover.

(2) Cock the striker by turning the wire-tensioning nut in a clockwise direction until the safety lever falls into a 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. NEUTRALIZING.

(1) Uncover the mine. Attach a 50-foot rope or wire to both hinged lids and pull them open from a covered position.

(2) Insert a wire through the safety-pin hole in the side of the mine.

(3) Remove the percussion-cap holder.
(4) Unscrew and remove the detonator.
(5) Withdraw the safety pin and lift off the detachable cover.
(6) Release the tension on the striker spring by turning the wire-retaining nut in a counterclockwise direction.

Section XIII. SWEDISH MINES

112. General

The Swedish Army during World War II had one mine, the dual-purpose mine described in paragraph 113. The Swedish Army paints live mines with yellow markings and training mines with blue markings.

113. Swedish Dual-Purpose Mine

a. DESCRIPTION. This dual-purpose mine (fig 119) consists of a pot-shaped iron case containing 6.84 pounds of explosive and a fuze with a spring-loaded striker. The fuze is specially designed for this mine. The mine lid is made of thin wood. Three short legs are welded to the bottom part of the cast-iron case. The mine is about 12 inches in diameter and 6 inches in height. Total weight of the armed mine is 16.3 pounds.

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

c. FUNCTIONING.
(1) Pressure on the striker ring and the wooden lid breaks the lid, releasing the striker.
(2) The striker, driven by the striker spring, fires the percussion cap, the detonator, booster charge, and the main charge.

d. INSTALLING AND ARMING.
(1) Insert the striker ring through the slit in the wooden lid and turn the ring 90° so it is at right angles to the slit. This places lid-retaining spring under compression since the striker spring is exerting a pull through the striker shaft and ring.
(2) Remove the safety pin.
(3) Place the lid assembly (fuze, detonator, and lid) in the mine. The lid rests on top of the mine case.

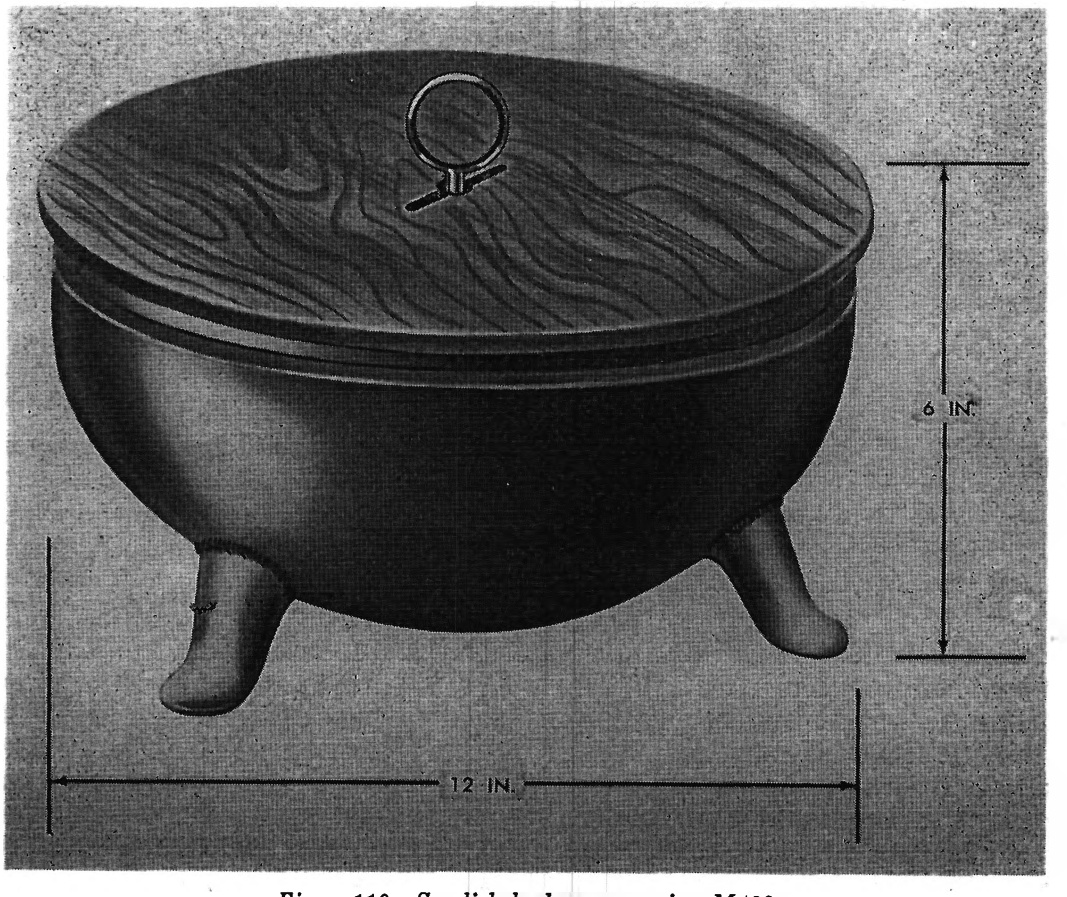


Figure 119. Swedish dual-purpose mine, M/39.

e. NEUTRALIZING.

(1) Make sure the striker ring is at right angles to the slit in the lid.

(2) Carefully remove the lid assembly (fuze, detonator, and lid).

(3) Insert the safety pin in the fuze.

(4) Turn the striker ring parallel to the slit and remove the fuze from the lid.

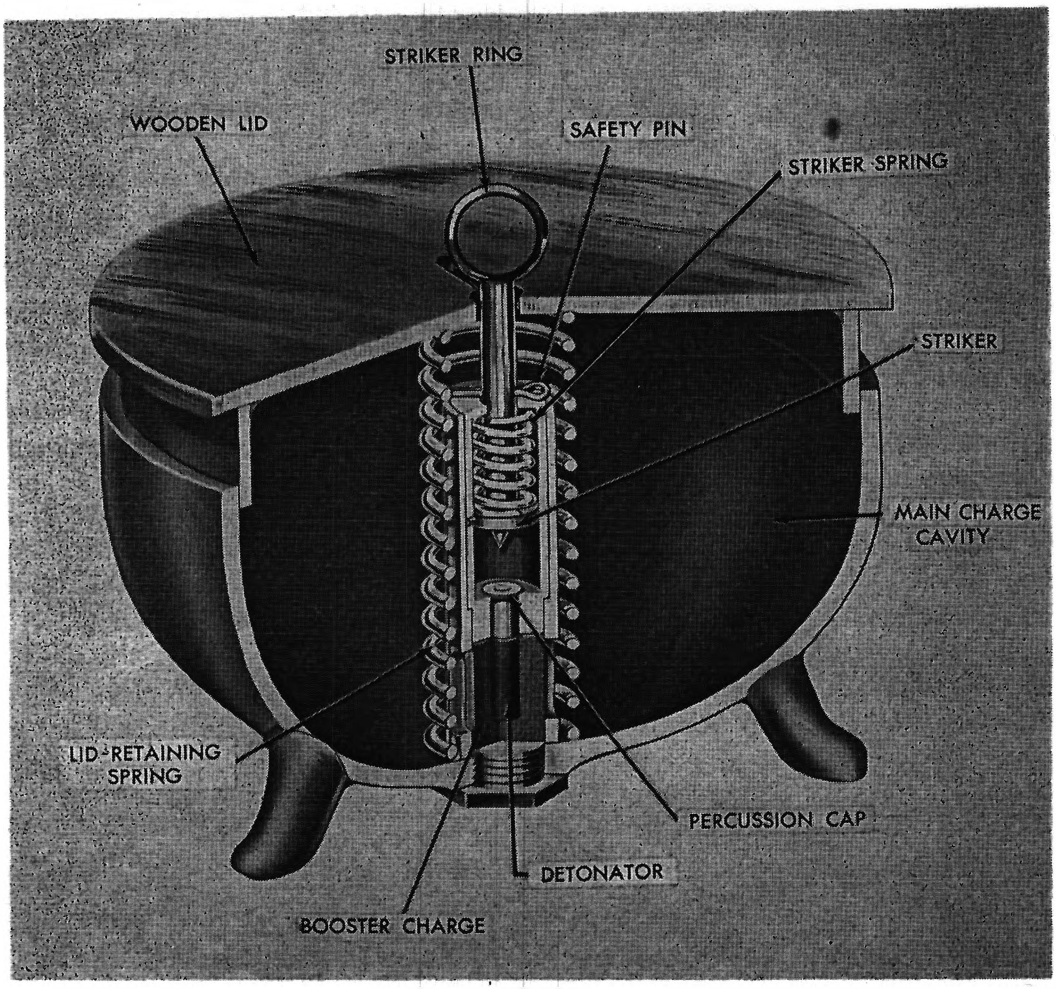


Figure 119—Continued.

Section XIV. SWISS MINES AND FUZES

114. General

The Swiss Army has several standard types of mines including a light antitank mine, a heavy 4½-inch shell mine M–G, and a wooden box antipersonnel mine.

115. Swiss Light Antitank Mine (Gliding Mine)

The Swiss light antitank mine (fig. 120) is a cylindrical steel mine with a flat bottom and a cone-shaped top. It has a centrally located fuze well and a pressure fuze with pressure disk which fits over the fuze. The mine resembles the Belgian antitank bottle mine (fig. 81) more closely than any other mine. This Swiss mine weighs a total of 11.5 pounds, including 6.5 pounds of TNT. It is painted in a camouflage pattern. This mine is sometimes referred to as the gliding mine since it may also be provided with a metal sled, on which it is mounted for pulling out onto a roadway in front of an approaching tank. A tilt type fuze is used.

116. Swiss Heavy Shell Mine, M–G

a. DESCRIPTION. The M–G heavy shell mine (fig. 121) is 4¾ inches in diameter and is nearly identical to the French shell mine. It is fuzed in the same manner. The Swiss provided from four to six 2-foot lengths of angle iron which are laid with one end resting on the fuze. These irons act as pressure bars and radiate from the fuze like the spokes of a wheel.

b. EMPLOYMENT. This mine is employed as an antitank or antivehicular mine in protective mine fields and road blocks.

c. FUNCTIONING.

(1) Pressure on the pressure bars is transmitted to the pressure piece causing the striker, in the pressure fuze, to shear the shear pin and fire the percussion cap and the primary detonator.

(2) The flash from the primary detonator passes down the flash tube and ignites the powder train which explodes the main detonator, the booster charge, and the shell.

d. INSTALLING AND ARMING.

(1) Screw the pressure fuze and the 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.

(4) Remove the brass safety pin from the pressure fuze from a safe distance.

e. NEUTRALIZING.

(1) Carefully inspect the loose pressure bars for pull wires and activation fuzes. If in doubt, attach a length of rope or wire to the pressure piece and remove the pressure piece from a safe distance.

(2) Remove the pressure bars.

(3) Unscrew the steel pressure fuze, being careful not to exert any pressure on the pressure plunger.

(4) Remove the percussion cap, the percussion-cap holder, and the primary detonator.

(5) Unscrew the fuze adapter.

(6) Remove the main detonator from the shell.

117. Swiss Wooden-Box Antipersonnel Mine

a. DESCRIPTION. The Swiss wooden-box antipersonnel mine (fig. 122) is identical to the Soviet PMD–6 antipersonnel mine (TM 5–223A), except that the pull fuze is slightly different in construc-

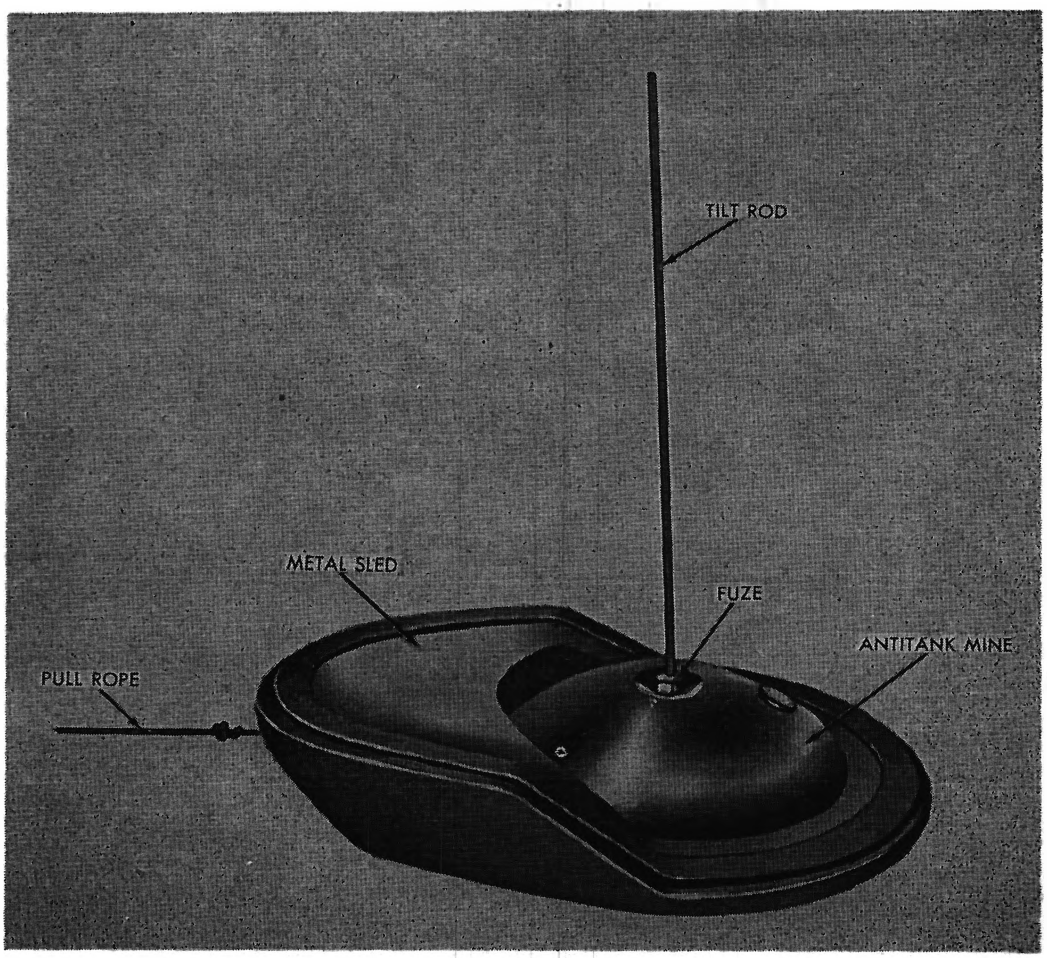
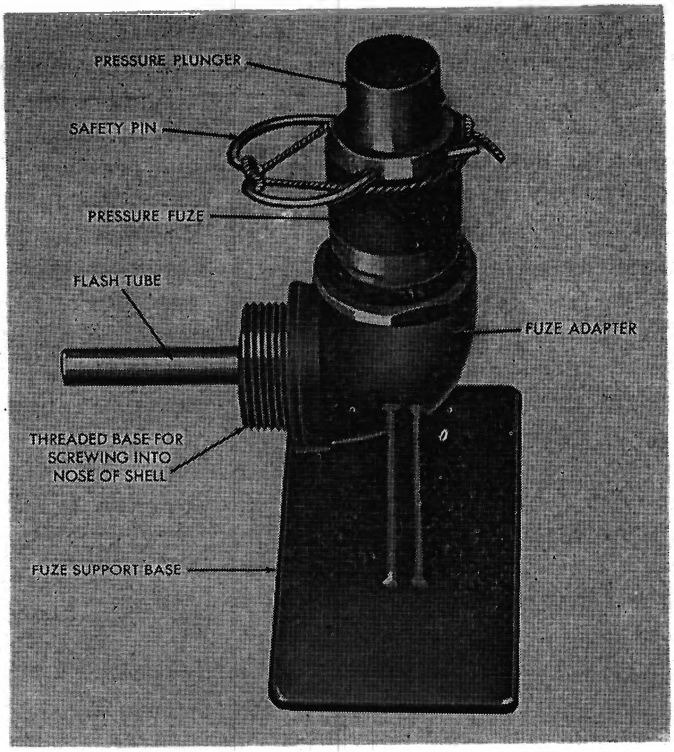


Figure 120. Swiss light antitank mine (gliding mine).



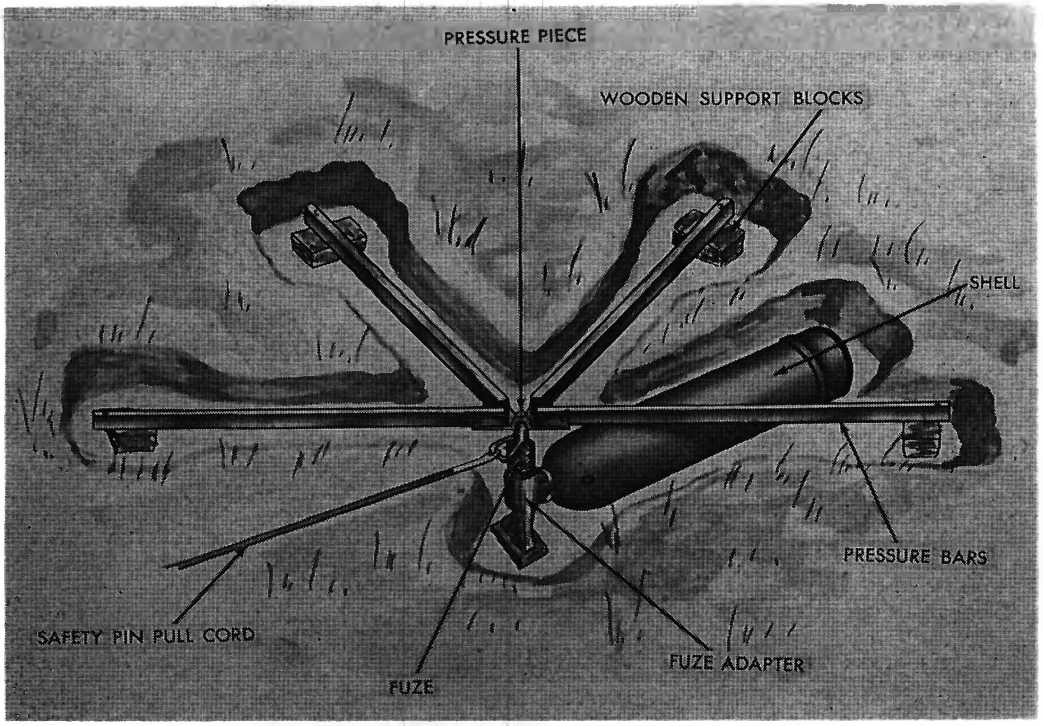


Figure 121. Swiss heavy shell mine, M–G.

tion. This mine is a wooden box with a hinged lid, which fits over the upper part of the charge container. Overall, the mine is 8 inches long, 3¼ inches wide, and 2 inches high. The portion of the mine case nearest the hinge of the lid contains a 0.5-pound explosive charge; the front portion contains a pull fuze, which is inserted into the main charge through a hole in the end of the mine detonator end first. The top of the fuze, with the striker-retaining pin, remains outside the end of the mine. A slot in the lid rests on the striker-retaining pin of the fuze. Some mines are provided with a thin metal rod which passes through holes in the sides of the mine, near the front. The rod acts as a safety bar to prevent the lid from actuating the fuze prematurely.

b. EMPLOYMENT. This mine is normally laid as security against opposing foot troops or in mine fields, paths, trails, road shoulders, and grassy areas.

c. FUNCTIONING. Pressure on the lid forces the pin out of the pull fuze, releasing the spring-loaded striker against the cap, which explodes the detonator and the charge.

d. INSTALLING AND ARMING.

(1) Lay the mine.

(2) Lift the lid and insert the explosive charge.

(3) Attach a percussion-cap-and detonator assembly to a pull fuze and insert the fuze into the charge, with the loop of the striker-retaining pin *down*.

(4) Close the lid of the mine.

(5) If there is a safety bar pull it from the mine with a cord or wire.

e. NEUTRALIZING.

(1) Search for and cut all slack trip wires connected to the fuze.

(2) Lift the lid carefully and slide the fuze out.

(3) Detach the detonator from the fuze.

Note. These mines may be activated by connecting the eye of the striker-retaining pin, by means of wire or cord, to a stake driven into the ground in front of the mine.

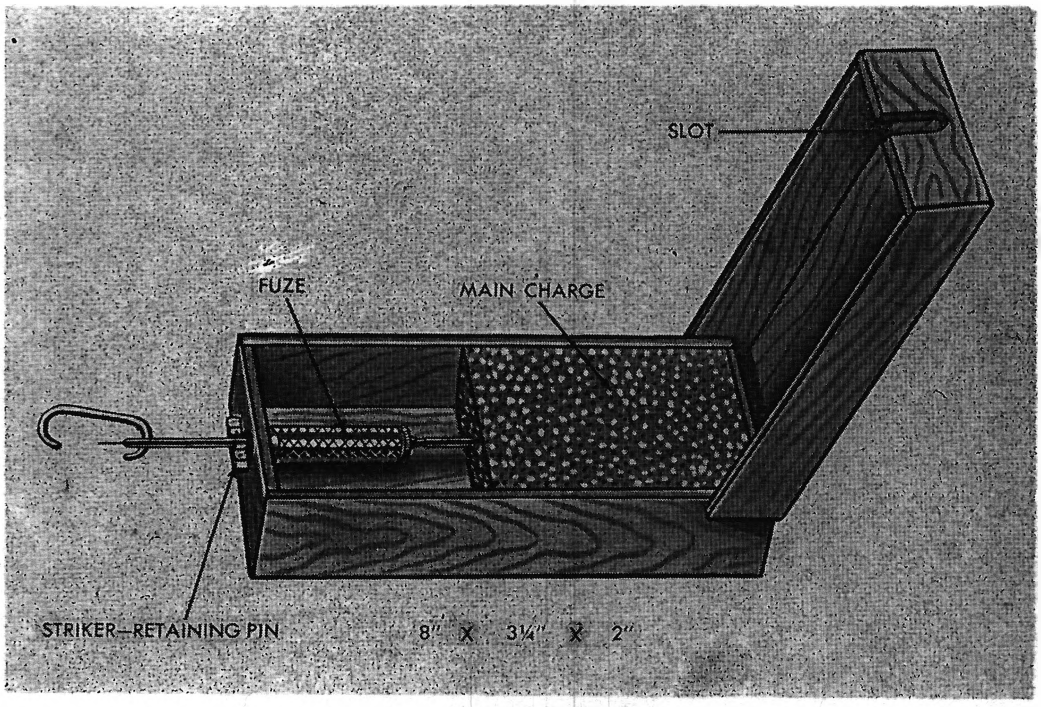


Figure 122. Swiss wooden-box antipersonnel mine.

Section XV. YUGOSLAVIAN MINES

118. General

Yugoslavia was known to have only one type of antitank mine (par. 119) in World War II. The following mines are included in Yugoslavian Army armament: German T.Mi. 35, T.Mi. 42, and T.Mi. 43 antitank mines; German S–Mi. 35 antipersonnel mines; Soviet TM–41 and TMD–B antitank mines; and Soviet PMD–6 and POMZ–2 antipersonnel mines.

119. Yugoslavian Antitank Mine

a. DESCRIPTION. This antitank mine (fig. 123) consists of a round, cast-metal case with curved walls containing 5.5 pounds of explosive and a fuze with a spring-loaded striker. Total weight of the mine is 11 pounds. The mine is 8¼ inches in diameter and 4⅜ inches high. The pressure plate is held off of the fuze by a safety band which acts as a safety device. There are three stud-like projections on the top of the pressure plate which permit the use of a thin layer of earth for camouflage and still permit positive detonation of the mine.

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

c. FUNCTIONING.

(1) A pressure of 220 pounds or more on the pressure plate depresses the striker, shearing the shear pin.

(2) Thus released, the striker, driven by the spring, fires the percussion cap, the detonator, and the main charge.

d. INSTALLING AND ARMING.

(1) Remove the safety band.

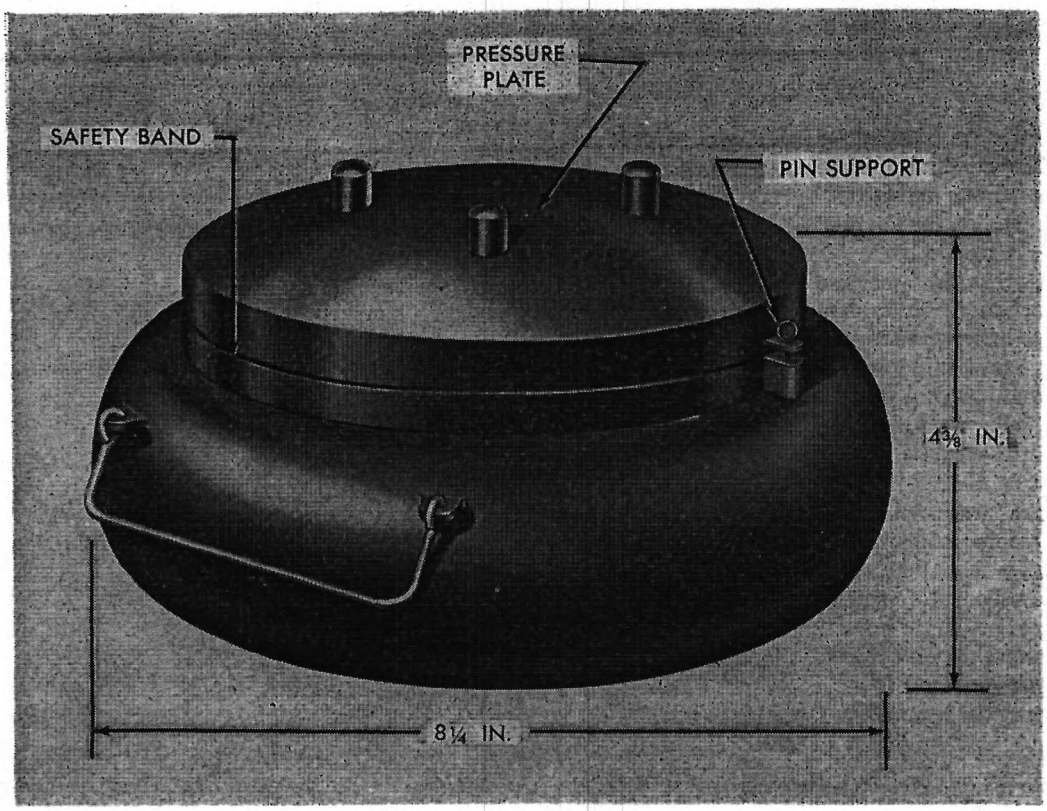
(2) Screw down the pressure plate until it rests on the striker cap.

e. NEUTRALIZING.

(1) Unscrew the pressure plate.

(2) Unscrew the fuze from the mine.

(3) Unscrew the percussion cap and detonator from the fuze.



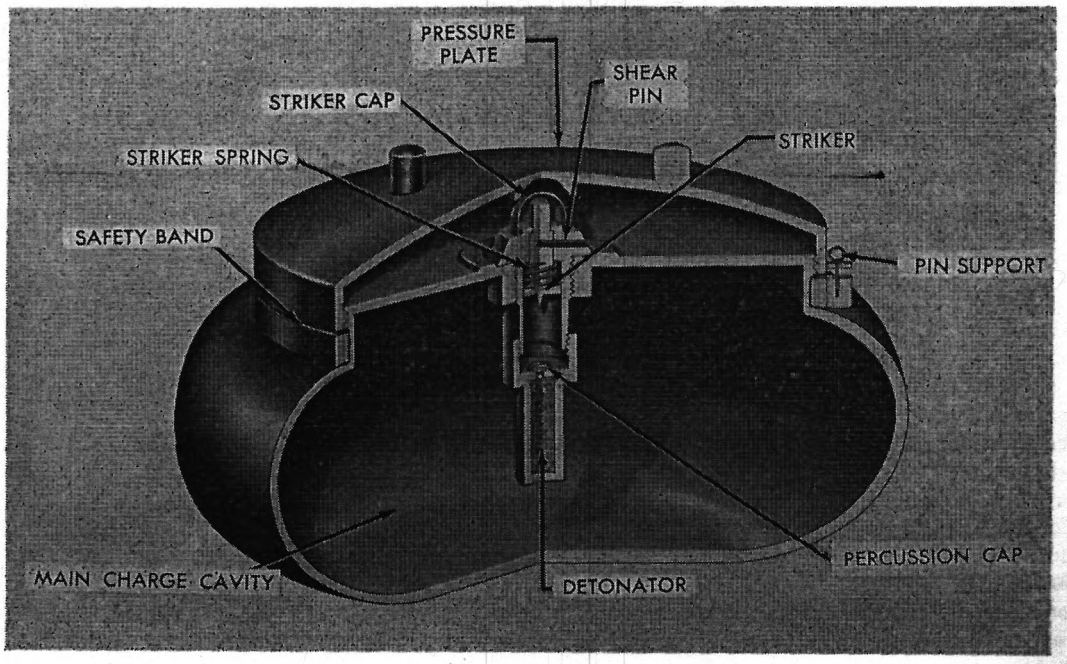


Figure 123. Yugoslav antitank mine.

INDEX

Note. **Paragraph numbers in bold-face type refer to most complete coverage of subject.**