

The start of 1945 indicated that the many cut-backs and terminations and non-reoccurrence of orders would result in unemployment and resulting hardship. Altho the Local War Manpower Commission was appealed to, no relief was given at the early critical stages. The number of workers employed dropped from a high of 2000 in January to less than 1000 in June.

Later, some of the Local Draft Boards took some of our most important key men in the 29 year class who were irreplaceable as it takes years to train men for the particular work involved and altho we appealed thru channels, the Men were inducted, thereby hampering and interfering with production on urgently critical materials needed for the Japanese war.

PARTIAL LIST OF
TERMINATIONS
1st 6 MONTHS OF 1945

		<u>ITEM</u>	<u>PIECES</u>	<u>DOLLARS</u>
2/14/45	U.S. ENGINEERS, BOSTON W37-018-eng-(MSP)-603	HLAL Pressure Type	250,000	109,500.
2/16/45	U.S. ENGINEERS, BOSTON W37-018-eng-(MSP)-604	M1 Delay	1,370,000	584,990.
4/19/45	SPRINGFIELD ORDNANCE DIST. W19-059-Ord-2005	Air Travel T3	488	3,772.
4/26/45	BENRUS WATCH COMPANY P.O. 21831	Arming Stems	600,000	40,002.
5/10/45	ELECTROLUX CORP. P.O. No. 9884	Armature	7,113	82,937.
5/14/45	SPRINGFIELD ORDNANCE DIST. W19-059-Ord-2347	Booster Cups	300,000	Not Estimated
6/1/45	EASTMAN MACHINE CO. P.O. 13177D P.O. 13883D	B7000E Motors	1,100 466	6,534. 2,768.
6/21/45	ELECTROLUX CORPORATION P.O. 11 P.O. 59	Field Coil Assembly Rotor Assembly	8,250 4,000	7,821. 9,880.

ELECTROLUX CORPORATION

GREENWICH, CONN.

Parts used in Signal Corps Generators.

<u>Pcs.</u>	<u>Item</u>	<u>Date</u>	<u>Order No.</u>	<u>Shipped thru June 28</u>
4000	28035-1 Field Coil	1/27/45	8676	4,000
5750	28035-1 " "	3/14/45	9868	4,393
3298	27739-1 " "	1/27/45	8676	3,298
5750	28034-1 " "	3/23/45	10040	192
4000	23834 " "	4/24/45	#11	3,258
1000	21129 Rotor Assm.	4/24/45	#59	100

NATIONAL FIREWORKS INC.

WEST HANOVER, MASS.

PARTS FOR HAND GRENADE FUZE

BODY

<u>Date</u>	<u>Order</u>	<u>Item</u>	<u>Quantity</u>	Shipped thru <u>6/28/45</u>
2/12/45	51392	Body-82-1-88A2	1,339,000	33,070 Pcs.
3/30/45	53084	"	1,023,000	

HOUSING

2/12/45	51392	Housing-82-1-88B2	1,339,000	56,102
3/20/45	53084	" "	1,023,000	

YENNY MANUFACTURING CO.

CRANSTON, R. I.

Parts for M5 Pressure-Release Firing Device

<u>Date</u>	<u>Order No.</u>	<u>Item</u>	<u>Pcs. Ordered</u>	<u>Pcs. Shipped</u>
3/1/45	5462	Die cast Base	178,000	178,000
4/2/45	5462	" " "	11,000	11,000
3/30/45	5462	Cellulose Pro- tective Sleeves	20,000	20,000

WALLACE METAL PRODUCTS CO: Inc.

New Haven, Conn.

Part No. 73-8-17283 SLEEVES

Order No. 4677 - dated 3/5/45 - for 125,000 pcs.

Shipped - thru 6/28/45 38,104 pcs.

TRANSLATIONS OF JAPANESE INSCRIPTIONS ON MINES

昭和十六年

SHOWA ERA 16th YEAR

ARMOR PENETRATION MINE, MAGNETIC
TYPE 99



SAFE



SAFE

ANTITANK MINE, TYPE 93



— 3 — 2 — 1 —

1. DELAY ACTION
2. 4.5 SECONDS
3. SECONDS (OF) TIME

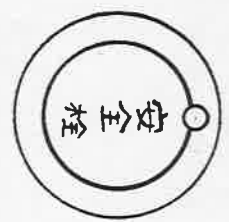
HAND GRENADE, TYPE 97



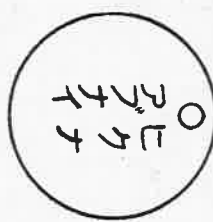
— 2 — — 1 —

PAY ATTENTION

1. WHEN BURYING, REMOVE SAFETY WIRE AND INSERT BURYING PLUG. USE AFTER COATING WITH DOPE.
2. WHEN USING IN CLOSE COMBAT, THERE IS NOTHING TO PREVENT USING THE CHARGE AFTER MERELY PULLING OUT THE SAFETY WIRE.



SAFETY PIN



— 2 — — 1 —

1. DO NOT PULL
2. DANGER

LAND MINE, TYPE 3



SAFETY WIRE

(READ THE BACK CAREFULLY)

BAR (YARDSTICK) MINE

埋栓個人 (Urisen Kogai)

BURYING PLUG

信管底部側 (Shin Kan Sotobottomo) 信管頭部側 (Shin Kan Uchikabuchi)

FUZE
BOTTOM PART
SIDE (OF MINE)

FUZE
TOP PART
SIDE (OF MINE)

Fuze for Type 93
Antitank Mine

Type 93
Antitank Mine

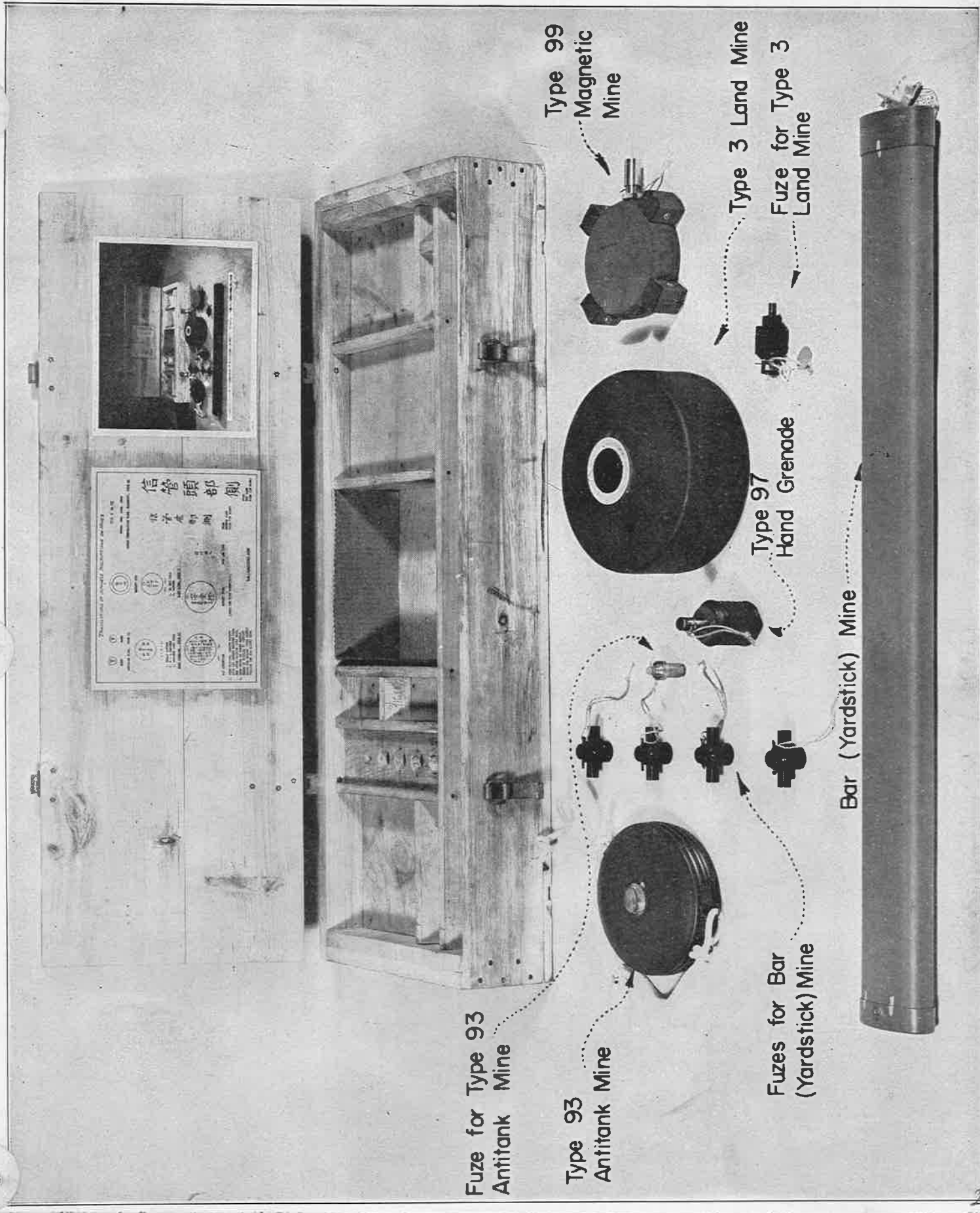
Fuzes for Bar
(Yardstick) Mine

Bar (Yardstick) Mine

Type 99
Magnetic
Mine

Type 3 Land Mine
Fuze for Type 3
Land Mine

Type 97
Hand Grenade



WAR DEPARTMENT TECHNICAL BULLETIN

USE OF JAPANESE MINE TRAINING AID SET NO. 2

War Department, Washington 25, D. C., June 1945

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Section I

GENERAL

1. **PURPOSE.** This Technical Bulletin is a guide for instructing troops in handling Japanese mines. It is intended for use with the Japanese mine training-aid set No. 2 (fig. 1).

2. **SCOPE.** This bulletin describes the components of the set and how they are used in training. It also covers use, recognition, functioning, and disposal of common Japanese mines.

3. **DESCRIPTION OF MINE TRAINING-AID SET.** *a. General.*

(1) *Container.* Japanese mine training-aid set No. 2 (figs. 1, 2, and 3) is packed in an unfinished wood case with hinged top. Outside dimensions of the wood case are 13 $\frac{1}{8}$ inches by 3 feet 2 $\frac{7}{8}$ inches by 5 $\frac{3}{8}$ inches. The complete set and container weigh 40 pounds.

(2) *Mines in set.* The mines in the set have been manufactured to resemble real Japanese mines as closely as possible. Enough of the moving parts have been incorporated in the mines and fuzes of the set to give proper instruction in arming and disarming of the various mines. All mines and fuzes are inert. Several of the mine cases have been designed so they can be filled with soil or sand to simulate the weight of the actual mines. The mines are tagged with instructions for handling, reproduced in Japanese characters. Training should include brief recognition and translation of Japanese inscrip-

tions. An accurate translation of all Japanese characters appearing on tags is glued to the *inside* of the packing case top (fig. 1).

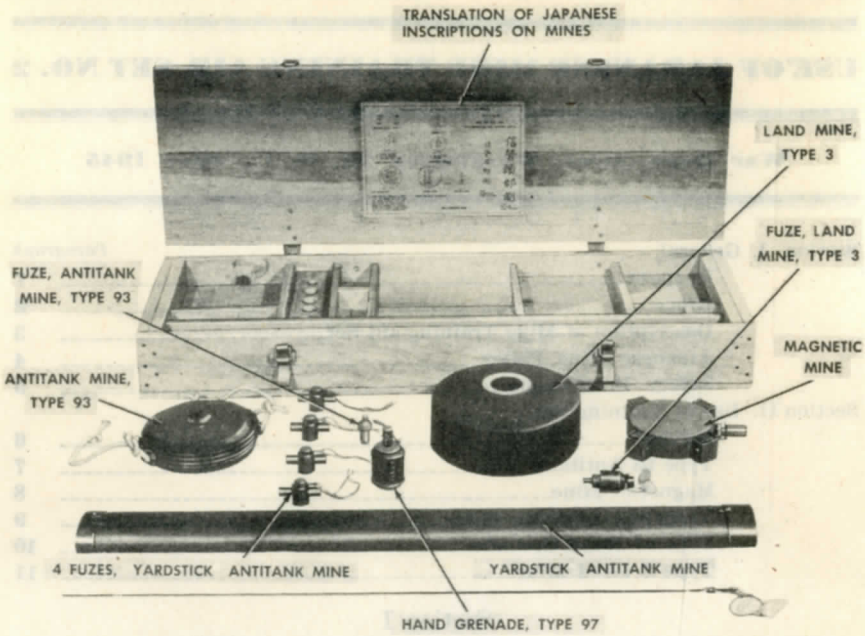


Figure 1. Components of Japanese mine training-aid set No. 2.

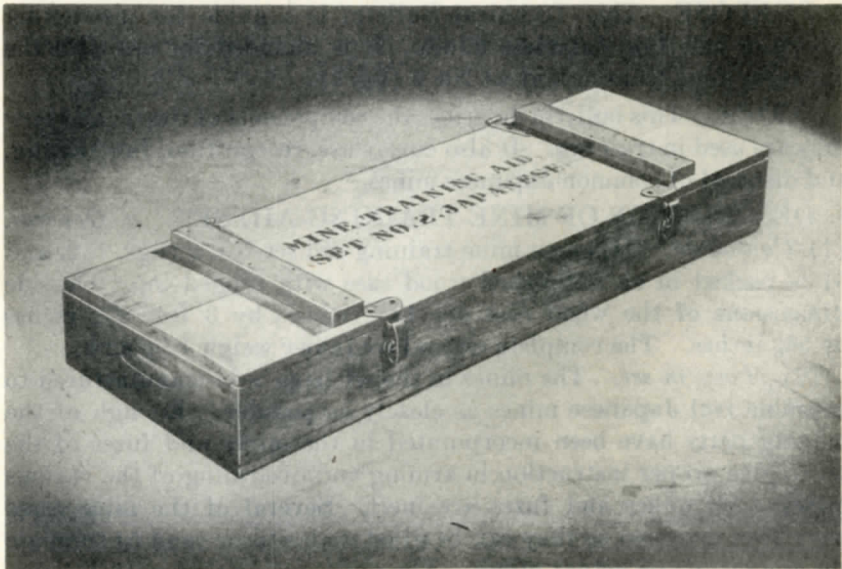


Figure 2. Packing case for mine training-aid set.

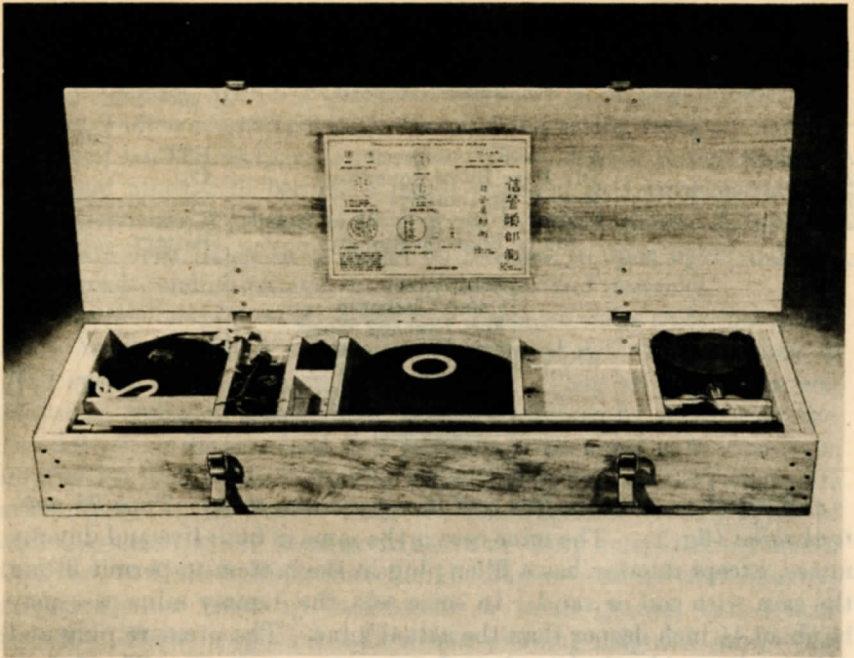


Figure 3. Arrangement of mines in case.

b. Components of mine training-aid set. (1) Correct nomenclature and stock numbers of the component parts of the Japanese mine training-aid set No. 2 are listed below :

Set No. 586-02, mine, training-aid, set No. 2, Japanese

Nomenclature	Unit	Stock No.	Quantity
Mine, training-aid, Japanese:			
Antitank, type 93	ea NX	04-6498. 500-100	1
Armor-penetration, magnetic, type 99.	ea NX	04-6498. 500-200	1
Bar, yardstick	ea NX	04-6498. 500-300	1
Hand grenade, type 97	ea NX	04-6498. 500-500	1
Land, type 3	ea NX	04-6498. 500-600	1

(2) Authorized distribution of the set is as follows:

T/A No.	T/O & E No.	Name of organization	Basis of distribution	Quantities
AGF T/AS		Sch; AGF Repl Depot	RTC	60
20-2		Div Engr Bn or Squadron	Co	3
20-2		Engr C Bn (nondiv)	Co	3
20-2		Except in Div Engr Bn or Squadron or Engr Bn (nondiv).	Troop	1
			Battery	
		ASFTC	Fort Belvoir	100
			Camp Claiborne	100
			Fort Leohard Wood	100
			Fort Lewis	150
			Engineer School	50
			Granite City Engr Depot	15
		Columbus ASF Depot (Engr Sec).		10

c. Variations between live and dummy mines. (1) *Type 93 anti-tank mine* (fig. 1). The mine case is the same in both live and dummy mines, except dummy has a filler plug in the bottom to permit filling the case with soil or sand. In some sets, the dummy mine case may be about 1/4 inch deeper than the actual mine. The pressure plug and safety tab are identical to their Japanese counterparts. The fuze is identical in appearance to the actual fuze, except that the bottom of Japanese fuze is recessed.

(2) *Magnetic mine* (fig. 1). In appearance, this mine and fuze are identical to the actual Japanese mine. However, the magnets are dummies and the canvas case contains wooden blocks to simulate the explosive charge.

(3) *Yardstick antitank mine* (fig. 1). This dummy mine is identical in appearance to the actual mine. It varies from the actual mine in that the explosive charge is simulated with plaster-of-paris blocks, and the fuzes are made in one piece with no removable parts such as the booster and striker holder of the actual fuzes.

(4) *Type 3 land mine* (fig. 1). This mine varies from the actual mine only in the construction of the fuze. The dummy does not contain a striker and the detonator tube is solid metal. The fuze can be disassembled and recocked by unscrewing the two halves of the fuze body and then pushing the percussion hammer up and reinserting the hammer-release fork. All dummy fuzes have right-hand threads, whereas Japanese counterparts have been found with either right- or left-hand threads. The fuze seat is also removable for filling the mine body with sand or soil.

(5) *Type 97 hand grenade* (fig. 1). This grenade is identical with the actual grenade, except that the fuze, instead of containing the de-

lay train and detonator, is solid. The fuze is removable, but the plug is not.

4. **JAPANESE MINE POLICY.** Japanese mine technique is improving and each new operation shows an increasing tendency toward the use of land mines on a larger scale. There is little reason to doubt that land mines will become a major problem in future operations.

a. Locations. Past use of land mines by the Japanese shows that mines are most likely to be found on beaches, in open fields and airfields, roads, and cities, and around pillboxes and obstacles.

b. Tactical employment. Captured Japanese notes state that mines are to be spaced 3 to 5 yards apart in front of defensive positions in dead spaces and near wire entanglements. They are also to be employed in defiladed areas which cannot be covered by small-arms fire. In addition to the standard Japanese mines discussed in this bulletin, improvised land mines including aerial bombs and artillery shells are encountered in the Pacific theater. The Japanese use all types of ordnance material and hand grenades in devising antipersonnel mines. Contrary to United States doctrine, the Japanese stress close-quarters attacks against tanks by individuals or small groups, called tank fighters. Their weapons include armor-piercing magnetic mines (fig. 1), combinations of grenades and mines, grenade clusters, Molotov cocktails, and pole mines. The Japanese use antiboat and beach mines extensively as a part of their beach defenses.

5. **SAFETY PRECAUTIONS.** The following safety precautions should be observed when dealing with all mines:

a. Never move a mine until the mine and the area surrounding it are closely inspected. All mines may be booby-trapped.

b. Remember, shear wires requiring less pressure can be substituted for the shear wire usually found in mines. The type 93 mine fuze is issued with a 25-lb shear for antipersonnel use.

c. Do not carry the mine any farther than is absolutely necessary from the area being cleared.

d. Mark located mines so they can be avoided by other personnel.

Section II

USE OF TRAINING SET

6. **GENERAL.** *a. Use with other training aids.* The Japanese mine training set used with other mine training aids will be valuable for training troops in the handling and disposal of common Japanese mines. To familiarize troops with the recognition, arming, disarming, and disposal of Japanese mines, the mine training set should be used in conjunction with graphic training aids, film strips, and

film bulletins. Detailed directions of arming, disarming, and disposal methods are given in FM 5-31.

b. Training schedules. Mine training schedules should stress recognizing mined areas, locating mines and booby traps, breaching mine fields, and disposing of mines. *Emphasis should be placed on disposal methods other than hand removal*, such as pulling out by rope or exploding in place. Mines should only be disarmed by hand when conditions do not permit other methods. An effort should be made to reproduce Japanese mine tactics in training. Night operations should be included in the schedule. Instructors should supplement information in this bulletin with the latest material from intelligence notes and documents and FM 5-31.

7. TYPE 93 ANTITANK MINE. *a. Description.* The Japanese type 93 antitank mine (fig. 4) is normally painted olive-drab with a red ring on top. Total weight is 3 pounds, including 2 pounds of picric acid explosive.

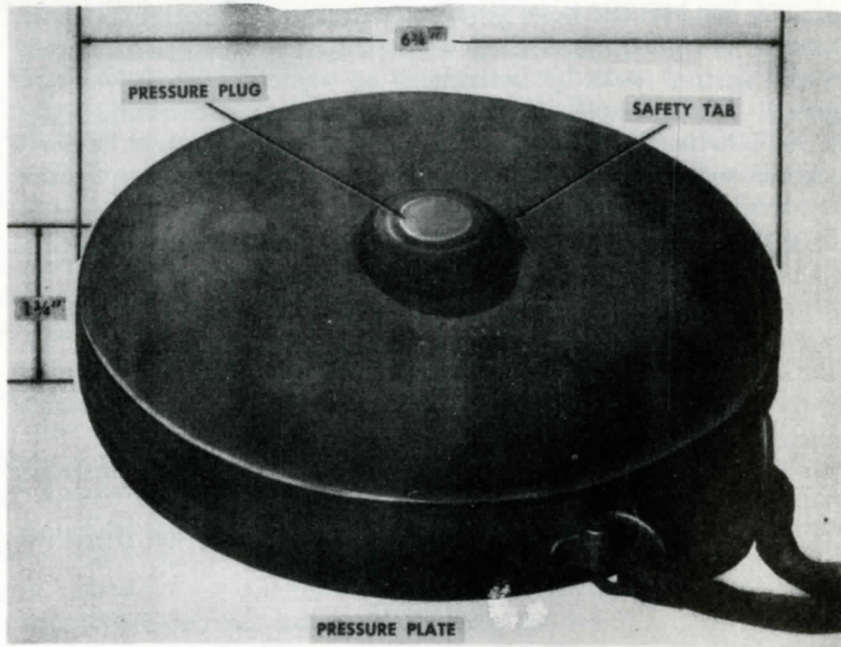


Figure 4. Japanese type 93 antitank mine.

b. Use. The Japanese use the mine against vehicles. To disable tanks, it is used in groups of two or three. The mines are normally tied together, one on top of the other.

c. Functioning (fig. 5). Normally, 250-pound pressure on the pressure plug will fire the mine. The pressure plug depresses the

striker pin which cuts the shear pin. Spring drives striker pin downward, firing percussion cap—detonator—booster—main charge.

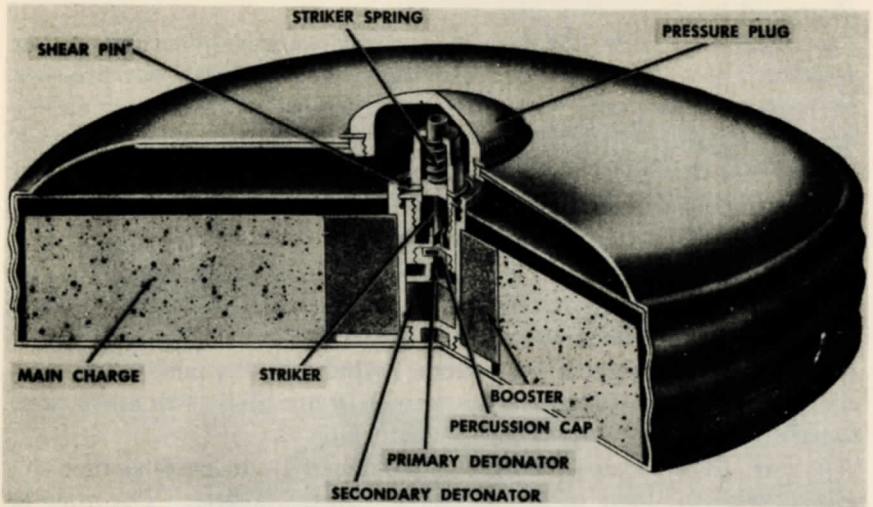


Figure 5. Cut-away of type 93 antitank mine.

d. Installing and arming. Unscrew pressure plug and remove leather washer. Lift off combination washer and sleeve (tab at-



Figure 6. Installing type 93 mine.

tached). Unscrew safety cap from fuze. Replace leather washer and screw pressure plug into place. Finally, bury mine with pressure plug at ground level.

e. Disarming (figs. 7① and ②). Examine mine and surrounding area for booby traps. Without moving mine or exerting any pressure on pressure plate, unscrew brass pressure plug. Screw brass safety cap, if available, firmly into top of fuze. Similarly, if combination washer and sleeve are available, place them over brass safety cap and replace pressure plug. To defuze the mine, (fig. 7③) unscrew pressure plug and then unscrew whole fuze.

8. MAGNETIC MINE. *a. Description.* The Japanese type 99 magnetic antitank mine (fig. 8) is normally covered with khaki-colored canvas. The mine and fuse are carried in a stiff canvas pouch (fig. 9). Total weight is $2\frac{1}{2}$ pounds, including a $1\frac{1}{2}$ -pound explosive charge. One mine will perforate $\frac{3}{4}$ -inch armor plate; two mines used together will perforate $1\frac{1}{4}$ -inch armor plate.

b. Use. The Japanese normally use this mine in pairs against armored vehicles, doors of pillboxes, and similar targets. The mine is held in place, flat against iron or steel objects by attraction of four magnets. The Japanese also use this mine as an antipersonnel weapon (figs. 10 and 11).

c. Functioning (fig. 12). When used against tanks, personnel placing the mine first remove the safety pin and depress plunger of delay action fuze, which releases steel balls into groove in the sliding cap. The striker, driven by the spring, fires the percussion cap which fires the delay pellet—detonator—main charge. The delay fuze allows 4 or 5 seconds for personnel to take cover after placing the mine.

d. Installing and arming. Remove wooden plug from body of mine. Screw fuze into body of the mine. Remove safety pin and press plunger and mine will detonate in 4 or 5 seconds.

e. Disarming. To disarm the Japanese magnetic mine, insert safety pin in safety-pin hole. To defuze the mine, loosen ring holding fuze in place and then remove fuze from mine body. Finally, (fig. 13 (3)) unscrew detonator from fuze to make parts safer to handle.

9. YARDSTICK ANTITANK MINE. *a. Description.* The yardstick mine (fig. 14) is normally painted olive drab. Total weight is $10\frac{1}{2}$ pounds, including 6 pounds of picric acid explosive.

b. Use. The yardstick mine is employed against vehicles and is usually buried in landing strips and trails (figs. 15 and 16).

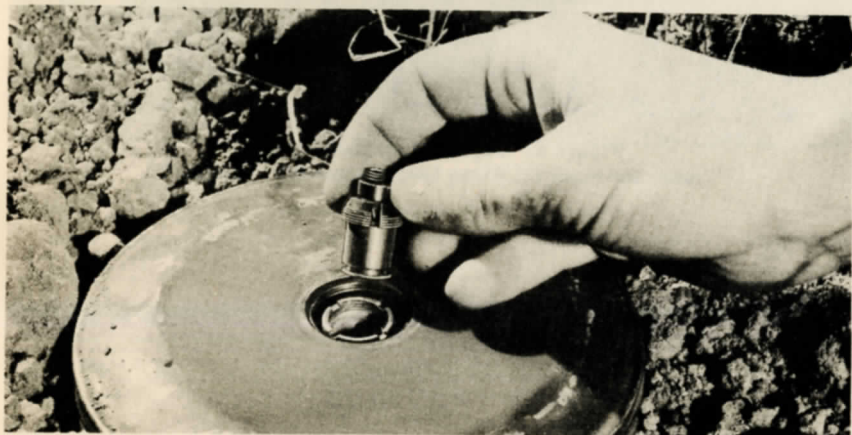
c. Functioning (fig. 17). A pressure of 335 pounds or more on the mine forces case against head of release plunger of fuze, shearing shear pin and forcing plunger down. The enlarged portion of slot in



① *Unscrewing brass pressure plug.*



② *Screwing safety cap into top of fuze.*



③ *Defuzing.*

Figure 7. Disarming type 93 mine.

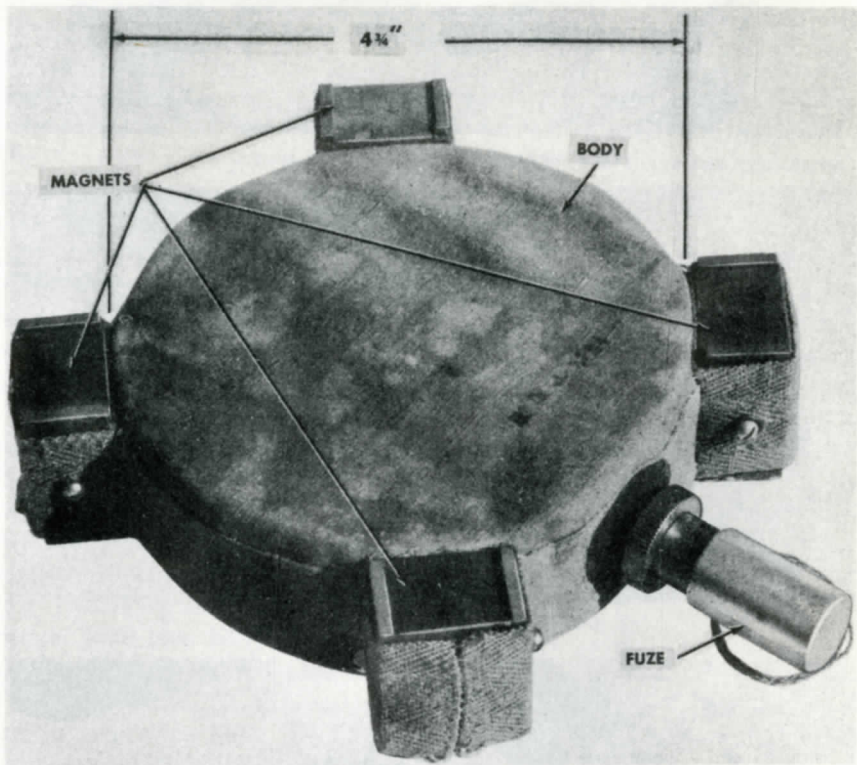


Figure 8. Japanese magnetic mine.

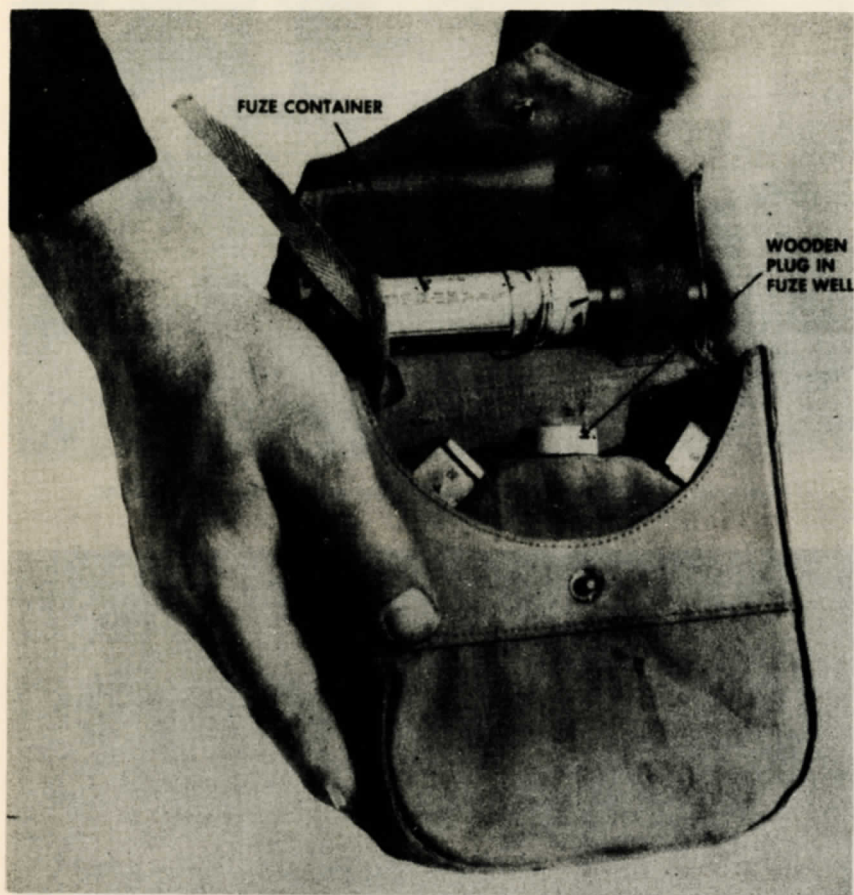


Figure 9. Canvas carrying pouch for magnetic mine.

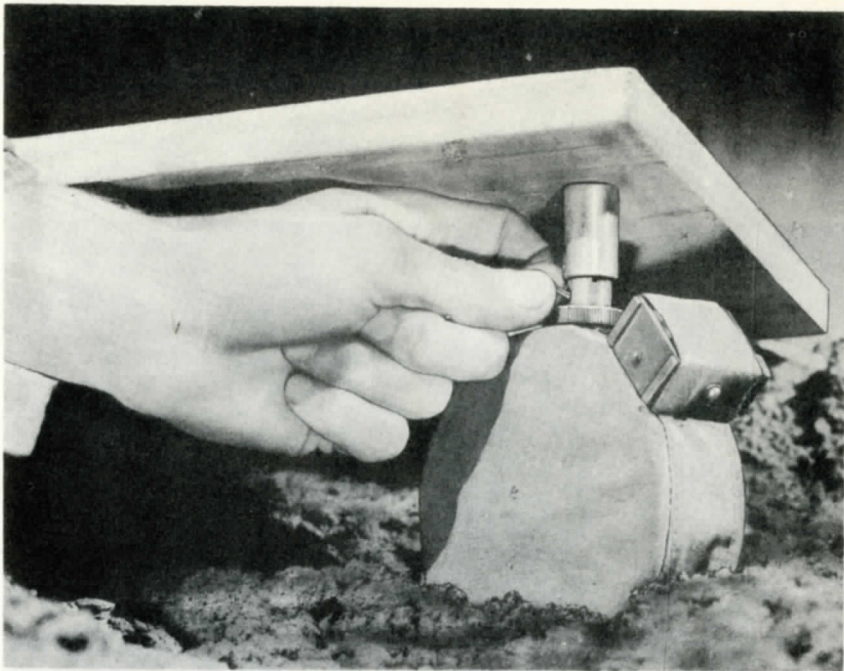


Figure 10. Rigging magnetic mine for use as an antipersonnel mine.



Figure 11. Using plank or board with magnetic mine to give more bearing on fuze.

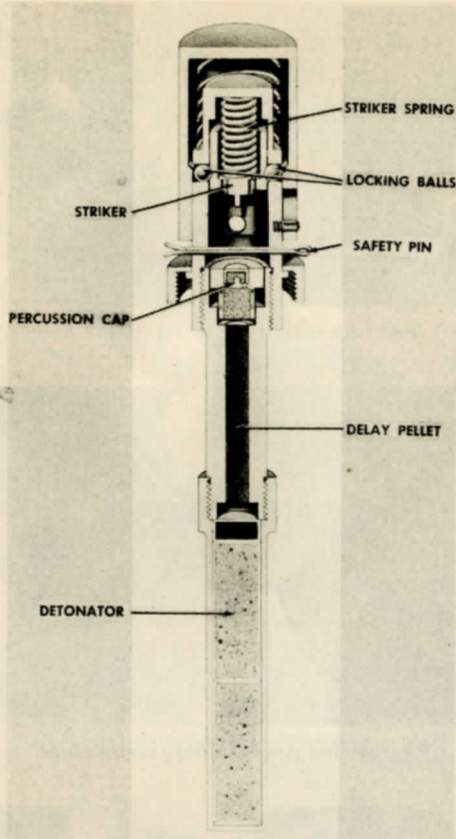


Figure 12. Cut-away of magnetic mine fuze.

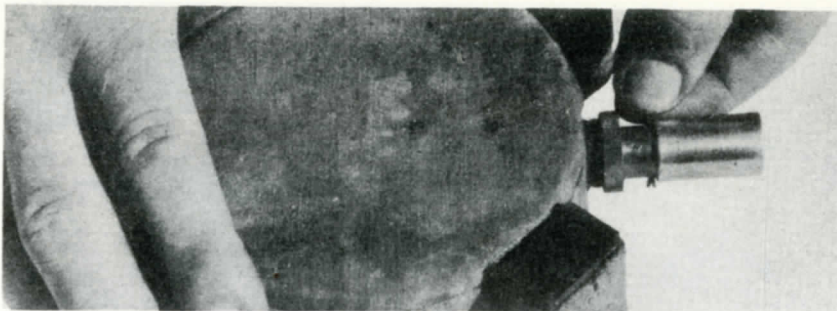
release plunger then moves down, and the striker drives through opening, firing the percussion cap—detonator—booster—main charge.

d. Arming. To arm the yardstick mine, remove the safety wire.

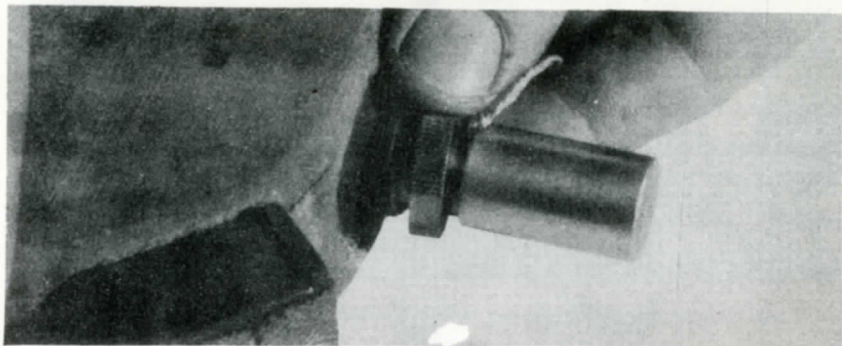
e. Disarming. Examine for booby traps. Remove blocks of explosives and fuzes from each case. Insert safety pin or improvised safety pin in safety-pin hole of each fuze (fig. 18).

10. TYPE 97 HAND GRENADE. *a. Description.* The Japanese type 97 grenade is a pressure-operated fragmentation grenade (fig. 19). It is normally black and has a grooved (horizontal and vertical) cast-iron case. Total weight is 1 pound, including 2 ounces of high explosive (fig. 20).

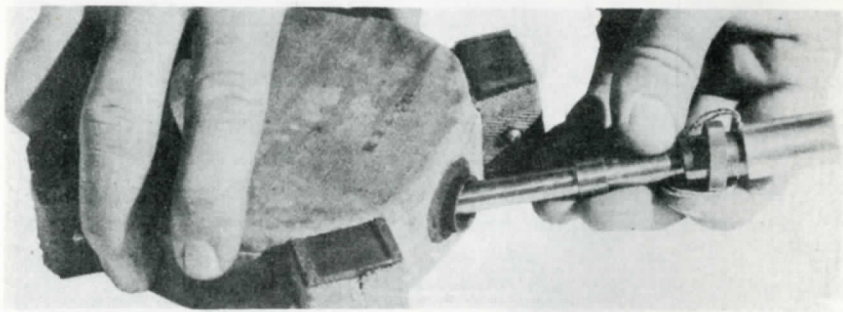
b. Use. The type 97 grenade is the standard Japanese hand grenade. However, it has been used as a pressure-operated booby trap by removing the pin and cap. The grenade has a delay fuze, but it can be removed and the detonator taped in the normal position of the delay



① Inserting safety pin in safety-pin hole.



② Loosening ring holding fuze in place.



③ Removing fuze from mine body.

Figure 13. Disarming magnetic mine.

train. With this change, the grenade fires immediately on pressing the cap.

c. Functioning (fig. 20). Remove safety pin and give cap a sharp pressure or blow to drive striker onto percussion cap. The percussion cap then ignites a 5-second delay train which sets off detonator and the main charge.

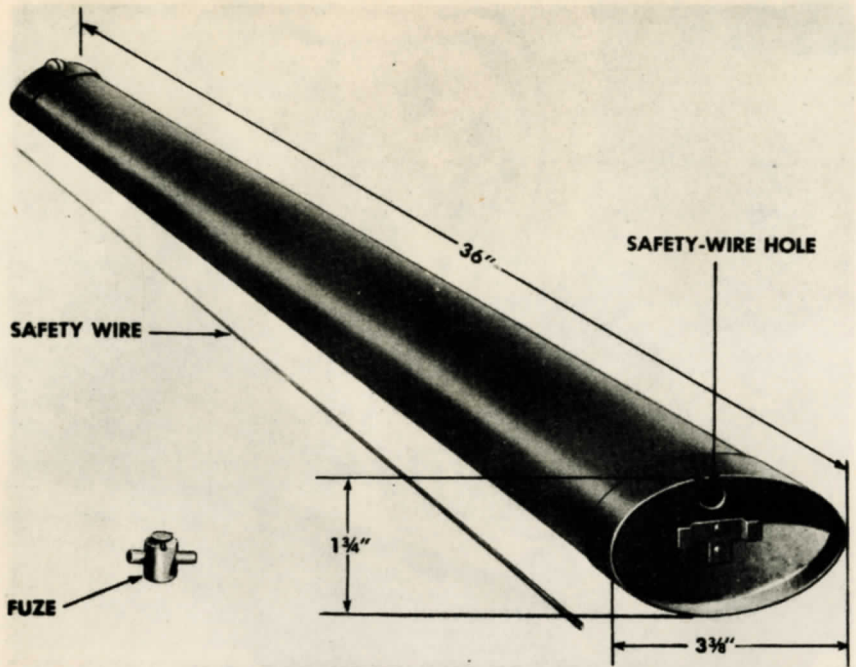


Figure 14. Japanese yardstick antitank mine.



Figure 15. Installing yardstick mine on road shoulder.



Figure 16. Yardstick mine used against vehicles.

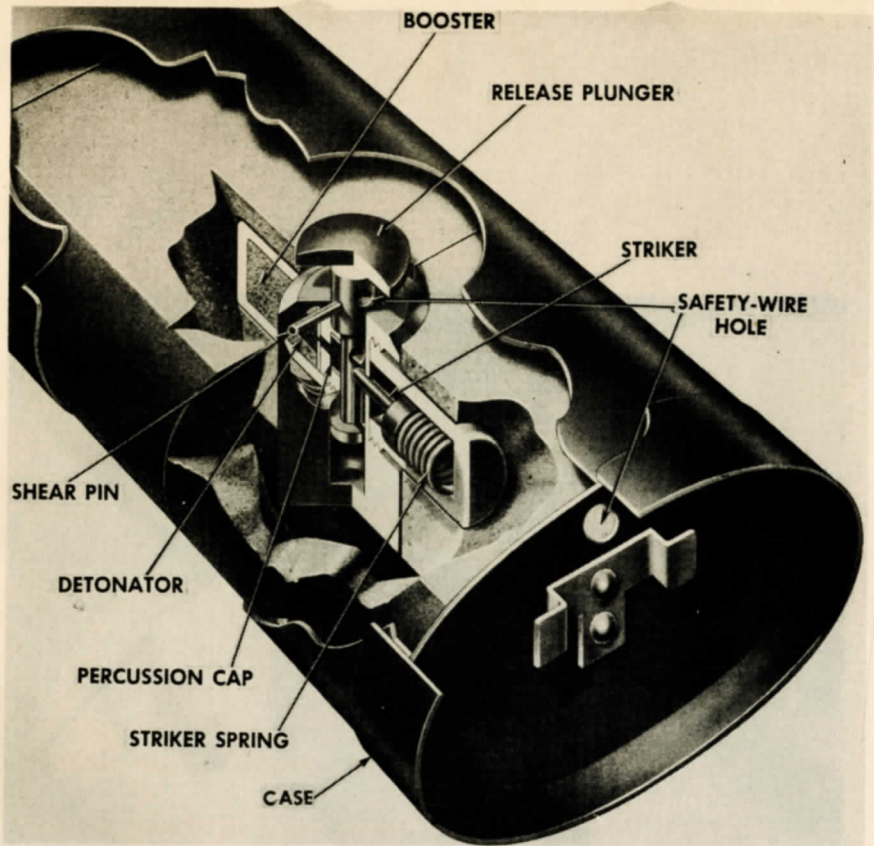
d. Installing and arming. To install the type 97 grenade as a booby trap, dig a small hole in the ground and place grenade upright with cap just above ground level. Camouflage excavation and grenade. Remove safety pin as last step.

e. Disarming. To disarm, remove metal cap and lift out striker. Finally, unscrew fuze and plug.

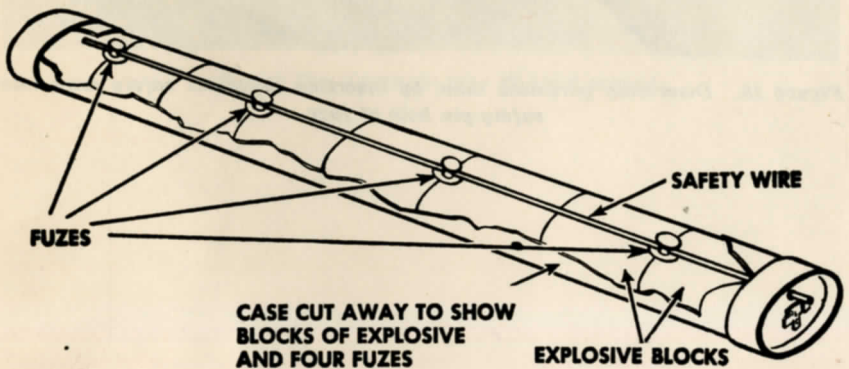
11. TYPE 3 LAND MINE. *a. Description* (fig. 21). The Japanese type 3 land mine has no exposed parts made of metal which makes detection difficult with standard mine detecting equipment. The circular terra cotta case has an earthen color. The fuze body is of bakelite with only springs, pins, and striker made of metal. The mine is manufactured in two sizes, 10½ inches in diameter and containing 6½ pounds of explosive, and 8½ inches in diameter and containing 4½ pounds of explosive.

b. Use. These mines have been found in mine fields and on roads and airfields. Normally they are used as antitank mines but they have been set up as antipersonnel mines with trip wires attached to the fuze. The mine has been found with pressure board on top to increase the pressure area.

c. Functioning (fig. 22). This mine may be detonated by pressure or pull, after the safety pin is removed. Normally, a percussion



①



②

Figure 17. Cut-away of yardstick mine.

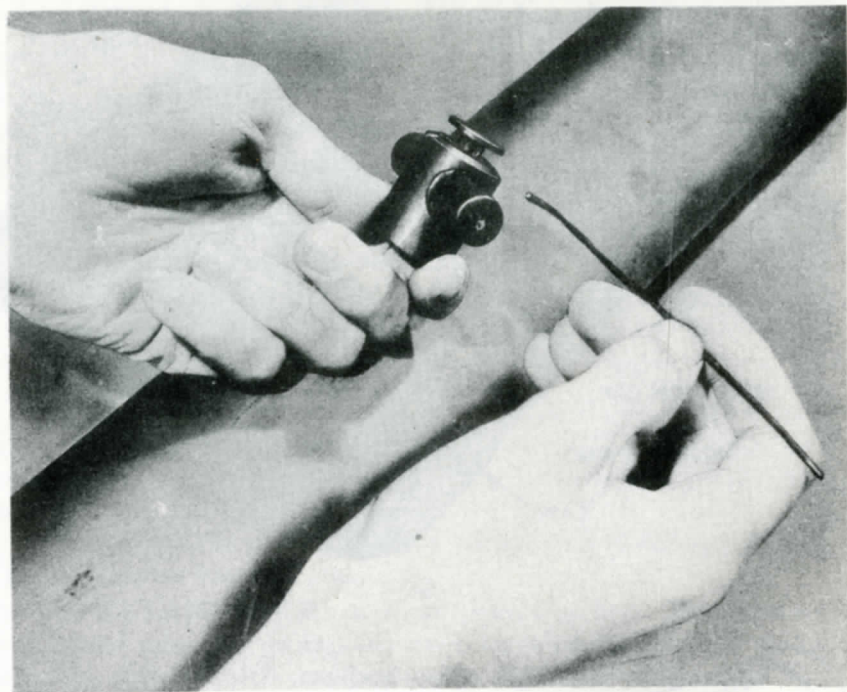


Figure 18. Disarming yardstick mine by inserting expedient safety wire into safety-pin hole of fuze.



Figure 19. Japanese type 97 hand grenade.

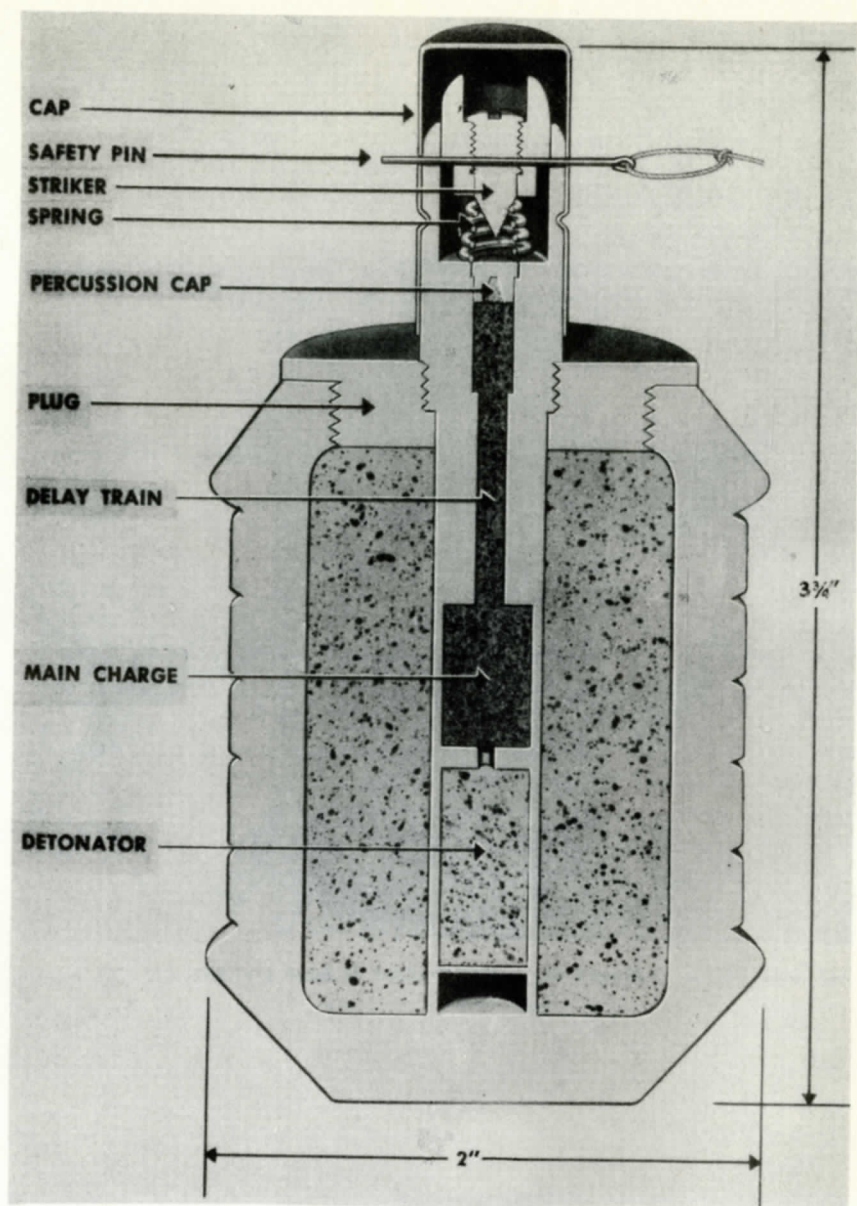


Figure 20. Cut-away of type 97 hand grenade

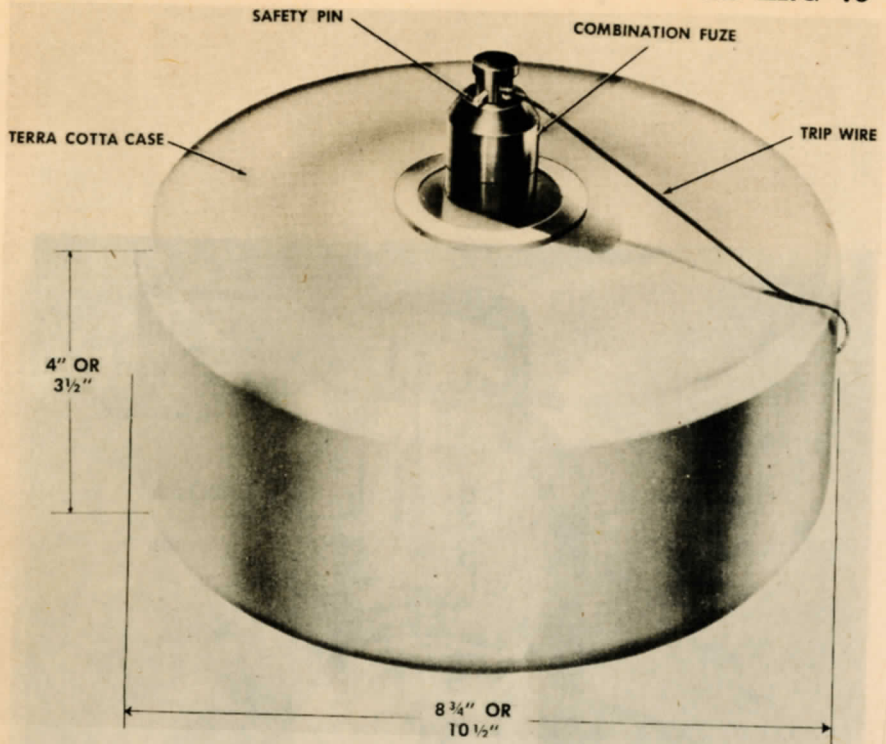


Figure 21. Type 3 Japanese land mine.

hammer within the fuze is held in position by a release fork to which a trip wire may be attached. When the wire is pulled, the fork releases the hammer, which is forced downward by the percussion hammer spring. The hammer hits the striker, forcing it against the percussion cap. A variable pressure up to 40 pounds, or a pull as low as 10 pounds, normally causes detonation.

d. Installing and arming. To install as an antitank mine, bury mine or lay it on surface of ground. Screw fuze into mine body and complete camouflage. Finally, remove safety pin from safety-pin hole.

e. Disarming (fig. 23). To disarm the mine, first examine carefully for trip wires. Then insert safety pin in fuze and cut any trip wires. To defuze, examine for booby traps, then with *safety pin in* and trip wires cut, unscrew fuze from mine (fig. 24). Fuze has either right- or left-hand thread.

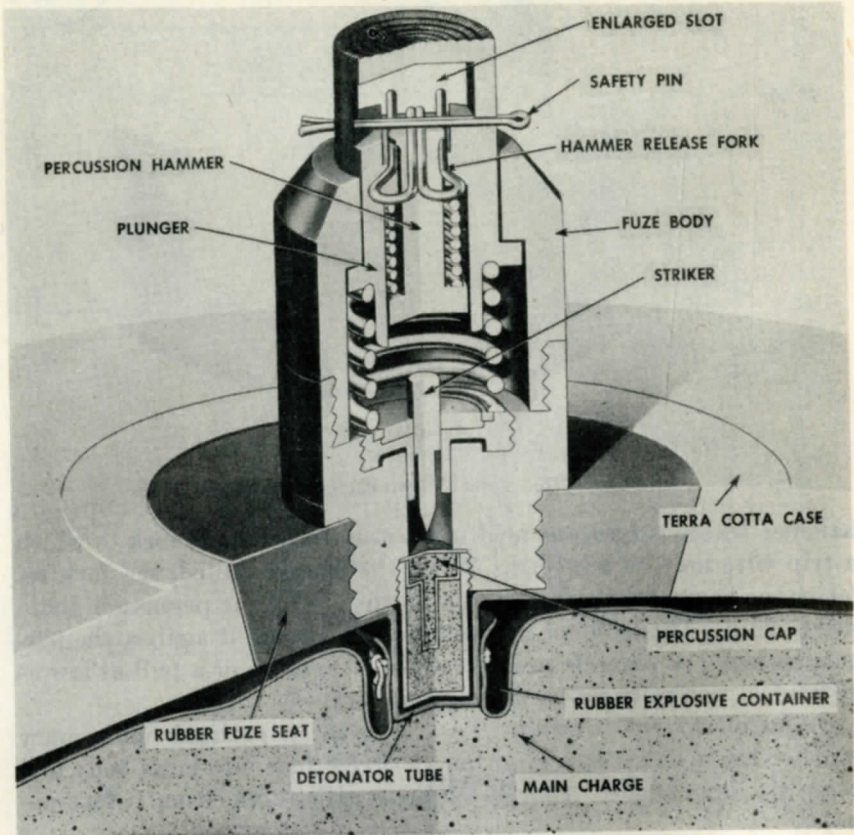


Figure 22. Cut-away of type 3 land mine.



Figure 23. Removing safety pin from safety-pin hole of fuze.

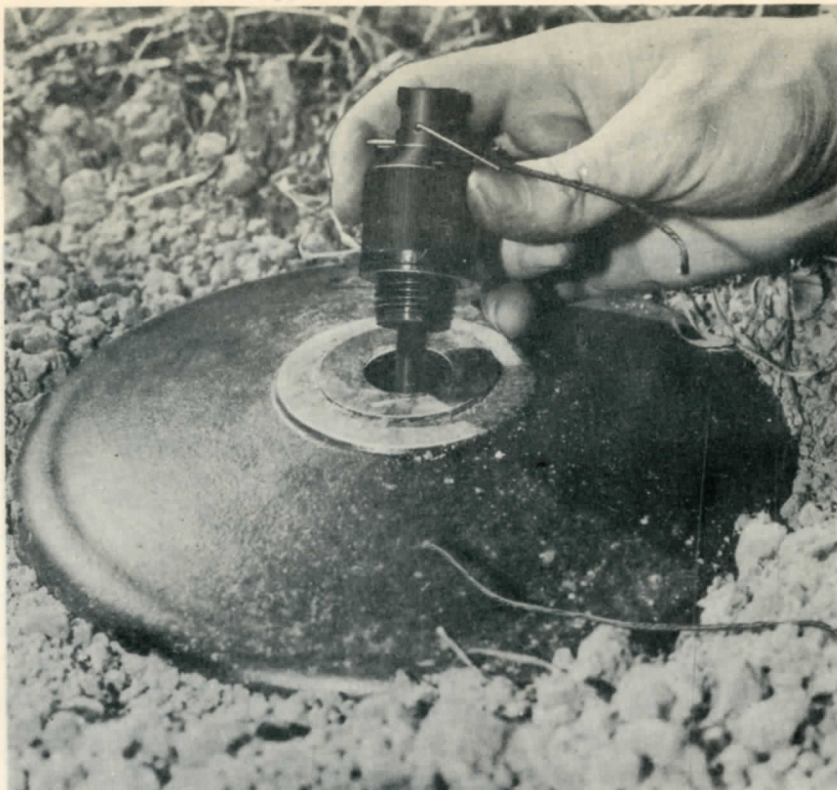


Figure 24. Defuzing type 3 land mine.

[AG 300.5 (4 Jun 45)]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

J. A. ULIO

Major General

The Adjutant General

G. C. MARSHALL

Chief of Staff

DISTRIBUTION:

AAF (10); AGF (10); ASF (2); T of Opn (5); T of Opn (Eng) (10); Arm & Sv Bd (1) except Eng Bd 15); S Div ASF (1); Tech Sv (2) except OCE (50); Sv C (10); ASF Dep (Eng Sec) (2); Dep 5 (2); Gen & Sp Sv Sch (2) except Eng Sch (50); USMA (2); AGF Repl Tng C (25); A (Eng Sec) (10); CHQ (Eng Sec) (10); D (2); B (2); R (2); Two (2) copies to the following T/O&E 5-15, 5-16, 5-17, 5-21, 5-72, 5-75, 5-88, 5-115, 5-116, 5-121, 5-135, 5-192, 5-200-1, 5-215, 5-216, 5-217, 5-225, 5-235, 5-267.

Refer to FM 21-6 for explanation of distribution formula.

THE ENGINEER BOARD

FORT BELVOIR, VA.

EXPERIMENTAL AND DEVELOPMENTAL MINE SET
TRAINING - JAPANESE

The above training mine sets are used to train men in the detection, arming, disarming and removal of Jap mines.

The set actually consists of replicas of Japanese Mines.

PRODUCTION

6/21/45 4 pieces

15,996 Open

16,000

CONTRACT

6/21/45 W44-009-eng-309 16,000 pcs.

WAR DEPARTMENT
THE ENGINEER BOARD
Fort Belvoir, Va.

Ref.
400.1 (DMS 476)

8 June 1945

Mr. A. C. Gilbert, President,
A. C. Gilbert Company
New Haven, Connecticut

Dear Sir:

Your attention is invited to Contract No. W44-009-eng-309 between the Engineer Board and The A. C. Gilbert Company for 16,000 Japanese Mine Training Aid Sets. Your organization is to be commended for their enthusiastic undertaking of the engineering, tooling and construction of pilot models of these sets in preparation for production. Your company submitted pilot models for approval ahead of contract schedule, this in spite of the fact that the time allowed was considered very short. The tooling and scheduling of materials for this contract, although not as well advanced, still is understood to be on schedule.

The pilot models have been approved and are considered to be what the Corps of Engineers needs for training our fighting men to safely deal with Japanese mines.

The end of the war in Europe signalled the swift acceleration of the war with Japan and the army's redeployment program started on V-E day, is placing increasing emphasis on the training of men for the Japanese war. The Japanese Mine Training Aid Sets are urgently needed for this training. As a result of accelerated training programs, these sets will be needed much sooner than was originally anticipated.

We need at least 2000 sets by the end of June and 6000 more by the end of July. I am therefore, asking you to exert every effort to move your entire production program for Japanese Mine Training Aid Sets ahead by one month. I am confident that you will achieve this goal efficiently and on time in the manner which has characterized past performances of The A. C. Gilbert Company in war production.

Your consideration of this urgent need and an early reply will be appreciated since further planning will be dependent on anticipated deliveries.

Very truly yours,

/s/ JOHN W. N. SCHULZ
Brig. Gen. U.S.A.
President

THE ENGINEER BOARD

FORT BELVOIR, VA.

5000 EXPERIMENTAL AND DEVELOPMENTAL MINE
ANTI-TANK YARDSTICK INDICATOR TYPE

This mine is intended to determine the efficiency of various mine field clearing devices. In other words, it indicates the amount of charge which will produce a blast sufficient to discharge a Japanese Yardstick mine by concussion.

PRODUCTION

6/21/45 2014 pcs.
Open 2986
5000

CONTRACT

3/24/45 W44-009-eng-311
5000 pieces

Order dated 3/24/45

WAR DEPARTMENT
SPRINGFIELD ORDNANCE DISTRICT
95 State Street
Springfield, Mass.

VANE ANEMOMETER

PRODUCTION

1073 pieces made and
shipped thru 6/28/45

CONTRACT

No. W19-059-Ord-2873 - 100,000 pcs.

Order dated 4/7/45

WAR DEPARTMENT
SPRINGFIELD ORDNANCE DISTRICT
95 State Street
Springfield, Mass.

FIN ASSEMBLY FOR SHELL, 81MM, M56

PRODUCTION

Wanted
August - 10,000
Sept: 42,000
Oct. 42,000
Nov. 42,000
December 42,000
Jan. '46 42,000
220,000

CONTRACT

4/11/45 W19-059-Ord-2904 - 220,000 pcs.

CANCELLED BY GENERAL HARDY ON JULY 6, 1945

AT CLEVELAND, OHIO

SPERRY GYROSCOPE COMPANY

Clinton Road & Stewart

Garden City, N.Y.

A84 BLOWER

For Restricted Experimental Work

<u>DATE</u>	<u>ORDER NO.</u>	<u>PIECES</u>
4/24/45	96084	40
4/27/45	R96524	20
6/4/45	R96550	20
6/21/45	606272	320

ANTI-PERSONNEL DEVICE, FOOTSHOOTER

INTRODUCTION

This instruction sheet is a guide to the use of the Anti-Personnel Device, Footshooter, which is designed to shoot a bullet thru the foot of the enemy when he steps on the device.

DESCRIPTION

The device when shipped includes the parts illustrated below.

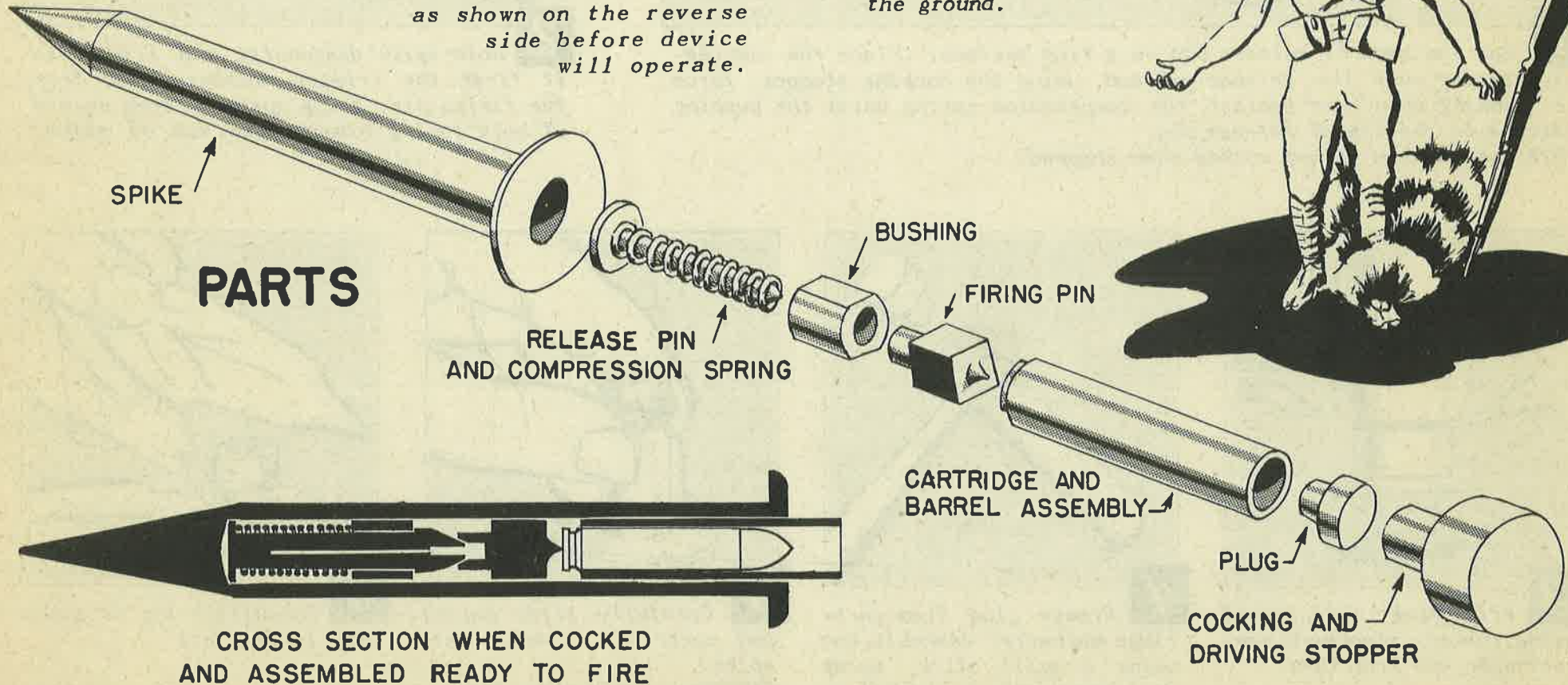
(A) The spike serves as a housing for the working parts and when the device is installed, serves to protect the device against moisture and dirt.

(B) The release pin, compression spring, and bushing comprise the trigger mechanism and must be cocked as shown on the reverse side before device will operate.

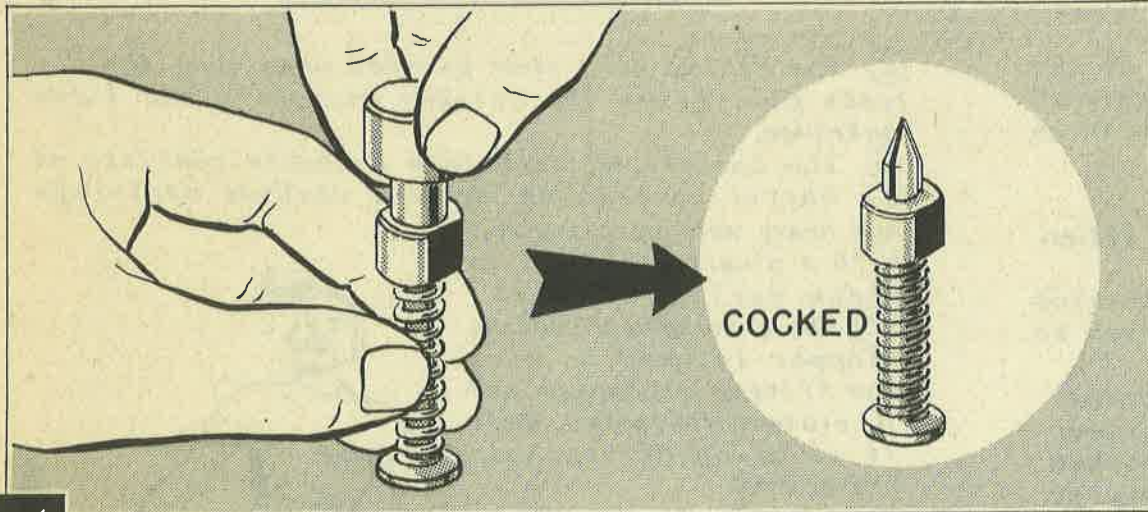
(C) The firing pin, when pressed down upon the release pin, trips the trigger mechanism and fires cartridge.

(D) The barrel and cartridge assembly consists of the barrel containing 30 cal. carbine cartridge and heavy waterproofing oil with a plug to hold oil in place during shipment.

(E) The driving and cocking stopper is used to cock the trigger mechanism and to protect the spike while it is being driven into the ground.

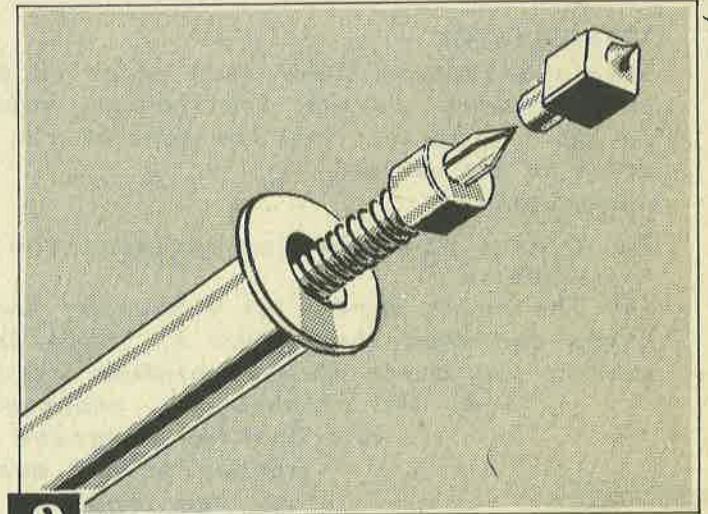


FOLLOW THESE SIX STEPS IN ASSEMBLING AND INSTALLING THE FOOTSHOOTER

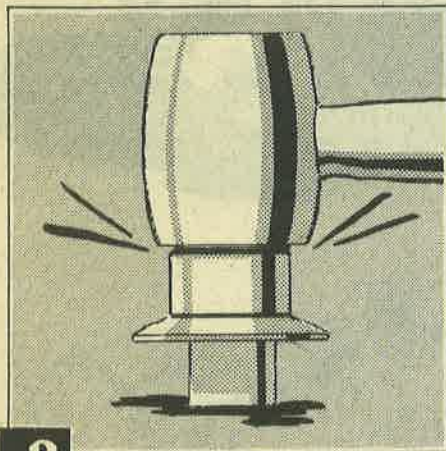


1 Set the base of release pin on a firm surface. Place the compression spring over the release pin and, using the cocking stopper, force the bushing down hard against the compression spring until the bushing catches on the lip of release pin.

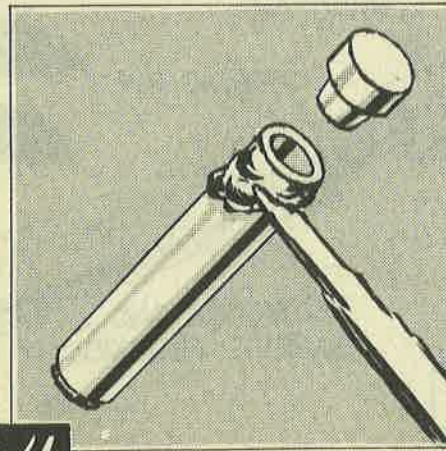
NOTE: Mechanism is not cocked when shipped.



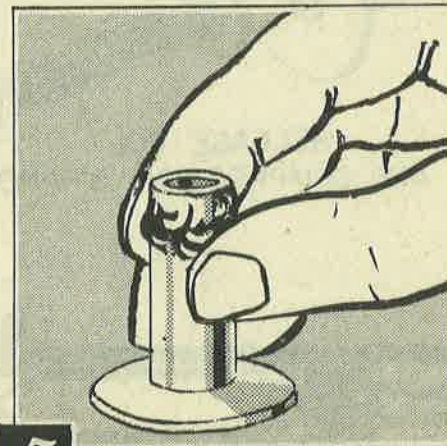
2 Hold spike diagonally and slide into it first the trigger mechanism and then the firing pin, being sure to keep points of both facing toward open end of spike.



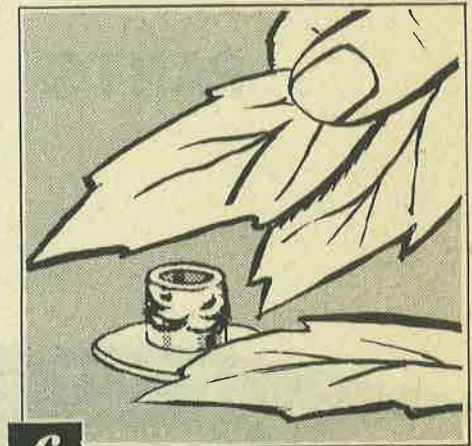
3 Drive spike into ground using cocking stopper to protect open end from dirt.



4 Remove plug from cartridge and barrel assembly and using a small stick, smear some heavy oil in barrel around outside of barrel $\frac{1}{4}$ " from end. This waterproofs device.



5 Carefully slide barrel and cartridge assembly into spike.
CAUTION: Don't drop into spike.



6 Camouflage top of spike with leaves, etc.

OFFICE OF STRATEGIC SERVICES

650 Fifth Avenue

New York, New York

FOOT SHOOTER

This is composed of a hollow spike which is driven into the ground and contains a firing mechanism which is topped by a Caliber .30 cartridge. An unwary enemy stepping or crawling on this device exerts enough pressure on the nose of the bullet to fire the device.

This device is similar to The Engineer Board, Fort Belvoir, Va.
T2 Pressure.

Order dated 5/5/45 - #1058 - for 5000 pcs.

Shipped 6/29/45 - 100 pieces

BRIDGEPORT MOLDED PRODUCTS

300 Myrtle Ave.

Bridgeport, Conn.

PROTECT PLUG CAP

This part is used in the electrical system of Airplane
Engines.

Order dated 5/22/45

4,000,000 Protect Plug Cap

PRODUCTION

Shipped through 6/26/45 - Total 994,684 pcs.

THE ENGINEER BOARD

Fort Belvoir, Va.

TYPE 3 LAND MINE FUZE

This fuze is used as an indicator test on the clearing of mine fields.

Order dated 6/7/45 - P.O. 39984 - 4000 pieces

Shipped 6/27/45 - 2000 pieces

A SHORT HISTORY OF FIRING DEVICES

Developed and Produced by The A. C. Gilbert Co.

Many of the items mentioned here are of a confidential nature and precautions should be taken that this report is not available for general distribution.

In February 1942, Major W. L. Erhardt (then 1st Lieutenant) of The Engineer Board, Fort Belvoir, Va. gave us the task of producing two types of Firing Devices, the M1 Pull type Firing Device and the M1 Pressure type Firing Device. Both were copies of devices used by the British with the exception of an American style base for attaching a blasting cap.

With only the Engineer Board drawings and no model, we made hand-made samples and immediately saw means by which they could be improved. On the Pull type we suggested wider slots in the firing pin to give more positive action and to simplify production, also vent slots in the head of the firing pin to prevent piston action which caused misfires, especially with water in the barrel.

On the Pressure type, whose firing pin was a hardened shear pin, we foresaw premature firing due to the effect of temperature changes or shock to this pin. Also it was impossible for reuse, a desirable feature for training. We, therefore, proposed the keyhole type trigger now in use.

Later we devised an adaptor which would function the device in a vertical position, a screw jack extension for use under higher objects and a three pronged extension, suggested by one used on a German fuze, for better camouflaging. The two latter were made standard equipment.

In March 1942, under Major Erhardt's supervision, we produced a sample of a toggle or tilt type of Pull Device which was studied by The Engineer Board but to our knowledge never adapted.

In April 1942, Major Erhardt brought us a model of a Pull device with a swivel head. The action of this device was such that it jammed fifty percent of the time causing misfires and our suggestions for improving it were requested. We submitted a model with a different action which functioned every time but required more than the desired pull to fire it. Upon further development to correct this fault, we discovered that with a simple alteration the device would function by pressure as well as pull. This was adopted and became known as the M1 Combination Firing Device which was for use by the Ordnance Dept. and called by them the Fuze for Anti-Personnel Mine M2 and M3. At the request of Capt. Marshall of Technical Division of Ordnance, a special base was designed for use with the A.P. Mine M2.

In April 1942, Mr. S. T. Franks from the Office of Coordinator of Information, later known as the Office of Strategic Services, brought us models, drawings, specifications and an order to produce Signal Relays. This was a duplicate of the British Delay Pencil. Only slight changes in this item were suggested which affected a considerable saving by reducing the cost of production. We take pride in our successful manufacture of this Device because of the laboratory accuracy which must be maintained in producing them for the various time delays required.

All these items were using great quantities of brass at a time when brass was at a premium so in August 1942 we submitted models of the M1 Pull, M1 Pressure and M1 Combination to The Engineer Board made of die cast zinc. Not only did these use a less strategic material but with some ingenuity in re-designing we were able to cut the cost of the devices in half without impairing, in any way, the efficiency of the item. Upon acceptance we changed over as quickly as dies could be made.

In August 1942 we experimented with an "L" Delay Device for The Engineer Board. This was a copy of a similar British device. It worked on the tensile strength of various diameters of a notched lead pellet, but was too inconsistent and never adopted.

In September 1942 Major Erhardt, not acquainted with the fact that we were producing Signal Relays, brought us one and asked if we could produce it with an American type base instead of a spring snout. He was pleasantly surprised with the early production date we could give him on these M1 Chemical Delay Firing Devices since it was only necessary to design and tool up for the new base and adapt it to the current production of Signal Relays.

Also in September 1942, Mr. J. P. Roysdon, Mechanical Engineer at The Engineer Board accompanied Major Erhardt and presented us with the problem of designing a friction type igniter, similar to a German device, but to be made of plastics. This little device, M2 Pull, had to be small, waterproof and as non-metallic as possible for booby trapping land mines. Many lots of this device, each lot slightly revised, were produced before the item finally satisfied all the requirements. A quantity was later purchased by the Navy Department for use with an underwater mine.

In November 1942, the Engineer Board submitted samples of the British Anti-Personnel Switch, commonly known as a Foot-shooter, for improvement. The British type were subject to premature firing. We devised an entirely different firing mechanism, which was approved, and produced a quantity for training.

In December 1942, we were asked to design a two (2) minute fuze, a waterproof device to cause a delay of two minutes between the firing of the device and the detonating of the charge. We succeeded in this assignment and submitted models to The Engineer Board but never produced any in quantities.

Also in December we developed a T3 Release type Firing Device similar to the British Release Switch and produced a quantity for training.

At the same time, December 1942, we started some development work for O.S.S. on a Pocket Relay. This was a Signal Relay with a special firing pin which struck a match and ignited a cylinder of thermite. With the assistance of a local fireworks manufacturer, we produced a number of models of this device.

In February 1943, we were called to the Pentagon Building to see Lieut. Col. P. O. Christensen (then Captain) of the Ordnance Department, Technical Division who went over an assembly drawing with us of an idea for an Impulse Delay Pressure type Firing Device, later called Impulse Actuated Firing Device, and asked us to design and build a model of a device which could be set to fire at any one of from one to thirty impulses or pressures applied to the device. A working model and drawings were delivered to him within a month. Several months later twelve more, slightly heavier models were requisitioned and built for the Ordnance Department.

In February 1943 Mr. Roysdon asked us to design a pull device which would also fire upon the release of or cutting the trip wire. The result was the T-3 Pull-Release Firing Device later designated M-3. Originating the mechanism for this device and making it a safe one to handle required considerable ingenuity. The device even has a built-in ratchet in order to obtain the proper tension on the trip wire.

In the same month we started making a Signal Relay Igniter for the Chemical Warfare Department, later for O.S.S. This was a time delay igniter for a pocket incendiary, an improved model of the Pocket Relay described above. We produced the Igniter only.

Shortly afterwards we produced a Special Time Delay unit for Harvard Chemical Laboratory. This functioned in a similar manner to the Pocket Incendiary mentioned above but was a much smaller and lighter unit which was to be dropped in large quantities from a plane and start innumerable fires.

In March 1943 we developed and produced a working model of a Mechanical Time Delay Firing Device which included a clockwork timer that could be set to fire at a predetermined time.

In the same month we started making A2 Type 6 Release Mechanisms and A2 Type 6 Pressure Mechanisms for O.S.S. These were copies of the similar British devices. We encountered considerable difficulty with the latter since the devices for British use and those for American use had to meet different requirements which were not discovered until after production had started and the devices tried in the field. To meet the need of either one was easy, but to combine both in the same device was an almost insurmountable task which was finally accomplished after much experimenting. We also made working models of an automatic extension for this device.

The O.S.S. adopted the American style Pull Type Firing Device instead of a British type since we could very readily convert part of our die capacity to accommodate the changes they required.

In April 1943 Captain Fritsche of the Engineer Board described to us an idea for a firing Device which would be activated by a concussion transmitted under water. The mechanism depended upon a thin glass wafer breaking, allowing the release pin to become free. A model was made and the glass couldn't be depended on to hold the release so it was restrained by a soluble pellet. Considerable research was required on this item both in determining the proper thickness of glass to react to a given concussion and also the best soluble material for the pellet. Since we didn't have the facilities for this sort of work, the development was turned over to Holmes Electric Protective Co. in New York, with us as consultants on the mechanical and production problems and we to produce samples. A satisfactory device was finally produced in quantities. In the meantime, Holmes Electric developed the same device working on a different principal which was a great improvement. At a joint meeting in November 1943 of representatives of N.D.R.C. for whom Holmes electric worked, The Engineer Board, the Navy, Spencer Thermostat Co. and The A. C. Gilbert Co. the new model, operated by a snap diaphragm was disclosed and adopted. We immediately started production on the M1 Concussion Detonator for the Army and the Demolition Firing Device Mark 6 for the Navy, with Capt. Estabrooks of The Engineer Board as the Integrating Officer.

In June 1943, Captain Torbert of The Engineer Board brought us a model of a release Device and asked us to make several samples incorporating some changes from this model. After the samples were approved we produced a quantity for training. In training it was found that further improvements were necessary. Several sets of revised models were made until finally one was produced which satisfied all requirements. This was known as M5 Pressure-Release type Firing Device.

In July 1943, Mr. Roysdon told us the Ordnance Department had requested an improved model fuze for the M2 A.P. Mine, with a safer action and with prongs as on the German fuze for that type of mine. Working with him we developed four different types of device, one of which was chosen to be produced. Samples were submitted to The Engineer Board, to Picatinny Arsenal and to Aberdeen Proving Grounds. This became the T12 and T13, later M6A1 and M7A1 for the Ordnance Department. While producing these we received an emergency call in January 1944 from Lt. Col. Christensen asking if we could produce a special base in a hurry for the T14 Fuze (the same fuze as above with a practice base for training.) To make a base to their blueprint, which was delivered by messenger that night, would require two months of tool work by their contracted facility, but by altering an old M2 base die we could produce a similar base in a much shorter time. The second day after the call we were in Washington with a drawing of the proposed alternate base. It was approved and in less than two weeks from the date of the call we were shipping T14 Bases.

In September 1943, Mr. Roysdon presented a request for a weatherproof fuse lighter which would be absolutely waterproof and show no visible flash. He brought with him a special, quiet, slow-burning primer and a spring snout. By using parts of another device and making a new firing pin and base, we produced for him an acceptable design and he returned to Fort Belvoir with a model the same night. After starting production on this item, we encountered trouble due to variations in this special primer. Availing ourselves of the Winchester Repeating Arm Co.'s proximity and good nature, we tested some of these primers in their laboratory. While there we discovered that its characteristics were in every respect the same as those of the Mark V Hand Grenade Primer which Winchester produces, but that the latter had less variations. We obtained a quantity, assembled them in M2 Fuze Lighters, sent them to The Engineer Board for test, received approval and have been using Mark V Primers ever since with more satisfactory results and a more dependable source of supply.

In October 1943 we submitted to The Engineer Board a working model of a "4 way" device; Pull, Pressure, Release or Pull-Release. A few months later we made accepted improvements on a Navy designed "4 way" Device. Neither device was produced in quantities as the man in the field was too apt to become confused and pull the wrong safety pin.

In January 1944, a representative from N.D.R.C. asked us to submit a design for a "Bushmaster" - a type of decoy weapon. A design was worked up and drawing submitted but we did no further work on it.

In May 1944 we were asked to duplicate, as near as possible, the German "Schu-Mine" for determining methods of mine field clearing. By using an M-2 Fuze Lighter body and firing pin, the base from an M-1 Pull device and a special release pin in a box, to the same dimensions as the German sample, we produced the "Simulated Foreign Demolition Container with Modified Fuze Lighter".

In October 1944, Capt. Hall of the R.D.A., Special Projects Branch of the Ordnance Department asked us to develop an Arming Delay, for a special bomb, similar to a sample he had which was used on another type bomb. We submitted two different models, the second one was accepted and we built a dozen samples for test. The A. C. Gilbert Company design was to be incorporated in the bomb fuze by the producer of the fuze. It was known as the T-3 Arming Delay and cover.

In February 1945, Captain McCord came from Fort Belvoir with a drawing of a special pull firing device to be used in mine field clearing. After certain revisions, to make the device practical from the production standpoint, a working model was made. After it was approved we produced a quantity for test purposes.

Also in February 1945 Mr. Roysdon brought up an assortment of Japanese mines and grenades. We are reproducing these in appearance and in certain functioning parts so that the soldier may be trained in detecting and disarming them. These are made up in kits called "Mine Training Aid Set No. 2, Japanese".

Some of these parts are also being produced with other details duplicated so that they may be used as indicators for testing mine clearing methods other than by personnel.

In May 1945 Lt. Col. McIntyre of O.S.S. sent us drawings to produce a "Foot Shooter, Anti-Personnel" which is the same as the one we designed for the Engineer Board with the addition of a short barrel into which the cartridge is placed to make it more effective.

At the same time work was started on a light weight Rocket Launcher mounted on a folding tripod for O.S.S.

In June 1945 Lieut. Pritchard of the Navy visited us for suggestions on waterproofing a delay device to be used under water. A week later Lieut. (j.g.) W. H. Taylor brought in drawings of the device and asked for our opinion of it. After several changes were proposed and made, samples were produced for test purposes.

In practically all cases we made the preliminary detail drawings for The Engineer Board and Ordnance Department and assisted with writing the specifications of the various devices. We also designed the packing for the devices. Many times during the course of production of these items, means were found to improve their functioning, decrease their cost or expedite their production and this information has been passed on to the contracting office.

The men of The A. C. Gilbert Company chiefly responsible for the design and development work on these devices are: Guy Schumacher, Works Manager; V.E. Dowman, Master Mechanic; W. J. Ziebell, Tool and Model Maker and J. E. McLoughlin, Design Engineer.

It is hoped that the various branches of the service will continue with research and development on this type of materiel after the war so that it will not be necessary to depend on our Allies or Enemies for ideas nor on hastily concocted devices for which there is no time for adequate testing or proper training.