TM 3-300 GROUND CHEMICAL MUNITIONS

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DEPARTMENT OF THE ARMY TECHNICAL MANUAL

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GROUND CHEMICAL MUNITIONS

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CHAPTER 1
INTRODUCTION

1. Purpose and Scope

This manual describes ground chemical munitions and gives information on their handling, functioning, storage, shipment, and destruction.

2. Record and Report Forms

a. DA Form 468 (Unsatisfactory Equipment Report). This form is used for reporting defects in design, manufacture, or operation of materiel, with a view to correcting such defects. It is also used for recommending modifications of materiel.

b. DD Form 6 (Report of Damaged or Improper Shipment). This form is used for reporting damages incurred in transit.

3. Markings on Chemical Munitions

a. Body Color. The bodies of chemical munitions are painted gray in conformity with standard markings for munitions.

b. Markings.

(1) One or two colored bands painted on the munition (or on the container in the case of the M25A1 grenade) indicate the type of chemical filling in accordance with the following code:

Type of filling	*Number and color of bands*
Nonpersistent war gas	One green band
Persistent war gas	Two green bands
Special-purpose agents	One red band
Smoke	One yellow band
Incendiary	One purple band

(2) The Chemical Corps symbol for the filling, the manufacturer's lot number, the date of filling, and other pertinent information are stenciled on the munition in the same color as the band.

4. Fillings for Ground Chemical Munitions

a. War Gases. War gases are described fully in TM 3–215.

b. Special-Purpose Agents. Special-purpose agents (TM 3–215) are used primarily for training and riot control.

(1) *Vomiting gases.* Vomiting gases are normally solids which vaporize when heated, forming toxic aerosols. Adamsite (DM), the standard vomiting gas, is used in ground chemical munitions only in combination with CN ((2) below).

(2) *Tear gases.* Tear gases are either solids which are burned to form an irritant vapor or liquids which are vaporized by a bursting-type munition. Tear gases used in chemical munitions are chloroactetophenone (CN), which is a solid used to fill grenades; and CNB, CNC, and CNS, which are liquids used in shell and spray tanks.

c. Smokes. Smoke-producing agents (TM 3–215) used in ground chemical munitions are—

(1) *HC smoke mixture.* HC smoke mixture consists of a mixture of hexachloroethane, zinc oxide, and grained aluminum. Type C mixture contains approximately 47 percent hexachloroethane, 47 percent zinc oxide, and 6 percent grained aluminum. In other types of HC mixtures, the proportion of hexachloroethane to aluminum is varied to control burning times.

(2) *White phosphorous.* White phosphorous (WP) is a chemical which ignites spontaneously when exposed to the air, giving off a dense white smoke.

(3) *Colored smoke mixtures.* Colored smoke mixtures are composed of baking soda, potassium chlorate, sugar, and a dye. The type of dye determines the color of the smoke.

(4) *Fog oil.* Fog oil is a petroleum oil used to fill thermal generator smoke pots. Two grades of fog oil, SGF1 and SGF2, are used. SGF1 is the thicker of the two and has a viscosity approximately the same as SAE 40 motor oil. The viscosity of SGF2 is approximately the same as SAE 15 motor oil. Kerosene is used to dilute the fog oil filling when smoke pots are to be operated at low temperatures.

d. Incendiary Fillings. Incendiary fillings used in ground chemical munitions are:

(1) *Thermite-base mixtures.*

(*a*) *TH1 thermite.* TH1 thermite is a mixture of powdered iron oxide and powdered aluminum. The mixture burns at approximately 4,000° F., and releases white-hot molten iron which acts as a heat reservoir and ignites combustible material with which it comes in contact.

(*b*) *TH2 and TH3 thermate.* TH3 thermate, the standard thermate filling for incendiary munitions, is a mixture of thermite, barium nitrate, and sulphur in an oil binder.

It has improved incendiary characteristics over thermite and, because of the binder, is more easily loaded into munitions. TH2 is an early version of thermate and is limited standard.

(2) *White phosphorous.* White phosphorous (WP), (*c* above), has limited incendiary effect caused by the heat evolved when the WP burns.

(3) *Thickened kerosene.* Kerosene thickened to a gel with M1 thickener (TM 3–366) is used as a filling in the M1 and M2 fire starters (pars. 80–87). The gel ignites easily and burns relatively slowly.

CHAPTER 2

SMOKE POTS

Section I. GENERAL

5. Description

Smoke pots are portable containers filled with a smoke-producing agent. They are of two general types: burning, and thermal generator. Burning-type pots are filled with HC smoke mixture (par. 4*c*(1)) and produce smoke when the filling is ignited. Thermal generator-type pots are filled with fog oil (par. 4*c*(4)) and produce smoke when the oil is vaporized by heat from burning fuel. Data on smoke pots are summarized in table I.

Table I. Smoke Pots

Smoke pot	Container size (in.)	Filling		Ignition method	Weight (lb)	Delay time (sec)	Burning time (min)	Units per container	Type of container	Shipping weight (lb)	Cubage (cu ft)
		Weight (lb)	Material								
Pot, smoke, HC, M1.	9 by 5½ dia	9½–11	Type C HC smoke mixture.	Match head and scratcher block (1)	12	10	5–8	3	Wood box	48	0.9
Pot, smoke, HC, 30-lb., M5.	9½ by 8½ dia.	28–34	——do——	Match head and scratcher block or electrical	33	20–30	12–22	1	——do——	47	1.1
Pot, smoke, floating, HC, M4A2.	13 by 12 dia.	23½ 27½	——do——	M207A1 floating smoke pot fuze.	38	10–20	10–15	1 1	Wood box Steel drum	47 48	2.0 2.1
Pot, smoke, floating, SGF2, AN–M7.	——do——	13–14 (2)	SGF2 (4)	M208 floating smoke pot fuze or M209 electric floating smoke pot fuze.	26.5 (5)	8–20	8–13	——	None	26.5 (5)	1.5
Pot, smoke, floating, SGF2, Mk 5 Mod 2.	——do——	——do——	——do——	——do——	25.5 (3)	——do——	——do——	——do——	——do——	25.5 (3)	——do——

(1) May be modified for electric firing.
(2) Shipped unfilled and w/o fuze.
(3) Filled weight, 39 lb.
(4) Filling for normal temperatures. See table II for hot- and cold-weather fillings.
(5) Filled weight, 40 lb.

6. Safety Precautions

Observe the following safety precautions when firing smoke pots:

a. When igniting a smoke pot manually, keep the head well to one side of the top of the pot and out of the way of possible sparks or flame.

b. Keep personnel at least 5 feet away from burning smoke pots to avoid flying sparks.

c. Wear a protective mask in heavy concentrations of smoke or when subjected to light concentrations for more than 10 minutes.

d. When training with smoke pots, take precautionary measures against accidental fires.

7. Methods of Firing

a. Single Ignition. Smoke pots can be ignited singly by using the means of ignition supplied with each pot. The M1 smoke pot (pars. 11–14) is designed for manual ignition but may be modified for electric ignition. The M5 smoke pot (pars. 15–18) has an integral electric ignition device in addition to a friction igniter and can be ignited either manually or electrically. Floating smoke pots (pars. 19–28) are ignited by igniting fuzes. Two of the floating smoke pots, the AN–M7 and the Mk 5 Mod 2, can be fitted with M209 electric floating smoke pot fuzes for electric ignition. Refer to paragraphs 120 through 123 for information on electric ignition.

b. Multiple Ignition. When a number of M1 or M5 smoke pots must be ignited simultaneously at different locations, they can be prepared for electric ignition and connected into an electric firing circuit as described in paragraphs 13*b* and 17*b*. The AN–M7 and Mk 5 Mod 2 floating smoke pots can also be ignited electrically in multiple when the M209 fuze is used.

c. Chain Ignition. A number of M1 or M5 smoke pots can be arranged to ignite in succession, thus providing smoke for a longer period than is possible using a single pot. To accomplish chain ignition, the pots can be placed in stacks (fig. 1) and one pot in the stack ignited, or they can be laid on their sides (fig. 2), end to end, and one pot ignited. Prior to stacking, the outer covers must be removed from all pots so that the igniting devices are exposed. Whether the pots are stacked vertically or laid on their sides, the heat generated by one burning pot in a series ignites the adjacent pot. When M1 smoke pots are stacked vertically, supports must be provided for stability. The M5 smoke pot is especially designed for vertical stacking, and because the bottom of one pot fits snugly into the top of the one below it, no support is required. The total burning time of a series of smoke pots ignited by chain ignition is slightly less than the sum of the

Figure 1. Smoke pots stacked vertically.

individual burning times, since each pot ignites shortly before the pot ignited previously is completely burned out.

8. Misfires

HC smoke pots which have misfired during normal ignition may be ignited by placing the ignition device in the misfired pot next to a burning pot and igniting the misfired pot by chain ignition (par. 7*c*). It is advisable to use a 4- to 6-foot pole when moving a misfired pot immediately following the first ignition attempt. After 5 minutes, the misfired pot can be moved safely by hand.

9. Concealing Glare of Burning Pots

When the tactical situation requires that the glare from a burning smoke pot be concealed, a shield must be improvised. The shield

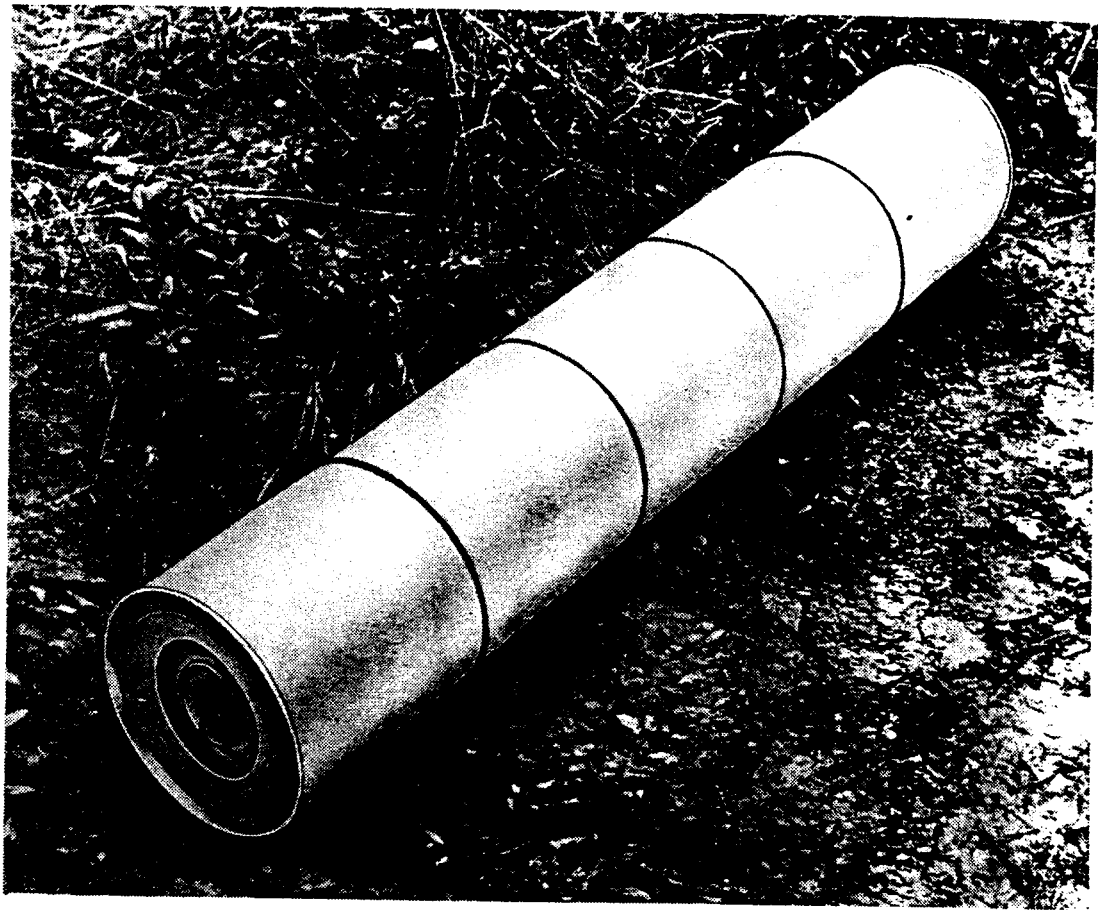


Figure 2. Smoke pots stacked horizontally.

must permit the smoke to escape freely while concealing the glare given off by the pot. The burning pot can be placed under a 55-gallon drum (A, fig. 3), in a covered trench (B, fig. 3), or the glare can be concealed by other field expedients. Neither the 55-gallon drum nor the trench will completely screen the light from the burning pots. Further, when a burning smoke pot is enclosed in a shield, slightly less smoke is emitted than from an unshielded pot; hence compensation must be made for the reduction in smoke by the use of additional smoke pots.

a. 55-Gallon Drum Method (A, Fig. 3). Cut a 14-inch-diameter hole in the center of one head of the drum and a 6-inch-diameter off-center hole in the other head. Place drum on blocks over smoke pot.

b. Covered Trench Method (B, Fig. 3). Dig a trench, 3½ feet long, 1 foot wide, and 3 feet deep. Place smoke pot on its side in the trench and cover trench with available materials, such as wood from packing boxes. Leave two 6-inch-wide openings for emission of the smoke.

10. Storage and Shipment

Filled smoke pots are group D chemical munitions. See paragraphs 124 and 125 for storage information. Shipments of smoke pots within

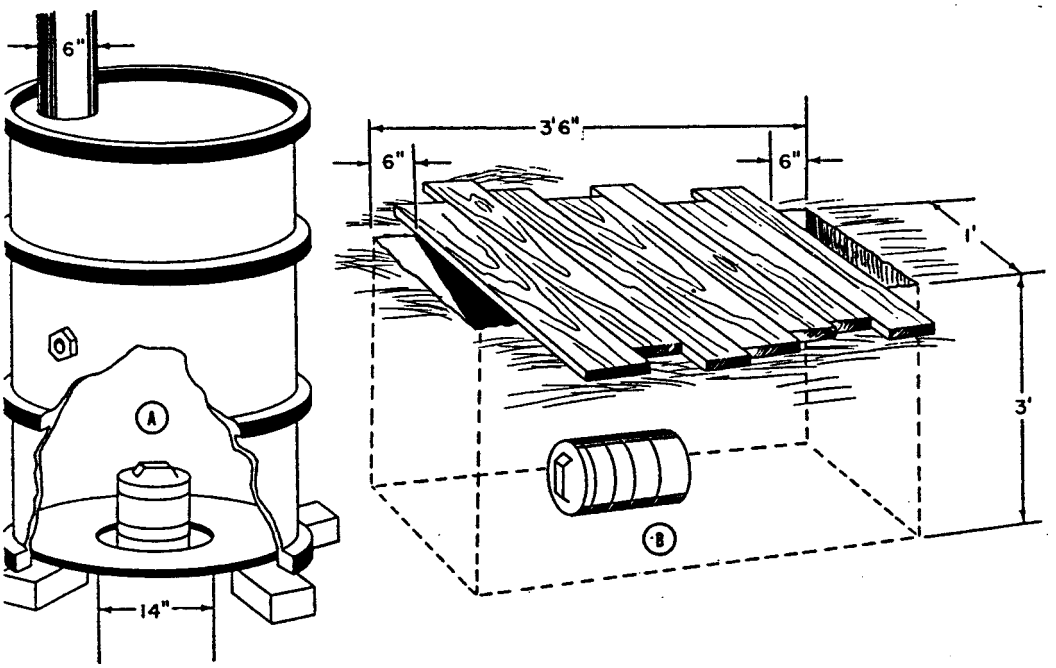


Figure 3. Methods of concealing glare from burning smoke pots.

e zone of interior must be made in accordance with applicable In-rstate Commerce Commission regulations for fireworks. Oversea ipments must comply with instructions contained in SR 55–730–10.

Section II. POT, SMOKE, HC, M1

. General

See paragraphs 5 through 10 for general information on smoke ›ts.

?. Description

The M1 smoke pot (fig. 4) is a cylindrical sheet-metal container, ½ inches in diameter by 9 inches high, filled with 9½ to 11 pounds type C HC smoke mixture and provided with an ignition device. A movable outer cover, which protects the contents during storage ıd shipment, is clamped to the top of the pot by a metal clamp and sealed with adhesive tape. A nonremovable inner cover with a ›le in its center covers the filling. A plastic cup containing a starter ixture is embedded in the filling directly under the hole in the inner ›ver. A match head is centered in the hole in the inner cover, in ›ntact with the starter mixture. A scratcher block in a paper en-›lope is packed between the outer and inner covers.

3. Operation and Functioning

a. Manual.

(1) *Single.* To prepare the M1 smoke pot for manual ignition,

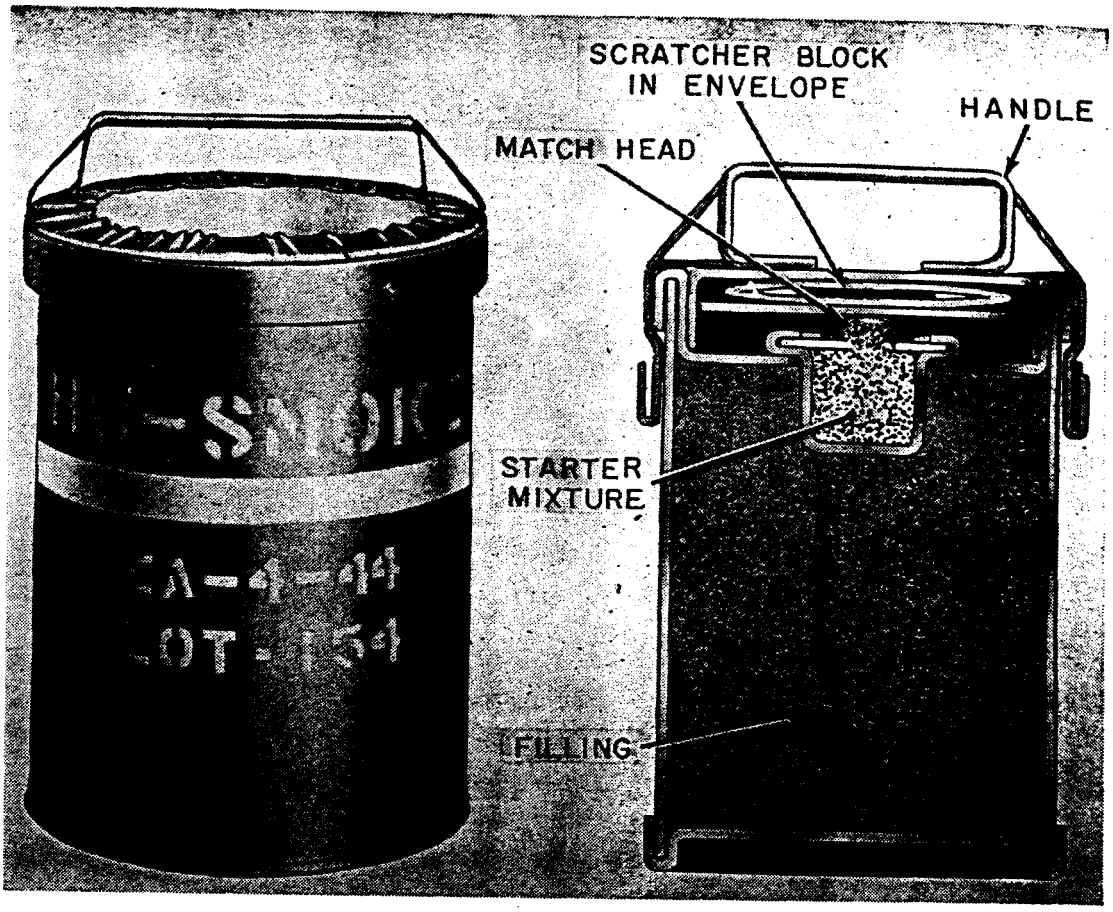


Figure 4. M1 HC smoke pot.

strip off the adhesive tape and clamp. Remove the outer cover, exposing the match head, and take the scratcher block from its envelope. To ignite, draw the scratcher block rapidly across the match head. The match head ignites the starter mixture, which in turn ignites the HC filling. After a delay of approximately 10 seconds, smoke is produced for 5 to 8 minutes.

(2) *Chain.* Remove the outer covers from the required number of pots, stack the pots vertically or lay them end-to-end horizontally, and ignite one pot (par. 7*c*).

b. Electric.

(1) The M1 flash-vented electric squib (par. 121*a*) is used to ignite the M1 smoke pot electrically. (This squib is not a component of the M1 smoke pot; it is issued separately.) Preparation for electric ignition is explained in (2) below and illustrated in figure 5. To ignite the pot, connect the lead wires from the squib to a source of electric current. Power sources, wire, and wiring for electric ignition are discussed in paragraphs 120 through 123.

(2) To prepare the M1 smoke pot for electric ignition, remove tape, clamp, and cover (A, fig. 5). Remove sealing com-

pound, using clamp as a scraper (B). Place squib beside match head with one hole in squib facing match head (C). Cover squib and match head with a piece of the waterproof tape which was removed from cover. Tape squib lead wires to cover with a second piece of tape (C). Make a shallow dent in lip of cover (D), then press cover firmly in place, allowing squib lead wires to pass under dent. Seal junction between pot and cover with sealing compound, using clamp as an applicator (E). Make a half hitch around pot with squib lead wires (F). Fasten clamp around pot, above half hitch in squib lead wires, to hold wires in place (F).

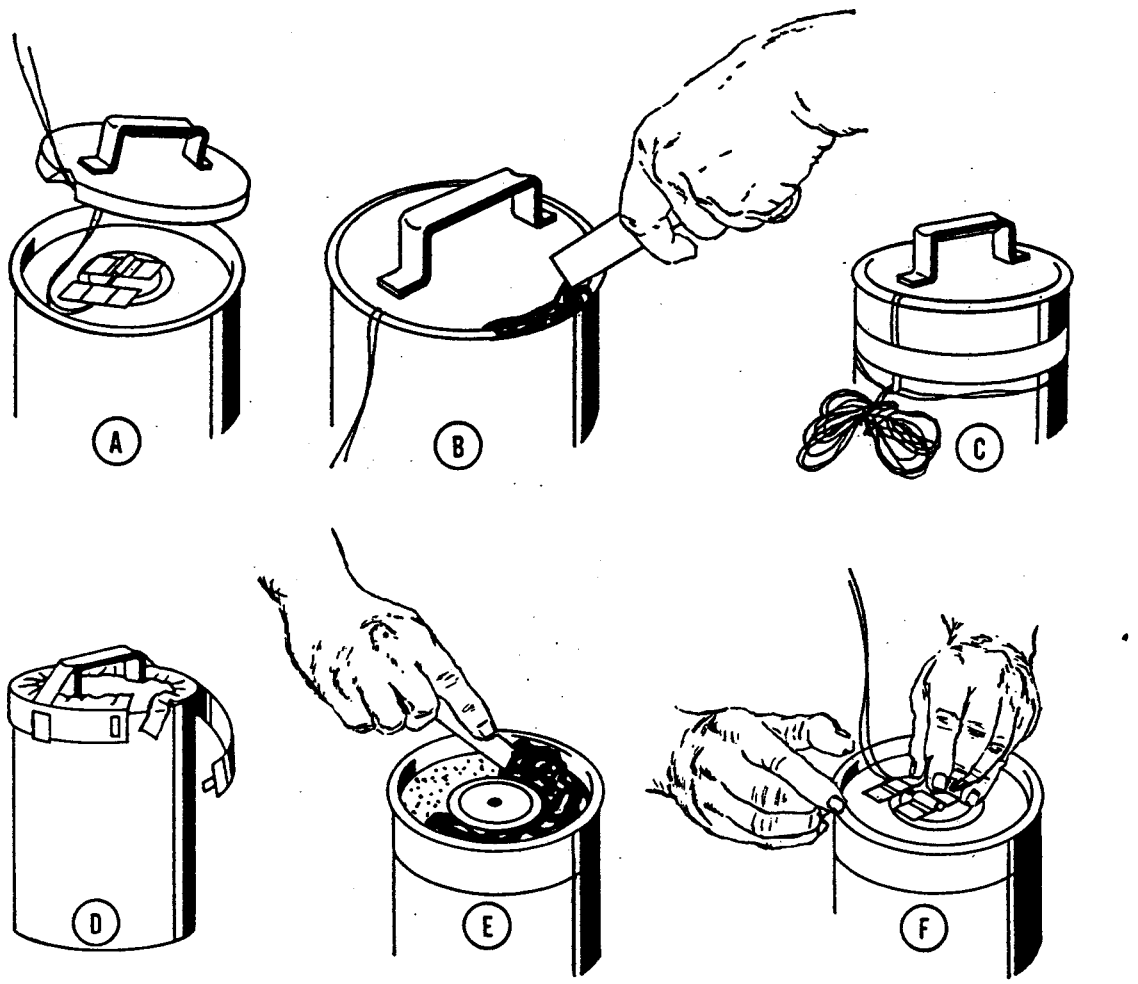


Figure 5. Preparing the M1 HC smoke pot for electric ignition.

14. Packing

Three M1 smoke pots are packed in a wood box. A box of pots weighs 48 pounds and displaces 0.9 cubic foot.

Section III. POT, SMOKE, HC, 30-LB., M5

15. General

See paragraphs 5 through 10 for general information on smoke pots.

16. Description

a. The M5 smoke pot (figs. 6 and 7) is a cylindrical sheet-metal container, 8½ inches in diameter by 9½ inches high, filled with approximately 30 pounds of type C HC smoke mixture and 1 pound of fast-burning smoke mixture and provided with an ignition device. The bottom of the container is tapered to a diameter of 8¼ inches to permit stable stacking.

b. The pot is covered by a nonremovable outer cover with a circular tear strip. Two binding posts, which are mounted on the outer cover, are connected internally by two lead wires to two electric squibs. (Pots produced before August 1954 have only one internal squib.) A carrying handle is mounted on the outer cover. An inner cover with a circular hole in its center covers the filling. A plastic cup containing a starter mixture is embedded in the top of the filling under the hole in the inner cover. A match head which is centered above the starter mixture is accessible when the tear strip is re-

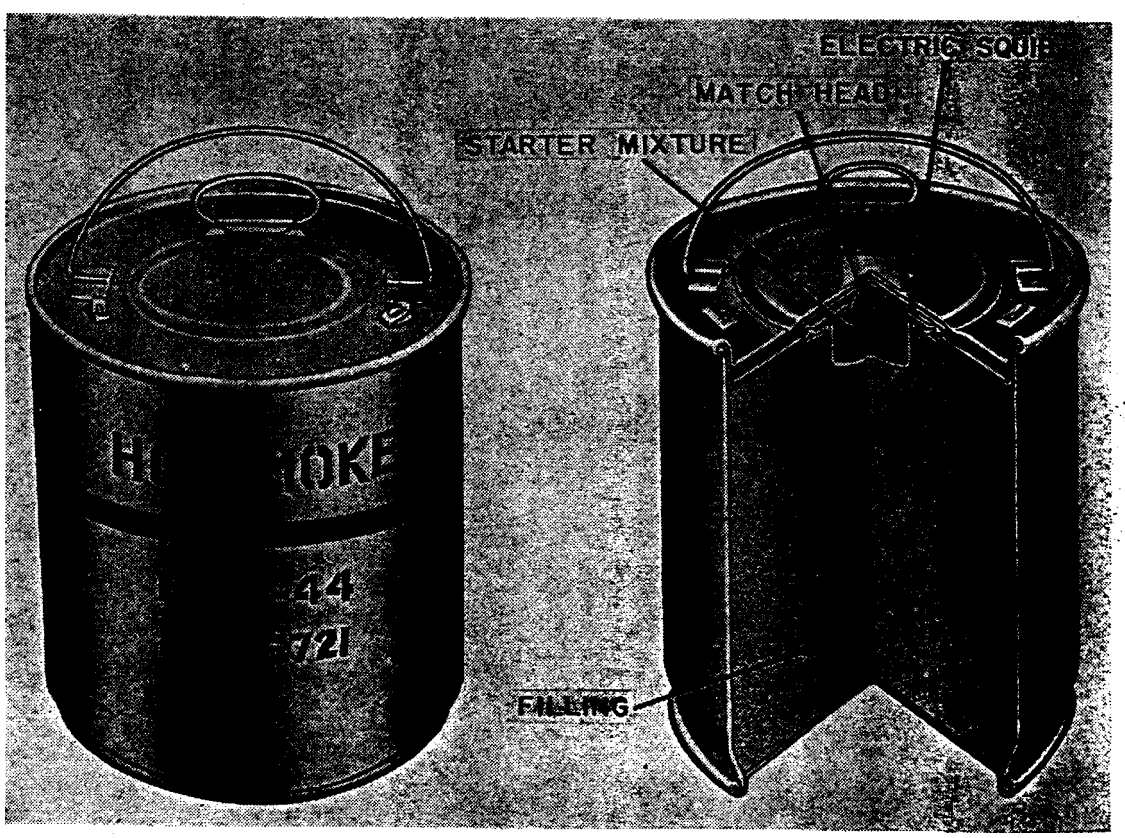


Figure 6. M5 30-lb. HC smoke pot.

moved. A scratcher block in a paper envelope is packed between the inner and outer covers.

17. Operation and Functioning

a. Manual.

(1) *Single.* To prepare an M5 smoke pot for manual ingestion (fig. 7), remove the tear strip by pulling the tear strip handle upward, and remove the scratcher block from its envelope. To ignite the pot, draw the scratcher block quickly across the match head. Flame from the match head travels to the starter mixture, which in turn ignites the HC

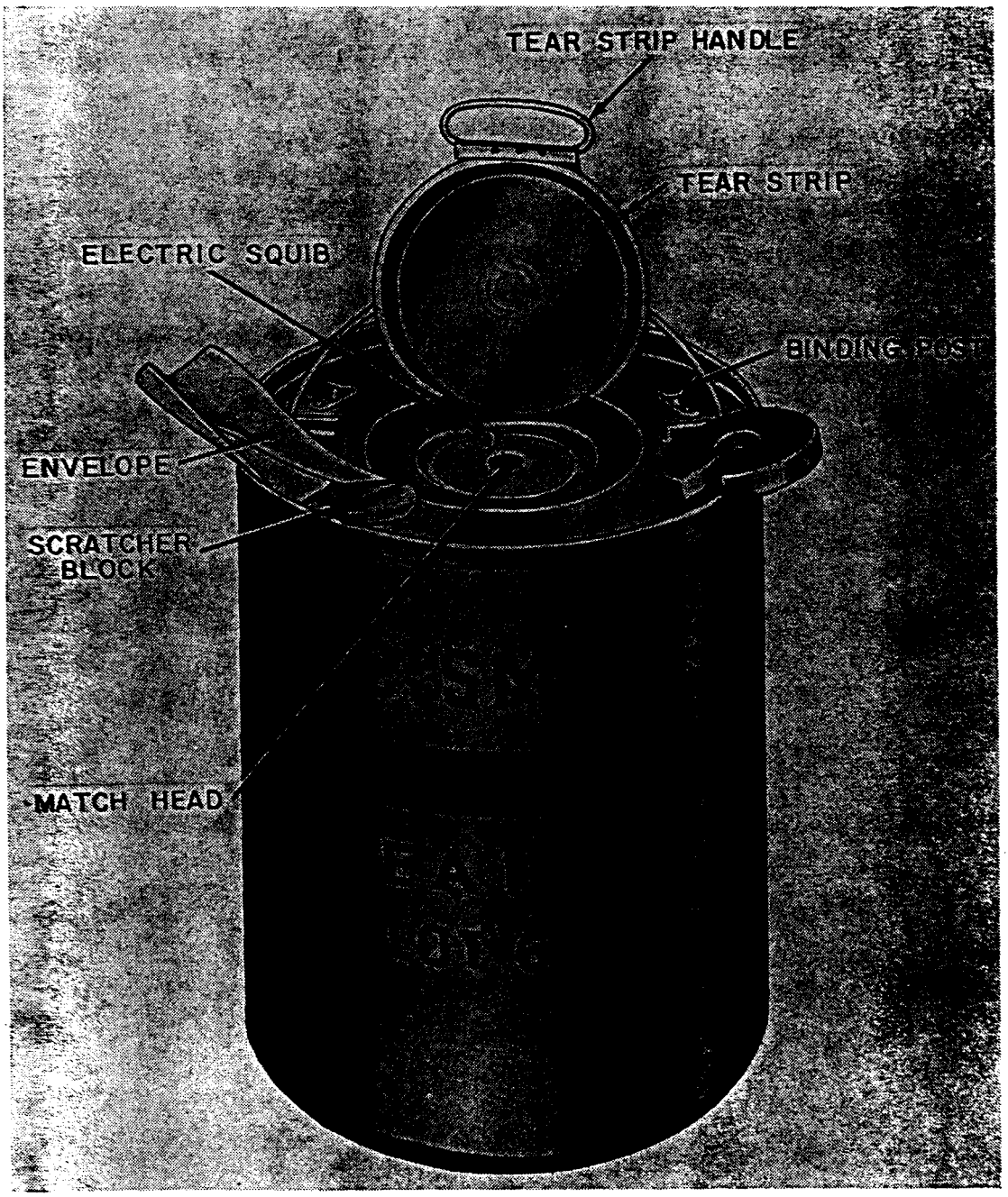


Figure 7. M5 smoke pot prepared for manual ignition.

filling. After a delay of 20 to 30 seconds, smoke is produced for 12 to 22 minutes.

(2) *Chain.* Remove tear strips from all pots; then stack the pots (par. 7*c*) by fitting the bottom of one into the top of the next. Stacks may be either vertical or horizontal. When the stack is complete, ignite the end pot.

b. Electric. M5 smoke pots may be ignited singly or in multiple by electric ignition. See paragraphs 120 through 123 for information on electric power sources, wire, and wiring. To prepare for electric ignition, connect wires from the power source to the binding posts. (It is not necessary to remove the tear strip when firing pots electrically.) When the electric circuit is completed, the squib ignites the match head, which in turn ignites the starter mixture. The burning starter mixture ignites the HC filling which generates sufficient heat to soften the solder holding the tear strip. Internal pressure blows off the tear strip, allowing the smoke to escape. When necessary, a 1½-volt flashlight battery (BA 30) can be used to ignite a single pot. To ignite the pot, attach or hold a 1-foot piece of wire to the center terminal of the battery, rest the base of the battery on one of the binding posts, and touch the other end of the wire to the other binding post, closing the circuit.

Warning: Move away from the M5 pot within 10 seconds after igniting it electrically, as the tear strip may be blown off with explosive force.

18. Packing

The M5 smoke pot is packed individually in a wood box. A box containing one pot weighs 47 pounds and displaces 1.1 cubic feet.

Section IV. POT, SMOKE, FLOATING, HC, M4A2

19. General

See paragraphs 5 through 10 for general information on smoke pots.

20. Description

a. The M4A2 floating smoke pot (fig. 8) is a metal container, 12 inches in diameter by 13 inches high. The lower third of the pot contains 23½ to 27½ pounds of HC smoke mixture. A waterproof outer cover secured to the pot by a quick-release clamp keeps moisture out of the pot and protects the fuze. A steel carrying handle is attached to the outer cover. A dish-shaped inner cover covers the filling and provides a mounting for a fuze adapter. Three vent holes in the

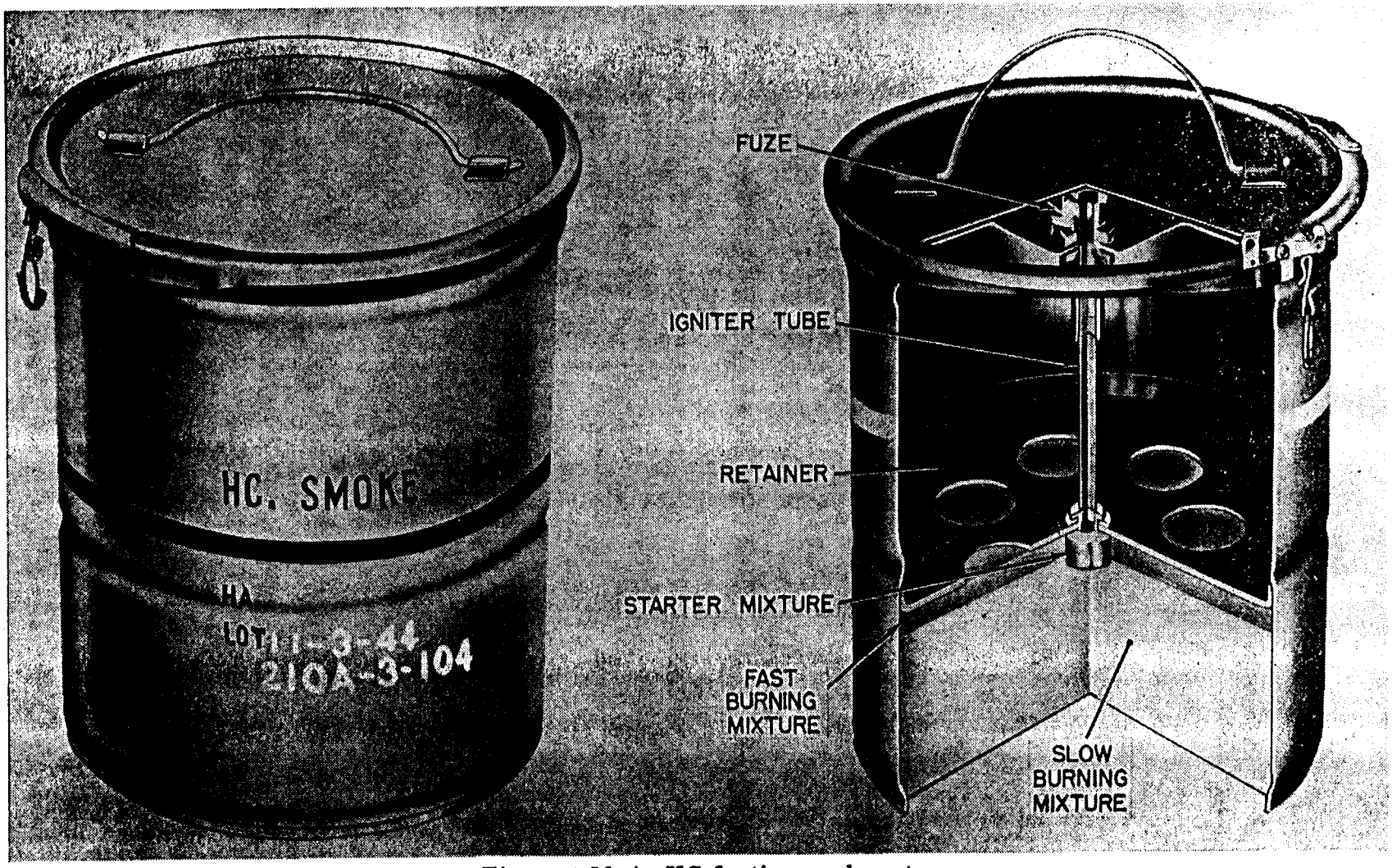


Figure 8. M4A2 HC floating smoke pot.

inner cover are covered with adhesive tape. A steel handle is attached to the inner cover for carrying the smoke pot after the outer cover has been removed.

b. Starter mixture in a plastic cup is embedded in the smoke mixture. The filling is separated from the air chamber above it by a plastic closure disk held in place by a metal retainer.

c. The M207A1 floating smoke pot fuze (fig. 9) is screwed into the fuze adapter in the inner cover. An igniter tube extends downward from the lower end of the fuze adapter to the starter mixture.

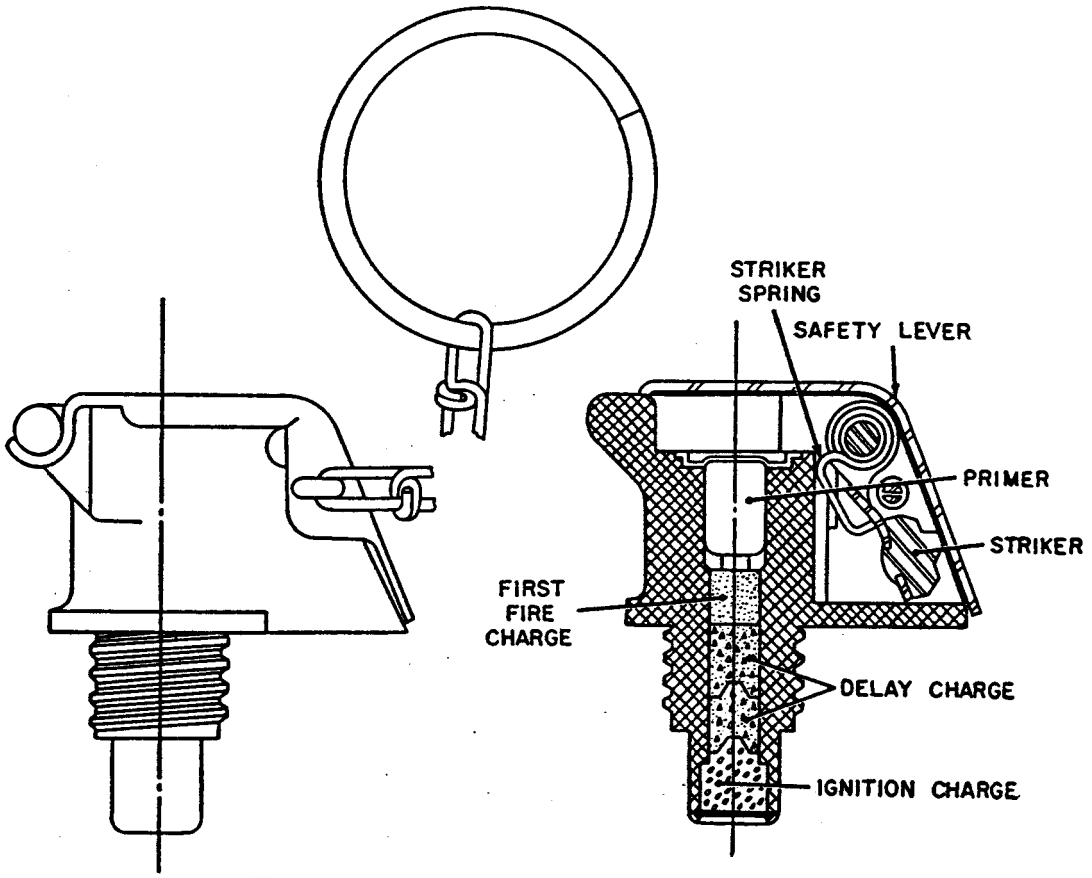


Figure 9. M207A1 floating smoke pot fuze.

21. Operation and Functioning

Remove the quick-release clamp and outer cover, exposing the fuze. Hold the safety lever (fuze lever) firmly against the fuze body and withdraw the safety pin (fig. 10). Lift the pot by its handle and drop it into the water, releasing the safety lever. When the safety lever is released, the striker (fig. 9), driven by the striker spring, hits the primer. The primer ignites the first-fire charge, which in turn ignites the delay charge. After 1.2 to 2 seconds, the delay charge ignites the ignition charge, completing the fuze action. Flame from the ignition charge travels through the igniter tube to the starter mixture, which in turn ignites the HC filling. Pressure builds up

inside the pot and blows off the adhesive tape covering the vents in the inner cover. Total delay time from release of the safety lever until smoke production begins is 10 to 20 seconds. The M4A2 smoke pot burns from 10 to 15 minutes.

22. Packing

M4A2 floating smoke pots are packed individually in either a wood box or a steel drum. The wood box containing one pot weights 47 pounds and displaces 2.0 cubic feet. The steel drum has a removable steel cover which is held in place by a closing ring. A packed steel drum weighs 48 pounds and displaces 2.1 cubic feet.

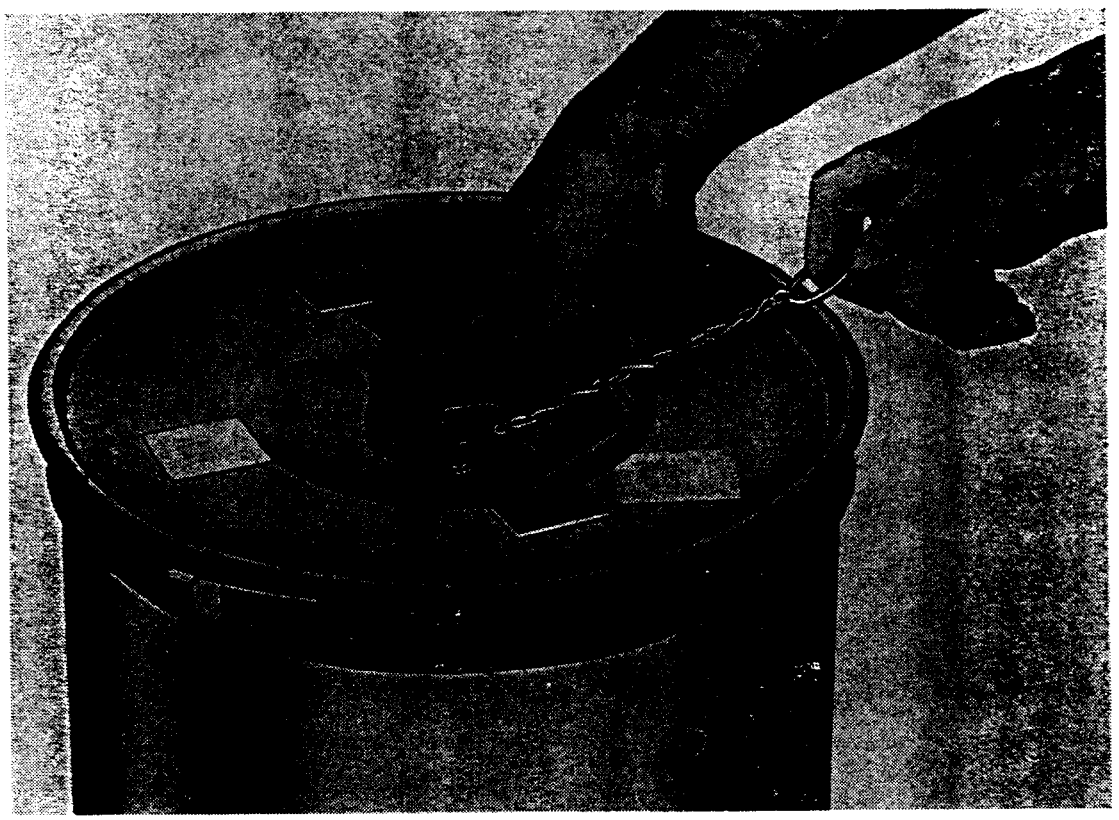


Figure 10. Firing the M4A2 floating smoke pot.

Section V. POT, SMOKE, FLOATING, SGF2, AN–M7, AND POT, SMOKE, FLOATING, SGF2, MK 5 MOD 2

23. Description

a. Body. The body of the AN–M7 floating smoke pot (fig. 11) is a metal container 12 inches in diameter by 13 inches high. The upper portion of the body is ribbed; the base of the body is slightly tapered to facilitate stacking in storage. An outer cover with a carrying handle attached is fastened to the pot by a ring clamp. A dish-shaped inner cover (figs. 12 and 3, fig. 13) with a carrying handle attached

is fastened to the body by lugs and steel strapping. A fuze adapter (2, fig. 13) in the center of the inner cover provides a seat for the fuze (18). Three vent holes spaced equally around the fuze adapter provide outlets for the smoke. When the pot is shipped, the vent holes are sealed with adhesive tape, and a plastic plug (fig. 12) is screwed into the fuze opening in the adapter.

Figure 11. AN–M7 SGF2 floating smoke pot.

b. Interior. An air chamber (4, fig. 13) below the inner cover (3) occupies the upper third of the body. Three sink holes (5), 1/8 inch in diameter, are cut in the side of the air chamber, and are sealed with a low-melting-point solder. An oil chamber (8), is directly below the air chamber and is separated from it by an air partition (17). The oil chamber extends to the bottom of the pot. A filling hole (14) in the side of the container, which is used when filling the pot with fog oil prior to use, is closed by a screw plug. Inside the oil chamber, a fuel chamber assembly consisting of a fuel chamber (12), venturi tube (16), pressure tube (6), and oil-feed tube (15) is crimped to the bottom of the body and sealed with a plastic compound. The fuel chamber contains a fuel block (9) which consists of slow-burning fuel mixture covered by a thin layer of fast-burning fuel mixture. The fuel mixtures are composed of varying proportions of ammonium

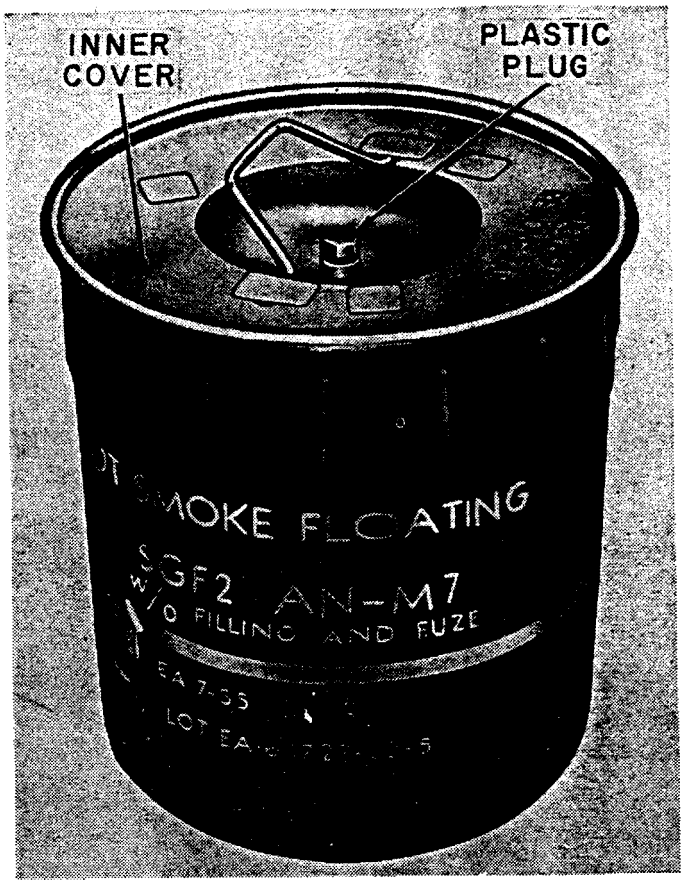


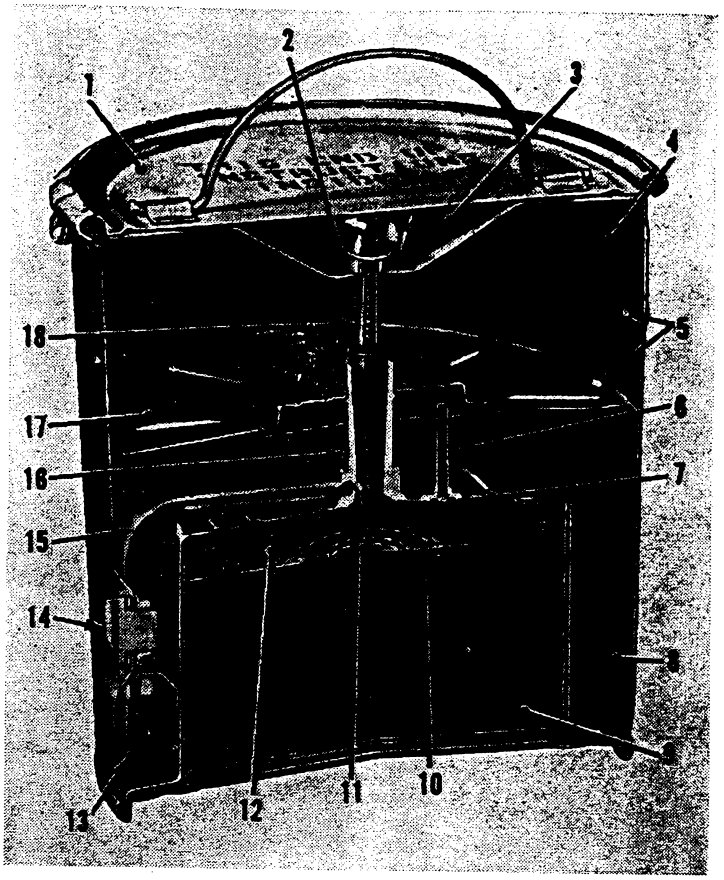
Figure 12. AN–M7 floating smoke pot with outer cover removed.

nitrate, charcoal, and wax. A doughnut-shaped ring of starter mixture (10) is embedded in the top of the fuel block. The venturi tube extends from the top of the fuel chamber, through the oil chamber, and into the air chamber. The oil-feed tube is connected to the side of the venturi tube and extends to the bottom of the fog oil chamber, where it is covered by a screen (13). The point of connection between the oil-feed tube and the venturi tube is sealed with a low-melting-point solder seal (11). The pressure tube is connected to the top of the fuel chamber and extends above the surface of the oil in the oil chamber. The fuel chamber end of the pressure tube also is sealed with a low-melting-point solder seal (7).

c. Fuzes. Either an M208 floating smoke pot fuze (fig. 14) or an M209 electric floating smoke pot fuze (fig. 15) may be used to ignite the smoke pot.

24. Filling and Fuzing

The AN–M7 floating smoke pot is normally shipped to the Navy and to the Army chemical depots unfilled and unfuzed. Fog oil and fuzes are shipped separately. Pots used by the Navy are normally filled and fuzed on shipboard immediately before use. Those used by the



1	Outer cover	10	Starter mixture
2	Fuze adapter	11	Solder seal
3	Inner cover	12	Fuel chamber
4	Air chamber	13	Screen
5	Sink holes	14	Filling hole and plug
6	Pressure tube	15	Oil-feed tube
7	Solder seal	16	Venturi tube
8	Oil chamber	17	Air partition
9	Fuel block	18	Fuze

Figure 13. Components of AN–M7 floating smoke pot.

Army are filled and fuzed at chemical depots before issue to using organizations.

a. The oil filling procedure may be varied depending on the available facilities and on the number of pots to be filled. When filling a large number of pots at one time, it may be desirable to connect several drums of oil to a filling manifold having a number of drawoff stations. In a smaller operation, oil may be drawn directly from a valve screwed into the end of an oil drum. See table II for the type of fog oil or mixture to be used at various temperatures.

b. When filling a pot with oil, leave the outer cover clamped on. Fill as follows:

(1) Lay the pot on its side with the filling hole uppermost and place chocks at both sides to prevent the pot from rolling.

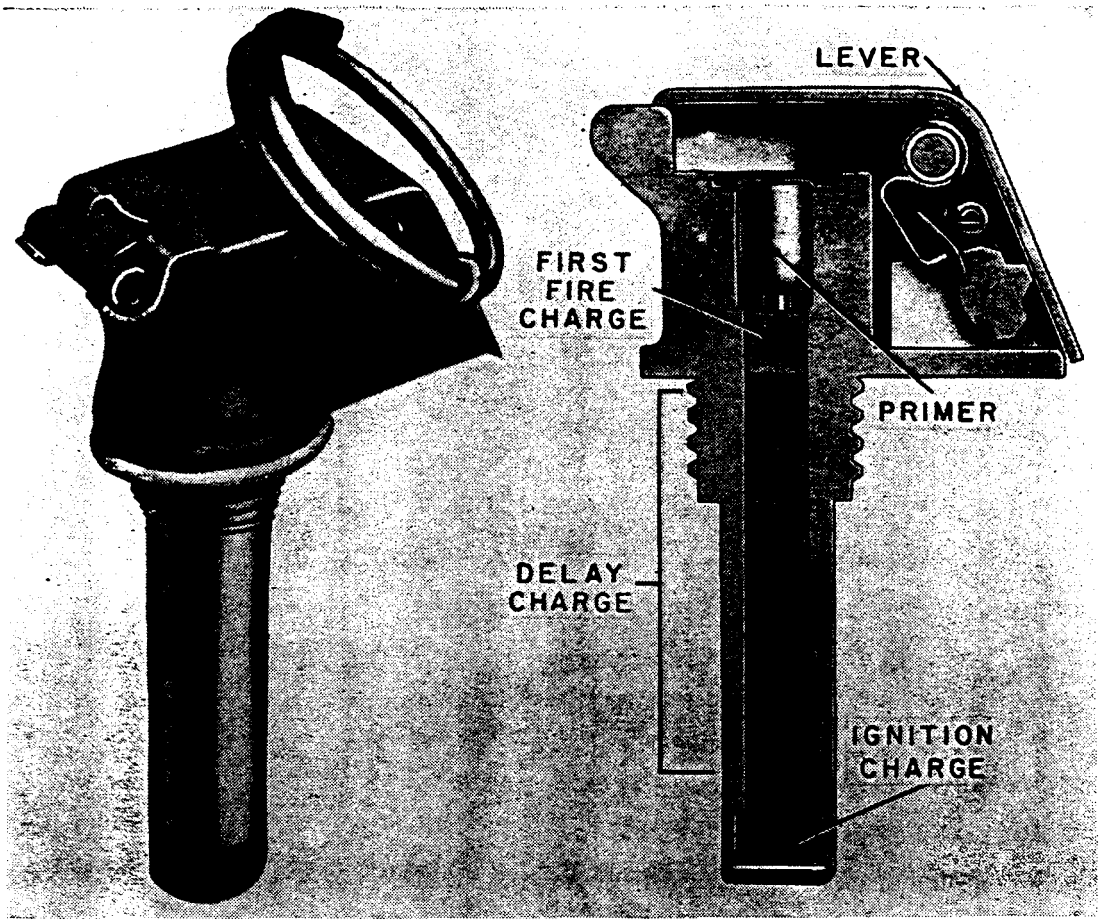


Figure 14. M208 floating smoke pot fuze.

Table II. Filling for Thermal Generator Smoke Pots

Operating temperature (° F.)	Recommended filling
Above 90	SGF1
Zero to 90	SGF2
Zero to —25	3 parts SGF2, 1 part kerosene
—25 to —40	Equal parts SGF2 and kerosene

(2) Remove the filling plug and asbestos gasket from the pot. Keep the gasket in place on the plug to prevent its loss.

(3) Pour oil into the oil chamber to the level of the bottom of the filling hole. Approximately 13½ pounds of oil will fill the oil chamber to this level and will leave the necessary void.

(4) Screw the filling plug and gasket in the filling hole, and tighten the plug with a wrench.

c. To fuze the smoke pot, remove the ring clamp and outer cover, unscrew the plastic plug from the fuze adapter, and screw an M208

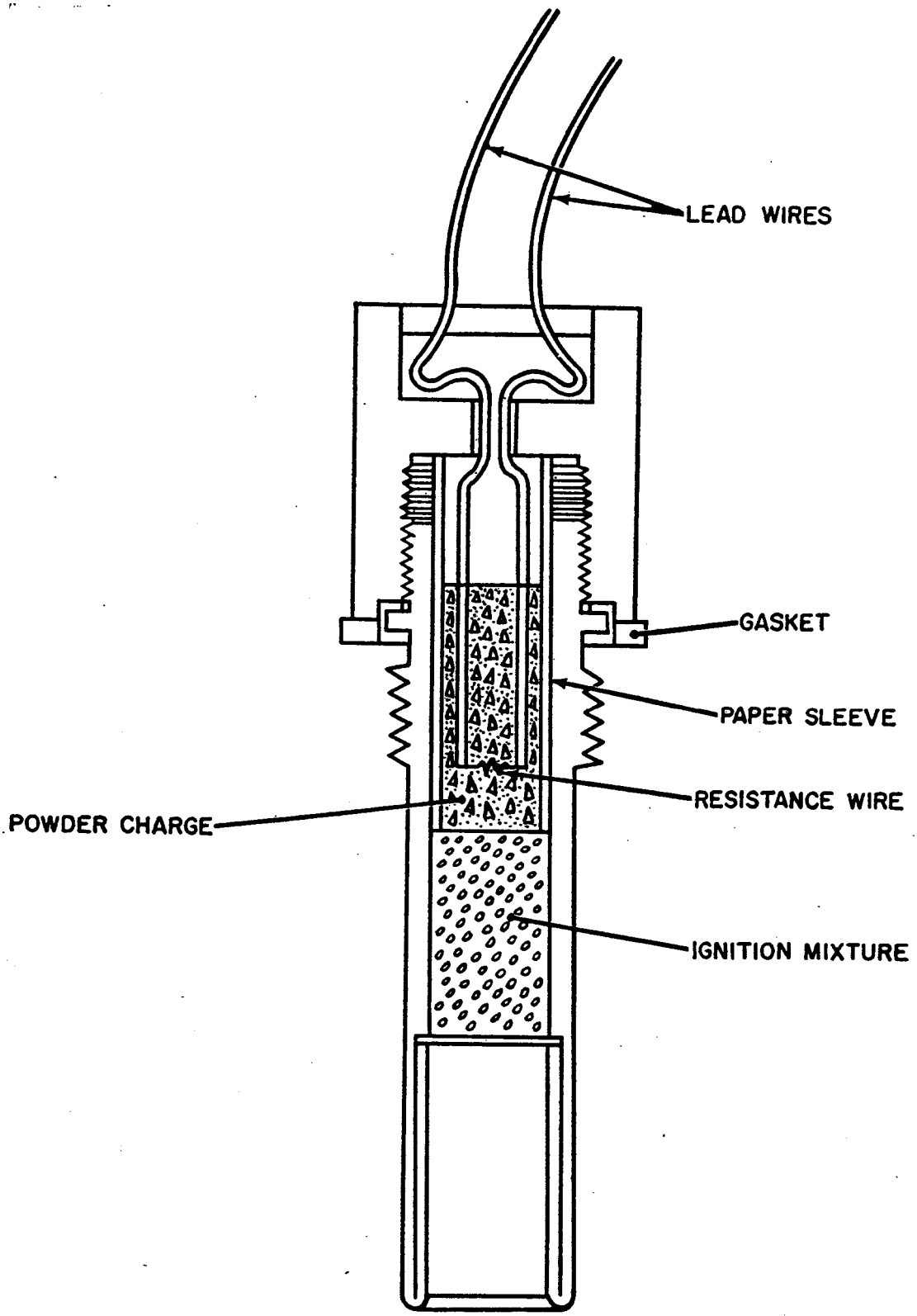


Figure 15. M209 electric floating smoke pot fuze.

floating smoke pot fuze or an M209 electric floating smoke pot fuze handtight into the fuze opening in the adapter.

Warning: Do not use pull ring or safety pin on fuze for lifting or handling the pot. Do not remove the tape covering the smoke-emission holes.

25. Operation

a. On Water. Hold the fuze safety lever on the M208 fuze firmly against the fuze body and withdraw the safety pin. Lift the pot by its handle and drop it into the water, releasing the safety lever.

b. On Land.

(1) *Manual ignition.* Place the smoke pot in the desired location and withdraw the safety pin, releasing the safety lever.

(2) *Electric ignition.* Only smoke pots equipped with an M209 electric floating smoke pot fuze can be ignited electrically. To ignite the pot electrically, connect the wires from the fuze to an electric firing circuit. See paragraphs 120 through 123 for information on electric power sources, wire, and wiring. When an electric current flows through the fuze, the fuze ignites.

26. Functioning

a. With M208 Fuze.

(1) *Fuze action.* When the safety lever is released, the striker, driven by the striker spring, hits the primer which ignites. Flame from the primer travels through the first-fire charge, the delay charge, and ignites the ignition charge, completing the fuze action.

(2) *Generation of smoke.* Flame from the ignition charge passes down the venturi tube and ignites the starter mixture, which ignites the fuel block. Hot gases from the burning fuel block pass upward through the venturi tube into the air chamber. The solder seals in the pressure tube and the venturi tube melt, allowing unobstructed flow of hot gases and fog oil. Pressure developed by hot gases in the fuel chamber is transmitted through the pressure tube to the surface of the oil in the oil chamber and forces oil up the oil-feed tube and into the venturi tube. Hot combustion gases rushing past the constriction in the venturi tube vaporize oil from the oil-feed tube and carry it into the air chamber. Pressure in the air chamber blows the adhesive tape from the three vent holes in the inner cover and heat melts the solder from the sink holes. As the vaporized oil escapes through the vent holes, it condenses and forms a thick white smoke. Smoke production begins from 8 to 20 seconds after the fuze safety lever is released and continues for 8 to 13 minutes. While the fuel block is burning, pressure is maintained inside the pot and water is prevented from entering through the sink holes. When the fuel is

consumed, pressure inside the pot falls to atmospheric pressure, and water enters through the sink holes, causing the pot to sink.

b. With M209 Fuze. Current flowing through the resistance wire in the fuze heats the resistance wire, which ignites the powder charge. The powder charge ignites the ignition mixture, completing the fuze action. Flame from the fuze passes down the venturi tube and ignites the starter mixture in the fuel block. The smoke pot then generates smoke in the same way as when ignited by the M208 floating smoke pot fuze (*a* above).

27. Packing

The AN–M7 floating smoke pot is shipped to the Navy and to Army chemical depots uncrated and without fuze or fog oil filling. Fuze and fog oil are shipped separately.

28. Mk 5 Mod 2 Floating Smoke Pot

The Mk 5 Mod 2 floating smoke pot is identical with the AN–M7 floating smoke pot except that the exterior of the metal container is not ribbed and the void above the fuel block in the fuel chamber is slightly smaller.

CHAPTER 3
CHEMICAL HAND GRENADES

Section I. GENERAL

29. Scope

Section I of this chapter is applicable to all chemical hand grenades; Sections II through X contain detailed descriptions of grenades and the chemical grenade projection adapter. Data for chemical hand grenades are summarized in table III. Chemical rifle grenades are the responsibility of the Ordnance Corps and are covered in TM 9–1900. Refer to table VII, appendix III, for information on fillings used in chemical rifle grenades.

Table III. Chemical Hand Grenades

Grenade	Use	Body	Filling		Fuze		Weight of complete grenade (oz)	Identification markings (1)	Burning time (sec)	Radius of burst (yd)	Shipping data			Storage group (TM-3-250)
			Weight (oz)	Material	Type	Delay (sec)					Units per box	Shipping weight (lb)	Cubage (cu ft)	
Grenade, hand, irritant, CN-DM, M6.	Special purpose. (2).	Cylindrical, thin metal.	10¼	CN-DM mixture.	Igniting M201A1.	1.2-2	17	1 red band and nomenclature in red.	20-60	------	16	33	0.8	D
Grenade, hand, tear, CN, M7A1.	-----do----	-----do----	12½	CN mixture.	-----do----	--do--	18½	-----do----	---do---	-----	16	35	0.8	D
Grenade, hand, tear, CN, M7.	-----do----	-----do----	10¼	----do---	-----do----	--do--	17	-----do----	---do---	------	16	33	0.8	D
Grenade, hand, riot, CN, M25A1.	-----do----	Spherical, plastic.	3½	----do----	Integral	1.4-3	7½	None. One red band on container. (1)	Bursts	5	50	60	2.0	D
Grenade, hand, smoke, WP, M15.	Screening, casualty, or incendiary.	Cylindrical, thin metal.	15	WP (4)	Detonating M206A1. (3)	4-5	31	1 yellow band and nomenclature in yellow.	Bursts (4)	20	16	46	0.8	C

Grenade, hand, smoke, HC, AN–M8.	Signalling or screening.	----do----	19	Type C HC smoke mixture.	Igniting M201A1.	1.2–2	25½	----do----	105–150	-----	16	41	0.8	D
Grenade, hand, smoke, colored, M18 (5).	Signalling	----do----	11½	Colored smoke mixture. (5)	----do----	--do--	19	1 yellow band. Color of smoke painted on top of body.	50–90	-----	16	34	0.8	D
Grenade, hand, incendiary, AN–M14 (7).	Incendiary	----do----	26½	TH2 Thermate TH3 Thermate (7)	----do----	--do--	32	1 purple band and nomenclature in purple.	40 max.	35 (6)	16	47	0.8	D

(1) All grenade bodies except M25A1 are painted gray. M25A1 is unpainted.

(2) For training and riot control.

(3) Ordnance fuze. See TM 9–1900 and FM 23–30.

(4) Contains supplementary bursting charge.

(5) Smoke colors are green, red, yellow or violet.

(6) When converted to bursting grenade.

(7) TH3 is standard filling. Grenades filled with TH2 will be used until stock is exhausted.

30. Purpose

Chemical hand grenades are chemical-filled munitions designed primarily to be thrown by the individual soldier or projected from a rifle or carbine using the M2A1 chemical grenade projection adapter (pars. 76–79). The range of a thrown grenade varies according to the type of grenade and the ability of the person throwing it. For example, the M25A1 CN grenade (par. 48), which is light (3½ ounces), can be thrown approximately as far as a baseball. The heavier (26½ ounces) AN–M14 grenade (par. 68) can be thrown only a short distance. The range of a grenade fired from a launcher is between the range of a grenade thrown by hand and minimum mortar range. Burning grenades may be placed by hand. Bursting grenades may be used as booby traps. For information on the tactical use of chemical hand grenades, see FM 3–5. The use of incendiary grenades for the destruction of classified documents is covered by directives issued by the Assistant Chief of Staff, Intelligence.

31. Safety Precautions

Observe the following safety precautions when handling chemical hand grenades.

a. Have fire-fighting equipment readily available when training with chemical hand grenades.

b. Do not use pull ring for lifting or handling grenades.

c. Do not strike top of fuze with a hard object. A blow may ignite the fuze.

d. Hold the safety lever firmly against the body of the grenade until the grenade is thrown.

e. Do not ignite bursting grenades closer to personnel than the bursting radius of the grenade (table III).

f. If an HC or colored smoke grenade is activated accidentally, throw it immediately. If it is dropped, while activated, move quickly to a safe distance.

g. If a WP grenade is activated accidentally while being held, throw it and take cover. If it is dropped, while activated, the 4- to 5-second fuze delay allows time for the grenade to be picked up quickly and thrown to a safe distance.

32. Misfires

Burning-type grenades which have misfired may be approached and retrieved after 5 minutes. Misfired bursting-type grenades should be destroyed in place by bomb disposal personnel.

33. Operation in Extreme Cold

a. Functioning. Extreme cold does not affect the functioning of chemical hand grenades unless ice has formed where it will interfere with functioning of the fuze.

b. Effectiveness. Chemical hand grenades tend to bury themselves in deep snow, which drastically reduces their effectiveness. When the ground is covered by deep snow, place signalling or screening grenades on a board or other insulating material, if possible. Throw or launch bursting grenades so that they burst before they strike the surface of the snow.

c. Visibility. Red smoke has the best visibility against snow. Green smoke is next, followed by violet and yellow. White smoke is least visible.

34. Storage and Shipment

See paragraphs 124 and 125 for information on storing chemical munitions. Army regulations and Interstate Commerce Commission regulations govern the shipment of chemical hand grenades within the zone of interior. Oversea shipments should be made in compliance with instructions contained in SR 55–730–10, TM 3–250, and TM 38–705.

35. Grenade Marking

Chemical grenades are marked as described in paragraph 3. In addition to the standard color marking, the top of each M18 grenade is painted the color of the smoke produced by the grenade (par. 66).

Section II. GRENADE, HAND, IRRITANT, CN–DM, M6

36. Description

The M6 CN–DM grenade (fig. 16) is essentially a cylindrical container filled with 10¼ ounces of CN–DM mixture and fitted with an M201A1 grenade igniting fuze (fig. 17). The body of the grenade is a thin sheet-metal cylinder approximately 2½ inches in diameter by 4½ inches high, with 6 emission holes in its top and 18 holes in its sides. The M201A1 fuze is screwed into an adapter in the top of the grenade. The CN–DM filling is a mixture of CN (chloroacetophenone), DM (adamsite), magnesium oxide, and smokeless powder. The filling is coated with a starter which aids ignition. The emission holes are covered with adhesive tape to protect the filling from moisture.

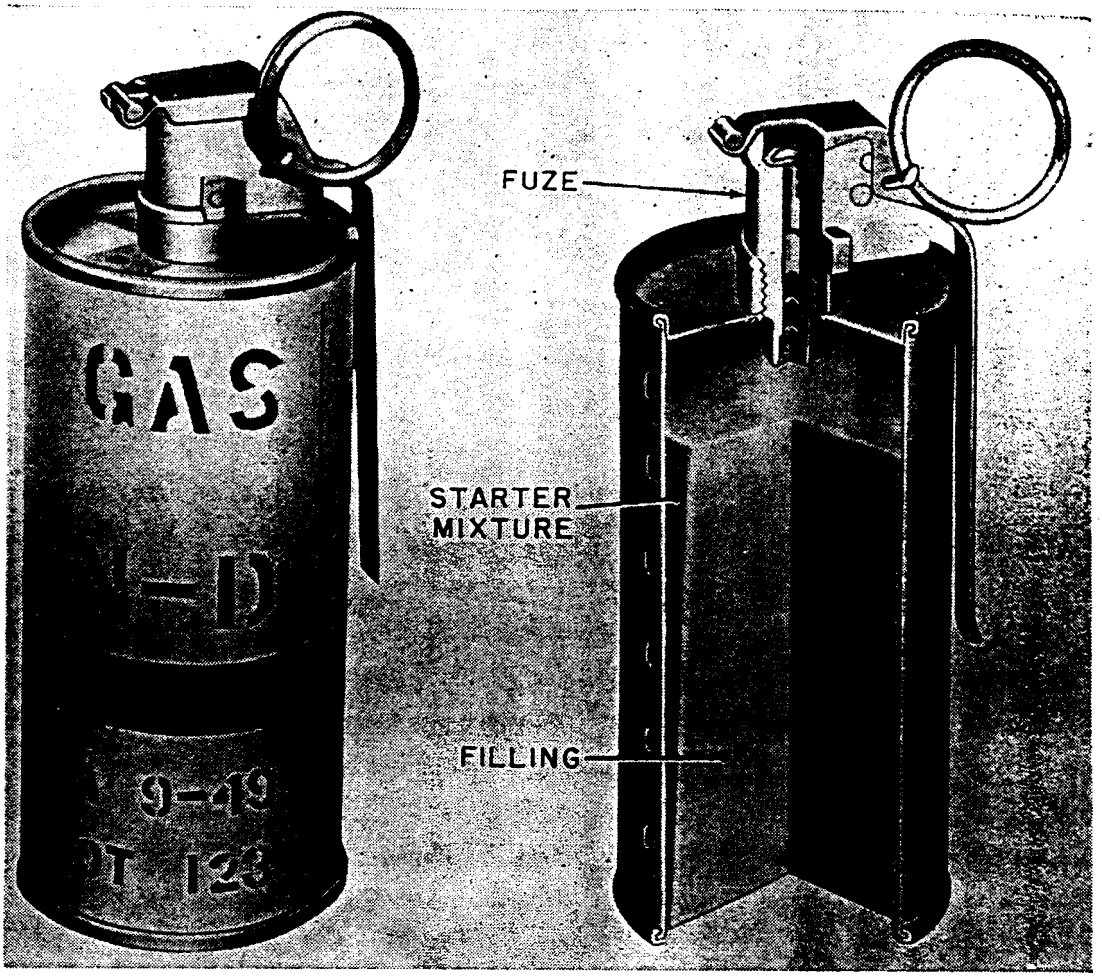


Figure 16. M6 CN–DM irritant hand grenade.

37. Operation and Functioning

a. Throwing Grenade. Hold the grenade in the throwing hand with the safety lever pressed firmly against the palm. Remove the safety pin with the free hand (fig. 18) and throw the grenade. The M201A1 fuze (fig. 17) begins to function when the grenade is thrown and the safety lever is released. Releasing the safety lever allows the striker to hit the primer, which ignites a delay element which burns for 1.2 to 2 seconds. Upon expiration of the delay time, the delay element ignites the ignition mixture, which ignites the grenade starter mixture and grenade filling. The adhesive tape is blown off the emission holes and CN–DM gas is emitted for 20 to 60 seconds.

b. Launching Grenade. The grenade may be launched from a rifle or carbine by using the M2A1 grenade projection adapter (par. 76).

38. First Aid

Exposure to the CN–DM gas emitted by this grenade will cause vomiting and tear formation. Remove the casualty to fresh air (FM 21–40).

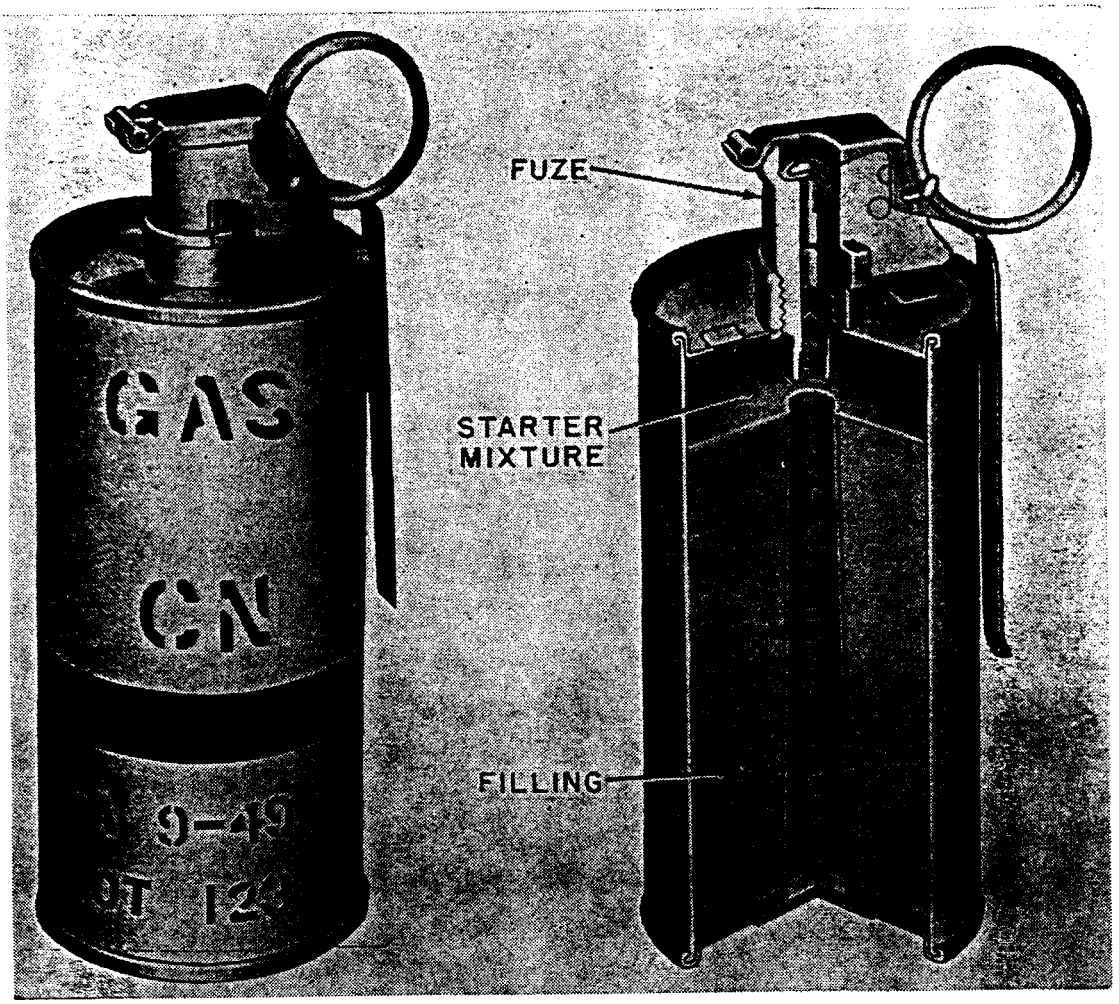


Figure 19. M7A1 CN tear hand grenade.

44. Marking and Packing

a. The body of the M7A1 grenade is painted with one red band, nomenclature, lot number, and date of filling.

b. The M7A1 grenade is packaged in a sealed metal container. Sixteen containers are packed in a wood box which weighs 35 pounds when filled and displaces 0.8 cubic foot.

45. Storage and Shipment

The M7A1 grenade is a group D chemical munition. See paragraphs 124 and 125 for shipping and storage information.

Section IV. GRENADE, HAND, TEAR, CN, M7

46. General

The M7 grenade is similar to the M7A1 grenade, except that the M7 grenade has 18 emission holes in the sides and none in the bottom, and produces about half as much effective CN gas as the M7A1 gre-

nade. The M7 grenade operates and functions in the same manner as the M7A1 grenade.

47. Marking and Packing

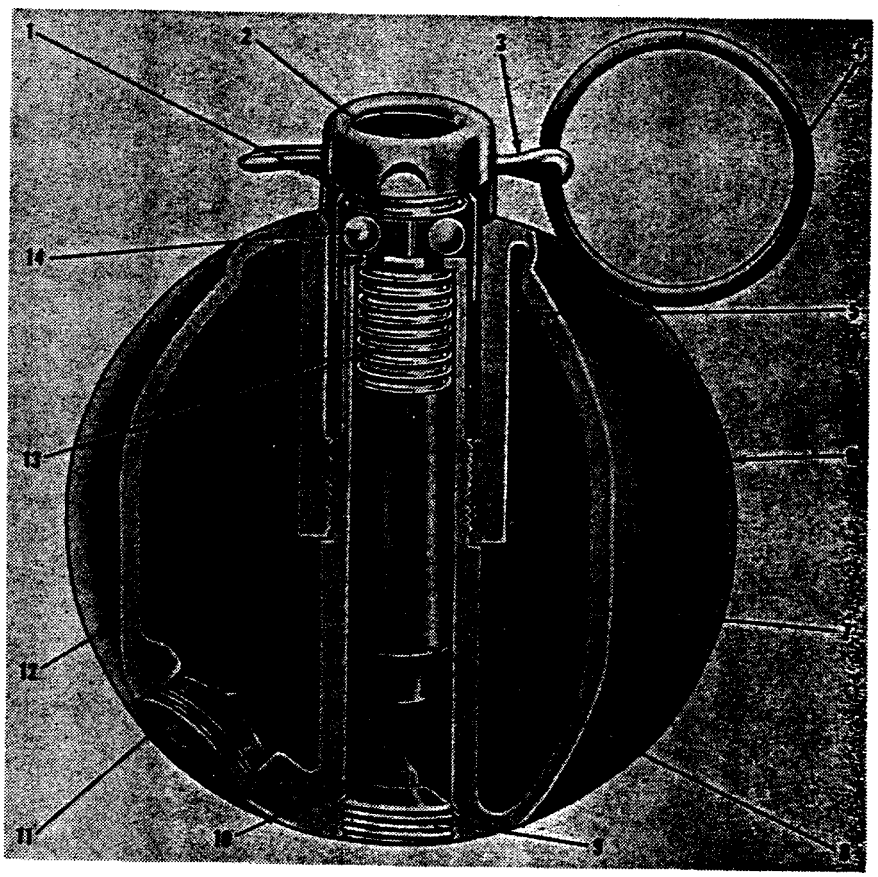
a. The body of the M7 grenade is painted with one red band, nomenclature, lot number, and date of filling.

b. The M7 grenade is packaged in a sealed metal container. Sixteen containers are packed in a wood box which weighs 33 pounds when filled and displaces 0.8 cubic foot.

Section V. GRENADE, HAND, RIOT, CN, M25A1

48. Description

The M25A1 grenade (fig. 20) is spherical in shape and is slightly less than 3 inches in diameter (approximately the size of a baseball). The body (6), which is made of two plastic hemispheres cemented



1	Arming spring	8	Slider
2	Arming sleeve	9	Closure plug
3	Safety pin	10	Firing pin
4	Safety pin ring	11	Filling plug
5	Upper half-sleeve	12	Filling
6	Grenade body	13	Firing spring
7	Lower half-sleeve	14	Safety balls

Figure 20. M25A1 CN riot hand grenade.

together, contains an upper half-sleeve (5), and a lower half-sleeve (7), which are parts of the two plastic hemispheres. The half-sleeves together form a fuze well. A closure plug (9) is screwed into the bottom of the fuze well and a filling plug (11) is screwed into the side of the grenade. The filling (12) consists of 3½ ounces of a mixture of magnesium oxide and finely pulverized CN. An integral fuze with a 1.4- to 3-second delay is installed in the fuze well.

49. Operation and Functioning

a. Throwing Grenade. Grasp the grenade in the throwing hand. Hold down the arming sleeve (2, fig. 20) with the thumb of the throwing hand and remove the safety pin (3) by pulling the safety pin ring (4) with the free hand (fig. 21).

b. Functioning. When the grenade is thrown, the arming spring (1, fig. 20) ejects the arming sleeve (2), freeing the two safety balls (14) to move out of the groove in the top of the slider (8). This frees the slider which is forced by the firing spring toward the firing pin (10) attached to the inner side of the closure plug. A primer contained in the end of the slider strikes the firing pin. The primer ignites a delay element inside the slider which, after 1.4 to 3 seconds, sets off a detonator also contained in the slider. The detonator ex-

Figure 21. Withdrawing safety pin from M25A1 grenade.

plodes, scattering the CN filling. The radius of effectiveness of the gas cloud is approximately 5 yards from the point of burst.

50. First Aid

The gas from this grenade will cause tear formation. Remove casualty to fresh air (FM 21–40).

51. Marking and Packing

a. The body of the M25A1 grenade is not marked for identification. A single band, lot number, and date of filling are painted in red on the grenade container.

b. The M25A1 grenade is packaged individually in a sealed metal container. Fifty containers are packed in a wood box which weighs 60 pounds when filled and displaces 2 cubic feet.

52. Storage and Shipment

The M25A1 grenade is a group D chemical munition. See paragraphs 124 and 125 for shipping and storage information.

Section VI. GRENADE, HAND, SMOKE, WP, M15

53. Description

The M15 grenade (fig. 22) is a cylindrical container filled with 15 ounces of WP and fitted with an M206A1 detonating fuze (TM 9–1900). The body of the grenade is an 18-gage sheet steel cylinder approximately 2⅜ inches in diameter by 4½ inches high. The body of the M15 grenade is made of thicker metal than the bodies of the other smoke grenades and has no smoke-emission holes, since the M15 grenade functions by bursting. The M206A1 detonating fuze, which is an Ordnance Corps fuze, is also used in high-explosive grenades (TM 9–1900). It is similar to the M201A1 igniting fuze (fig. 17) but has a high-explosive burster instead of an ignition mixture. The fuze is screwed into an adapter in the top of the grenade. A fuze well in the center of the grenade receives the bursting charge which is part of the fuze.

54. Operation and Functioning

Hold the grenade in the throwing hand with the safety lever pressed firmly against the palm. Remove the safety pin with the free hand and throw the grenade. The fuze begins to function when the grenade is thrown and the safety lever is released. The bursting charge explodes 4 to 5 seconds after the safety lever is released, rupturing the grenade body and scattering burning WP over a 20-

Figure 22. M15 WP smoke hand grenade.

yard radius. The grenade projection adapter cannot be use to launch the M15 grenade.

55. First Aid

Treat burns caused by WP in the same way as ordinary burns (FM 21–40). If particles of WP are embedded in the flesh, immerse the wound in water or pack with cloths wet with water to halt combustion, and pick or squeeze out the WP. The particles will reignite spontaneously if allowed to dry. Copper sulphate solution, if available, will halt combustion of the WP particles when applied to them, permitting them to be removed without igniting.

56. Marking and Packing

a. The body of the M15 grenade is painted with one yellow band, nomenclature, lot number, and date of filling.

b. The M15 grenade is packaged in a sealed metal container. Sixteen containers are packed in a wood box which weighs 46 pounds when filled and displaces 0.8 cubic foot.

57. Storage and Shipment

The M15 grenade is a group C chemical munition. See paragraphs 124 and 125 for shipping and storage information.

Section VII. GRENADE, HAND, SMOKE, HC, AN–M8

58. Description

The AN–M8 grenade (fig. 23) is a cylindrical container filled with 19 ounces of type C HC smoke mixture (par. 4*c*) and fitted with an M201A1 igniting fuze (fig. 17). The body of the grenade is a thin sheet-metal cylinder, approximately 2½ inches in diameter by 4½ inches high, with four smoke-emission holes in its top. The M201A1 fuze is screwed into an adapter in the top of the grenade. A plastic cup set in the top of the filling contains starter mixture which is centered under the fuze. The smoke-emission holes are covered with adhesive tape to protect the filling from moisture.

59. Operation and Functioning

a. Throwing Grenade. Hold the grenade in the throwing hand with the safety lever pressed firmly against the palm. Remove the safety pin with the free hand (fig. 18) and throw the grenade. The fuze begins to function when the grenade is thrown and the safety lever

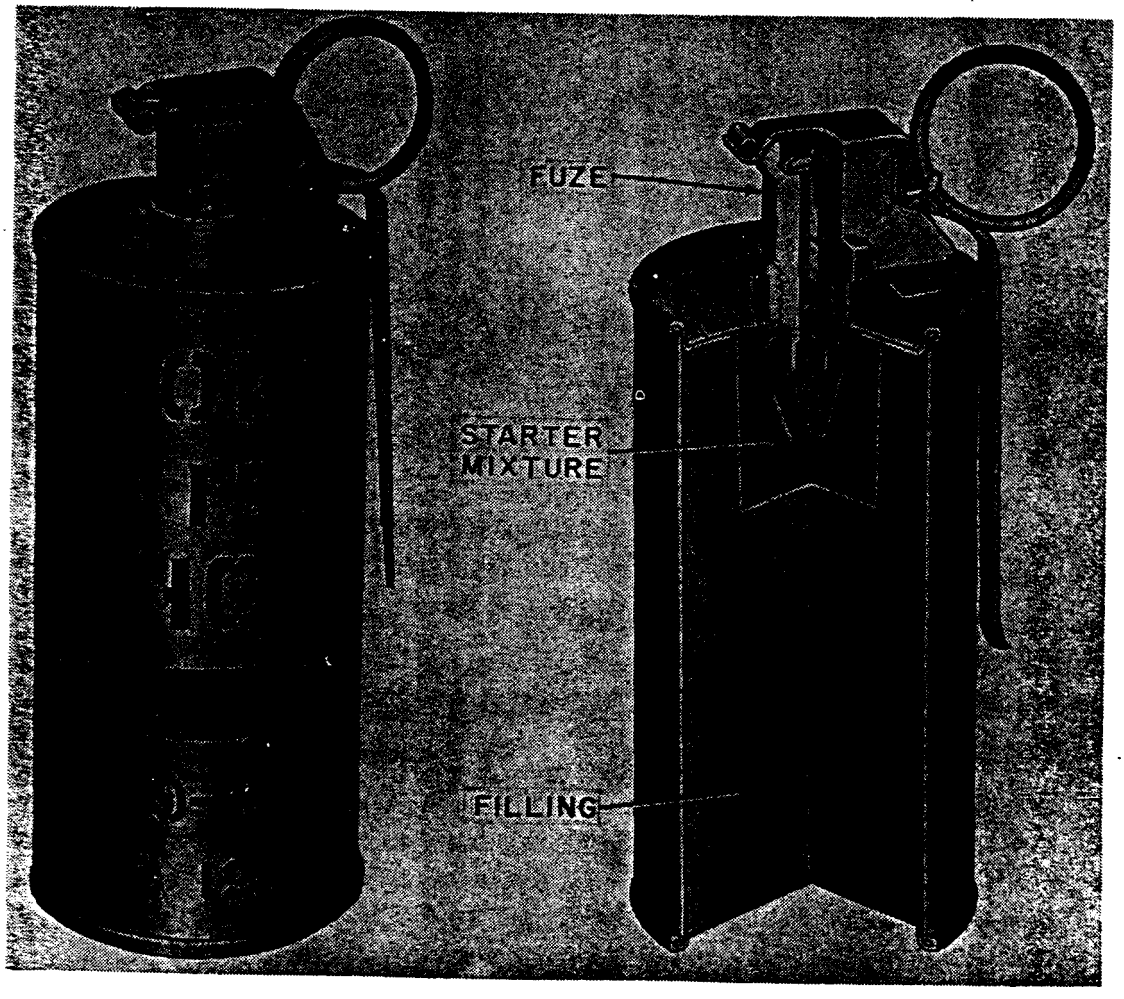


Figure 23. AN–M8 HC smoke hand grenade.

is released. Releasing the safety lever allows the striker to hit the primer, which ignites the 1.2- to 2-second delay element. Upon expiration of the delay time, the delay element ignites the ignition mixture, which ignites the grenade starter mixture and grenade filling. The grenade emits white smoke for 105 to 150 seconds.

b. Launching Grenade. The grenade may be launched from a rifle or carbine by using the M2A1 grenade projection adapter (par. 76).

60. First Aid

Treat burns in the same manner as those caused by flame (FM 21–40).

61. Marking and Packing

a. The body of the M8 grenade is painted with one yellow band, nomenclature, lot number, and date of filling.

b. The AN–M8 grenade is packaged in a sealed metal container. Sixteen containers are packed in a wood box which weighs 41 pounds when filled and displaces 0.8 cubic foot.

62. Storage and Shipment

The AN–M8 grenade is a group D chemical munition. See paragraphs 124 and 125 for shipping and storage information.

Section VIII. GRENADE, HAND, COLORED SMOKE, M18

63. Description

The M18 grenade (fig. 24) is a cylindrical container filled with 11½ ounces of either red, green, violet, or yellow smoke mixture (par. 4*c*) and fitted with an M201A1 igniting fuze (fig. 17). The body of the grenade is a thin sheet-metal cylinder, approximately 2½ inches in diameter by 4½ inches high, with 6 smoke-emission holes in its top and 1 in its bottom. The M201A1 fuze is screwed into an adapter in the top of the grenade. A tapered hole in the filling is lined with starter mixture. The top of the filling is also covered with starter mixture. The smoke-emission holes are covered with adhesive tape to protect the filling from moisture.

64. Operation and Functioning

a. Throwing Grenade. Hold the grenade in the throwing hand with the safety lever pressed firmly against the palm. Remove the safety pin with the free hand (fig. 18) and throw the grenade. The fuze begins to function when the grenade is thrown and the safety lever is released. Releasing the safety lever allows the striker to hit the primer,

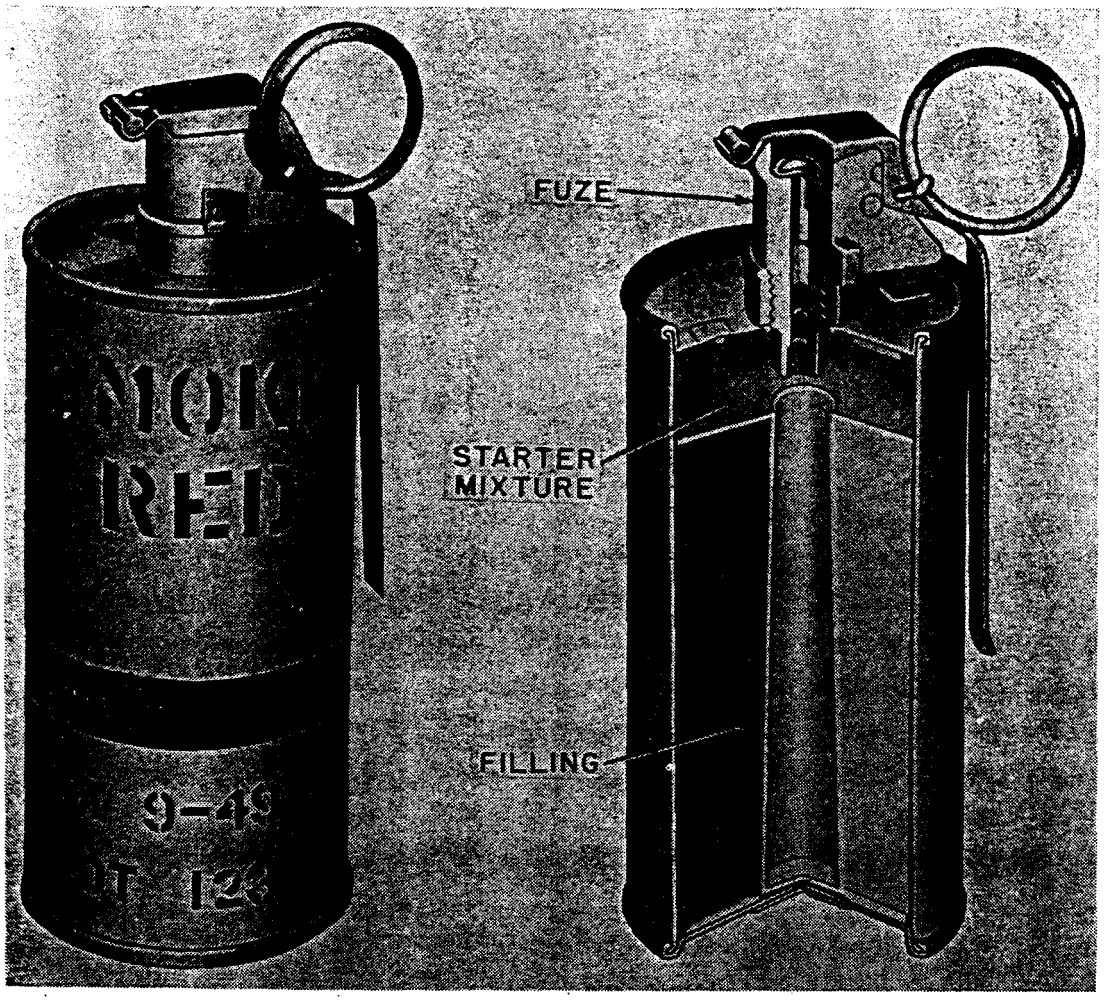


Figure 24. M18 colored smoke hand grenade.

which ignites the 1.2- to 2-second delay element. Upon expiration of the delay time, the delay element ignites the ignition mixture, which ignites the grenade starter mixture and grenade filling. The grenade emits colored smoke for 50 to 90 seconds.

b. Launching Grenade. The grenade may be launched from a rifle or carbine by using the M2A1 grenade projection adapter (par. 76).

65. First Aid

Treat burns in the same manner as those caused by flame (FM 21–40).

66. Marking and Packing

The top of the grenade is painted the color of the smoke it produces. The body is painted with one yellow band, nomenclature, lot number, and date of filling. The grenade is packaged in a sealed metal container. Sixteen containers are packed in a wood box which weighs 34 pounds when filled and displaces 0.8 cubic foot.

67. Storage and Shipment

The M18 grenade is a group D chemical munition. See paragraphs 124 and 125 for shipping and storage information.

Section IX. GRENADE, HAND, INCENDIARY, TH3, AN–M14

68. Use and Description

The AN–M14 grenade (fig. 25) is designed primarily to provide a source of intense heat for destroying equipment. By using an explosive charge (par. 71), the grenade can be used for casualty effect. The grenade is a cylindrical container filled with 26½ ounces of incendiary mixture and fitted with an M201A1 grenade igniting fuze (fig. 17). The body of the grenade is a thin sheet-metal cylinder, approximately 2½ inches in diameter by 4½ inches high, with four holes in the top. The M201A1 fuze is screwed into an adapter in the the top of the grenade. The standard filling is TH3 thermate (par. 4*d*). TH2 filling, which is limited standard, is no longer loaded in grenades, although it may be encountered in the field. The top of the

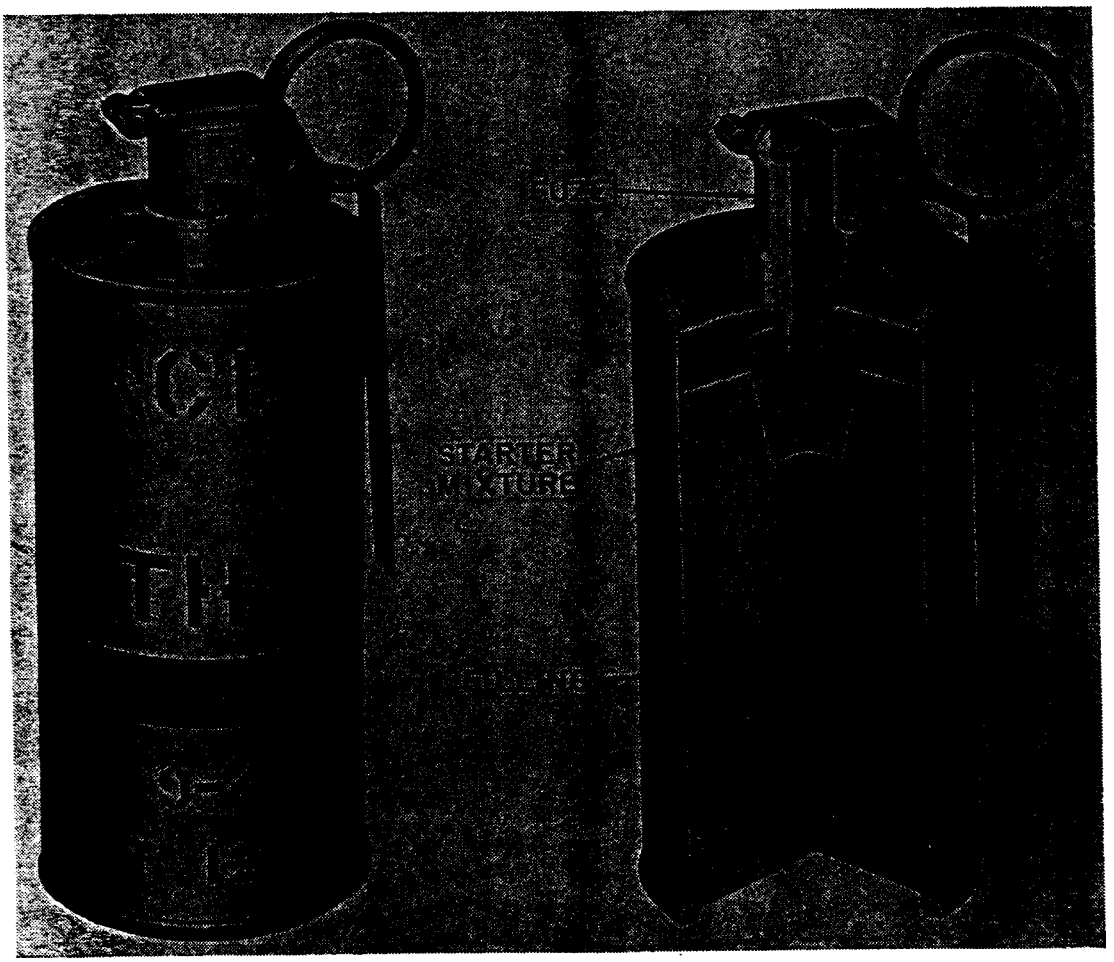


Figure 25. AN–M14 TH3 incendiary hand grenade.

filling has a central indentation and is covered with starter mixture. The holes in the top of the grenade are covered with adhesive tape to protect the filling from moisture.

69. Operation and Functioning

a. Destroying Equipment. Place the grenade in the desired location, preferably on a flat surface. If it is necessary to fasten the grenade in place, use a metal fastening, as the heat from the burning grenade will quickly burn through flammable material. Hold down the safety lever with one hand and withdraw the safety pin with the other. When ready to ignite the grenade, release the safety lever and move several feet away. The safety lever is forced off by the striker and the striker hits the primer, which ignites the 1.2- to 2-second delay element. Upon expiration of the delay time, the fuze ignites the ignition mixture which, in turn, ignites the grenade filling. The grenade will burn through a sheet of ½-inch-thick steel and will weld together steel or iron machinery parts when molten iron released by the burning filling flows between them. The filling burns for approximately 40 seconds.

b. Destroying Dangerous Flammable Material. Dangerous flammable material, such as gasoline or explosives, can be ignited from a distance by throwing the grenade or by using a lanyard to remove the safety pin. To throw the grenade, hold it in the throwing hand with the safety lever pressed firmly against the palm. Remove the safety pin with the free hand and throw the grenade. To ignite the grenade with a lanyard, fasten the grenade securely in the desired location, tie a lanyard to the ring on the safety pin, and lead the free end of the lanyard to a protected firing position. Make sure that the lanyard is free to move and that it is not under tension. Hold down the safety lever with one hand and straighten the end of the safety pin with a pair of pliers so that the pin can be withdrawn easily. A pull on the lanyard will withdraw the safety pin, causing the grenade to function.

c. Launching Grenades. The grenade may be launched from a rifle or carbine by using the M2A1 grenade projection adapter (par. 76).

70. Modification for Electric Ignition

The AN–M14 grenade may be modified for electric ignition by replacing the fuze assembly with an electric squib.

Warning: Field modification by untrained personnel is not authorized.

a. Materials Required.

(1) AN–M14 grenade.
(2) Cork, rubber stopper, or other plug to fit the fuze adapter.
(3) M1 flash-vented electric squib (par. 121*a*).

75. Storage and Shipment

The AN–M14 grenade is a group D chemical munition. See paragraphs 124 and 125 for shipping and storage information.

Section X. ADAPTER, GRENADE PROJECTION, CHEMICAL M2A1

76. Use

The M2A1 chemical grenade projection adapter (fig. 29) provides a means for launching chemical hand grenades from a grenade launcher installed on a rifle or a carbine. (See FM 23–30 for information on grenade launchers.) The adapter can be used with the M6 CN–DM grenade, the M7 and M7A1 CN grenades, the AN–M8 HC smoke grenade, the M18 colored smoke grenade, and the AN–M14 incendiary grenade.

77. Description

The adapter consists of a stabilizer assembly and a setback band. The stabilizer assembly is a metal tube with a stabilizing fin at one end and a base plate with three clips at the other. The metal tube is bored to fit over a standard grenade launcher. The setback band is a metal band, the ends of which are joined by a coil spring.

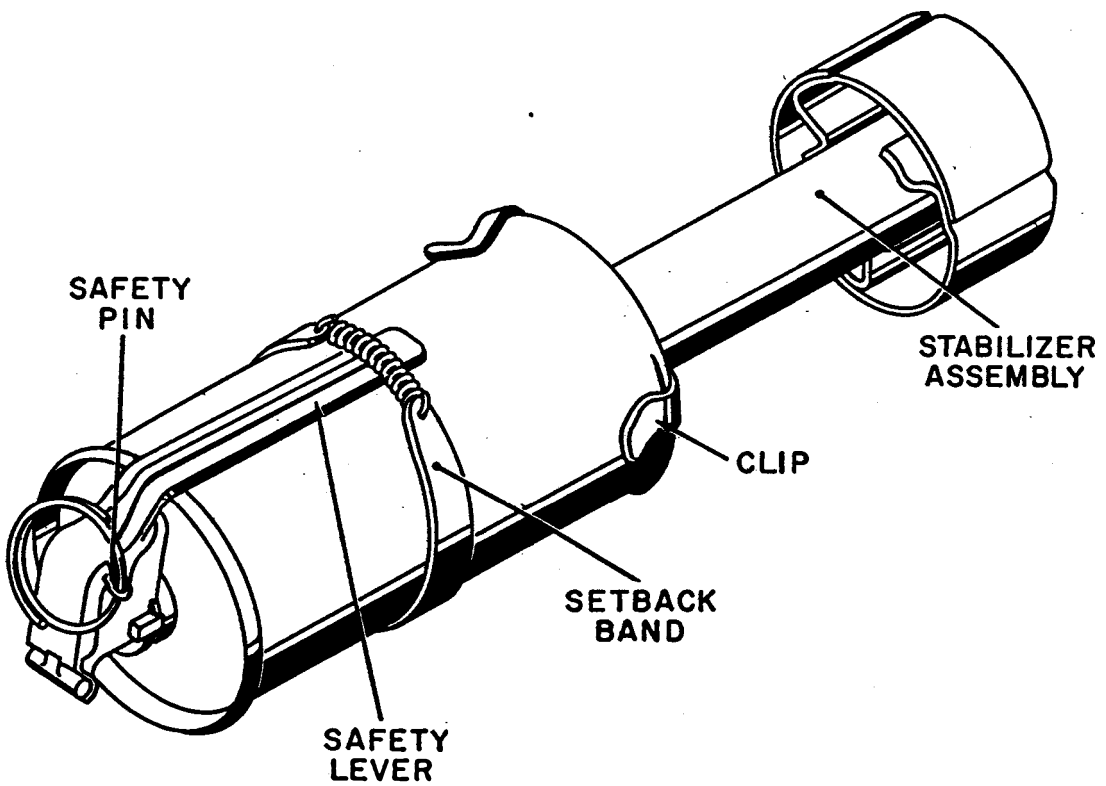


Figure 29. M2A1 chemical grenade projection adapter.

78. Preparation for Firing

a. Install the sebtack band on the grenade with the coil spring directly over the safety lever and slide the band to approximately 1 inch from the end of the safety lever, as shown in figure 29.

b. Force the base of the grenade firmly into the clips on the base plate.

c. Slide the tube of the stabilizer assembly over the launcher to the position that will give the desired range (FM 23–30).

d. Rotate the grenade and adapter on the launcher so that the safety lever is downward.

e. Remove the safety pin from the grenade and fire the weapon.

79. Functioning

The adapter and grenade are propelled forward when the weapon is fired. Inertia causes the setback band to slide toward the base of the grenade, releasing the safety lever. The adapter remains attached to the grenade until the grenade lands.

Note. **Because of the ballistic characteristics of the adapter and grenade, grenades launched at high angles (above 45°) will function in flight, and smoke grenades will be partially or completely burned out upon impact.**

CHAPTER 4

FIRE STARTERS AND INCENDIARIES

Section I. STARTER, FIRE, M1

80. Use and Description

The M1 fire starter (fig. 30) is used for starting fires under adverse climatic conditions, such as in wet jungles or on snow-covered terrain. It is a cylindrical cellulose nitrate container 1¼ inches in diameter by 3¼ inches in length filled with 0.8 ounce of thickened kerosene (par. 4*d*) and provided with an ignition device. The ignition device is a match head attached to a disk which covers the filling. A scratcher is attached inside a metal cap which covers the match head end of the fire starter. The cap is fastened to the container with adhesive tape. Pertinent data on the fire starter are summarized in table IV.

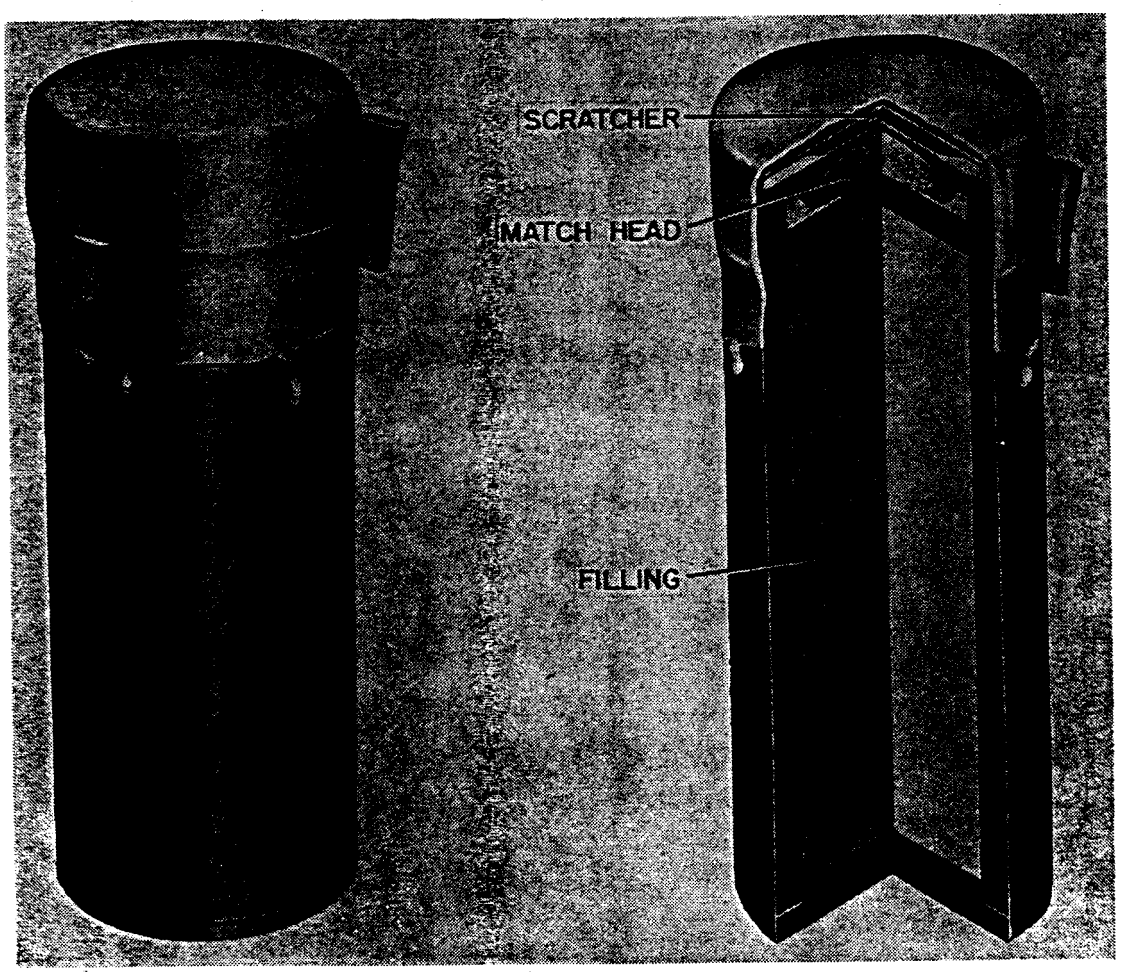


Figure 30. M1 fire starter.

Table IV. Fire Starters and Incendiaries

Incendiary	Container size (in.)	Filling		Ignition method	Delay (sec)	Approx. burning time (min)	Weight	Shipping data			
		Weight	Material					Units per wood box	Shipping weight (lb)	Cubage (cu ft)	Storage group
Starter, fire, M1	1¼ dia by 3¼ long	0.8 oz	Thickened kerosene.	Match head and scratcher.	0	13	2½ oz	216	40	1.6	D
Starter, fire, M2	½ by ½ by 3	0.2 oz	---do---	Match head and scratcher wire.	0	4	½ oz	500	35	1.12	D
Incendiary, safe destroying, TH1, M1A1.	21 by 15 by 1¼	28 lb minimum	TH1 thermite.	M201A1 igniting fuze or electric squibs.	1.2 to 2 0	1	34 lb	1	55	1.1	D
Incendiary, safe destroying, TH1, M1A2.	---------do---------	----do----	----do----	M209 electric floating smoke pot fuze. M210 incendiary fuze.	0 1.2 to 2	1	---do--	1	55	1.1	D
Incendiary, equipment destroying, TH1, M2A1.	16 by 8½ by 1	8½ lb minimum	----do----	-----do-----	--do--	¾	11¼ lb	2	33	0.8	D

Incendiary, file destroyer, M4.	10½ by 8¼ by ½ (Oxidizer and igniter boxes).	26½ oz (1) 12 oz (2)	Sodium nitrate (3) Sodium nitrate and wood flour (4)

(1) Weight of filling in each oxidizer box.
(2) Weight of filling in each igniter box.
(3) Type of filling in oxidizer box.
(4) Type of filling in igniter box.
(5) Average time for complete destruction.

M1 electric squib.	0	30 (5)	25½ lb	1	160	4.1	D

81. Operation and Functioning

Prepare the fire starter for ignition by pulling off the adhesive tape and removing the metal cap. To ignite, take the scratcher from under the cap, hold the fire starter by its base with the match head pointed downward, and draw the scratcher rapidly across the match head. Allow the filling to burn for several seconds, then set the fire starter on its base in the desired position. The burning time of the fire starter is approximately 13 minutes.

82. Marking and Packing

The base of the M1 fire starter is dyed purple to identify the fire starter as an incendiary. Nomenclature and lot number are marked on the side. Two hundred and sixteen fire starters are packed in a wood box which weighs 40 pounds when filled and displaces 1.6 cubic feet.

83. Storage and Shipment

The M1 fire starter is a group D munition. See paragraphs 124 and 125 for shipping and storage information.

Section II. STARTER, FIRE, M2

84. Use and Description

The M2 fire starter (fig. 31) is designed to be carried in a pocket of the Air Force survival kit and is used by downed Air Force crew members to start fires under adverse climatic conditions. It is a rectangular cellulose nitrate container, ½ by ½ by 3 inches, filled with 0.2 ounce of thickened kerosene (par. 4*d*) and provided with an ignition device. The ignition device is a match-head mixture with a pull-type scratcher wire. The scratcher wire is provided with a metal handle and is cemented lightly to the side of the container. The end of the container housing the ignition device is colored red; the opposite end is colored purple. The entire fire starter is waterproof. Two labels on the side of the fire starter give instructions for use. One label, which includes an illustation of wood arranged for ignition, reads: "1. Start fire on a dry base; 2. Use thin pieces of dry dead wood arranged as shown." The other label reads: "Starter, Fire M2. Inflammable. To ignite, point red end down and pull wire out of side of case. Keep fingers clear of red area." Pertinent data on the M2 fire starter are summarized in table IV.

85. Operation and Functioning

Prepare the fire starter for ignition by freeing the handle on the scratcher wire and pulling the wire away from the side of the con-

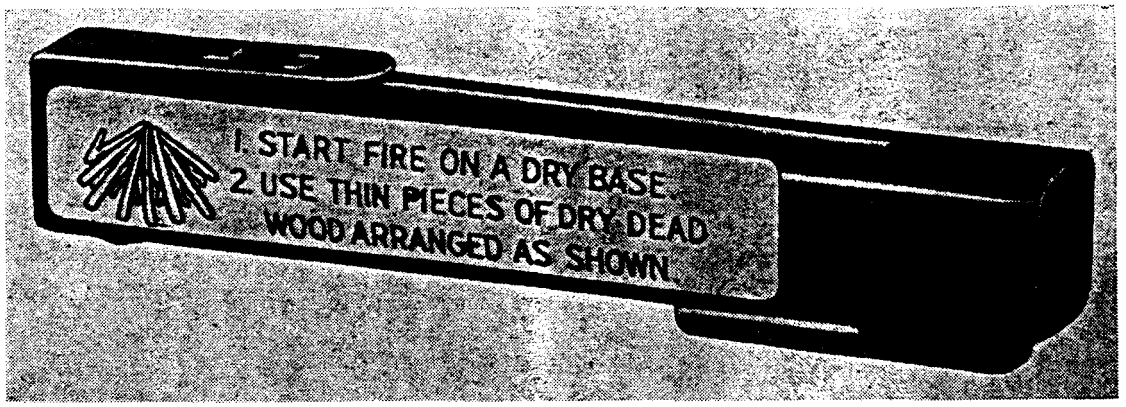


Figure 31. M2 fire starter.

tainer, breaking the cement which holds it in place. Hold the starter by the purple end and point the red end downward. Press the thumb of the hand holding the fire starter just below the place where the scratcher wire comes out of the container. The thumb so placed helps to insure that the scratcher wire does not cut the container. To ignite, grasp the handle and pull steadily away from the case and perpendicular to it. Allow the filling to burn for several seconds, then set the fire starter in the desired position. Should the ignition device fail, the red end of the fire starter can be ignited with a match. The fire starter burns for approximately 4 minutes.

86. Marking and Packing

The M2 fire starter is marked as described in paragraph 84. Five hundred fire starters are packed in a wood box which weighs 35 pounds when filled and displaces 1.12 cubic feet.

87. Storage and Shipment

The M2 fire starter is a group D munition. See paragraphs 124 and 125 for shipping and storage information.

Section III. INCENDIARY, SAFE DESTROYING, TH1, M1A1

88. Use and Description

a. Use. The M1A1 safe destroying incendiary (fig. 32) is designed for the sole purpose of destroying cryptographic equipment CSP 2900, SIGROD, or ASAMI–1, stored in the Signal Corps CH–76 two-section safe. It is authorized for issue only outside the zone of interior. It cannot be used to destroy papers or other materials in field safes, since it does not supply oxygen. This incendiary is limited standard and is being replaced by the M1A2 safe destroying incendiary (par. 94).

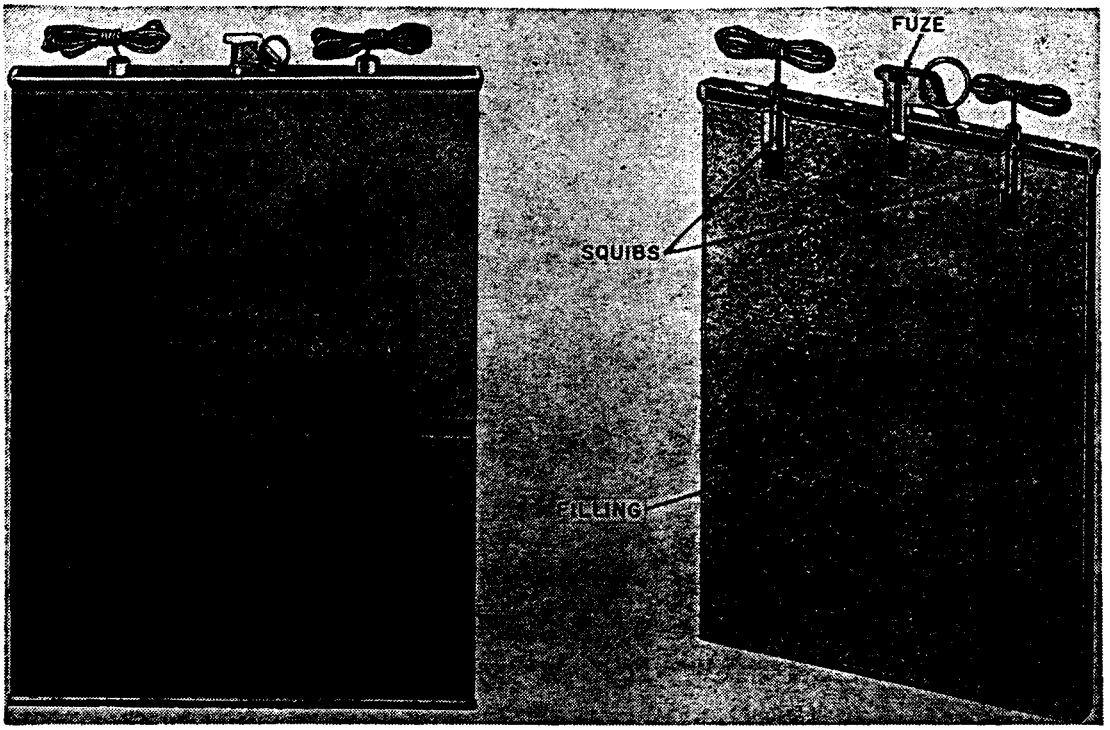


Figure 32. M1A1 TH1 safe destroying incendiary.

b. Description. The incendiary is a sheet-metal box, 21 inches long by 15 inches wide by 1¼ inches deep, filled with 28 pounds of TH1 incendiary mixture (par. 4*d*), and fitted with two electric squibs and an M201A1 igniting fuze (fig. 17) with a shortened safety lever. Three cellulose acetate cups filled with first-fire mixture are embedded in the filling; one directly under the igniting fuze, the other two under the electric squibs. Three metal hangers, six ¼-inch bolts, six ¼-inch washers, and six ¼-inch nuts are packed with the incendiary for use when installing it in a CH–76 safe. Pertinent data on the M1A1 safe destroying incendiary are summarized in table IV.

89. Installation

Install the hangers in the top of the CH–76 safe and place the incendiary in the hangers.

90. Ignition

To ignite the incendiary electrically, connect the squib lead wires to a source of electric current. A single squib may be used, or the two squibs may be connected to the current source in series or in parallel. See paragraphs 120 through 123 for information on electric ignition. If it is anticipated that the incendiary will have to be ignited electrically on very short notice, insert a switch between the source of electric current and the squibs in the incendiary and complete all electrical connections. Closing the switch will ignite the incendiary. To

ignite the incendiary with the M201A1 grenade igniting fuze, withdraw the safety pin and allow the safety lever to fly off. The incendiary burns for approximately 1 minute.

91. Functioning

a. Electric. An electric current flowing through the squibs causes them to ignite. The flash of fire from the squibs ignites the first-fire mixture, which ignites the filling.

b. Manual. Withdrawing the safety pin from the M201A1 fuze causes the fuze to function as described in paragraph 37. After 1.2 to 2 seconds have elapsed following release of the safety lever, flame from the fuze ignites the first-fire mixture, which ignites the filling.

92. Marking and Packing

The M1A1 incendiary is marked with a purple band, nomenclature, lot number, and date of filling. One incendiary is packed in a wood box which weighs 55 pounds when filled and displaces 1.1 cubic feet.

93. Storage and Shipment

The M1A1 incendiary is a group D munition. See paragraphs 124 and 125 for shipping and storage information.

Section IV. INCENDIARY, SAFE DESTROYING, TH1, M1A2

94. Use and Description

The M1A2 safe destroying incendiary (fig. 33) is a modification of the M1A1 incendiary (par. 88) and is designed for the same purpose. Like the M1A1 incendiary, it is authorized for use only outside the zone of interior by units equipped with CSP 2900, SIGROD, or ASAMI-1 cryptographic devices stored in Signal Corps CH–76 two-section safes. It is identical in size and construction with the M1A1 incendiary except that the center fuze is an M210 incendiary fuze, and that two M209 electric floating smoke pot fuzes (fig. 15) take the place of the electric squibs in the M1A1 incendiary. The M210 incendiary fuze is identical with the M201A1 grenade igniting fuze (fig. 17) except that it has a short safety lever. The M1A2 incendiary is installed in the same way as the M1A1 incendiary.

95. Ignition and Functioning

To ignite the incendiary electrically, connect the lead wires from the M209 fuze to a source of electric current. A single fuze may be used or both fuzes may be connected in series or in parallel to a source of electric current. (See pars. 120–123 for information on elec-

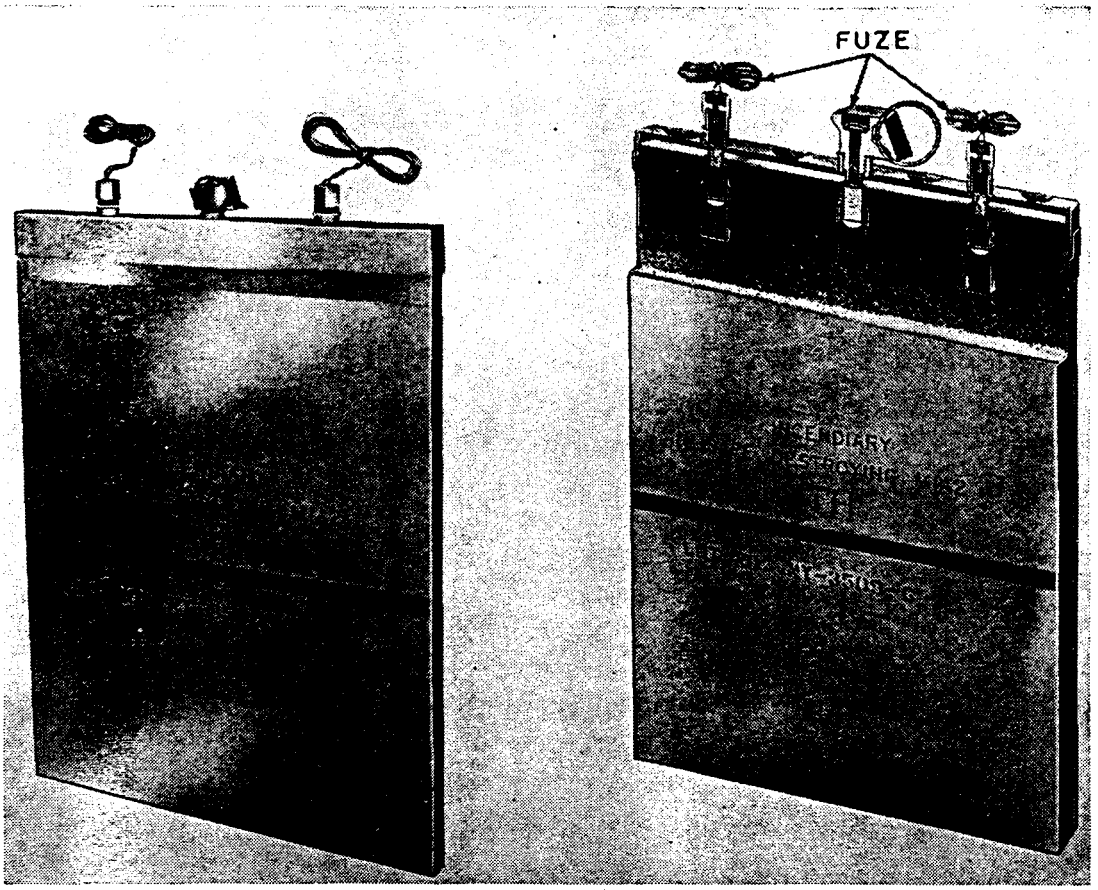


Figure 33. M1A2 TH1 safe destroying incendiary.

tric ignition.) To ignite the incendiary manually, withdraw the safety pin from the M210 fuze. The M210 incendiary fuze functions in exactly the same way as the M201A1 grenade igniting fuze (par. 37*a*).

96. Marking and Packing

The M1A2 incendiary is marked with a purple band, nomenclature, and lot number. One incendiary is packed in a wood box which weighs 55 pounds when filled and displaces 1.1 cubic feet.

97. Storage and Shipment

The M1A2 incendiary is a group D munition. See paragraphs 124 and 125 for shipping and storage information.

Section V. INCENDIARY, EQUIPMENT DESTROYING, TH1, M2A1

98. Use and Description

The M2A1 equipment destroying incendiary (fig. 34) is similar in construction to the M1A1 safe destroying incendiary (par. 88) but is smaller and has only two fuzes. It is designed solely for the purpose

of destroying a single item of classified cryptographic equipment which is made of plastic and wire and is housed in a special container. It is issued only for the purpose for which it is designed and only as directed by the Assistant Chief of Staff, Intelligence. This incendiary is a metal box, 16 inches long by 8½ inches wide by 1 inch deep, filled with 8½ pounds of TH1 thermite (par. 4*d*) and fitted with an M210 incendiary fuze (par. 94) and an M209 electric floating smoke pot fuze (fig. 15). (Early production models contained an electric squib and an M201A1 igniting fuze instead of the M209 and M210 fuzes.) Two cellulose acetate cups filled with first-fire mixture are embedded in the filling, one directly under each fuze. Pertinent data on the incendiary are summarized in table IV.

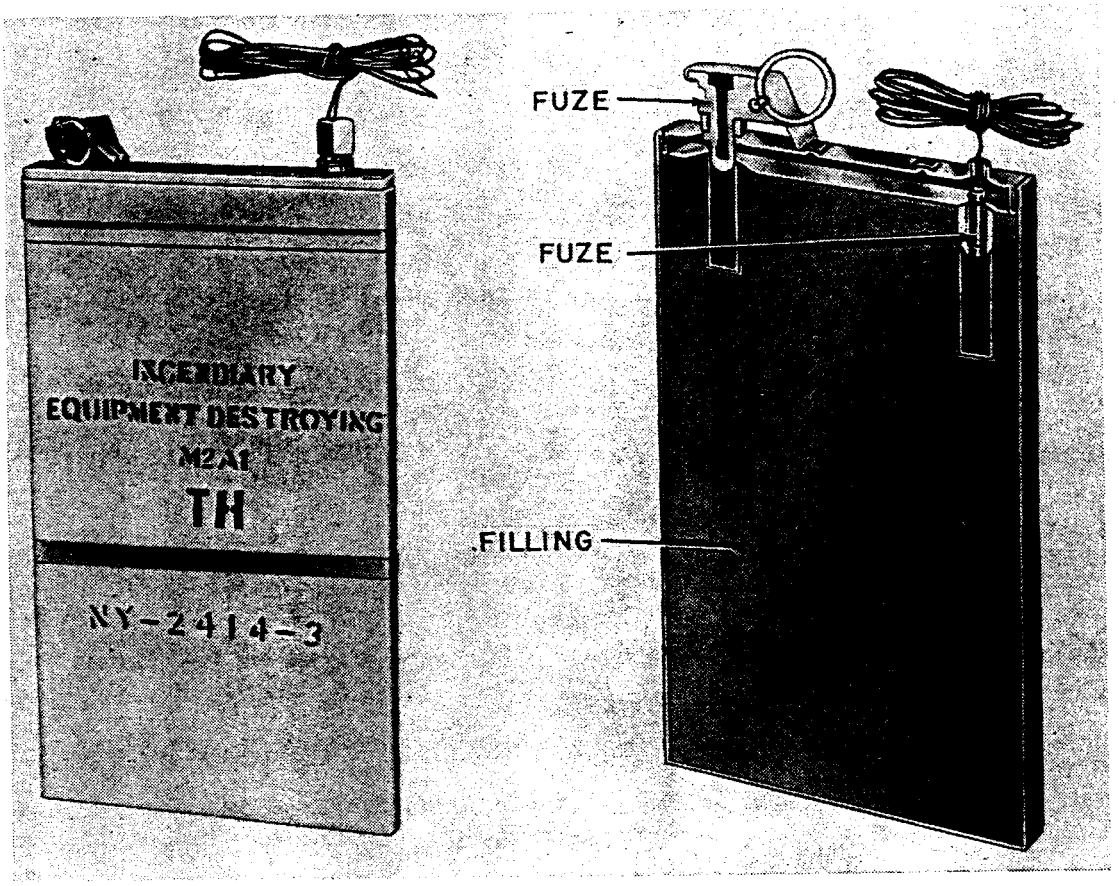


Figure 34. M2A1 TH1 equipment destroying incendiary.

99. Installation

Install the incendiary, in the holder provided for it, in the container housing the cryptographic equipment.

100. Ignition

To ignite the incendiary electrically, connect the wires from the M209 fuze to a source of electric current. See paragraphs 120 through 123 for information on electric ignition. If it is anticipated that the

incendiary will have to be ignited on very short notice, insert a switch between the source of electric current and the fuze and complete all electrical connections. Closing the switch will ignite the incendiary. To ignite the incendiary using the M210 fuze, withdraw the safety pin from the fuze and allow the safety lever to fly off. The incendiary burns for approximately three-quarters of a minute.

101. Functioning

a. Electric. An electric current flowing through the M209 fuze causes the fuze to ignite. The flash of flame from the fuze ignites the first-fire mixture, which ignites the filling.

b. Manual. Withdrawing the safety pin from the M210 fuze causes the fuze to function in the same way as the M201A1 fuze (par. 37*a*). Flame from the fuze ignites the first-fire mixture, which ignites the filling.

102. Marking and Packing

The M2A1 incendiary is marked with a purple band, nomenclature, and lot number. Two incendiaries are packed in a wood box which weighs 33 pounds when filled and displaces 0.8 cubic foot.

103. Storage and Shipment

The M2A1 incendiary is a group D munition. See paragraphs 124 and 125 for shipping and storage information.

Section VI. INCENDIARY, FILE DESTROYER, M4

104. Use and Description

a. Use. The M4 file destroyer incendiary (fig. 35) is intended primarily to be used to destroy classified material in three- or four-drawer filing cabinets provided with combination locks. It is designed to permit maximum destruction of classified matter with minimum damage to the premises where the filing cabinets are kept. Combustible material other than files may be destroyed with this incendiary if the installation procedures are varied to suit the circumstances.

b. Description. The file destroyer incendiary consists of 44 oxidizer boxes, 4 igniter boxes, and 4 racks (fig. 36). The oxidizer boxes furnish oxygen to permit papers to be burned in a closed file drawer. The igniter boxes set fire to the papers and oxidizer boxes. The racks compress the papers and oxidizer boxes while the papers are burning. Forty-four pounds of paper can be destroyed with this incendiary. Pertinent data on the incendiary are summarized in table IV.

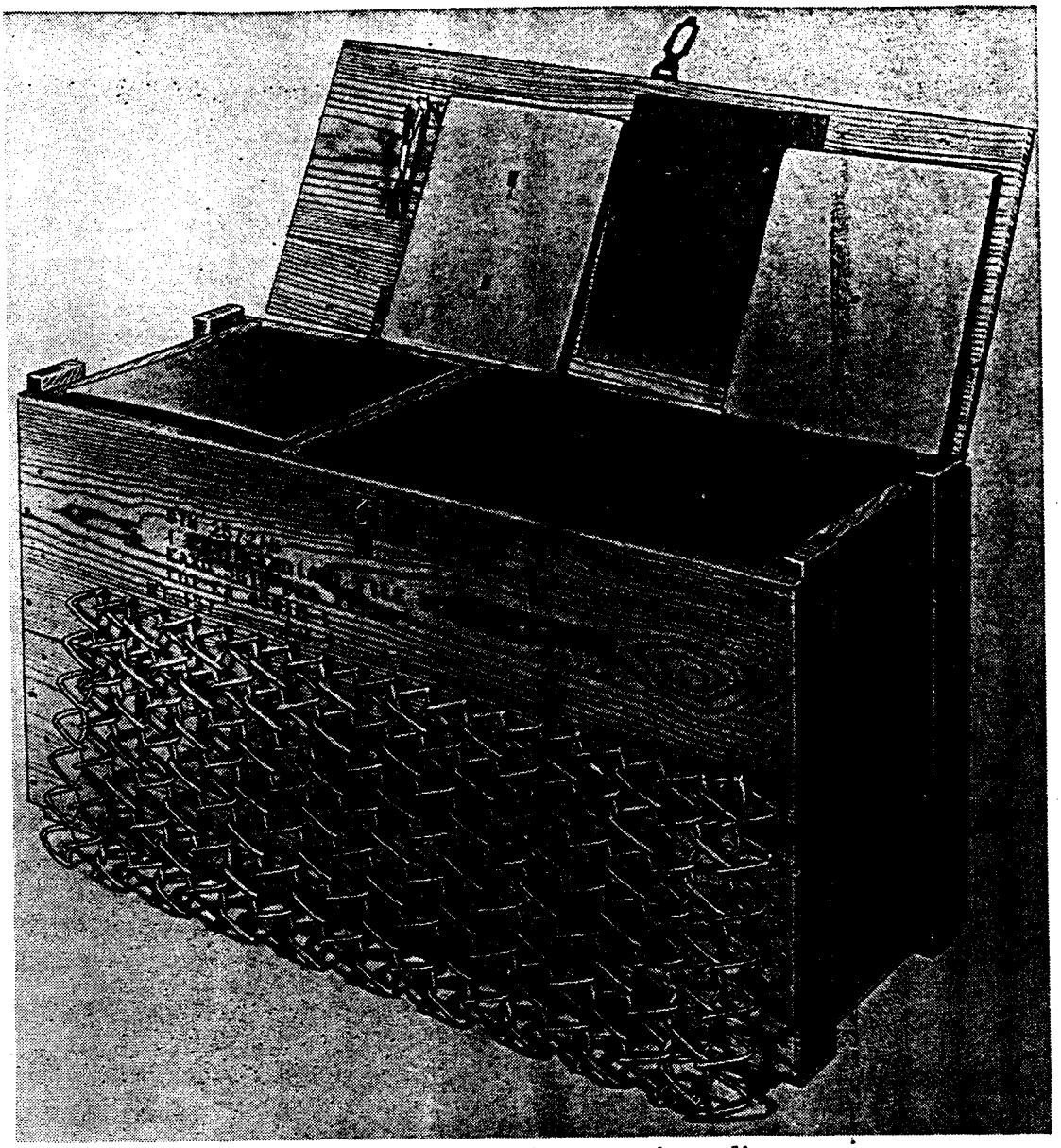


Figure 35. M4 file destroyer incendiary.

(1) *Oxidizer boxes.* The oxidizer boxes are celluloid boxes 10½ inches long by 8¼ inches wide by ½ inch deep filled with approximately 26½ ounces of sodium nitrate.

(2) *Igniter boxes.* The igniter boxes are celluloid boxes of the same size as the oxidizer boxes and are filled with approximately 12 ounces of a mixture of sodium nitrate and finely powdered wood (wood flour). Each igniter box contains two M1 squibs (par. 121*a*) connected in parallel to a pair of igniter wires which are used to connect the squibs to a power source.

(3) *Racks.* The racks are made of interlocking links of heavy wire formed into a flexible rectangle measuring 12 inches wide by 29 inches long and weighing 6½ pounds. The flexible construction of the racks allows them to follow the

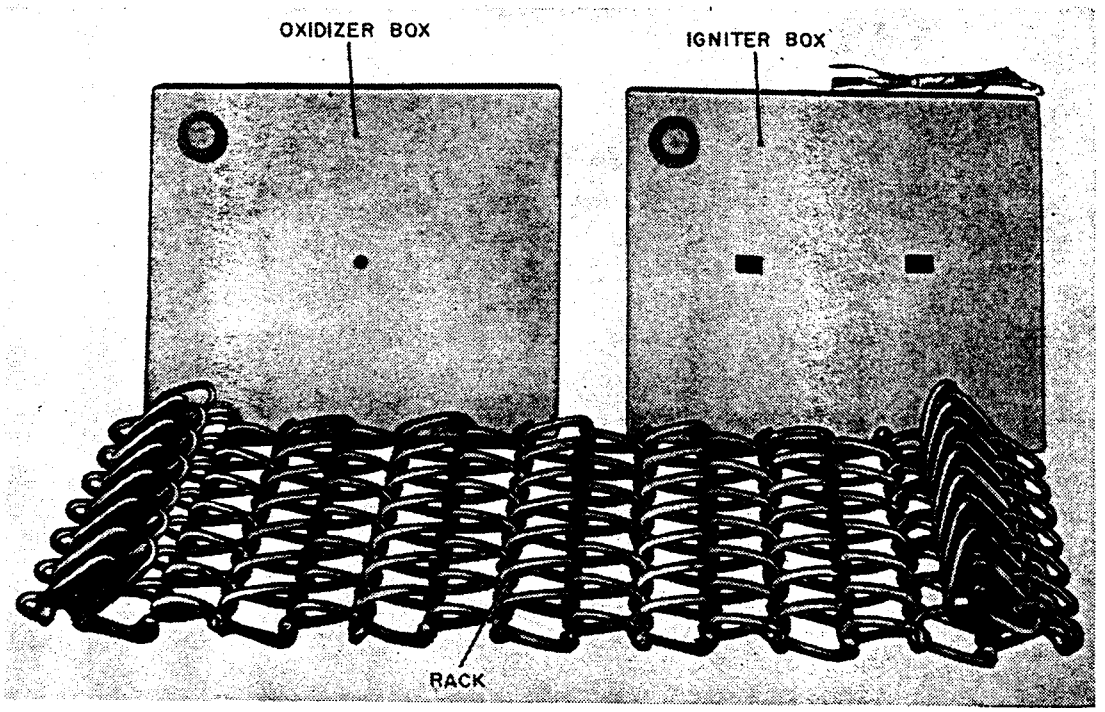


Figure 36. Oxidizer box, igniter box, and rack.

contours of the tops of the papers in a file drawer, and to keep the papers compressed while they are burning.

105. Safety Precautions

Protect the igniter and oxidizer boxes from accidental ignition by sparks or flame. In situations where the premises must be protected from damage by fire, remove any combustible material from near the cabinet. After ignition, move away from the cabinet to avoid the acrid smoke which is produced. If file destroyer incendiaries in several cabinets are to be ignited individually, provide means to ignite each incendiary separately from a remote point not subjected to smoke from the first incendiary fired.

106. Installation

a. Install 1 oxidizer box in the front of the file drawer and 1 oxidizer box behind each ½-inch thickness of paper in the drawer until the drawer is full. Prepare other drawers in the same manner.

b. Place an igniter box ahead of the first oxidizer box in each file drawer. Run the wires from the igniter box out of the drawer, passing them either over the edge of the drawer or through the hole used for the rod that holds the file separators in place. Be careful not to cut the insulation on the wires or the wires themselves.

c. Place a rack on top of the papers and boxes in each drawer prepared as in *a* and *b* above, adjusting the rack so that it will remain in contact with the contents of the file as burning progresses.

d. Close all file drawers and lock them if possible.

mine and bursting charge. Place the mine in the hole with the bursting charge down, lead the detonating cord or the wires from the blasting cap out of the hole, and cover the mine with approximately 4 inches of earth. Camouflage as required (FM 20–32). If there is no time to dig holes for the mines, they may be laid on the surface of the ground with the bursting charge down.

116. Exploding the Mines

a. Electrically. Connect the wires from the blasting cap to an electric firing circuit. The decision to use a series, parallel, or series-parallel firing circuit must depend on the number of blasting caps to be fired simultaneously and the type of electric power available. Refer to FM 5–25 for information on how to determine the type of circuit to use and the maximum number of blasting caps that can be fired in each type of circuit using various power sources. See paragraphs 120 through 123 for general information on electric circuits, wiring, and electric power sources. To explode the mines, connect the electric firing circuit to a source of electric power.

b. Nonelectrically.

(1) Lay out a detonating cord ring main (FM 5–25) in such a way that it passes close to each mine to be detonated. Make all changes of direction of the detonating cord gradual, since sharp bends or kinks will interfere with proper functioning. Tie the detonating cord from each mine to the detonating cord ring main using a girth hitch.

(2) Tape a blasting cap to an end of the detonating cord used to make the ring main. If an electric blasting cap is used, connect the lead wires to an electric firing circuit. Use a source of electric current capable of furnishing 1.5 amperes at 2 volts at the blasting cap. To fire the blasting cap, connect the firing wire to the source of electric current. If a nonelectric blasting cap is used, before taping it to the detonating cord crimp it to a piece of safety fuse (time fuse) long enough to allow time for personnel firing the circuit to move to safety. After the blasting cap is taped to the detonating cord, attach a fuse lighter to the free end of the safety fuse and light the safety fuse. If a fuse lighter is not available, light the safety fuse with a match. The blasting cap will fire when the safety fuse has completed burning and the detonating cord ring main will detonate, exploding the mines.

117. Functioning

Exploding the bursting charge disperses the chemical filling of the mine over a radius of approximately 5 yards.

118. Marking and Packing

a. The body of the chemical land mine is painted with two green bands, the symbol for the filling, lot number, and date of filling.

b. Ten empty mines are packed in a fiberboard box. A box of unfilled mines weighs 15 pounds and displaces 2.3 cubic feet.

119. Storage and Shipment

a. Store empty mines in a dry place.

b. Filled mines are classified in chemical storage as group A munitions. See paragraphs 124 and 125 for shipping and storage information. Do not store mines filled with toxic agent for more than 30 days. Mines filled with MR can be stored as long as 6 months. Vent stored filled mines periodically to prevent pressure from building up and to minimize leaks (TM 3–250).

CHAPTER 6

FIRING COMPONENTS, ACCESSORIES, AND ELECTRIC CIRCUITS

120. General

Explosive and igniting components such as blasting caps, detonating cord, safety fuse, and fuse lighters, which are not issued as part of a chemical munition, are Ordnance Corps items used principally by the Corps of Engineers. A description of such components and information on their use are given in detail in FM 5–25. Electric squibs (Squib, Electric, Flash-Vented, M1) are Chemical Corps items and are described in detail in paragraph 121*a*. Firing circuits used with chemical munitions are described briefly in this chapter and are described in detail in FM 5–25.

121. Firing Components

a. Electric Squib. The M1 flash-vented electric squib (fig. 39) is a metal tube three-sixteenth inch in diameter by 1½ inches long containing a small powder charge compressed around a filament of high-resistance wire. The ends of the filament are connected to 12-foot lead wires which are used for connecting the squib to a source of electric current. The free ends of the lead wires are connected together during manufacture and must not be separated until just before connecting the squib to a firing circuit. The end of the metal tube is pierced at the side by several small holes which vent the flame produced by the powder charge when the squib is ignited. The M1 squib has a resistance of 1.5 ohms and requires a current of no less than 0.6 amperes for ignition. A single flashlight cell (BA 30) will furnish the necessary current to ignite the squib if used with no more than 10 feet of wire between it and the squib. When an electric current flows through the filament, the filament becomes hot and ignites the powder. The powder burns rapidly causing flame to issue from the holes in the end of the tube. Several other types of squibs are used with ground chemical munitions, but these are components of the munitions (for example, the squibs in the M5 smoke pot). These internal squibs function in the same way as the M1 squib, but the tubes are made of paper or cardboard as there is no need for physical protection of an interior part.

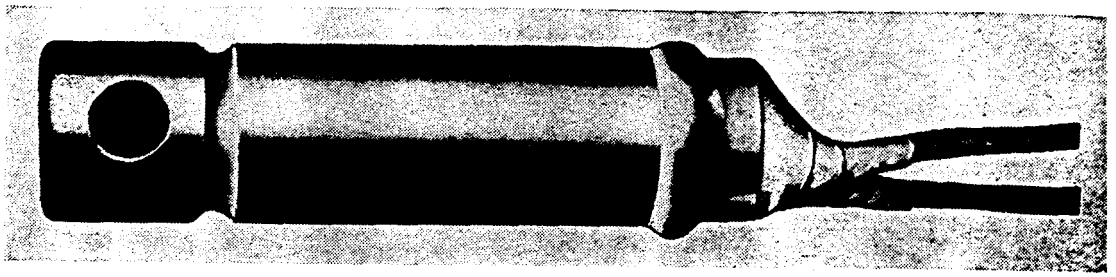


Figure 39. M1 flash-vented electric squib.

b. Blasting Caps. A blasting cap (FM 5–25) is a copper or aluminum tube of small diameter. The tube is closed at one end and is half-filled with a heat-sensitive explosive. In the nonelectric blasting cap (fig. 40) the explosive is coated with a flash charge which ignites when exposed to the flame from safety fuse. The unfilled end of the nonelectric cap receives the end of a length of safety fuse, which usually is crimped in place. In the electric blasting cap (fig. 41), a filament or "bridge" of high-resistance wire is buried in the heat-sensitive explosive. The ends of the filament are connected to 12-foot lead wires which are used to connect the cap to a source of electric current. The free ends of the lead wires are soldered together during manufacture and must not be separated until just before connecting the cap to a firing circuit. The electric blasting cap has a resistance of 2.0 ohms and requires a current of no less than 0.6 amperes to function.

Warning: Blasting caps are sensitive to heat and shock. Handle them carefully to prevent accidental detonation.

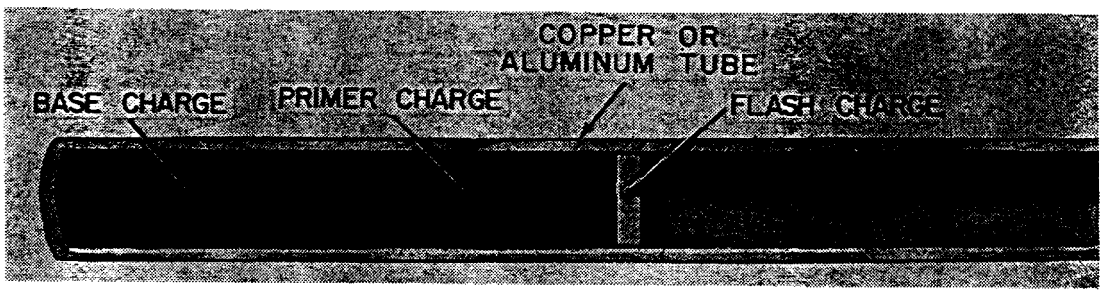


Figure 40. Nonelectric blasting cap.

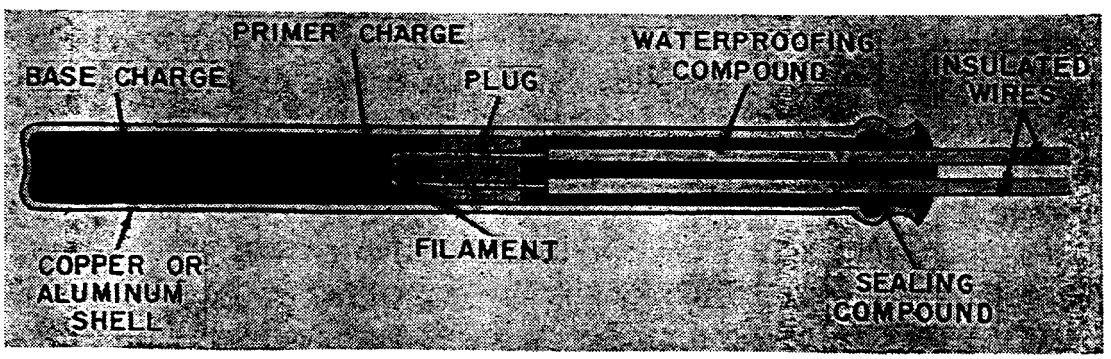


Figure 41. Electric blasting cap.

c. Detonating Cord. Detonating cord (primacord, fig. 42) is a high-explosive cord made by covering a core of PETN explosive with waterproof fabric. The fabric covering has a waxy surface and is colored yellow or yellow and black. Detonating cord is flexible and can be coiled or tied in the same way as a piece of rope. Detonating cord is used with chemical munitions, primarily as a bursting charge for the M1 chemical land mine and as an explosive train to connect land mines to a detonator.

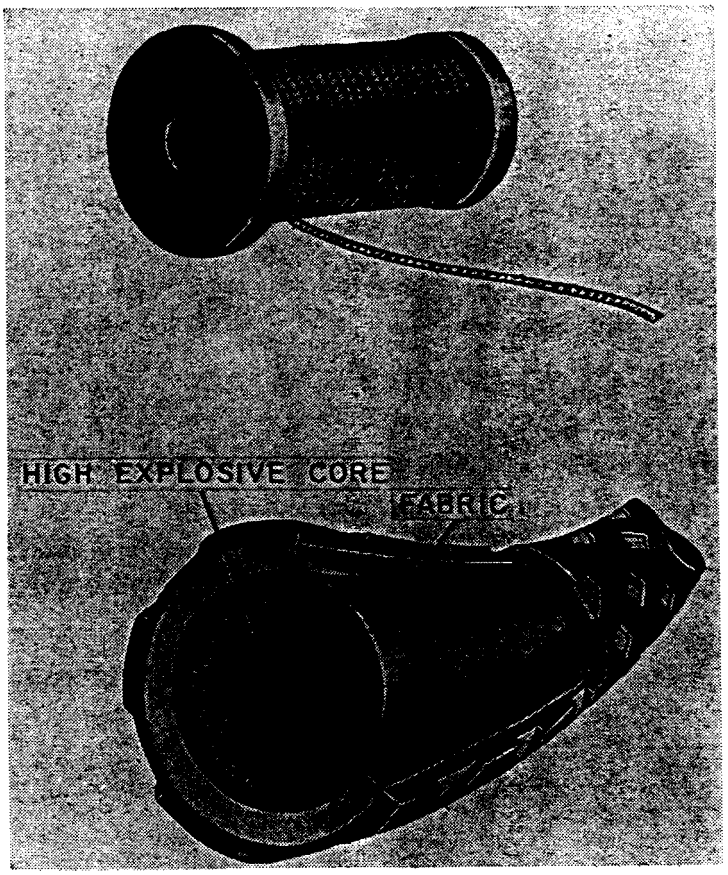


Figure 42. Detonating cord.

d. Safety Fuse. Safety fuse (time fuse, fig. 43) is a slow-burning powder train enclosed in a tube of waterproof fabric or plastic. The fuse burns at a rate of 1 foot in 30 to 45 seconds. Before using safety fuse, test the actual burning time by cutting a 1-foot length and measuring the length of time it takes to burn. To ignite safety fuse, either attach a fuse lighter (*e* below) to it, or slit the end of the fuse to expose the powder train, bury a match head in the powder, and set fire to the match head.

Warning: Do not attempt to extinguish safety fuse by stepping on it, since compressing the powder train will greatly accelerate the burning rate.

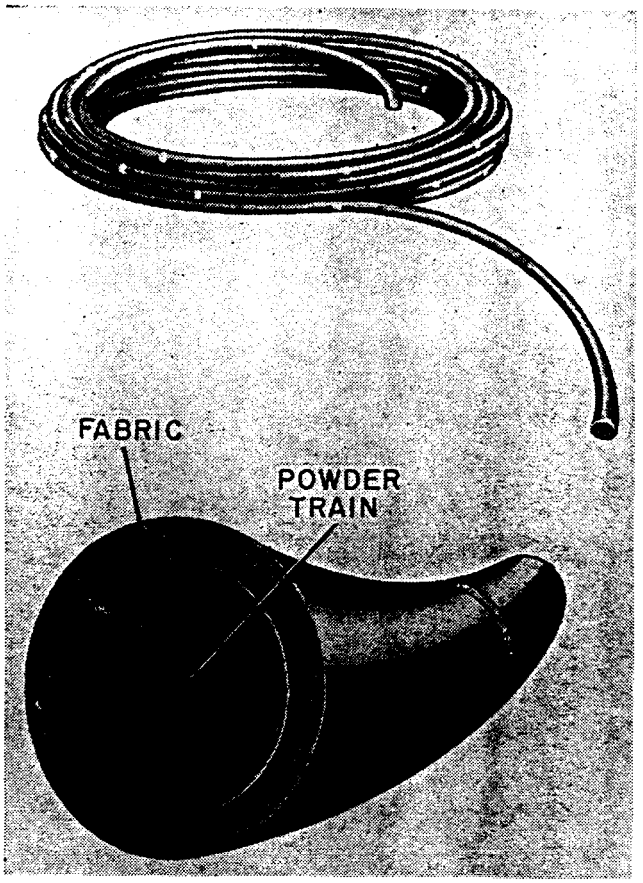


Figure 43. Safety fuse.

e. Fuse Lighters.

(1) The M1 friction-type fuse lighter (fig. 44) is a paper tube containing match-head mixture and having a pull-wire scratcher. The fuse lighter is installed on the end of safety fuse, and is held in place by internal teeth which grip the fabric covering of the safety fuse. To operate the M1 friction-type fuse lighter:

(*a*) Cut off and discard approximately 6 inches from the end of the safety fuse. Insert the newly cut end of the proper length of fuse all the way into the fuse lighter.

(*b*) To fire the fuse lighter, hold both the paper tube and the safety fuse with one hand, and pull the pull-wire with the other hand.

(2) The M2 waterproof fuse lighter (fig. 45) consists of a metal barrel which holds a firing mechanism, and a base which contains a percussion cap and a fuse retainer. When the striker-retaining pin (safety pin) is pulled, the striker hits the percussion cap, which in turn ignites the fuse. To operate the M2 waterproof fuse lighter:

(*a*) Prepare the safety fuse as described in (1) (*a*) above and slide the fuse retainer over the end of the fuse.

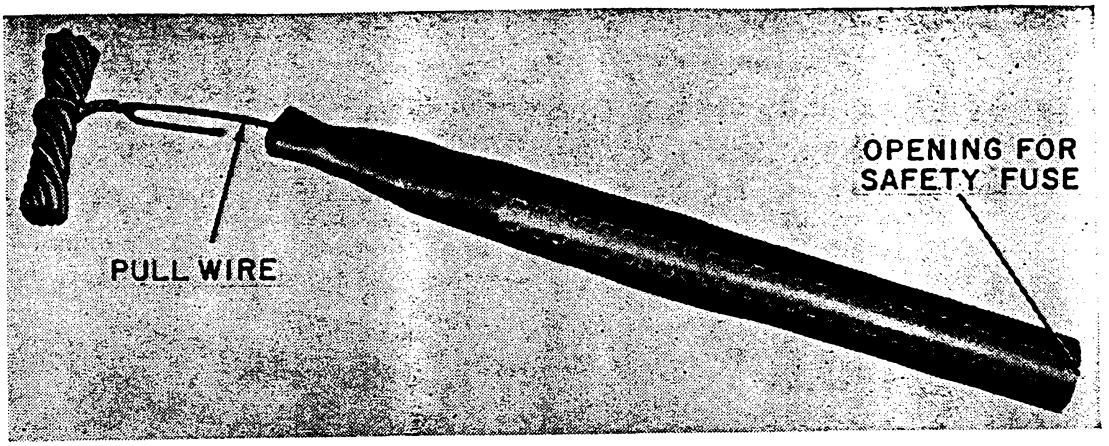


Figure 44. M1 friction-type fuse lighter.

Waterproof the joint between the fuse and the fuse lighter if necessary.

(*b*) To fire the fuse lighter, hold the barrel in one hand and pull the release ring with the other hand.

122. Firing Accessories
(FM 5–25)

a. Firing Wire. Firing wire for electric firing is a 2-conductor No. 18 AWG (American Wire Gage) plastic- or rubber-covered wire. Firing wire is a Corps of Engineers item and is normally available in 500-foot lengths. Field telephone wire or other wire of similar gage can also be used for electric firing.

b. Blasting Machines. A blasting machine is a small electric generator that furnishes current for firing electric blasting caps. The 10-cap blasting machine (fig. 46) will fire 10 blasting caps or electric

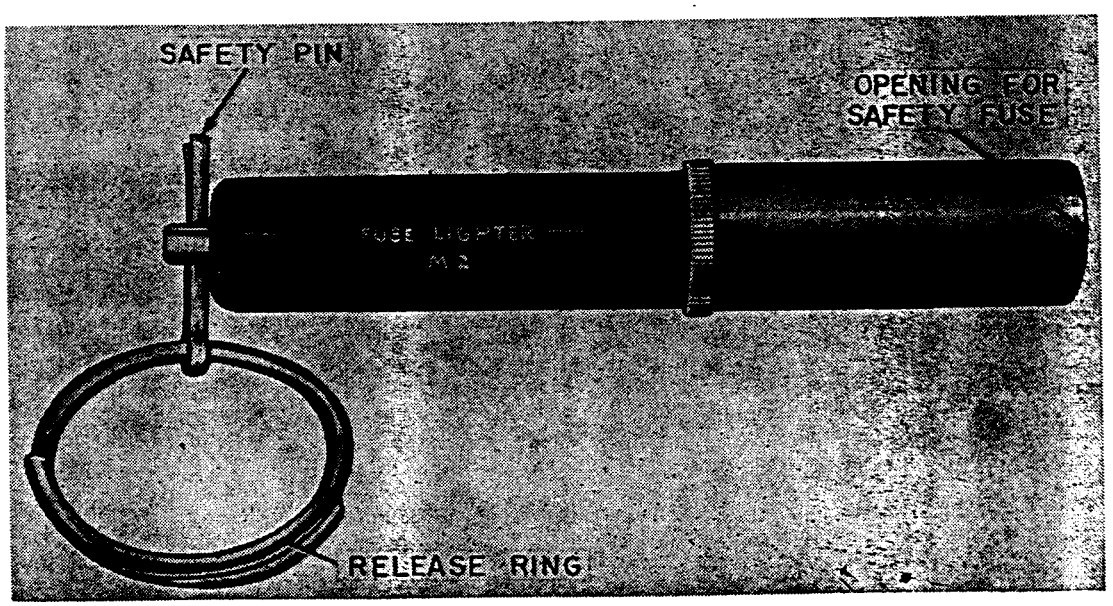


Figure 45. M2 waterproof fuse lighter.

squibs connected in series. The 30-cap blasting machine (fig. 47) and 50-cap blasting machine will fire, respectively, 30 and 50 caps or squibs connected in series. To use the blasting machine, connect one conductor from the firing wire to each terminal of the blasting machine. Electric current is generated when the handle of the 10-

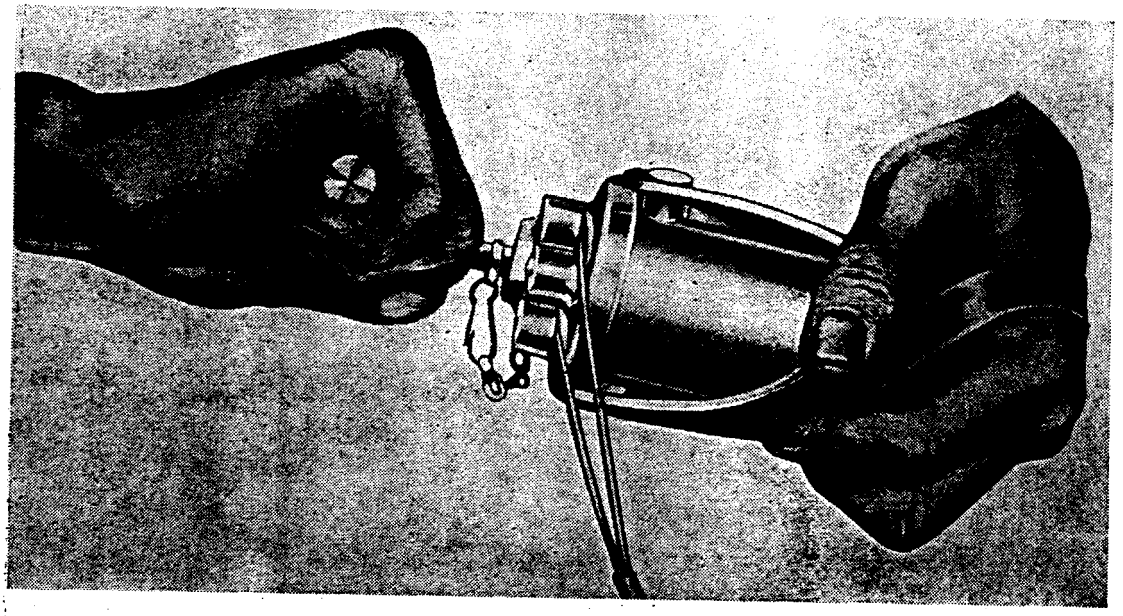


Figure 46. Ten-cap blasting machine.

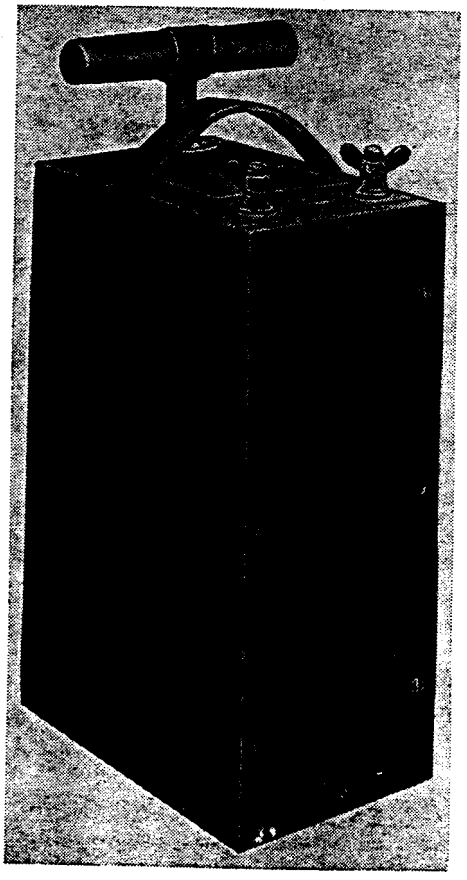


Figure 47. Thirty-cap blasting machine.

cap machine is twisted sharply or when the handle of the 30-cap or the 50-cap machine is pushed down after being raised as far as possible.

c. Galvonometers. The galvonometer (fig. 48) is a sensitive voltage-measuring device used to test electric firing circuits. It has a special internal dry cell which produces the voltage required for testing. It can be connected in an electric firing circuit, and readings can be taken without danger of initiating the charges in the circuit.

Warning: For testing the circuit, do not use any source of voltage other than the special dry cell contained in the galvonometer. Even a single flashlight cell used for testing may fire the charges in an electric firing circuit.

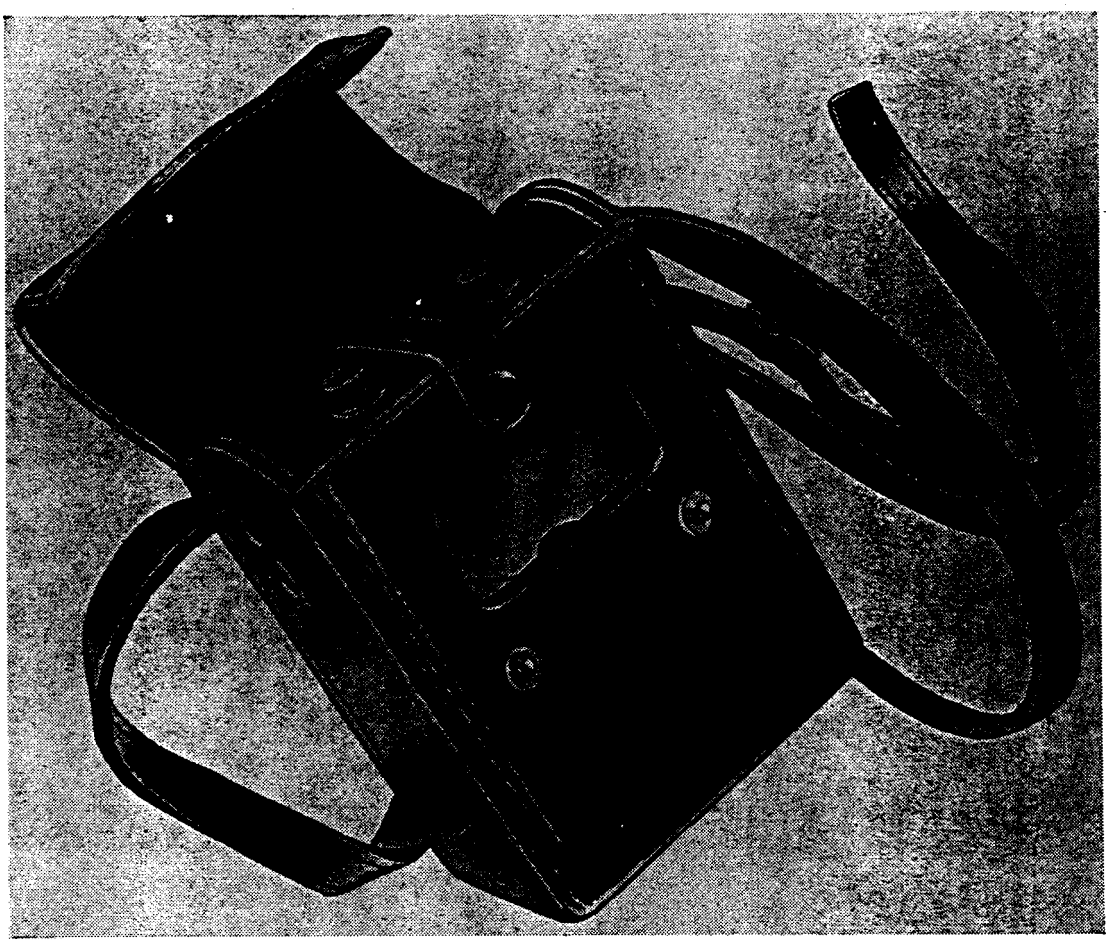


Figure 48. Galvonometer.

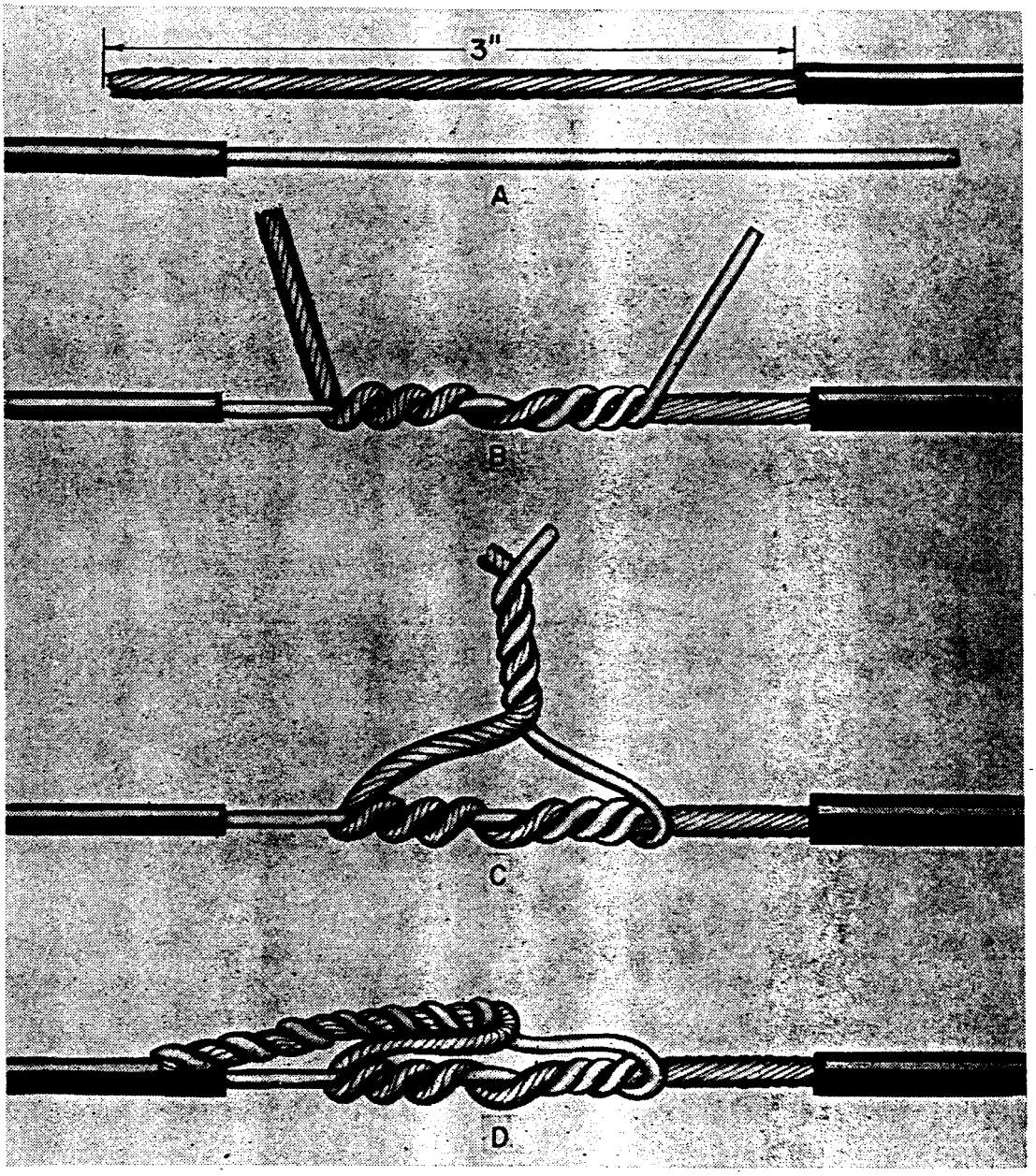
123. Electric Firing Circuits

a. General. Electric firing circuits are used to connect electric squibs or electric blasting caps to a source of current. The type of power source required differs with the number of squibs or caps to be initiated simultaneously and with the type of circuit used. A power source having greater capabilities than the minimum require-

ments may be substituted for a source of minimum capabilities. Electric firing circuits for use with blasting caps are discussed in detail in FM 5–25. Electric firing circuits designed to be used for blasting caps can also be used for electric squibs.

b. Splicing Wires.

(1) To splice two conductors together, first strip or scrape all insulation from 3 inches of the end of each conductor. Twist together the strands of each stranded conductor to form a single lead (A, fig. 49). Next, twist the wires around each other with several tight turns (B). Then



A Remove insulation
B Twist wires together
C Twist ends together
D Bend twisted ends

Figure 49. Method of splicing two wires.

CHAPTER 7
STORAGE AND SHIPMENT

124. General

Storage and shipment of chemical munitions are covered in detail in TM 3–250. Storage information is summarized in this chapter. Army regulations and Interstate Commerce Commission regulations govern the shipment of chemical munitions within the zone of interior. Oversea shipments should be made in compliance with instructions contained in SR 55–730–10, TM 3–250, and TM 38–705. Chemical munitions are classified for storage purposes as follows:

Group A War gases requiring protective masks and complete protective clothing
B War gases requiring protective masks
C Spontaneously flammable
D Incendiary and readily flammable

Warning: Do not store chemical munitions of one storage group with those of any other group or with any other type of munition or component.

125. Storage Requirements

a. Magazine Storage (tables V and VI, app II).

(1) Group A chemical munitions must be stored in igloo-type or Corbetta-type magazines with concrete floors treated with sodium silicate. Wood flooring or other porous floor covering must not be used in magazines. Protective masks and complete protective clothing must be readily available in area where group A chemical munitions are stored.

(2) Group B chemical munitions must be stored in igloo-type or Corbetta-type magazines with concrete floors treated with sodium silicate. Wood flooring or other porous floor covering must not be used in magazines. Protective masks and necessary protective clothing must be readily available to personnel handling group B munitions.

(3) Group C chemical munitions must be stored in a fire-resistive magazine. Storage in an igloo-type or Corbetta-type magazine is preferred. Stacking must be arranged to permit proper inspection. The temperature within the maga-

zine must be maintained below 110° F. to prevent the WP filling from melting. Protective equipment consisting of flameproof gloves and coveralls and safety goggles must be readily available and must be worn by personnel working with WP-filled munitions.

(4) Group D chemical munitions must be stored in a dry, fire-resistive magazine. Water must not be allowed to come in contact with the filling of any group D chemical munition, since water deteriorates the fillings, and HC may ignite spontaneously when moist. Methods used for stacking must provide for good ventilation to all parts of the stacks. Adequate dunnage must be used to protect munitions from ground seepage or moisture. Protective masks and fire-fighting equipment must be available.

b. Field Storage. Chemical munitions may be stored in the open if they are segregated by storage groups and if the stocks of munitions are adequately protected from the elements. Storage areas should be well drained and free of weeds and debris. A 50-foot fire break should encircle the entire area and adequate access roads or paths should be provided within it. Adequate dunnage should be used to raise the munitions above ground and to provide ventilation. Protection from rainfall and direct rays of the sun must be provided by tarpaulins placed over and raised above the top level of the stacks. Numerous fire points containing 55-gallon drums full of water, filled sand buckets, shovels, picks, and burlap must be established.

c. Quantity-Distance Storage Information. All magazines and sites should be posted with signs, well visible from an appreciable distance, indicating the group of munition stored therein. See tables V and VI, appendix II, for quantity-distance storage information.

126. Fire Fighting

a. Fires in group A and B storage areas require the evacuation of all personnel not necessary to combat the blaze. Fire fighters should confine their efforts to preventing fires from spreading.

b. Outside storage areas containing group C munitions fitted with fuse or burster and packed in containers should be abandoned if the fire cannot be controlled. Fires in igloo-type or Corbetta-type magazines will not be fought.

c. Observe the following precautions when fighting fires in storage areas where group C chemical munitions without fuses or bursters are stored:

(1) Phosphorus, once extinguished, should either be immersed

in water or sprayed continually with water to prevent the flames from bearing out anew.

(2) Personnel with portable extinguishers should not be permitted in the magazine after a fire gains headway, unless they are equipped with lifelines to prevent them from becoming lost in smoke while combating the flames.

(3) Use fog nozzles on fire hose. If fog nozzles are not available, use the lowest water pressure that will be effective, since a high-velocity stream of water tends to spread the fire.

d. Fire fighters is areas containing group D munitions should onfine their efforts to preventing fires from spreading in magazine reas or storage areas. Fires in igloo-type or Corbetta-type magaines will not be fought. Fires of HC mixtures must be deluged with ater, since small volumes of water are ineffective and may increase he fire. Incipient fires among group D munitions may be smothered y sand.

CHAPTER 8

EVACUATION AND DESTRUCTION TO PREVENT ENEMY USE

127. General

When ground chemical munitions are in danger of being captured by an enemy, the decision must be made to evacuate, destroy, or abandon them. Evacuation is preferable to destruction and, except in some cases involving munitions filled with war gas (par. 130), destruction is preferable to abandonment. The authority to evacuate, destroy, or abandon chemical munitions must be obtained from the responsible commander.

128. Evacuation

Evacuation to prevent capture must be in the following priority:

a. Secret or confidential munitions or components.

b. Primers, fuzes, items in short supply, munitions filled with war gas. (table VII, app III).

c. Other items, as transportation is available.

129. Destruction and Abandonment

The conditions under which munitions will be destroyed will vary according to such factors as the tactical situation, security classification of the munition (AR 380–5), quantity and location of munitions, facilities for accomplishing destruction, and time available. In general, ground chemical munitions can be destroyed most effectively by burning, as described below. Small quantities of munitions can be destroyed by igniting them with their own fuzes. Destruction to prevent capture must be in the following priority:

a. Secret or confidential munitions or components.

b. Primers, fuzes.

c. Items specifically designated as capable of being used with enemy equipment.

d. Fuzed munitions, such as hand grenades, capable of being used by an enemy.

e. Munitions not included in *a*, *b*, *c*, and *d* above may be abandoned, since their use by an enemy is unlikely, and they may be expected to remain serviceable until recapture.

130. Munitions Filled with War Gas

Munitions filled with war gas (table VII, appendix III) should be evacuated if possible. If evacuation is impossible, such munitions will not be destroyed unless destruction is directed by the theater army commander, since their destruction will contaminate the area, and if gas is not already in use in the theater, such action may provide the basis for a claim by the enemy that gas warfare has been initiated (FM 9–6).

131. Methods of Destruction

a. HC and Colored Smoke Munitions. Destroy these munitions by burning or by mechanical means. See TM 9–1900 and TM 9–1901 for information on the destruction of artillery ammunition.

(1) *Burning.* Pile the munitions with all available flammable material such as brush or dunnage, pour gasoline over the pile, and ignite it from a safe distance.

Warning: Be sure that the smoke produced by burning HC does not interfere with operations of nearby tactical units.

(2) *Mechanical means.* Puncture containers with tools or small-arms fire, and wet the filling.

b. WP-Filled Munitions. Pile the munitions in a pit or defiladed location and burn as in *a*(1) above.

Warning: Be sure that the smoke produced by burning WP does not interfere with operations of nearby tactical units. Provide personnel with protection from WP particles, since WP-filled munitions contain explosive charges which will explode when heated. Remove rocket motors from WP-filled rocket warheads before burning the warhead.

c. Munitions with Incendiary Fillings. Destroy these munitions by burning. To burn munitions with incendiary fillings, pile them and ignite as in *a*(1) above.

(1) Thermate-filled grenades and thermite-filled incendiaries can be used to destroy other munitions and equipment.

(2) Fire starters can be used to start fires for destroying munitions and equipment.

d. Thermal Generator Smoke Pots. Destroy filled or unfilled thermal generator smoke pots by burning as in *a*(1) above, or puncture the oil chamber with tools or small-arms fire.

e. Land Mines. Refer to paragraph 130 for information on destroying munitions filled with war gas. Puncture empty land mines with tools or small-arms fire, or smash them with heavy implements.

f. Firing Components and Accessories. Destroy explosive or flammable firing components and accessories by piling in a pit or defiladed location and burning as in *a*(1) above.

Warning: Provide personnel with protection from flying fragments of metal, since heat will cause explosive components to detonate.

APPENDIX I

REFERENCES

AR 55–105	Transportation by Commercial Means; General.
AR 55–155	Traffic Requirements and Procedures Governing Domestic Route Orders.
AR 55–225	Transportation of Explosives and Other Dangerous Articles.
AR 55–228	Transportation by Water of Explosives and Hazardous Cargo.
AR 380–5	Safeguarding Defense Information.
SR 55–730–10	United States Army, Navy, and Air Force Joint Ocean Shipping Procedures.
SR 320–5–1	Dictionary of United States Army Terms.
SR 320–50–1	Authorized Abbreviations.
DA Pam 108–1	Index of Army Motion Pictures, Television Recordings, and Filmstrips.
DA Pam 310–1	Index of Administrative Publications.
DA Pam 310–2	Index of Blank Forms.
DA Pam 310–3	Index of Training Publications.
DA Pam 310–4	Index of Technical Manuals, Technical Regulations, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
FM 3–5	Tactics and Technique of Chemical, Biological, and Radiological Warfare.
FM 3–8	Chemical Corps Reference Handbook.
FM 3–65	Chemical Depot Company.
FM 5–25	Explosives and Demolitions.
FM 9–6	Ordnance Ammunition Service in the Field.
FM 20–32	Employment of Land Mines.
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 21–8	Military Training Aids.
FM 21–30	Military Symbols.
FM 21–40	Defense Against CBR Attack.
FM 21–41	Soldier's Manual for Defense Against CBR Attack.
FM 21–48	CBR Training Exercises.

FM 23–30	Hand and Rifle Grenades.
TM 3–205	Protective Masks and Accessories.
TM 3–215	Military Chemistry and Chemical Agents.
TM 3–220	Decontamination.
TM 3–250	Storage and Shipment of Dangerous Chemicals.
TM 3–255	Chemical Filling and Handling Equipment.
TM 3–290	Individual Protective and Detection Equipment.
TM 3–366	Flame Thrower and Fire Bomb Fuels.
TM 9–1900	Ammunition, General.
TM 9–1901	Artillery Ammunition.
TM 38–705	Army Shipping Document.

Interstate Commerce Commission Regulations.

APPENDIX II

QUANTITY-DISTANCE STORAGE TABLES

*Table V. Group C and D Chemical Munitions**

(Without explosive components; packaged in approved storage containers.)

Total weight of chemical filling in stack (pounds)		Minimum allowable distance (feet) from			
From—	To—	Inhabited building	Public railway	Public highway	Magazine
100	1,000	75	75	75	50
1,000	5,000	115	115	115	75
5,000	10,000	150	150	150	100
10,000	20,000	190	190	190	125
20,000	30,000	215	215	215	145
30,000	40,000	235	235	235	155
40,000	50,000	250	250	250	165
50,000	60,000	260	260	260	175
60,000	70,000	270	270	270	185
70,000	80,000	280	280	280	190
80,000	90,000	295	295	295	195
90,000	100,000	300	300	300	200
100,000	200,000	375	375	375	250
200,000	300,000	450	450	450	300
300,000	400,000	525	525	525	350
400,000	500,000	600	600	600	400

* Quantity-distance storage tables for group A and B chemical munitions without explosive components are not established, since no explosive hazard exists.

Table VI. Chemical Munitions Assembled with Explosive Components

Total weight of explosives in stack (pounds)	Minimum allowable distance (feet) from			
	Inhabited building	Public railway	Public highway	Magazine
Not over 500,000	1,200	1,200	1,200	300

APPENDIX III

GROUND CHEMICAL MUNITIONS FILLED BY CHEMICAL CORPS

Table VII. Ground Chemical Munitions Filled by the Chemical Corps

Munition	Filling		Reference
	Type	Weight (pounds)	
Candle, Smoke, Oil, SGF2, M6	SGF2	0.20	Navy munition

	Type	Weight (grams)	Cml C Directive
Canister, Smoke, 105-mm Shell, M1.	HC	750	391
Canister, Smoke, Colored, 105-mm Shell, M2 (Red, Green, Violet, Yellow).	RS, GS VS, YS	440, 410 410, 380	392
Canister, Smoke, 155-mm Shell, M1.	HC	2,580	387
Canister, Smoke, 155-mm Shell, M2.	HC	1,360	388
Canister, Smoke, Colored, 155-mm Shell, M3 (Red, Green, Violet, Yellow).	RS, GS VS, YS	1,500, 1,500 1,500, 1,350	389
Canister, Smoke, Colored, 155-mm Shell, M4 (Red, Green, Violet, Yellow).	RS, GS VS, YS	750, 750 750, 760	390
Canister, Smoke, 5-inch Projectile, M5.	WP	7.06 lb.	None.

	Type	Weight (ounces)	Reference
Grenade, Rifle, Smoke, M19A1	WP	8.5	TM 9-1900
Grenade, Rifle, Smoke, Colored, M22 (T8E1) (Red, Green, Violet, Yellow).	RS, GS VS, YS	7.0	TM 9-1981
Grenade, Rifle, Colored Smoke Streamer, M23 (T12) (Red, Green, Violet, Yellow).	RS, GS VS, YS	6.4	Do.

Munition	Filling		Reference
	Type	Weight (pounds)	
Rocket, Smoke, 2.36-inch, M10	WP	0.89	TM 1–1900
Rocket, Smoke, 2.36-inch M10A1.	------do------	------do------	TM 9–1950
Rocket, Smoke, 2.36-inch, M10A2.	------do------	------do------	Do.
Rocket, Smoke, 2.36-inch, M10A3.	------do------	------do------	Do.
Rocket, Smoke, 2.36-inch, M10A4.	------do------	------do------	Do.
Rocket, Smoke, 3.5-inch, M30_	------do------	2.23	Do.
Rocket, HVAR, Smoke, 5.0-inch, Mk 4 Mod 1.	PWP	19.3	Navy munition.
Rocket, Gas, 7.2-inch, M25___	CG	20.6	TM 9–1950
Shell, Smoke, 57-mm, M308A1	WP	0.37	TM 9–1901
Shell, Smoke, 60-mm, M302___	------do------	0.76	Do.
Shell, Smoke, 75-mm, M311A1	------do------	1.35	Do.
Shell, Smoke, 75-mm, M64____	------do------	1.35	Do.
Shell, Smoke, 75-mm, M64____	FS	1.51	Do.
Shell, Smoke, 3-inch (76-mm), M312, Smokeless.	WP	0.73	Do.
Shell, Smoke, 81-mm, M57____	WP	4.09	Do.
Shell, Smoke, 81-mm, M57____	FS	4.59	Do.
Shell, Smoke, 90-mm, M313___	WP	1.97	Do.
Shell, Smoke, BE, HC, 105-mm, M84.	HC	5.08	Do.
Shell, Smoke, Colored, BE, 105-mm, M84.	GS, RS YS, VS	2.7, 2.9 2.5, 2.7	Do.
Shell, Smoke, 105-mm, M60___	WP	4.06	Do.
Shell, Smoke, 105-mm, M60___	FS	4.61	Do.
Shell, Smoke, 105-mm, M325__	WP	4.06	Do.
Shell, Smoke, 115-mm, M104__	------do------	15.68	Do.
Shell, Smoke, 115-mm, M104__	FS	16.90	Do.
Shell, Smoke, 155-mm, M105__	WP	15.60	Do.
Shell, Smoke, 155-mm, M105__	FS	16.90	Do.
Shell, Smoke, 155-mm, M110__	WP	15.60	Do.
Shell, Smoke, 155-mm, M110__	FS	16.90	Do.
Shell, Smoke, BE, HC, 155-mm, M116.	HC	2.00	Do.
Shell, Smoke, Colored, BE, 155-mm, M116.	GS, RS YS, VS	11.6, 11.6 10.6, 11.6	Do.

Munition	Filling		Reference
	Type	Weight (pounds)	
Shell, Gas, Persistent, 105-mm, M60.	H, HD	3.17	TM 9–1901
Shell, Gas, Persistent, 155-mm, M104.	H, HD	11.70	Do.
Shell, Gas, Persistent, 155-mm, M110.	H, HD	11.70	Do.
Shell, Gas, Nonpersistent, 105-mm, M360.	GB	1.7	None.
Shell, Gas, Nonpersistent, 155-mm, M121.	------do-----	6.3	None.
Shell, Gas, Nonpersistent, 155-mm, M122.	------do-----	1.7	None.
Shell, Smoke, 4.2-inch Mortar, M2.	WP, FS, FM	7.50	TM 9–1901
Shell, Gas, Persistent, 4.2-inch Mortar, M2.	H	6.20	Do.
Shell, Gas, Persistent, 4.2-inch Mortar, M2.	HD	6.00	Do.
Shell, Gas, Persistent, 4.2-inch Mortar, M2.	HT	5.75	Do.
Shell, Gas, Nonpersistent, 4.2-inch Mortar, M2.	CK	5.00	Do.
Shell, Gas, Nonpersistent, 4.2-inch Mortar, M2.	CG	6.25	Do.
Shell, Gas, Nonpersistent, 4.2-inch Mortar, T172.	GB	3.2	Do.
Shell, Gas, Irritant, 4.2-inch Mortar, M2.	CNB	5.45	Do.
Shell, Gas, Irritant, 4.2-inch Mortar, M2.	CNC		Do.
Shell, Gas, Irritant, 4.2-inch Mortar, M2.	CNS	7.00	Do.

INDEX

[AG 470.6 (23 May 56)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

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NG: State AG (6); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see SR 320–50–1.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1956—400513

TECHNICAL MANUAL

GROUND CHEMICAL MUNITIONS

TM 3-300
CHANGES No. 5

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *24 May 1962*

TM 3-300, 14 August 1956, is changed as follows:

17. Operation and Functioning

* * * * * * *

b. Electric. M5 smokepots may * * * from the installation. A 6-volt source is required to ignite a number of smokepots simultaneously (par. 123), but a 1½-volt flashlight battery (BA 30) can be used to ignite a single pot. Use two batteries in series if the connecting wire is of higher resistance than the squib in the smokepot. To ignite a pot in this manner, attach a wire not more than 10 feet long to each of the two binding posts of the smokepot. Stretch the wires their full lengths, being careful not to pull them from the binding posts, and touch the free end of one wire to the center terminal of the battery and the free end of the other wire to the base of the battery, closing the circuit.

Warning. Deleted.

49. Operation and Functioning

Warning. (As added by C 4, 31 Aug 61) Before removing the safety pin, look through slotted openings in the top of the arming sleeve to make sure that the safety balls (14, fig. 20) are present. If the safety balls are not visible, ***do not pull the safety pin;*** turn in the grenade as hazardous ammunition (TM 9-1903).

a. Throwing Grenade. Grasp the grenade * * * hand (fig. 21).

* * * * * * *

APPENDIX I

REFERENCES

TM 9-1903 (As added by C 4, 31 Aug 61)	Care, Handling, Preservation, and Destruction of Ammunition.

*These changes supersede C 4, 31 August 1961.

BY ORDER OF THE SECRETARY OF THE ARMY:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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Cml Dep (5)
Cml Fld Maint Shop (1)
POE (1)
USA Trans Tml Comd (2)
Army Tml (2)
OSA (1)
PG (5)
Cml Arsenal (3)
Cml Proc Dist (3)
USA Corps (1)

NG: None.

USAR: Same as Active Army except allowance is one copy to each unit.

For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1962

TECHNICAL MANUAL

GROUND CHEMICAL MUNITIONS

TM 3-300
CHANGES No. 3

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *25 August 1959*

TM 3-300, 14 August 1956, is changed as follows:

17. Operation and Functioning

* * * * * * *

b. Electric. (Superseded) M5 smokepots may be ignited singly or in multiple by electric ignition. See paragraphs 120 through 123 for information on electric power sources, wire, and wiring. To prepare for electric ignition, connect wires from the power source to the binding posts. (It is not necessary to remove the tear strip when firing pots electrically.) When the electric circuit is completed, the squib ignites the match head, which in turn ignites the starter mixture. The burning starter mixture ignites the HC filling which generates sufficient heat to soften the solder holding the tear strip. Internal pressure blows off the tear strip, allowing the smoke to escape. When firing the M5 smokepot electrically, fire the pots from a position a short distance from the installation. A 6-volt source is required to ignite the flash-vented squib (or squibs) of the M5 smokepot. However, a flashlight battery may be used to ignite the M5 smokepot if a higher voltage source is not available. To ignite the M5 smokepot with a flashlight battery, attach a short length of wire to each binding post on the smokepot. Hold the free end of one of the wires to the base of the flashlight battery and touch the free end of the other wire to the central terminal of the flashlight battery, to close the circuit.

Warning. (Superseded) **If a flashlight battery is used to ignite the M5 smokepot, move away from the smokepot immediately after closing the circuit, since the tear strip may be blown from the smokepot with explosive force.**

Table III. Chemical Hand Grenades (page 28).

On the Grenade, hand, smoke, WP, M15 change the fuze delay from 4–5 seconds to 2.5–6 seconds, and the radius of burst from 20 yards to 35 yards.

30.1 Shapes of Grenades

(Added)

The differences in shape of burning-type grenades and bursting-type grenades make it possible to identify the grenades by feel in the dark. The burning-type grenades (pars. 36, 41, 46, 58, 63, and 68)

have cylindrical bodies, flat tops and flat bottoms, and tape-covered emission holes around the fuze adapter and, in some cases, down the sides of the body. The bursting-type grenades (pars. 48 and 53) are either round or cylindrical, have rounded tops and bottoms, and have no emission holes. A new chemical grenade, the M34 WP smoke hand and rifle grenade (TB3–300–5), is similar in size and shape to the M15 WP hand grenade except that the body is encircled by an indentation and the bottom half is tapered. Also, the body of the M34 WP grenade is scored vertically and horizontally to increase its fragmentation effect.

53. Description

The M15 grenade * * * of the fuze.

Warning. (Added) **The M15 WP hand grenade is a dangerous, bursting-type munition. The white phosphorus filling not only causes a dense white smoke but also causes burns and fires. When the grenade bursts, particles of white phosphorus are scattered over an area about 35 yards in radius; these particles ignite spontaneously on contact with the air. For safety reasons, the M15 WP hand grenade must be thrown at a distance of over 35 yards from all personnel during training.**

54. Operation and Functioning

Hold the grenade * * * lever is released. The bursting charge explodes 2.5 to 6 seconds after the safety lever is released, rupturing the grenade body and scattering burning WP over a 35-yard radius. The grenaded projection cannot be used to launch the M15 grenade.

69. Operation and Functioning

* * * * * * *

Warning. (Added) **The AN–M14 grenade has a violent burning action which throws molten material in all directions. After releasing the safety lever, personnel must move to a distance of not less than 5 yards from the burning grenade.**

88. Use and Description

a. Use. The M1A1 **incendiary cryptographic equipment destroyer (fig. 32) is designed for the sole purpose of destroying cryptographic devices TSEC/KO–6, TSEC/KW–22, TSEC/KW–2, TSEC/KL–1, and TSEC/KL–29. It is authorized for use outside CONUS on the basis of 3 per device.** It cannot be * * * equipment destroyer (par. 94).

* * * * * * *

90. Ignition

* * * * * * *

Warning. (Added) **The M1A1 incendiary cryptographic equipment destroyer deteriorates after 2 years' storage in arctic climates and may explode violently when ignited.**

94. Use and Description

The M1A2 incendiary * * * the same purpose. Like the M1A1 destroyer, it is authorized for use outside CONUS **by units equipped with cryptographic devices TSEC/KO–6, TSEC/KW–22, TSEC/KW–2, TSEC/KL–1, and TSEC/KL–29 on the basis of 3 per device.** It is identical * * * the M1A1 destroyer.

95. Ignition and Functioning

To ignite the * * * hand grenade (par. 37*a*).

* * * * * * *

Warning. (Added) **The M1A2 incendiary cryptographic equipment destroyer deteriorates after 2 years' storage in arctic climates and may explode violently when ignited.**

98. Use and Description

The M2A1 incendiary * * * only two fuzes. It is designed solely for the purpose of destroying **cryptographic device TSEC/KW–4 and is authorized on the basis of 3 per device outside CONUS.** This destroyer is * * * in table IV.

100. Ignition

To ignite the * * * of a minute.

Warning. (Added) **The M2A1 incendiary cryptographic equipment destroyer deteriorates after 2 years' storage in arctic climates and may explode violently when ignited.**

104. Use and Description

a. Use. The M4 incendiary * * * cabinets are kept. **It is used outside CONUS only when authorized by commanders on the basis of one per file cabinet (SB 725–1300–1).** Combustible material other * * * suit the circumstances.

* * * * * * *

APPENDIX I

REFERENCES

* * * * * * *

SB 725–1300–1 (Added) Requisitioning and Issuing Cryptographic Equipment Destroyers, Incendiary, M1A1, M1A2, M2A1; Grenade, Hand, AN–M14; Document Destroyer, Emergency, Incendiary, M3; and File Incendiary, M4.

TB 3–300–5 (Added) Grenade, Hand and Rifle, Smoke, WP, M34.

[AG 470.6 (28 Jul 59)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

L. L. LEMNITZER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

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Cml Proc Dist (4)

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1959

TECHNICAL MANUAL

GROUND CHEMICAL MUNITIONS

TM 3–300
CHANGES No. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *5 May 1958.*

TM 3–300, 14 August 1956, is changed as follows:

Wherever they appear in this manual, nomenclature of the following items will be changed as indicated:

Change	*To*
Fuze, Floating Smoke Pot, Electric, M209.	**Fuze, Smoke Pot, Electric, M209.**
Fuze, Floating Smoke Pot, M208.	**Fuze, Smoke Pot, M208.**
Fuze, Grenade, Hand, M206A1.	**Fuze, Hand Grenade, M206A1.**
Fuze, Igniting, Grenade, M201A1.	**Fuze, Hand Grenade, M201A1.**
Incendiary, File Destroyer, M4.	**File Destroyer, Incendiary, M4.**
Incendiary, Safe Destroying, TH1, M1A1.	**Cryptographic Equipment Destroyer, Incendiary, TH1, M1A1.**
Incendiary, Safe Destroying, TH1, M1A2.	**Cryptographic Equipment Destroyer, Incendiary, TH1, M1A2.**
Incendiary, Equipment Destroying, TH1, M2A1.	**Cryptographic Equipment Destroyer, Incendiary, TH1, M2A1.**
Pot, Smoke, Floating, HC, M4A2.	**Smoke Pot, Floating, HC, M4A2.**
Pot, Smoke, Floating, SGF2, AN–M7.	**Smoke Pot, Floating, SGF2, AN–M7.**
Pot, Smoke, Floating, SGF2, Mk 5 Mod 2.	**Smoke Pot, Floating, SGF2, Mk 5 Mod 2.**
Pot, Smoke, HC, M1	**Smoke Pot, HC, 10-lb., M1.**
Pot, Smoke, HC, 30-lb., M5	**Smoke Pot, HC, 30-lb., M5.**
Starter, Fire, M1	**Starter, Fire, NP3, M1.**
Starter, Fire, M2	**Starter, Fire, NP3, M2.**

•These changes supersede C 1, 16 August 1957.

21. Operation and Functioning

(As changed by C 1, 16 Aug 57)

Remove the quick-release * * * to 15 minutes.

Warning: Vent HC floating smoke pots for at least 5 minutes within 24 hours before firing by removing adhesive tape from two vent holes in the inside cover. Re-cover holes with adhesive tape before firing smoke pots.

31. Safety Precautions

* * * * * * *

e. (Superseded) During training, bear in mind that the bursting radius shown in table III is the effective radius of burst; fragments may be projected well beyond this distance. Take cover when using a grenade which contains a bursting charge.

* * * * * * *

g. (Superseded) If the safety lever on a WP grenade is released accidentally, throw the grenade and take cover, or if the grenade has been dropped with the safety pin removed, take cover immediately.

h. (Added) See AR 385–63 for additional safety precautions.

32. Misfires

* * * * * * *

Caution: (Added) Do not remove a burning-type grenade from the sealed container in which it is packaged until shortly before the grenade is to be used. Exposure of an unpackaged grenade to rain will cause the grenade to misfire. High atmospheric humidity may also cause a misfire.

49. Operation and Functioning

* * * * * * *

b. Functioning. When the grenade * * * the CN filling. **The radius of burst is approximately 5 yards. The radius of effectiveness of the gas cloud depends upon wind speed; under calm conditions, the effective radius is from 25 to 35 yards.**

84. Use and Description

The M2 fire starter (fig. 31) is designed **for use by Army and Air Force personnel in starting fires under adverse climatic conditions.** It is a * * * in table IV.

85. Operation and Functioning

(Superseded)

Prepare the fire starter for ignition by freeing the handle on the starter wire and pulling the wire away from the side of the container, breaking the cement which holds it in place. Puncture the red end of the fire starter with the end of the freed handle. If the red end is not punctured, pressure generated by the rapid burning of the match-head mixture will blow off a portion of the match-head mixture before the fire starter is fully ignited, and incomplete ignition will result. After these preliminary preparations, grasp the starter by the purple end and point the red end downward. Press the thumb of the hand holding the fire starter just below the place where the scratcher wire comes out of the container. The thumb, so placed, helps to insure that the scratcher wire does not cut the container. To ignite, grasp the handle and pull steadily away from the case and perpendicular to it. Allow the filling to burn for several seconds; then set the fire starter in the desired position. Should the ignition device fail, the red end of the fire starter can be ignited with a match. The fire starter burns for approximately 4 minutes.

120. General

(Superseded)

Explosive and igniting components such as electric squibs, blasting caps, detonating cord, safety fuse, and fuse lighters, which are not issued as part of a chemical munition, are Ordnance Corps items. A description of such components and information on their use are given in detail in FM 5–25. Firing circuits used with chemical munitions are described briefly in this chapter and in detail in FM 5–25.

121. Firing Components

a. (As changed by C 1, 16 Aug 56) *Electric Squib.* The M1 flash-vented electric squib (fig. 39) is a metal tube 3/16 inch in diameter by 1½ inches long containing a small powder charge compressed around a filament of high-resistance wire. The ends of the filament are connected to 6-foot lead wires which are used for connecting the squib to a source of electric current. The free ends * * * an interior part.

* * * * * * *

APPENDIX I

REFERENCES

AR 385–63 (Added) Regulations for Firing Ammunition for Training, Target Practice, and Combat.

[AG 470.6 (3 Apr 58)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official:

HERBERT M. JONES,
Major General, United States Army,
The Adjutant General.

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USA Avn Bd	CmlCMat Com	Mil Dist
USA Armor Bd Test Sec	USMA	US Army Corps (Res)
USA Air Def Bd Test Sec	Svc Colleges	Sectors, US Army Corps (Res)
US ARADCOM	Br Svc Sch	Cml Proc Dist
OS Maj Comd	PMST Sr Div Units	
MDW	PMST Jr Div Units	
	PMST Mil Sch Div Units	

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USAR: None.

For explanation of abbreviations used, see AR 320–50.

U. S. GOVERNMENT PRINTING OFFICE: 1958