TECHNICAL REGULATIONS
No. 1355–75A

WAR DEPARTMENT,
WASHINGTON, *November 21, 1927.*

# MOBILE ARTILLERY AMMUNITION

## AMMUNITION FOR 75-MM. FIELD GUNS, M1897 (FRENCH); M1916 (AMERICAN); AND M1917 (BRITISH)

Prepared under direction of the
Chief of Ordnance



## SECTION I

## GENERAL



**1. Purpose and scope.**—These regulations are intended for the using branches. They give all necessary information regarding the construction, functioning, and identification of the different classes of 75-mm. ammunition and the components thereof.

**2. References.**—*a.* Before attempting to handle ammunition of any type, personnel should be thoroughly familiar with TR 1370–A.

*b.* For the preparation and use of blank ammunition for these guns, see TR 1370–B.

*c.* Proper nomenclature for ammunition described herein is given in Standard Nomenclature List (S. N. L.) R–1, "Fixed Ammunition, all types, for Mobile Artillery," and in S. N. L. R–3, "Service Fuzes and Primers for Mobile Artillery." This nomenclature is mandatory and will be used in all requisitions.

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*d.* The following firing tables are based upon the use of the ammunition herein described:

| Gun | Firing table No. |
|---|---|
| 1897 (French) | 75–B–1 and 983D (gas shell only). |
| 1916 (American) and 1917 (British) | 75–E–1. |

*e.* TR 1305–75A, 1305–75B, and 1305–75C describe the operation, care, and maintenance of the guns and carriages for which this ammunition was designed.

## SECTION II

## GENERAL DISCUSSION



**3. General remarks.**—The 75-mm. field guns, M1897, M1916, and M1917 all take the same types of ammunition..

**4. Types of ammunition.**—*a. Characteristics.*—Three general types of ammunition are provided, as follows: High-explosive shell ammunition, chemical shell ammunition, and shrapnel ammunition.

(1) The high-explosive or chemical shell is issued unfuzed so that, before firing, it is necessary to remove the adapter plug from the nose of the shell and insert a fuze.

(2) The shrapnel is issued with the fuze in place but, before firing, it is necessary to remove the waterproof cover and give the fuze the proper time setting.

*b. Components.*—These different types of ammunition are made up of the following components.

| Component | High-explosive shell | | Chemical shell | Shrapnel |
|---|---|---|---|---|
| Projectile | Mk. I | Mk. IV | Mk. II | Mk. I. |
| Cartridge case | For 75-mm. field gun. | For 75-mm. field gun. | For 75-mm. field gun. | For 75-mm. field gun. |
| Adapter and booster | Mk. III | Mk. III-B | Mk. IV-B | None. |
| Fuze | Mk. III or V | | Mk. III or V | 21-second combination. |
| Bursting charge | TNT or amatol | | Tetryl booster charge. | Black powder. |
| Filling | | | Gas or smoke | Lead balls and resin. |
| Propelling charge | Nitrocellulose smokeless powder. | | | |
| Primer | 49-grain percussion, Mk. I. | | | |

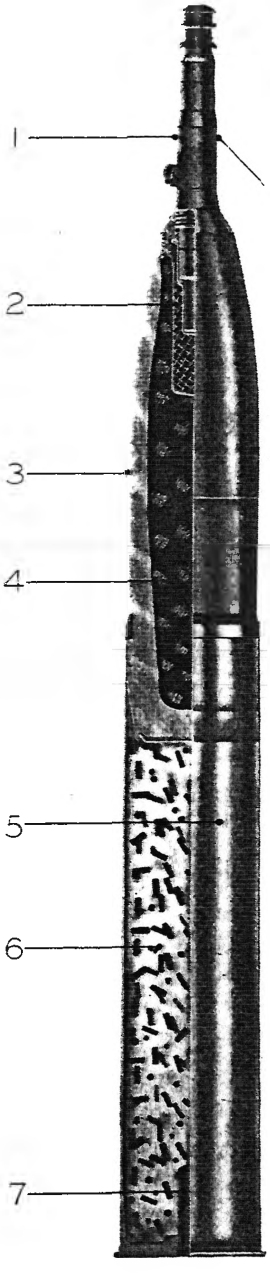



FIG. 1.—Assembled round 75-mm. ammunition

1. Fuze, point detonating, Mk. III.
2. Adapter and booster, Mk. III–B.
3. High-explosive shell, Mk. IV.
4. Bursting charge, TNT.
5. Cartridge case.
6. Propelling charge.
7. 49-grain primer, Mk. I.

*c. Weights.*—The weight of a round of ammunition as shipped varies somewhat with the kind of projectile used and is approximately as follows:

| Components | High-explosive shell Mk. I | High-explosive shell Mk. IV | Chemical shell Mk. II | Shrapnel Mk. I |
|---|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Projectile (empty) | 9.5 | 11.13 | 9.42 | 7.68 |
| Bursting charge | 1.75 | 1.40 | | .18 |
| Adapter and booster | .58 | .57 | .82 | |
| Cartridge case with primer | 2.75 | 2.75 | 2.75 | 2.75 |
| Propelling charge | 1.3 | 1.6 | 1.3 | 1.5 |
| Fuze | | | | 1.25 |
| Filling | | | 1.55 | 6.84 |
| Total weight of round as issued | 15.88 | 17.45 | 15.84 | 20.20 |

**5. Identification of components.**—For identification purposes, practically all assembled units or components are given a Mark number or Model. The Mark number form of identification was adopted in 1917 and in this system the first design of a certain component was called "Mark I." abbreviated as Mk. I or, in some cases, MI, the second design "Mark II," abbreviated as Mk. II or, in some cases, MII, and so on. The previous method was to designate the component as the model of a certain year, for instance, "M1916," indicating that it was designed in the year 1916.

## SECTION III

## PROJECTILES



**6. Types.**—*a.* The three types of projectiles authorized for use in this gun are made of steel and are—

(1) Common steel or high-explosive shell, Mks. I and IV.

(2) Chemical shell, Mk. II.

(3) Shrapnel, Mk. I.

*b.* A further type of high-explosive shell is authorized for manufacture as a substitute for the Mks. I or IV high-explosive shell in an emergency. This is the Mk. XII semisteel shell and is made from a casting. A small quantity of these shell are on hand, but they are not authorized for issue at the present time.

7. **General remarks.**—*a. Base cover.*—All projectiles containing high explosive are fitted with a base cover which is designed to prevent the gas from the propelling charge coming in contact with the explosive charge of the shell through possible defects in the base. Two types of base covers are in use, the older type consisting of a slightly dished brass plate, covering a lead disk, the brass plate being crimped into the base of the projectile. The new type consists of a disk of sheet brass or steel sweated to the base of the projectile with solder.

*b. Rotating band.*—(1) The functions of the rotating band are to impart rotation and thus to maintain the stability of the projectile during flight and also to prevent the propelling charge gases from escaping past the projectile when the gun is fired. The band is a cylindrical ring of copper, pressed into a groove near the base of the projectile. The surface of this groove is knurled or roughened to prevent the band from slipping while the projectile is being rotated in the bore of the gun

(2) When the gun is fired, the rotating band engages with the rifling of the gun, which is of a spiral or screw shape and thus the projectile is forced out of the barrel of the gun with a rotating motion. Since the diameter of the band is greater than the greatest diameter of the rifling in the gun, the rotating band completely fills the bore of the gun and prevents the propelling charge gases from escaping past the projectile.

(3) Rotating bands must be made of a comparatively soft metal that will flow readily and fill the rifling grooves in the gun barrel. The material must be sufficiently soft to prevent excessive wear of the lands and, at the same time, not so soft as to strip under the resistance met in rotating the projectile. The rotating band material should have a high melting point. Copper is probably the best available material and is used for all rotating bands. Care should be exercised to avoid rough handling of the projectile so as not to deform the rotating band. Such handling may result in deformation to such an extent that the projectile can not be loaded in the gun.

*c. Painting and marking.*—(1) All projectiles are painted, both as a means of ready identification and as a rust preventive.

(*a*) Projectiles containing high explosive (TNT, amatol, etc.), such as the Mks. I and IV shell, are painted yellow.

(*b*) Projectiles containing chemicals (gas or smoke), such as the Mk. II shell, are painted blue-gray.

(*c*) Projectiles containing low explosive (black powder), such as the Mk. I shrapnel, are painted red.

(2) Projectiles are also stenciled to show the caliber, lot number, kind of filling, etc.

**8. Common steel or high-explosive shell, Mk. I.**—*a. Description.*—This design of shell is an adaptation of the French M1900, and represents the older type of shell in use before the Mk. IV shell was developed. Figure 2 shows this shell in detail. It has a rather blunt nose, the radius of which is 1½ calibers.[1] The portion in rear of the rotating band is cylindrical, or straight, in shape, in contradistinction to the Mk. IV shell which is boat-tailed. The explosive charge is about 1.75 pounds of TNT. A few shell are loaded with 50–50 amatol. No more Mk. I shell will be manufactured after the present supply is exhausted. The round containing this shell is marked for identification as shown in Figure 4.

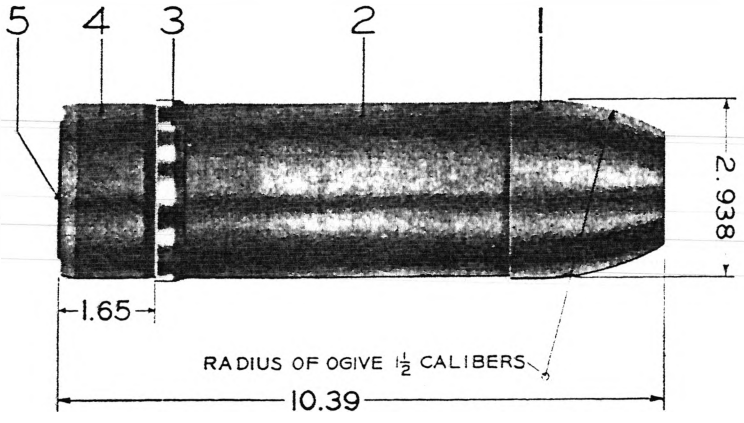



FIG. 2.—High-explosive shell, Mk. I

1. Bourrelet.
2. Body.
3. Rotating band.
4. Base (straight or cylindrical).
5. Base cover.

*b. Weights.*—The weights of unfuzed loaded Mk. I shell vary from approximately 10 pounds 11 ounces to approximately 12 pounds 5 ounces, and obviously this variation in weight will result in considerable variation in range. In order that these variations in weight may be conveniently noted by the service, the shell are divided into five weight zones. Each particular lot number of ammunition contains only shell of one weight zone and more uniform ballistic results should be obtained by firing groups containing shell of the

[1] By caliber is meant the diameter of the bore of the gun. A radius of ogive of 1½ calibers is, therefore, a radius of 1½ times 75 millimeters or 112.5 millimeters.

same weight zone. The weight zones and the identification marks which are stenciled on the shell to indicate these weight zones are as follows:

| From— | | To— | | Mark |
|---|---|---|---|---|
| Pounds | Ounces | Pounds | Ounces | |
| 10 | 11 | 11 | 0 | L |
| 11 | 0 | 11 | 5 | + |
| 11 | 5 | 11 | 11 | ++ |
| 11 | 11 | 12 | 0 | +++ |
| 12 | 0 | 12 | 5 | ++++ |

**9. Common steel or high-explosive shell, Mk. IV.**—*a. Description.*—The Mk. IV high-explosive shell (fig. 3) is a later French design, more efficient ballistically than the Mk. I. This type is known as "streamline" and in it were incorporated the latest developments in shell design—to increase range—known at the time of its adoption. The head is much sharper and has a radius of 6¼ calibers. This shell has a boat-tail base tapered off at an angle of 7½ degrees. This combination of a sharp nose and tapered base adds to the efficiency in flight. The explosive charge is about 1.40 pounds of TNT. The round containing this shell is marked for identification as shown in Figure 4.

*b. Weights.*—The loaded and unfuzed Mk. IV shell are divided into five weight zones in the same manner as described in paragraph 8*b*. The weight zones and the identification marks which are stenciled on the shell to indicate these weight zones are as follows:

| From— | | To— | | Mark |
|---|---|---|---|---|
| Pounds | Ounces | Pounds | Ounces | |
| 12 | 4 | 12 | 10 | L |
| 12 | 10 | 13 | 0 | + |
| 13 | 0 | 13 | 5 | ++ |
| 13 | 5 | 13 | 10 | +++ |
| 13 | 10 | 14 | 0 | ++++ |

**10. Chemical shell, Mk. II.**—*a. Description.*—This type of shell differs from the high-explosive shell, Mk. I, only in regard to the threads in the nose for the adapter and booster and in that it does not contain a base cover. In the Mk. II chemical shell these threads are tapered, or pipe threads. When the adapter and booster is tightly screwed into place a gas-tight joint is formed. This shell is known as a "chemical shell" because of the nature of the filler. The filler may be a lachrymatory gas or a smoke compound. When the shell bursts, the chemical filler produces a gas or smoke cloud, in contradistinction to the effect of the high-explosive shell, which depends upon the blast of explosion and the fragmentation of the shell body.

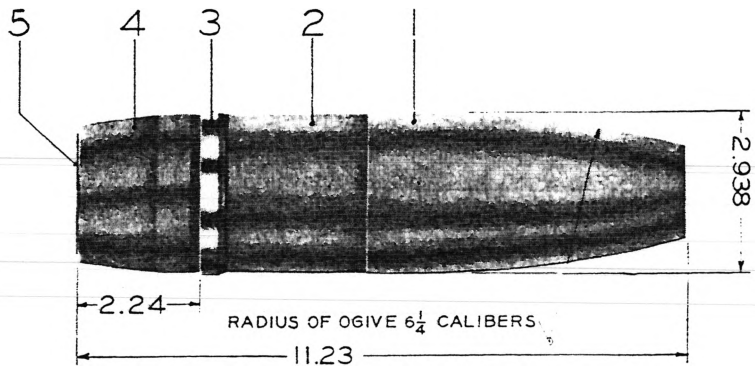
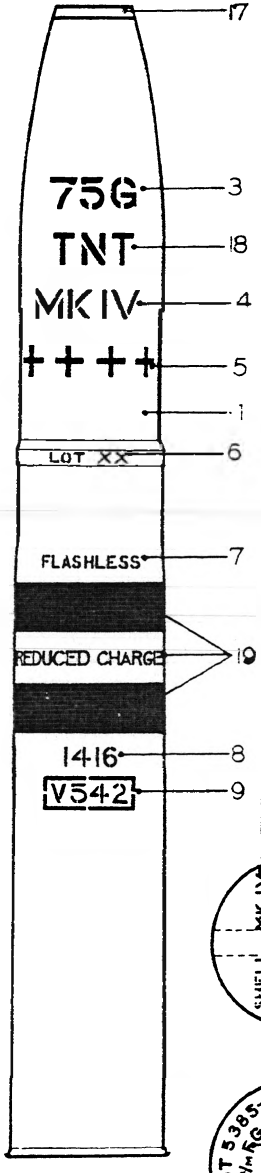
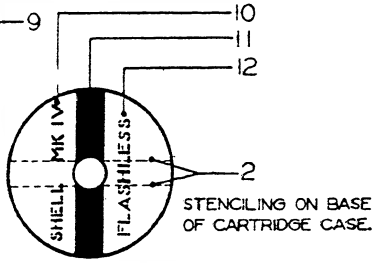



FIG. 3.—High-explosive shell, Mk. IV

1. Bourrelet.
2. Body.
3. Rotating band.
4. Base (taper or boat-tail).
5. Base cover.

*b. Identification.*—(1) All Mk. II chemical shell are painted blue-gray. A change in the marking of chemical ammunition was made during 1925; and since it is not contemplated re-marking the ammunition now in service, marked in accordance with the old system, and as chemical ammunition marked in accordance with both systems will be encountered in service for some time to come, both systems will be described in these regulations. The old marking system consisted of using a series of different colored bands painted around the shell to designate both the specific type of chemical filler and also its effect, whereas in the new marking system, for gas shell, the bands painted around the shell are green in color and the number of bands indicates the degree of persistency of the filler, the specific type of chemical filler being designated by lettered symbols stenciled on the shell.



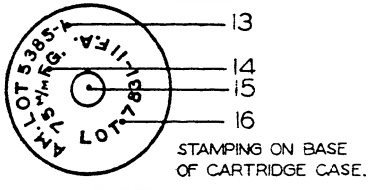




FIG. 4.—Marking of 75-mm. high-explosive fixed ammunition for field gun

1. Caliber and type of cannon, mark number of shell, lot number of unfilled shell, initials or symbol of machining plant and inspection marks (stamped on shell, under paint).
2. An additional stripe denotes reduced charge.
3. Caliber and type of cannon (G=gun).
4. Mark number of shell.
5. Weight zone marks (L, +, – –, – – –, or – – – –).
6. Ammunition lot number (stamped on rotating band only when loaded shell are shipped unfixed).
7. When flashless powder is used.
8. Lot number of propelling charge powder.
9. Muzzle velocity, in feet per second. Rectangle as shown denotes service charge. (Rectangle omitted when reduced charge is used.)
10. Mark number of shell.
11. One stripe as shown denotes service charge. (See 2 above.)
12. When flashless powder is used.
13. Ammunition lot number.
14. Caliber and type of cannon.
15. For stamping on primer, see Figure 14.
16. Lot number of cartridge case and initials or symbol of manufacturer of cartridge case.
17. Adapter may or may not be painted. For stamping on adapter, see Figure 9.
18. Type of filler.
19. Two black bands and lettering denote reduced charge.

NOTE.—1, 6, 13, 14, and 16 are stamped on, others are stenciled with black paint.

(2) The old marking system is shown in Figure 5. The symbol of the chemical filler corresponding to the bands on the shell and the stencil marking on the shell to show the type of chemical filler are as follows:

| Symbol of shell filler | Color of bands | | Stencil marking |
|---|---|---|---|
| | 1st band | 2d band | |
| WP | Yellow | None | Smoke. |
| FM | Yellow | Yellow | Smoke. |

(3) The new marking system is shown in Figure 6. In this system, for the purpose of marking, all fillers are divided into two classes, nonpersistent and persistent. Nonpersistent fillers are indicated by one green band and persistent fillers by two green bands, as follows:

| Persistent filler | | | Nonpersistent filler | | |
|---|---|---|---|---|---|
| Symbol of shell filler | Number of green bands | Stencil marking | Symbol of shell filler | Number of green bands | Stencil marking |
| CN | 2 | CN Gas | | 1 | |

Additional information relative to chemical ammunition will be published in supplementary regulations.

(4) All screening smoke fillers are indicated by one yellow band, and the symbol of the smoke filler, followed by the word "Smoke," is stenciled on the shell.

*c. General remarks.*—It is difficult to define persistency as applied to the various chemical fillers, since the length of time during which a cloud persists varies greatly for the different fillers, and even for the same filler under different conditions. Therefore chemical shell must be used only with a full understanding of the characteristics of the particular filler and after careful consideration of the effect of existing conditions. Two green bands are a general indication that the cloud will persist for a considerable length of time after being released. One green band is a general indication that the cloud will be quickly dissipated.

*d. Weights.*—The filled and unfuzed Mk. II chemical shell are divided into the same weight zones as the Mk. I high-explosive shell described in paragraph 8*b*.

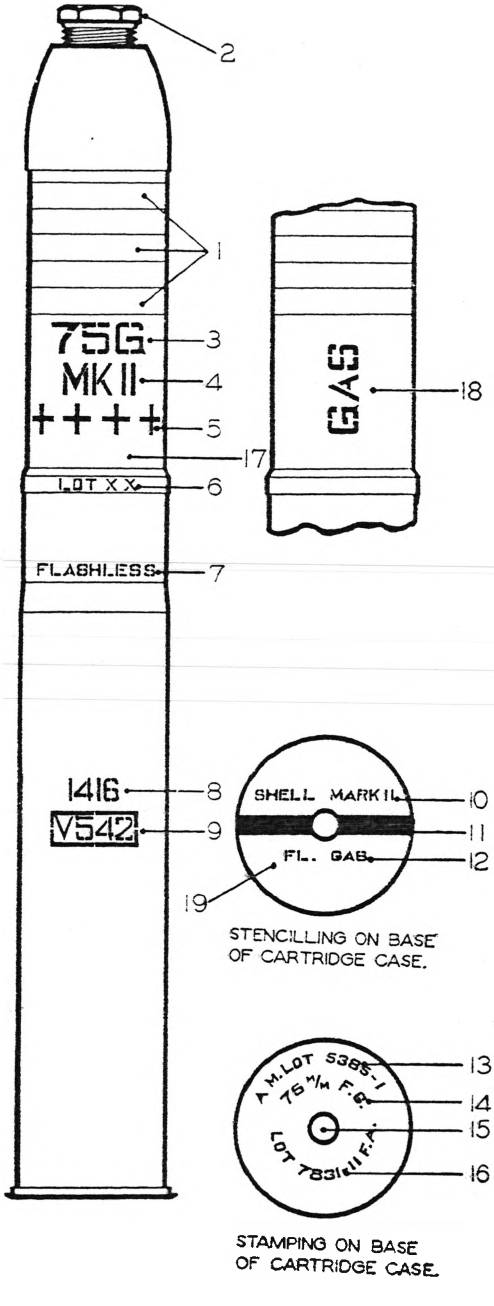



FIG. 5.—Marking of 75-mm. chemical shell, Mk. II, fixed ammunition for field gun (Old system)

1. Colored bands to designate type of chemical filler.
2. Adapter and booster may or may not be painted. (For stamping on adapter and booster, see fig. 10.)
3. Caliber and type of cannon (G = gun).
4. Mark number of shell.
5. Weight zone marks (L. +, + +, + + +, or + + + +).
6. Ammunition lot number. (Stamped on rotating band only when filled shell are shipped unfixed.)
7. When flashless powder is used.
8. Lot number of propelling charge powder.
9. Muzzle velocity in feet per second. (Rectangle as shown denotes service charge.)
10. Mark number of shell.
11. One stripe as shown denotes service charge.
12. "Gas" or "smoke" to denote type of chemical filler.
13. Ammunition lot number.
14. Caliber and type of cannon.
15. For stamping on primer, see Figure 14.
16. Lot number of cartridge case and initials or symbol of manufacturer of cartridge case.
17. Caliber and type of cannon, mark number of shell, lot number of unfilled shell, initials or symbol of machining plant and inspection marks (stamped on shell, under paint).
18. Type of chemical filler in shell.
19. When flashless powder is used (FL = flashless).

NOTE.—6, 13, 14, 16, and 17 are stamped on, others are stenciled with black paint.

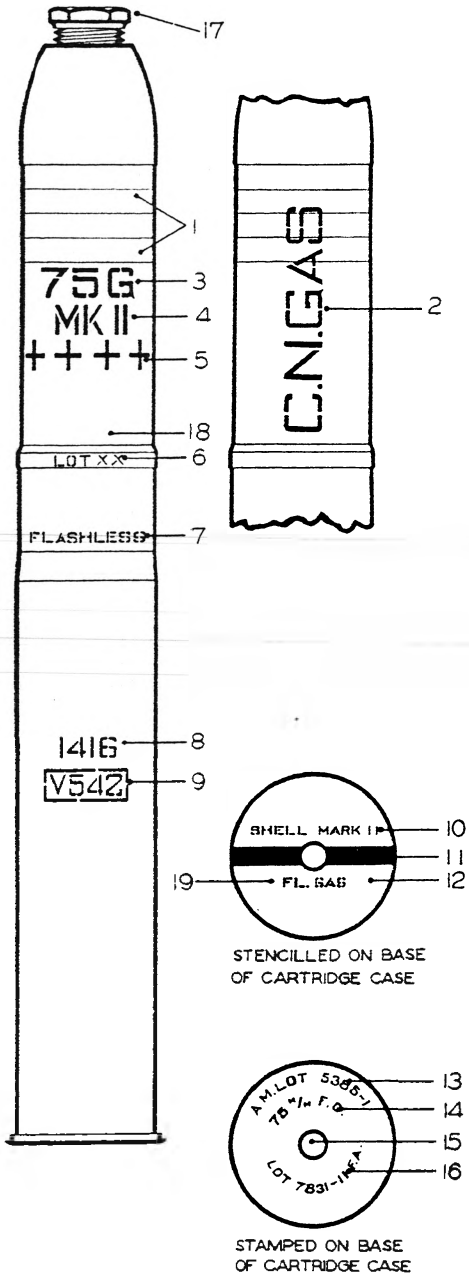



FIG. 6.—Marking of 75-mm. chemical shell Mark II fixed ammunition for field gun. (New system)

1. Colored bands—one green band denotes nonpersistent filler, two green bands denote persistent filler, yellow band denotes smoke (phosphorus).
2. Symbol of chemical filler and type of chemical shell.
3. Caliber and type of cannon (G=gun).
4. Mark number of shell.
5. Weight zone marks (L, +, + +, + + +, or + + + +).
6. Ammunition lot number (stamped on rotating band only when filled shell are shipped unfixed).
7. When flashless powder is used.
8. Lot number of propelling charge powder.
9. Muzzle velocity, in feet per second (rectangle as shown denotes service charge).
10. Mark number of shell.
11. One stripe as shown denotes service charge.
12. "Gas" or "smoke" to denote type of chemical shell.
13. Ammunition lot number.
14. Caliber and type of cannon.
15. For stamping on primer, see Figure 14.
16. Lot number of cartridge case and initials or symbol of manufacturer of cartridge case.
17. Adapter and booster may or may not be painted (for stamping on adapter and booster, see fig. 10).
18. Caliber and type of cannon, mark number of shell, lot number of unfilled shell, initials or symbol of machining plant and inspection marks (stamped on shell, under paint).
19. When flashless powder is used (FL=flashless).

NOTE.—6, 13, 14, 16, and 18 are stamped on, others are stenciled.

**11. Shrapnel, Mk. I.**—*a. Description.*—The Mk. I shrapnel is shown in Figure 7. The base or bursting charge consists of 3 ounces of black powder, which is placed in the base of the projectile. A steel diaphragm acts as a cover for the base charge and supports the balls and matrix. The shrapnel also carries a central tube which conducts the flame from the fuze to the base charge. The shrapnel filling is composed of about 270 lead balls approximately ½ inch in diameter, averaging 42 to the pound, the total weight of the balls being about 6 pounds 7 ounces. The balls are held in a matrix of melted resin poured into the shrapnel case during the loading of the balls. A steel head closes the shrapnel case and forms an adapter for the 21-second combination fuze.

*b. Action.*—In action the shrapnel is really a complete gun in itself. When the time fuze has burned its predetermined time the magazine charge flashes through the central tube and ignites the base charge. The explosion of the base charge does not rupture the case, but ejects the diaphragm, balls, head, etc., from the case with a velocity of about 350 feet per second, this velocity being in addition to that of the shrapnel at the time of burst. The balls are projected forward in the form of a cone, due to rotational velocity. The angle of this cone depends on the relation of the angular velocity of the outermost balls in the case and their linear velocity.

*c. Identification.*—Shrapnel are painted red to indicate that the filler charge is a low explosive. The round containing the Mk. I shrapnel is marked for identification as shown in Figure 8.

*d. Weight.*—Weight markings are not placed on shrapnel, as there is seldom a variance of more than 1 per cent from the normal weight, fuzed, of 15.95 pounds. The weight is adjusted in manufacture by assembling more or fewer balls than prescribed, as may be necessary.

*e. Fuze.*—The 21-second combination fuze, M1907M, is used with the Mk. I shrapnel. Figure 7 shows this shrapnel with the fuze attached. All shrapnel are issued fuzed with the fuze set at safe. Great care should be used to keep the complete round in a dry condition.

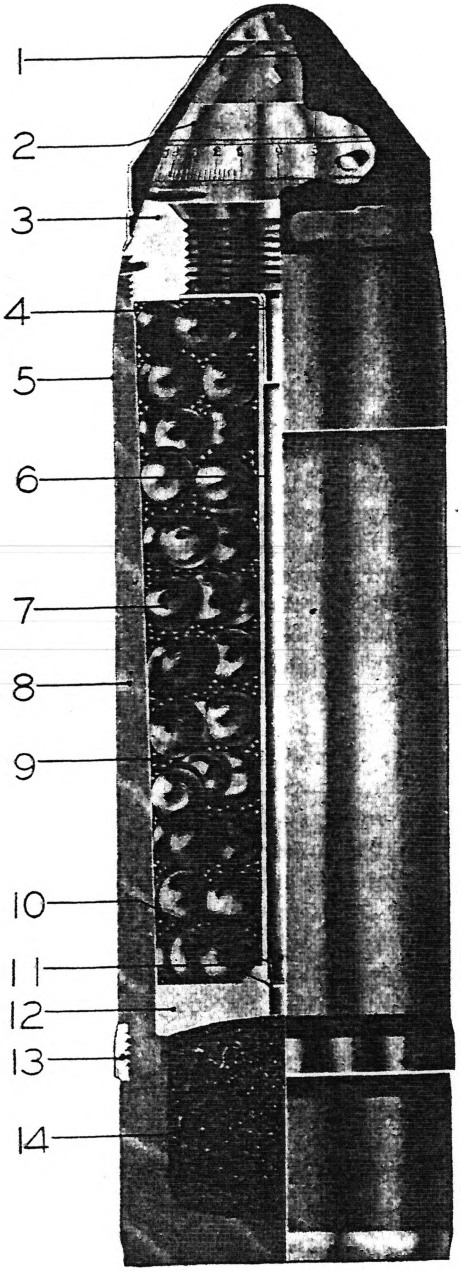



FIG. 7.—75-mm. shrapnel

1. Waterproof cover.
2. 21-second combination fuze.
3. Head.
4. Inner tube.
5. Bourrelet.
6. Central tube.
7. Balls.
8. Case.
9. Matrix (resin).
10. Fiber paper cup.
11. Cloth disk.
12. Diaphragm.
13. Rotating band.
14. Base charge (loose black powder).

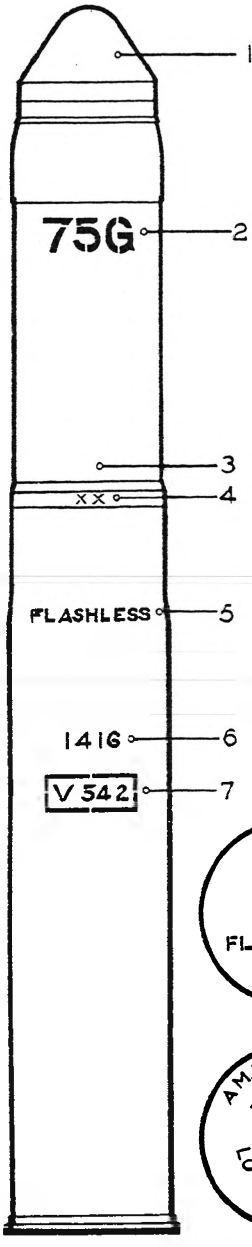
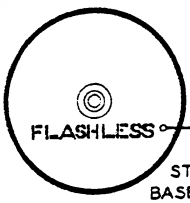


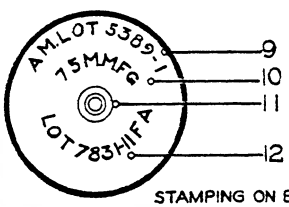

FIG. 8.—Marking for 75-mm. shrapnel fixed ammunition for field guns

1. Fuze and waterproof cover are stamped with model of fuze, lot number, initials or symbol of manufacturer and month and year of loading.
2. Caliber and type of cannon (G=gun).
3. Caliber and type of cannon, mark number of shrapnel, lot number of unloaded shrapnel, initials or symbol of machining plant and inspection marks (stamped on shrapnel, under paint).
4. Ammunition lot number (stamped on rotating band only when loaded shrapnel are shipped unfixed).
5. When flashless powder is used.
6. Lot number of propelling charge powder.
7. Muzzle velocity in feet per second (rectangle as shown denotes service charge).
8. When flashless powder is used.
9. Ammunition lot number.
10. Caliber and type of cannon.
11. For stamping on primer, see Figure 14.
12. Lot number of cartridge case and initials or symbol of manufacturer of cartridge case.

NOTE.—1, 3, 4, 9, 10, and 12 are stamped on, others are stenciled with black paint.




STENCILLING ON BASE OF CART. CASE.




STAMPING ON BASE OF CARTRIDGE CASE.

## SECTION IV

## ADAPTERS AND BOOSTERS



**12. Function.**—Adapters and boosters are used in all 75-mm. shell ammunition. The adapter is a bushing that fits into the nose of the shell, thus adapting the shell to fit the fuze. Attached to the adapter is a booster casing, containing high explosive, which acts as a booster charge for the fuze, since the detonator of the fuze is not powerful enough to dependably detonate the charge in the high-explosive shell. In the chemical shell, the function of the

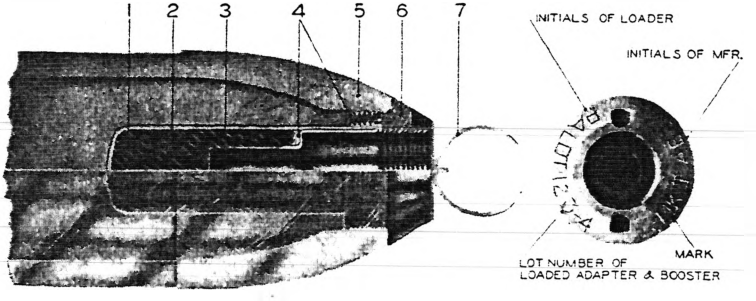



FIG. 9.—Adapter and booster, Mk. III

1. Booster charge (tetryl).
2. Booster casing.
3. Fuze socket.
4. Felt washers.
5. Shell.
6. Adapter.
7. Adapter plug.

booster is to break up the shell and disperse the chemical filler. These two assembled components are known as the "Adapter and booster." The adapter and booster is issued assembled to the shell. The following adapters and boosters are used in 75-mm. shell ammunition: Adapter and booster Mk. III, adapter and booster Mk. III–B, adapter and booster Mk. IV–B.

**13. Adapter and booster, Mk. III.**—The adapter and booster, Mk. III, is used in the 75-mm. high-explosive shell, Mk. I. Figure 9 shows this adapter and booster, and gives the names of the principal parts, together with the stamping identifications. A fuze socket protects the booster charge from moisture. As fuzes are never assembled in the shell until the round is to be used, an adapter plug is supplied which acts as a protection against the entrance of foreign

substances and prevents injury to the threads of the adapter. This adapter plug consists of a piece of felt thoroughly oiled and held in position between two metal plates by wire cleats. A ring is provided by which the plug may be removed. The booster charge consists of approximately 1 ounce of tetryl. Some boosters are loaded with half tetryl and half TNT, the tetryl being placed around the fuze socket.

**14. Adapter and booster, Mk. III–B.**—The adapter and booster, Mk. III–B, is used in the 75-mm. high-explosive shell, Mk. IV. It is identical with the Mk. III, except that the diameter of the flange of the adapter is made smaller to fit the Mk. IV shell. Figure 9 shows this adapter and booster, and gives the names of the principal parts, together with the stamping identifications.

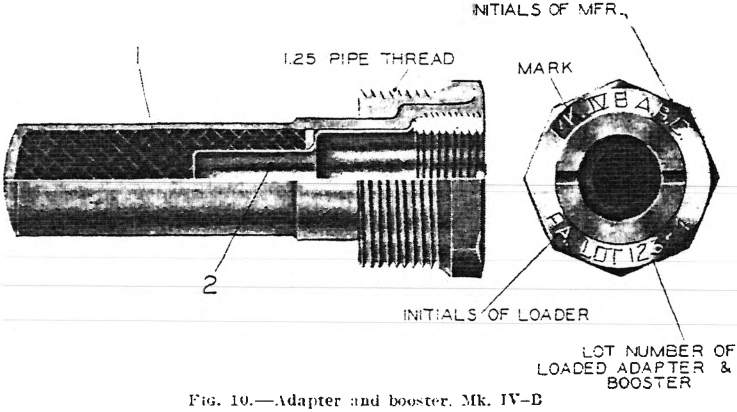



FIG. 10.—Adapter and booster, Mk. IV–B

1. Booster charge (tetryl). 2. Fuze socket.

**15. Adapter and booster, Mk. IV–B.**—The adapter and booster, Mk IV–B, is used in the 75-mm. chemical shell, Mk. II. Figure 10 shows this adapter and booster, and gives the names of the principal parts, together with the stamping identifications. Its function is to break up the shell so that the contents can escape. This component differs from that which is used in the high-explosive shell in that the adapter and booster are made in one piece and the threads are tapered (pipe threads) instead of being straight, this type of thread and the one-piece construction being necessary to make a gas-tight assembly. The joint made by the tapered threads is the only place where the gas can escape from the shell due to defective assembly. The booster charge consists of approximately 1¼ ounces of tetryl. Some boosters are loaded with half tetryl and half TNT, the tetryl being placed around the fuze socket.

## SECTION V

## FUZES



**16. Types.**—*a.* A fuze is a device inserted in a projectile and used to detonate or explode the bursting charge at the time and under the circumstances desired. The following types of fuzes are authorized for use with the 75-mm. ammunition:

(1) Point detonating fuze, Mk. III or III–A (fig. 11).

(2) Point detonating fuze, Mk. V (fig. 12).

(3) 21-second combination fuze, M1907M (fig. 13).

*b.* General instructions prescribing the percentage of the several types of authorized fuzes to be issued with each type of projectile can not be given. The allowances depend on the availability of supply, and since stocks of all types may not always be available, the use of certain other types of fuzes than those authorized is permitted. The permissible fuzes for 75-mm. high explosive and chemical ammunition are as follows:

| Projectile | Permissible fuzes | | | |
|---|---|---|---|---|
| | Mk. III or III–A | Mk. IV | Mk. IV–star | Mk. V |
| Mk. I, high-explosive shell, normal charge | Yes | No | * | Yes. |
| Mk. I, high-explosive shell, reduced charge | No | * | * | Yes. |
| Mk. IV, high-explosive shell | Yes | No | * | Yes. |
| Mk. II, chemical shell | Yes | No | * | Yes. |

"Yes" indicates that the fuze is prescribed for the projectile in question.
"No" indicates that the fuze is either unsafe for use or that it will not function in this gun.
*indicates that this type is not prescribed, but that there is no reason against its use from the standpoint of safety or certainty of functioning.

**17. Point detonating fuze, Mk. III.**—*a. Description.*—The point detonating fuze, Mk. III (PDF Mk. III), is a superquick fuze; it is used when it is desired to secure a quick burst above ground with the least possible penetration of the projectile. It is authorized for use in Mks. I, II, and IV shell ammunition, but should not be used in Mk. I shell ammunition with reduced charge, since its use at this velocity causes the projectile to be unstable in flight. The design of this fuze is practically the same as that of the French 24/31 I. A. L. M1916 (Instante Allongé Lefevre or the instantaneous elongated fuze of the Lefevre design). Figure 11 shows this fuze, together with the names of the principal parts.

The Mk. III–A fuze differs from the Mk. III only in a different arrangement of the upper detonator. The centrifugal plunger or interrupter (11) is a safety feature incorporated in the American design. There are a number of both Mk. III and III–A fuzes in service without this feature. This fuze weighs approximately 0.97 pound.

*b. Safety device.*—The plunger or interrupter (11) constitutes a partial bore-safety device[1] and is operated by centrifugal force. It is set at an angle, so that linear acceleration tends to oppose the centrifugal force. While the shell is being accelerated in the bore of the gun, this plunger remains in the safe position and prevents any premature action of the upper detonator (8) or primer (7) from reaching the lower detonator (14), thus making the fuze bore safe to that extent. After linear acceleration ceases, centrifugal force moves the plunger (11) outward and opens the channel (10) between the two detonators (8) and (14).

*c. Action upon firing.*—The firing pin (6) is held away from the primer (7) by means of a spiral (2) and a safety pin (5). The spiral (2) is composed of a split ring (1) assembled to a brass ribbon (4) having a weighted end. This ribbon (4) will not unwind until after the shell is out of the bore of the gun. At this time centrifugal force acting upon the weighted end of the ribbon unwinds it, taking the split ring (1) with it. The safety pin (5) holds the firing pin (6) during flight.

*d. Action at target.*—Upon impact with the target, the safety pin (5) bends or breaks, and the firing pin (6) functions the primer (7). The primer (7) causes the upper detonator (8) to explode. The flame from this explosion passes through the open channel (10) to the lower detonator (14), causing it to function. This detonation is transmitted to the booster and, in turn, is transmitted to the explosive charge of the shell. These explosions follow in such rapid succession as to make the bursting of the shell practically simultaneous with the first impact of the firing-pin head.

*e. Shipment.*—These fuzes are never assembled in projectiles before shipping, but are packed in waterproof boxes, 50 fuzes to each box, and form a separate shipment. The spiral is held in position during shipment by means of a piece of tarred tape (15). A lead foil cap is fitted over this tape as a waterproof cover and is cemented to the fuze with a mixture of tar and rubber or other waterproofing compound.

[1] A bore-safe fuze is one in which the detonating train is interrupted between the detonator and the booster charge until the projectile has cleared the muzzle of the gun. This prevents premature action of the shell charge in the bore of the gun, due to mal-functioning of the more sensitive elements of the fuze.

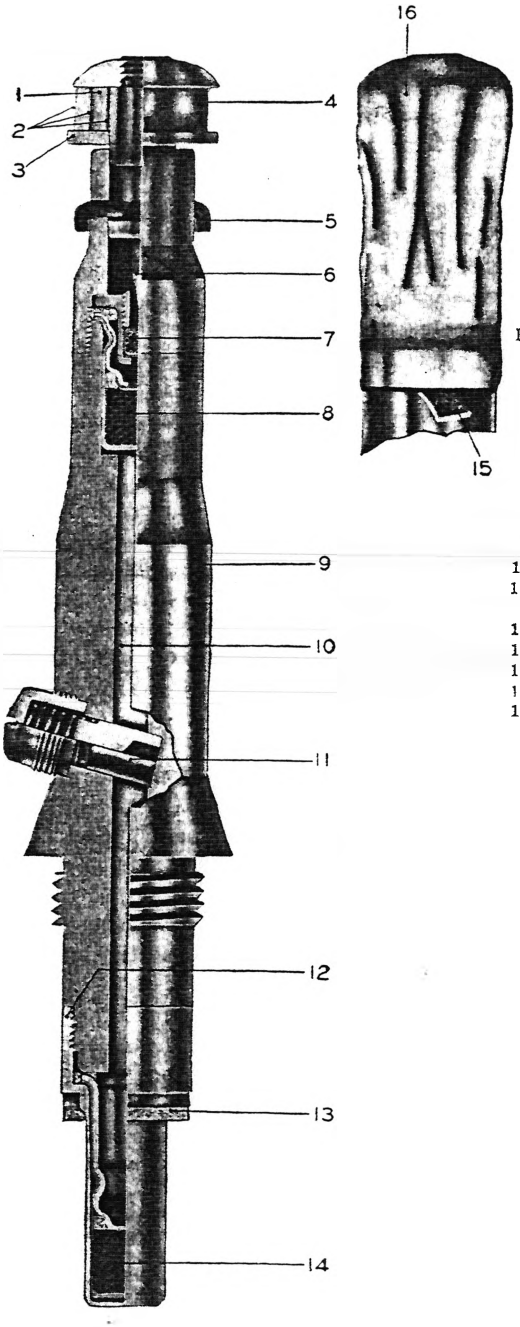



FIG. 11.—Point detonating fuze, Mk. III

1. Half ring or split ring.
2. Spiral.
3. Supporting washer.
4. Brass ribbon.
5. Safety pin.
6. Firing pin.
7. Primer.
8. Upper detonator.
9. Fuze body.
10. Central channel.
11. Centrifugal plunger or interrupter.
12. Detonator socket.
13. Felt washer.
14. Lower detonator.
15. Tape.
16. Waterproof cover.

*f. General information.*—(1) Previous to placing the round in the gun, the fuze is screwed tightly into the adapter, using the wrench provided. Before placing the round in the gun, the tape and waterproof cap are removed by pulling on the loose end of the tape, which is exposed.

(2) Never screw a fuze into a shell if the tarred tape and lead foil cap are not in their proper places.

(3) After the fuze is screwed into the shell and the tape removed from the neck of the fuze, examine the spiral (brass ribbon) and safety pin to see that they are in their proper places. If the ribbon is broken, the fuze cannot function, for centrifugal force is not sufficient to arm the fuze, unless the weighted end of the ribbon is in place. If the spiral is not in place, there is danger of premature explosion in the gun. In either case the fuze will be removed and destroyed. The gun personnel should become familiar with the appearance of this fuze.

*g. Marking.*—The point detonating fuze, Mk. III, is identified by a ½-inch blue-gray band painted just below the waterproof cover. In addition it has the following stamping on the body:

(1) Initials or symbol of metal parts manufacturer.
(2) PDF Mk. III. (Mark number of fuze.)
(3) Lot number of loaded fuze.
(4) SQ. (Superquick.)
(5) Initials or symbol of loading plant.
(6) Month and year of loading.

**18. Point detonating fuze, Mk. V.**—*a. Description.*—(1) The point detonating fuze, Mk. V (PDF Mk. V), is made especially for 75-mm. field guns; and is used when a slight delay action is desired, or for ricochet firings. It is authorized for use in all 75-mm. shell ammunition. The design was practically copied from the French fuze (24 31, M1899—M1908). Figure 12 shows this fuze together with the names of the principal parts. This fuze weighs approximately .46 pound.

(2) This fuze should not be confused with the point detonating fuze, Mk. IV, which is similar in design and appearance, except that the Mk. IV has a flat head. The action of the two fuzes is practically the same, both are armed by inertia or "setback,"[1] but

[1] The term "setback" is the name given to the reaction to the force required to give any part of the projectile a forward movement in the gun. The total "setback" of a projectile is equivalent (frictional and rotational components neglected) to the total pressure exerted by the propelling charge gases on the base of the projectile. In other words, the expansion of the gases from the propelling charge creates a pressure in the chamber and bore of the gun, which results in an acceleration of the projectile. The projectile, due to its inertia, resists this acceleration and tends to remain stationary. This resistance to the pressure on the base is "setback." Any part not rigidly supported in the projectile will be given a relative motion toward the base of the projectile by this force when the projectile is being accelerated in the bore of the gun.

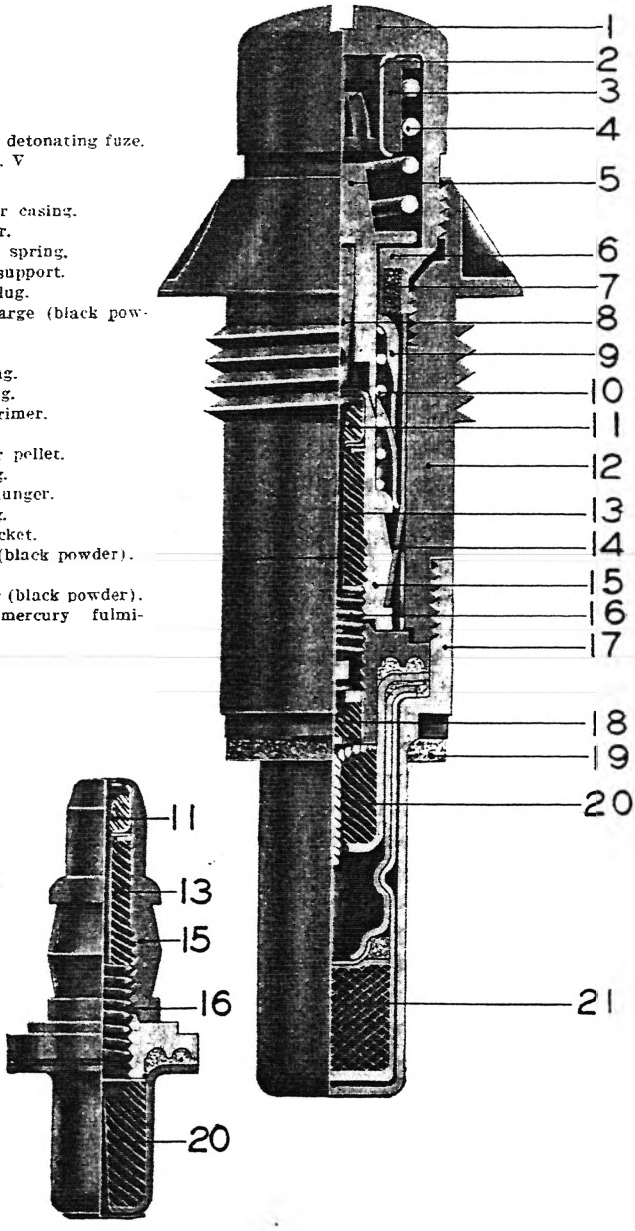



FIG. 12.—Point detonating fuze, Mk. V

1. Closing cap.
2. Head plunger casing.
3. Head plunger.
4. Head safety spring.
5. Head safety support.
6. Firing pin plug.
7. Magazine charge (black powder).
8. Firing pin.
9. Arming casing.
10. Arming spring.
11. Percussion primer.
12. Fuze body.
13. Black powder pellet.
14. Safety casing.
15. Percussion plunger.
16. Retard spring.
17. Detonator socket.
18. Delay pellet (black powder).
19. Felt washer.
20. Relay powder (black powder).
21. Detonator (mercury fulminate).

the Mk. V is provided with an additional arming device known as the "head safety feature." This double arming device is a distinctive feature of the Mk. V fuze.

(3) The following types of Mk. V fuzes have been manufactured, but the short delay is the only type now authorized for manufacture. The amount of delay is indicated by color markings.

(*a*) Nondelay (N. D.)—white head.
(*b*) Short delay (S. D.)—approximately .05 second—black head.
(*c*) Long delay (L. D.)—approximately .15 second—black head and violet socket.

*b. Action upon firing.*—In action, the head plunger (3) (fig. 12), through its inertia or setback at the impulse of the propelling charge, compresses the spring (4) and engages the prongs of the casing (2) with the head safety support (5), locking them together. The head plunger (3) and the head safety support (5) are now free from the pressure of the spring (4), and can either creep forward or move forward on impact, so that the firing pin (8) is exposed and the fuze armed. The arming casing (9) at the impulse of discharge parallels the action of the head plunger, above described, by pushing back the arming spring (10). The sides of the arming casing (9) disengage the prongs of the safety casing (14) from the percussion plunger (15), while the prongs of the arming casing (9) engage the collar on the side of the percussion plunger (15). The arming casing (9) is thus held back, exposing the percussion primer (11) and completing the arming of the fuze. The percussion plunger (15) is held from creeping forward during flight by the retard spring (16).

*c. Action at target.*—On impact, the percussion plunger (15) moves forward and the primer (11) is exploded by the firing pin (8). The flame of this explosion is transmitted to the powder pellet (13) below the primer (11), to the delay pellet (18), or to the relay powder (20), in the case of the nondelay, and to the magazine charge (7) of the firing pin plug (6). The gases from the powders (13 and 7) are necessary to carry the ignition to the relay powder (20), after the delay pellet (18) has burned. The relay powder (20) supplies hot gases which explode the detonator (21), consisting of approximately 30 grains of mercury fulminate. This detonates the booster charge, which, in turn, detonates the shell filler.

*d. Shipment.*—This fuze is never shipped assembled in a projectile—100 are packed in a waterproof box and form a separate shipment. When the round is ready to be put in the gun, the fuze is screwed tightly into the adapter, using the wrench provided. It is essential that a felt washer be under the detonator socket flange to hold the fuze in the adapter properly.

*e. Marking.*—The point detonating fuze Mk. V is identified by the marking, which is as follows:

(1) Stamping—
- (*a*) Initials or symbol of metal parts manufacturer.
- (*b*) PDF Mk. V (Mark of fuze).
- (*c*) Lot number of loaded fuze.
- (*d*) NON (for nondelay).
  S. D. (for short delay—.05 second).
  L. D. (for long delay—.15 second).
- (*e*) Initials or symbol of loading plant.
- (*f*) Month and year of loading of fuze.

(2) Marking—
- (*a*) The head of the nondelay fuze is painted white.
- (*b*) The head of the short delay fuze is painted black.
- (*c*) The head of the long delay fuze is painted black and the detonator socket violet.

**19. 21-second combination fuze, M1907M.**—*a. General description.*—(1) The 21-second combination fuze is used with shrapnel. It can be set and reset at any time from 0, for canister effect, to 21.2 seconds—the longest time that the fuze will burn after leaving the muzzle of the gun. It is made of brass and bronze and weighs 1.25 pounds.

(2) The fuze is always assembled to the shrapnel for shipment. It is protected by a waterproof cover which is removed and thrown away when the fuze is set for time of flight.

(3) This fuze does not have a detonating element, as it is designed to ignite the base charge of black powder in the shrapnel. If the time element of the fuze fails to function, or the setting is too long, the percussion element will cause the shrapnel to function upon impact, the term "combination" thus being derived from this double action feature. Figure 13 shows a view of the fuze with the waterproof cover (19) in place and the fuze set for 0 time of burning. It also shows a sectional view of the fuze set at 0 with the names of the principal parts.

*b. Canister action.*—(1) When the setting is at 0[1] for canister effect, the action is as follows: When the gun is fired, the concussion plunger (2) will slip through the resistance ring (3), due to inertia or the setback action in the projectile. The concussion primer (4), which is held in the concussion plunger, is thus fired by the firing pin (5). The flame from this primer (4) passes through a hole in the body and ignites the powder pellet (16), which is in the upper time-train ring (6). The flame from this pellet (16) is transmitted to the ignition pellet (17), which is located in the lower or

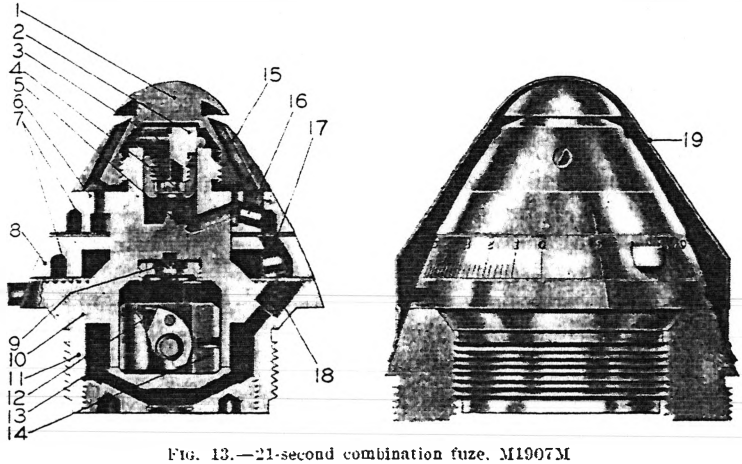



FIG. 13.—21-second combination fuze, M1907M

1. Closing cap.
2. Concussion plunger.
3. Resistance ring.
4. Concussion primer.
5. Concussion firing pin.
6. Upper time-train ring.
7. Powder train.
8. Lower or graduated time-train ring.
9. Percussion primer.
10. Channel.
11. Body.
12. Percussion firing pin.
13. Magazine charge (black powder).
14. Percussion plunger.
15. Vents.
16. Powder pellet.
17. Powder pellet.
18. Powder pellet.
19. Waterproof cover.

graduated time-train ring (8). The flame from this pellet ignites the ignition pellet (18) of the body (11). The magazine charge (13) is exploded and the flame of same passes through the central tube of the shrapnel to the base charge.

(2) In the above action it is readily seen that when the fuze is set at 0, the action is merely a transmission of flame from the concussion primer (4) to the magazine charge (13) by means of powder pellets. The powder train (7), which is responsible for the time feature, does not enter into this action.

[1] This should cause the shrapnel to burst within 50 feet of the muzzle of the gun.

*c. Time action.*—When the fuze is set for time, say 15 seconds, the action is somewhat different. The lower or graduated time-train ring (8) is moved counterclockwise until the 15 is in line with the lines on the body and the upper time-train ring. The action of the concussion plunger (2) is the same, and the flame reaches the powder pellet (16) as previously described. This powder pellet (16) ignites the powder train (7). The powder train (7) is machined in both the upper and lower time-train rings in the shape of a horseshoe; that is, there is a solid section of metal at the beginning and end of the powder train. The ignition pellet (17) of the lower or graduated time-train ring (8) has been moved in setting the fuze, and it is necessary that the powder train (7) of the upper time-train ring burn until this pellet is reached by the flame. Then, with the ignition of the pellet (17), the powder train (7) of the lower or graduated time-train ring will begin to burn. When the flame reaches ignition pellet (18) in the body (11) the action is as previously described. The gases from the powder train (7) escape to the atmosphere by means of the vents (15) in the closing cap (1).

*d. Percussion action.*—The combination feature of this fuze is that it will function on impact. In the percussion plunger (14), the percussion firing pin (12) is armed by centrifugal force; that is, the firing pin is unlocked and revolves to the armed position so that on impact it will function the percussion primer (9). The flame from this primer passes through the channel (10) in the body to the magazine charge (13), thus firing the shrapnel.

*e. General notes.*—(1) Every precaution should be taken to keep moisture away from this fuze. The fuze is protected by a waterproof cover and the powder trains (7) are covered with waxed paper, but short exposure in damp places will allow moisture to enter. A piece of felt cloth is on the underside of each powder train (7), which prevents the flame creeping faster than it should. If these pieces of felt cloth get wet, the powder will absorb some of the moisture, which will greatly alter the time of burning.

(2) When the lower or graduated time-train ring (8) is set so that the mark "S" is in line with the marks on the body and the upper time-train ring, it is said to be "safe." At this setting, the solid metal section of the upper time-train ring is completely covering the ignition pellet (17) in the lower or graduated time-train ring and the solid metal section of the lower or graduated time-train ring is completely covering ignition pellet (18) in the body which connects with the magazine charge (13). It would be possible for both powder trains (7) to burn completely, but no flame would

reach the ignition pellet (18) and, therefore, the shrapnel would not explode, except by percussion action. When firing shrapnel for percussion action, the fuze should be set at "S." These fuzes are always issued set "safe" and if not used after making a setting, they should be reset to "safe" again, before handling.

*f. Marking.*—This type of fuze may be identified by the following stamping which appears on the bevel edge of the body:

(1) 1907M (model or mark number of fuze).
(2) Lot number.
(3) Initials or symbol of manufacturer.
(4) Month and year of loading.

Practically this same stamping also appears on the waterproof cover.

## SECTION VI

## CARTRIDGE CASE



**20. Cartridge case.**—*a. Description.*—The cartridge case is of drawn brass (fig. 1) and is about 13.8 inches long. A cartridge case assembled with a loaded primer weighs about 2.75 pounds. A projecting rim or flange is formed on the head of the cartridge case, and the extractor of the gun engages this rim to eject the case from the gun after firing. This rim or flange also acts as a stop for the round when it is loaded into the gun. The primer (fig. 14) is fitted in the center of the head of the case and is forced into its seat by a press.

*b. Function.*—The function of the cartridge case is to contain the propelling charge and to act as an obturator in preventing the propelling charge gases from escaping into the breech mechanism of the gun. The metal near the mouth of the cartridge case is thin and comparatively soft, so that the pressure of the propelling charge gases expands it tightly against the walls of the gun, thus preventing any leakage of gases past the cartridge case. The metal of the cartridge case, however, is springy enough so that when the gas pressure is released the cartridge case will contract and can be extracted from the gun without difficulty. Cartridge cases can be used many times if resized and proper care taken of them. They should be handled carefully, since being made of thin, comparatively soft, metal they are easily dented.

*c. Marking.*—Cartridge cases are stamped and stenciled for identification, as shown in Figures 4, 5, 6, and 8.

## SECTION VII

## PRIMER



**21. 49-grain percussion primer, Mk. I.**—*a. Type.*—75-mm. gun ammunition uses a percussion primer: that is, the round is fired by the primer being struck by the point of the firing pin of the gun in the same way that a rifle cartridge is fired. The primer is called a "49-grain percussion primer, (Mk. I)," because it contains 49 grains of black powder. This black powder acts as an igniter to the smokeless powder in the cartridge case.

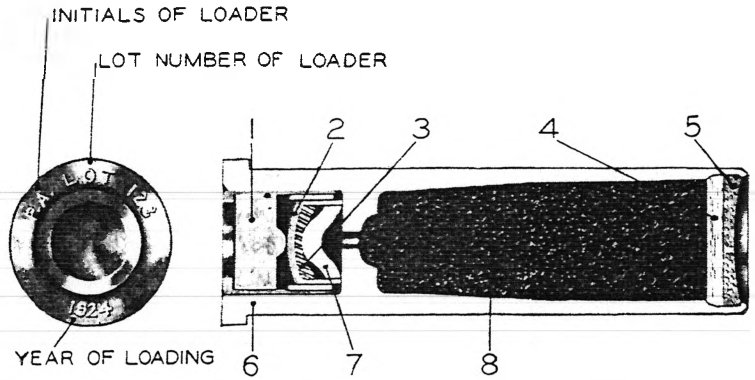



FIG. 14.—49-grain percussion primer, Mk. I

1. Firing plug.
2. Cup.
3. Composition pellet.
4. End closing wad.
5. Shellac.
6. Body.
7. Anvil.
8. Black powder.

*b. Action.*—Figure 14 shows the 49-grain percussion primer, Mk. I. When the firing plug (1) is struck by the firing pin of the gun, the top of the cup (2) is indented and the composition pellet (3) is exploded. The flame of this explosion passes through a hole and ignites the black powder charge (8), which, in turn, fires the propelling charge in the cartridge case. The composition pellet (3) is sensitive, and care must be taken that the firing plug (1) is not hit by any hard object. A blow simulating that of a firing pin attached to a 1-pound weight and dropped through a height of 3 inches may cause it to function.

*c. Marking.*—Identification marks are stamped on the bottom of the primer case, as shown in Figure 14.

## SECTION VIII

## PROPELLING CHARGE



**22. Propelling charge.** — *a. General.* — (1) The propelling charge is nitrocellulose smokeless powder. The amount used varies according to the type of projectile used, but weighs approximately 1.5 pounds, except that a reduced charge can be used for short ranges. Provision has been made for such a charge for use with the high-explosive shell Mk. I. Projectiles and their corresponding charges and muzzle velocities are as follows:

| Projectile | Mark | Weight of charge | Muzzle velocity (feet per second) | |
|---|---|---|---|---|
| | | | M1897 (French) | M1916 (American) and M1917 (British) |
| High-explosive shell (reduced charge) | I | 9.25 oz | [1] 1,130 | [1] 1,089 |
| High-explosive shell | I | 1.3 lb | [1] 1,805 | [1] 1,742 |
| High-explosive shell | IV | 1.6 lb | [1] 1,955 | [1] 1,900 |
| Chemical shell | II | 1.3 lb | [1] 1,805 | [1] 1,742 |
| Shrapnel | I | 1.5 lb | 1,755 | 1,693 |

[1] When Mk. V fuze is used; slightly lower velocity when Mk. III fuze is used.

(2) This powder is contained in a brass cartridge case, as shown in Figure 1. A grain of powder will burn freely in the open and has none of the characteristics of an explosive until it is confined. If the powder is confined in a chamber the rate of burning is very rapid, as the rate of burning increases as the gases are liberated, and the pressure in the chamber increases.

*b. Action.*—(1) The pressure of gases from the burning powder expels the projectile from the gun. If these gases are created too rapidly, too much pressure will be developed and the gun may burst. On the other hand, if the gases are not generated rapidly enough, the projectile will leave the muzzle before the grains are entirely burned and at a lowered velocity. It is, therefore, necessary to make the grains of powder of such size that when the projectile has reached the muzzle of the gun they have completely burned and the pressure will not have exceeded a certain prescribed limit. To meet this condition it has been found convenient to make the grains of powder with a number of holes, or perforations, running lengthwise of the grain. As the grain is perforated, it will burn on the inside and outside surfaces at the same time and gas will be created much faster than if the grain were solid. The size of the grain for the 75-mm. gun is about one-eighth inch in diameter by

three-eighths inch long, with seven perforations running lengthwise of the grain. The color varies from a light brown to a black.

(2) It is assumed that all the exposed surfaces of the grain of powder begin to burn at the same time. Figure 15 shows the end view of a typical grain of powder, and also the progressive burning action until the grain is practically consumed. The dotted lines show the original shape of the grain of powder. The small triangular sections are called "slivers." These slivers will burn if the powder is properly designed.

(3) The maximum allowable pressure in the 75-mm. guns is 36,000 pounds per square inch, and the muzzle velocity varies as shown in *a*(1) above. This powder is affected by moisture, and great care should be taken to have the assembled round kept in a dry condition.


FIG. 15.—Grain of powder

## SECTION IX

## PACKING



**23. Packing of assembled round.**—*a. General.*—(1) Assembled rounds of ammunition for the 75-mm. gun are packed and shipped in wooden packing boxes. Each round is contained in an individual packing can, which is waterproof. This can is of metal, about $3\frac{7}{16}$ inches in diameter and 24 inches long. The round is supported by the flange of the cartridge case resting on the corrugated end of the packing can and by a fiber tube extending from the other end of the packing can to the rotating band of the projectile. The cover is held in place by means of a soldering strip, which is torn off to unpack the round. The cup, or depression in the cover, is to protect the primer in the cartridge case. After the round has been packed in the can and the cover soldered on, the can is tested

for leaks by applying an air pressure of 4 pounds per square inch through the hole at the bottom of the can. Leaks are indicated by an air pressure gauge. After satisfactorily passing this test, the test hole is soldered over. The packing can is varnished externally after being sealed.

(2) Some 75-mm. ammunition in service is packed in individual fiber containers. This packing was authorized during the war due to a shortage of tin, and when ammunition is expected to be used without much delay, as in war time, is entirely satisfactory. Either tin or fiber containers are authorized at present, although the tin containers are more generally used.

*b. Marking.*—(1) A 2-inch band is painted around the middle of the can to signify the nature of the projectile. The colors are as follows:

(*a*) Yellow, denotes a high-explosive shell.
(*b*) Blue-gray, denotes a chemical shell.[1]
(*c*) Red, denotes a shrapnel.

(2) The ammunition lot number is stenciled on the can. The soldering strip bears the following stamping:

(*a*) 75-mm. shell or 75-mm. shrapnel (caliber of gun and type of projectile).
(*b*) Mk. I, Mk. II, or Mk. IV (mark number of projectile).
(*c*) Gun-Mod. '97-1916-1917 (model of gun).

**24. Packing box for shell and shrapnel.**—*a. Type.*—(1) The standard packing box for 75-mm. ammunition contains four rounds in individual containers. It is an end-opening box, and the cover or end is secured by a wing nut fastened to a rod which extends to the opposite end of the box. To remove the contents, the wing nut is removed, which permits the end of the box to be detached and the contents withdrawn. This box measures $8\frac{13}{16}$ inches square by $27\frac{3}{4}$ inches long, and occupies about 1.25 cubic feet of space. The total weight for boxed shell is about 95 pounds, and about 115 pounds for boxed shrapnel.

(2) A great many packing boxes made during the World War are in service, which contain nine rounds of ammunition in individual containers. The lid of this box is fastened by means of two hinges and two hasps. Rope handles are fastened to both ends to facilitate handling. This box is approximately $28\frac{1}{2}$ inches long, $12\frac{3}{8}$ inches wide and 13 inches high. It occupies about 2.7 cubic feet of space.

[1] When chemical shell marked in accordance with the new marking system are issued the packing cans will also be marked with the same designating bands and symbols in the same colors that appear on the shell. These markings will be placed on the blue-gray band on the packing can.

The total weight of the box packed with shell ammunition is about 200 pounds and packed with shrapnel ammunition is about 225 pounds.

(3) Each packing box contains a completely filled-in ammunition data card which gives complete information regarding the lot number, manufacturer, date of manufacture, date of packing, etc., of the round, together with similar information about each of the components of the round.

*b. Marking.*—(1) The marking which appears on the packing box for the Mk. I and Mk. IV high-explosive shell is shown in Figures 16 and 17.

(2) The system of marking packing boxes for the Mk. II chemical shell was changed when the system of marking the chemical ammunition was changed. The old marking system is shown in Figures 17 and 18 and the new marking system is shown in Figures 17 and 19.

(3) The marking which appears on the packing box for the Mk. I shrapnel is shown in Figures 17 and 20.

**25. Packing box for fuzes.**—*a. Type.*—The point detonating fuzes, Mk. III and Mk. V, are never assembled in ammunition for shipment. They are shipped in separate metal-lined wooden boxes. The fuzes are packed in trays which prevents excessive movement in shipment. There are 50 Mk. III or 100 Mk. V fuzes in a box. The exterior dimensions of the box are exactly the same for both fuzes, the difference being in the tray. The cover is hinged and is held in place by two thumb nuts. A wire is tacked to the lid and to the side of the box and sealed, thus preventing tampering with the contents of the box without destroying the seal. The marking on this packing box is shown in Figure 21.

*b. Metal lining.*—The boxes have a metal lining which makes them waterproof, this lining being a complete box in itself. The cover is secured by a soldering strip which must be entirely removed before removing the cover. After the fuzes have been packed in the lining and the cover soldered on, the lining is tested for leaks by applying an air pressure of 4 pounds per square inch through the hole in the cover. Leaks are indicated by an air-pressure gauge. After satisfactorily passing this test, the test hole is soldered over. If a box of fuzes is opened and for any reason part of the fuzes only are used during the season, the tin strip should not be resoldered but the wood cover should be securely fastened in place and the box appropriately marked so that the remaining fuzes may be used at the first opportunity.

*c. Size and weight.*—The outside dimensions in inches of the wooden box are as follows: 9⅝ inches by 8¾ inches by 17$\frac{13}{16}$ inches. It occupies about 0.9 cubic foot of space. The total weight packed with Mk. III fuzes is about 80 pounds and with Mk. V fuzes about 70 pounds.

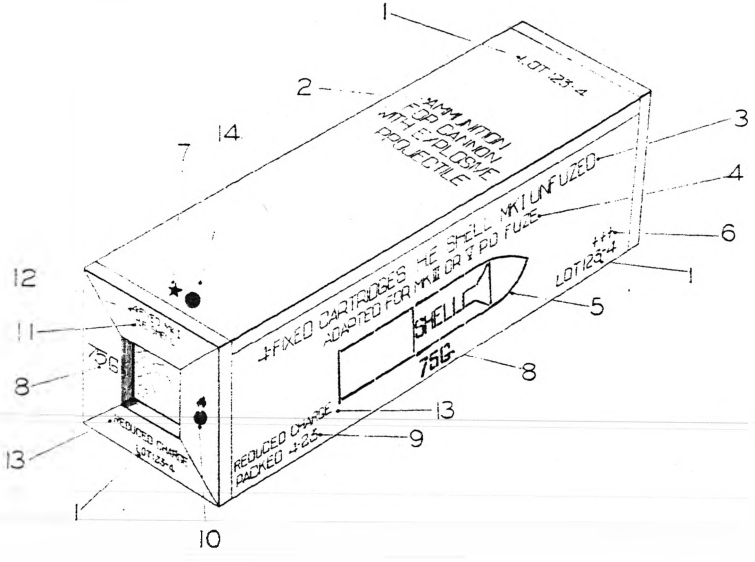



FIG. 16.—Packing box for 75-mm. high-explosive fixed ammunition for field gun

1. Ammunition lot number.
2. To comply with I. C. C. regulations.
3. Number of complete rounds, type of projectile, mark number and condition.
4. Statement of fuzes to be used.
5. Symbol of ammunition in box.
6. Weight zone marks.
7. Inspector's stamp.
8. Caliber and type of cannon.
9. Month and year of packing.
10. Ordnance insignia.
11. Type of projectile.
12. Number of rounds and mark number of projectile.
13. When reduced charge is used.
14. Name of place where packed.

NOTE. Both ends of box are marked alike. For marking on side not shown (address side), see Figure 17.

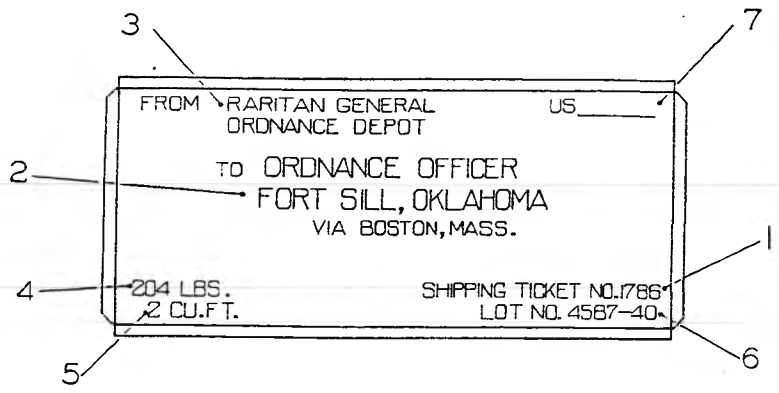



FIG. 17.—Address side for all packing boxes

1. Number of shipping ticket.
2. Designation and address of consignee (as shown on shipping instruction).
3. Consignor.
4. Gross weight, in pounds.
5. Cubic displacement, in cubic feet.
6. Ammunition lot number.
7. To indicate United States property.

NOTE.—Shipping officer may omit 2 and 3 in carload shipments.





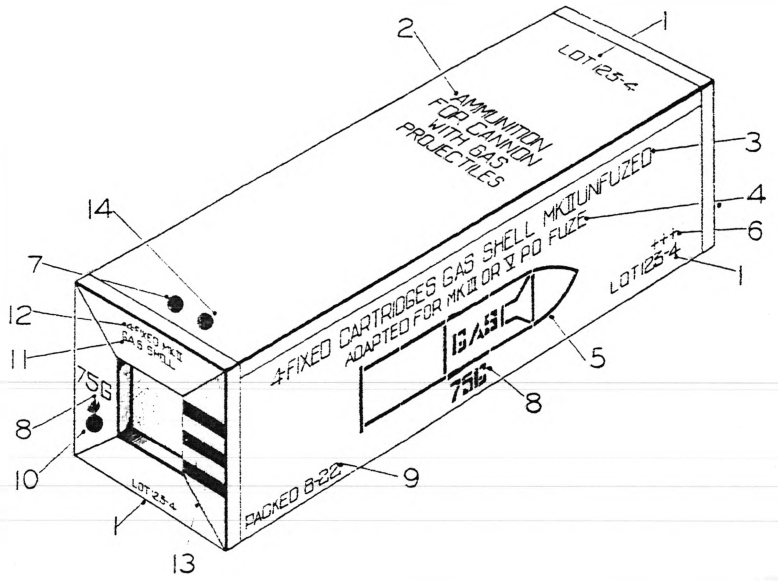



FIG. 18.—Packing box for 75-mm. chemical shell fixed ammunition for field gun. (Old system)

1. Ammunition lot number.
2. To comply with I. C. C. regulations.
3. Number of complete rounds, type of projectile, mark number and condition.
4. Statement of fuzes to be used.
5. Symbol of ammunition in box.
6. Weight zone marks.
7. Inspector's stamp.
8. Caliber and type of cannon.
9. Month and year of packing.
10. Ordnance insignia.
11. Type of projectile.
12. Number of rounds and mark number of projectile.
13. Colored stripes on blue-gray background to designate type of chemical filling of shell.
14. Name of place where packed.

NOTE.—Both ends of box are marked alike. For marking on side not shown (address side), see Figure 17.

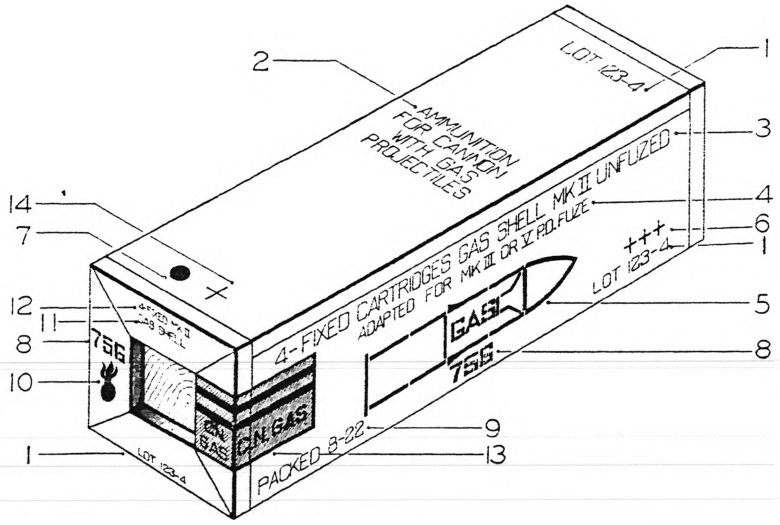



FIG. 19.—Packing box for 75-mm. chemical shell fixed ammunition for field gun. (New system)

1. Ammunition lot number.
2. To comply with I. C. C. regulations.
3. Number of complete rounds, type of projectile, mark number and condition.
4. Statement of fuzes to be used.
5. Symbol of ammunition in box.
6. Weight zone marks.
7. Inspector's stamp.
8. Caliber and type of cannon.
9. Month and year of packing.
10. Ordnance insignia.
11. Type of projectile.
12. Number of rounds and mark number of projectile.
13. Colored bands on blue-gray background and symbol of chemical filler. One green band denotes nonpersistent filler, two green bands denote persistent filler, yellow band denotes smoke (phosphorus).
14. Name of place where packed.

NOTE.—Both ends of box are marked alike. For marking on side not shown (address side), see Figure 17.

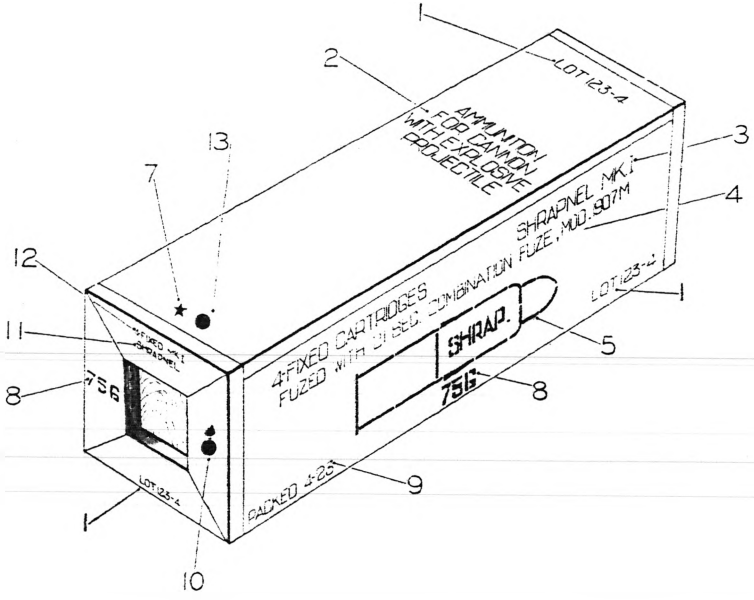



FIG. 20.—Packing box for 75-mm. shrapnel fixed ammunition for field gun

1. Ammunition lot number.
2. To comply with I. C. C. regulations.
3. Number of complete rounds, type of projectile, and mark number.
4. Statement of fuze used.
5. Symbol of ammunition in box.
7. Inspector's stamp.
8. Caliber and type of cannon.
9. Month and year of packing.
10. Ordnance insignia.
11. Type of projectile.
12. Number of rounds and mark number of projectile.
13. Name of place where packed.

NOTE.—Both ends of box are marked alike. For marking on side not shown (address side), see Figure 17.

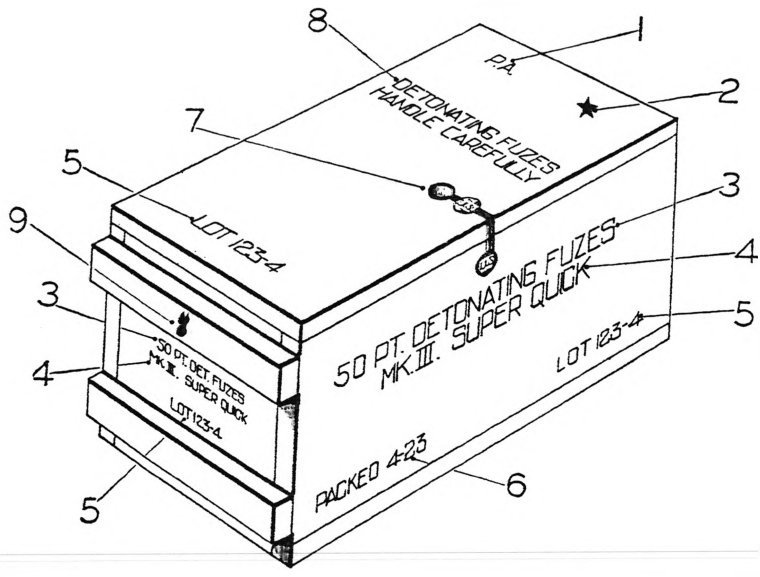



FIG. 21.—Packing box for point detonating fuze

1. Name of place where packed.
2. Inspector's stamp.
3. Quantity and kind of fuze.
4. Mark number and type of fuze.
5. Lot number.
6. Month and year of packing.
7. Seal.
8. To comply with I. C. C. regulations.
9. Ordnance insignia.

NOTE.—Both ends of box are marked alike. For marking on side not shown (address side), see Figure 17.

[A. G. 062.12 (5–3–26).]

BY ORDER OF THE SECRETARY OF WAR:

C. P. SUMMERALL,
*Major General.*
*Chief of Staff.*

OFFICIAL:

LUTZ WAHL.
*Major General.*
*The Adjutant General.*

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