Handbook on Fragmentation Drop Bombs, Mark IIa, II, I and III.

Compiled by Ordnance Department

WAR PLANS DIVISION
August, 1918

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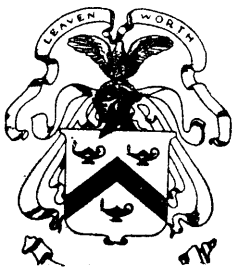

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WAR DEPARTMENT,
WASHINGTON, *August* 6, 1918.

The following pamphlet, "Handbook on Fragmentation Drop Bombs, Mark IIa, II, I, and III," is published for the information and guidance of all concerned.

(062.1 A. G. O.)

BY ORDER OF THE SECRETARY OF WAR:

PEYTON C. MARCH,
General, Chief of Staff.

OFFICIAL:
H. P. McCAIN,
The Adjutant General.

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FRAGMENTATION DROP BOMB, MARK IIA.

The Fragmentation Drop Bomb, Mark IIA, is intended for use against personnel, such as troops in the field or on the march, in railroad depots and rest billets, or wherever the protection afforded is slight. The standard 3-inch artillery shell is fitted with stabilizers and a very sensitive firing mechanism which protrudes from the nose of the shell; this is so rapid in action that detonation is caused before the shell has penetrated the ground.

The average radius of effective dispersion is between 40 and 50 yards from the point of impact. However, the danger zone is considerably greater, as fragments are at times hurled to a distance of 200 yards or more.

The bomb consists of three major parts:

(a) The shell
(b) The firing mechanism
(c) The explosive elements.

(*a*) *THE SHELL*

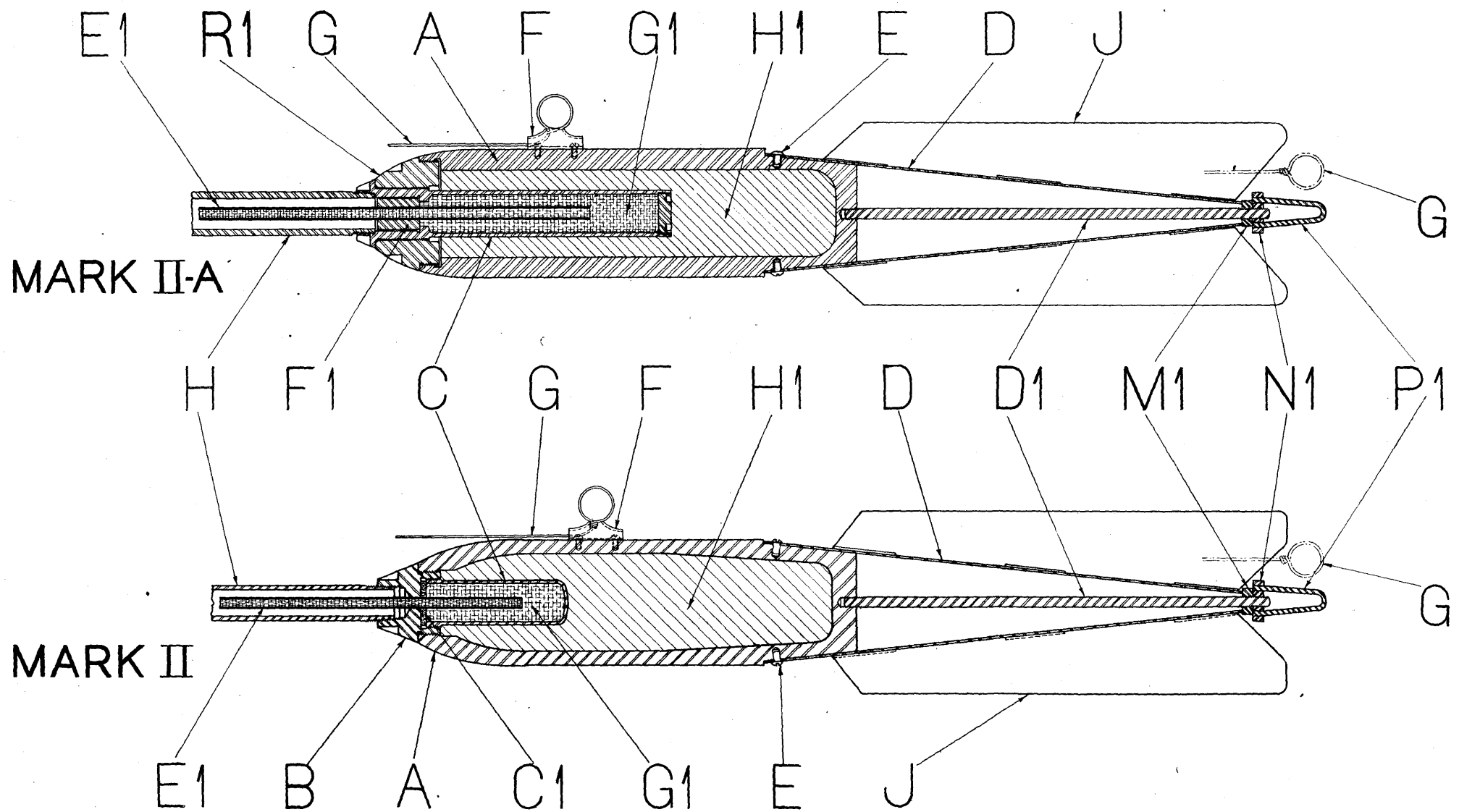
In the manufacture of this bomb, use has been made of 3 inch common steel shells, which have been rejected by army inspectors as unsuited for use in cannon. The standard combination booster cup-adapter is likewise employed.

THE SHELL—(A) measures 11.49 inches from the base to the top of the head (R1) and 2.98 inches at the point of maximum diameter. From the upper shoulder of the rotating band recess, 2.187 inches from the bottom, the base of the shell is tapered down from a diameter of 2.737 inches, at a 6 degree angle, to receive the rear cap (D). Two holes, diametrically opposite each other and .312 of an inch below the shoulder, are drilled to a depth of .25 of an inch, and tapped to receive the 10 x 32 round head machine screw (E), which serves to secure the rear cap to the shell.

THE REAR CAP—(D) is a truncated cone of sheet steel .037 of an inch thick, measuring 11.25 inches in length with a diameter of 2.812 inches at the base. It carries the four stabilizers (J). Two holes .203 of an inch in diameter are drilled diametrically opposite each other and .312 of an inch from the base of the cone, to receive the screws (E) by means of which the cap is secured to the shell. The top of the cone is pierced by a hole .3125 of an inch in diameter through which the threaded portion of the suspension rod protrudes.

THE STABILIZERS—(J) are irregularly shaped steel plates .037 of an inch thick, 11 inches long and 3 inches wide. Three lugs, 1.5 inches long and .25 of an inch wide, are provided on the inner edge of each stabilizer and bent at right angles to it, by means of which the stabilizer is spot-welded to the rear cap (D).

In order that the bomb may be carried in the British release mechanism for the Cooper bomb, a means is provided whereby it may be suspended vertically from the tail. A 10 inch length of ¼ inch steel *ROD* is screwed into the center of the shell base for a distance of .375 of an inch. The opposite end of the rod is threaded for a distance of .75 of an inch, to receive a standard hexagon *NUT* (M1) which



Assembly Drawings of Fragmentation Drop Bombs, Mark IIA and II.

CHART I.

Nomenclature of Fragmentation Bombs, Mark II and IIA.

A	Shell	Forged Steel	Artillery shell. Contains bursting charge (H1).
B	Adapter	Cold drawn steel	Screws into nose of shell (A). Supports firing tube (H) and booster cup (C). (In Mark IIA, integral with booster cup).
C	Booster cup	Cold drawn steel	Screws into base of adapter (B). Carries booster charge (G1).
D	Rear cap	Sheet steel	Fitted on base of shell (A). Carries stabilizers (J).
E	Rear cap screws (2)	Steel	Screws into base of shell (A). Secures rear cap (D) in place.
F	Safety wire guide	Sheet steel	Fastened in shell body (A). Guides and supports safety wire (G).
G	Safety wire	Music wire	Extends from release pin (Y) to release mechanism. Keeps release pin (Y) in body (K) until withdrawn.
H	Firing tube	Wrought iron or steel	Connects firing mechanism to shell (A). Protects fuse (E1).
J	Stabilizers (4)	Sheet steel	Welded to rear cap (D). Steady bomb in flight.
C1	Gasket	Felt	Between adapter (B) and booster cup (C). Supports fuse (E1) (In Mark II only).
D1	Rod	Steel	Protrudes from base of shell (A). Part of suspending device.
E1	Fuse	Cordeau-Bickford	Extends from detonator recess into booster cup (C). Detonates booster charge (G1).
F1	Fuse Support	C. R. Steel	Secured between end of firing tube (H) and shoulder of booster cup (C). Supports fuse (E1) (Mark IIA only).
G1	Booster charge	T.N.T.—Tetryl	In booster cup (C). Detonates main charge (H1).
H1	Main charge	High explosive	In body of shell (A). Causes fragmentation of shell.
M1	Hexagon nut	C. R. steel	Screws on rod (D1) over rear cap (D). Locates and locks disc (N1).
N1	Disc	C. R. steel	Screws on rod (D1) over nut (M1). Carries staple (P1).
P1	Staple	Steel wire	Riveted to disc (P1). Provides means of suspension.
R1	Head	C. D. steel	Screws into nose of shell (A). Part of shell supporting booster cup adapter (B) (Mark IIA only).

is screwed down against the end of the rear cap (D) and a steel *DISC* (N1), .875 of an inch in diameter and .25 of an inch thick, which is screwed securely against the nut. The disc (N1) is pierced by two holes, .56 of an inch apart, to receive the two ends of the *STAPLE* (P1), which are riveted in place; the staple is made of No. 11 gauge steel wire and when bent is 1.75 inches long.

THE SAFETY WIRE—(G) is a piece of .031 music wire, with a rounded corners, measuring .92x1.31 inches; it has a raised portion .25 of an inch high and .187 of an inch wide running lengthwise through its center to form a channel for the passage of the *SAFETY WIRE* (G). The bottom is curved to fit the shell (A), to which it is fastened, at a point 4.25 inches from the top of the adapter (B), by means of four 5x32 round head machine screws .25 of an inch long. The raised portion fits into the channel of the release mechanism and serves to steady the bomb in flight. In the center of the upper surface a hole is punched to permit the passage of the safety wire (G) in such a manner that the upturned edges act as a support for the loop of the safety wire, when the horizontal release mechanism is employed.

THE SAFETY WIRE—(G) is a piece of .031 music wire, with a loop .75 of an inch in diameter at one end and measures 33.75 inches below the loop. When the vertical method of suspension is employed, the safety wire (G) is passed through the channel of the safety wire guide (F) and extends from the staple (P1) to the release pin (Y.). If the bomb is to be carried in the horizontal release mechanism the wire is cut to a length of 11.5 inches below the loop; the straight end is passed through the punched hole and into the channel of the safety wire guide (F).

(b) *THE FIRING MECHANISM*

(Plate II)

The firing mechanism consists of the *BODY* (K), the *FIRING PIN* (L), the *FIRING PIN RETAINER* (M), the *DETONATOR CASING* (N), the *DETONATOR RETAINER* (P), the *DETONATOR SPRING* (W), the *SPRING RETAINER* (V), the *SPRING CAP* (X), the *DETONATOR PLUG* (S), the *DETONATOR PAD* (T), the *PLUG* (U), the *RELEASE PIN* (Y), the *RELEASE PIN SPRING* (Z), the *RELEASE PIN SPRING SEAT* (A1) and the *FIRING TUBE* (H).

THE BODY—(K) is irregular in shape, measuring 4 inches overall, 2.75 inches in width and 1.4375 inches thick. The forward end tapers to a diameter of 1.5 inches. Here a hole 1.25 inches in diameter is bored to a depth of .875 of an inch at a point .093 of an inch from the forward end a recess is turned in the inner surface to a diameter of 1.343 inches and .156 of an inch long, to receive the firing pin retainer (M).

An axially drilled hole .375 of an inch in diameter leads from the larger recess to the detonator recess and is intended to receive the firing pin (L). The detonator recess, .453 of an inch in diameter, is drilled at right angles to the long axis of the body and through the section of greatest width, at a point 2.25 inches from the forward end. For a distance of 1.25 inches from the lower edge the recess is

enlarged to a diameter of .578 of an inch, to receive the flanged portion of the detonator casing (N). At a point .968 of an inch from the lower edge this section is traversed at right angles by a .218 of an inch hole, intended to receive the release pin (Y). The upper end of the detonator recess is bored out and tapped to a diameter of .687 of an inch to receive the spring retainer. (V).

THE SPRING RETAINER—(V) is a hollow brass plug, .625 of an inch long, threaded for .25 of an inch at the lower end to fit into the detonator recess and turned down to a diameter of .593 of an inch above the threaded portion. A recess, .453 of an inch in diameter and .5 of an inch deep, is intended to receive the detonator spring (W). A .062 of an inch slot traverses its surface to provide a grip for a screw driver.

THE DETONATOR SPRING—(W) consists of about eight coils of .031 of an inch music wire, with an outside diameter of .406 of an inch and a length of 1.5 inches before compression. One end rests in the spring retainer (V) and the other in the spring cap (X), above the detonator casing.

THE SPRING CAP—(X) is a copper thimble, .02 of an inch thick and .1875 of an inch long. It is placed over the lower end of the spring to prevent the end of the wire from catching between the detonator and the wall of the recess.

At the opposite end of the detonator recess, a brass *DETONATOR PLUG*—(S) .25 of an inch thick and .687 of an inch in diameter, is screwed into the body to seal the hole. A .062 of an inch slot is cut in the face of the plug to provide a grip for a screw driver.

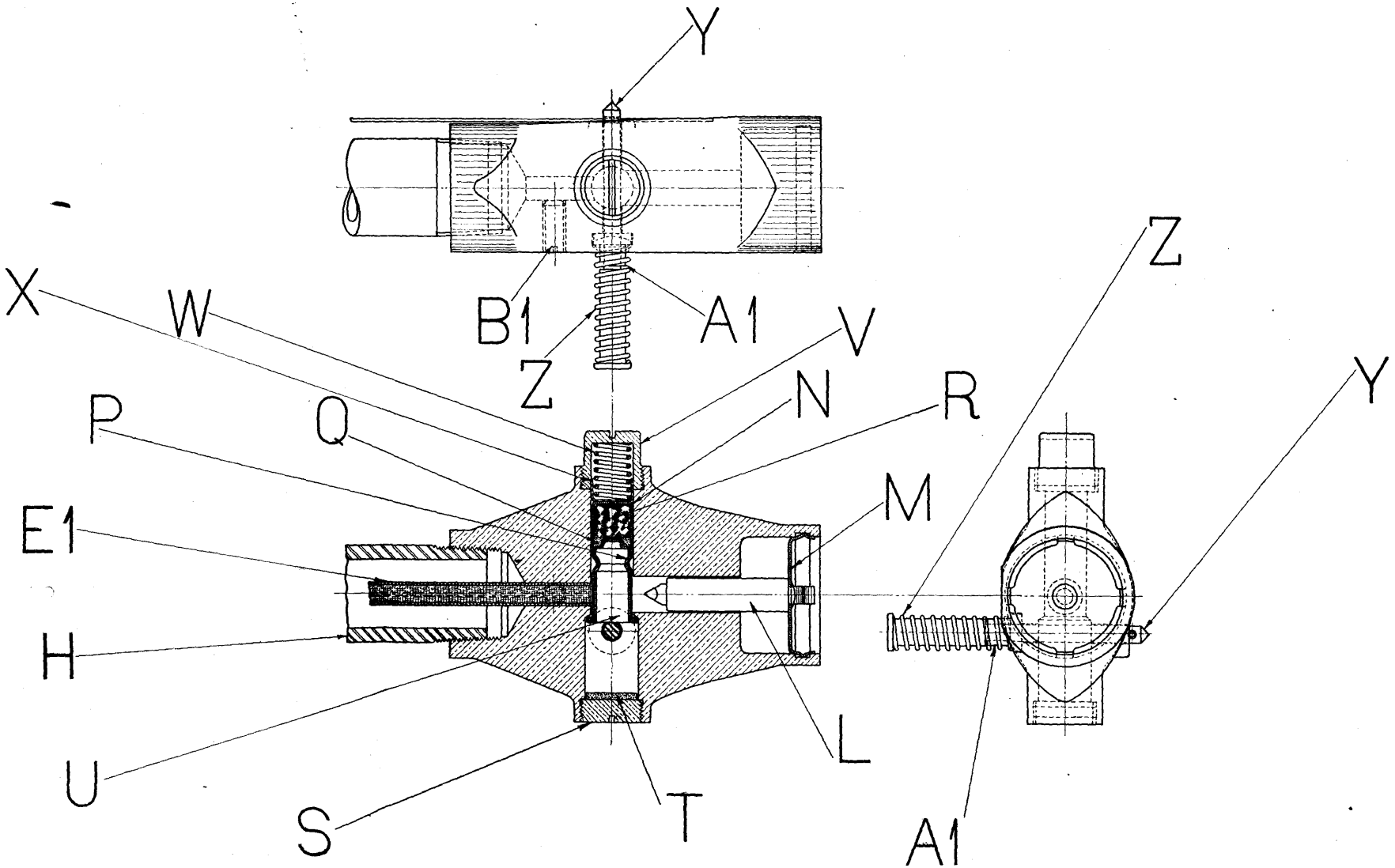
THE DETONATOR PAD—(T) is a felt disc .562 of an inch in diameter and .062 of an inch thick, which is glued to the inner side of the plug (S); it is intended to cushion the striking of the detonator assembly, when the safety pin is removed.

The detonator assembly is the same as that used in the French type artillery fuses, Mark III and Mark V. This consists of a detonator casing, a detonator retainer, a detonator casing washer and a fulminate charge.

THE DETONATOR CASING—(N) is a copper thimble designed to fit in the detonator recess. It carries a charge of 30 grains of fulminate (R) in its lower or closed end.

THE DETONATOR RETAINER—(P) is placed inside the casing (N), with its flanged shoulder seated on the shoulder of the casing (N). In this position the bottom of the retainer (P) rests on the felt *DETONATOR CASING WASHER*—(Q) which secures the fulminate (R) in place. After insertion of the retainer (P) in the casing (N), the latter is crimped near the bottom to secure the former in its proper position.

A STEEL PLUG—(U) .625 of an inch long and .340 of an inch in diameter, tapered down at a 30 degree angle for a distance of .093 of an inch at the bottom, is pressed into the open end of the retainer



Assembly Drawing of Firing Mechanism.

CHART II.

Nomenclature of Firing Mechanism.

K	Body	Cast brass	Screwed on front end of firing tube (H). Contains firing mechanism.
L	Firing pin	C. R. steel	In front end of body (K). Pierces detonator on impact.
M	Firing pin retainer	Sheet steel	In front end of body (K). Supports firing pin (L).
N	Detonator casing	Copper	In detonator recess in body (K). Contains fulminate (R) and detonator retainer (P).
P	Detonator retainer	Copper	In detonator casing (N). Holds fulminate (R) in position and contains plug (U).
Q	Detonator casing washer	Felt	In detonator casing (N) over fulminate (R). Supports detonator retainer (P).
R	Fulminate charge	Fulminate of mercury	In base of detonator casing (N). Detonates fuse (E1).
S	Detonator plug	Brass rod	Screws into detonator recess in body (K). Carries detonator pad (T).
T	Detonator pad	Felt	Glued to detonator plug (S). Cushions seating of detonator assembly.
U	Plug	C. R. steel	Inside detonator retainer (P). Prevents functioning of fulminate (R) when bomb is dropped safe.
V	Spring retainer	Brass rod	Screws into body (K) of firing mechanism. Contains detonator spring (W).
W	Detonator spring	Music wire	In spring retainer (V). Moves detonator assembly into firing position when release pin (Y) is pulled.
X	Spring cap	Brass	On lower end of detonator spring (W). Insures smooth action of spring.
Y	Release pin	C. R. steel	Traverses detonator recess. Supports detonator in safe position until withdrawn.
Z	Release pin spring	Music wire	On release pin (Y). Forces pin out of body (K) when safety wire (G) is withdrawn.
A1	Release pin spring seat	Steel	On release pin (Y). Acts as lower bearing for release pin spring (Z).
B1	Anchor screw	Steel	Screws in body (K) over fuse (E1). Anchors fuse in position.

(P) until the top is flush with the flanged shoulder of the retainer; this serves to prevent the functioning of the firing pin (L) when the bomb is to be dropped safe.

The rear end of the body (K) tapers down to a diameter of 1.375 inches at a point .25 of an inch from the edge; from this point to the edge the surface is turned straight. A hole .625 of an inch deep is drilled axially in the end and tapped with a ¾ inch pipe tap to receive the firing tube (H) which connects the firing mechanism with the shell (A). A .25 of an inch hole is drilled from the bottom of this recess to the detonator recess, to receive the end of the fuse (E1). At a point 1.125 inches from the rear end, a hole is drilled and tapped from the outer surface of the body (K) to the fuse hole and provided with a .25x.562 of an inch *SET SCREW* (B1), to anchor the fuse (E1) in position.

THE FUSE SUPPORT—(F1) is a cold rolled steel cylinder 1.062 inches long and .77 of an inch in diameter, which is inserted in the recess in the booster cup-adapter (C) and is held in position between the end of the firing tube and the shoulder of the booster cup. A .25 of an inch hole is drilled through the center and serves to center the fuse (E1) in its proper position.

THE FIRING TUBE—(H) consists of a four inch length of ¾ inch extra heavy wrought iron or steel pipe threaded at both ends. The forward end is fitted into the body of the firing mechanism; the rear end is screwed into the booster cup (C).

THE RELEASE PIN—(Y) is a built-up, cold rolled steel cylinder 2.843 inches long and .406 of an inch at its largest diameter. This section is .062 of an inch wide and acts as the upper bearing for the release pin spring (Z). The pin is turned down to a diameter of .281 of an inch for insertion in the spring. The lower end of the pin is made .187 of an inch in diameter for insertion through the holes traversing the denotator recess, except for a distance of .093 of an inch from the end, where it tapers to a point. A .062 of an inch hole is drilled through the end of the pin at a point 1.593 inches from the lower shoulder to receive the safety wire (G).

THE SPRING SEAT—(A1) is a steel cylinder .375 of an inch long and .406 of an inch in diameter. It is turned to a diameter of .281 of an inch for a distance of .25 of an inch from one end for insertion in the spring (Z). A hole .203 of an inch in diameter is drilled through the spring seat to receive the release pin (Y).

THE RELEASE PIN SPRING—(Z) consists of approximately 10 coils of .051 of an inch music wire, with an inside diameter of .312 of an inch and a normal length of 2.5 inches. It is placed over the release pin (Y) and serves to drive the latter out of the body (K) when the safety wire (G) is withdrawn.

THE FIRING PIN—(L) is a cold rolled steel cylinder, 1.656 inches long and .343 of an inch in diameter. The front end is turned down to a diameter of .187 of an inch for a distance of .093 of an inch for insertion in the firing pin retainer (M). The opposite end is

turned to a diameter of .218 of an inch and tapered off at a thirty degree angle to a wedge-shaped point, the width of which is .062 of an inch.

THE FIRING PIN RETAINER—(M) is a disc of steel, 1.25 inches in diameter and .031 of an inch thick. Four lugs, equally spaced about the circumference, are bent upward, perpendicular to the disc. In the center of each lug is a protruding corrugation, .031 of an inch high, which is intended to secure the retainer (M) in the recess provided for the purpose in the front end of the body (K).

(c) *THE EXPLOSIVE ELEMENTS.*

The explosive elements consist of the fulminate, the fuse, the booster charge and the main high explosive charge.

THE FULMINATE CHARGE—(R) consists of 30 grains of fulminate carried in the bottom of the detonator casing (N) in the body (K) of the firing mechanism.

THE FUSE—(E) is a length of Bickford detonating fuse, consisting of T. N. T. with a thin lead covering. It extends from the detonator recess in the body, where it is fastened by means of the set screw (B1), through the firing tube into the booster cup (C).

THE BOOSTER CHARGE—(G1) consists of a combination of T. N. T. and Tetryl, put into the standard booster cup (C) under 5,000 lbs. pressure.

THE MAIN CHARGE—(H1) consists of about 1¼ lbs. of high explosive, carried in the body of the shell.

OPERATION.

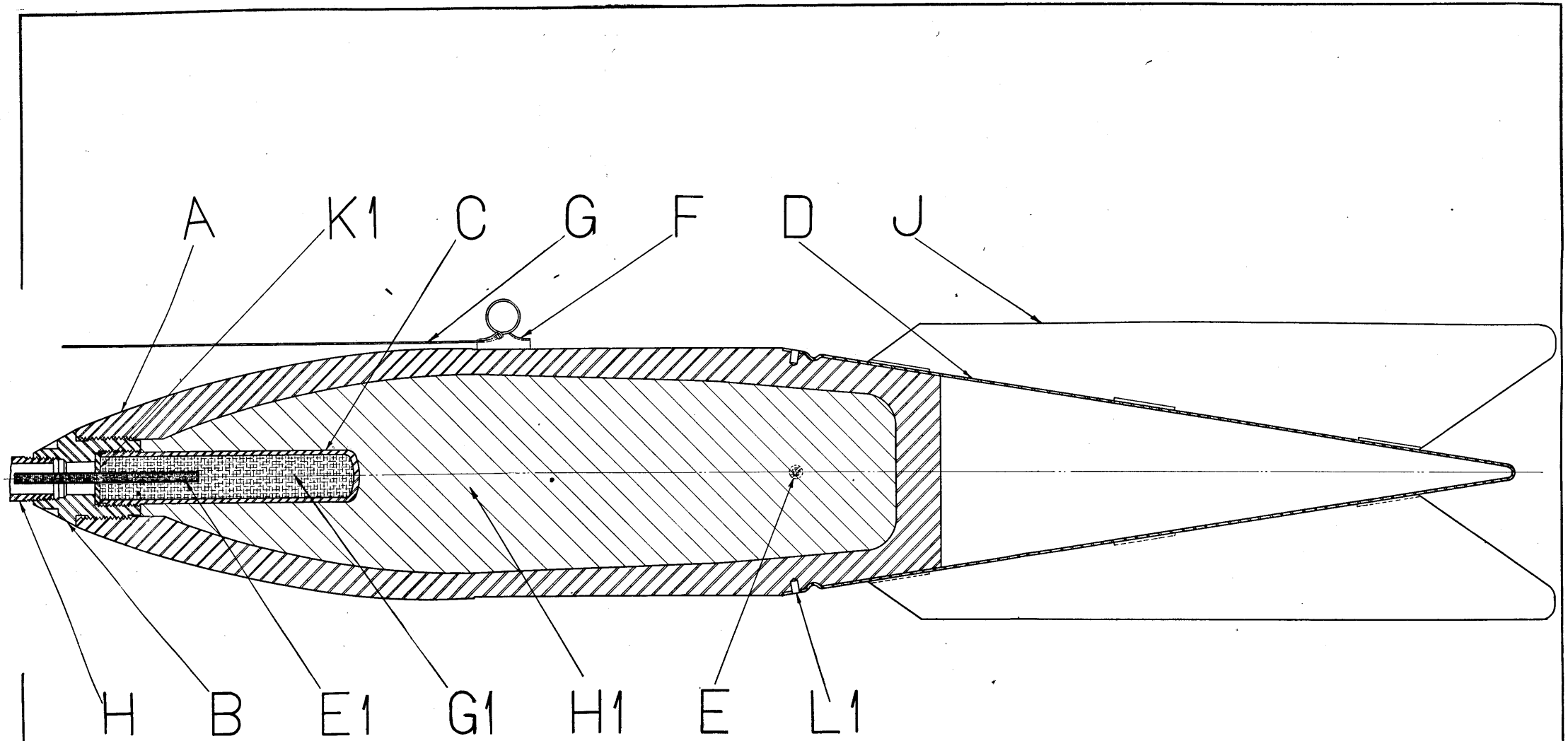
Upon release of the bomb from the plane the safety wire (G) is withdrawn from the release pin (Y), whereupon the latter is thrown out by the action of the release pin spring (Z). The detonator casing (N) now slides down the detonator recess, impelled by the compressed detonator spring (W) until it strikes the detonator pad (T). In this position, the fulminate charge (R) lies between the firing pin (L) and the fuse (E1).

Upon impact, the firing pin (L) is driven into the fulminate (R), which then explodes. This detonates the fuse (E1), which rapidly transmits the detonating wave to the booster charge (G1), whereupon the main charge (H1) is in turn detonated.

When the bomb is dropped safe, the safety wire (G) is not withdrawn and the detonator accordingly retains its original position. On impact the firing pin (L) strikes the steel plug (U). The shock of the fall may detonate the fulminate (R), but this will not set off the fuse (E1), for the latter will not detonate unless in close contact with the fulminate.

MARKING AND PACKING.

The exterior surfaces of the bomb are painted olive drab. As an indication of the type to which this bomb belongs a blue band, one inch wide, is painted around the nose, three inches from the tip. A black center-of-gravity band, one inch wide, is painted around the bomb to indicate the center of gravity. Each bomb is stenciled in



Assembly Drawing of Fragmentation Drop Bombs, Mark I and III.

CHART III.

Nomenclature of Fragmentation Bombs, Mark I and III.

A	Shell	Forged steel	Artillery shell. Contains bursting charge (H1).
B	Adapter	Cold drawn steel	Screws into nose of shell (A). Supports firing tube (H) and booster cup (C).
C	Booster cup	Cold drawn steel	Screws into base of adapter (B). Carries booster charge (G1).
D	Rear cap	Sheet steel	Fitted on base of shell (A). Carries stabilizers (J).
E	Rear cap screws (2)	Steel	Screws into base of shell (A). Secure rear cap (D) in place.
F	Safety wire guide	Sheet steel	Fastened on shell body (A). Guides and supports safety wire (G).
G	Safety wire	Music wire	Extends from release pin (Y) to release mechanism. Keeps release pin in body (K) until withdrawn.
H	Firing tube	Wrought iron or steel	Connects firing mechanism to shell (A). Protects fuse (E1).
J	Stabilizers (4)	Sheet steel	Welded to rear cap (D). Steadies bomb in flight.
E1	Fuse	Cordeau-Bickford	Extends from detonator recess into booster cup (C). Detonates booster charge (G1).
G1	Booster charge	T.N.T.—Tetryl	In booster cup (C). Detonates main charge (H1).
H1	Main charge	High explosive	In body of shell (A). Causes fragmentation.
K1	Washer	C. R. steel	In adapter (B) under firing tube (H). Supports fuse (E1).
L1	Pins (2)	Steel	In base of shell. Locate rear cap. (Mark I only).

white paint on the center-of-gravity band to indicate the name of the manufacturer, the lot, the lot number and the inspector's initials, together with the designation of the bomb.

Five bombs are packed in a wooden shipping box. The detonators are packed, five in a tin box, which is placed in a separate compartment in the shipping box.

PREPARATIONS FOR USE.

For preparations for use, see "Instructions," page 19.

FRAGMENTATION DROP BOMB, MARK II.

In the manufacture of Fragmentation Bomb, Mark II, the 75 mm. common steel shell is employed. Except for the changes necessary to permit the use of this shell, as noted below, the firing mechanism and all other details are identical with those of the Mark IIA (see Plate 1).

The overall length is 30 inches; the shell (A) itself is 11.89 inches in length, including the adapter (B), while the maximum diameter is 2.938 inches. A rounded recess, .125 of an inch deep, is cut in the base of the shell .812 of an inch below the shoulder for the rotating band; in assembling, the rear cap (D) is peened into the recess as an additional means of securing the cap (D) to the shell (A).

A SPECIAL ADAPTER—(B) is required to permit the attachment of the firing tube (H). It is in the shape of a truncated cone, 1.5 inches long overall and 1.88 inches in diameter at the base, with a cylindrical projection on the base .468 inches high. This projection is threaded on the outside to a diameter of 1.446 inches, to screw into the nose of the shell (A) and tapped on the inside to a diameter of 1.129 inches for a depth of .468 inches, to receive the standard booster cup (C).

THE FRONT END OF THE ADAPTER—(B) is bored and tapped with a ½ inch Briggs standard pipe tap, for a distance of .5 of an inch. The total depth of this recess is .625. From this point, the diameter of the bore tapers down to .25 of an inch, to permit the insertion of the fuse (E1). In place of the fuse support, a felt *GASKET* (C1), 1 inch in diameter, .125 of an inch thick, is placed between the adapter (B) and the top of the booster cup (C); it has a hole, .234 of an inch in diameter, to permit the passage of the fuse (E1).

Two rounded recesses, exactly opposite each other and .25 of an inch wide, are cut in the top of the adapter, .5 of an inch deep, with centers 1.35 inches apart to provide a grip for a spanner wrench.

THE FIRING TUBE—(H) is a piece of ½ inch extra heavy standard wrought iron or steel pipe 5.0 inches long.

MARKING AND PACKING.

The method of marking and packing is similar to that of the Mark IIA.

PREPARATIONS FOR USE.

For preparations for use, see "Instructions," page 19.

FRAGMENTATION DROP BOMB, MARK I.

Fragmentation Drop Bomb, Mark I, is similar in design to the Mark II. The 6-inch common steel shell is used with the identical firing mechanism described above. Except for the changes in dimensions and design necessary to permit the use of this shell, as noted below, the firing mechanism and all other details are identical with those of Mark IIA and Mark II (see Plate III).

The bomb measures 58.3 inches overall; the shell (A), with the adapter (B) in place, measures 21.23 inches. The standard booster cup (C) and adapter (B) are used, except that the front end of the adapter (B) is drilled and tapped with a ¾ inch Briggs standard pipe tap to receive the firing tube. The firing tube (H) is ¾ inch extra heavy pipe 18 inches long. The safety wire (G) is 31.5 inches long below the loop.

A STEEL WASHER—(K1) 1.25 inches in diameter and .125 of an inch thick, is placed in the fuse recess of the adapter (B) and is secured in this position when the firing tube (H) is screwed in place. A hole .234 of an inch in diameter is intended to receive the fuse (E1), and support it in the proper position.

THE BASE OF THE SHELL—(A) is tapered at a 9 degree angle from a diameter of 5.835 inches at a point 3.875 inches from the base to fit into the rear cap (D).

THE REAR CAP—(D) is a cone 17.875 inches in length, with a base of sufficient diameter to fit over the base of the shell. As this bomb is not intended for vertical release the suspending rod is omitted and the rear cap (D) terminates in a rounded point.

THE STABILIZERS—(J) are 17.625 inches long, 4.448 inches wide and .062 of an inch thick. They are spot-welded to the rear cap (D) by means of three lugs on each stabilizer (J), 1.5 inches long and .5 of an inch wide, bent at right angles to the plane of the stabilizer.

THE BASE OF THE REAR CAP—(D) is slottted in two places, midway between the screw (E) holes already described, to receive the two positioning pins (L1), set in the base of the shell.

The main charge consists of approximately 13 pounds of high explosive.

MARKING AND PACKING.

The Marking is similar to that of the bombs described above.

One bomb, completely assembled, except that the detonator is carried in a separate compartment, is packed in each shipping case.

PREPARATIONS FOR USE.

For preparations for use, see "Instructions," Page 19.

FRAGMENTATION DROP BOMB, MARK III.

Fragmentation Drop Bomb, Mark III, is similar in design to the Mark I. The 4.7 inch common steel shell, with standard booster cup and adapter, is used with the same firing mechanism as has been described above. Except for the changes in dimensions necessary to permit the use of this shell, as noted below, the firing mechanism and all other details are identical with those of Mark I (see Plate III).

The overall length of the bomb is 50.38 inches, while the shell, with the adapter in place, measures 16.07 inches. The adapter is tapped with a ¾ inch Briggs standard pipe tap to receive the firing tube, which is 12 inches long.

The base of the shell is tapered from a diameter of 4.52 inches at a point 2.76 inches from the base at a 6 degree, 15 minute angle, to fit into the rear cap.

The rear cap is a cone 20.01 inches long with a base of sufficient diameter to fit over the base of the shell. The locating pins are omitted.

The stabilizers are 19.75 inches long, 4.395 inches wide and .037 inches thick. The lugs, by means of which the stabilizers are spot-welded to the rear cap, measure 1.5 by .375 inches.

The main charge consists of approximately 6 pounds of high explosive.

MARKING AND PACKING.

The marking is similar to that of the bombs described above.

Two bombs, completely assembled (except that the detonator is carried in a separate compartment), are packed in each shipping case.

PREPARATIONS FOR USE.

For preparations for use, see "Instructions," Page 19.

INSTRUCTIONS.

PROCEDURE TO BE FOLLOWED IN PREPARING BOMBS FOR USE.

Place the bomb in a horizontal position on a suitable rest or bench provided for the purpose.

(1) See that the firing mechanism and firing tube (H) are screwed securely in place.

(2) Turn the bomb so that the brass detonator plug (S) is *up* and the spring retainer (P) is *down.*

(3) Remove the release pin (Y) with spring (Z) and seat (A1) by withdrawing the safety wire (G). To prevent the release pin from flying out hold one hand over the pin while the safety wire is withdrawn with the other.

(4) Unscrew the detonator plug (S) and detonator spring retainer (V) and remove the detonator spring (W) and spring cap (X).

(5) See that the safety wire (G) is inserted in the safety wire guide (F) in the proper manner, as determined by the type of release mechanism to be employed.

(6) Take the detonator assembly from its shipping compartment and carefully place it in the detonator recess in the body, flanged side up.

(7) *Make certain that the detonator has dropped to the bottom of the recess* and replace the release pin (Y), spring (Z) and seat (A1), securing the pin (Y) in the proper manner with the safety wire (G).

(8) Replace the detonator plug (S), spring (W), cap (X) and spring retainer (V).

NOTE—*Never replace* the detonator spring (W) and spring retainer (V) *before* the release pin (Y) is in position.

The bomb is now ready for use.