

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

TM 9-1985-6

TO 39B-1A-8

ITALIAN
AND
FRENCH
EXPLOSIVE ORDNANCE

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

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DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

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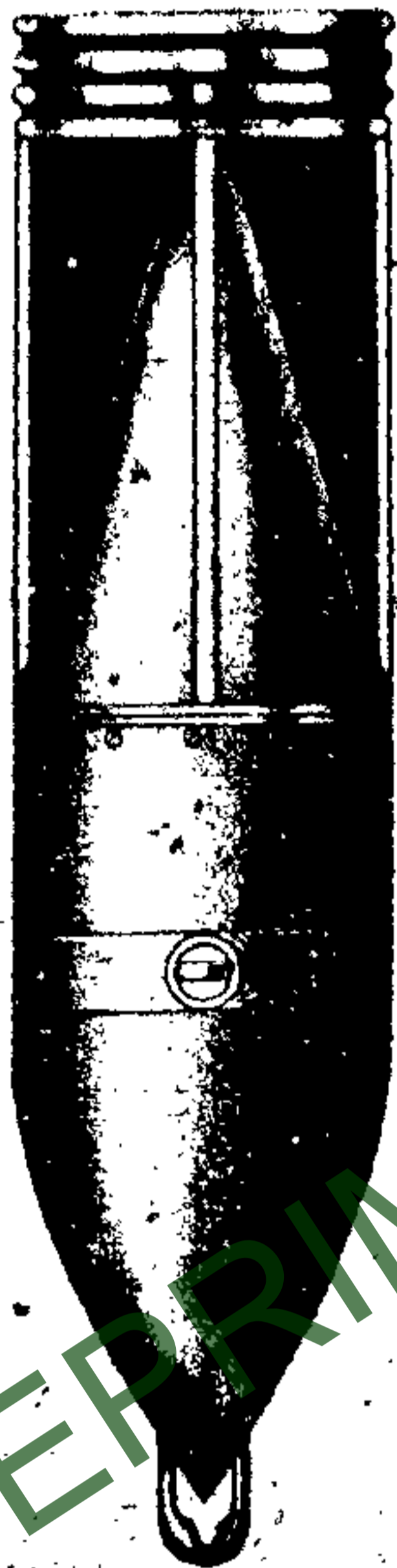


Figure 8 - 50-kg. G.P.-H.E. Bomb

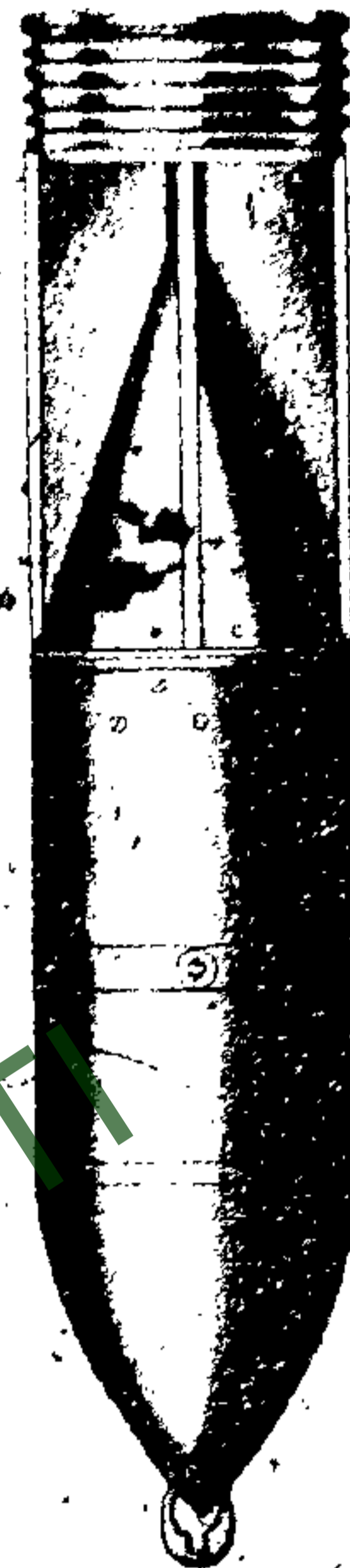


Figure 9 - 100-kg. G.P.-H.E. Bomb

50-kg. G.P.-H.E. Bomb

Data

Over-all length.....	40.5 in.
Body length.....	21.7 in.
Body diameter.....	9.9 in.
Wall thickness.....	0.25 in.
Tail length.....	18.4 in.
Tail width.....	9.9 in.
Type of filling.....	Amatol
Weight of filling.....	29.20 kg.
Total weight.....	59.31 kg.

Fuzing

Tail only—Type C or Y

Description

The bomb body consists of a base section and a nose section, both steel. Screwed into the nose is a pointed steel block, pierced to take a suspension link. The tail is secured to the base plate, which is attached to the casing with one row of screws. The tail assembly consists of four vanes, tail cone, and corrugated strengthening ring, all sheet metal. The bomb can also be suspended horizontally.

Color and Markings

Over-all—dull blue

100-kg. G.P.-H.E. Bomb

Data

Over-all length.....	51.3 in.	
Body length.....	32.5 in.	
Body diameter.....	10.7 in.	
Tail length.....	22.0 in.	
Tail width.....	10.7 in.	
Type of filling.....	TNT	Amatol
Weight of filling.....	50.6 kg.	49.5 kg.
Total weight.....	100 kg. (approx.)	

Fuzing

Tail only—Type C-1 or Y-1

Description

The bomb body is a drawn-steel tube to which is riveted a cast-steel nose, pierced to take a suspension link. The base plate is attached to casing with two rows of screws. The tail assembly is sheet metal, consisting of four vanes, cone, and corrugated reinforcing ring, all attached to the bomb base. The bomb can be suspended vertically or horizontally.

Color and Markings

TNT filled: Over-all—grey; nose—red

Amatol filled: Over-all—dull blue; nose—red



Figure 10 - 250-kg. G.P.-H.E. Bomb

250-kg. G.P.-H.E. Bomb

Data

Over-all length	73.8 in.
Body length	35.4 in.
Body diameter	17.6 in.
Tail length	39.4 in.
Tail width	17.6 in.
Type of filling	TNT
Weight of filling	125.7 kg.
Total weight	259.1 kg.

Fuzing

Nose—Type A

Tail—Type O

Description

The bomb casing is a drawn-steel tube with a cast-steel nose riveted to it. The base plate has a double flange and is attached to the casing with a double row of screws. A cast-alloy tail is attached to the upper flange of the base plate with screws. A lug is secured to the body near the center of gravity for horizontal suspension.

Color and Markings

Over-all—grey; nose—red

500-kg. and 800-kg. G.P.-H.E. Bombs

Data

	500 kg.	800 kg.
Over-all length	96.6 in.	127.8 in.
Body length	52.0 in.	77.1 in.
Body diameter	18.0 in.	18 in.
Tail length	35.7 in.	52.8 in.
Tail width	18.0 in.	18 in.
Type of filling	TNT	
Weight of filling	216 kg.	357 kg.
Total weight	508 kg.	821.6 kg.

Fuzing

Nose—Type A

Tail—Type O

Description

The bombs have a steel body and nose cast in one piece, with double-flanged base plate attached by double rows of screws. The cast-alloy tail is attached to the upper flange. The 500-kg. and 800-kg. vary only in length and weight.

Color and Markings

Over-all—grey; nose—red

Remarks

A 630-kg. time bomb has been made from the 800-kg. by reducing the thickness of walls, so as to use a greater explosive charge.



Figure 11 - 500-kg. and 800-kg. G.P.-H.E. Bombs

1,000-kg. G.P. Bomb

Data

Over-all length.....	140 in.
Body length.....	94.5 in.
Body diameter.....	20.5 in.
Wall thickness.....	0.29 in.
Tail length.....	45.5 in.
Tail width.....	28 in.
Type of filling.....	TNT
Weight of filling.....	Unknown
Total weight.....	1000 kg. (approx.)

Fuzing

Nose fuze only—Unknown

Description

The bomb casing is made up of four pieces welded together: (1) the nose; (2) a cylindrical part; (3) a truncated cone; and (4) the conical part to which the tail fins are attached. At about 30 in. from the rear, a steel diaphragm is welded inside the casing to contain the main filling before this point. A steel nose plug carries a steel fuze adapter, and both these have serrated flanges to form seals against rubber packings which are counter-sunk into the relative surfaces on the bomb nose plug, respectively. A steel booster tube, about 1½ in. diameter, runs the length of the bomb; it is inserted from the tail end, where it is screwed into the tail cone, and at the nose end it is located by a sleeve which forms an extension to the fuze adapter.

A plug, which is drilled to take the detonator, is screwed into the forward end of the booster tube; there is a felt washer beneath this plug. An internal plug, which is located by grub screws, seals the booster charge at the rear. A steel plug closes the booster tube at the tail end. The booster tube contains penthrite. Around the booster tube and forming a core to the main filling is a tube, 3 in. external diameter, with a bore 2 in. diameter; this is composed of annular rings of compressed TNT about 2¼ in. long.

Remarks

A glider attachment was used with this bomb. The controls for the glider contain a gyro unit for azimuth and an air-speed unit to control the dive angle.

Figure 12 — 1,000-kg. G.P. Bomb

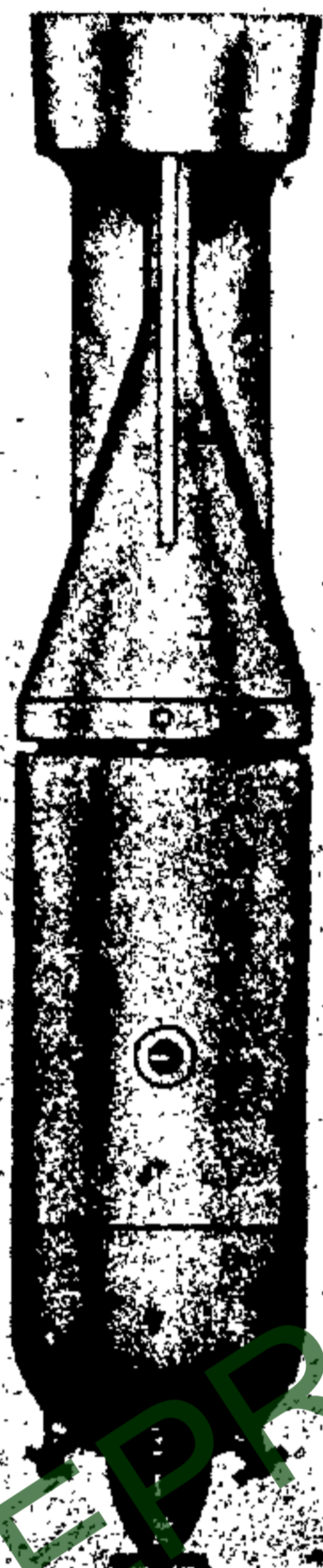


Figure 13 - 500-kg. G.P.-H.E. Bomb

500-kg. G.P.-H.E. Time Bomb

Data

Over-all length	93.7 in.
Body length	50.9 in.
Body diameter	18.1 in.
Wall thickness	0.25 in.
Tail length	43.3 in.
Tail width	18.1 in.
Type of filling	TNT
Weight of filling	247.0 kg.
Total weight	

Fuzing

Nose—Four Type J and one Long-Delay Clockwork Nose

Tail—One Long-Delay Clockwork Tail

Description

Main body and nose are cast in one piece. In the nose is a centrally-located clock work fuze and provision for four additional impact fuzes. If a time fuze is used, impact fuzes can be made inoperative. The cast aluminum-alloy tail is attached to bomb by screws.

Color and Markings

Over-all—grey; nose—red

Remarks

A similar bomb weighing between 800-1000 kg. is thought to have been used by the Italians.



Figure 14 - 15-kg. S.A.P. Bomb

15-kg. S.A.P. Bomb

Data

Over-all length	31.0 in.
Body length	20.7 in.
Body diameter	4.7 in.
Tail length	13.8 in.
Tail width	6.3 in.
Type of filling	TNT
Weight of filling	5.2 kg.
Total weight	15.5 kg.

Fuzing

Tail—Type N

Description

The bomb is thick-walled with a steel body and nose cast in one piece, to which a dome-shaped base is attached. Sheet metal tail fins are attached to a metal band, clamped around the body.

Color and Markings

Over-all—grey; nose—red

31-kg. S.A.P. Bomb

Data

Over-all length.....	31.7 in.
Body length.....	22.5 in.
Body diameter.....	6.4 in.
Tail length.....	12.5 in.
Tail width.....	7.2 in.
Type of filling.....	TNT
Weight of filling.....	10.5 kg.
Total weight.....	31.0 kg. (approx.)

Fuzing

Tail only—Type N-2

Description

The thick-walled steel body has a heavy nose, larger than the rest of the body, welded on. A suspension band is bolted about the body. The sheet-metal tail is attached to a band which clamps around the body.

Color and Markings

Over-all—grey; nose—red

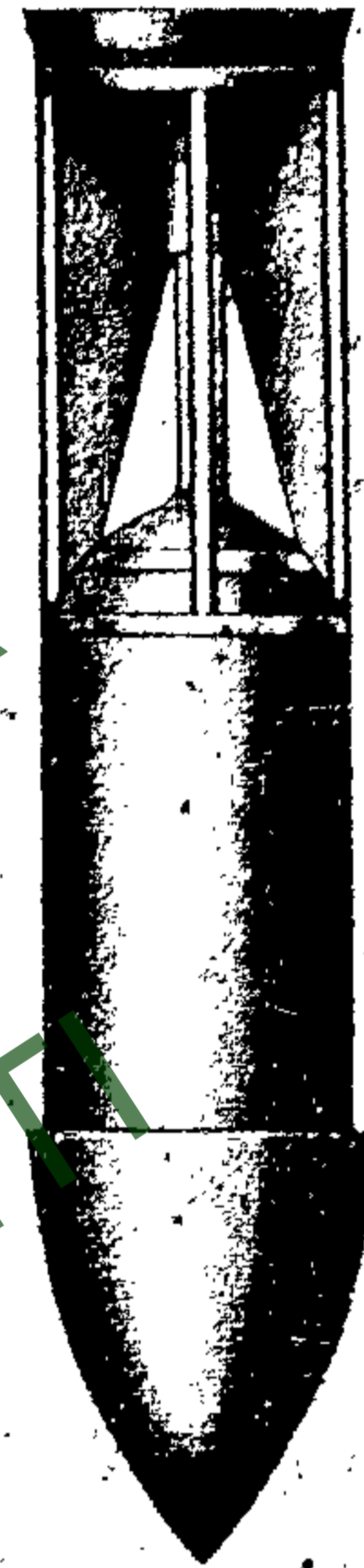


Figure 15 — 31-kg. S.A.P. Bomb

100-kg. S.A.P. Bomb

Data

Over-all length.....	50.5 in.
Body length.....	31.0 in.
Body diameter.....	9.9 in.
Wall thickness.....	0.5 in.
Tail length.....	21.3 in.
Tail width.....	9.9 in.
Type of filling.....	Amatol
Weight of filling.....	27.3 kg.
Total weight.....	109.0 kg.

Fuzing

Tail fuze—Type C-1 or Y-1

Description

The bomb has a single-piece casing with a base plate attached by two rows of screws. A sheet metal tail is attached to base plate by screws.

Color and Markings

Over-all—grey or dull blue; nose—red band



Figure 16 — 100-kg. S.A.P. Bomb

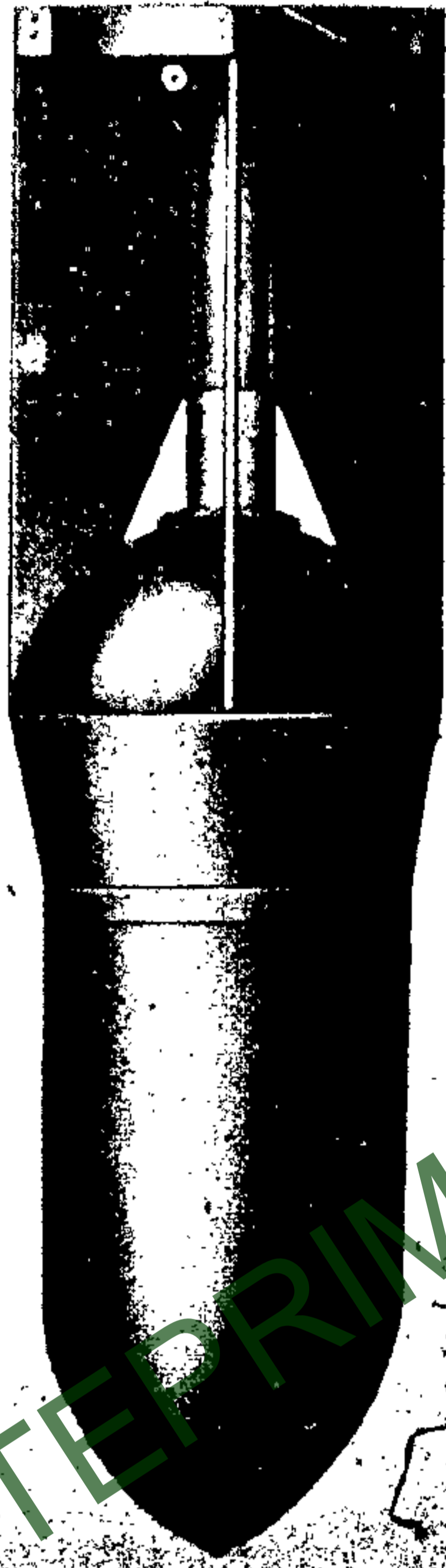


Figure 17 -- 104-kg. S.A.P. Bomb

104-kg. S.A.P. Bomb

Data

Over-all length.....	43.0 in.
Body length.....	28.0 in.
Body diameter.....	10.0 in.
Tail length.....	15 in. (approx.)
Tail width.....	11 in.
Type of filling.....	TNT
Weight of filling.....	30 kg. (approx.)
Total weight.....	104.0 kg.

Fuzing

Tail only—Type C

Description

The steel body and nose are cast in one piece. A dome-shaped base plate receives the sheet-metal tail fins, which are attached to a metal band which clamps around the body.

Color and Markings

Over-all—grey; nose—red



Figure 18 -- 12-kg. Smoke Bomb

12-kg. Smoke Bomb

Data

Over-all length.....	47 in.
Body length.....	33 in.
Body diameter.....	5.2 in.
Wall thickness.....	Unknown
Tail length.....	14 in.

Tail width 7 in.
 Type of filling Smoke composition
 Total weight 28 lb.

Fuzing

Nose only—Special fuze for this bomb

Description

Body is light alloy all-welded construction (including tail unit) with longitudinal seam down the body. Mounted to fuze body, on a central stand, is the smoke-producing composition. There are 26 smoke pellets, each 3 in. diameter and 1 in. thick, made of purple composition, enclosed in a perforated metal container. Between each one and the next, there is a metal spacer. A length of safety fuse leads from fuze to pellets and then to a self-destroying charge in the nose.

Color and Markings

Body—grey; tail—red

0.5-kg. Incendiary Bombs Types IP, IT, and FI

Data

	IP	IT	FI
Over-all length.....	6.1 in.	5.1 in.	4.95 in.
Body length.....	4.5 in.	3.5 in.	3.35 in.
Body diameter.....	2.75 in.	2.5 in.	2.5 in.
Total weight.....	0.5 kg. (approx.)		

Fuzing

All—Type K

Description

Type IP: This bomb consists of a thin mild-steel container of cylindrical shape whose filling consists of cotton wicks soaked in gasoline.

Type IT: Bomb is also of thin sheet mild steel of cylindrical shape; but the main filling is thermite.

Type FI: The casing is of mild steel and somewhat thicker than in the above two cases. The main filling is phosphorus.

Color and Markings

Type IP: Over-all—light green; **IP** stenciled in black on the body

Type IT: Over-all—dark green; **IT** stenciled in black on the body

Type FI: Over-all—field grey; **FI** stenciled in black on the body

Remarks

These bombs are usually dropped in a bomb container.



Figure 19 - 0.5-kg. Incendiary Bombs

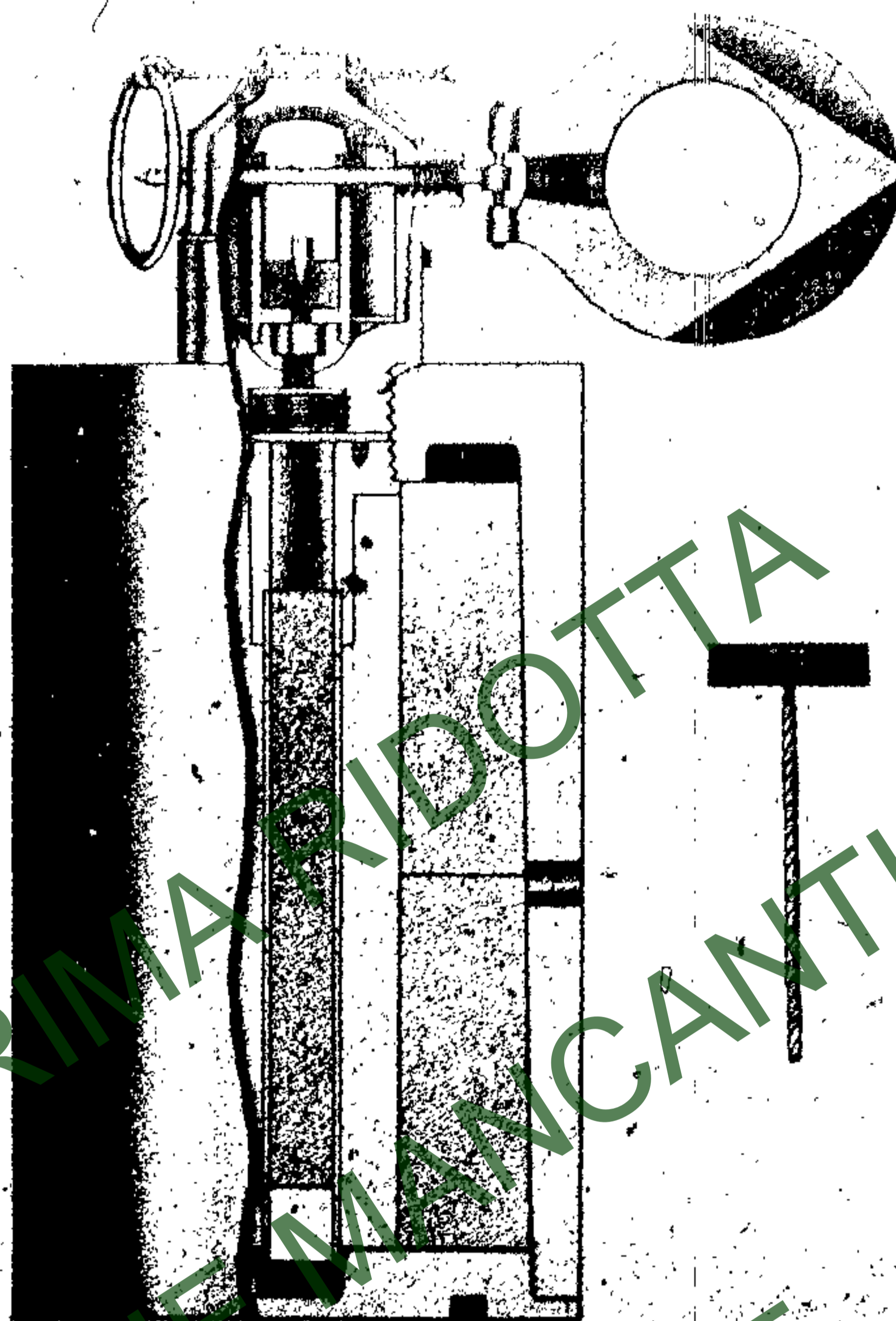


Figure 20—1-kg. Incendiary Bomb Type I and Internal Igniter for Type II.

1-kg. Incendiary Bombs Types I and II

Data

Types I and II

Over-all length.....	6.1 in.
Body length.....	4.6 in.
Body diameter.....	2.7 in.
Type of filling.....	Magnesium and thermite mix
Weight of filling.....	0.084 magnesium and 0.473 kg. thermite
Total weight.....	1 kg. approx.

Fuzing

Type K

Description

Type I: The bomb is a tail-less cylinder made of electron metal. On the curve surface are three small holes plugged with cork. These act as vent holes when the thermite filling is ignited. The thermite is in the form of a lightly pressed filing, pressed in two halves, with a central cylindrical which is filled with magnesium powder. Below

the fuze is a powder pellet which is separated from the thermite by a paper disc which is glued to a cardboard ring. Through the paper disc is looped a piece of quick-match which extends into the magnesium.

Type II: This type, made of the same material and having the same dimensions as Type I, differs in the internal arrangement for igniting the thermite. In place of the quick-match, a thin aluminum tube is inserted in the magnesium filling. This tube contains a number of holes on its surface covered by thin paper, and is filled with magnesium powder. It is sealed at its lower end by a cork plug.

Color and Markings

Over-all—reddish brown; nose—red

Remarks

1. These bombs can be dropped singly or in a bomb container.
2. These bombs were used also for sabotage work by using the Fuze Type H.

2-kg. Incendiary Bombs Types I and II

Data

	Types I and II
Over-all length.....	12.2 in.
Body length.....	10.6 in.
Body diameter.....	2.7 in.
Wall thickness	
Upper cylinder.....	0.34 in.
Lower cylinder.....	0.06 in.
Type of filling.....	Type I—Thermite and oil Type II—Magnesium, Mercuric oxide, and Nitrobenzene
Weight of filling.....	Type I—0.339 kg. oil and 0.660 kg. mix Type II—Unknown
Total weight.....	Type I—2.12 kg. Type II—Unknown

Fuzing

Type I and II—Type K

Description.

Type I: The bomb consists of two cylinders screwed together. The upper cylinder is the same as the 1-kg. Incendiary Bomb Type II, except that the base plate is drilled to take four screws which secure the top plate of the lower cylinder to the base plate of the upper cylinder. The lower portion is of sheet steel and contains a high-boiling turpentine oil.

Type II: This bomb is very similar to Type I, except for the filling in both the upper and lower cylinders. The upper part contains magnesium and mercuric oxide powders, and the other contains nitrobenzene.

Color and Markings

Type I: Over-all—grey; nose—red

Type II: Over-all—reddish brown; nose—red



Figure 21 — 2-kg. Incendiary Bomb Type I

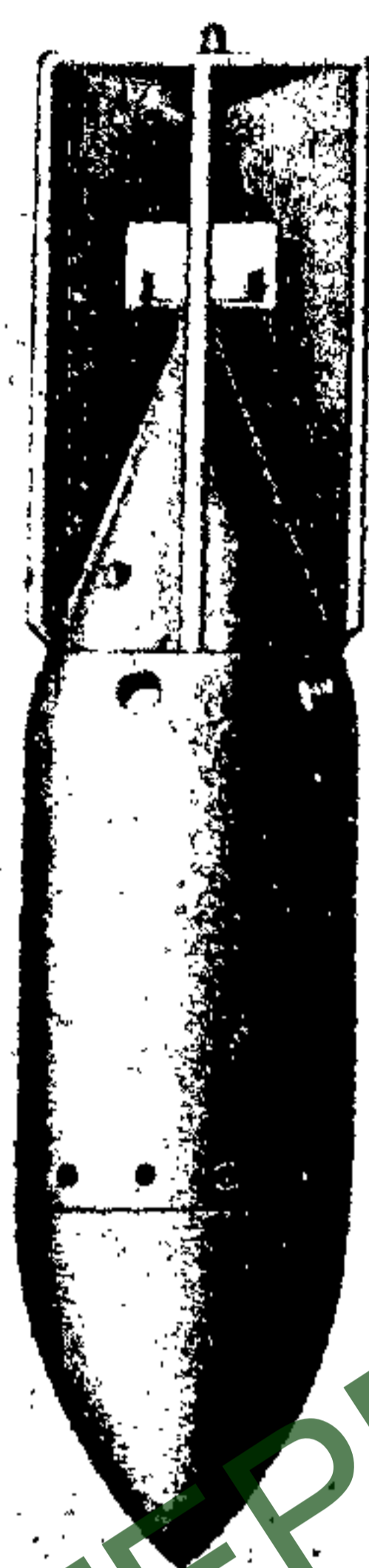


Figure 22 - 20-kg. Incendiary Bomb



Figure 23 - 70-kg. Incendiary Bomb

20-kg. Incendiary Bomb

Data

Over-all length.....	34.0 in.
Body length.....	20.5 in.
Body diameter.....	6.3 in.
Wall thickness.....	0.75 in.
Tail length.....	15.8 in.
Tail width.....	6.3 in.
Type of filling.....	Thermite
Weight of filling.....	10.58 kg.
Total weight.....	20.17 kg.

Fuzing

Tail only—Type E

Description

The bomb consists of nose, body, and tail, all secured by screws. The body is electron; the nose is a steel plug; and the tail is alloy or sheet metal. The fuze vanes halfway along tail length insure limited terminal velocity for the vanes. Five holes at the rear of the bomb casing are closed by cork plugs. The fuze functions on impact; igniter fires thermite; corks blow out and filling burns about three minutes; then casing breaks and burns with a white heat for ten minutes.

Color and Markings

Over-all—reddish brown; nose—red

70-kg. Incendiary Bomb

Data

Over-all length.....	47.2 in.
Body length.....	23.6 in.
Body diameter.....	9.9 in.
Wall thickness.....	1.0 in.
Tail length.....	24.0 in.
Tail width.....	9.9 in.
Type of filling.....	Thermite
Weight of filling.....	36.6 kg.
Total weight.....	74.5 kg.

Fuzing

Tail only—Type G

Description

Bomb casing is electron metal. The nose is encased in a steel cap 12 in. long and $\frac{1}{8}$ in. thick attached to the body by eight screws. The cap insures adequate penetration without damage to the casing. An alloy tail unit is secured to body by eight screws. Vent holes, $1\frac{1}{4}$ in. in diameter, are plugged with cork. The igniter for the thermite filling is magnesium powder in an aluminum tube passing through the center of the tail into the bomb body.

Color and Marking

Over-all—reddish brown; nose—red

100-kg. Special Bomb Combination Anti-Personnel Bomb and Bomb Container

Data

Over-all length	53.2 in.
Body length	29.0 in.
Body diameter	10.7 in.
Wall thickness	0.07 in.
Tail length	20.8 in.
Tail width	10.7 in.
Type of filling	TNT
Total weight	113.0 kg. or 82.1 kg.

Fuzing

Nose—Type X
Tail—Type Z

Description

This is a composite which comprises: (1) 32 small Spezzine bombs; (2) a central bomb; and (3) a nose charge which acts as an anti-personnel bomb. If Spezzine bombs are filled with H. E., the bomb is called 100-kg. Sp. I. In the latter, the 32 small bombs (1 kg. I) may be replaced by 16 (2-kg. I bombs).

Nose fuze (Type X) functions at a preset height and causes the conical nose portion, carrying a length of burning safety fuse and an explosive charge enclosed in concrete, to fall away and explode subsequently; small bombs thus released fall independently. The main body continues its flight, containing the central bomb, which explodes on impact under the action of the tail fuze.

The container part consists of two concentric sheet-steel cylinders, the outer 0.08 in. thick and the inner 0.04 in. thick, held together by four strips and the end plate. The tail is attached to the outer cylinder by four threaded studs; in the inner cylinder is fitted the central bomb, of the "Mitroglia" type. The nose fuze protrudes and is attached by a steel adapter and locking-ball device to the central bomb.

Spezzine bombs are packed, with safety pins removed, in eight columns of four; each column has a conical spring to keep it in compression. Under one spring is a spring-loaded plunger, protruding through the end plate and acting as a safety pin for Fuze Type Z of the central bomb.

Color and Markings

Over-all—reddish brown; nose—red

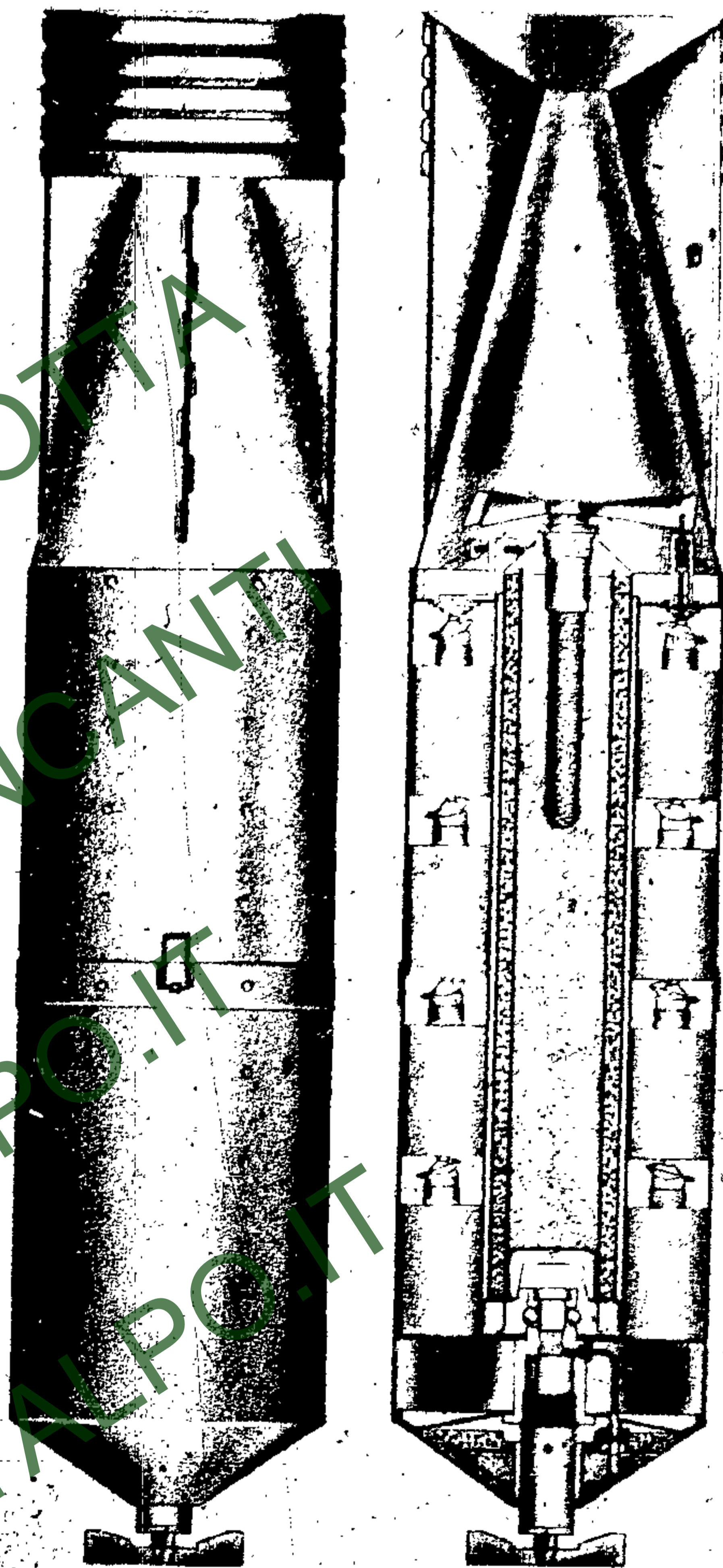


Figure 24 - 100-kg. Special Bomb

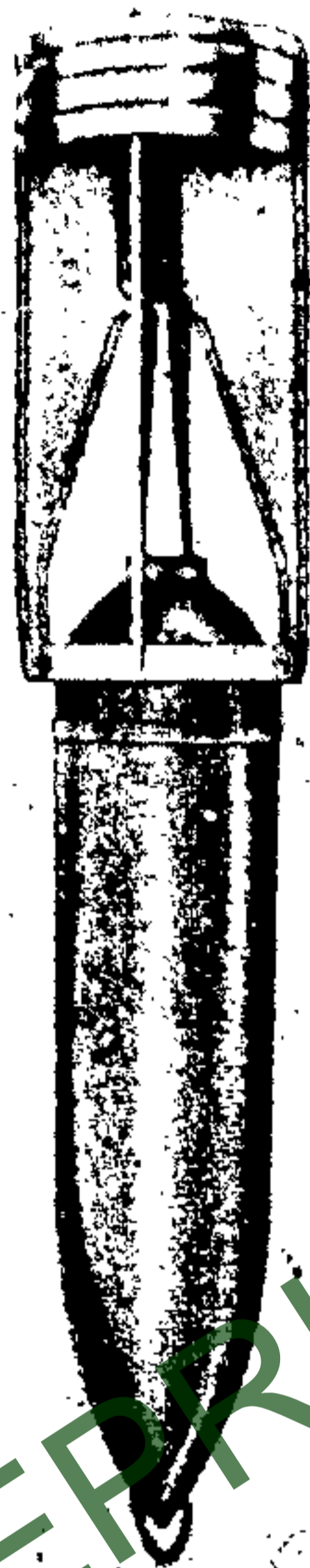


Figure 25 - 15-kg. Gas Bomb

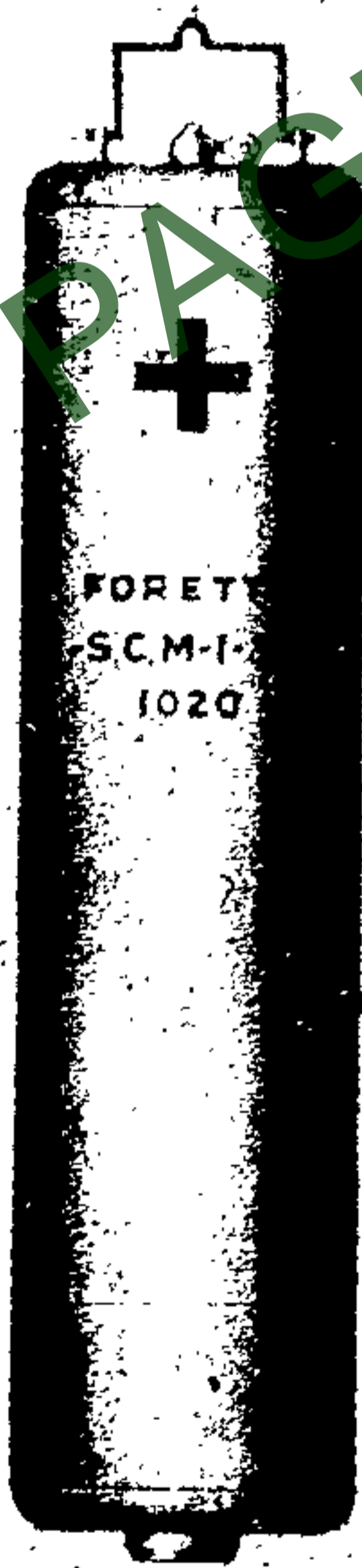


Figure 26 - 25-kg. Gas Bomb (Furretta)

15-kg. Gas Bomb

Data

Over-all length.....	31.0 in.
Body length.....	20.7 in.
Body diameter.....	4.7 in.
Tail length.....	13.8 in.
Tail width.....	6.3 in.
Type of filling.....	Diphenyl Chlorarsine
Weight of filling.....	3.65 kg.
Burster used.....	TNT
Weight of burster.....	1.7 kg.
Total weight.....	16 kg.

Fuzing

Tail fuze—Unknown

Description

The bomb is thick-walled, with a steel body and nose cast in one piece, to which a dome-shaped base is attached. Sheet-metal tail fins are attached to a metal band clamped around the body.

Color and Markings

Over-all—yellow; Geneva cross stenciled on the body

Remarks

This bomb is thought to be the same as the 15-kg. S. A. P. except for filling.

25-kg. Gas Bomb (Furretta)

Data

Over-all length.....	32.7 in.
Body length.....	30 1 in.
Body diameter.....	6.3 in.
Type of filling.....	Lachrymator
Weight of filling.....	10 kg.
Total weight.....	25 kg.

Fuzing

Tail fuze—Type K

Description

The bomb has a blunt nose and parallel sides, but no tail or stabilizing fins. This is a percussion bomb; but it functions as a tear-gas generator. There is no burster charge, but the casing is pierced with small holes through which the lachrymator is emitted.

Color and Markings

Over-all—yellow; Geneva cross in red

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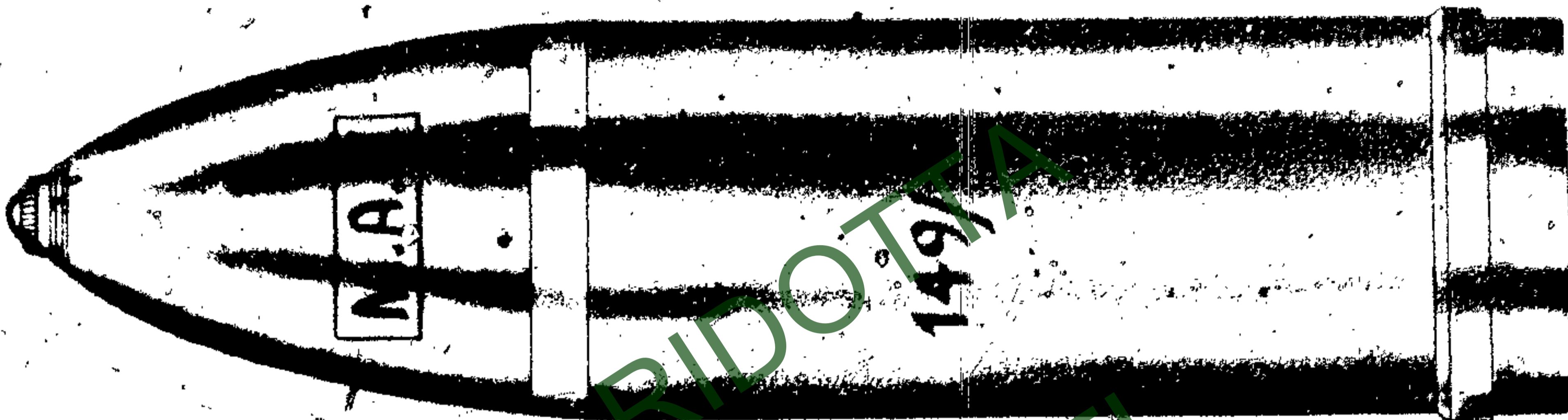


Figure 153 - 149/13-mm H.E.

149/13-mm H.E.		Without fuze	552.7 mm
Data		Diameter at base	147.4 mm
Guns used in	149/13-mm Heavy Field Gun	Distance base to band	28 mm
Fuzing	Nose Percussion Fuze M17	Width of band	20 mm
Over-all length		Diameter at bourrelet	148.6 mm
With fuze	568 mm	Type of filling	MAT
		Weight of filling	5.12 kg
		Weight of loaded projectile	40.095 kg.



Figure 154 - 149/35-mm H.E. M32

149/13-35-mm H.E. M32 and 149/140-mm H.E. M35		Diameter at base	125 mm
Data		Distance base to band	82 mm
Guns used in	149/13-mm Heavy Field Gun 149/40-mm Gun 149/35-mm Gun	Width of band	16 mm
Fuzing	Nose Percussion Fuze M17	Diameter at bourrelet	148.6 mm
Over-all length		Type of filling	TNT
With fuze	625.3 mm	Weight of filling	6.327 kg.
Without fuze	610 mm	Weight of loaded projectile	42.675 kg.

Remarks

The projectiles for the 149/40-mm and 149/35-mm guns differ from the 149/13-mm projectiles in diameter of the rotating band.



Figure 155 - 149/35-mm H.E. M32/38

149/35-mm H.E. M32/38

Data

Gun used in.....	149/35-mm Gun
Fuzing.....	Nose Percussion Fuze (Guerritore) I. M38 M. C.
Over-all length With fuze.....	738 mm

Without fuze.....	707 mm
Diameter at base.....	128 mm
Distance base to band.....	82 mm
Width of band.....	26 mm
Diameter at bourrelet.....	148.6 mm
Type of filling.....	MBT or MST MNDT
Weight of filling.....	4.900 kg.
Weight of loaded projectile.....	45.950 kg.



Figure 156 - 149/12-35-mm H.E. (Cast-Steel)

149/12-35-mm H.E. (Cast-Steel)

Data

Guns used in.....	149/12-mm Heavy Field Howitzer 149/35-mm Gun
Fuzing.....	Nose Percussion Fuze M17
Over-all length With fuze.....	523.3 mm
Without fuze.....	508 mm

Diameter at base.....	154 mm
Distance base to band.....	24 mm
Width of band.....	25 mm
Diameter at bourrelet.....	148.5 mm
Type of filling.....	MAT
Weight of filling.....	4.75 kg.
Weight of loaded projectile.....	38.47 kg.

Remarks

The projectile is made of cast steel.

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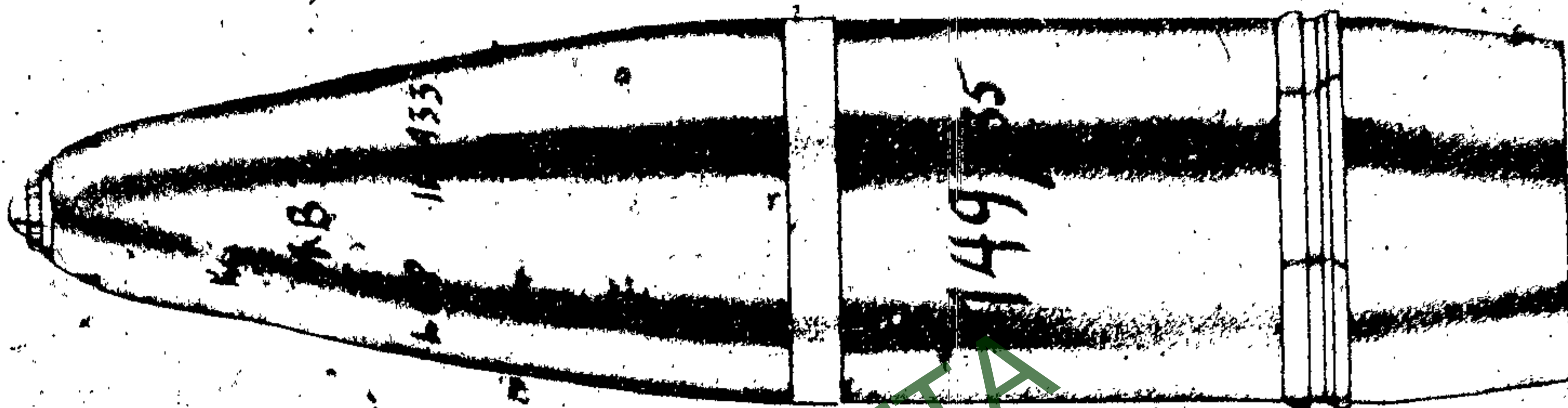


Figure 157 - 149/13-35-mm H.E. (One-Piece)

149/13-35-mm H.E. (One-Piece)

Data

Gun used in	149/13-mm and 149/35-mm Guns	Distance base to band	86 mm
Fuzing	Nose Percussion Fuze M17 or M (Guerritore)	Width of band	25 mm
Over-all length		Diameter at bourrelet	148.5 mm
With fuze	595 mm	Type of filling	MBT or MNDT or MST
Without fuze	580 mm	Weight of filling	6.95 kg., 5.26 kg., or 5.7 kg.
Diameter at base	130 mm	Weight of loaded projectile	37.93 kg., 36.24 kg., or 37.1 kg.

Remarks

The weight of this projectile depends upon the type of filling.



Figure 158 - 149/35-mm H.E. (British)

149/35-mm H.E. (British)

Data

Gun used in	149/35-mm Gun	Distance base to band	23 mm
Fuzing	Nose Percussion Fuze M17 or M (Guerritore)	Width of band	25 mm
Over-all length		Diameter at bourrelet	148.5 mm
With fuze	538.2 mm	Type of filling	TNT or MST
Without fuze	521.2 mm	Weight of filling	6.61 kg. or 4.8 kg.
Diameter at base	148.0 mm	Weight of loaded projectile	42.80 kg. or 41.45 kg.

Remarks

This projectile is of British manufacture and has British markings.

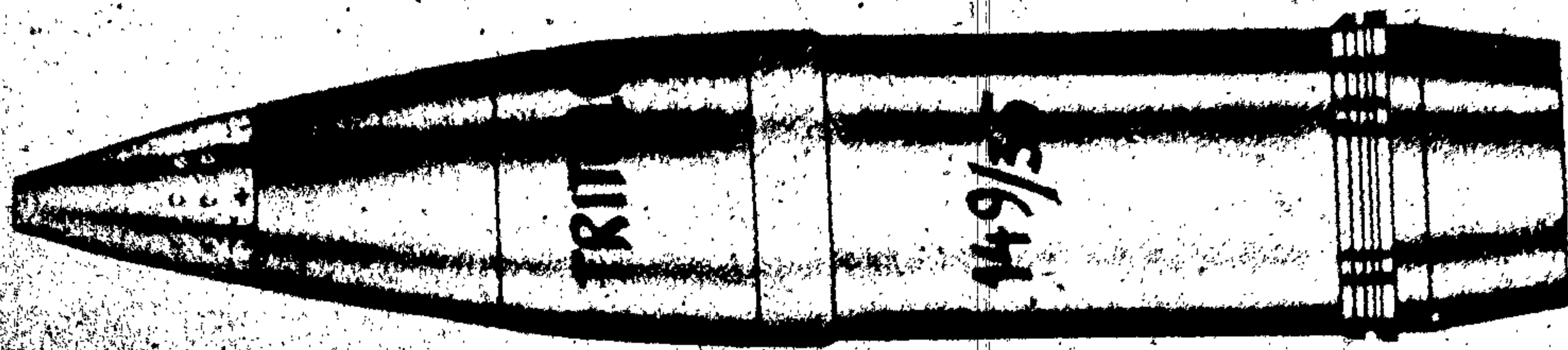


Figure 159 - 149/35-mm A.D.E. M32

149/35-mm A.D.E. M32

Data

Gun used in	149/35-mm Gun
Fuzing	Nose Fuze A. D. E. M32
Over-all length	
With fuze	728 mm
Without fuze	614.4 mm

Diameter at base	128 mm
Distance base to band	62 mm
Width of band	25 mm
Diameter at bourrelet	148.6 mm
Type of filling	TNT
Weight of filling	4.90 kg.
Weight of loaded projectile	45.9 kg.



Figure 160 - 149/40-mm A.D.E.-H.E. M35

149/40-mm A.D.E.-H.E. M35

Data

Gun used in	149/50-mm Gun
Fuzing	Nose Fuze A. D. E. M36
Over-all length	
With fuze	745.5 mm
Without fuze	650.5 mm

Diameter at base	129.3 mm
Distance base to band	105 mm
Width of band	22.8 mm
Diameter at bourrelet	148.6 mm
Type of filling	Probably TNT
Weight of filling	6.387 kg.
Weight of loaded projectile	46.200 kg.

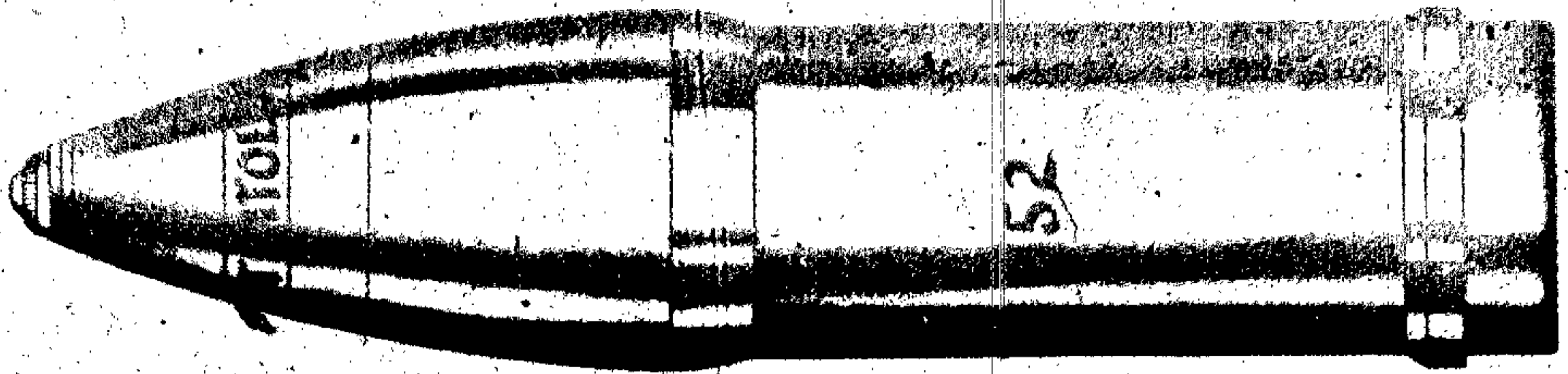


Figure 161 - 152-mm H.E.

152-mm H.E.

Data		Without fuze.....	650 mm
Guns used in.....	152/37-mm Gun, 152/45-mm Gun	Diameter at base.....	151.2 mm
Fuzing.....	Nose Percussion Fuze M17	Distance base to band.....	32 mm
Over-all length		Width of band.....	21.5 mm
With fuze.....	665.3 mm	Diameter at bourrelet.....	151.8 mm
		Type of filling.....	TNT
		Weight of filling.....	5.52 kg.
		Weight of loaded projectile.....	45.9 kg.



Figure 162 - 152/13-mm H.E. (Short)

152/13-mm H.E. (Short)

Data		Without fuze.....	471.5 mm
Gun used in.....	152/13-mm Heavy Field Howitzer	Diameter at base.....	150.1 mm
Fuzing.....	Nose Percussion Fuzes British Nos. 101, 101E, 106, or 44	Distance base to band.....	31.5 mm
Over-all length		Width of band.....	26.5 mm
With fuze.....	522.5 mm	Diameter at bourrelet.....	151.4 mm
		Type of filling.....	TNT
		Weight of filling.....	5.670 kg.
		Weight of loaded projectile.....	45 kg.

Remarks

The fuze is similar to 152/13-mm (long) and is also British designed.

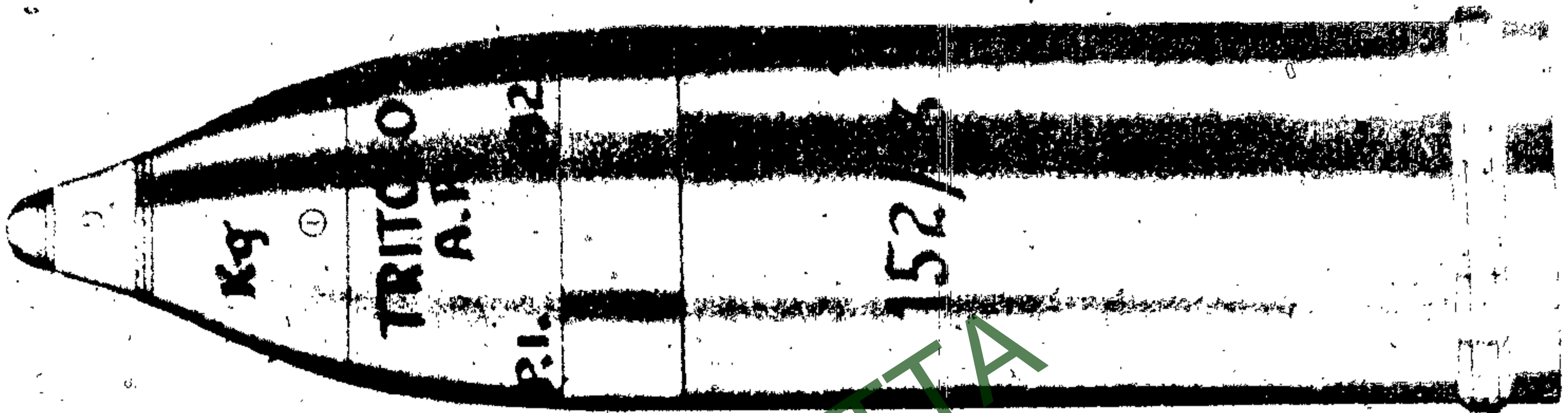


Figure 163 - 152/13-mm H.E. (Long)

152/13-mm H.E. (Long)

Data

Gun used in 152/13-mm
Heavy Field
Howitzer

Fuzing Nose Percussion
Fuzes British
Nos. 100, 101,
101E, 106, or 44

Over-all length
With fuze 582 mm

Without fuze 531 mm

Diameter at base 150.1 mm

Distance base to band 21 mm

Width of band 17 mm

Diameter at bourrelet 152 mm

Type of filling TNT

Weight of filling 3.340 kg.

Weight of loaded projectile 45 kg.

Remarks

This projectile is of British design and uses British fuzes.



Figure 164 - 152/37-mm H.E.

152/37-mm H.E.

Data

Gun used in 152/37-mm Gun

Fuzing Nose Percussion
Fuze M17
(Guerritore)
I.M35 m. c. or
I.M38 m. c.

Over-all length
With cap 844 mm

Diameter at base 150.9 mm

Distance base to 1st band 25 mm

Distance base to 2nd band 64 mm

Width of 1st band 30 mm

Width of 2nd band 35 mm

Diameter at bourrelet 151.87 mm

Type of filling TNT

Weight of filling 4.68 kg.

Weight of loaded projectile 54.0 kg.

Remarks

The projectile has a ballistic cap and two rotating bands.



Figure 165 - 152/45-50-mm H.E. (Base-Fuzed)

152/45-50-mm H.E. (Base-Fuzed)

Data:

Guns used in.....	152/45-mm Gun, 152/50-mm Gun
Fuzing.....	Base Fuze M914
Over-all length.....	599 mm
Diameter at base.....	144.5 mm
Distance base to band.....	35 mm
Width of band.....	65 mm
Diameter at bourrelet.....	Unknown
Type of filling.....	TNT
Weight of filling.....	3.75 kg.
Weight of loaded projectile.....	47 kg.



Figure 166 - 152/32-45-mm H.E. (Base-Fuzed)

152/32-45-mm H.E. (Base-Fuzed)

Data:

Guns used in.....	152/32-mm Gun, 152/45-mm Gun
Fuzing.....	Base Fuzes M914, M909K25, or M911/917
Over-all length.....	545 mm
Diameter at base.....	150.3 mm
Distance base to band.....	32.4 mm
Width of band.....	25 mm
Diameter at bourrelet.....	Unknown
Type of filling.....	TNT
Weight of filling.....	3.351 kg.
Weight of loaded projectile.....	47 kg.



Figure 167 - 152/37-mm A.P.

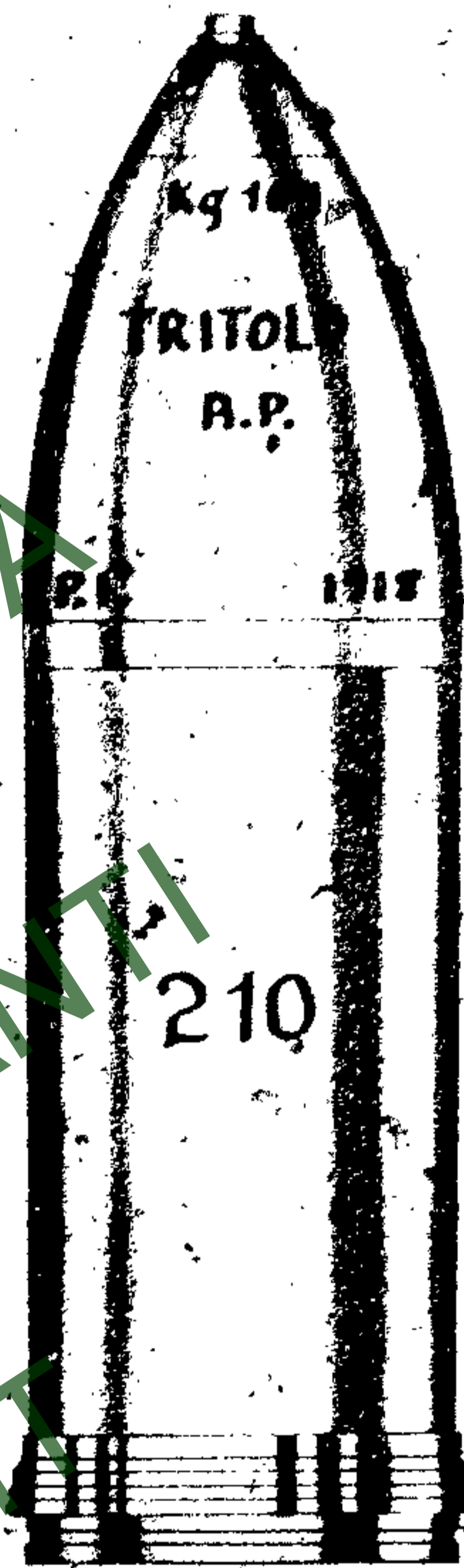


Figure 168 - 210-mm H.E.

152/37-mm A.P.

Data

Gun used in.....	152/37-mm Gun
Fuzing.....	Base Fuze M11 K. S. R.
Over-all length.....	519.6 mm
Diameter at base.....	151.2 mm
Distance base to 1st band.....	24 mm
Distance base to 2nd band.....	63 mm
Width of 1st band.....	30 mm
Width of 2nd band.....	35 mm
Diameter at bourrelet.....	151.8 mm
Type of filling.....	0.42 kg.
Weight of loaded projectile.....	52.78 kg.

Remarks

The projectile has a double rotating band and both piercing and ballastic caps.

210-mm H.E.

Data

Guns used in.....	210/8-mm Field Gun, 210/22-mm Howitzer
Fuzing.....	Nose Percussion Fuze M17
Over-all length.....	
With fuze.....	730.3 mm
Without fuze.....	712 mm
Diameter at base.....	Unknown
Distance base to band.....	25 mm
Width of band.....	25 mm
Diameter at bourrelet.....	209.30 mm
Type of filling.....	TNT or MAT or MBT
Weight of filling.....	14.125 kg.
Weight of loaded projectile.....	100.500 kg.
Booster used.....	No. 4 M38

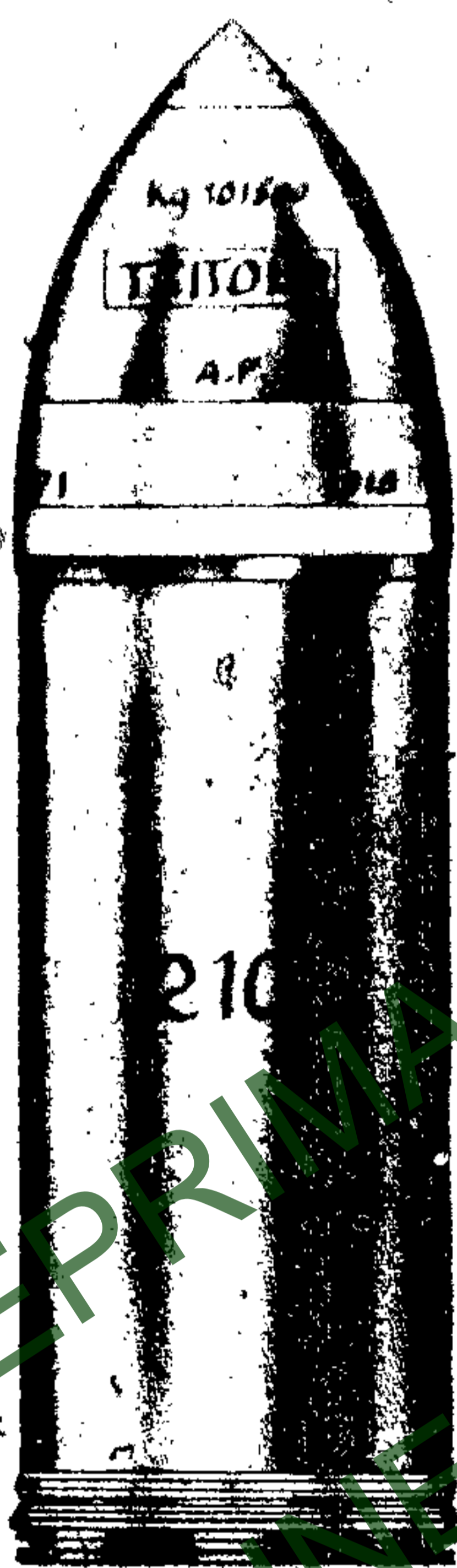


Figure 169 - 210-mm H.E. (Cast-Steel)

Figure 170 - 210-mm H.E. (Bomba)

210-mm H.E. (Cast-Steel)

Data:

Gun used in	210/8-mm Field Gun
Fuzing	Nose Percussion Fuze M17
Over-all length	735 mm
Diameter at base	200 mm
Distance base to band	14.5 mm
Width of band	25 mm
Diameter at bourrelet	209.3 mm
Type of filling	TNT
Weight of filling	11 kg. to 14.70 kg.
Weight of loaded projectile	100 kg. to 103.6 kg.

210-mm H.E. (Bomba)

Data

Gun used in	210/8-mm Field Gun
Fuzing	Nose Percussion Fuze (Guerritore I. M35 or I. M38)
Over-all length	
Without fuze	776 mm
Diameter at base	208 mm
Distance base to band	107.5 mm
Width of band	25 mm
Diameter at bourrelet	209.5 mm
Type of filling	MST
Weight of filling	21 kg.
Weight of loaded projectile	60.5 kg.

Remarks

The projectile has a very unusual round base.



Figure 171 - 210/22-mm H.E. M35



Figure 172 - 260/9-mm H.E.

210/22-mm H.E. M35

Data

Gun used in.....	210/22-mm Field Gun
Fuzing.....	Nose Percussion Fuze (Guerritore V. M38)
Over-all length	
With fuze.....	851.2 mm
Without fuze.....	820.2 mm
Diameter at base.....	185 mm
Distance base to band.....	102.5 mm
Width of bourrelet.....	30 mm
Diameter at bourrelet.....	209.4 mm
Type of filling.....	Amatol
Weight of filling.....	18.590 kg.
Weight of loaded projectile.....	101.133 kg.

260/9-mm H.E.

Data

Gun used in.....	260/9-mm Field Gun
Fuzing.....	Nose Percussion Fuze M17
Over-all length with nose plug.....	953 mm
Diameter at base.....	Unknown
Distance base to band.....	73 mm
Width of band.....	34 mm
Diameter at bourrelet.....	Unknown
Type of filling.....	NT
Weight of filling.....	25.940 kg.
Weight of loaded projectile.....	219.100 kg.
Booster.....	No. 4 M38

Remarks

The projectile has a streamlined base. One modification has less wall thickness.



Figure 173 - 260/9-mm H.E. (Cast-Steel)

Figure 174 - 305-mm H.E. (Short)

260/9-mm H.E. (Cast-Steel)

Data

Gun used in.....	260/9-mm Field Gun
Fuzing.....	Nose Percussion Fuze M17
Over-all length.....	953 mm
Diameter at base.....	256 mm
Distance base to band.....	73 mm
Width of band.....	34 mm
Diameter at bourrelet.....	Unknown
Type of filling.....	TNT
Weight of filling.....	19.8900 kg.
Weight of loaded projectile.....	222.700 kg.
Booster.....	No. 4 M38

305-mm H.E. (Short)

Data

Gun used in.....	305/8-mm Field Howitzer
Fuzing.....	Base Fuze M09
Over-all length.....	946 mm
Diameter at base.....	203 mm
Distance base to band.....	24 mm
Width of band.....	57.5 mm
Diameter at bourrelet.....	304.4 mm
Type of filling.....	TNT
Weight of filling.....	32 kg.
Weight of loaded projectile.....	287 kg.

Remarks

The projectile is similar to 305-mm H. E. (Long).

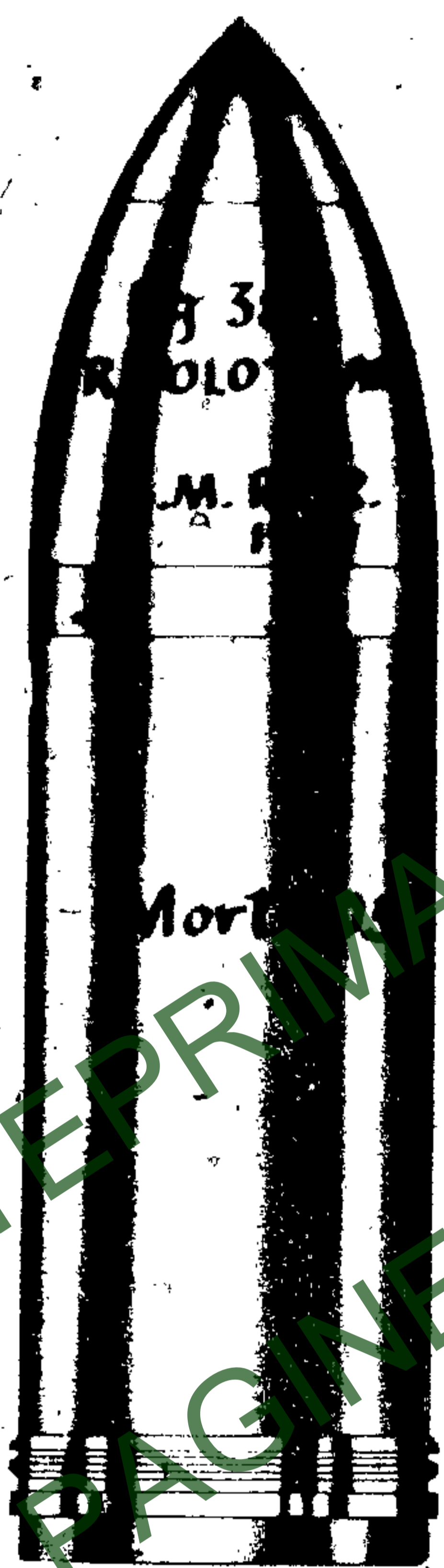


Figure 175 - 305-mm H.E. (Long)

305-mm H.E. (Long)

Data	
Gun used in	305 8-mm Field Howitzer
Fuzing	Base Fuze MO9
Over-all length	1130 mm
Diameter at base	303 mm
Distance base to band	24 mm.
Width of band	57.5 mm
Diameter at bourrelet	304.4 mm
Type of filling	TNT
Weight of filling	34.33 kg.
Weight of loaded projectile	380 kg.

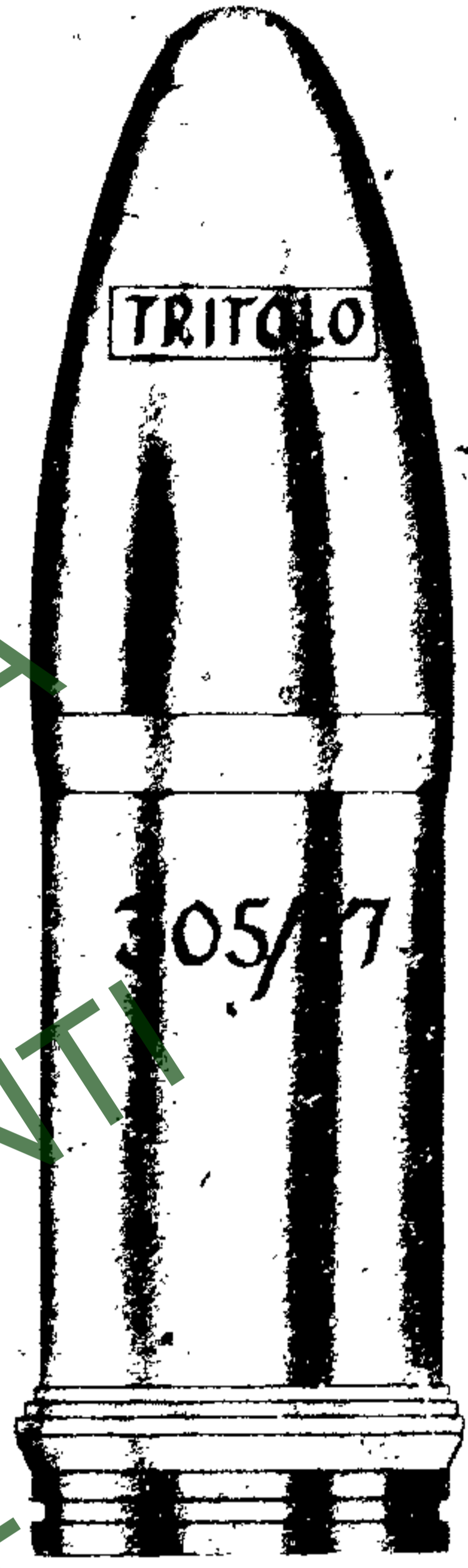


Figure 176 - 305-mm H.E. (Long and Short Light-Case)

305-mm H.E. (Long and Short Light-Case)

Data	
Gun used in	305 /17-mm Howitzer
Fuzing	Base fuze M14 for 305 /17
Over-all length	
Short	1148 mm
Long	1183 mm
Diameter at base	302.2 mm
Distance base to band	56 mm
Width of band	50.8 mm
Diameter at bourrelet	303.5 mm
Type of filling	TNT
Weight of filling	
Short	33.600 kg.
Long	38.320 kg.
Weight of loaded projectile	
Short	348.0 kg.
Long	350 kg.

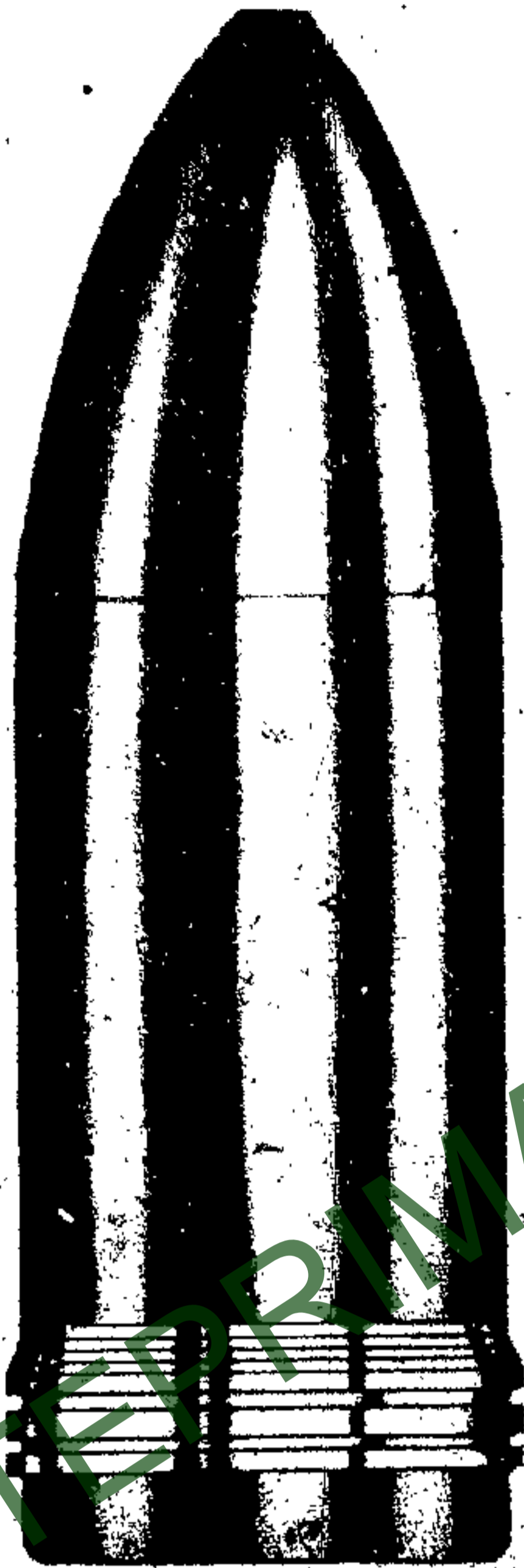


Figure 177 - 305-mm H.E. (British Short and Long)

305-mm H.E. (British Short and Long)

Data	
Gun used in	305 /17-mm Howitzer
Fuzing	
Short—	British Nose Fuze No. 101E
Long—	British Nose Fuze 450A or Italian M17
Over-all length without fuze	
Short	975.5 mm
Long	1075.5 mm
Diameter at base	301.3 mm
Distance base to band	51 mm
Width of band	76 mm
Diameter at bourrelet	Unknown
Type of filling	Probably TNT
Weight of filling	
Short	31.400 kg.
Long	45.000 kg.
Weight of loaded projectile	
Short	340.690 kg.
Long	340.500 kg.



Figure 178 - 305/17-mm H.E.

305/17-mm H.E.

Data	
Gun used in	305 /17-mm Howitzer
Fuzing	
Nose—	Unknown
Over-all length with plug	1151 mm
Diameter at base	302.2 mm
Distance base to band	55 mm
Width of band	51.5 mm
Diameter at bourrelet	303.8 mm
Type of filling	TNT
Weight of filling	43.100 kg.
Weight of loaded projectile	348 kg.
Booster used	No. 4 M38

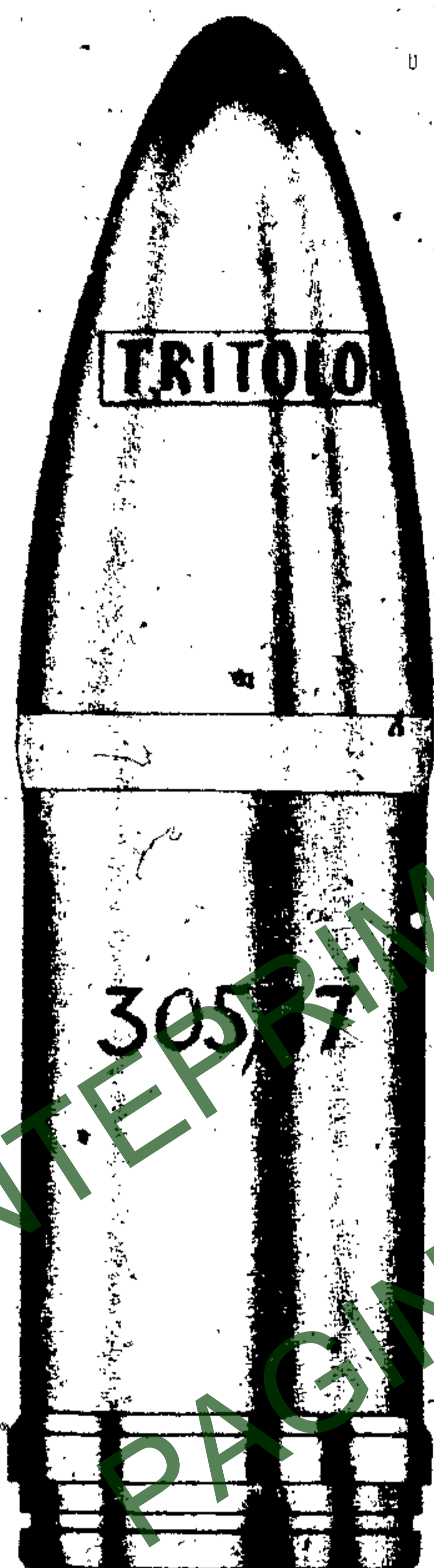


Figure 179 - 305/17-mm H.E. (Heavy)

305/17-mm H.E. (Heavy)

Data	
Gun used in.....	305/17-mm Howitzer
Fuzing.....	Base Fuze M14 for 305/17
Over-all length.....	1175 mm
Diameter at base.....	302.2 mm
Distance base to band.....	55 mm
Width of band.....	51.5 mm
Diameter at bourrelet.....	303.8 mm
Type of filling.....	TNT
Weight of filling.....	19.145 kg.
Weight of loaded projectile.....	441.100 kg.



Figure 180 - 305/17-mm H.E. (Cast-Steel)

305/17-mm H.E. (Cast-Steel)

Data	
Gun used in.....	305/17-mm Howitzer
Fuzing.....	Nose—Unknown
Over-all length without fuze.....	10236 mm
Diameter at base.....	302.4 mm
Distance base to band.....	55 mm
Width of band.....	51.5 mm
Diameter at bourrelet.....	303.8 mm
Type of filling.....	MST
Weight of filling.....	33.490 kg.
Weight of projectile.....	328.500 kg.
Booster.....	No. 4 M38

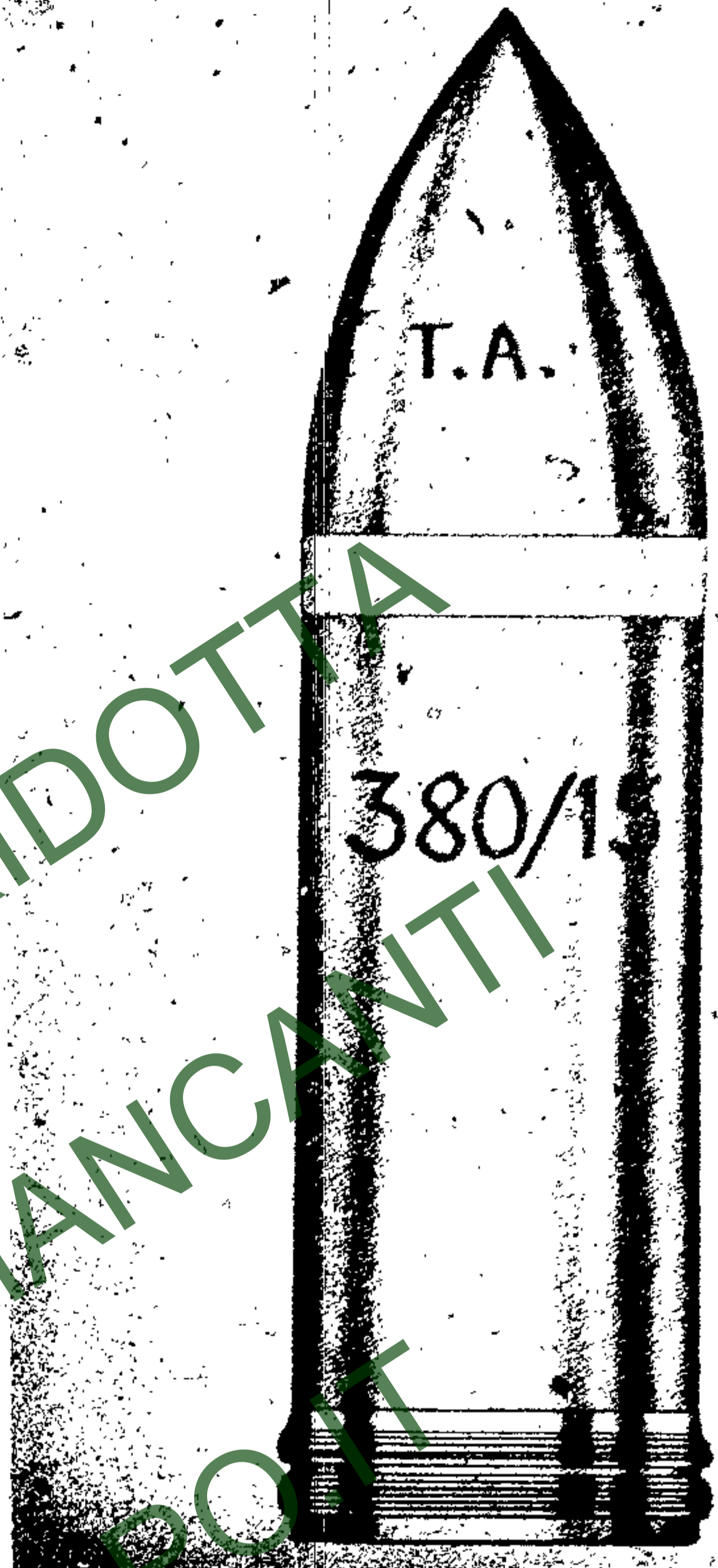
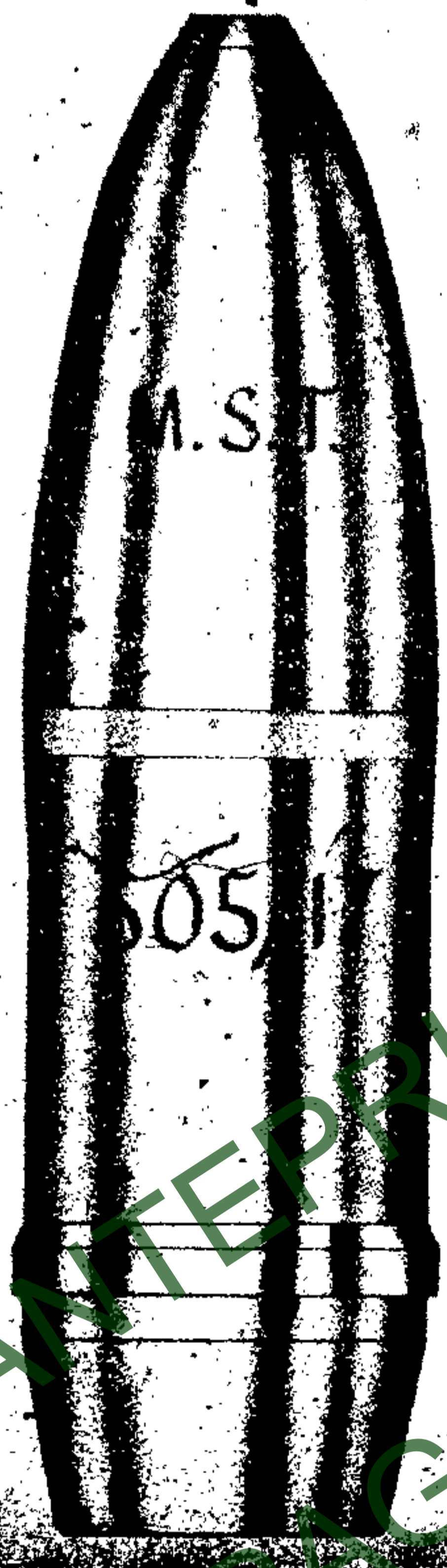


Figure 181 - 305/17-mm H.E. (One-Piece)

Figure 182 - 380/15-mm H.E. (Base-Fuzed)

305/17-mm H.E. (One-Piece)

Data

Gun used in.....	305/17-mm Howitzer
Fuzing.....	Nose Percussion Fuze M17
Over-all length without fuze.....	1130 mm
Diameter at base.....	Unknown
Distance base to band.....	177 mm
Width of band.....	51.8 mm
Diameter at bourrelet.....	303.52 mm
Type of filling.....	MST
Weight of filling.....	46.125 kg.
Weight of loaded projectile.....	259 kg.
Booster used.....	No. 4, M38

Remarks
The projectile is of one-piece construction.

380/15-mm H.E. (Base-Fuzed)

Data

Gun used in.....	380/15-mm Heavy Howitzer
Fuzing.....	Base Fuze M16
Over-all length.....	1402 mm
Diameter at base.....	378 mm
Distance base to 1st band.....	25 mm
Distance base to 2nd band.....	65 mm (approx.)
Width of 1st band.....	33.6 mm
Width of 2nd band.....	32.5 mm
Diameter at bourrelet.....	379 mm
Type of filling.....	TNT
Weight of filling.....	71.49 kg.
Weight of loaded projectile.....	750 kg.



Figure 183 - 420-mm H.E. (Short and Long)

420-mm H.E. (Short and Long)

Data

Gun used in 420/12-mm
Heavy Howitzer

Fuzing
Base—Unknown

Over-all length
Short 1375 mm
Long 1554 mm

Diameter at base 485.9 mm
Distance base to 1st band 25 mm
Distance base to 2nd band 70 mm

Width of 1st band 25 mm
Width of 2nd band 40.5 mm
Diameter at bourrelet
Short 418.8 mm
Long 418.7 mm
Type of filling TNT
Weight of filling
Short 75 kg.
Long 90 kg.
Weight of loaded projectile
Short 800 kg.
Long 1000 kg.

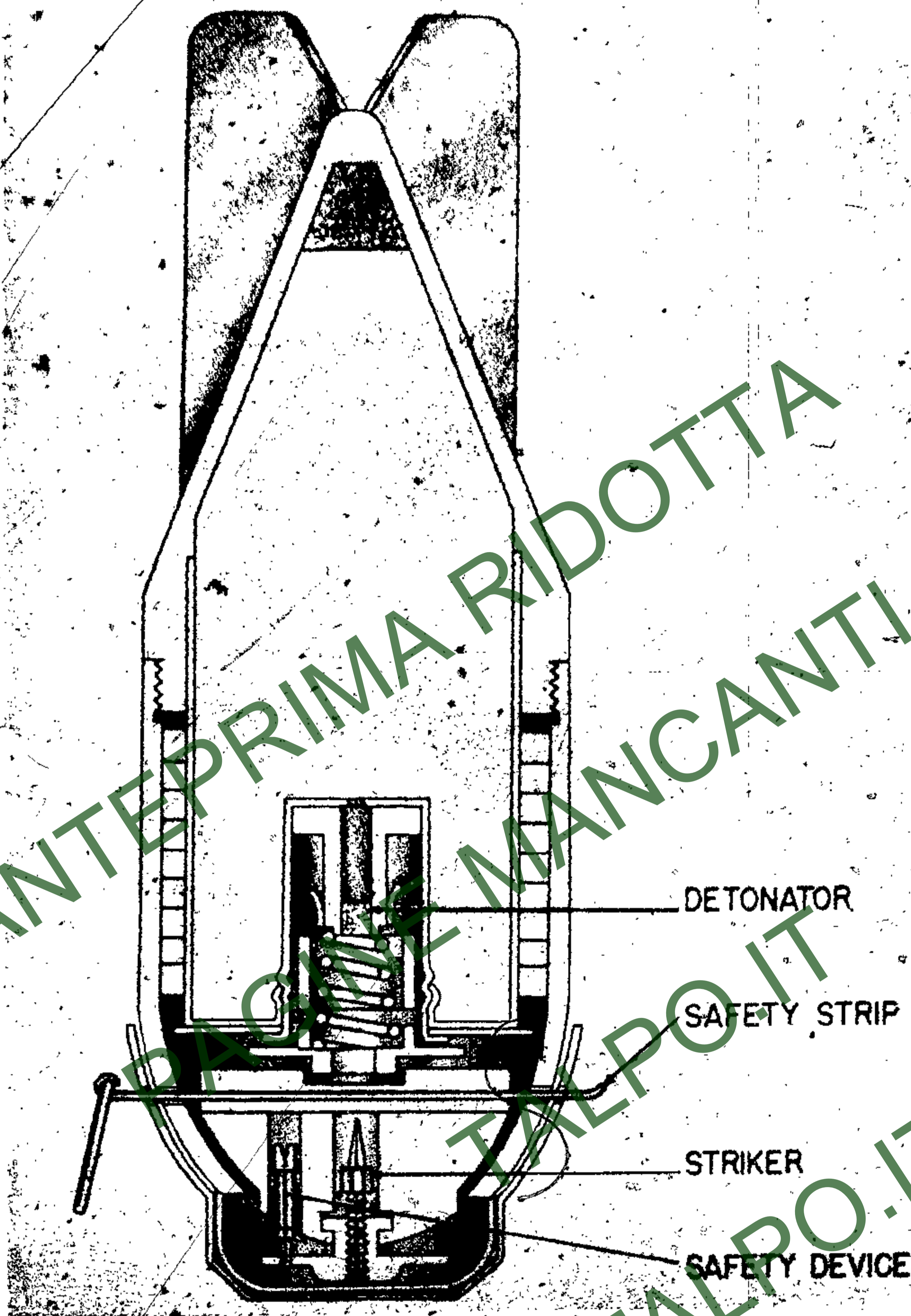


Figure 231 - Breda Mortar Grenade

Operation

On withdrawing the safety strip, the cap is freed; and, on firing, the setback causes the safety device to move down into its slot. This safety device consists of a short brass rod which projects into one of the holes in the disc and holds the disc from rotating. Four light brass spring strips hold the rod in the "setback" position. At the same time, the collar also sets back onto the firing-cap holder,

being held in position by the detent spring. The collar and holder then act as one, and can move under the influence of the spring. During flight, the disc rotates as air passes through the oblique holes near the edge of the disc. The striker, being prevented from rotating by the square shape of the portion moving in a square-shaped channel, is thus moved toward the detonator. The grenade is then armed. On impact, the detonator rides forward on the spring and hits the striker.



Figure 232 - Incendiary Bottle Grenade

Incendiary Bottle Grenade

Data

Bottle	-----	1-liter size
Color	-----	Transparent
Filling	-----	Inflammable liquid

Description

The incendiary grenade is made from an ordinary one-liter glass bottle, fitted with a metal pressure cap, and containing an inflammable liquid. A fuse match, protected by a canvas cover, is fixed to the side of the bottle by two rings of cord. To the top of the fuse is attached a fine cord, which, on being pulled, fires the fuse. To avoid accidental ignition by a chance drawing of the cord, the cord has a small wooden handle and is fixed to the neck of the bottle by a ring of thread.

Operation

Just before use, the wooden handle is freed by a

light pull on the ring of thread which is securing it to the neck of the bottle. The handle is then given a sharp pull, and a small flame will appear at the lower end of the fuze. The bottle should then be thrown with force against the target. If the bottle is not thrown immediately, it may burst before reaching the target. A minimum of two seconds is given between the lighting of the fuse and the bursting of the bottle. The Italians consider the grenade to be a good weapon for defense against A. F. V.'s at close quarters.

Miscellaneous Hand Grenades

SMOKE HAND GRENADES

Types

- S. R. C. M. Model 35 F
- O. T. O. Model 35 F
- Breda Model 35 F

Markings

Top part red; lower part black; white letter F (Fumogeno) on black background.

Description

These grenades are similar in construction to H. E. equivalents, but contain a liquid smoke filling, mixture of chlorosulfonic acid and sulphur trioxide. They produce a fairly dense white smoke cloud of two to three yards front, but cannot be used if wind strength is above 7 m. p. h.



Figure 233 - Breda Drill Grenade

Operation

Same as H. E. equivalents

SMOKE INCENDIARY HAND GRENADES

Types

- | | |
|---------------------|-------------|
| 1. S. R. C. M. | Model 35 FI |
| 2. O. T. O. | Model 35 FI |
| 3. Breda | Model 35 FI |

Markings

Top part red; lower part black; letters FI on black background.

Description

Correspond to H. E. equivalents, with explosive filling replaced by a charge of white phosphorus. The burst creates a dense white smoke covering an area of about 11 by 4 yards.

Operation

Same as H. E. equivalents.

PRACTICE AND DRILL GRENADES

1. The grenade containing a small charge is white, with a 1/2-in. red band around the place where the two parts of the body join.

2. The instruction or drill grenade is unpainted or black.

3. The practice grenade with a smoke filler is yellow.

S. R. C. M. Mod 35 Practice Grenade is recognizable by six large holes cut in its body above and below the screw threads. The lower cylinder containing the H. E. charge is replaced by a brass

cylinder having a truncated conical bottom with four holes in it. This cylinder holds smoke-producing charge in a celluloid container. The shutter is simplified so that there is no "safe" position at impact.

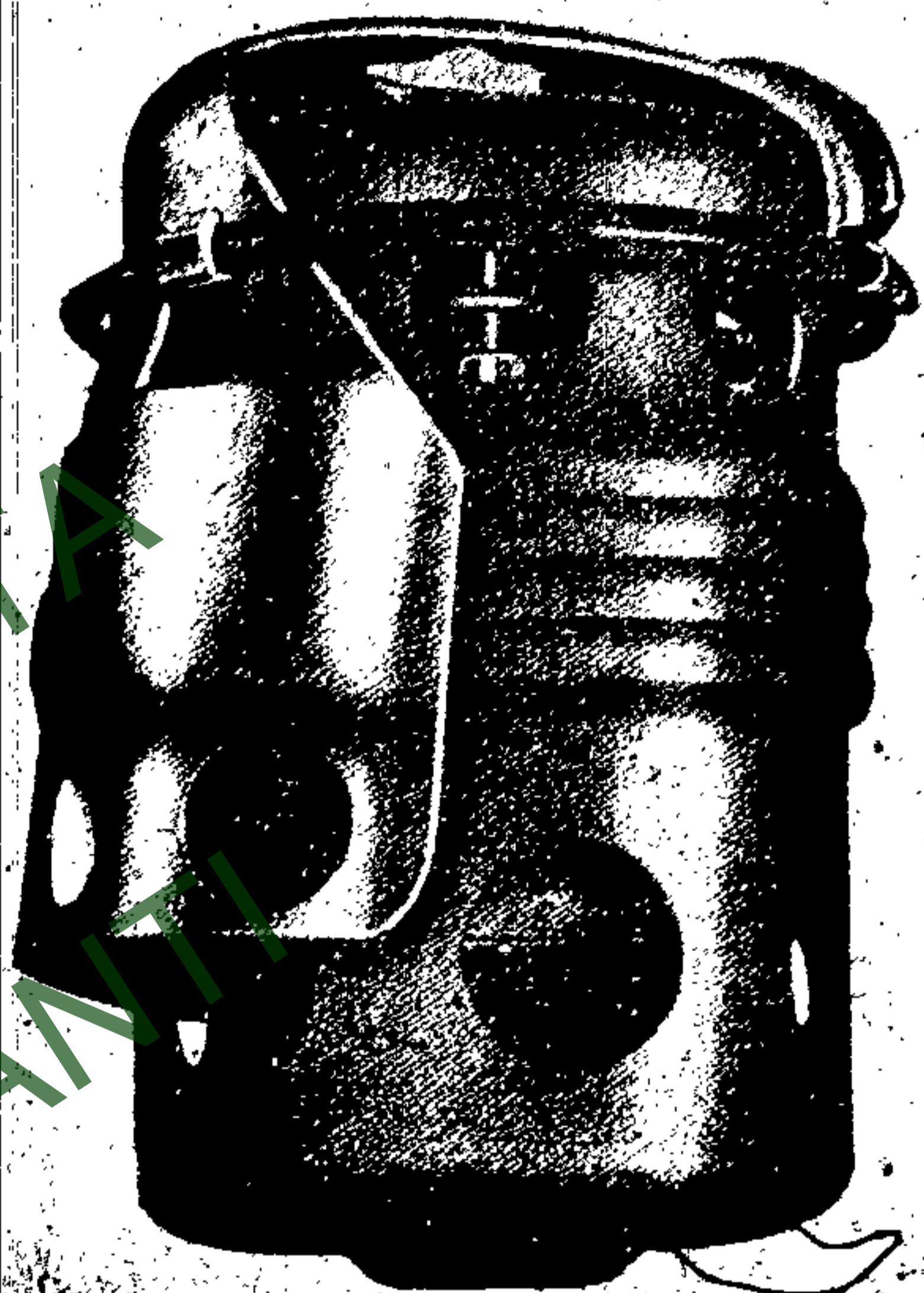


Figure 234 - S.R.C.M. Practice Grenade

ANTERPRIMA PIPOTTA
PRAGINE MANCANTALPO.IT



Figure 235 – Picket Mine (Anti-Personnel)

ITALIAN MINES AND TRAPS

Italian anti-personnel mines are operated by pressure or trip wires. They were often difficult to detect, especially those operated by pressure in which only a portion of the lid or igniter may appear above the ground. The Italians used bakelite and wood in the construction of some mines to prevent detection by magnetic instruments.

Anti-tank mines vary in appearance. They are tubular, rectangular, or circular in shape. Some are made of bakelite or wood to prevent detection.

Improvised mines seem to have been the Italian specialty in the field. They used a majority of the improvised mines in Abyssinia, since the supply of standard mines was apparently limited. Most of these mines were of wooden construction and used blocks of TNT for the explosive. Sometimes shells were used for explosive and shrapnel for mines.

Picket Mine—Anti-Personnel Mine

Data	
Over-all length	17.6 in. (with picket)
Over-all length	5.7 in. (without picket)
Body diameter	1.6 in.
Type of filling	TNT
Weight of filling	100 grams
Total weight	1.75 lb.

Description

The mine proper consists of a thin sheet metal cylinder around which is wound the strip metal loading. The mine is mounted on a wooden picket and contains a 100-gram cartridge of TNT. The mine is closed by a screw-on lid which carries the spring-loaded striker.

Riveted to the underside of the lid is the stirrup-shaped holder, into the center of which is pressed the detonator-locating tube. Passing diametrically through the lid, through slots in the side, is the aluminum cap holder, which is located in the armed and unarmed positions by the spring. The coiled end of the spring engages in the groove in the armed position and in the groove in the unarmed position.

The loops at the ends of the cap holders enable the cap holders to be pulled into the armed position by remote control and at the same time prevent it from being pulled out completely.

Operation

To arm the mine, the striker is pulled out, and a pin is inserted in the lower hold. A trip wire is attached to the pin. Then a detonator cap is inserted in the cap holder, and the holder pulls into the armed position.

Functioning

The trip wire is pulled, and the spring-loaded striker hits the detonator.

Mine B-4—Anti-Personnel Mine

Data	
Over-all length	8 in. (approx.)
Type of filling	TNT
Weight of filling	25 lb.
Total weight	3.0 lb.

Description

The mine consists of two cylinders, one inside the other. The space between the walls is filled with scrap metal. The outer cylinder is flattened on one side, where there are six sharp projections for attaching the mine to a tree or post. Two clips are provided with fireproof cord for securing the mine by special rings.

The cylinders are held together at their common base and by a cover at the top. Into one end of the brass moulding, screws a brass cap carrying the striker and the spring. Below this, there is the percussion cap in the holder which is inserted from the side. The lower portion of the moulding takes the detonator and the charge. The open end of the moulding is closed by the plug. The cavity between the brass moulding and the inner cylinder is filled with powdered TNT. The trip-release system consists of a trip-key having a ring at one end, to which the cords are attached.

The key is held by the grooves in the brass cap so that it can move slightly in a direction parallel to the end of the mine. This allows the key to fit



Figure 236 -- Mine B-4 -- Anti-Personnel Mine

into the groove on the striker when in the armed position. A ring guides the cords which are wound on a bobbin, the latter being covered by a hinged flap, held closed by the pin. The pin is used as the safety pin before setting the mine.

There is a special mechanism for detonating the mine, when a cord attached to the trip-release is cut. This mechanism is in the form of a hammer on the cover which is set by attaching the thin cord to the eye and stretching it under sufficient tension to hold the hammer at least 4 mm from the end of the trip-key. When the cord is cut, the hammer drives the trip-key forward, releasing the striker. This hammer is not provided on all B-4 mines.

Italian Bakelite and Wooden 1-Lb. Mine—
Anti-Personnel

Data

Over-all length	5.5 in.
Over-all width	2.5 in.
Over-all height	1.5 in.
Type of filling	TNT
Wooden	.33 lb.
Total weight (wooden)	1 lb.

Description

These two mines are similar except that one case is bakelite and the other is wood. The igniter used has a spring-loaded striker held in the cocked position by a trip-key, and has a cap and detonator leading into the main charge. The lid of the mine has, in one end, a slot which fits around the striker and rests on the trip-key. The mine also contains metal fragmentation plates on three sides of the charge.

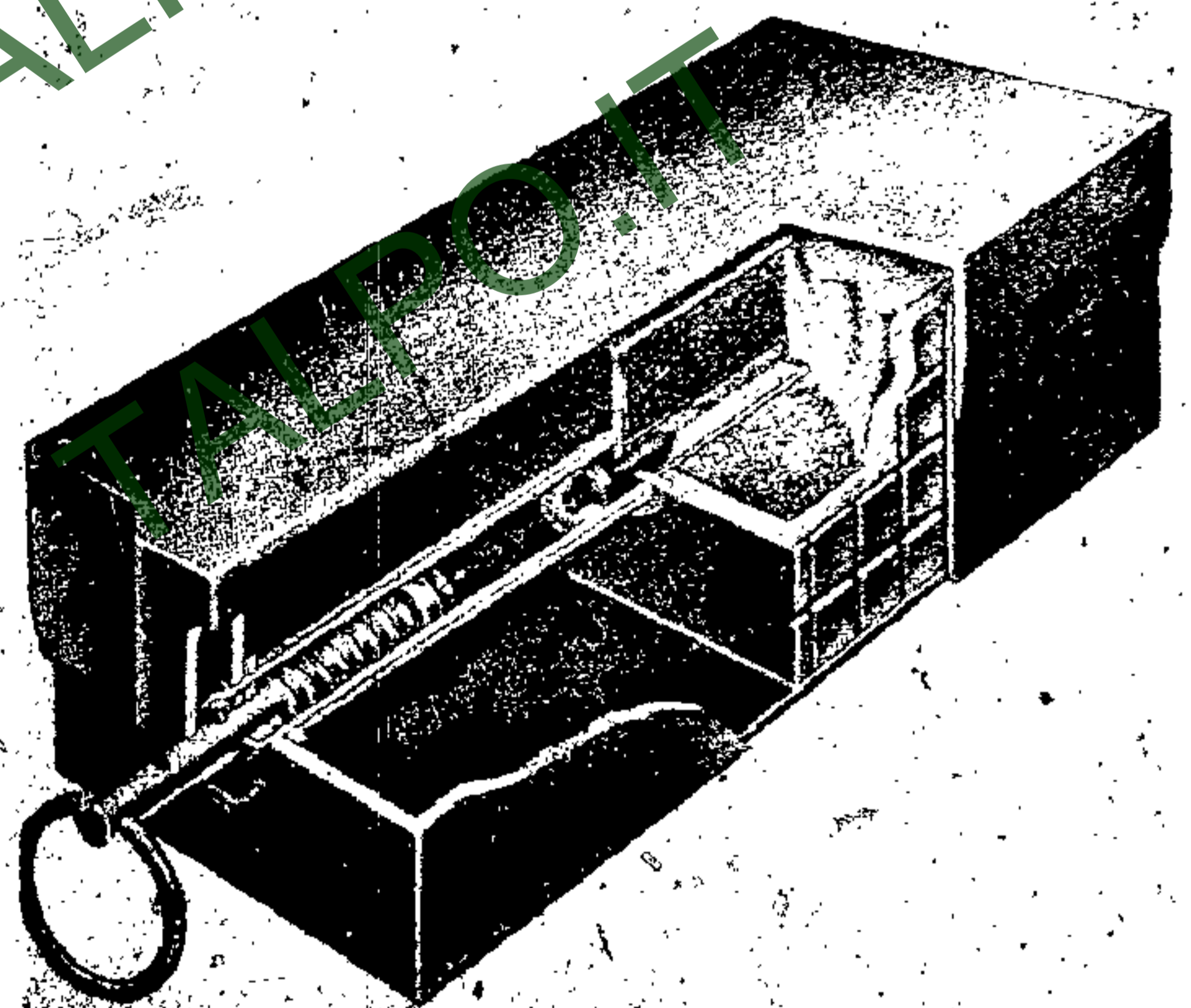


Figure 237 -- Bakelite Mine -- Anti-Personnel

Operation

One to five pounds pressure on the hinged lid presses the trip-key out of the hole in the striker. This action releases the striker, which is driven by the striker spring into the cap, detonating the main charge.

Ratchet Mine (Railroad Mine)

Data

Over-all length	9.1 in.
Over-all width	6.1 in.
Over-all height	11.8 in.
Type of filling	Unknown
Weight of filling	5.1 lbs.
Total weight	18 lbs.

Description

The mine consists of two parts: the explosive container and the housing for the ratchet mechanism. A hinged wooden device with the leather strap is provided for carrying the mine. The wooden base is screwed to the base of the mine, and a loop in the strap holds the ratchet winding key.

The explosive container of the mine is fitted with a short skirt which is a sliding fit over the upper portion of the housing. The two parts are attached to each other by two bolts and held apart by two springs, which are canvas-covered to insure their free movement when buried below ground. The bolt heads are protected by the covers.

Through the top of the housing, projects a spring-loaded plunger, which operates the ratchet mechanism. The striker, which initiates the detonation of the mine, is retained by a ratchet wheel having 60 teeth on its periphery. This latter may be set to release the striker after any desired number up to 59 depressions of the explosive container. The setting is made by the use of a key inserted in the hole situated below the setting observation window in the side of the mine.

The mine is designed for use under railway tracks, and the ingenious use of lead shot in the hollow spring-loaded platform insures a continuous rigid contact between the explosive container and the underside of the railway sleeper or rail. The lead shot is inserted before laying the mine by removal of the screw in the center of the platform. The platform is released, when the mine has been positioned, by removing the retaining pin.

Repeated operations of the ratchet mechanism by successive wheels of the same train is obviated by means of a delayed return of the ratchet pawl.

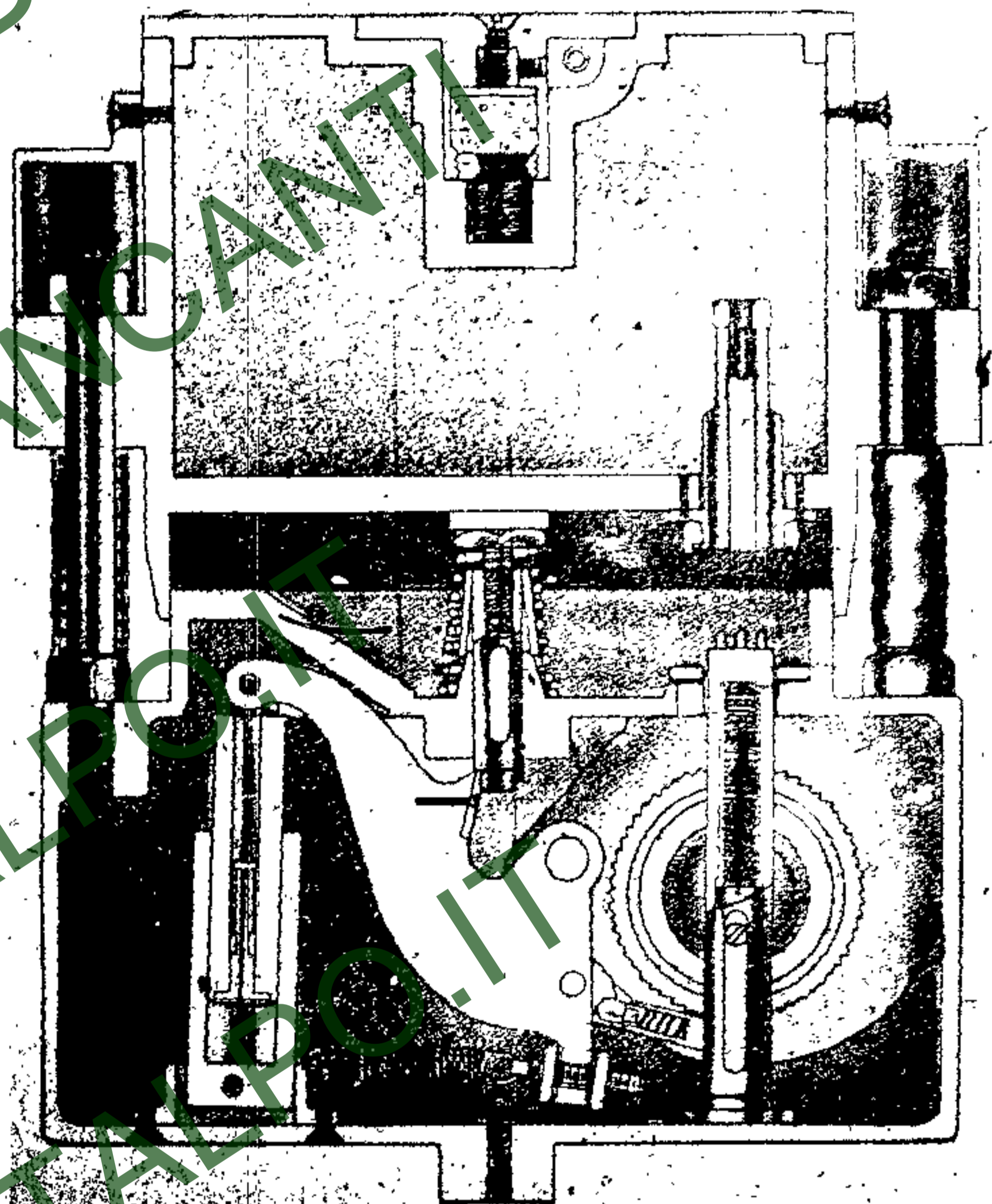
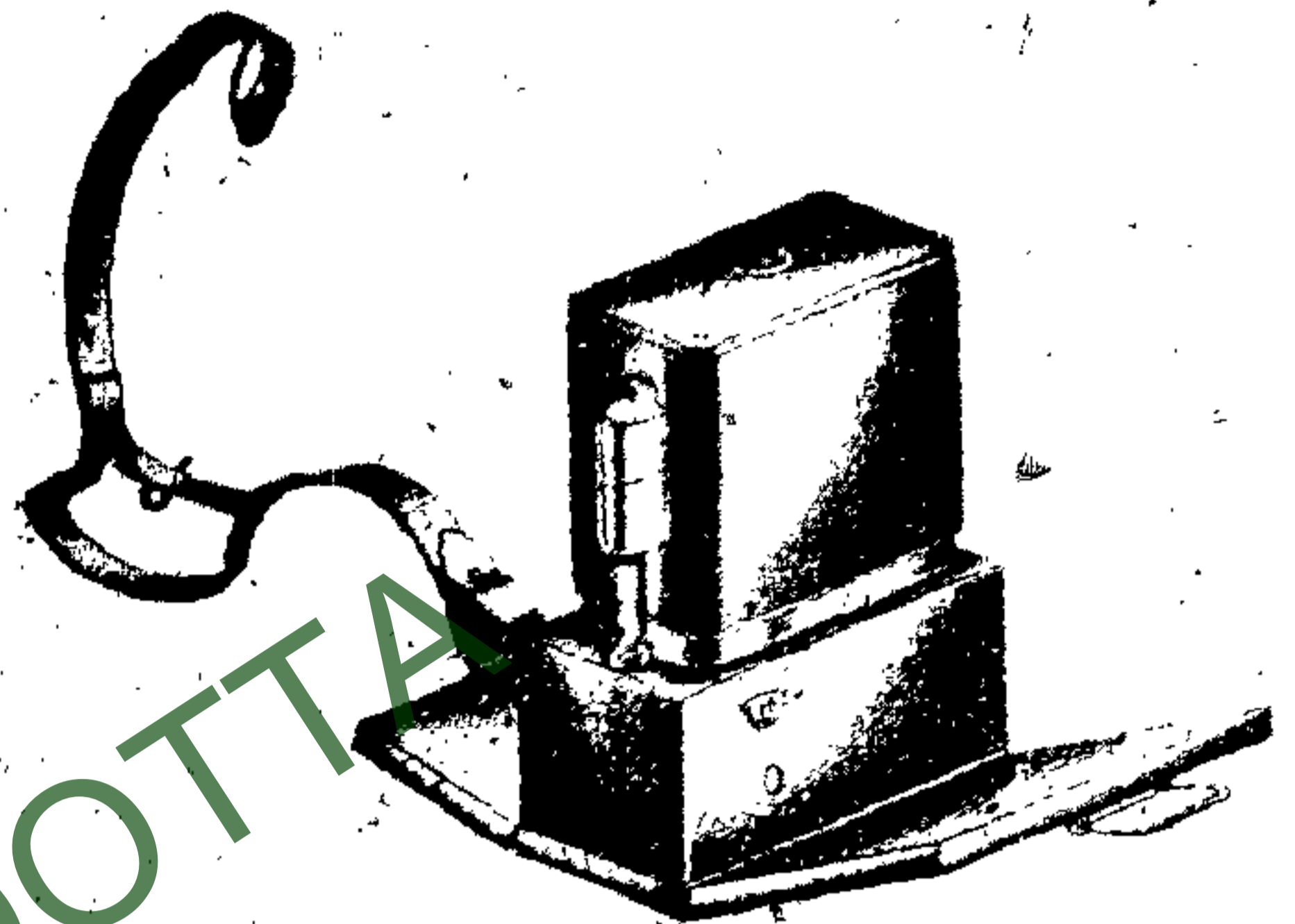


Figure 238 - Ratchet Mine (Railroad Mine)

Provision is made for the attachment of an additional igniter by the screw-threaded adapter in the side of the explosive container.

Railway Mine

Data

Over-all diameter	12 in.
Over-all height	4 in.
Type of filling	Gelignite

Description

This mine is made of a light alloy. The lid, which

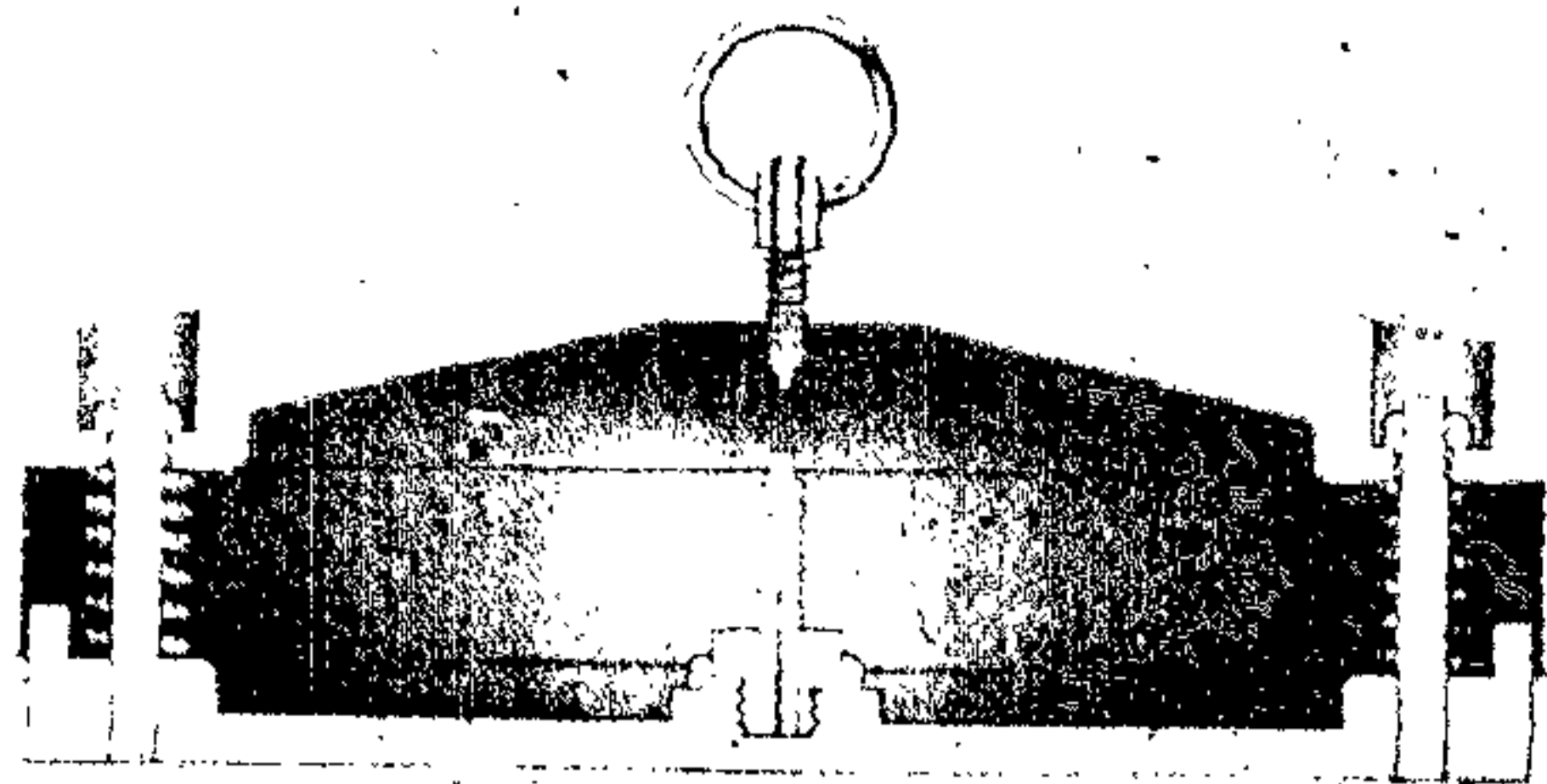


Figure 239 - Railway Mine

is attached to body by four bolts, is recessed to take the four bolts with hexagonal nuts. The lid is supported on four springs and thus holds the striker away from the detonator.

In the unarmed condition, the striker with its ring is screwed into a recess in the side of the mine. When arming the mine, the striker is placed in position over the detonator.

Operation.

Pressure on the lid forces the springs down, and the striker pierces the detonator, setting off the main charge.

Wooden Box Mine (Anti-Tank)

Data

Over-all length	9.5 in.
Over-all width	8.0 in.
Over-all height	3.0 in.
Type of filling	Gelignite
Weight of filling	2.5 kg.
Total weight	3.3 kg.

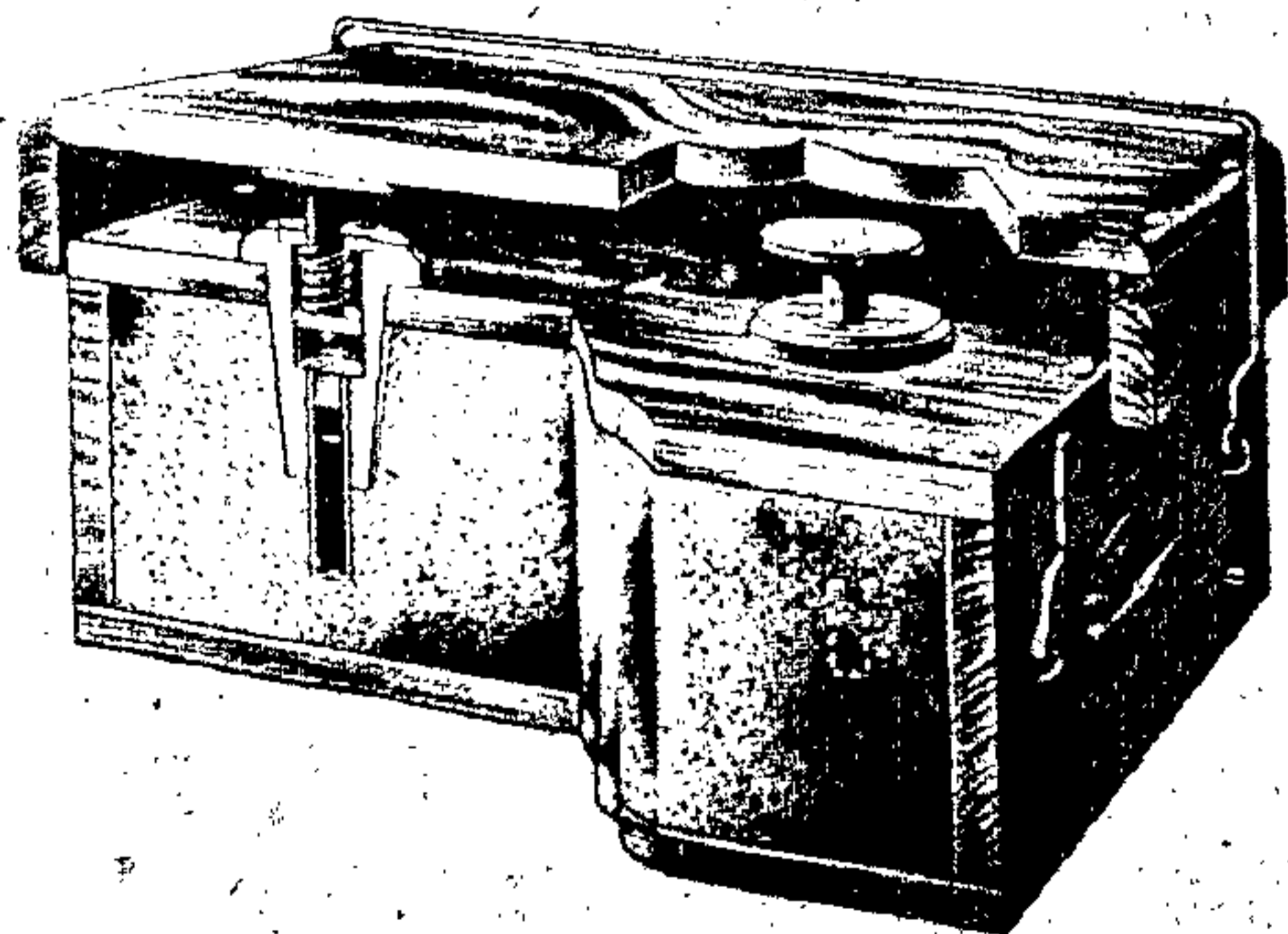


Figure 240 - Wooden Box Mine (Anti-Tank)

Description

The mine consists of a wooden box which houses the explosive charge, a false lid, two igniters, and a separate wooden cover. The explosive charge smells strongly of almonds; it consists of 24 cartridges, weighing 100 grams; is 5 in. long and 1 1/2 in. in diameter.

In the false lid are two holes, each 1/4 in. in diameter, to receive the igniters. Igniters have an aluminum alloy body which tapers slightly and has a mushroom-shaped head. The head is recessed to accommodate a steel washer, through which passes the shank of the striker. The striker spring is maintained compressed between this washer and the striker head by means of a copper shear pin.

Below the striker is the detonator, and the latter is a push-fit into the base of the igniter. On the underside of the mine cover are two metal plates, located above the igniters and intended to bear upon the strikers. The mine cover is held in position by two wire retaining straps, which can rotate about the pins, securing them to the mine body. All the parts are nailed together. The mine is crossed inside and out.

Operation

Pressure from 185 to 380 lb. on the cover shears the copper shear pins, and the springs drive the strikers onto the detonators.

Four-Igniter Mine—Anti-Tank Mine

Data

Over-all length	12.25 in.
Over-all width	10 in.
Over-all height	6.25 in.
Type of filling	TNT
Weight of filling	11 lb.

Description

Four holes in the lid of this box accommodate four igniters, and the mine is completed by the addition of a false lid which consists of a movable pressure platform attached to a wooden frame by means of canvas.

When assembled, the framework is secured to the mine body by four clips, and the pressure platform rests on top of the four igniters with the canvas fully stretched. The whole mine is painted for camouflage. There is a single rope carrying handle.

Two types of igniters have been used in this mine. One consists of a bakelite cone to which a bakelite lid is cemented. A projection below the cone fits into an ordinary detonator, and the latter is then pressed on. Within the cone is a small paper cylinder

containing small pieces of hard limestone mixed with a small quantity of a chlorate flash mixture. Pressure on the mine lid, the bakelite cones, and friction between the hard limestone and the chlorate mixture, produces a flash which ignites the detonators, initiating the mine. The other igniter is also bakelite, but is of more robust construction.

The base of the body is screw-threaded to take the plug which retains the detonator. The detonator contains a cap, and a thin bakelite washer is inserted above this cap to give clearance for the striker needle and to insure that the detonator is held securely by the plug.

The striker holder rests on a conical boss within the body of the igniter, and the latter is closed by a push-fit cover. The igniter functions when pressure on the lid of the mine causes the igniter body to break down and force the needle onto the cap. Trials have shown that the mine, when fitted with this igniter, functions under a static load of approximately 300 lb.

Operation

Pressure on the lid causes the igniters to function, detonating the main charge.

Anti-Tank Mine B-2

Data

Over-all length	3 ft. 6 in.
Over-all width	5 in.
Height	4.7 in.
Type of filling	TNT
Weight of filling	7 lb.
Total weight	33 lb.
Firing pressure (On each spring)	220 lb.

Description

This mine, the latest development of older types "S. C. G." and "hinged lid," consists of a welded sheet-metal box with a metal lid resting on two springs. The lid has two openings covered by hinged flaps corresponding to the positions of the striker assembly and the wire-tensioning screw.

At the ends of the box are charges, each consisting of eight 200-gram slabs of TNT. On the underside of the lid are welded two short lengths of steel tube to fit into springs; two similar lengths of tube are welded on the base of the box; all four serve to locate the springs.

The explosive compartments and the foundation of the ignition mechanism are wood. In the center of the lid, a knife is located directly above the guides.



**Figure 241.— Four-Igniter Mine —
Anti-Tank Mine**

Through these guides passes a tension wire, fastening the striker to a brass adjustable hook.

The striker mechanism consists of a body with a slot for the percussion cap and holder, and the striker and spring. The nut retains one end of the spring; the thread takes the nut which retains the detonator (open and toward the percussion cap); a short length of F. I. D., and a long length of D. I. D. connecting the detonator with a second charge.

A tie-rod with a spring provides against premature firing in the event of damage to the tension wire, and, when the lid is depressed, insures normal

V-3 and V-5—Anti-Tank Mines

Data

Over-all length	3 ft. 8.9 in.
Over-all width	2.4 in.
Over-all height	2.7 in.
Type of filling	TNT
Weight of filling	16 lb.
Total weight	17 lb.

Description

V-3: The mine is made of sheet steel, its body strengthened by two partitions. The charge extends between two firing mechanisms. The cover is secured to the body by concave-headed nuts, engaging an actuating bolts positioned by springs resting between a nut on the underside of the cover and a plate covering the firing mechanism.

When the nuts beneath the lid are screwed down, the springs compress, increasing the pressure required to operate the mine. Unscrewing the nuts makes the mine more sensitive to pressure; as little as 22 lb. weight can be made to trip the striker. The underside of the cover has two knives engaging in guides provided to take copper pins. (A weight of 264 lb. is required to shear the pins.) At each end of the body are cocking grips, pulled to cock the firing pins. The mechanism is shown. When the striker spring is compressed, the flange of the striker is held by a cotter on a U-shaped spring clip. A percussion cap is accommodated in a holder which is inserted in a hole in the side of the mine. The holder passes into an annular space in the striker body, held there by a blade retaining spring engaging in the slot. The actuating pin inserted through a hole in the side of the body is the connection between an actuating bolt and the U-shaped spring clip carrying the cotter.

The pressure applied to the mine cover forces down the actuating bolt against the spring, which comes into contact with the actuating pin, causing a



Figure 243 — V-3 Anti-Tank Mine



Figure 242 — Anti-Tank Mine B-2

function by pressure on the lever, which releases the detent. This additional safety device is not found on all types.

A safety pin placed on a hole in the body of the striker remains in position until the mine is loaded, the hinged flaps are closed, and the mine is covered with earth. The mine functions when pressure on the lid overcomes the resistance of springs, the cutting blade descends to sever the wire holding the striker, and the lid depresses the detent lever.

Remarks

1. Type S. C. G. differs in that the lid has only one opening and has a small charge.
2. Type (Hinged Lid) was the earliest type, was smaller, and was made of wood.

U-shaped spring clip to depress against the retaining spring. The flange thus freed allows the striker to initiate the percussion cap and fire the detonator.

V-8. Similar to V-3, except for reduction of charge to 2 pounds of cylindrical borehole charge, omission of shear wire, and inversion of parts so V-5 has appearance of V-3 upside down.

Pignone Type I and Type II—Bakelite Anti-Tank Mines

Data

	Type I	Type II
Overall diameter	13 in.	13 in.
Diameter of casing	11.87 in.	11.87 in.
Overall height	5.12 in.	5.5 in.
Weight of casing	5 lb.	5 lb.
Type of filling	TNT	TNT
Weight of filling	7 lb.	7 lb.
Activating pressure	110 lb.	300 lb.

Description

Mines are constructed of moulded bakelite; both types are of waterproof design. Metal parts in the

mines when armed are:

1. The case of the detonator
2. The brass striker pellet and its helical spring
3. The brass bush which houses the striker pellet, two steel balls, and brass shear pins
4. A perforated steel bar which slides to prevent the striker from the detonator in the inactive position.
5. Brass tumblers in the igniter locking device
6. Nine steel helical creep springs supporting the pressure plate.
7. In Type I, the steel wires supporting the pressure plate.

Type I. The casing contains the detonator in two halves, top and bottom, being respectively $1\frac{1}{2}$ in. and $\frac{1}{2}$ in. thick. They are moulded to form a central circular chamber for the igniter. The top is strengthened with ribs. The two halves are assembled with an outer circumferential round sunk joint and an inner spigoted joint.

The outer joint has rubber sealing ring and is secured by hollow plastic rivets passing through 12 pairs of lugs. The inner joint is secured by a base

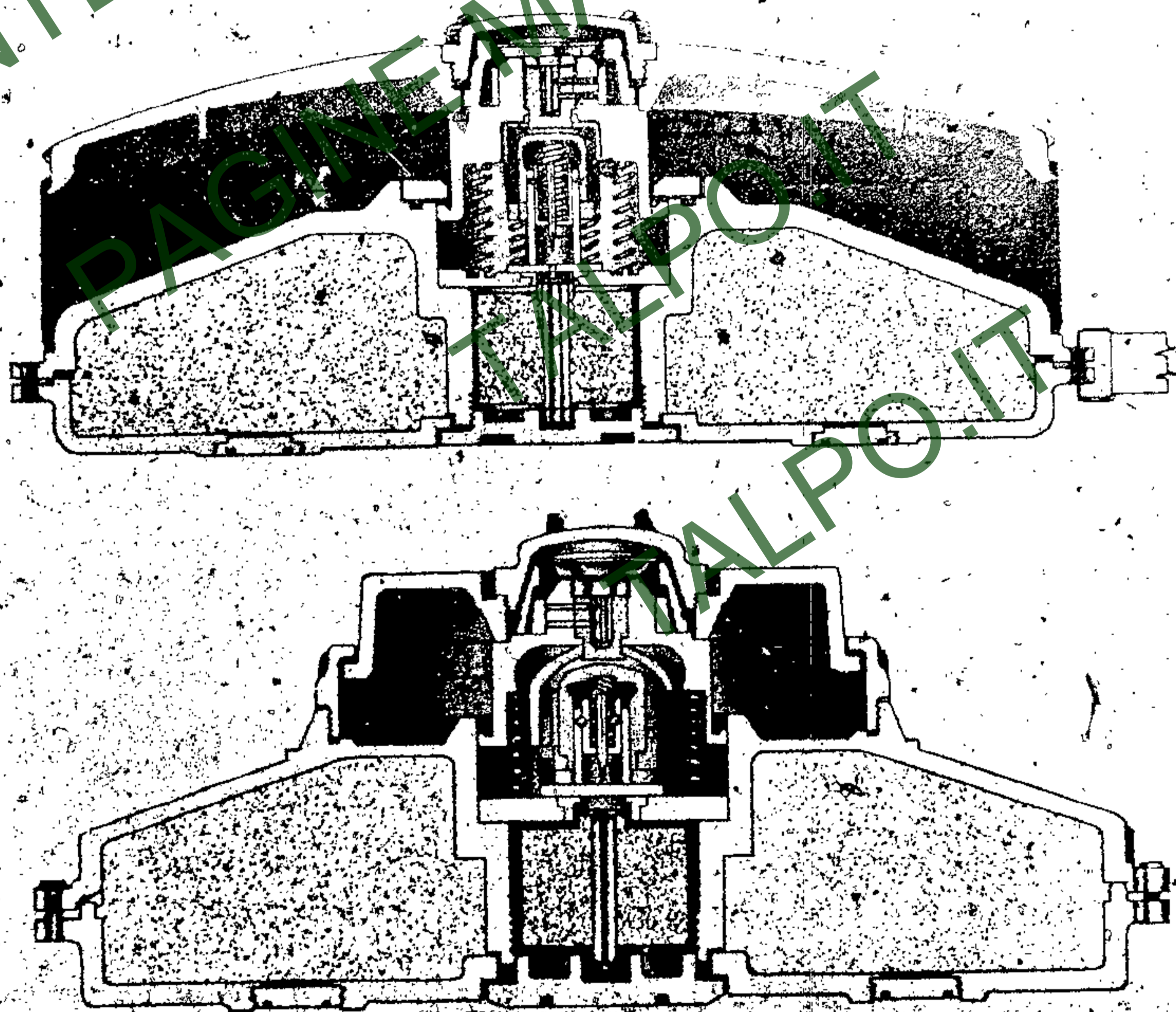


Figure 244 — Pignone Anti-Tank Mines Types I and II

FRENCH BOMBS

Classes

French bombs may be divided into three classes. The bombs in each class are named according to their weight, approximately in multiples of 10 kg., and there follows a designation intended to differentiate several bombs of the weight. H. E. service bombs are made of steel-hardened, forged, or drawn steel; welded sheet or cast steel. The bomb fillings are generally as follows:

Hardened steel bombs	M Mn
Steel bombs	M Dn
Other bombs	D D

Fillings

The following fillings are used in French bombs:

M Mn—Trimonite (U. S. A.)

70% melinite (picric acid)

30% mononitronaphthalene

M Dn or MFDN

80% melinite

20% dinitronaphthalene

D D—Shellite (British)

60% melinite

40% dinitrophenol

Of these, "M Mn" is the most usual filling for cast steel anti-personnel bombs. The remainder are normally filled with "M Dn", "D D" being confined to certain types which are now considered obsolete.

Flares

Flares are normally used in reconnaissance of targets or landing grounds. They may be 10 or 30 kg. in weight and should be used at altitudes between 1,500 and 5,000 feet. The star burns for four or five minutes. The smoke bomb produces, on impact, a cloud of smoke which lasts about a minute and indicates the direction of the wind.

Coloring of Bombs

1. Service Bombs

H. E. bombs	Yellow
H. E. bombs (old pattern)	Grey
Flares	Red

Incendiary—1 kg. (old pattern)	Blue body Black tail
Incendiary—(new pattern)	Red body Green tail
Incendiary—10 kg.	Red body Green tail
Smoke	Black nose Green body and tail

2. Miscellaneous Bombs

Practice bombs	Yellow, blue band or unpainted
Instructional bombs	Grey or black Blue band
Ballast bombs	Gray or black White band

Markings on French Bombs

Markings, indicating manufacture are stamped on the nose of the bomb, either transversely near the nose-fuze pocket or in a direction parallel to the axis of the bomb.

On mild or forged steel bombs they indicate the source of the steel, the establishments which have carried out the tempering and the manufacture, a consecutive number, the lot number and year of manufacture. The letter M shows that the bomb is of rolled steel.

On bombs of cast steel, markings indicate the foundry, the lot number, the year of manufacture, and the mark of the factory.

The nature of the explosive filling is indicated by letters 0.4 inch in height, stamped on the bomb at 0.4 inch from the nose-fuze pocket.

The following markings are painted on the bombs:

IN BLACK, initials of the firm which carried out the filling, with the month and year of filling, e. g. PCFD-7-22.

Source and lot number of the explosive filling, e. g. SF-514-20.

Nature of filling.

Lot number and year of filling, e. g. 4-22.

IN RED, the inscription "F de Culot" on the same side as the other markings, in the case of bombs

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fuzed in the tail. In addition, bombs of 100 kg. and over, carry, below all other markings, a number

indicating the exact weight of the bomb, to the nearest kilogram.

FRENCH NAVY BOMBS

Little information has been found on French Navy bombs. Only the information in the following chart is available, except for the 125-kg. light-case bomb, which is included in the bomb section.

Designation	Max. Diam. of Bomb	Weight and Nature of Filling	Total Weight	Type of Fuze
14 kg. A. P.	3 $\frac{3}{4}$ in.	1 $\frac{3}{4}$ lb. picric acid and TNT	31 lb.	
222 kg. Model 1938 A. P.	10 $\frac{3}{4}$ in.	50 lb. picric acid and TNT	500 lb.	Nose Tail No. 7
410 kg. Type L A. P.	15 $\frac{3}{4}$ in.	265 lb. picric acid or picric acid and TNT.	900 lb.	Nose No. 9 Tail No. 8
438 kg. Model 1938 A. P.	11.9 in.	24 lb. picric acid	1,000 lb.	Nose Tail No. 7
224 kg. Type K	14.75 in.	240 lb. picric acid or picric acid and TNT.	490 lb.	Nose No. 10 Tail No. 8
720 kg. Type-M	20.5 in.	860 lb. TNT	1,600 lb.	Nose No. 11 Tail No. 8
73 kg. Type G2 Antisubmarine	8.66 in.	102 lb. TNT	160 lb.	Nose No. 11 Tail No. 8
150 kg. Type 12 Antisubmarine	14 in.	224 lb. TNT	330 lb.	Nose No. 11 Tail No. 8

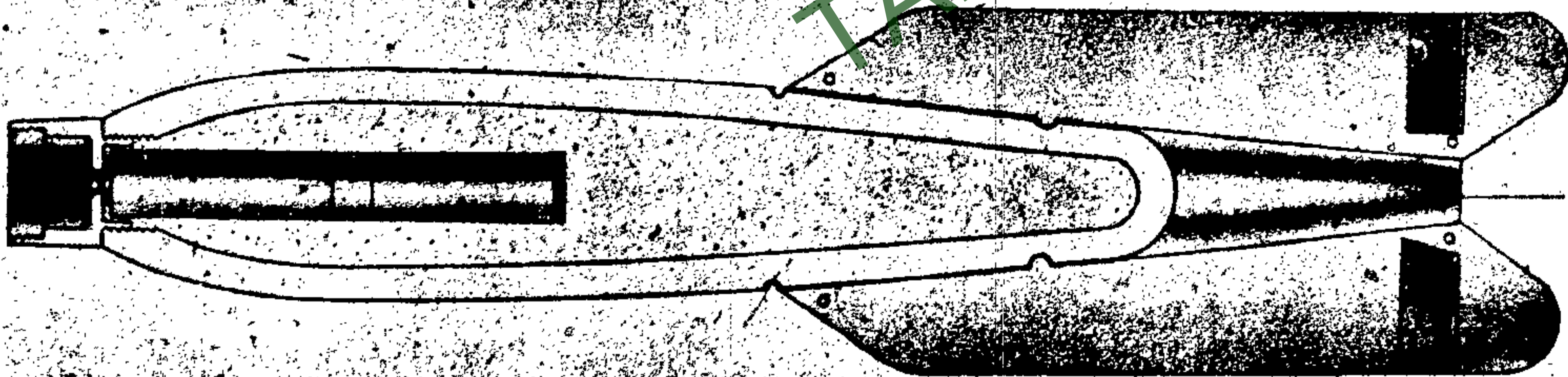


Figure 249 - 10-kg. (P.A.) Anti-Personnel Bomb

10-kg. (P.A.) Anti-Personnel Type I and Type II

Data

	Type I and Type II
Over-all length.....	21.5 in.
Body length.....	Unknown
Body diameter.....	3.54 in.
Wall thickness.....	0.5 in.
Tail length.....	9.3 in.
Tail width.....	5.5 in.
Type of filling.....	70% Picric acid, 30% Mononitronaphthalene
Weight of filling.....	2.5 lb.
Total weight.....	21.0 lb.

Fuzing

Nose only—24/31 Type H, Model 1921 R. S. A.
24/31 Model 1925 or Model 1928.

Description

The bomb casings are single-piece steel castings, internally threaded at the nose to accommodate the tapered steel fuze adaptor. Type II is similar to Type I, with the following exceptions: no struts are fitted to the tail unit, and strengthening is effected by pressing the lateral and longitudinal corrugations in each tail vane. In Type I, the tail unit is formed of four similar segments riveted together, fitted over the rear of the bomb, and secured by crimping the tail cone into an annular groove out in the bomb body.

Color and Markings

Over-all—yellow.
Stamped 0.4 in. from nose fuze pocket in letters 0.4 in. in height—nature of filling.

10-kg. (P.) Anti-Personnel Type I and Type II

Data

	Type I and Type II
Over-all length.....	21.5 in.
Length of body.....	Unknown
Body diameter.....	3.5 in.
Wall thickness.....	0.5 in.
Tail length.....	Unknown
Tail width.....	Unknown

Fuzing

Nose only—24/31 Type H 1921 R. S. A.
24/21 Model 1925 and Model 1928



Figure 250 - 10-kg. (P) Anti-Personnel Bomb

Description

TYPE I: The bomb body consists of a converted 90-mm artillery shell. A sheet-metal extension fits over the upper end of the body and is secured to it by crimping within two annular grooves machined in the body. The tail unit is riveted to the upper half of the extension.

TYPE II: This bomb is similar to Type I, with the following exceptions: no conical extension is fitted, but a tail cone formed of a single-piece casting

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is fitted over the upper end of the bomb and is secured to it by crimping within a single annular groove.

Color and Markings

Over-all—yellow

Stamped 0.4 in. from the nose fuze pocket in letters 0.5 in. in height—nature of filling

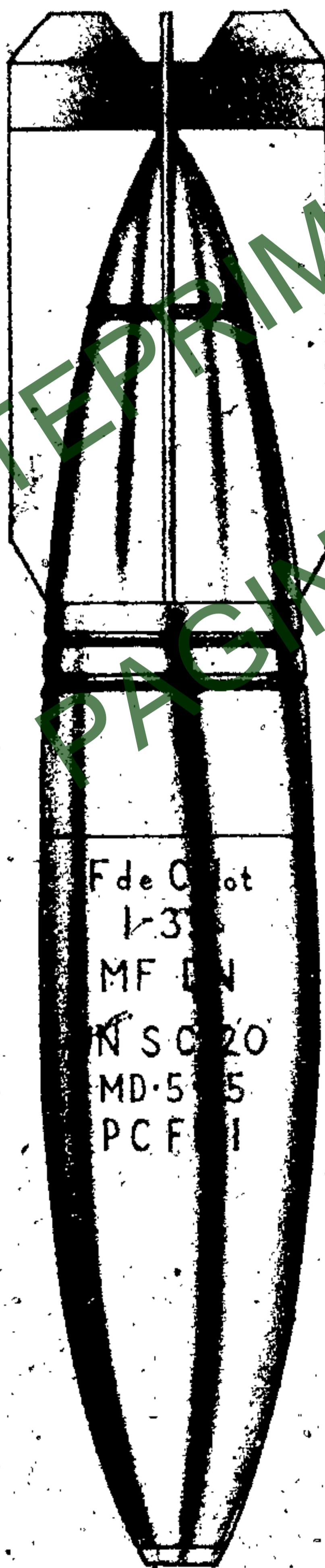


Figure 251 — 50-kg. (A) G.P.-H.E. Bomb

50-kg. (A) and 50-kg. (G.A.M.Mn) G.P.-H.E.

Data

	(A)	(G. A. M. Mn)
Over-all length	39.0 in.	46.5 in.
Body length	Unknown	Unknown
Body diameter	6.15 in.	7.85 in.
Wall thickness	0.69 in.	0.125 in.
Tail length	17.0 in.	Unknown
Tail width	7.85 in.	Unknown
Type of filling	MDn	MMn
Weight of filling	22.0 lb.	63.0 lb.
Total weight	88.0 lb.	112.0 lb.

Fuzing

(A): Nose—Type H Model 1921; Tail 3B15
(G. A. M. Mn): Tail—M. No. 2

Description

(A): The body of this bomb is a single-piece steel forging made from a rejected 155-mm artillery shell.

(G. A. M. Mn): This bomb is made of sheet steel; it has either a longitudinal or a circumferential weld.

Color and Markings

Both bombs: Over-all—yellow

Painted on bomb case—Type of filling and "F de Culot" if tail-fuzed only

50-kg. (D.T. No. 1, No. 2, and No. 3)
G.P.-H.E.

Data

	No. 1	No. 2	No. 3
Over-all length	46.5 in.	46.5 in.	46.5 in.
Body diameter	8.25 in.	7.7 in.	7.86 in.
Wall thickness	0.375 in.	Unknown	Unknown
Tail length	Unknown	21.0 in.	Unknown
Tail width	Unknown	10.2 in.	Unknown
Type of filling	MDn or DD		
Filling weight	44.0 lb.	42.0 lb.	44.0 lb.
Total weight	123.0 lb.	123.0 lb.	123.0 lb.

Fuzing

No. 1, No. 2 and No. 3: Tail only—3B15

No. 2: Nose—Type H, Model 1921, R. S. A Model 1925, or Model 1928. Tail—Sch. R. Model 1938.

Description

These bombs are single-piece forgings; No. 1 made from converted 220-mm artillery shell, No. 3 from converted hydrogen cylinder; both made obsolete

100-kg. and 200-kg. G.P.-H.E.

Data

	100-kg.	200-kg.
Over-all length	56.0 in.	62.0 in.
Body length	Unknown	Unknown
Body diameter	10.8 in.	14.5 in.
Wall thickness	0.44 in.	0.44 in.
Tail length	18.9 in.	27.25 in.
Tail width	10.2 in.	14.5 in.
Type of filling	M108 or D41	
Weight of filling	258.0 lbs.	503.0 lbs.

Fuzing

Nose--A modified, R. S. A. 30/45, Model 1930

Tail--3B15 (100 kg. only) Sch. R. Model 1938



Figure 252 - 50-kg. (D.T. No. 2) G.P.-H.E. Bomb.

by the French. The tail consists of four vanes fastened to the tail cone, strengthened between the vanes by sheet metal struts.

Color and Markings

Over-all--yellow

Painted on body--Type of filling, source, year of filling, etc.

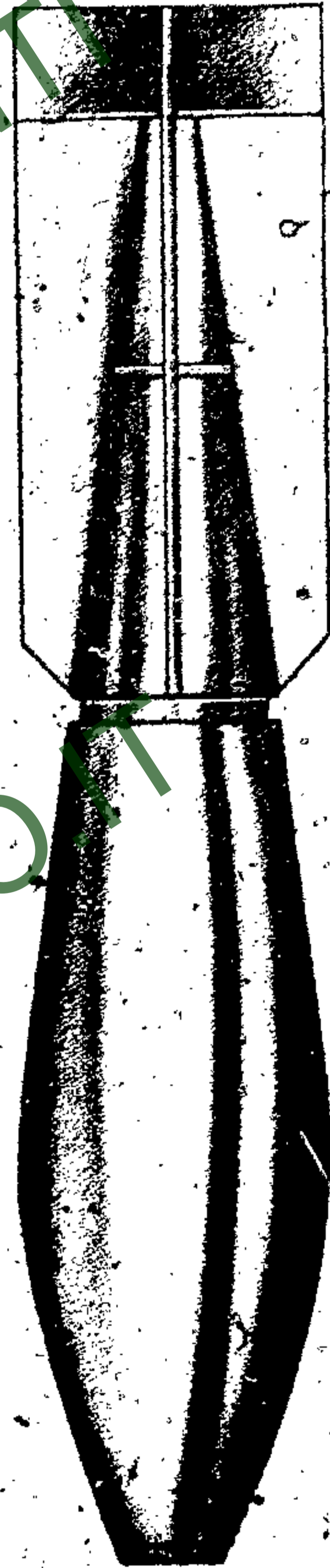


Figure 253 - 200-kg. G.P.-H.E. Bomb

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Description

These bombs have a forged steel case. The tail assembly consists of four vanes attached to the tail cone and reinforced by struts made of strip steel.

Color and Markings

Over-all—yellow

Painted on the bomb case—Type of filling, source, etc. and "F de Culot" if tail-fuzed only

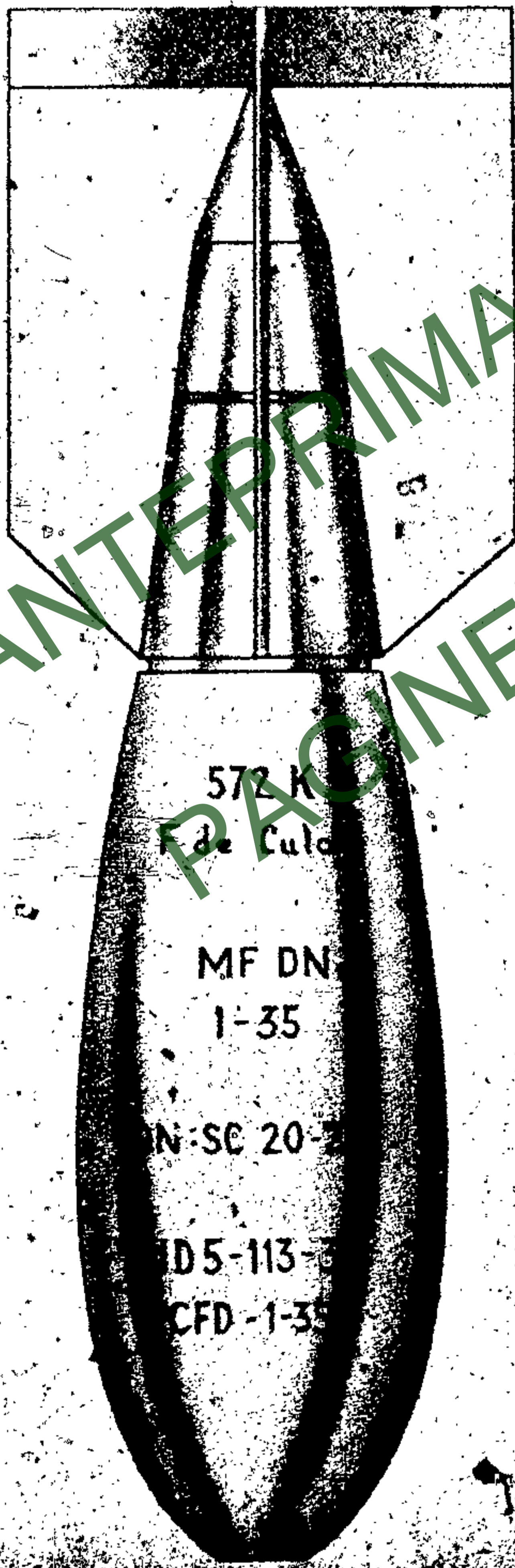


Figure 254 — 500-kg. G.P.-H.E. Bomb
Model 1930

500-kg. (Model 1930, No. 1, and No. 2)
G.P.-H.E.

Data

	Model 1930	No. 1	No. 2
Over-all length	84.0 in.	83.0 in.	79.0 in.
Body length	Unknown	Unknown	Unknown
Body diameter	19.3 in.	21.4 in.	19.6 in.
Wall thickness	0.56 in.	0.44 in.	0.625 in.
Tail length	34.2 in.	Unknown	Unknown
Tail width	24.2 in.	Unknown	Unknown
Type of filling		MDn or DD	
Filling weight	600 lb.	662 lb.	595 lb.
Total weight	1285 lb.	1182 lb.	1148 lb.

Fuzing

Nose—A modified R. S. A. Mod. 1930 (except 500 kg. Model 1930)

Tail—3B15 Sch. R. 1938 (500 kg. Model 1930 only)

Description

Model 1930: Bomb case is made of a single-piece steel forging.

No. 1: This bomb is made of three sheet-steel sections welded together, presumably circumferentially.

No. 2: The bomb case is made of a single-piece steel forging.

The tail assembly of these bombs consists of a tail cone with four vanes attached.

Color and Markings

Over-all—yellow

Painted on case—Type of filling, source, etc.

125-kg. G.P.-H.E. (Naval)

Data

Over-all length	61.5 in. (without fuze)
Body length	36.0 in.
Body diameter	12.2 in.
Wall thickness	0.25 in.
Tail length	26.8 in.
Tail width	12.0 in.
Type of filling	TNT
Weight of filling	Unknown
Total weight	125 kg. (approx.)

Fuzing

Nose—Type A

Tail—No. 8



Figure 255 - 125-kg. G.P.-H.E. Bomb (Naval)

Description

This bomb is light cased. The tail assembly is secured to the bomb body by four clamping bolts which are received by four lugs on the body. The tail unit has corrugated stiffening plates for strengthening.

Color and Markings

Unknown

40-kg. Fragmentation Bomb

Data

Over-all length	35.75 in.
Body length	Unknown
Body diameter	6.25 in.
Wall thickness	Unknown
Tail length	16.75 in.
Tail width	7.75 in.
Type of filling	Unknown
Weight of filling	Unknown
Total weight	Unknown



Figure 256 - 40-kg. Fragmentation Bomb

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Fuzing

Nose—No. 3

Tail fuze—Unknown

Description

This bomb is a converted artillery shell. The tail unit is the cross-blade type, with the blade joined near the end of the bomb by a narrow strengthening band.

Color and Markings

Unknown



Figure 257—1-kg. Incendiary Bomb Type A

1-kg. Incendiaries Type A and Type B

Data

	Type A	Type B
Over-all length	14.5 in.	14.5 in.
Body length	9 in.	Unknown
Wall thickness	0.35 in.	0.35 in.
Tail length	4.75 in.	Unknown
Tail width	2.0 in.	2.0 in.
Type of filling	Thermite	Thermite
Total weight	1 kg.	1 kg.

Fuzing

Nose only—Fuzes for 1-kg. Incendiaries.

Description

The bomb bodies are cylindrical castings of magnesium alloy, with the nose internally threaded to take a nose fuze. Toward the nose, the bomb casing is perforated by two small vents, plugged with wax. The bombs differ in tail assemblies, with Type A consisting of three sheet-metal vanes supported at the ends by a circular ring and Type B consisting of a cast-alloy tail cone and eight vanes.

Color and Markings

Type A: Body—blue; tail—black

Type B: Body—red or blue; Tail—green or black

10-kg. (Model 1927) Incendiary

Data

Over-all length	22.1 in.
Body length	Unknown
Body diameter	3.54 in.
Wall thickness	Unknown
Tail length	10.2 in.
Tail width	5.5 in.
Type of filling	Magnesium Incendiary
Total weight	8 kg.

Fuzing

Nose only—24/31 Type H Model 1929 or
24/31 R. S. A. Model 1929

Description

The bomb consists of three parts: (1) a cast-steel nose filling sleeve and fuze adapter which screws into (2) a cast magnesium alloy body at the rear of which is screwed another (3) magnesium alloy casting in the form of a truncated cone with a base plate as an integral part of the castings. The booster tube is threaded into the nose sleeve. Plates divide the bomb into three sections; nose, central body,

10-kg. Parachute Flares, Old Type (A) and New Type (B)

Data

Over-all length.....	Type A, 10 kg.
Body length.....	45.3 in.
Body diameter.....	4.4 in.
Wall thickness.....	Unknown

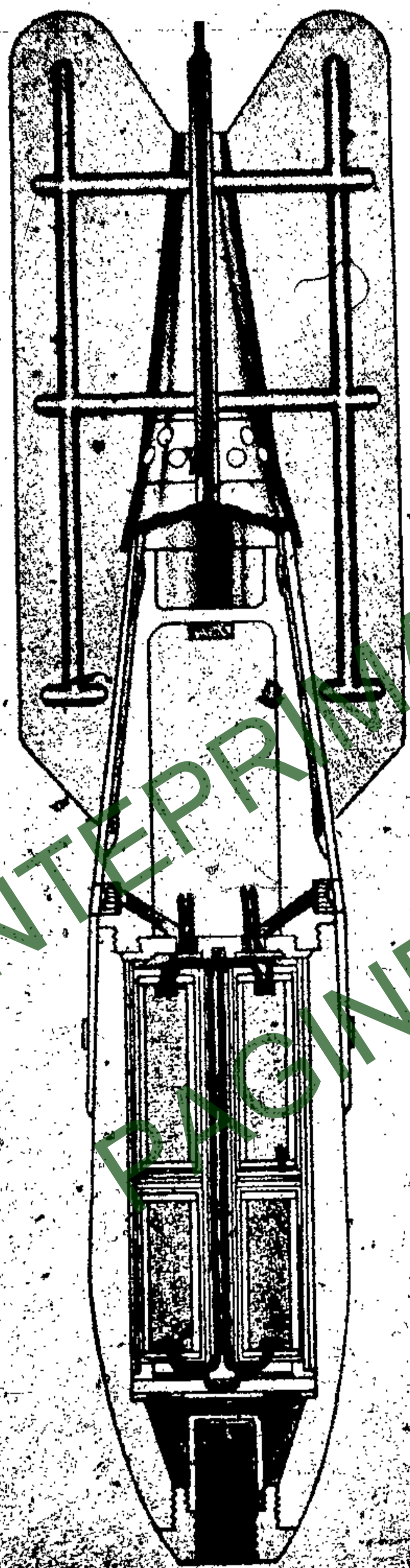


Figure 258 - 10-kg. Incendiary Bomb (Model 1927)

and tail portion. The incendiary filling is contained in twelve triangular tubes made of magnesium and filled with incendiary composition.* The tail unit also contains incendiary. All the incendiary composition is connected with wicks for ignition.

Color and Markings

- Body—red or blue
- Tail—green or black

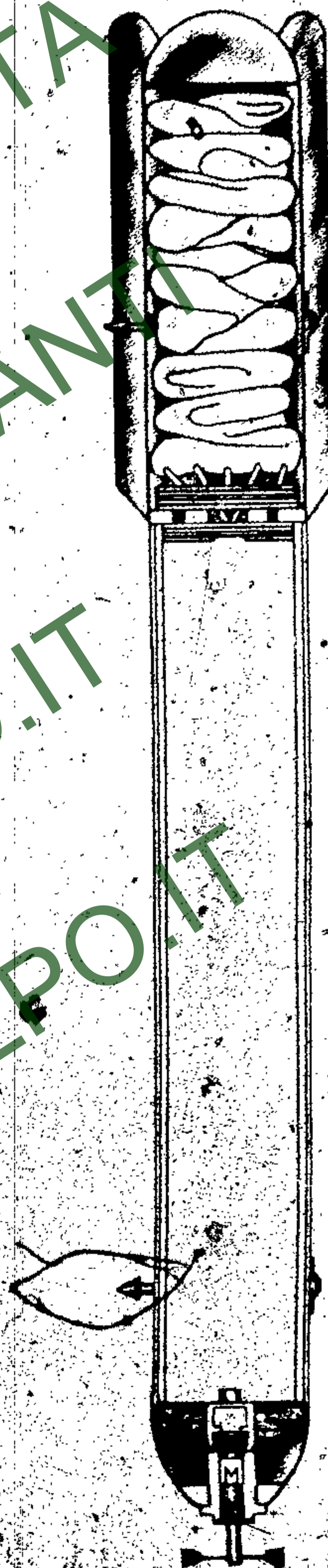


Figure 259 - 10-kg. Parachute Flare Type A



Figure 260 - 10-kg. Parachute Flare Type B

Tail length	Unknown
Tail width	Unknown
Type of filling	Star composition
Weight of filling	8 kg.
Total weight	13 kg.

Fuzing

- Type A: Nose only—Time Fuze V. M.
- Type B: Nose only—Time Fuze Model 1930

Description

These types of flares are very similar. They come in weights 10, 15, 30, and 50 kg. The Type A is the older type and B is the newer.

TYPE A: The 10-kg. flare of this type has a body of sheet iron, tin plated. When the fuze functions, it ignites the powder charge, and this, in turn, ignites the flare composition. At the same time, the gas caused by the combustion of the powder creates sufficient pressure to eject the star and parachute through the tail of the flare, the cup of which is tightly attached to the body.

TYPE B: The newer type of flare is made of aluminum. The tail cover is attached to the body by a lead strip running around the joint between the body and the tail. The expulsion of the stars and parachute is accomplished in the same manner as in the Type A. The head of the flare contains ballast, as well as the powder charge which ignites and expels the contents of the flare. The ignition of the large star is caused by the safety fuses. When the parachute opens, the six small stars hang around the large star.

Color and Markings

- Type A: Over-all—red
- Type B: Over-all—white; painted near the head of flare—three grey stars

Smoke Bomb

Data

Over-all length	9.45 in.
Body length	Unknown
Body diameter	2.75 in.
Tail length	4.25 in.
Tail width	3.15 in.
Filling	Titanium Tetrachloride
Bottle content	100 cc.

Fuzing

None

Description

The casing is sheet aluminum, with the head pressed separately and soldered in several places to the body. A glass container fits within the casing, protected from breakage by cork at the tail, felt washers along the side of the casing, and a collar



Figure 261 - Smoke Bomb

supported on a helical spring at the nose. A U-shaped safety pin holds the collar in position. On release, the safety pin is pulled, freeing the bottle in the case. On impact, the bottle moves forwards

against a spring onto four cutters in the nose of the body.

Color and Markings

Body and tail—green
Nose—black

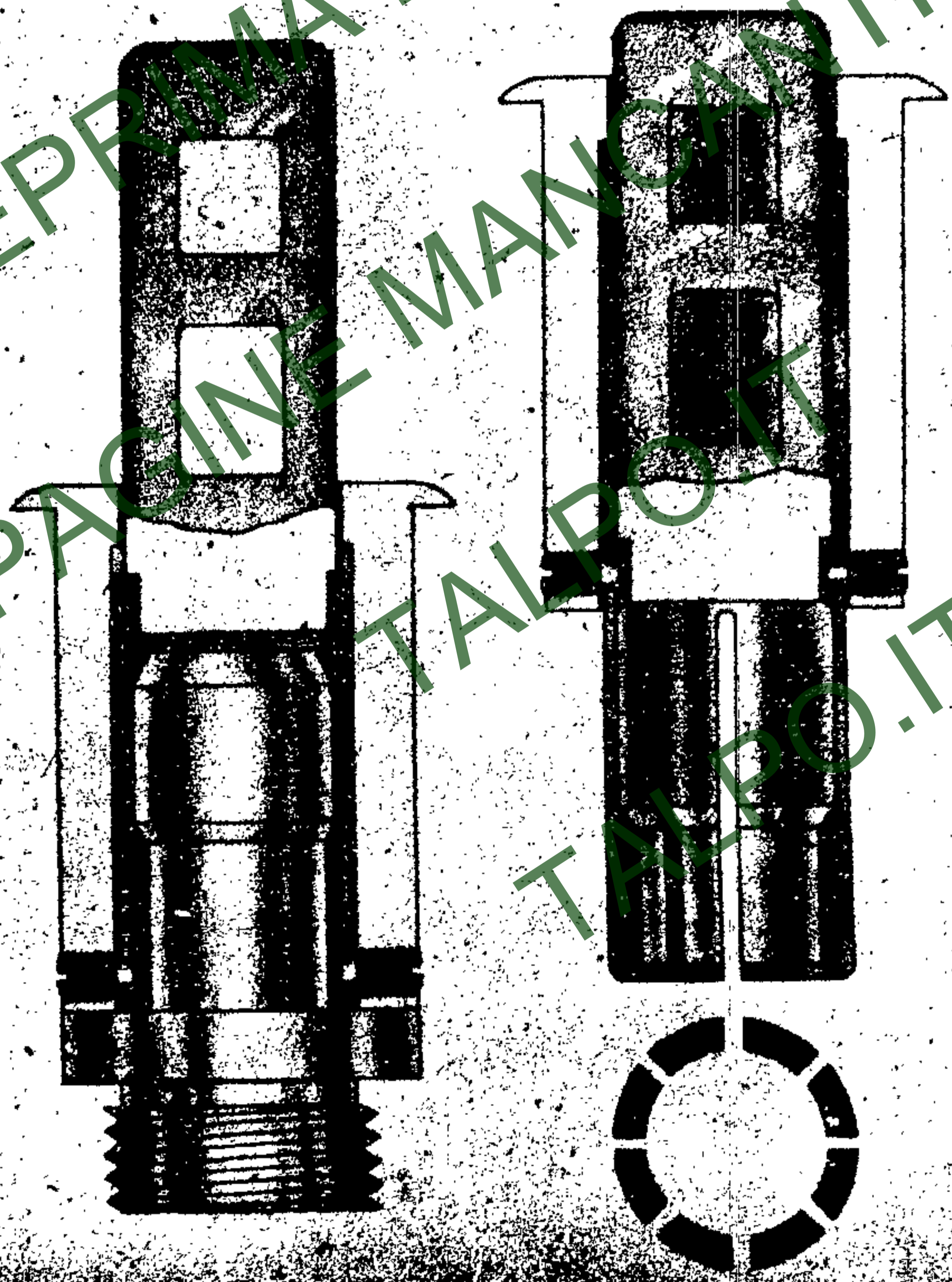


Figure 262 - Secondary Safety Devices

Chapter 9

FRENCH BOMB FUZES

Generally speaking, French bombs are fuzed in nose or tail (or in both) with mechanical fuzes (i. e. containing strikers and detonators, and with a wind-vane arming device), somewhat similar to U. S. fuzes.

Bombs falling without initial speed and without rotation cannot become armed by employing the effects of setback or centrifugal force. On the other hand, in order to prevent premature functioning of the fuze in the vicinity of the airplane, arming must not take place until the bomb is sufficiently clear of the machine. The arrangement for arming, therefore, is also a safety arrangement, and often takes the form of a vane with screwed spindle which immobilizes the striker and holds it apart from the flash cap.

For transportation, the vane itself is held fast by a safety pin. The vanes having been freed, when the bomb is dropped, the rush of air causes the vanes to rotate. The spindle either screws down or unscrews in order to bring the striker into the functioning position, and the fuze is then armed. Fuzes (except bomb flare V. M. which acts in a special manner) act on impact either by the striker being forced onto the cap or by the effect of inertia causing a movable part to sit forward.

Types of Bomb Fuzes

There are three types of bomb fuzes:

1. Percussion fuzes: In these, the arming is effected either by the resistance of the air operating a vane (fuzes a helice) or by the speed of descent (fuzes R. S. A.).

The main feature of this R. S. A. percussion system is that there is no special means of arming this fuze. It is, in fact, armed when the bomb has acquired the requisite speed. This speed is normally attained after a fall of at least 66 feet.

2. Aerial-burst fuzes: These may operate by the action of a vane, a certain number of rotations being necessary to cause the fuze to function, or by the burning of a powder pellet, the length of the pellet determining the time.

3. Time fuzes (Clockwork Mechanisms and Fixed Time)

These types are for explosive bombs, with instantaneous action or delay of 0.05 or 0.15 seconds. In addition to the usual safety device, a supplementary security mechanism called "security largable" is used in some fuzes.

Colored Markings on Fuzes

1. On Vanes:

Vane tips all white	Instantaneous
Vane tips alternately black and white	Short delay
Vane tips all black	Long delay
Vane tips alternately red and black	Delay marked on fuze and body e. g., C. R. (short delay)

2. On body of fuze above screw threads:

All-white band	Instantaneous
Alternate black and white band	Short delay
Black band	Long delay

Removal of Fuzes

Most fuzes, if unarmed and not badly deformed by impact, may be removed from the bomb with the use of special tools.

Unexploded bombs (if armed) are dangerous to handle, as a jar in one direction, similar to the blow of impact (but much less) may make a striker pierce a detonator; or a jar in the other direction may withdraw a striker from a partially pierced but unfired detonator. The result of either form of movement or shock will probably cause detonation.

Arming vanes should not be screwed or unscrewed nor any parts pushed in or pulled out (this call for great care in the use of the probe when locating). Adhesive tape should be used to lock the fuze and arming devices before bombs are moved, provided this can be effected without movement of the parts.

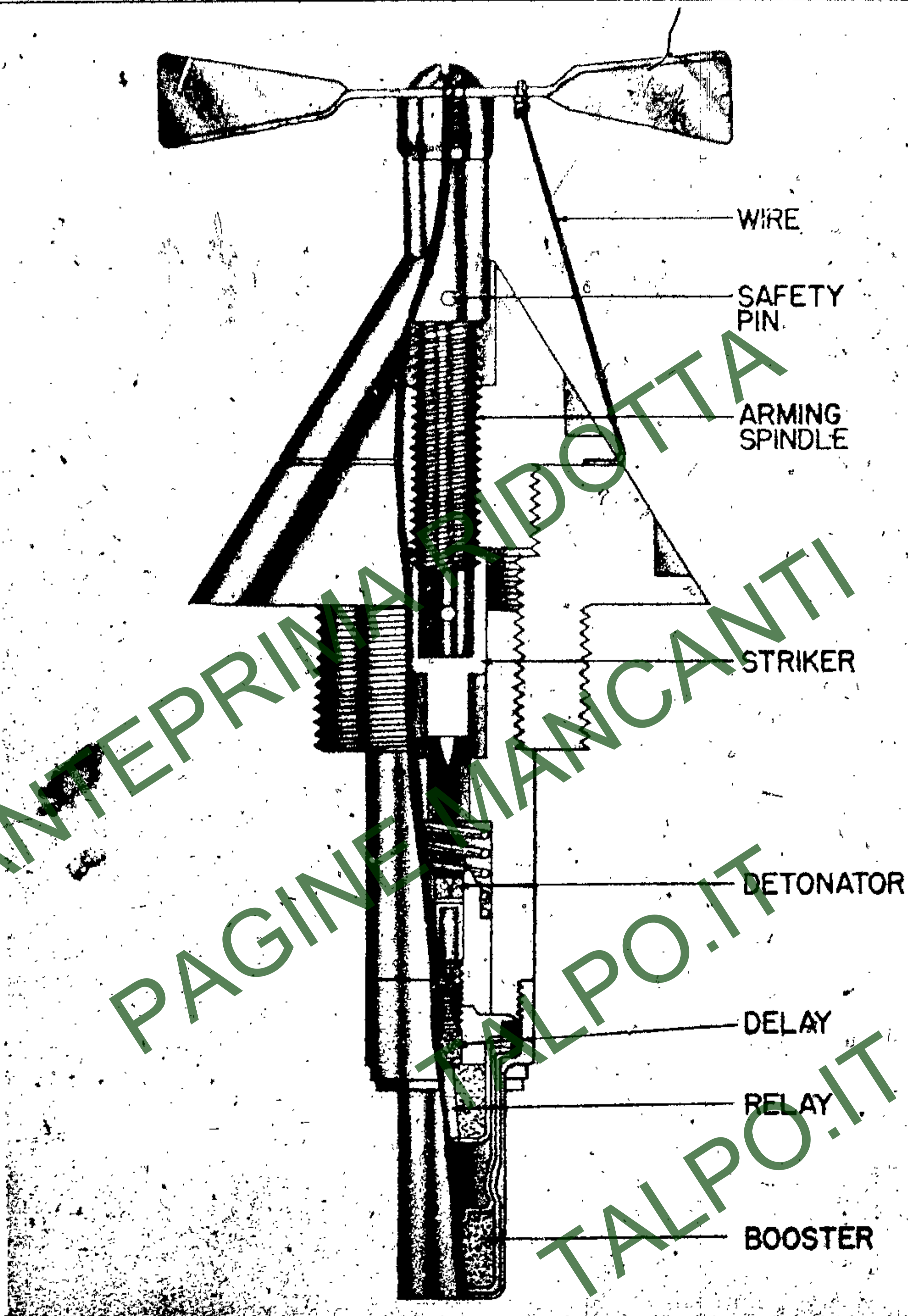


Figure 263 - Mechanical Impact Nose Fuze
Type A

Designation

French bombs may be described as follows.

1. By their type; e. g., percussion-detonating (percutante detonateur)
2. By a letter or number; e. g., H. A. 3 bis
3. By the date of the particular model; e. g., 1921, 1928, 1930

4. By a fraction indicating the dimensions of the fuze; e. g., 24/31, 36/67.5. Here the numerator indicates the diameter, in millimeters, of the threaded portion which screws into the bomb, while the denominator gives the diameter of the base; i. e., the portion which abuts onto the bomb casing.

5. By an abbreviation indicating the delay of the fuze, viz—

I.....	"instantaneous"	Instantaneous
S. R.....	"sans retard"	One or two relays, no delay
C. R.....	"court retard"	Short delay, 0.05 sec.
L. R.....	"long retard"	Long delay, 0.15 sec.
R. S. A.....	"Raymondie sans armament"	Raymondie being the name of manufacturer and "sans armament" meaning without arming device.
bis.....	"bis"	Twice, encore, again

6. Also—all fuzes bear markings indicating the factory or origin, lot number, and year of manufacture, in addition to any designation symbols.

Secondary Safety Devices

Secondary safety devices are used with some French fuzes. These are known as "dispositif de securite largable", and are of three types, as follows:

1. **Safety device Model 1928:** This device is incorporated with the 1928 and 1929 Models of the R. S. A. Fuze when used for horizontal suspension of 10 and 50-kg. bombs, and is shown at the top of Figure 262. It is also used in a slightly modified form with R. S. A. Fuze Model 1925. It consists of two symmetrical steel hoods joined by a band of spring steel. The interior of these hoods is shaped to conform with the contour of the fuze head. The safety device is closed by means of a clip to which cord and a ring are attached. The latter is attached to the ball-release cord, so that the clip is pulled away when the bomb is released. The safety device then opens during the descent of the bomb and falls away.

2. **Safety device, Sch. R. ("Schneider-Raymondie"):** This device, shown in the lower portion of figure 262, is used with R. S. A. Fuze Models 1928 and 1929, for vertical suspension of 10- and 50-kg. bombs. It consists of a steel sleeve through which passes the suspension lug. Attached to the base of the latter is a spring-steel collet, each steel strip having the projection to grip the fuze head. The sleeve can slide over the collet guided by two

screws. When the bomb is released, the sleeve remains with the dropping gear by means of the projection. The collet travels with the fall of the bomb for the length of the sleeve, at which point the strips can open out sufficiently to allow the fuze head to be freed from the releasing gear.

3. **Safety device for use with the R. S. A. Fuze 30/45, Model 1930:** This is shown in figure 266. It consists of a single piece of bronzed steel in the shape of a hood. Inside of the apex of the hood is a spring which holds the head of the fuze away from the hood, and assists in the removal of the hood after the bomb is released. The hood is held in the head of the fuze by three spring-loaded pins, which pass through the lower portion of the wall of the hood, and are held in position by a spring collar. When the collar is closed by the clip, the pins are pressed into a groove on an adapter, which screws into the bomb. When the bomb is released, the clip is pulled away, the three pins are free to move, and, with the assistance of the spring, the safety hood falls away from the path of the bomb.

Mechanical Impact Nose Fuze—Type A

Data

Bombs used in	50-kg., 100-kg., 200-kg., GP-HE and 125-kg.
Fuzes used with	No. 3 Bis Tail Fuze
Over-all length	6.9 in. (with booster)
Over-all length of vanes	3.1 in.
Width of fuze body	2.6 in.

Description

The fuze consists of: (1) An upper brass conical section threaded internally to receive the arming spindle, (2) a truncated, conical section of steel which is externally threaded to screw into the bomb fuze pocket, and internally threaded to receive the upper section of the fuze; and (3) a brass tube containing the detonator.

The striker is attached to the arming spindle by a pin. The detonator is housed in a double-walled copper container which is retained in the rear position by a creep spring.

Vanes are attached to the upper end of the arming spindle by a brass screw, and are prevented from rotating by a safety pin through a slot in the body and a hole in the spindle. A second safety device consists of a copper wire secured to one vane and caught between the upper brass and steel sections of the fuze body. If the fuze is to be used for

ITALIAN AND FRENCH EXPLOSIVE ORDNANCE.

long- or short-delay action, one or more delay pellets may be fitted into the top of the detonator holder.

Operation

When the bomb is dropped, the safety wire is cut and the safety pin is withdrawn. As the vanes rotate, the arming screw advances near the detonator until the striker rests on the recess in the fuze.

On impact, the striker remains stationary, and the detonator holder overcomes the creep spring and hits the striker. The flash from the detonator passes directly to the booster or through the delay and relay pellets to the booster.

Remarks

Fuzes are marked to show the following functions:
S. R.—Instantaneous
C. R.—(Short Delay) 0.05 seconds
L. R.—(Long Delay) 0.15 seconds

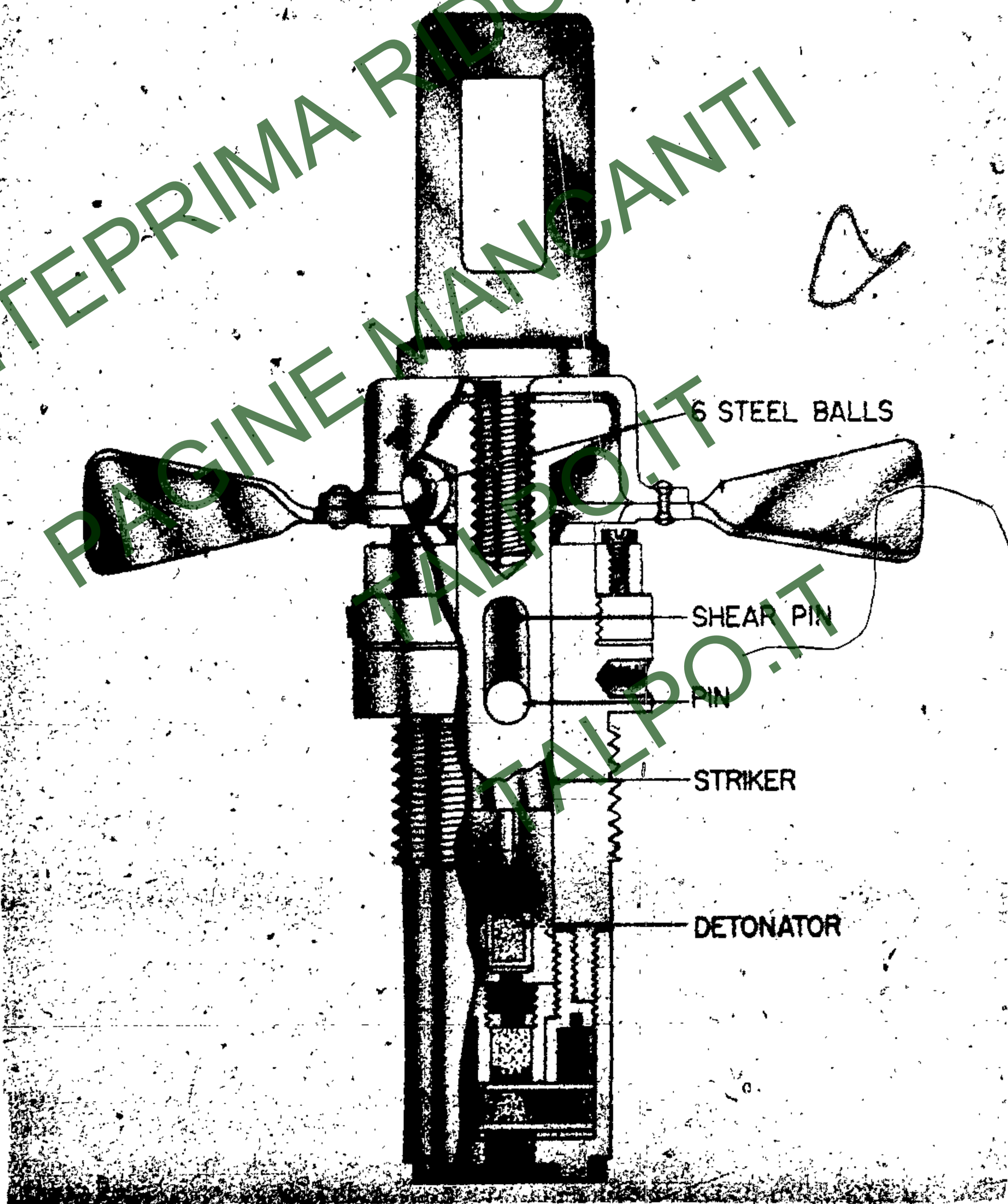


Figure 264 — Mechanical Impact Nose Fuze—
Type H

**Mechanical Impact Nose Fuzes Type H
Models 1921 and 1929**

Data

Bombs used in	
10-kg. P. A. Anti-Personnel, 50-kg. D. T. No. 2	
G. P.-H. E.	
Fuzes used with	
Alone in 10-kg. 3 Bis or Sch. R. Tail Fuze in	
50-kg.	
Over-all length	
(With booster) Model 1921	5.6 in.
(Without booster) Model	
1929	4.6 in.
Over-all length of vanes	
Model 1921	3.5 in.
Model 1929	3.25 in.
Width of fuze body	
Model 1921	1.2 in.
Model 1929	1.3 in.
Markings	24/31-H-Mle. 21 or 29

Description

These fuzes are similar in outward appearance, differing mainly in size and detonator assembly, but both are easily distinguished by the square eyebolt on the upper cap. Sixteen vanes are formed on a ring riveted to the cap. The base of the eyebolt has a bolt formed with it which screws into the striker. Between the striker plate and the upper locking ring of the body are six steel balls.

A brass ring is screwed over the main brass fuze body and secured by a setscrew. The striker is held in place by a steel threaded pin through the fuze body which passes through the lower portion of the slot in the striker. A brass shear pin also passes through the slot and the body.

The model 1921 has a long booster containing a detonator, a booster charge on the detonator, and delay, relay, and booster charges. The model 1929 has a short detonator holder containing a detonator cap, delay, and relay. These fuzes may give instantaneous, short-delay (0.05 sec.) or long-delay (0.15 sec.) action, depending on the delay pellet used.

Operation

As the bomb is released, the safety pin is withdrawn, freeing the vanes. When vanes have rotated sufficiently, steel balls fall out and finally the vanes completely unscrew and fall out, carrying the suspension eyebolt with them. The striker is now held only by the shear pin. On impact, the striker shears the pin and hits the detonator.

**Nose Impact Fuzes R.S.A. Models 1925,
1928, and 1929**

Data

Bombs used in	
Mle. 25—10-kg. G. P.-H. E.	
Mle. 28—10-kg. and 50 kg. G. P.-H. E.	
Mle. 29—10-kg. Incendiary Model 1927	
Fuzes used with	
Mle. 1925 and 1928—Alone	
Mle. 1929—Tail Fuze No. 3 Bis or Sch. R.	
Over-all length	
(With booster) Mle. 25	5.15 in.
(With booster) Mle. 28	4.2 in.
(Without booster) Mle. 29	3.4 in.
Width of fuze body	
Mle. 25 and 29	1.2 in.
Mle. 28	1.15 in.
Markings	R. S.-A. Mle. 25; or 28; or 29 24131

Description

Similar in function and appearance, these fuzes differ slightly in construction. Mle. 28 and 29 are one-piece, Mle. 25 consists of two pieces screwed together. The upper part of the body contains a Raymondie (or Re'mondy) percussion-arming device, consisting of a cup with a detonator in the base and two vertical slots in the walls to receive the wings of a washer resting on top of the detonator. The striker and cup are held by a shear pin which passes through the fuze body.

Below the creep spring between the striker and washer, a central flash channel leads to the relay pellet and booster in Mle. 25; in Mle. 28, the brass fitting contains a delay pellet and relay pellet; Mle. 29 is similar to Mle. 28 that except a short booster replaces a long one sealed by lead solder, the fuze being used to ignite incendiaries.

Operation

These fuzes are used with or without secondary safety device (other than the shear pin) in the striker. The secondary safety is removed when the bomb is released; no further arming occurs until impact, when the striker and cup are forced back. The shear pin joins them, and comes to rest against the upper ledge in the fuze recess while the detonator cap sets forward against the washer in slots of the cup and against a creep spring. The detonator and washer overcome the creep spring; the detonator hits the striker, igniting the explosive system.

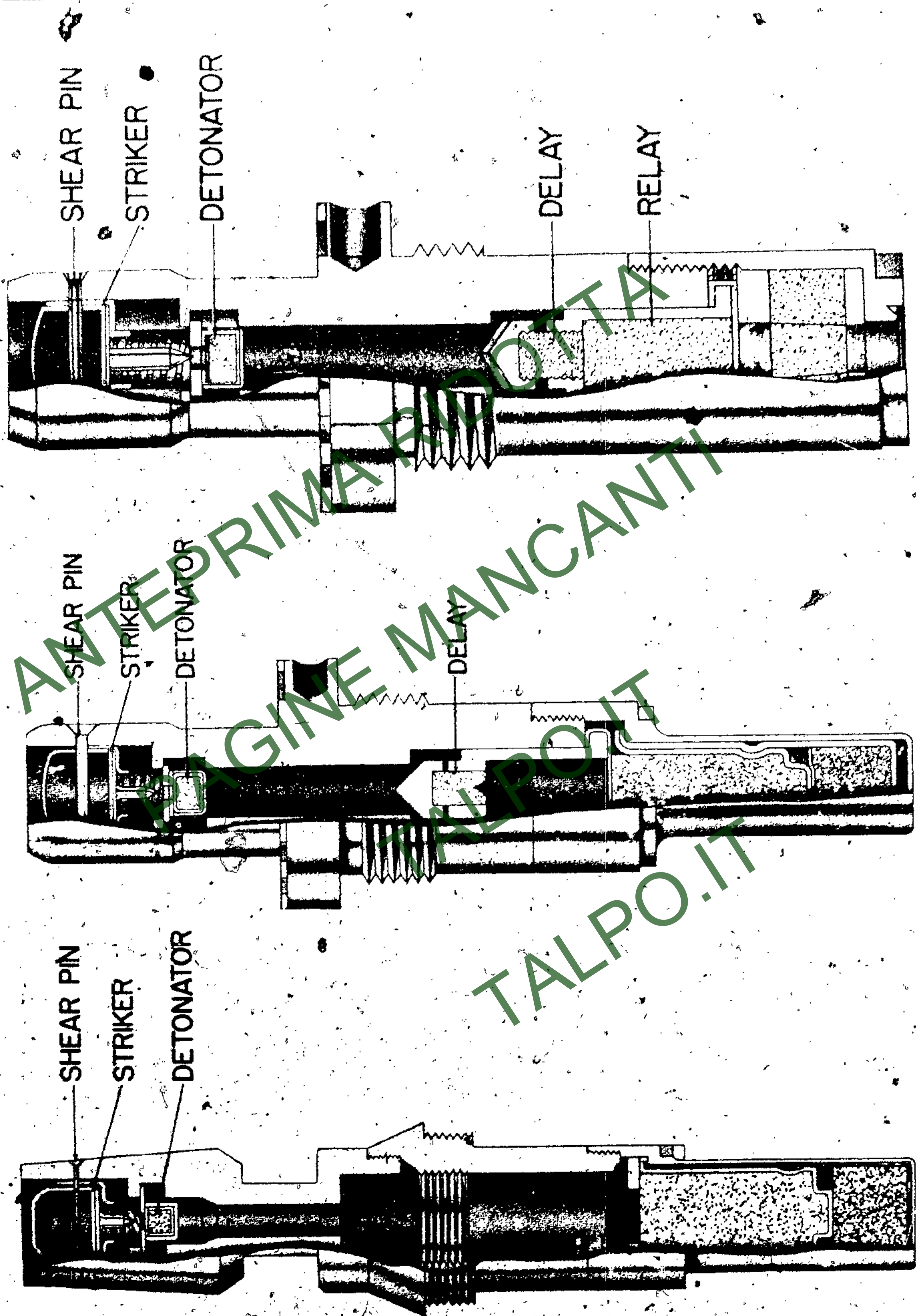


Figure 265 - Nose Impact Fuzes R.S.A. Models 1925, 1928, 1929

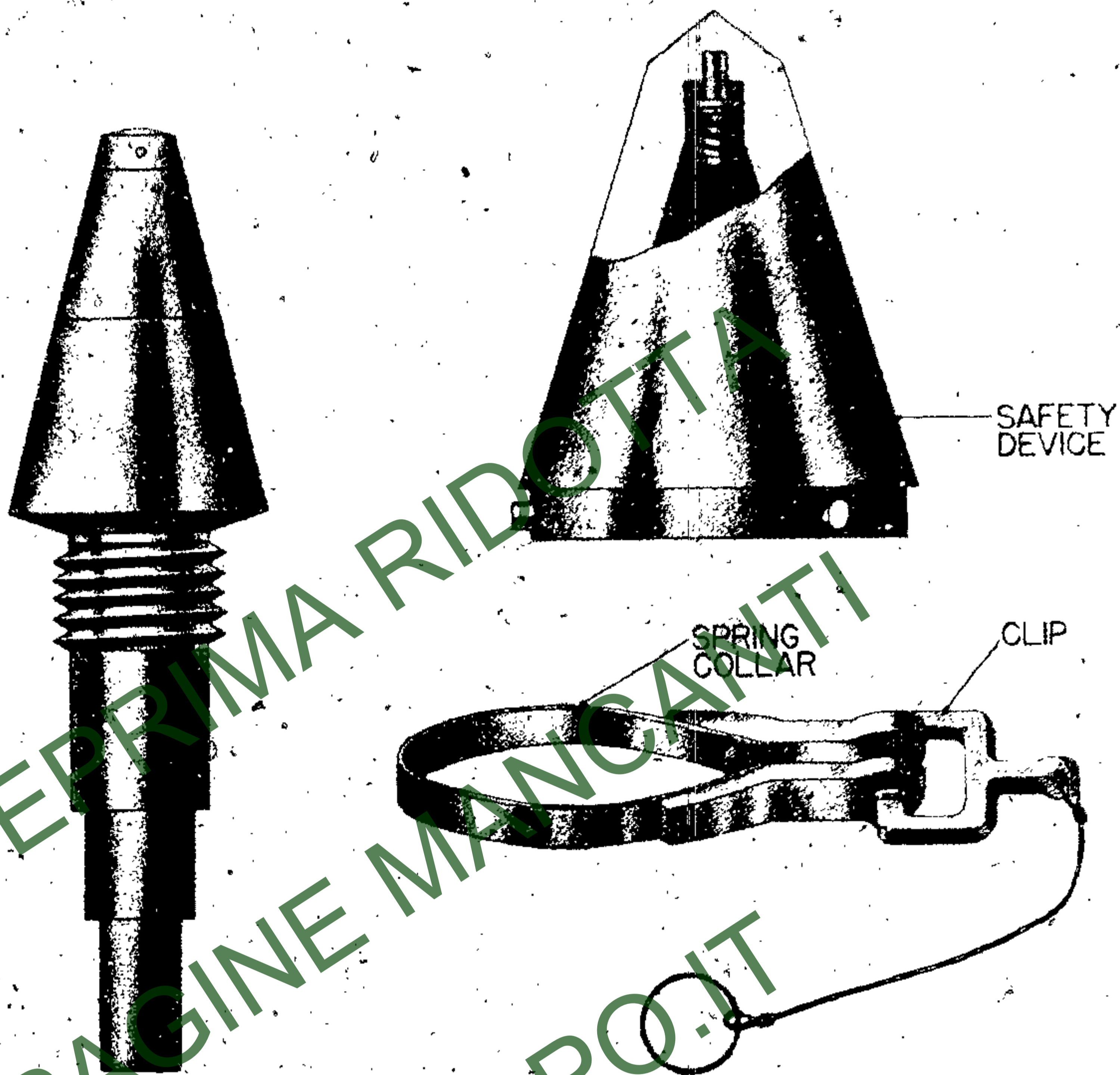


Figure 266 - Nose Impact Fuze R.S.A. Model 1930

Nose Impact Fuze R.S.A. Model 1930

Data

- Bombs used in
100-kg., 200-kg., 500-kg., (No. 2), 500-kg.
(Model 1930) G. P.-H. E. May be found in
other bombs from 100-kg. to 1,000-kg.
- Fuzes used with
No. 3 Bis. or Sch. R. Model 1938
- Over-all length..... 6.8 in.
- Width of fuze..... 1.8 in.

Description

The internal assembly of this fuze is the same as the other R. S. A. models already described. The distinguishing features are the truncated hood and the large diameter. The hood on the dome cover is set down over the regular R. S. A. fuze mechanism.

At the apex inside the dome, there is a spring which is compressed when the hood is placed on the

fuze. Around the base of the hood are three spring loaded detents. The clip fits around the base of the hood and compresses the spring-loaded detents which are pressed into the A-groove on an adapter which screws into the bomb.

Operation

When the bomb is released, the clip is pulled away, releasing the spring-loaded detents which spring out and fall away. The hood then falls off with the help of the spring. The function of the fuze then is the same as described in the R. S. A. Models 1925, 1928, and 1929.

Remarks

The usual markings to indicate the delay are found on the pin at the base of the truncated hood and are as follows:

- White—Instantaneous
- Alternate Black and White—Short delay
0.05 seconds
- Black—Long delay 0.15 second

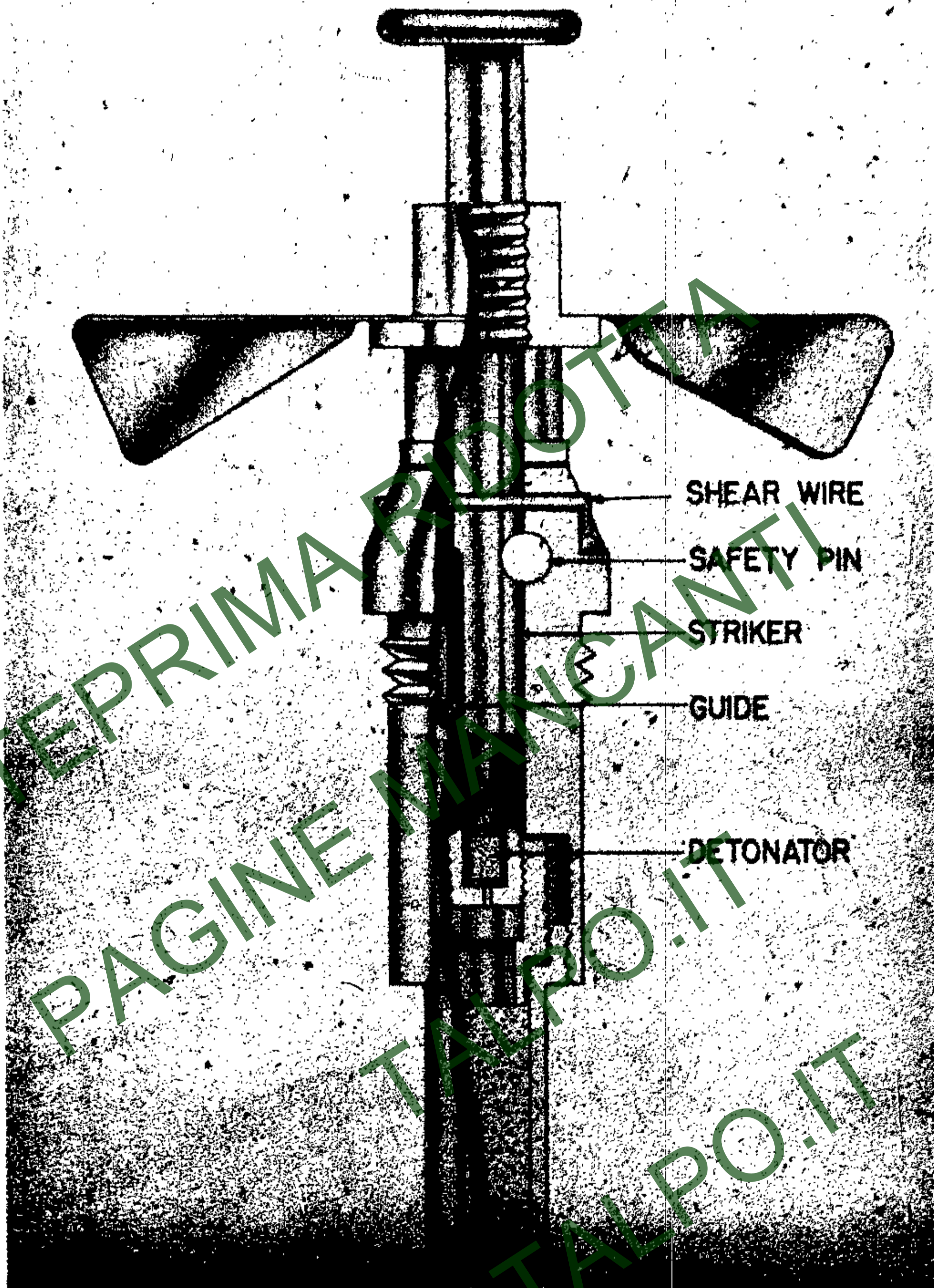


Figure 267 - Mechanical Impact Nose Fuze
M. Bis

Mechanical Impact Nose Fuze—M. Bis

Data

Bombs used in.....	10-kg. Anti-Personnel
Fuzes used with.....	Alone
Over-all length.....	5.1 in.
Over-all length of vanes....	3.4 in.
Width of fuze body.....	1.2 in.

Description

This fuze consists of a brass body and steel striker. The striker is held in place by the safety

bolt, which passes through the fuze body and engages a groove in the striker. The arming vanes are screw-threaded on the striker. The shear wire passes through the striker and body.

Operation

When the bomb is dropped, the safety bolt is removed. The vanes rotate and rise on the striker spindle. On impact, the striker is forced down, cutting the shear pin and contacting the detonator, initiating the explosion.

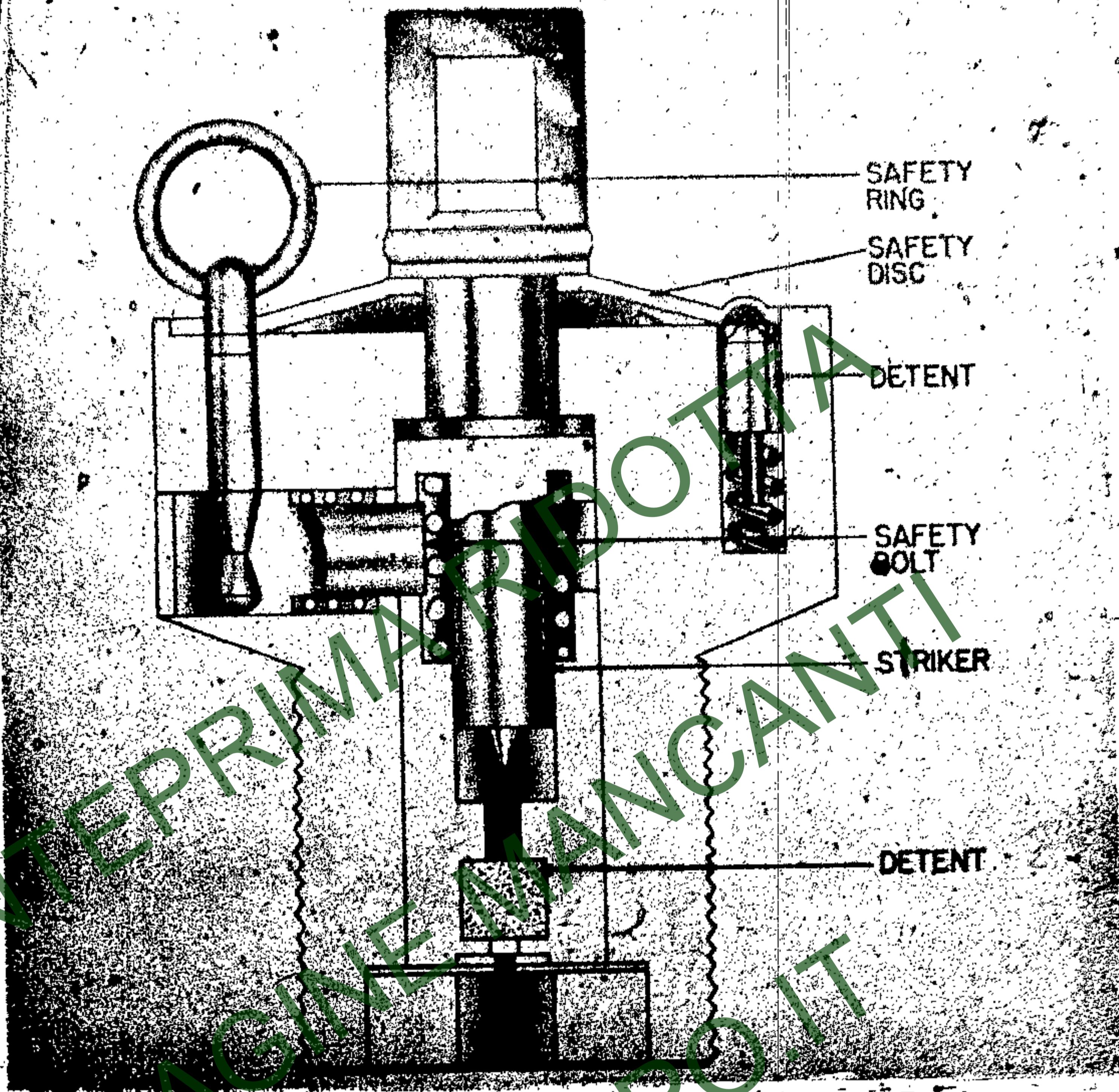


Figure 268 - Incendiary Bomb Fuze

Incendiary Bomb Fuzes Models 1925 and 1930

Data

Bombs used in	Both models 1-kg. Magnesium Incendiary Bombs
Fuzes used with	Alone
Over-all length	3.4 in. (With lug)
Width of fuze body	2.0 in.
Material of construction ..	Magnesium Alloy

Description

The main fuze body is cylindrical, tapering sharply to a smaller cylinder threaded to screw into the bomb case. The top of the fuze is covered by a domed safety cover held in place by a square suspension lug screwed onto the central pillar the base of which is flanged to fit into the striker recess of the fuze. The safety cover has two domed projections 90 degrees apart to receive the spring-loaded stop held in a recess in the body. A safety pin is located in the fuze head 180 degrees from the

spring-loaded stop and is prevented from moving by the safety cover in the safe position. There is a ring at the upper part of the safety pin. The striker block and inertia weight containing the detonator are kept apart by a creep spring and a spring-loaded safety bolt held between the two parts by the safety pin.

Operation

When the bomb is placed in the plane, the suspension lug is rotated 90 degrees, causing the safety cover to rotate also. This allows the opening in the safety cover to come beneath the safety pin, freeing the pin. When the bomb is released, the safety pin ring, which has been held by the dropping gear, is withdrawn; this allows the spring-loaded safety bolt to move from between the striker block and the inertia cap holder. On impact, the inertia cap holder "sets forward", compressing the creep spring until the striker detonates the detonator.

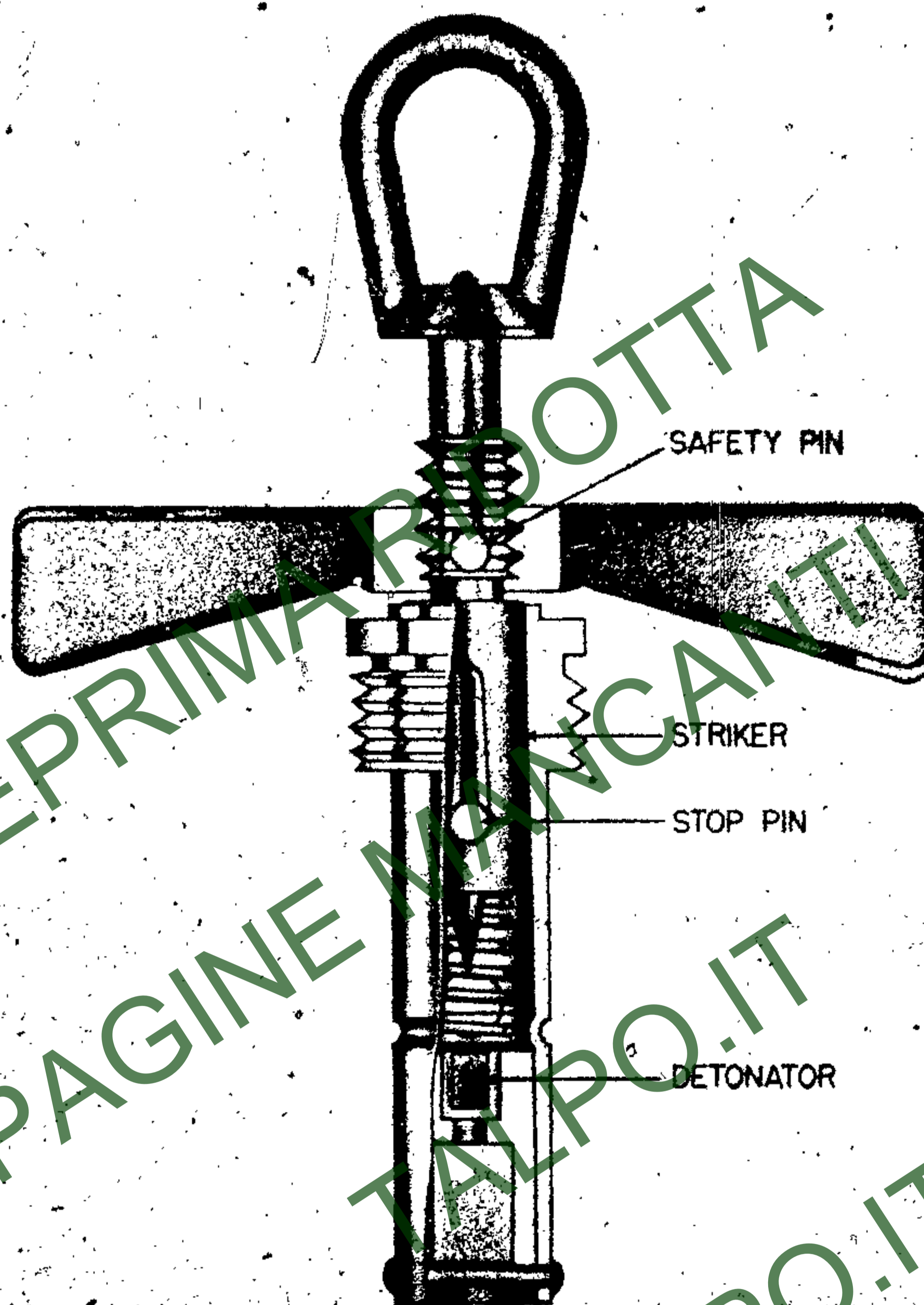


Figure 269 - Mechanical Impact Nose Fuze
(Designation Unknown)

Mechanical Impact Nose Fuze (Designation Unknown)

Data

Bombs used in.....	Unknown
Fuze used with.....	Alone
Over-all length.....	4.5 in.
Over-all length of vanes.....	3.2 in.
Width of fuze body.....	0.9 in.

Description

The nose of the fuze consists of a lug which is a part of the striker. The striker is threaded just below the lug in order to receive the arming vanes.

The fuze body has a narrow shoulder, immediately beneath which are the threads which screw into the nose-fuze pocket of the bomb. A stop pin inserted in a channel in the striker prevents the spindle from turning with the arming vanes. The primer cap is located in the lower part of the fuze body, with another small charge of explosives. A creep spring separates the striker from the primer.

Operation

The safety pin is withdrawn when the bomb is dropped. The vanes rotate in flight and raise the striker. The striker then rests on the creep spring. Upon impact, the striker overcomes the creep spring, contacts the primer, and initiates the explosion.

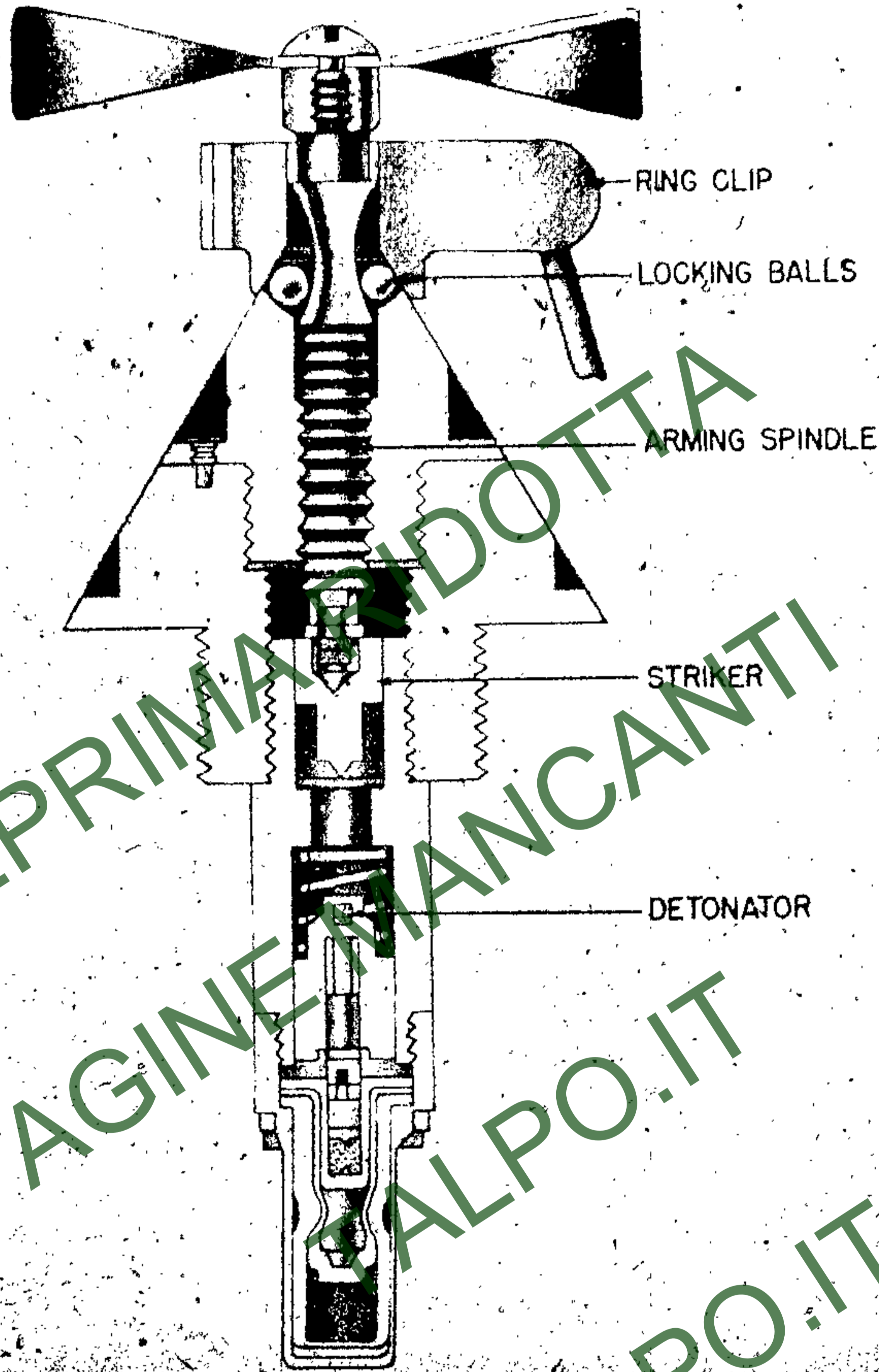


Figure 270 - Mechanical Impact Nose Fuze
No. 10

Mechanical Impact Nose Fuzes No. 9 and No. 10

Data

Bombs used in

No. 9—410-kg. Type I (Naval)

No. 10—125-kg. and 224-kg. Type K (Naval)

Over-all length (No. 10) 6.3 in.

Over-all length of vanes (No. 10) 3.0 in.

Width of fuze body (No. 10) 2.5 in.

Dimensions of No. 9 Unknown

Description

The No. 9 and No. 10 are similar in operation.

The only difference between them is that the No. 10 Fuze has a longer delay. The portion of the fuze which protrudes from the bomb is cone-shaped. A ring clip is inserted between the fuze body and the vanes. The clip retains the two steel balls which fit in the depression of the arming spindle. The striker spindle is attached to the arming spindle by a pin. The detonator is held back by a creep spring. The fuze body is threaded immediately beneath the cone to thread into the bomb-fuze pocket. The base of the fuze is threaded to receive the booster and delay element.

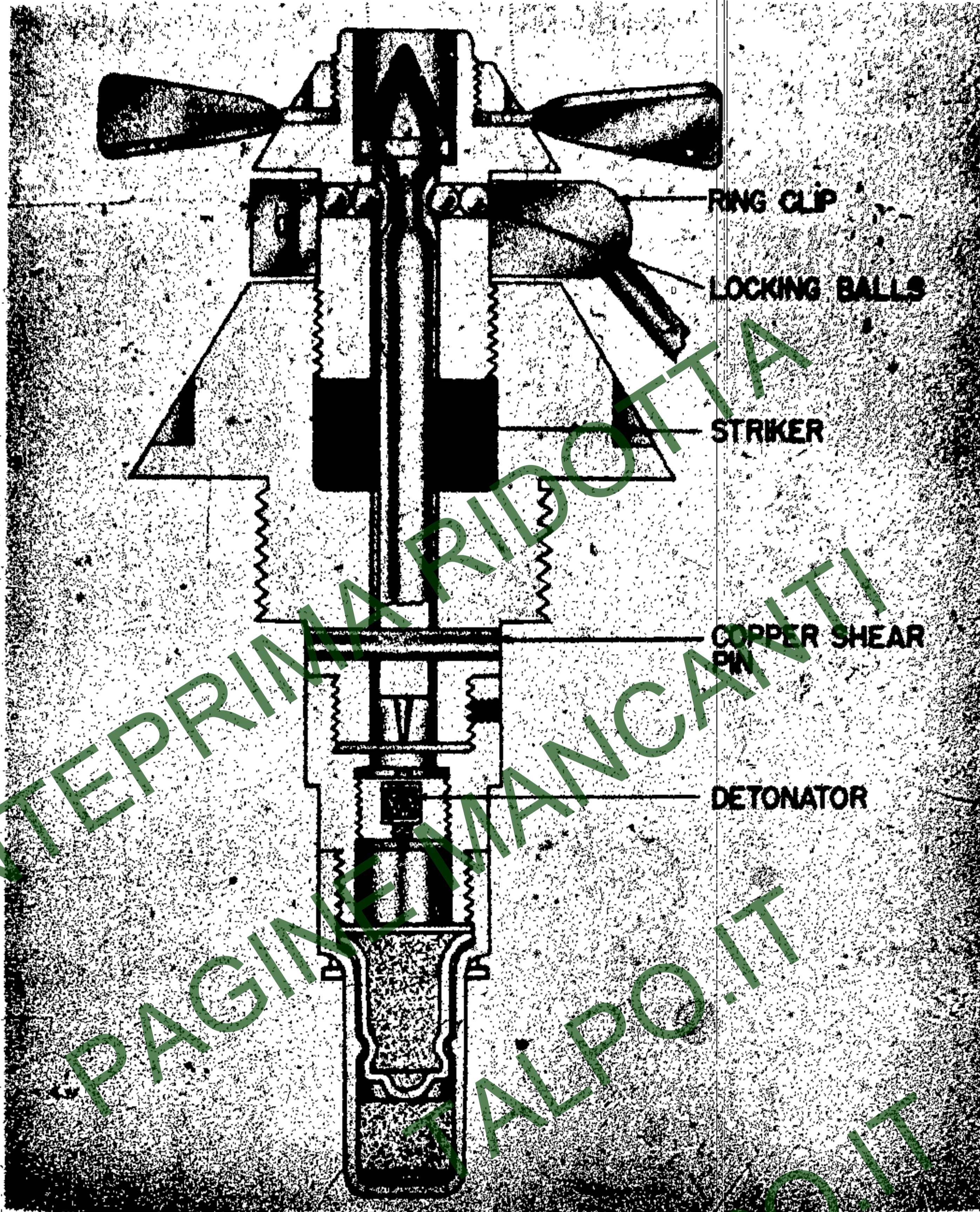


Figure 271 - Mechanical Impact Nose Fuze Type No. 11

Operation

The safety clip is withdrawn upon releasing from the plane. This releases the steel balls, which fall out, permitting the rotation of the arming spindle and vanes to lower the striker until it recesses on the shoulder in the lower part of the fuze. On impact, the detonator overcomes the creep spring and hits the striker.

Mechanical Impact Nose Fuze Type No. 11

Data

Bombs used in
73-kg. G2 (Naval)

150-kg. 12 (Naval)	
720-kg. Type M (Naval)	
Fuzes used with	Unknown
Over-all length	6.0 in. (with booster)
Over-all length	3.0 in.
Width of fuze body	2.6 in.

Description

The portion of the fuze which protrudes from the bomb is cone-shaped. The vanes and vane housing are held from the fuze body by the safety clip. The striker has a painted head which rests in the recess of the vane housing and is held in position by a

copper shear pin. The upper recess of the fuze body is threaded to receive the vane housing. The fuze body is externally threaded beneath the cone to screw into the bomb. The detonating element is contained in a small cup-shaped container which screws onto the base of the fuze.

Operation

Upon being dropped from the plane, the safety clip is withdrawn, and the balls fall out, releasing vane housing. The vanes rotate and screw the vane housing into the recess of the body which exposes the striker head. Upon impact, the striker head is forced down, shearing the copper pin and striking the detonator cap, exploding the bomb.

Mechanical Impact Tail Fuze No. 3 Bis.

Data

- Bombs used in
 - 50-kg., 100-kg., 200-kg., 500-kg. G. P.-H. E.
- Fuzes used with
 - Type H Model 1921
 - R. S. A. Mle. 25, Mle. 28, and Mle. 1930
- Over-all length ----- 16.0 in. (with booster)
- 14.5 in. (without booster)
- Over-all length of vanes ----- 3.0 in.
- Width of fuze body ----- 0.9 in.

Description

The body is long and cylindrical, being internally threaded at the top to receive the dome-shaped brass collar. The brass collar is internally threaded to receive the arming spindle. The arming spindle is connected to the vanes, which are six in number. The arming spindle screws into the striker. Beneath the striker are the creep spring and detonator. The base of the body is externally threaded to screw into the bomb, and it also has external threads at the base to receive the booster.

Operation

A piece of copper wire prevents the vanes from rotating. Upon being released from the plane, the wire is broken, permitting the vanes to rotate, thus withdrawing the arming spindle. The vanes and spindle may fall away and free the striker to rest on the creep spring. The fuze is fully armed when the threaded spindle is withdrawn 0.5 in. Upon impact, the striker overcomes the creep spring, striking the detonator, which ignites black powder in the tube. The flash goes down the flash channel to the delay and relay elements respectively, which detonate the bomb.

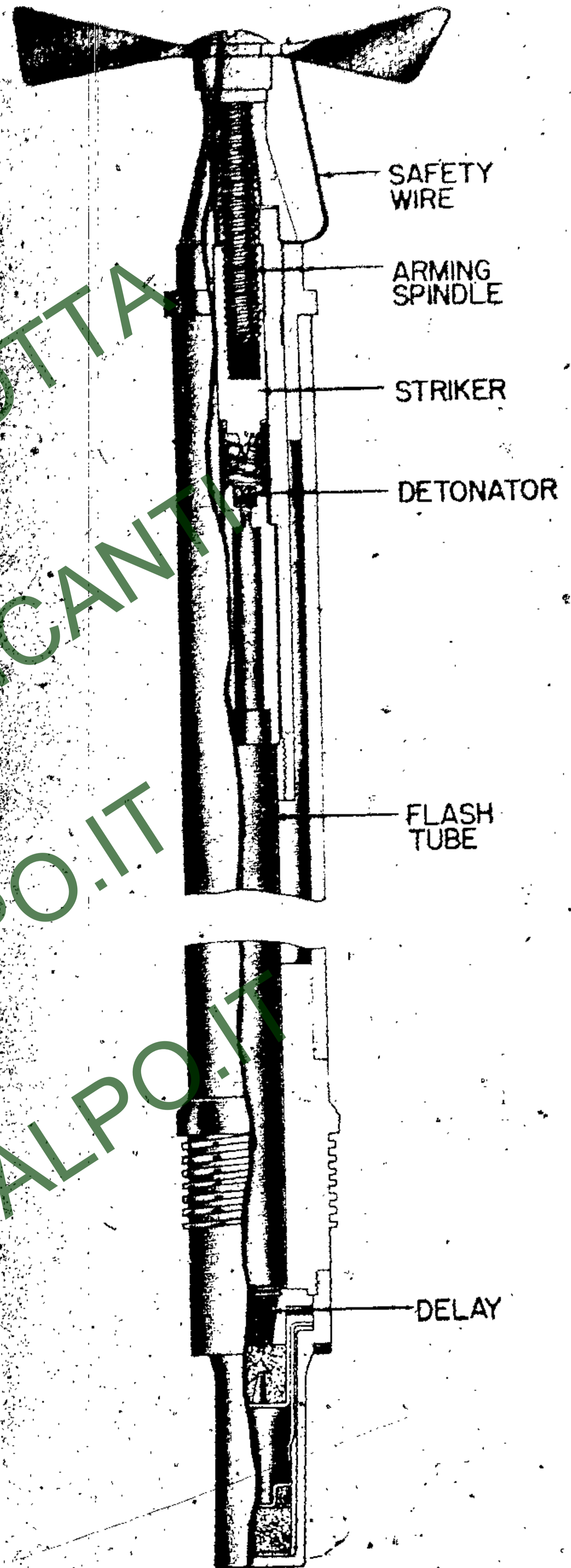


Figure 272 - Mechanical Impact Tail Fuze No. 3 Bis