

Part III
British Under-
water Ordnance

MINE DISPOSAL HANDBOOK

PART III

BRITISH UNDERWATER ORDNANCE



CONFIDENTIAL

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CHAPTER 5

BRITISH DEPTH BOMBS

Depth
Bombs

BRITISH DEPTH BOMBS

British Designation	Total Weight (lbs.)	Type & Wt. of Charge (lbs.)	Shape of Nose	Max. Diam.	Overall Length (in.)	Fuzing	Markings	Status
Mk. I	100	45 RDX/TNT or 49 Torpex	Round	8.05	42	Nose Fuze # 32	Dark green overall, 1/2" red band	Obsolescent
Mk. II	100	"	"	"	"	"	1" from nose, 1" light green band 6"	"
Mk. III	100	"	"	"	"	"	from nose. Early de- signs, yellow overall.	"
Mk. IV	100	"	"	"	"	Tail Pistols #28 or #30		"
Mk. VI	100	"	See Note 1	"	See Note 1	"		Service
Mk. I	250	149 Baratol or 140 TNT	Round	11.2	59	Nose Fuze # 32	Same as 100 lb. class, except that light green band is 4 1/2"	Obsolescent
Mk. II	250	"	"	"	"	"		"
Mk. III	250	"	"	"	"	"		"
Mk. IV	250	134 RDX/TNT 132 TNT	"	11.35	58	Tail Pistols #28 or #30	from nose.	Service
Mk. I	500	291 TNT	Round	14.0	74	Nose Fuze # 32	Same as 100 lb. class, except that light green band is 6"	Obsolescent
Mk. II	500	"	"	"	"	"		"
Mk. III	500	308 Baratol	"	14.3	76	"		"
Mk. IV	500	282 TNT	"	"	72.5	Tail Pistols #28 or #30	from nose.	"
Mk. I	600	432 Minol 439 Torpex	Concave	17.5	56.7	Tail Fuze # 862	Same general markings.	Service

Note -

- Attachment welded to nose to prevent ricochet, increasing the overall length of 42 inches by several inches.

Table 1 - British Depth Bombs

British Designation	Location	Fitted in the following bombs	Means of Arming	Means of Firing	Max. Diam.	Length	Status
No. 32 Fuze	Nose	Mk. I, II, III series.	Air vanes. 200 ft. at 100 m/hr.	Impact with delays of 0.5, 1.0, 1.5, 2.0 seconds.	2 1/2	7 1/2	Obsolescent.
No. 30 Pistol No. 28 Pistol	Tail	Mk. IV, VI Series.	Air vane. 13 revolutions	Impact with delays up to 11 seconds.	2 1/2	3 1/8	Service. # 28 is for land bombardment.
No. 862 Fuze	Tail	Mk. I 600 lbs.	Arming wire with-drawn.	Hydro-static Pressure 30 ft. depth.	2 1/2	5 1/2	Service.
No. 875 & 895 Fuzes	Tail	Mk. VI 100 lb. Mk. I 600 lb.	Arming wire with-drawn.	Hydro-static Pressure.	2 1/2	4 7/8	Service 895 is replacing 875.

Table 2 - British Depth Bomb Fuzes and Pistols

Introduction

1. The British employ four sizes and types of depth bombs:
 - (a) 100 lb. Marks I, II, III, IV and VI.
 - (b) 250 lb. Marks I, II, III and IV.
 - (c) 500 lb. Marks I, II, III and IV.
 - (d) 600 lb. Mark I.
2. Service depth bombs are ordinarily fuzeed in the tail only, although earlier models, now obsolescent, employ only nose fuzes. In rare cases, both nose and tail fuzes may be encountered. Two methods are employed to obtain depth firing:
 - (a) Delay firing detonators and powder trains.
 - (b) Hydrostatic fuzes.
3. All service depth bombs are painted dark green overall although earlier models are painted yellow. A 1" light green band is painted around the nose just abaft an 0.5" red band.
4. The bomb cases are either cylindrical with round ends or tear-drop shaped, and are fitted with the standard British single suspension lug on the top center line. The 600 lb. Mark I may also be fitted with double suspension lugs for use with U. S. aircraft.
5. The tail sections for these bombs consist of a cone fitted with four fins mounted radially at 90° to each other and enclosed in a cylindrical shroud. On these bombs which take vane-armed impact-firing tail fuzes, a cylindrical vane extension rod extends from the after end of the tail body through its longitudinal axis to the fuze body in the bomb case. This rod serves as an arming spindle, the arming vane being attached to its outer end while its forked inner end engages an arming nut on the fuze. All tail sections are secured to the bomb cases by four spring clips except in the case of the 100 lb. Mark VI, the tail section of which is secured by four bolts. The clip-secured tail sections are designed to break off on impact with the water.
6. The following general precautions should be observed when dealing with bombs of this type:
 - (a) Obtain all possible information covering the type of bomb and the type and condition of the fuze or fuzes fitted before attempting any disposal operations.
 - (b) Do not attempt to render safe unless absolutely necessary. Destroy the bomb by countermining whenever feasible.
 - (c) Do not move or jar the bomb unnecessarily.
 - (d) Never move or rotate the arming vanes.
 - (e) When diving operations are necessary, raise the bomb before proceeding to render it safe.
 - (f) If a fuze is jammed in its pocket, make every effort to dispose of it by means other than withdrawal or disassembly. If it is not feasible to countermine the bomb where it lies, it may be more desirable to transport it to a demolition area for countermining than to attempt to render it safe.
 - (g) When dealing with a bomb which has multiple fuzeing, dispose of the nose and tail fuzes in that order.
 - (h) Mine Disposal personnel should not attempt disassembly of fuzes fitted except as hereinafter indicated.
7. Rendering these bombs safe consists of disposing of the particular fuze or fuzes which may be fitted. A brief description and operation of each fuze, together with the approved procedure for rendering safe, is included below.

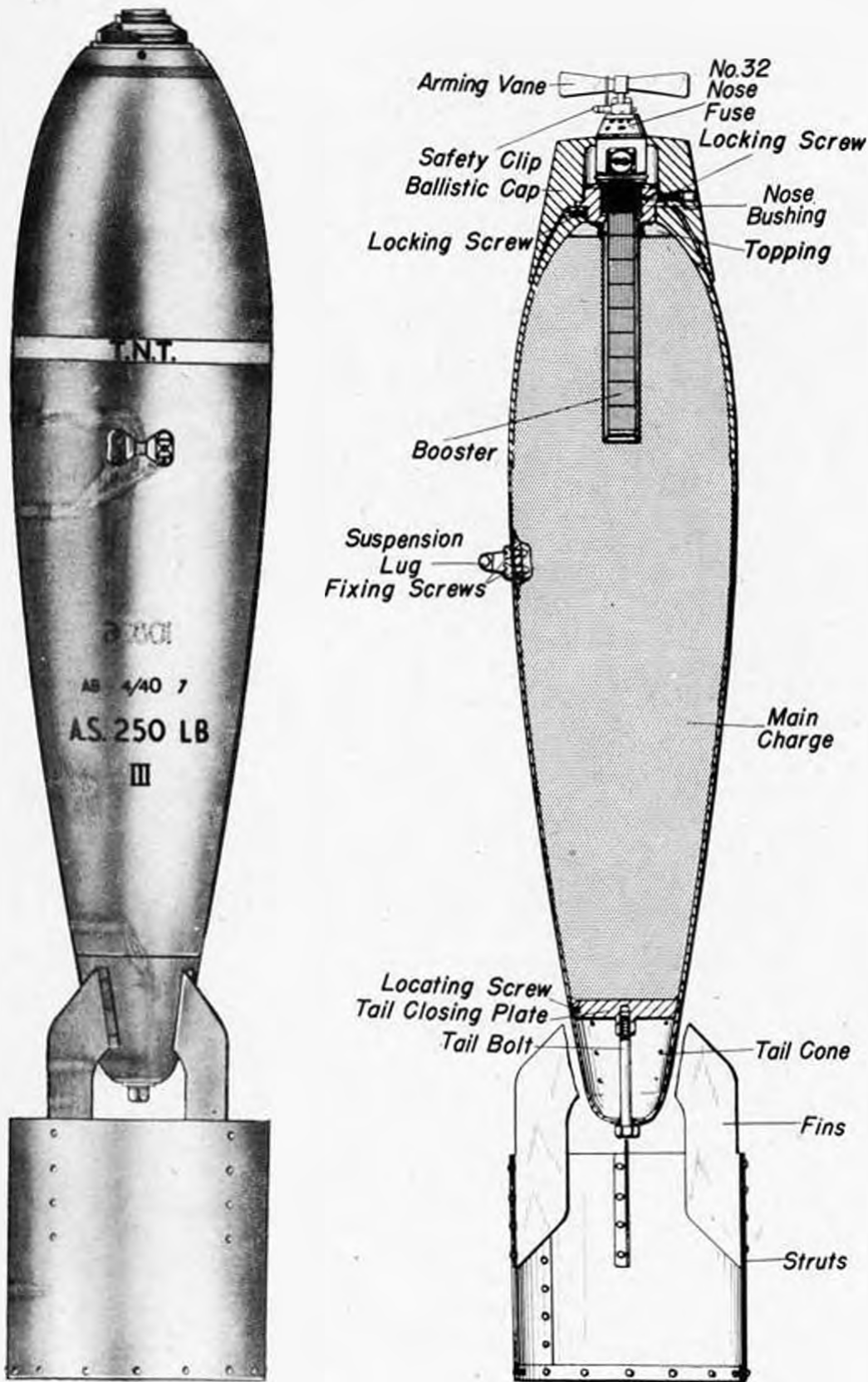


Fig. 1 - Mk. I, II and III Series of 100, Fig. 2 - Mk. I, II and III Series of 100, 200 and 500 lb. Depth Bombs, Elevation

200 and 500 lb. Depth Bombs, Sectional View



Fig. 3 - Mk. IV Series of 100, 250 and 500 lb. Depth Bombs, Elevation

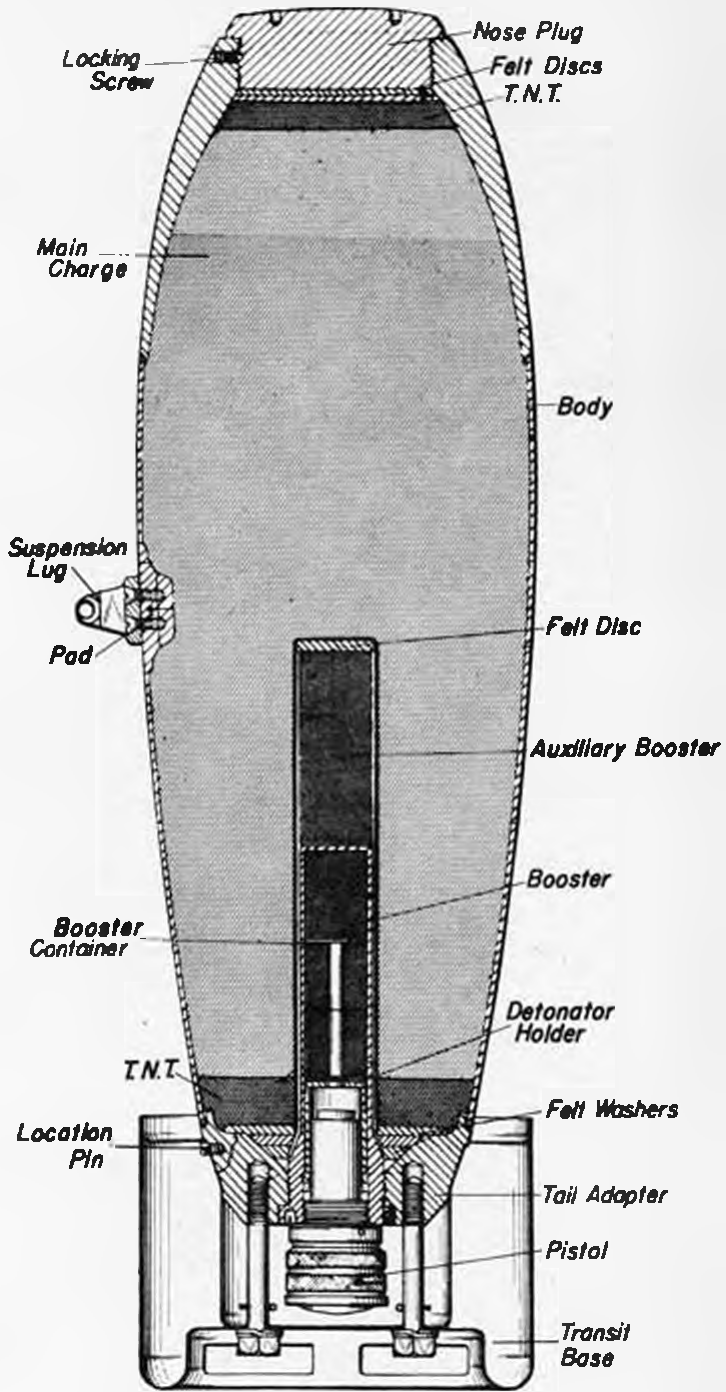


Fig. 4 - Mk. IV Series of 100, 250 and 500 lb. Depth Bombs, Sectional View

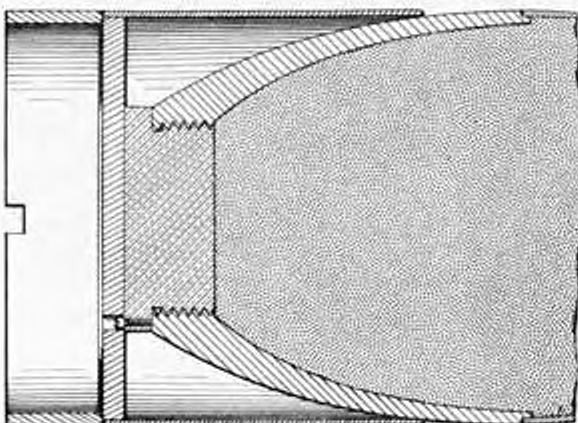


Fig. 5

Nose Modification for Converting Mk. IV 100 lb. to Mk. VI 100 lb. Depth Bomb

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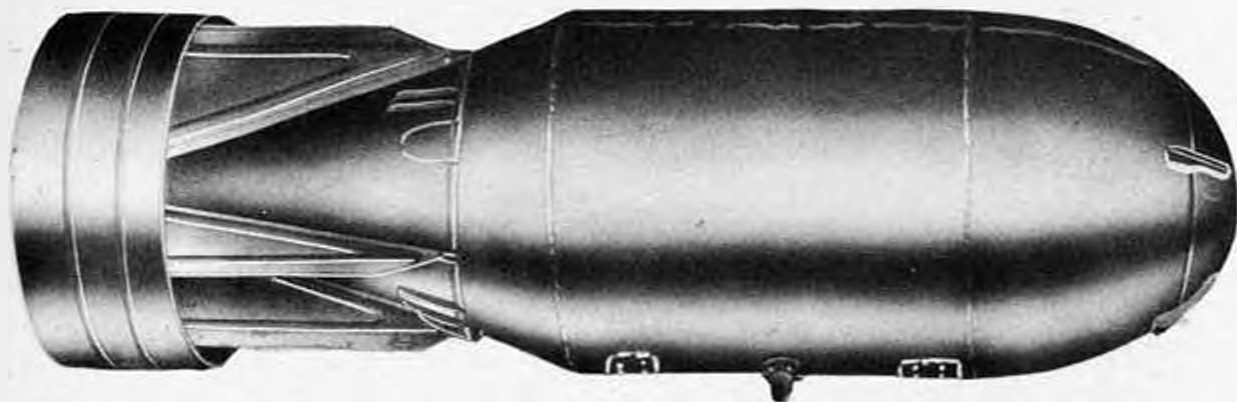


Fig. 6 - Mk. I, 600 lb. Depth Bomb, Elevation

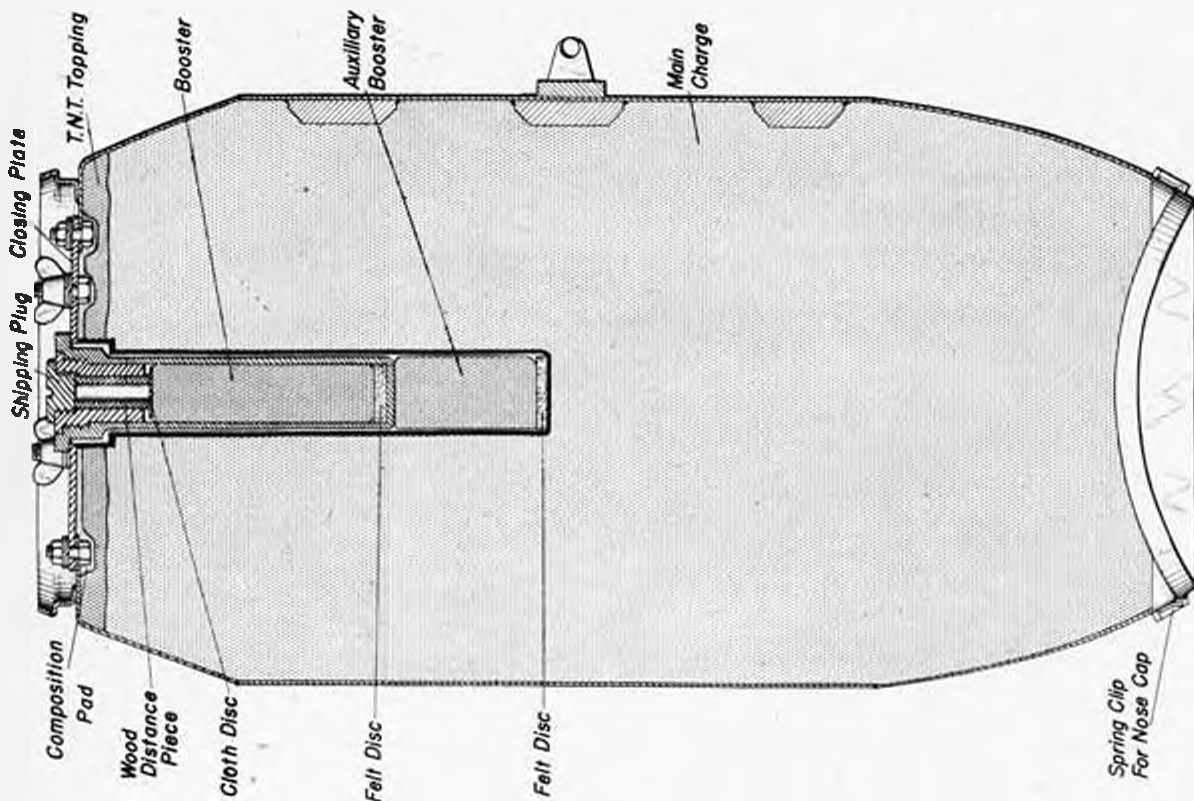


FIG. 7 - Mk. I, 600 lb. Depth Bomb without Tail or Nose Cap, Sectional View

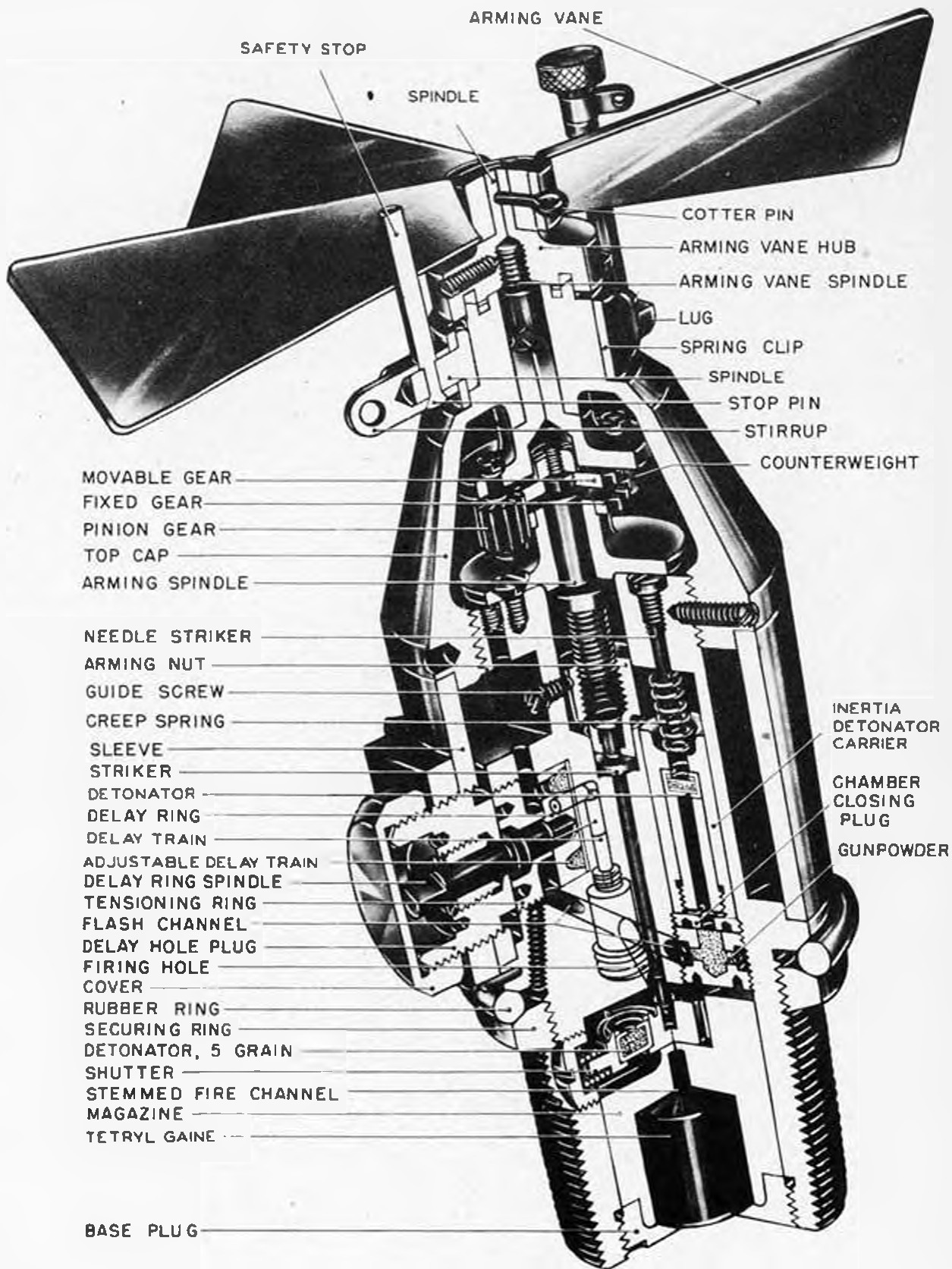
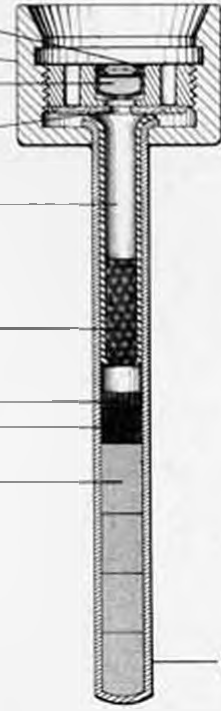


Fig. 8 - Nose Fuze #32, Sectional View

BRITISH DEPTH BOMBS



PAPER LABEL

HEAD

PERCUSSION CAP

FLASH HOLES

FLASH CHANNEL

DELAY COMPOSITION

PRESSED GUN POWDER

A.S.A. MIXTURE

PRESSED TETRYL

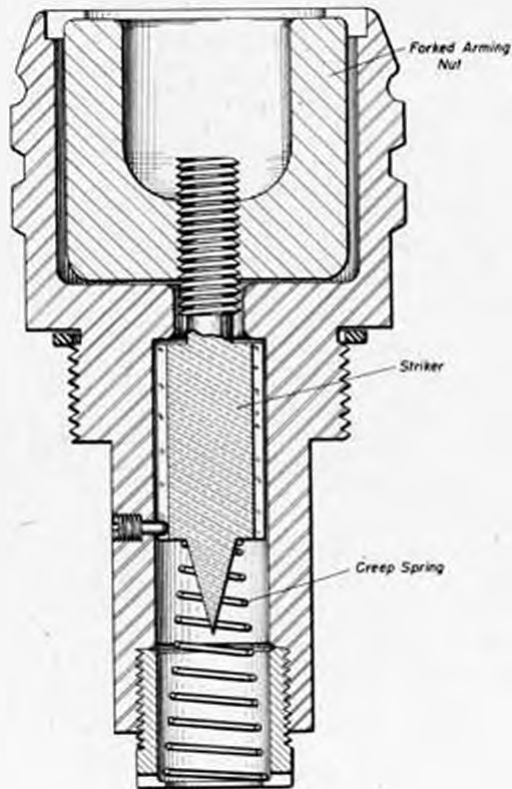
$\frac{3}{8}$ " BAND OF BLACK PAINT

$\frac{3}{8}$ " BAND OF ALUMINUM PAINT

1" LENGTH PAINTED RED

Fig. 9 - No. 49 Detonator, Mk. I, Sectional View

Fig. 10 - No. 53 Detonator, Mk. I, Sectional View



Forked Arming Nut

Striker

Creep Spring

Fig. 11 - Tail Pistol #28, Sectional View. (Tail Pistol #30 is identical except for round-nosed striker.)

Nose Fuze #32, Marks II° and IIIDescription

1. Instantaneous or short delay impact fuze incorporating firing delays of 0.5, 1, 1.5, or 2 seconds. The fuze screws into a pocket in a booster container which in turn screws into the bomb case and is locked by a single set screw. A rubber washer and securing ring make a water-tight joint around the fuze body.
2. The fuze is 7" long and 2"2 in maximum diameter. .
3. There is no means of determining the armed or unarmed condition of the fuze from an exterior examination.

Operation

1. Armed by an air vane which rotates the working parts of the fuze through a gear train until the striker and detonator are aligned. Impact sufficient to crush the upper fuze body forces the striker down onto the detonator. Impact with water or any impact insufficient to crush the upper body ignites a delay powder train when inertia causes a detonator carrier to move against a striker.

Rendering Safe Procedure

1. Tape the air vane to the fuze body.
2. Unscrew the fuze from the booster container.
3. Loosen the set screw and unscrew the booster container from the bomb case.
4. Dispose of all explosive elements.

Tail Pistols #28, Marks II°, III and IV°, and #30, Marks III° and IVDescription

1. Instantaneous, impact pistol (fuze), screwed into a booster container and locked by a cylindrical locking ring which encircles the pistol body. Although the pistol operates instantaneously upon impact, a 0.025 second delay detonator is ordinarily used with the #28 pistol and a 0.5 second delay detonator with the #30 in order to achieve depth firing. These detonators are not a part of the fuze proper and are fitted loosely into the detonator envelope in the booster container.
2. The pistol is 3"9 long and 2" in maximum diameter.
3. The pistol is not visible unless the tail section of the bomb is removed. If armed, the forked arming nut will not be present and the threaded striker spindle will be visible.

Operation

1. Armed by an air vane which unscrews the forked arming nut from the striker spindle after thirteen complete revolutions. Removal of the arming nut leaves the striker restrained only by a creep spring which is overcome by inertia on impact.

Rendering Safe Procedure

1. Remove the tail section (if present).
2. Unscrew the pistol from the booster container.
3. Remove the detonator from the booster container using a small-gauge wire hook or other suitable means.
4. Loosen the set screw and unscrew the booster container from the bomb case.
5. Dispose of all explosive elements.

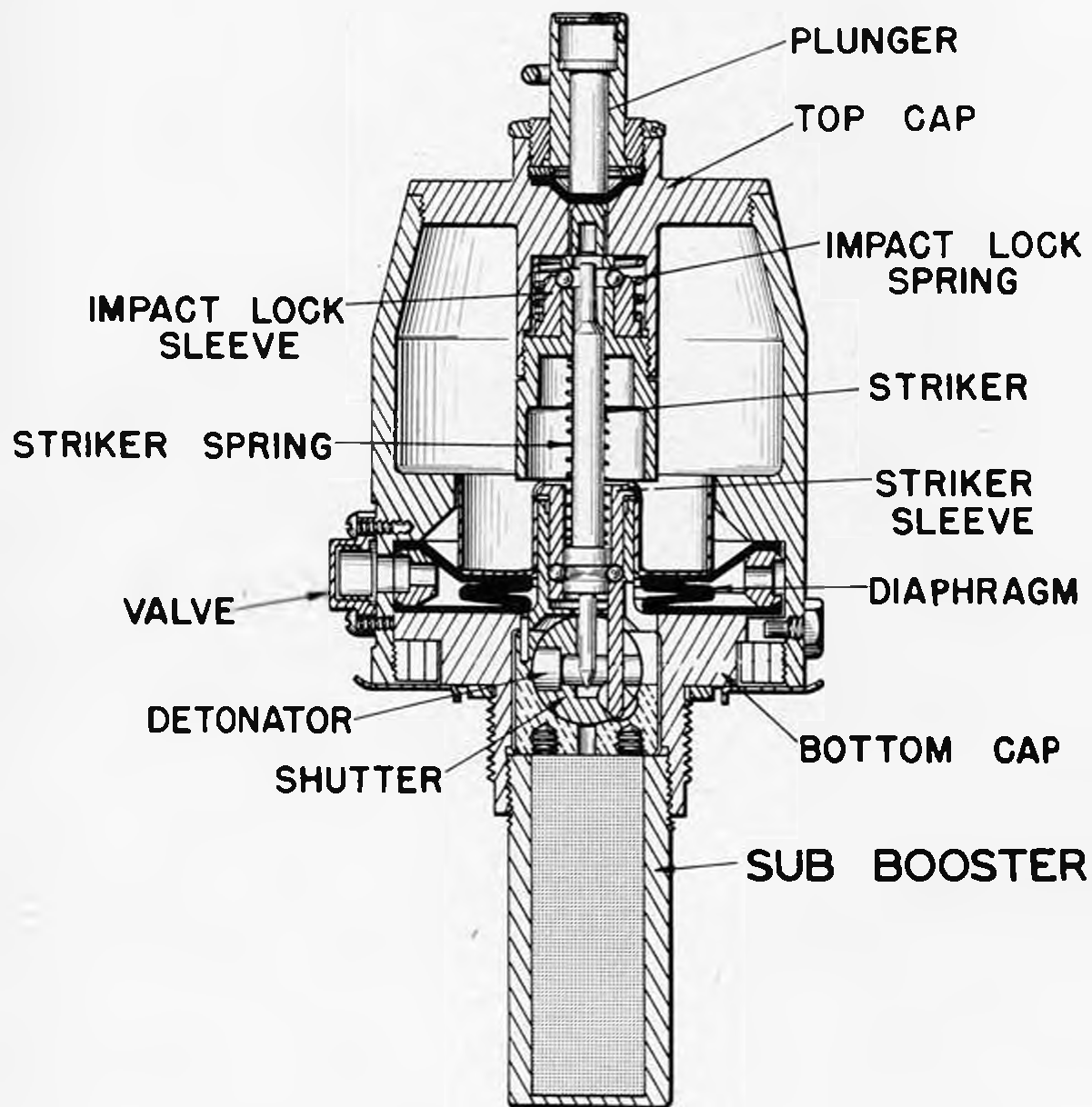


Fig. 12 - Tail Fuze #995, Sectional View

Tail Fuzes #895A, Mark I, #875A, #875B and #875CDescription

1. Hydrostatically operated. #895A, Mark I fires at a mean depth of 18 ft. while #875A, #875B and #875C fire at 18 ft., 22 ft. and 30 ft. respectively. All these fuzes screw into a booster container and are locked by a lock washer.
2. The fuzes are 4"75 long and 2"2 in maximum diameter.
3. The fuzes are operative unless the arming wire is in place. However, they should be safe to handle if out of water.

Operation

1. The arming wire is removed when the bomb is dropped. As the bomb sinks, water enters the fuze body. Hydrostatic pressure expands the diaphragm which raises the firing sleeve, thereby compressing the striker spring and operating a rotary shutter. This aligns the detonator with the striker. When the firing sleeve rises sufficiently to allow the lock balls to clear a stationary sleeve, the balls fall into a recess and the striker impinges on the detonator.

Rendering Safe Procedure

1. Remove the tail section.
2. Unscrew the fuze from the booster container.
3. Loosen the set screw and unscrew the booster container from the bomb case.
4. Dispose of all explosive elements.

Tail Fuze #862, Marks I and IIDescription

1. Hydrostatically-operated fuze with a firing depth of 30 ft. The fuze screws into the booster container; a rubber washer and securing ring make a watertight joint around the fuze body.
2. The fuze is 5"5 long and 2" in maximum diameter.
3. The fuze is operative unless the arming wire is in place. However, it should be safe to handle if out of water.

Operation

1. The arming wire is removed when the bomb is dropped. As the bomb sinks, water enters the fuze body. Hydrostatic pressure operates a shutter which aligns the detonator with the striker. It also compresses the diaphragm which forces the striker down toward the detonator, thereby pushing the striker levers down and the spring-loaded lever-blocks out. When the levers move past a position where they make an angle of 90° with the striker, the lever-block springs force the blocks inward and the levers snap the striker down onto the detonator.

Rendering Safe Procedure

1. Remove the tail section (if present).
2. Loosen the locking ring. Although considerable force may be necessary to accomplish this, the fuze is not sensitive to impact or shock and the operation is not unduly dangerous.
3. Unscrew the fuze from the booster container.
4. Loosen the set screw and unscrew the booster container from the bomb case.
5. Dispose of all explosive elements.

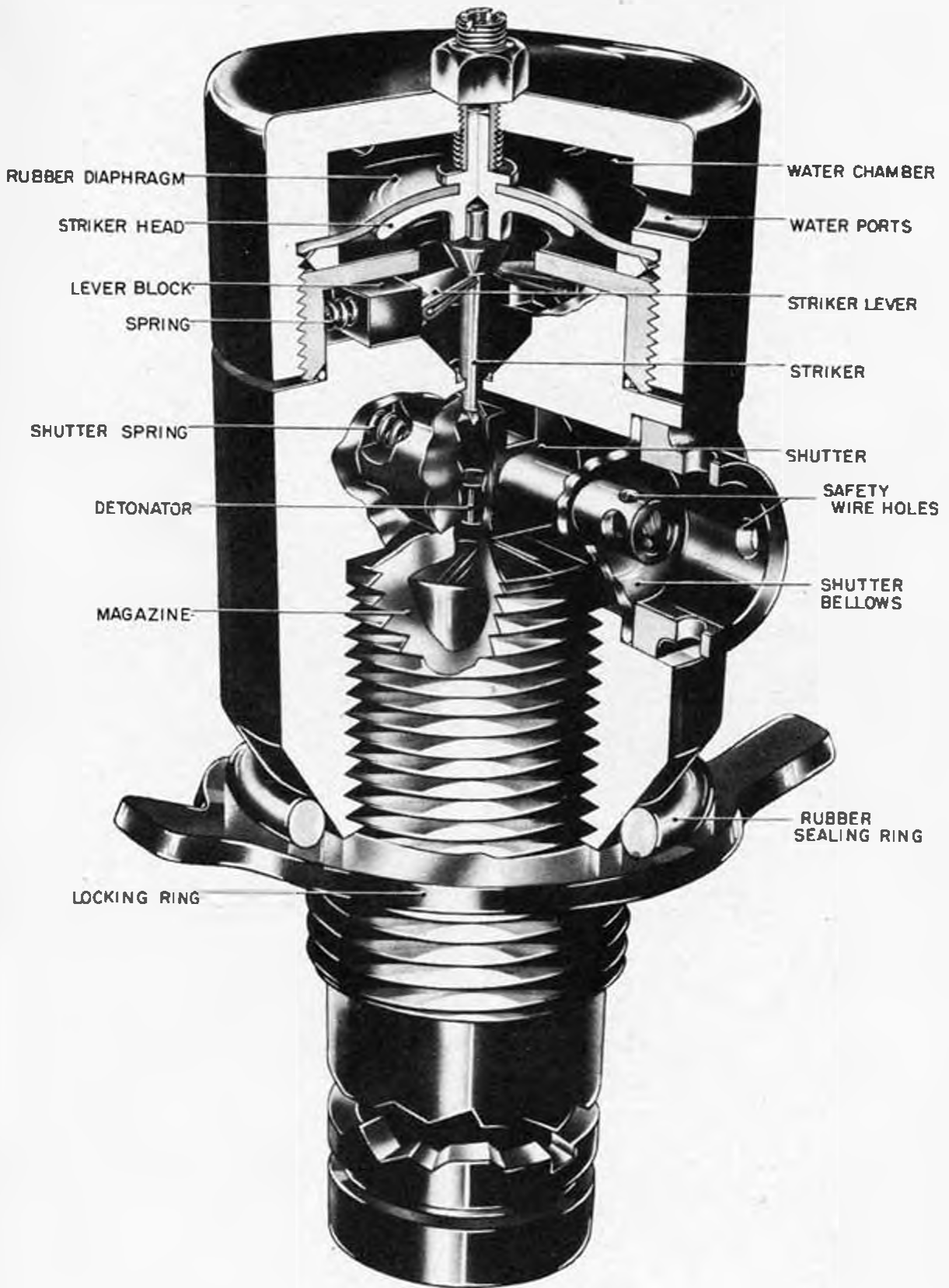


Fig. 13 - Tail Fuze #862, Sectional View

MINE DISPOSAL HANDBOOK

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BRITISH UNDERWATER ORDNANCE



CHAPTER 6

BRITISH AHEAD-THROWN ANTI-SUBMARINE WEAPONS

Ahead-Thrown
Anti-Sub.
Weapons

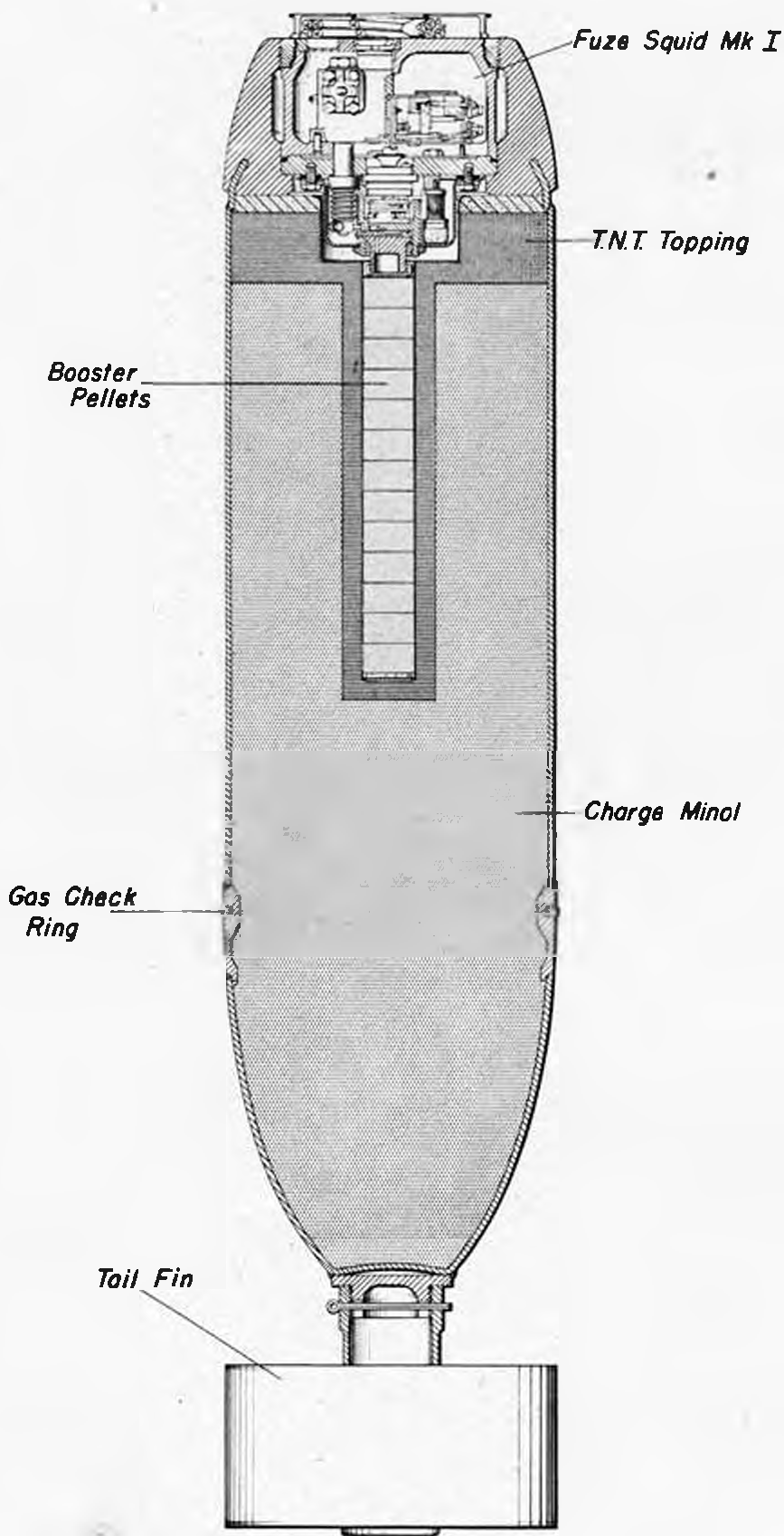


Fig. 1 - Squid, Sectional View

Introduction

1. This chapter deals with the British Hedgehog and Squid projectiles, and the fuzes which may be fitted to them.
2. All of the fuzes are extremely sensitive and dangerous to handle when armed. For this reason they should be rendered safe only in extreme emergencies.

Hedgehog

1. This weapon differs from the U.S. 7¹/₂ Ahead-Thrown Projector Charge (Hedgehog) as follows:
 - (a) Its cartridge propellant charge is Cordite rather than smokeless powder.
 - (b) Its high explosive charge is invariably Torpex.
2. Except for the changes noted above and minor constructional details, the weapon is identical with the U.S. Hedgehog. The fuze fitted to the British charge is the No. 420 Mark I. It is very similar to the U.S. Mark 136 fuze.
3. For further details and the approved rendering safe procedure, see Part II, Chapter 6. In step No. 1 of the rendering safe procedure it is emphasized that, while rotating the arming vane to disarm, the space referred to should never be closed to a distance less than about 3/16".

SquidGeneral

1. Ahead-thrown anti-submarine projectile.
2. Launched in patterns of three or six from mortar-type projectors on the forecastle of patrol vessels.

Description

1. Case

Shape	Cylindrical, with hemispherical ends. Fitted with helical, finned tail.
Material	Steel
Diameter	11 ⁷ / ₃₂
Length with tail	56 ⁷ / ₈
Charge	207 lbs. Minol.
Total weight in air	400 lbs. approx.

2. Fuze, Squid, Mark I

- (a) This fuze, a combination inertia-hydrodynamic-clockwork firing device, is mounted in a pocket in the nose of the projectile and secured by a keep ring. A small water-entry port sealed by a wax covering is located on the nose of the fuze along with a safety key.
- (b) The fuze may be set to fire at depths between 20 and 800 ft. by variable settings on its delay clock. Automatic depth setting by remote control is made by an electrical mechanism attached to the Asdic. Recorded contacts on the Asdic are transmitted to the fuze through cables which are sheared upon launching.

Operation

1. When the projectile is inserted in the projector, the fuze safety key is turned clockwise 90° and then removed, thereby unlocking the inertia-operated arming mechanism. Initial setback upon launching displaces an inertia block which unlocks the hydrodynamic "arming" mechanism. The inertia block is locked in the armed position by a spring-loaded detent.

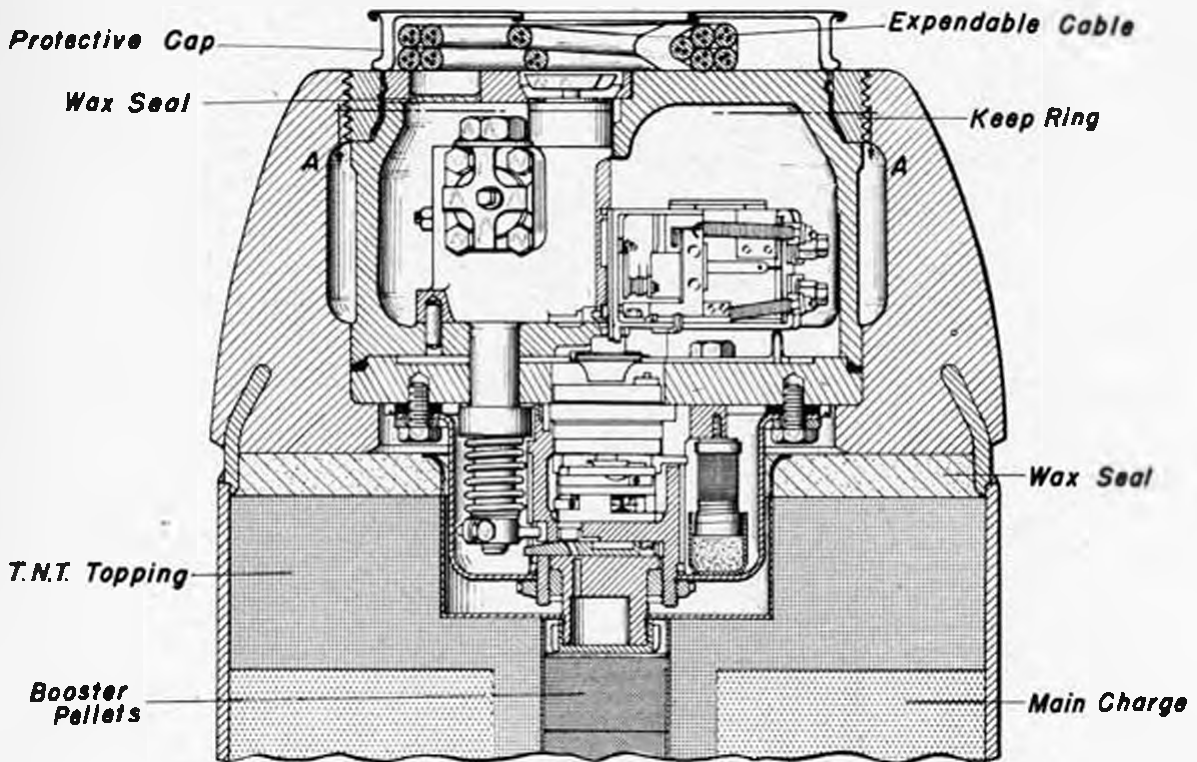


Fig. 2 - Fuze, Squid, Mark I, Sectional View

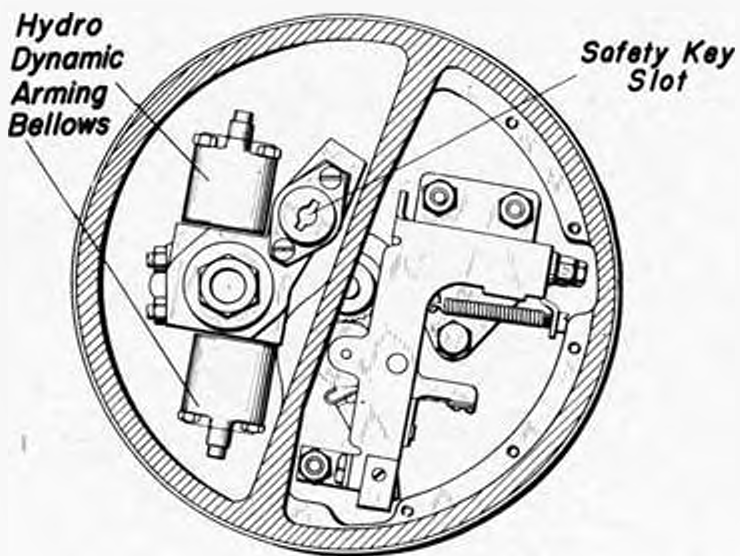


Fig. 3 - Fuze, Squid, Mark I, Section A-A

"Squid" Cont.

Impact with the water breaks the wax seal on the water entry port allowing water to enter the fuze body. Hydrodynamic pressure operates a rotary shutter which aligns the detonator with the striker and booster, and starts the delay firing clock.

2. The fuze and projectile fire when the clock runs off its delay setting, releasing the striker to impinge on the detonator.

Precautions

1. Note that there is no positive means of determining the armed or un-armed condition of the fuze from an exterior examination. However, if the wax seal on the water entry port is broken, the fuze has probably armed.
2. Do not move or jar the projectile except from a safe distance. The fact that the fuze fires by a clock delay makes it extremely dangerous.
3. Never attempt to render the projectile safe by removal or disassembly of the fuze. Countermine the projectile whenever feasible. In extreme emergency, thermite burning offers a possible solution to the disposal problem, but it cannot be recommended.

Rendering Safe Procedure

1. None known.

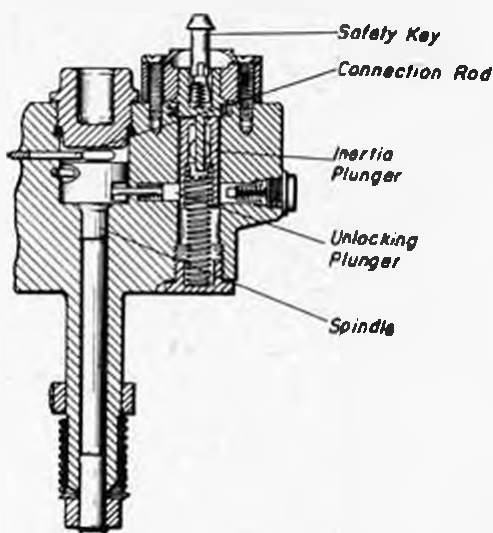


Fig. 4 - Squid Inertia Arming Mechanism, Sectional View

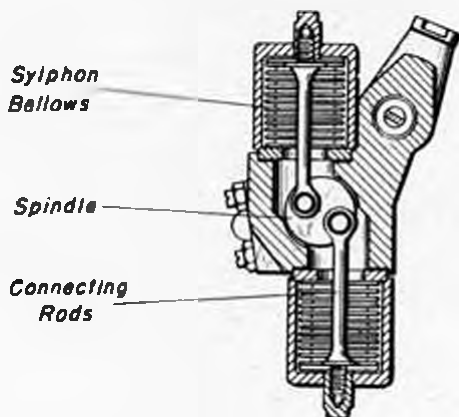


Fig. 5 - Squid Hydrodynamic Arming Mechanism, Sectional View

MINE DISPOSAL HANDBOOK

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BRITISH UNDERWATER ORDNANCE

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CHAPTER 7

BRITISH CONTROLLED MINES

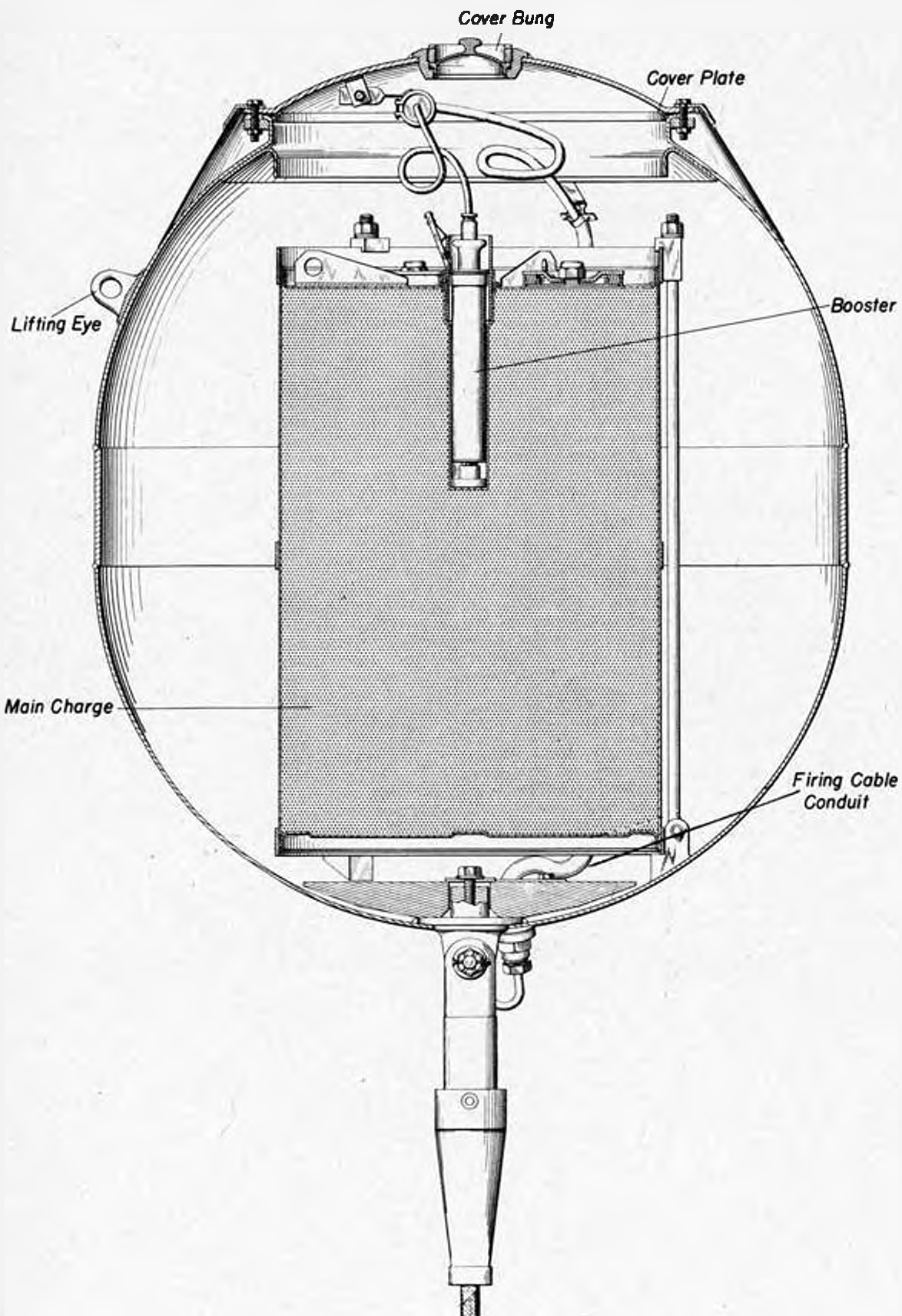


Fig. 1 - L Mk. II Mine, Sectional View

L Mark I (L Mark II)General

1. Moored, controlled mine.
2. Laid by surface craft.
3. Defensive mine, used primarily for harbor protection.

Description

1. Case

Shape	Two hemispheres, joined by a 6"5 cylindrical mid-section.
Color	Black
Material	Steel
Diameter	38"5
Length	50" approx.
Charge	500 lbs. TNT or Amatol
Total weight in air	1100 lbs. approx.

2. External fittings

Cover plate	In center of upper hemisphere, secured by bolts.
Base plate	In center of lower hemisphere, lap-fitted, secured by bolts. Fitted with gland in center for firing cable.
Cover bung	In cover plate, secured by keep ring or strongback and screw.
Protective cover	Shaped like section of truncated cone, fits over top of case.
Lifting eyes	Three, on upper hemisphere. Mine recovery chain is suspended from two eyes.

3. The L Mk. II differs from the L Mk. I as follows:

- (a) Its protective cover does not completely enclose the top of the mine.
- (b) It is not fitted with a base plate.
- (c) Firing cable gland is fitted on lower hemisphere.
- (d) Its diameter is 40".

Operation

1. Mine is armed manually prior to laying.
2. An observer fires the mine electrically from a distance.
3. No self-disarming devices are fitted.

RMS (L Mk. I)

1. Cut and tape the firing cable lead.
2. Remove the protective cover and cover bung.
3. Cut and tape each detonator lead separately.
4. Remove spring clip retaining the booster.
5. Turn detonator and booster to right and remove from bayonet joint.
6. Dispose of detonator, booster and charge.

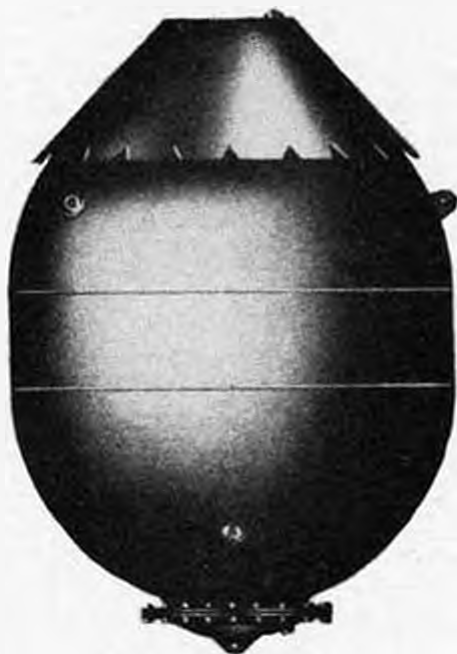


Fig. 2 - L Mk. I Mine



Fig. 3 - L Mk. I Mine, Floating

L Mark I (L Mark II) Cont.

RMS (L Mk. II)

1. Cut and tape the firing cable lead.
2. Remove cover bung.
3. Reach in and remove the rubber box connector from its clip.
4. Press booster retaining pawl inward and withdraw detonator and booster.
5. Dispose of detonator, booster and charge.



Fig. 4 - L Mk. II Mine