

R E S T R I C T E D

AIR PUBLICATION

I 6 6 I C

VOLUME I

(2nd Edition)

FUZING COMPONENTS

Prepared by direction of
the Minister of Supply

A. C. P. Roberts.

Promulgated by Order
of the Air Council

J. H. Barnes.

A I R M I N I S T R Y

AMENDMENT RECORD SHEET

Incorporation of an Amendment List in this publication is to be recorded by signing in the appropriate column and inserting the date of incorporation.

A.L. No.	AMENDED BY	DATE	A.L. No.	AMENDED BY	DATE
1			27	<i>EAD</i>	6/5/52
2			28		
3			29		
4	<i>L M Lawrence</i>	29/12/59	30		
5	<i>L M Lawrence</i>	1/2/50	31		
6	<i>L M Lawrence</i>	1/2/50	32		
7	<i>L M Lawrence</i>	7/2/50	33		
8	<i>L M Lawrence</i>		34		
9	<i>L M Lawrence</i>		35		
10	<i>L M Lawrence</i>	15/2/50	36		
11	<i>L M Lawrence</i>		37		
12	<i>L M L</i>	22/3/50	38	<i>M. Buckoke</i>	17.5.54
13	<i>L M L</i>		39		
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15	<i>L M L</i>	17/2/50	41	RAF MUSEUM	
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22			48	<i>MB</i>	28/10/54
23			49		
24	<i>EAD</i>	6/5/52	50	<i>MB</i>	4/3/55
25			51	<i>MB</i>	12/7/55
26			52	<i>MB</i>	1/11/55

(Continued overleaf)

Amendment Record Sheet (continued)

A.L. No.	AMENDED BY	DATE	A.L. No.	AMENDED BY	DATE
53			81	MSW	4/5/61
54	MB	7/12/56	82		
55			83		
56			84		
57	MB	7/12/56	85		
58			86		
59	MB	5/4/56	87		
60			88		
61	MB	11/12/56	89		
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66	MB	8.8.57	94		
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70	MB	8/4/59	98		
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76	MB	17/5/60	104		
77	MSW	22/6/60	105		
78	MSW	31/1/61	106	*	
79	MSW	3/5/61	107		
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* An Amendment Record Continuation Sheet (R.A.F. Form 2094A) will be required when this page is full. Order it now.

LETHAL WARNING

EJECTION SEATS AND CANOPY JETTISON MECHANISMS

1. Ejection seats and canopy jettison mechanisms are sources of potential danger to personnel and of damage to the aircraft. Serious injury (possibly fatal) may result if any firing mechanisms are inadvertently operated whilst the aircraft is on the ground.

2. The following instructions are to be obeyed:—

R.N. Safety Precautions contained in A.P.(N.)140—Naval Aircraft Maintenance Manual.

R.A.F. ALL PERSONNEL before entering the cockpit or cabin of an aircraft fitted with an ejection seat are to report to the N.C.O. immediately in charge of air-frame servicing who is to ensure that all safety pins (or other safety devices) are correctly positioned to render the seat and canopy jettison firing mechanisms safe. On completion of servicing, tradesmen are to report to the N.C.O.

3. Full instructions for rendering the firing mechanisms safe are contained in the A.P.4288 and A.P.(N.) 1023 series, in Aircraft Servicing Schedules and in the A.D.5037 series.

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NOTE TO READERS

The subject matter of this publication may be affected by Air Ministry Orders, or by "General Orders and Modifications" leaflets in this A.P., in the associated publications listed below, or even in some others. If possible, Amendment Lists are issued to correct this publication accordingly, but it is not always practicable to do so. When an Order or leaflet contradicts any portion of this publication, the Order, or leaflet, is to be taken as the overriding authority.

The inclusion of references to items of equipment does not constitute authority for demanding such equipment.

Each leaf bears the date of issue and, when applicable, the number of the Amendment List with which it was issued. New or amended technical information on new leaves which are inserted when this publication is amended will be indicated by a vertical line in the margin. This line merely denotes a change and is not a mark of emphasis. When a Section or Chapter is issued in a completely revised form, the line will not appear.

* * *

LIST OF ASSOCIATED PUBLICATIONS

	A.P.
<i>Bombs</i>	1661B (2nd Edn.)
<i>Bomb dump procedure and bombing-up of aircraft</i> ...	2852A
<i>Clusters</i>	1661J
<i>Comprehensive classified list of government explosives</i> ...	3228
<i>Demolition explosives, destructors, and associated stores</i> ...	1661G (2nd Edn.)
<i>Equipment regulations for the R.A.F.</i>	830, Vol. 2 (2nd Edn.)
<i>Explosives regulations for the Royal Air Force</i>	{ 2608A (1st Edn.) 2608A (2nd Edn.)
<i>Guide to Armament Air Publications</i>	2264B
<i>Inter-Service ammunition, and ammunition package markings</i>	3095
<i>Missile ancillary fittings</i>	1661K
<i>Pyrotechnics</i>	1661E (2nd Edn.)
<i>Volume 2 for the "1661" series of Armament Air Publications</i>	1661, Vol. 2
<i>Explosives and associated compositions</i>	
<i>Services textbook of explosives</i>	

(A.L.63, Sep. 56)

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PREFACE

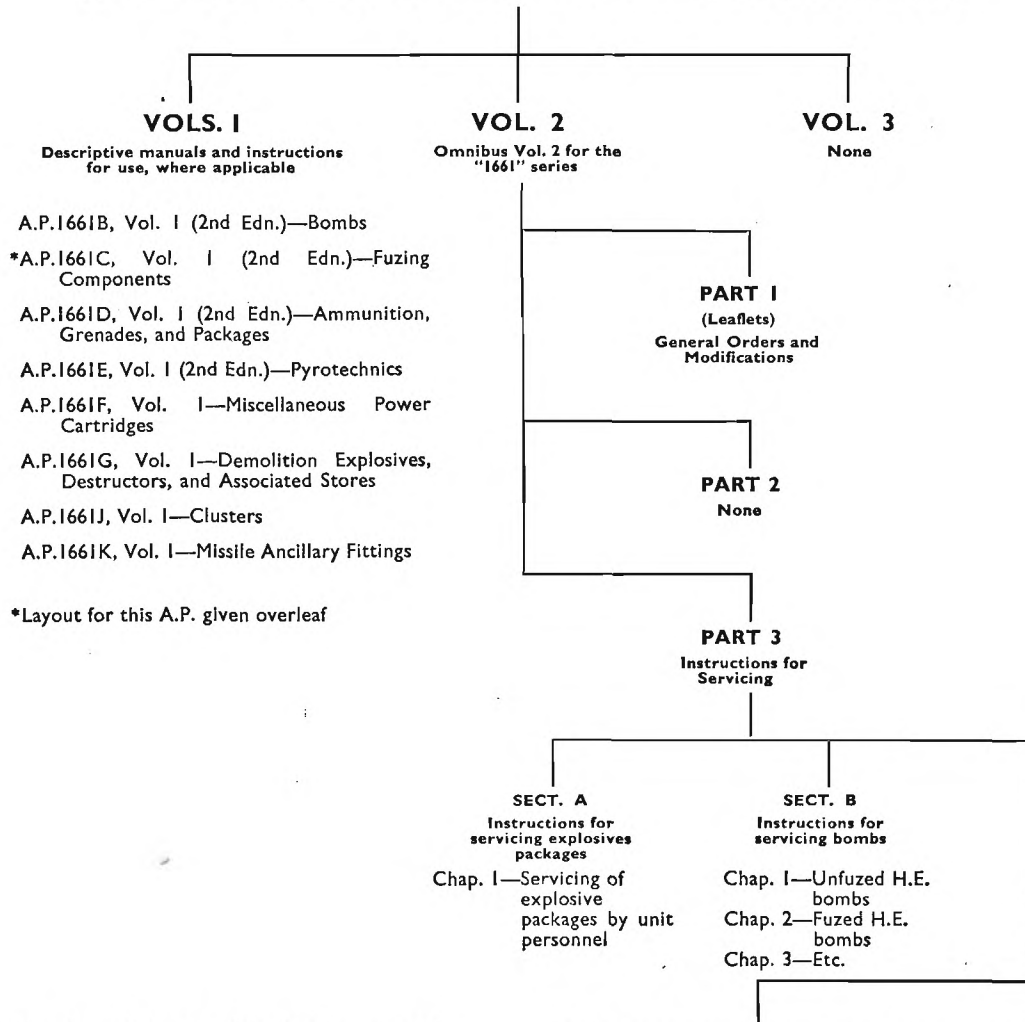
1. For information relating to supply and storage, attention is directed to the following publications:—

A.P.1086	Vocabulary of R.A.F. Equipment.
A.P.2608A	Explosive Regulations for the Royal Air Force.
A.P.3228	Comprehensive Classified List of Government Explosives.

2. The practice of covering obsolete stores by Addenda has been discontinued. When a store covered by a chapter in this volume is declared obsolete, the chapter will remain and its title in the List of Chapters be endorsed "Store obsolete" until stocks of the store have been disposed of.

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LAYOUT TREE FOR THE "1661" SERIES OF ARMAMENT AIR PUBLICATIONS



The above Vols. I, with the exception of A.P.1661K, are divided into Sections, each of which is divided into Chapters. The List of Sections at the beginning of each Volume, and the List of Chapters at the beginning of each Section, give particulars.

The following Sections, where they exist, are divided into Chapters, similarly to Section B. The List of Sections at the beginning of Vol. 2, Part 3, and the List of Chapters at the beginning of each Section, give particulars.

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(A.L.63, Sep. 56)

LAYOUT OF A.P.1661C (Second Edition) FUZING COMPONENTS

VOL. 1 2nd Edition Descriptive manual

SECT. 1 **Pistols**

- Chap. 1—General information on pistols
- Chap. 2—Pistol, aircraft, smoke float, tail, No. 23, Mk. 1
- Chap. 3—Pistols, bomb, tail, No. 37, Mk. 4* and Mk. 5
- Chap. 4—Pistols, bomb, tail, No. 37, Mk. 4**, 5* and 6
- Chap. 5—Pistol, bomb, D.A., No. 44, Mk. 3
- Chap. 6—Etc.

SECT. 2 **Fuzes**

- Chap. 1—General information on fuzes
- Chap. 2—Fuze, No. 42, Mk. 4
- Chap. 3—Fuzes, flare, mechanical, time, M 111A1 and M 111A2
- Chap. 4—Fuzes, aircraft bomb, AN-M120 and AN-M120A1
- Chap. 5—Etc.

Sect. 3 and the following sections are divided into chapters similarly to Sect. 1 and 2. The List of Sections at the beginning of Vol. 1, and the List of Chapters at the beginning of each Section, give details.

VOL. 2

Vol. 2 matter on Fuzing Components appears in A.P.1661, Vol. 2, the Omnibus Vol. 2 for the 1661 Series of Armament Air Publications. (See the Layout Tree for the "1661" series shown on the previous page.)

VOL. 3

None; the stores described in this publication are listed in A.P.1086

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FUZING COMPONENTS

LIST OF SECTIONS

Note.—A list of chapters appears at the beginning of each section

- 1 **Pistols**
- 2 **Fuzes**
- 3 **Detonators and detonator bursters**
- 4 **Intermediaries**
- 5 **Miscellaneous components**

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(A.L.63, Sep. 56)

This leaf issued June, 1949

A.P.1661C, Vol. I (2nd. Edn.)

SECTION I

PISTOLS

SECTION 1
PISTOLS

LIST OF CHAPTERS

Note.—A list of contents appears at the beginning of each chapter

- 1 General information on pistols
- 2 Pistol, aircraft, smoke float, tail, No. 23, Mk. 1 (*Store obsolete*)
- 3 Pistol, bomb, tail, No. 37, Mk. 7
- 4 Pistols, bomb, tail, No. 37, Mk. 4**, 5* and 6
- 5 Pistol, bomb, D.A., No. 44, Mk. 5 (*Store obsolete*)
- 6 Pistol, bomb, D.A., No. 45, Mk. 1 (*Store obsolete*)
- 7 Pistol, bomb, No. 47, Mk. 3 (*Store obsolete*)
- 8 Pistol, aircraft, smoke float, tail, No. 48, Mk. 1 (*Store obsolete*)
- 9 Pistol, bomb, D.A., No. 52, Mk. 2 (*Store obsolete*)
- 10 Pistol, bomb, tail, No. 53, Mk. 2
- 11 Pistol, bomb, tail, No. 54, Mk. 1
- 12 Pistol, bomb, D.A., No. 55, Mk. 1 (*Store obsolete*)
- 13 Pistol, bomb, tail, No. 58, Mk. 1 (*Store obsolete*)
- 14 Pistol, bomb, tail, No. 65, Mk. 1 (*Store obsolete*)
- 15 Pistol, bomb, tail, No. 73, Mk. 1 and 2
- 16 *Store not introduced*
- 17 Pistol, bomb, tail, No. 75, Mk. 2 and 3
- 18 Pistol, bomb, nose, No. 76, Mk. 1
- 19 Pistol, bomb, nose, No. 77, Mk. 1 (*Store obsolete*)
- 20 Pistol, bomb, tail, No. 78, Mk. 1
- 21 Pistol, bomb, tail, No. 79, Mk. 1 and 2
- 22 Pistol, bomb, tail, No. 80, Mk. 1 (*Store obsolete*)

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Chapter I

GENERAL INFORMATION ON PISTOLS

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Introduction

1. A pistol is a fuzing component having a mechanical device, termed a striker assembly, for initiating the functioning of the store with which it is used. The pistols described in the succeeding chapters of this section are all ground-burst, which means that they are in the group of fuzing components which function on or after impact.

2. A pistol does not contain any explosive material and in this respect differs from a fuze (Sect. 2). When a pistol is used as an initiation in a high explosive system, it is used in conjunction with a sensitive type detonator, or percussion cap, each of which contains the initial explosive charge of the explosive train.

3. Pistols are of two types and are used for either nose or tail fuzing; they are not interchangeable. Certain tail pistols are for use in conjunction with tail units which incorporate an arming mechanism. Normally, these pistols have an arming fork which engages the arming fork of the tail unit. Other tail pistols have an arming vane which is threaded internally to permit its attachment to the threaded portion of the striker spindle of the pistol. Rotation of the arming vane of the tail unit, or pistol, makes live the pistol.

4. When the horizontal method of fuzing is used, pistols are adapted to receive a safety wire which is withdrawn by a horizontal pull-off when a fuzed store is released, ready to be made live, from an aircraft.

Nose pistols

5. Nose pistols fire the initial explosive charge (and consequently the fuzed store) on impact, and are classified as direct-acting pistols. Existing direct-acting nose pistols are diaphragm operated, the shock of the impact reversing the curvature of the dia-

phragm thus forcing the striker to hit and fire the detonator.

Tail pistols

6. Tail pistols are of two types and either fire the initial explosive charge (and consequently the fuzed store) immediately after impact, or, they may have incorporated within them a delay system and so not fire the initial explosive charge until after the delay period has expired.

7. Those tail pistols which function immediately after impact generally incorporate an inertia pellet, a striker, and a creep spring or other means of restraint which, after the pistol is made live, prevents the striker moving on to the detonator until after impact occurs. On impact, the inertia developed by the striker overcomes the resistance of the creep spring or other restraint.

8. The usual type of delay tail pistol utilizes the solvent action of acetone on celluloid, the length of the delay period being determined by varying the strength of acetone and the thickness of celluloid during manufacture. Delay periods ranging from $\frac{1}{2}$ hr. to 144 hr. can be obtained by selecting a pistol having appropriate acetone dilution and thickness of celluloid.

9. The arming vanes on the tail units used with delay tail pistols are coloured either red or white, and are of opposite hand to the normal type. This is necessary to reverse the direction of rotation and so screw the arming vane spindle down into the pistol body when the fuzed store is released, ready to be made live, from an aircraft. The white arming vane is used to identify stores fitted with pistols having a nominal delay of over one hour, and the red arming vane is to identify stores fitted with pistols having a nominal delay of one hour or less.

Chapter 3

(Completely revised)

PISTOL, BOMB, TAIL, No. 37, Mk. 7
(ANTI-REMOVAL)

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Fig. 1. The No. 37, Mk. 7 pistol and Bakelite cover

F.S./1

(A.L.74, Nov. 58)

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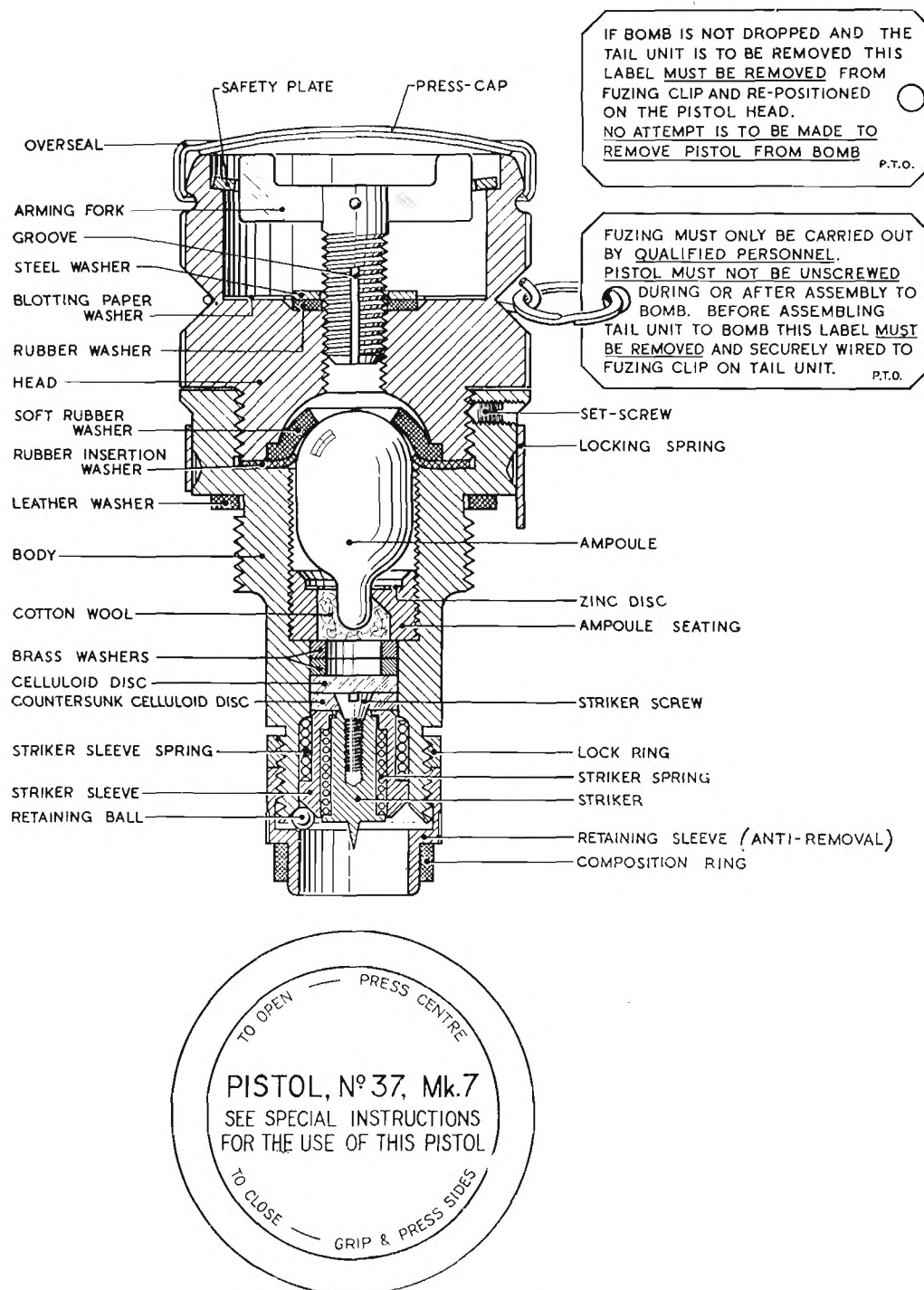


Fig. 2. Sectional view of the No. 37, Mk. 7 pistol

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Introduction

1. The No. 37, Mk. 7 pistol is a long delay ANTI-REMOVAL pistol of the normal arming fork type. A V-shaped groove around the pistol head is painted yellow to distinguish the pistol from other Marks of No. 37 pistols which do not incorporate an anti-removal device.

2. Variants of the pistol, having successively longer delay times are provided as follows:—

Pistol No.	Delay time	Ref. No.
37, Mk. 7	6 hr.	12G/1435
37A, Mk. 7	12 hr.	12G/1436
37E, Mk. 7	144 hr.	12G/1437

Note . . .

The times of delay are nominal and may vary appreciably as a result of manufacturing tolerances and the effect of temperature on the delay system.

3. The delay of the pistol is dependent upon the solvent action of acetone on celluloid. The acetone is contained in a sealed glass ampoule and the celluloid is in the form of a seating in which the tapered head of a striker screw is embedded. One or more celluloid discs are added according to the length of delay.

4. Special two-bladed arming vanes, painted yellow, are supplied with the pistol, and are to be fitted to the tail units of bombs fuzed with these pistols.

Description

5. The pistol has a recessed head, through which the threaded spindle of an arming fork is screwed, a body which houses the sealed glass ampoule containing acetone, and a striker assembly. The head is screwed into the top of the body and is locked in position with a set-screw. An anti-removal device is fitted to the base of the pistol body. A Bakelite cover, screwed on to the body thread, protects the striker mechanism, particularly if the pistol is stored under damp conditions.

6. The arming fork spindle has a right-hand screw thread which has three longitudinal grooves along which acetone from a defective ampoule can penetrate to a blotting-paper washer located in the pistol head. Either a blue or red stain on the blotting-paper is definite evidence of a defective ampoule. A

steel washer on the arming fork spindle compresses a rubber sealing washer in the pistol head and seals the acetone within the pistol, when the pistol is armed.

7. The ampoule is housed in the pistol body beneath the arming fork spindle and is supported on an ampoule seating. The sealed end of the ampoule projects into a cotton wool pad in the bore of the seating; the other end is stabilized by the pistol head and protected by rubber insertion and soft rubber washers.

8. A striker assembly, consisting of a spring-loaded striker sleeve, a spring-loaded striker, and a striker screw, is retained in position in the lower end of the pistol body, against the action of the striker sleeve spring, by a number of steel balls and the retaining sleeve. The striker screw engages a threaded hole in the striker and retains the striker spring in compression, the tapered head of the screw being embedded in a countersunk celluloid disc positioned on top of the striker assembly.

9. The retaining sleeve has a composition ring near one end, and forms the anti-removal device. The sleeve is screwed on to the bottom of the pistol body and is reduced diametrically to fit into the head of the detonator when the pistol is screwed into a bomb. In so doing the retaining sleeve is locked in the detonator holder, or exploder container by the compression, and consequent expansion of the composition ring. A step on the retaining sleeve abuts a corresponding step on a lock ring which is screwed on to the pistol body and locked by a grub screw; the step prevents the retaining sleeve from binding against the lock ring when the pistol is assembled into a bomb.

10. The acetone used in the No. 37 and 37E pistols (6 hr. and 144 hr. respectively) is coloured red; in the No. 37A pistol (12 hr.) the acetone is blue.

11. The V-shaped groove around the pistol head forms a weak neck so that should side impact of the bomb occur the pistol will fracture at the weak neck and so avoid damaging the internal mechanism and sealing devices.

12. A safety plate to prevent the arming fork from rotating during transit and storage, engages recesses in the pistol head; the head is closed by a press-cap and overseal.

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(A.L.74, Nov. 58)

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13. The pistol is provided with a tab locking spring to lock the pistol in a bomb, and a rubber or leather washer to prevent the ingress of moisture.

Identification markings

14. The following information is stamped on the pistol body:—

- (1) The number and Mark number and where appropriate the suffix letter of the pistol.
- (2) The manufacturer's initials or recognised trade mark.
- (3) The month and year of manufacture.
- (4) The nominal delay time.

15. The V-shaped groove around the pistol head is painted yellow to identify the pistol as being of the anti-removal type.

Functioning

16. When a fuze bomb is released from an aircraft, clockwise rotation of the arming fork by the tail arming mechanism causes the end of the arming fork spindle to break the glass ampoule and so release the acetone. Concurrently, the arming fork forces the steel washer to compress the rubber sealing washer which expands and seals the three grooves in the arming fork spindle. The acetone is thus sealed within the pistol.

17. The acetone dissolves the celluloid and after the appropriate delay frees the striker screw. The striker is then free to move and, under the pressure of its spring, hits and fires the detonator in the bomb.

Safety devices

18. The following safety devices are incorporated in the pistol:—

- (1) *The safety plate*—This is retained in position by the press-cap and overseal and prevents rotation of the arming fork during transit, handling, and storage. When a tail unit is fitted to a fuze bomb, the safety plate is removed and the pistol arming fork is then engaged by the locked arming mechanism of the tail unit.
- (2) *The blotting-paper washer*—The presence of either red or blue stains on this washer is definite evidence of a defective ampoule.

Examination before use and safety precautions

19. When handling a pistol, and before use the following general information and precautions are to be observed:—

- (1) Fuzing operations are only to be undertaken by selected and fully instructed

armament personnel under the supervision of a qualified armament N.C.O. conversant with this type of pistol.

(2) Because of the similarity in the external appearance of these pistols and other Marks of No. 37 pistols, special care must be taken to identify a pistol as being of the anti-removal type.

(3) Remove the Bakelite cover and examine the step on the retaining sleeve to ensure that it is abutting the step on the lock ring. If this is not so, rotate the sleeve clockwise to bring the steps together. Put back the Bakelite cover.

(4) Before use ensure that the ampoule is not defective or broken. To do this remove the overseal and press-cap and examine the blotting-paper washer in the pistol head; the presence of a red or blue stain, or the characteristic odour of acetone, is evidence of a broken or defective ampoule. If no such evidence is apparent put back the press-cap.

Warning

(a) *A pistol with a broken or defective ampoule is to be set aside for A.I.S. inspection.*

(b) *After a No. 37, Mk. 7 pistol has been screwed into a bomb it is FATAL to attempt to unscrew the pistol. A slight turn counter-clockwise is sufficient to cause the pistol to function instantly.*

(5) Should a fuze bomb be found to have a pistol with a broken ampoule the armament N.C.O. is to inform the Station Armament Officer immediately, stating the delay time involved. The Station Armament Officer is to make the necessary arrangements for disposal of the bomb.

(6) A special two-bladed arming vane, painted yellow, and of opposite hand to the normal type, is to be used on the arming mechanism of the bomb-tail unit.

Principle of the anti-removal device

20. The anti-removal device is so designed that should the retaining sleeve be unscrewed by approximately one half-turn, the complete striker assembly is released.

When the pistol is assembled in a bomb, the composition ring on the retaining sleeve binds against the inside of the detonator holder or exploder container and so locks the sleeve against rotation. Consequently any attempt to unscrew such a pistol results in the pistol body unscrewing from the retaining sleeve thus releasing the retaining balls and freeing the complete striker assembly from all restraint.

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Chapter 4

PISTOLS, BOMB, TAIL, No. 37, Mk. 4**, Mk. 5*, and Mk. 6

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Introduction

1. These are long-delay tail pistols of the normal arming fork type. They do not incorporate an anti-removal device, and are to be used in conjunction with a sensitive type detonator.

2. The No. 37, Mk. 4**, 5*, and 6 pistols are identical in construction and functioning, but whereas the Mk. 4**, and Mk. 5* are converted Mk. 4*, and Mk. 5 pistols respectively, the Mk. 6 pistol is manufactured to the modified design. A white painted band round the V-shaped groove in the pistol head serves to distinguish these pistols from earlier No. 37 pistols which incorporate an anti-removal device.

3. The delay action of the pistols depends on the solvent action of acetone on celluloid discs, the acetone being contained in a glass ampoule. Alternative delay periods are obtained by varying, during manufacture, the strength of the acetone and the number of celluloid discs. The following delay times are provided by variants of the pistol, the figures given being nominal times at 60 deg. F.:—

Nomenclature	Nominal Delay Time
Pistol, bomb, tail, No. 37, Mk. 4**, 5*, or 6	6 hrs.
Pistol, bomb, tail, No. 37A, Mk. 4**, 5*, or 6	12 hrs.
Pistol, bomb, tail, No. 37B, Mk. 4**, 5*, or 6	36 hrs.
Pistol, bomb, tail, No. 37D, Mk. 4**, 5*, or 6	72 hrs.
Pistol, bomb, tail, No. 37E, Mk. 4**, 5*, or 6	144 hrs.

Note...

The times of delay are subject to considerable variations as a result of manufacturing tolerances and the effect of temperature on the delay system.

4. Special two-bladed arming vanes, coloured white, and of opposite hand to the normal type, are to be used with the tail units of bombs fuzed with these pistols.

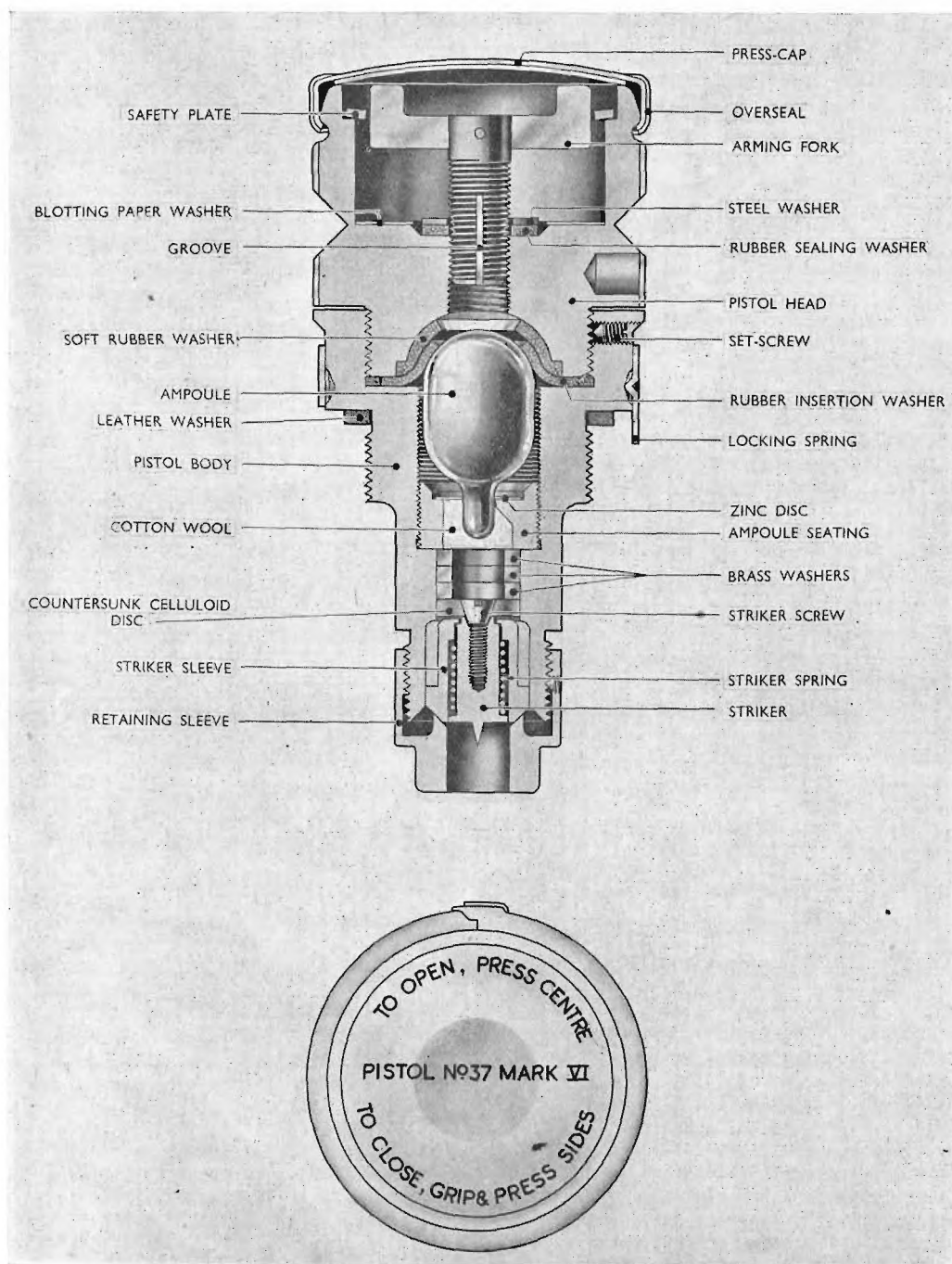


Fig. 1. Sectional view of the No. 37, Mk. 6 pistol

General description (fig. 1 and 2)

5. The pistol has a recessed head, through which an arming fork is screwed, and a body which houses a sealed glass ampoule, containing acetone, and a striker assembly. The head is screwed into the top of the body and is locked in position by a set-screw.

6. The arming fork spindle, which has a right-hand screw thread, also has three grooves along which acetone from a defective ampoule can penetrate to a blotting paper washer. The presence of acetone stains on this washer would, therefore, provide definite evidence of a defective ampoule. A steel washer on the arming fork spindle presses against a rubber sealing washer in the pistol head and seals the acetone in the pistol, after the pistol has been functioned.

7. The ampoule is housed in the pistol body beneath the arming fork spindle and rests on an ampoule seating. The sealed end of the ampoule projects through a perforated zinc disc, and the opposite end is protected by a rubber insertion washer and a soft rubber washer. Additional protection of the ampoule is provided by a cotton wool pad in the bore of the ampoule seating.

8. The striker assembly is housed in the pistol body beneath the ampoule and includes a striker sleeve housing a cocked striker; the striker sleeve being held in position by a retaining sleeve which is screwed and locked to the base of the pistol body. Secured to the striker is a striker screw the head of which seats in a countersunk celluloid disc above the striker assembly and retains the striker in the cocked position, against the action of a compressed striker spring.

9. The celluloid disc, which is retained in position by three brass distance washers, provides the nominal delay of 6 hours with the No. 37 pistol and the 12 hours delay with the No. 37A pistol. The difference in delay times between these two pistols is obtained by the use of dilute acetone, coloured blue, in the ampoule of the No. 37A pistol. In pistols No. 37B, 37D and 37E, the specified delay times depend upon a greater or lesser number of celluloid discs replacing the brass washers. In all the pistols, other than the No. 37A, the acetone is coloured red.

10. The pistol body has an external screw thread to engage the bomb, and a spring

locking tab and leather sealing washer. The pistol head has a weak neck, formed by a deep V-shaped groove, so that should severe side impact of the bomb occur, the projecting portion of the pistol will fracture at the weak neck, rather than at any other point, without damaging the sealing devices.

11. A safety plate engages the arming fork and seats in two recesses in the pistol head and prevents rotation of the arming fork during transit, handling and storage. A press-cap and overseal closes the pistol head and retains the safety plate in position. A Bakelite cover, screwed on to the external threads of the pistol body, protects the striker mechanism.

Identification markings

12. The following identification markings are stamped on the pistol body:—

- (1) The number, Mark, and where appropriate, the suffix letter of the pistol
- (2) The manufacturer's initials or recognised trade mark
- (3) The month and year of manufacture
- (4) The nominal delay time.

The press-cap bears the number, mark, and, where appropriate, the suffix letter of the pistol.

13. The V-shaped groove in the pistol head is painted white to denote that the pistol is not of the anti-removal type.

Functioning

14. When a bomb using one of these pistols is released, ready to be made live, from an aircraft, air pressure rotates the tail unit arming mechanism which, in turn, rotates the pistol arming fork in a clockwise direction. The arming fork spindle is thus screwed down into the pistol body and so crushes the ampoule and releases the acetone. In descending, the arming fork forces the steel washer against the rubber sealing washer which expands and closes the three grooves in the arming fork spindle. The acetone is thus sealed within the pistol body.

15. The celluloid disc is gradually dissolved by the acetone until the head of the striker screw is free, and under the action of its compressed spring, the striker moves to hit and fire the detonator.

Safety devices

16. The pistol has the following safety devices:—

(1) The safety plate and press-cap.—The safety plate is retained in position by the press-cap and prevents rotation of the arming fork during transit, storage, and handling of the pistol, and also until the tail unit is assembled to the fuzed bomb. When a tail unit is fitted to a fuzed bomb, the safety plate is removed and the pistol arming fork is then engaged by the locked arming mechanism of the tail unit.

(2) The blotting paper washer.—The presence of acetone stains on this washer is a definite indication of a defective ampoule which, if the pistol is fitted to a bomb, will function the bomb after the delay time of the pistol has expired. This device, therefore, enables action to be taken to ensure that a pistol having a defective ampoule is not used, or, if the pistol is in a bomb when the defect is discovered, that the bomb is immediately unfuzed.

Instructions for use, inspection, tests and safety precautions

17. Detailed fuzing instructions, including the inspection and testing of this pistol, are given in the publication describing the bomb to be fuzed. The following general information should, however, be noted:—

- (1) Fuzing operations must only be undertaken by selected and fully instructed armament personnel working under the supervision of a qualified armament N.C.O., conversant with this type of pistol. Attention is directed to the instructions on the label affixed to the underside of the lid of the box in which the pistols are packed.
- (2) Due to the great similarity in the external appearance of these pistols and the anti-removal No. 37 pistols, the greatest care must be taken to identify a pistol as being of the non-anti-removal type before any attempt is made to remove it from a fuzed bomb.
- (3) When fuzing a bomb with a No. 37 pistol, a special two-bladed arming vane, coloured white, and of opposite hand to the normal type, must be used on the arming mechanism of the bomb tail unit.

(4) Before use the pistol must be inspected and tested as follows:—

- (a) Remove the overseal, press-cap and safety plate, and check that the arming fork is flush with the top of the pistol head. This is essential for correct engagement with the tail arming mechanism. Inspect the blotting paper washer in the pistol head for signs of acetone stains, either red or blue, which will be present should the ampoule be defective. The characteristic odour of acetone may also be evident with a defective ampoule. If the arming fork and ampoule are in order, replace the safety plate, and press-cap.

WARNING

- (i) *The arming fork must not be rotated.*
- (ii) *A pistol with a broken or defective ampoule must not be used.*
- (b) Remove the Bakelite cover and ensure that the screw thread on the pistol body is free from dirt and grease. Check that the leather washer on the pistol body and the tab locking spring are in position and, that the point of the striker is not damaged.

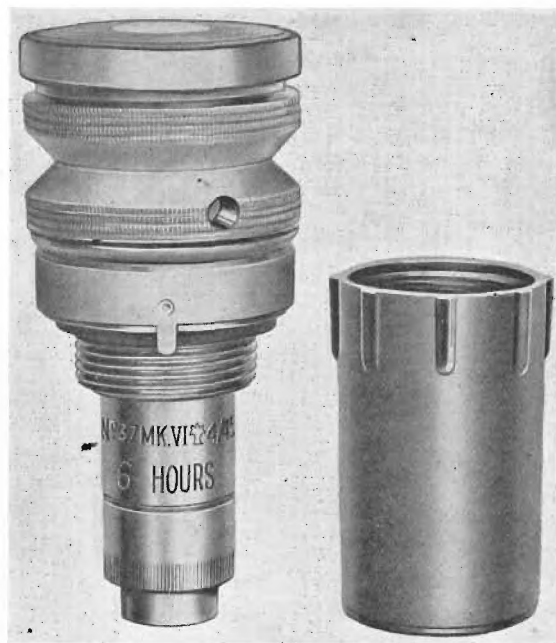


Fig. 2. The No. 37, Mk. 6 pistol and Bakelite cover

- (5) If a pistol is accidentally dropped or knocked, it must be treated as if made live, due to possible fracture of the ampoule, and must be set aside for A.I.S. inspection. Similarly, if a bomb having a No. 37 pistol be accidentally dropped or receive a severe shock in any other way, the bomb must be unfuzed taking such precautions as time and circumstances permit.
- (6) The safety plate and press-cap must always be kept on the pistol head (except when examining the arming fork and blotting paper washer) and must not be removed until immediately before attaching the tail unit.
- (7) An unexpended bomb must be immediately unfuzed if, after inspection, its pistol is suspected of having a broken ampoule. Should the pistol be considered satisfactory, the bomb must be unfuzed as soon as practicable.

Supply

18. Twenty pistols with Bakelite covers and twenty special arming vanes, No. 3,

Mk. 2, painted white, are supplied in Box, B.346. To ensure that the acetone from a defective ampoule shall reach the blotting paper washer, the pistols are packed head downwards. The stowage dimensions of the box are 15 in. $\times$ 11.25 in. $\times$ 6.15 in., and its filled weight is approximately 42.5 lb.

19. The No. 3, Mk. 2 special arming vane is also issued as part of a No. 3, Mk. 1 horizontal fuzing conversion set, which consists of one No. 1, Mk. 1 arming wire guide, one No. 3, Mk. 2 arming vane, one No. 1, Mk. 1 safety wire, and two No. 1, Mk. 1 safety clips.

Note . . .

The No. 3, Mk. 2 arming vanes supplied with early issues of the pistols, and in conversion sets, are painted red.

Storage

20. The boxes containing the pistols, can be stored in the same explosives storehouse as the filled bombs with which they are to be used. They must, however, be stacked well clear of the filled bombs and of boxes containing other types of pistols.

Addendum I**PISTOL, BOMB, D.A., No. 52, Mk. 2****LIST OF CONTENTS**

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Introduction

1. This pistol was used in conjunction with a No. 1, Mk. 1 exploder adapter (*Sect. 4*) for the nose fusing of certain American H.E. bombs.

2. The pistol is diaphragm operated and was used with the horizontal system of fuzing.

3. A conical spring (supplied with the pistol) was used to support the detonator and so retain it in contact with the base of the pistol striker guide, when the pistol was inserted into a bomb.

Identification markings

4. The following information is stamped on the safety cap and also on the base of the striker guide:—

- (1) The number and Mark of the pistol.
- (2) The manufacturer's initials or recognised trade mark.
- (3) The month and year of manufacture.

Safety devices

5. The pistol has the following safety devices:—

- (1) The safety pin, which prevents the safety cap from rotating during transit, storage, and handling.
- (2) The safety cap, which

protects the diaphragm against accidental or premature reversal.

Supply

6. The pistols are packed 36 in Box, B.470, Mk. 1 including 36, No. 1, Mk. 1 safety wires, and 72 No. 1, Mk. 1, safety clips. The stowage dimensions of the box are 25 in. × 12 in. × 13 in., and its filled weight is approximately 77 lb.

Storage

7. The boxes, containing the pistols, are stored in the same explosives storehouse as the filled bombs with which they were to be used.

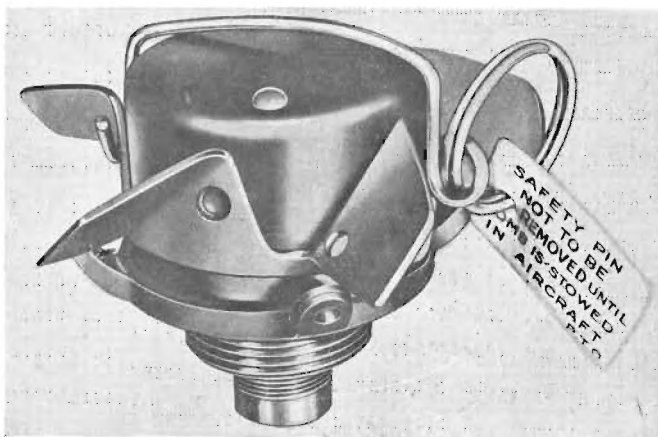


Fig. 1. The No. 52, Mk. 2 pistol

R E S T R I C T E D

Chapter 10

PISTOL, BOMB, TAIL, No. 53, Mk. 2

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Introduction (fig. 1)

1. This is a long delay pistol of the normal arming fork type. It does not incorporate an anti-removal device, and is to be used in conjunction with a sensitive type detonator.

2. In external appearance and functioning the pistol is similar to the No. 37 pistol and differs internally only by the inclusion of a ball device in the striker assembly which enables shorter delay periods to be obtained.

3. The delay action depends on the solvent action of acetone on celluloid, the acetone being contained in a glass ampoule. There are, at present, the following two variants of the pistol, the appropriate nominal time of delay, at 60 deg. F. being clearly stamped on the body:—

Nomenclature	Nominal delay time
Pistol, bomb, tail, No. 53, Mk. 2	30 min.
Pistol, bomb, tail, No. 53A, Mk. 2	1 hr.

The longer delay time of the No. 53A pistol is obtained by using dilute acetone which is coloured violet. The acetone used in the No. 53 pistol is coloured green.

Note . . .

The delay times are subject to considerable variations as a result of manufacturing tolerances and the effect of temperature on the delay system.

4. Special two-bladed arming vanes, coloured red and of opposite hand to the normal type, are to be used on the arming mechanism of tail units of bombs fuzed with this pistol.

General description (fig. 2)

5. The pistol has a recessed head, through which an arming fork is screwed, and a body which houses an ampoule and a striker assembly. The head is screwed into the top



Fig. 1. The No. 53, Mk. 2 pistol and Bakelite cover

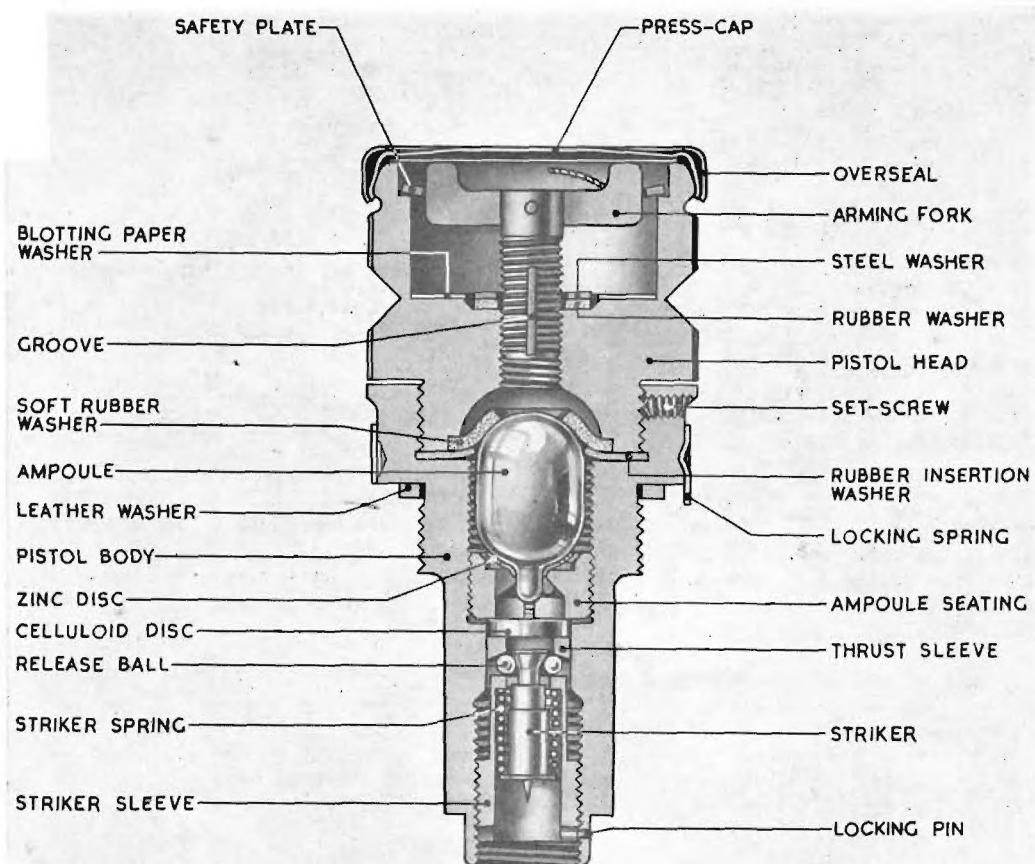


Fig. 2. Sectional view of the No. 53, Mk. 2 pistol

of the body and is locked in position by a set-screw.

6. The arming fork spindle, which has a right-hand screw thread, also has three grooves along which acetone from a defective ampoule can penetrate to a blotting paper washer in the pistol head. The presence of acetone stains on this washer would, therefore, provide positive evidence of a defective ampoule. A rubber washer is inset in the pistol head beneath a steel washer on the arming fork* spindle and prevents loss of acetone when the pistol is functioned.

7. The sealed glass ampoule, containing acetone, is housed in the pistol body beneath the arming fork spindle and rests on an ampoule seating. The sealed end of the ampoule projects through a perforated zinc disc, the opposite end being protected by a rubber insertion and soft rubber washers.

8. The striker assembly is located beneath the ampoule and includes a striker sleeve which is screwed into the base of the pistol body and secured in position by a locking pin in the body engaging a slot in the end of the sleeve. The sleeve houses a striker which is retained in the cocked position against the action of a compressed striker spring by a ball-lock consisting of a number of release balls. These balls engage a tapered neck on the striker and are held against displacement by the chamfered face of a thrust sleeve which abuts a celluloid disc interposed between the thrust sleeve and the under-side of the ampoule seating.

Note . . .

The majority of Mk. 2 pistols are converted Mk. 1 pistols and in addition to the locking pin, have a grub screw visible near the base of the pistol body. Any pistol having a grub screw but no locking pin must not be used.

9. The pistol head has a weak neck, formed by a deep V-shaped groove, so that should severe side impact of the bomb occur, the projecting portion of the pistol will fracture at this neck, rather than at any other point, without damaging the sealing devices. A safety plate engages the arming fork and seats in two recesses in the pistol head and prevents rotation of the arming fork during transit, handling and storage.

10. A leather washer on the body thread prevents the ingress of moisture when the pistol is screwed into a bomb, and a tab

locking spring enables the pistol to be locked into a bomb. A Bakelite cover, screwed on to the body thread, protects the striker mechanism.

Identification markings

11. The following identification markings are stamped on the pistol body:—

- (1) The number, Mark and, where appropriate, the suffix letter of the pistol
- (2) The manufacturer's initials or recognised trade mark
- (3) The month and year of manufacture
- (4) The nominal time of delay

The press cap also bears the number and Mark of the pistol.

12. The V-shaped groove in the pistol head is painted white to denote that the pistol does not include an anti-removal device.

Functioning

13. When a bomb using this pistol is released, ready to be made live, from an aircraft, air pressure rotates the tail unit arming mechanism which, in turn, rotates the pistol arming fork in a clockwise direction. The arming fork spindle is thus screwed down into the pistol body and so crushes the ampoule and releases the acetone. In descending the arming fork forces the steel washer against the rubber washer which expands and closes the three grooves in the arming fork spindle, thus sealing the acetone within the pistol body.

14. The celluloid disc is gradually dissolved by the acetone and, the pressure exerted by the compressed spring through the striker and release balls forces the chamfered thrust sleeve to move upwards. This movement permits the balls to become disengaged from the striker, which, under the action of the spring, then moves to hit and fire the detonator.

Safety devices

15. The pistol has the following safety devices:—

- (1) The safety plate and press-cap.—The safety plate is retained in position by the press-cap and prevents rotation of the arming fork during transit, storage and handling of the pistol, and also until the tail unit is assembled to the fuzed bomb. When a tail unit is fitted to a fuzed bomb, the safety plate is removed and the pistol arming

fork is then engaged by the locked arming mechanism of the tail unit.

(2) The blotting paper washer.—The presence of acetone stains on this washer is a definite indication of a defective ampoule which, if the pistol is fitted to a bomb, will function the bomb after the delay time of the pistol has expired. This device, therefore, enables action to be taken to ensure that a pistol having a defective ampoule is not used or, if the pistol is in a bomb when the defect is discovered, to unfuze the bomb immediately.

Instructions for use, inspection, tests, and safety precautions

16. Detailed fuzing instructions, including the inspection and testing of this pistol, are given in A.P.1661B, Chap. 1 of the section appropriate to the bomb being fuzed. Before use, however, the following general information and inspectional requirements should be observed:—

(1) Fuzing operations must only be undertaken by selected and fully instructed armament personnel working under the supervision of a qualified armament N.C.O. conversant with this type of pistol. Attention is directed to the instructions on the label affixed to the underside of the lid of the box in which the pistols are packed.

(2) When fuzing a bomb with a No. 53 pistol, a special two-bladed arming vane, coloured red and of opposite hand to the normal type, must be used on the arming mechanism of the bomb tail unit.

(3) Before use, the pistol must be inspected and tested as follows:—

(a) Remove the overseal, press-cap, and safety plate, and check that the arming fork is flush with the top of the pistol head. This is essential for correct engagement with the tail arming mechanism. Inspect the blotting paper washer in the pistol head for signs of acetone stains, either green or violet, which will be present should the ampoule be defective. The characteristic odour of acetone may also be evident with a defective ampoule. If the arming fork and ampoule are in order, replace the safety plate and press-cap.

WARNING

A pistol with a broken or defective ampoule must not be used. The arming fork must not be rotated.

(b) Remove the Bakelite cover and ensure that the screw thread on the pistol body is free from dirt and grease. Check that the leather washer and tab locking spring are in position, and that the point of the striker is not damaged.

(4) If a pistol is accidentally dropped or knocked, it must be treated as if made live, due to possible fracture of the ampoule, and must be set aside for A.I.S. inspection. Similarly, if a bomb having a No. 53 pistol be accidentally dropped or receive a severe shock in any other way, the bomb must be unfuzed, taking such precautions as time and circumstances permit.

(5) The safety plate and press-cap must always be kept on the pistol (except when inspecting the arming fork and blotting paper washer), and must not be removed until immediately before attaching the tail unit.

(6) An unexpended bomb must be immediately unfuzed if, after inspection, its pistol is suspected of having a broken ampoule. Should the pistol be considered satisfactory, the bomb must be unfuzed as soon as practicable.

Supply

17. Twenty pistols with Bakelite covers and twenty special arming vanes, No. 3, Mk. 2, painted red, are supplied in Box, B.346. To ensure that the acetone from a defective pistol shall reach the blotting paper washer, the pistols are packed head downwards. The stowage dimensions of the box are 15 in. × 11.25 in. × 6.15 in., and its filled weight is approximately 45 lb.

18. The No. 3, Mk. 2 special arming vane is also issued as part of a No. 3, Mk. 1 horizontal fuzing conversion set, which consists of one No. 1, Mk. 1 arming wire guide, one No. 3 Mk. 2 arming vane, one No. 1, Mk. 1 safety wire, and two No. 1, Mk. 1 safety clips.

Storage

19. The boxes containing the pistols can be stored in the same explosives storehouse as the filled bombs with which they are to be used. The boxes containing them must, however, be stacked well clear of the filled bombs and of boxes containing other types of pistols.

Chapter II

PISTOL, BOMB, TAIL, No. 54, Mk. I

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Introduction (fig. 1)

1. This is a multi-ways pistol which provides sensitive tail initiation and replaces the No. 30 and the No. 65 pistols used in low level bombing operations. The pistol is to be used only in conjunction with a No. 55, Mk. 2 (11 sec. delay) detonator or a No. 57, Mk. 2 (25/30 sec. delay) detonator, as dictated by operational requirements.

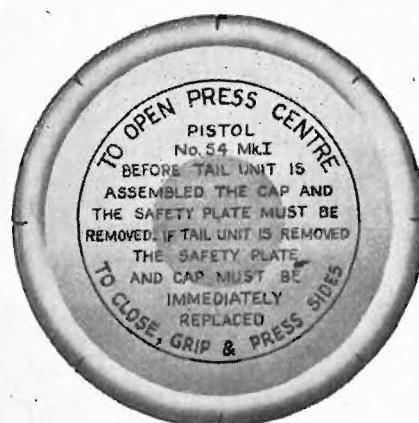
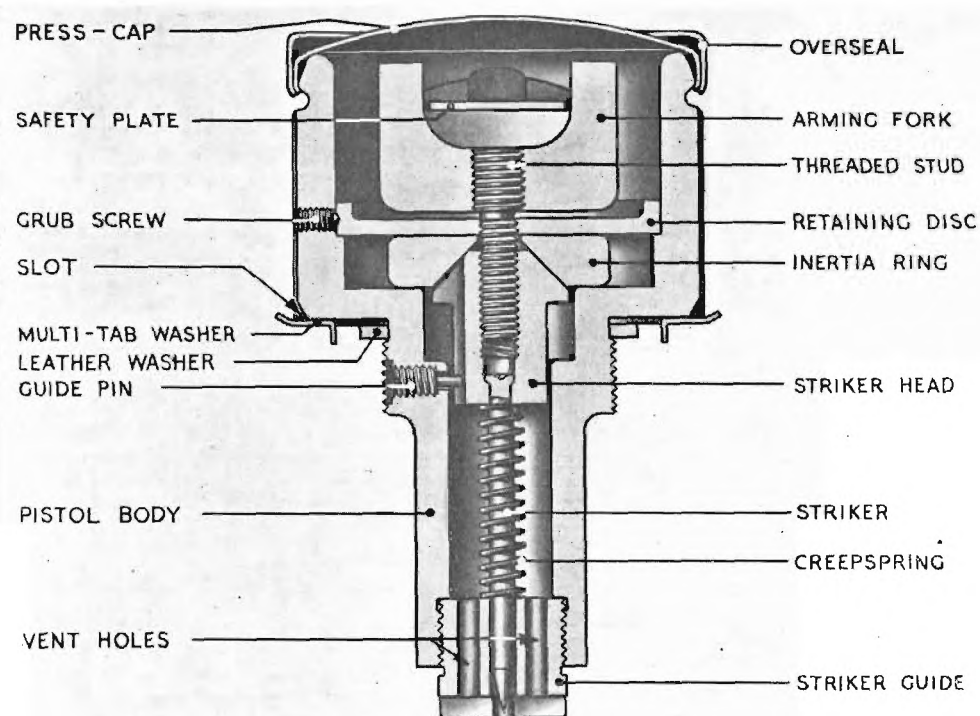
General description (fig. 2)

2. The pistol is approximately 4 in. in length by $2\frac{1}{2}$ in. maximum diameter and has a pistol body and striker guide, a sharp-pointed striker and creep spring, an inertia ring and retaining disc, and an arming fork.

3. The pistol body has a recessed head which houses the arming fork, inertia ring, and the retaining disc. The inertia ring has a central countersunk hole which seats on the coned head of the striker and is retained in position by a retaining disc secured by three grub-screws.



Fig. 1. The No. 54, Mk. I pistol



Top view of press-cap

Fig. 2. Sectional view of the No. 54, Mk. I pistol

4. The arming fork is secured to one end of a threaded stud, the other end of which is screwed through the retaining disc, and then passes through the inertia ring and screws into the coned striker head. A guide pin, projecting through the pistol body, engages a groove in the striker and prevents the striker rotating with the arming fork, but permits longitudinal movement when the pistol is functioned.

5. The striker guide, which has three holes, screws into the base of the pistol body and retains the creep spring on the striker. The centre hole houses the pointed end of the striker, the other two being vent holes to allow gases to escape when the detonator is fired.

6. A safety plate engages the arming fork and seats in two recesses in the pistol head, thus preventing premature rotation of the arming fork. The safety plate is retained in position during transit, handling, and storage by a press-cap and overseal which closes the pistol head.

7. The pistol body has an external thread for screwing into a bomb and a leather washer to form a water-tight seal. A multi-tab washer on the thread enables the pistol to be locked into a bomb.

Identification markings

8. The following particulars are stamped on the pistol body:—

- (1) The number and Mark of the pistol
- (2) The manufacturer's initials or recognised trade mark
- (3) The month and year of manufacture.

Similar information is printed on the press-cap which also bears instructions concerning the press-cap and safety plate (*fig. 2*).

Functioning

9. When a bomb using this pistol is released, ready to be made live, from an aircraft, air pressure rotates the tail unit arming mechanism and, consequently, the arming fork and screwed stud, in an anti-clockwise direction. The arming fork and stud thus become unscrewed from the striker head and fall away. The striker is then free and is prevented from moving only by the creep spring.

10. On normal impact, the momentum of the striker overcomes the resistance of the creep spring and the striker moves to hit and fire the detonator.

11. Should side impact occur, the momentum of the inertia ring causes it to move radially across the pistol head. The inclined surface of the inertia ring seating thus produces a wedge action between the retaining disc and the coned striker head. As the retaining disc is rigidly secured in the pistol head, the pressure on the striker head, due to the wedge action, overcomes the resistance of the creep spring, and forces the striker to move on to the detonator.

Safety devices

12. The pistol has the following safety devices:—

(1) The safety plate and press-cap.—The safety plate is retained in position by the press-cap and prevents the arming fork rotating during transit, storage, and handling of the pistol and until the tail unit is attached to the fuzed bomb. When a tail unit is attached to a fuzed bomb, the safety plate is removed and the pistol arming fork is then engaged by the locked arming mechanism of the tail unit.

(2) The creep spring.—This prevents the striker moving on to the detonator, when the pistol is made live, until impact of the fuzed bomb occurs.

Instructions for use, inspection, tests, and safety precautions

13. Detailed fuzing instructions, including the inspection and testing of this pistol are given in A.P.1661B, Vol. 1, Chap. 1 of the section appropriate to the bomb being fuzed. Before use, however, the following general information and inspectional requirements should be observed:—

- (1) Remove the overseal, press-cap, and safety plate, and test the arming fork for freedom of movement by rotating it two turns in an anti-clockwise direction. Then screw the arming fork back an equal amount and replace the safety plate and press-cap.
- (2) Check that the striker point has not been damaged and does not protrude beyond the striker guide.
- (3) Ensure that the leather and the multi-tab washers are in position and are serviceable and that the external body thread is clean.
- (4) The press-cap and safety plate must not be removed from the pistol until immediately before assembling the tail unit to the fuzed bomb.

- (5) If the tail unit is subsequently removed from the bomb, the safety plate and press-cap must immediately be replaced.

Note . . .

If, after removing the tail unit, the arming fork is found to be standing proud of the pistol body, the arming fork must not be screwed down to enable the safety plate and press-cap to be attached, until after the pistol has been unscrewed from the bomb.

Supply

14. Twenty pistols are packed in Box, B.346, Mk. 1. The stowage dimensions of the box are 15 in. $\times$ 11.25 in. $\times$ 6.0 in., and its filled weight is approximately 41 lb.

Storage

15. The boxes, containing the pistols, can be stored in the same explosives storhouse as the filled bombs with which they are to be used.

Chapter 15

(Completely revised)

PISTOLS, BOMB, TAIL, No. 73, Mk. 1 and 2

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Introduction

1. No. 73 series pistols are long delay pistols of the normal arming fork type and are to be used in conjunction with No. 57, Mk. 2 sensitive detonators.

2. Variants of both Mk. 1 and Mk. 2 pistols having successively longer delay times, are provided as follows:—

Mk. 1 pistol

Pistol No.	Delay time	Ref. No.
73	$\frac{1}{2}$ hr.	12G/1281
73A	1 hr.	12G/1363
73B	6 hr.	12G/1364
73C	12 hr.	12G/1365
73D	36 hr.	12G/1366
73E	72 hr.	12G/1367
73F	144 hr.	12G/1368

Mk. 2 pistol

Pistol No.	Delay time	Ref. No.
73	$\frac{1}{2}$ hr.	12G/1423
73A	1 hr.	12G/1424
73B	6 hr.	12G/1425
73C	12 hr.	12G/1426
73D	36 hr.	12G/1427
73E	72 hr.	12G/1428
73F	144 hr.	12G/1429

Note . . .

The times of delay are nominal and may vary appreciably as a result of manufacturing tolerances and the effect of temperature on the delay system.

3. The delay of the pistols is dependent upon the solvent action of acetone on celluloid. The acetone is contained in a glass ampoule and the celluloid, for the No. 73,



Fig. 1. Pistol, No. 73, Mk. 2

(A.L.71, May, 58)

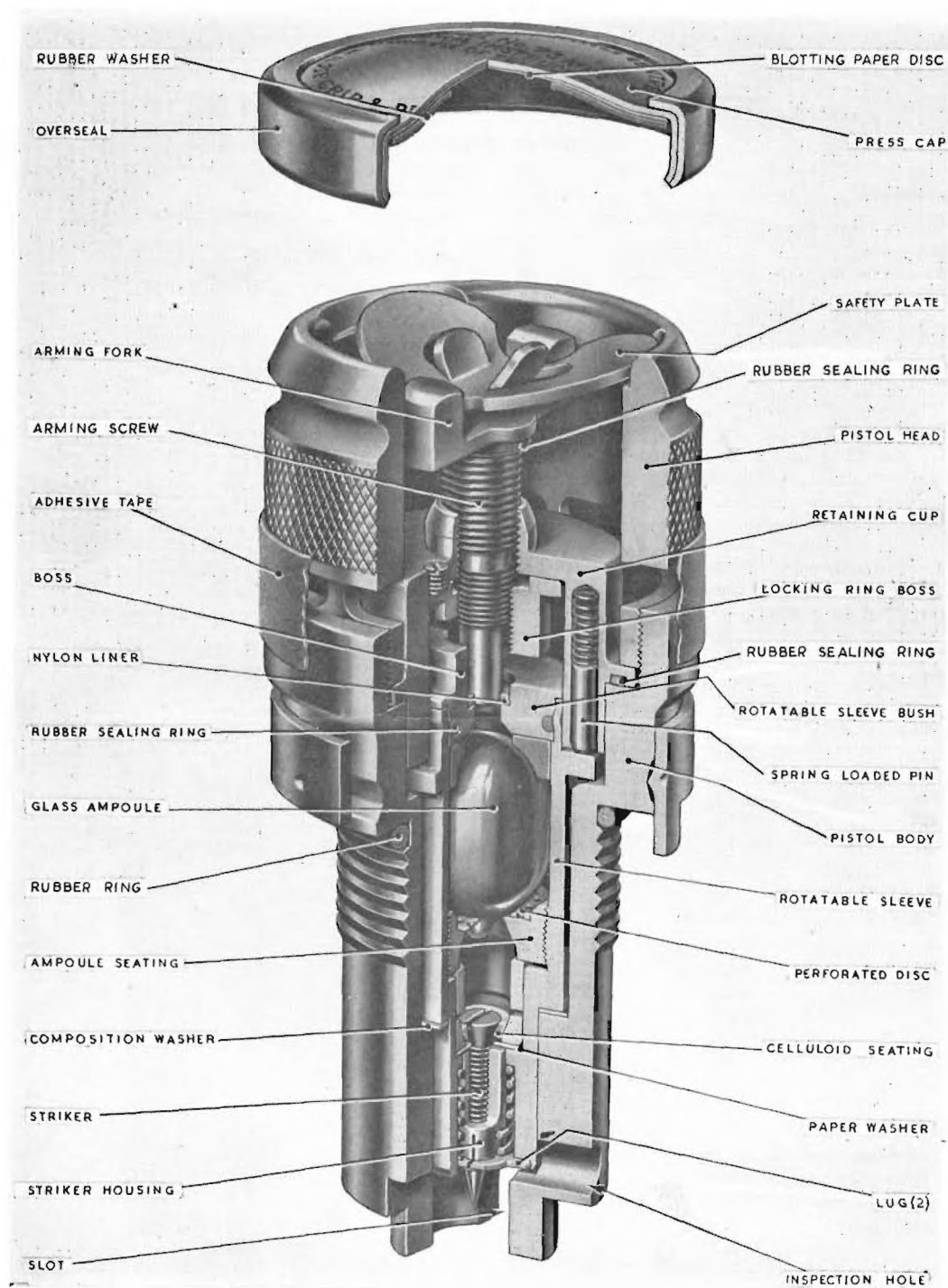


Fig. 2. Cutaway view of the No. 73, Mk. 2 pistol

RESTRICTED

Mk. 1 and 2 ($\frac{1}{2}$ hr. delay) pistol, is in the form of a seating in which the striker is embedded. For pistols with a delay time exceeding $\frac{1}{2}$ hr., the celluloid seating, in both the Mk. 1 and the Mk. 2 pistol, is augmented by one or more celluloid discs. The successively longer delays of the A to F pistols are obtained by varying the number of discs and strength of acetone used, during manufacture.

4. Special arming vanes No. 10, Mk. 1, of opposite hand to the normal type, are supplied with the pistols and are to be fitted to the tail units of bombs fuzed with these pistols. The arming vanes are painted either red or white; those painted red are to be used with pistols having a nominal delay of one hour, or less, and the white arming vanes are to be used with pistols having a nominal delay in excess of one hour.

No. 73, Mk. 2 PISTOL

Description

5. The pistol consists mainly of a pistol head, and a pistol body housing an arming screw, a retaining cup, a locking ring, and a rotatable sleeve containing a glass ampoule and a striker assembly.

6. The pistol head screws into the upper end of the body and is weakened immediately above its screw thread, by four circumferential slots, so that should severe side impact of a fuzed bomb occur, the pistol will fracture at the weak position and so lessen the risk of damaging the internal mechanism of the pistol.

7. The rotatable sleeve is retained in the body by the retaining cup, and this, in turn is retained by the pistol head which seats on a flange around the cup and secures the cup against a shoulder in the pistol body; a rubber sealing ring between the flange and the shoulder prevents the ingress of water. The pistol head is locked in position with a grub screw.

8. The retaining cup has a central hole threaded to accept the arming screw at one end of which is the arming fork. The screw has two independent threads of different diameters; the larger thread screws into the hole in the cup, and the smaller thread protrudes inside the cup and screws into a central hole through the locking ring from which projects a semi-circular boss.

9. On the arming screw, immediately beneath the fork, is a rubber sealing ring which, when the pistol is armed, is compressed against the top of the retaining cup and prevents water from seeping along the screw into the interior of the pistol. This seal, in conjunction with the sealing ring under the retaining cup, renders the pistol watertight.

10. The rotatable sleeve, housing the ampoule and the striker assembly, is closed with a bush having a nylon liner to accept the end of the arming screw. The bush is sealed with a rubber sealing ring to prevent loss of acetone when the ampoule is broken during the arming of the pistol, and has a semi-circular boss which registers with the similar boss on the locking ring, so that rotary movement of the locking ring is transmitted to the sleeve.

11. During the arming of the pistol the sleeve is rotated until a fixed locking pin in the rim of the retaining cup abuts one end of a cutaway in a flange on the sleeve, and a spring-loaded pin, also in the retaining cup, abuts the other end of the cutaway. Thus, when the pistol is armed the sleeve is locked against further rotation in either direction.

12. The sealed glass ampoule is positioned immediately beneath the bush in the rotatable sleeve. The ampoule is supported on a perforated zinc disc on an ampoule seating, the top of the ampoule being cushioned by a soft rubber washer.

13. The striker assembly is located in the lower end of the sleeve and consists of a spring-loaded striker screwed into a striker housing, the tapered head of the striker being embedded in a celluloid seating; the seating is supported on a shoulder in the sleeve and retains the striker in the cocked position. The base of the striker is provided with two diametrically opposed lugs which, when the pistol is in the safe condition, are positioned transversely to a slot in the base of the pistol body and so prevent the striker from functioning. When the pistol is armed by the rotation of the sleeve, the lugs are aligned with the slot and the striker is then prevented from functioning only by the celluloid seating.

14. Two diametrically opposed holes positioned at 90 deg. to the slot in the base of the pistol body, are provided for inspection

(A.L.72, Oct. 58)

purposes. When the pistol is in the safe condition the ends of the lugs on the striker assembly are visible through the holes.

15. The pistol body has an external thread for screwing into a missile and is provided with a tab locking spring and a rubber sealing ring. The pistol head is closed with a press-cap and overseal. On the inside of the press-cap is a white blotting-paper disc which serves as a tell-tale; should the ampoule be inadvertently broken, the disc would show traces of red or amber acetone stains.

Identification markings

16. The following information is stamped on the pistol body:—

- (1) The number, the Mark number, and where appropriate the suffix letter, of the pistol.
- (2) The manufacturer's initials, recognised trade mark, or approved inspection stamp.
- (3) The month and year of manufacture.
- (4) The Lot number.
- (5) The nominal delay time.

Functioning

17. When a fuzed missile is released from an aircraft, clockwise rotation of the arming fork by the tail arming mechanism causes the end of the arming screw to break the glass ampoule and so release the acetone.

18. The locking ring also, rotates with the arming screw and, through the medium of the contacting surfaces of the projecting bosses, rotates the sleeve until one end of the cutaway on the sleeve abuts the fixed pin in the retaining cup, and positions the two lugs on the striker in alignment with the slot in the base of the pistol body, and so arms the pistol. The other end of the cutaway then abuts the spring-loaded pin in the retaining cup, thus locking the sleeve against further rotation in either direction.

19. The acetone dissolves the celluloid and, after the appropriate delay frees the striker which, under the pressure of its spring, hits and fires the detonator in the bomb.

Safety devices

20. The following safety devices are incorporated in the pistol:—

- (1) *The safety plate.*—This is retained in position by the press-cap and overseal, and prevents rotation of the arming fork during transit, handling, and storage. When a tail unit is fitted to a fuzed missile, the safety plate is removed

and the pistol arming fork is then engaged by the locked arming mechanism in the tail unit.

- (2) *The two lugs on the striker assembly.*—These lugs prevent the striker from moving should the ampoule be accidentally broken and the celluloid be dissolved.

- (3) *The blotting-paper disc.*—The presence of either red, or amber stains on this disc is definite evidence of a broken ampoule.

Instructions for use and safety precautions

21. Detailed fuzing instructions, including the examination of the pistol are given in A.P.1661B in the section appropriate to the bomb being fuzed. Before using a pistol, however, the following general information and precautions are to be observed:—

- (1) Fuzing operations must only be undertaken by selected and fully instructed armament personnel under the supervision of a qualified armament N.C.O. conversant with this type of pistol.
- (2) When fuzing a bomb with this pistol, a special arming vane No. 10, Mk. 1 either red or white as appropriate (*para.* 4) is to be fitted to the bomb tail unit.
- (3) Before use the pistol is to be examined to ensure that the ampoule is not defective or broken. To do this, remove the overseal and press-cap, and examine the blotting-paper disc on the inside of the press-cap; the presence of amber or red acetone stains, or the characteristic odour of acetone, will be evidence of a defective ampoule. If no such evidence is apparent, put back the press-cap.

WARNING

A pistol having a broken or defective ampoule is to be set aside for A.I.S. inspection. The arming fork must not be rotated during the examination.

- (4) Ensure, by sighting through the inspection holes, that the lugs on the striker body are seated snugly in the small slots in the base of the rotatable sleeve. If the lugs are standing proud of the sleeve, the pistol is not to be used.
- (5) If a pistol is accidentally dropped or receives a knock it must be regarded as suspect, due to possible fracture of the ampoule, and is to be set aside for A.I.S. inspection. Similarly, if a fuzed bomb should be dropped or receive a severe shock, it must be unfuzed taking such precautions as time and circumstances permit.

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- (6) A fuzed bomb which is no longer required is to be unfuzed as soon as practicable. If however, from examination of the safety wire and arming vane, rotation of the striker assembly is suspected, the bomb is to be immediately unfuzed taking such precautions as time and circumstances permit.

No. 73, Mk. 1 PISTOL

Comparison with the No. 73, Mk. 2 pistol

22. The No. 73, Mk. 1 pistol is similar to the Mk. 2 pistol with the following exceptions:—

- (1) A Mk. 1 pistol does not incorporate the rubber sealing rings on the arming screw and under the retaining cup and, therefore, is not watertight (*para.* 9).
- (2) Either blue or red acetone is used in a Mk. 1 pistol, instead of amber or red as in a Mk. 2.

23. The information, otherwise, given in para. 1 to 21 is also applicable to the Mk. 1 pistol.

Chapter 17

(This chapter supersedes that issued with A.L.45)

PISTOL, BOMB, TAIL, No. 75, Mk. 2 AND 3

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The No. 75, Mk. 3 pistol	1	Cut-away view of the No. 75, Mk. 3 pistol	2

Introduction (fig. 1)

1. The No. 75 pistol provides a high degree of safety, the design being such that the striker is retained in positive engagement with a threaded arming fork stem during the making live period, which ensures that a released bomb is well clear of an aircraft before the striker is free to move. In addition, the arming fork and arming fork stem cannot rebound on to the striker after the pistol is made live.

2. In addition to new production pistols, a number of No. 65 and No. 30 pistols have been converted to No. 75 pistols, and some of these differ in external appearance from new production by having an annular groove in the body knurling. Both new production and converted pistols are, however, of similar internal construction and functioning characteristics, and are, operationally, interchangeable. The converted pistols have the letter 'c' stamped on the creep spring holder, immediately following the manufacturer's initials or recognised trade mark, for example, JS/c (para. 12).

3. The Mk. 2 and 3 pistols can be used with any of the detonators detailed in Sect. 3, Chap. 2 according to requirements.



Fig. 1. The No. 75, Mk. 3 pistol

(A.L.53, May 55)

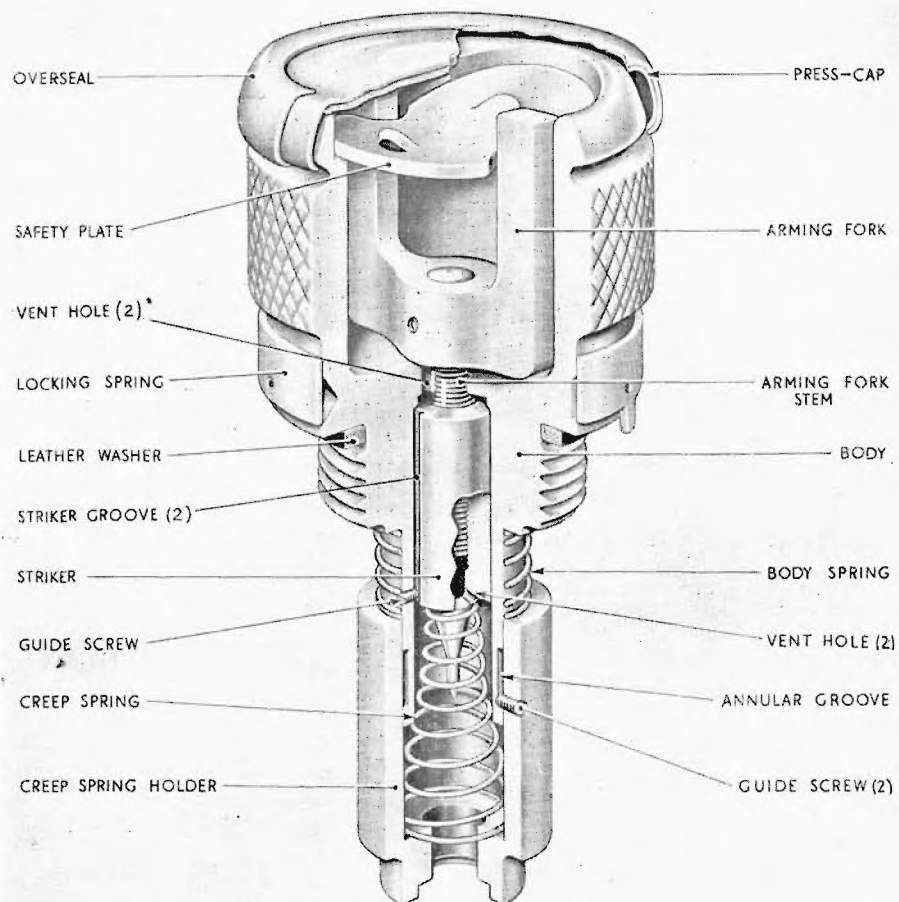


Fig. 2. Cut-away view of the No. 75, Mk. 3 pistol

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PISTOL No. 75, Mk. 3

General description (fig. 2)

4. Pistol No. 75, Mk. 3 (Stores Ref. 12G/1386) is approximately 4 in. in length by 2 in. maximum diameter, and has a body which houses an arming fork and arming fork stem, a safety plate, a striker, and a creep spring.

5. The pistol body has a recessed head to accommodate the arming fork which is secured to one end of the threaded arming fork stem. The stem is screwed into a web formed between the recessed head and the striker housing and then screws into a threaded hole in one end of the striker.

6. The other end of the striker is pointed and has two small vent holes which connect with the threaded hole and so allow gases to escape when the bomb detonator is functioned. Two diametrically opposed guide screws in the pistol body protrude one into each of two grooves in the striker and prevent the striker from rotating with the arming fork but permit longitudinal movement of the striker when the pistol functions. Two vent holes in the web between the recessed head and the striker housing are provided to further facilitate the discharge to atmosphere of gases from the bomb detonator.

7. One end of the creep spring abuts the pointed end of the striker and the other end is retained in position by a creep spring holder.

8. The creep spring holder is in the form of an external sleeve which passes over the lower end of the pistol body. It is retained in position by two, diametrically opposed, guide screws in the wall of the holder, which protrude into an annular groove in the pistol body. The creep spring holder has a limited amount of longitudinal movement, the extent of which is governed by the guide screws and the annular groove.

9. An external spring on the pistol body retains the base of the creep spring holder in contact with a detonator, when the pistol is screwed into a bomb.

10. The safety plate engages the arming fork, and seats in two recesses in the pistol head and prevents premature rotation of the arming fork. The safety plate is retained in position by a press-cap secured by an over-seal, which close the pistol head.

11. The pistol body has an external thread for screwing into a bomb, a leather washer to ensure a water-tight seal, and a tab locking spring for locking the pistol in a bomb.

Identification markings

12. The following particulars are stamped on the creep spring holder:—

- (1) The number and Mark of the pistol.
- (2) The manufacturer's initials, or recognised trade mark, which, on converted pistols is followed by the letter c.
- (3) The month and year of manufacture.

13. The number and Mark of the pistol are printed on the press-cap, which also bears important instructional information.

Functioning

14. When a bomb using this pistol is released the tail unit arming mechanism, and consequently, the pistol arming fork and stem, are rotated anti-clockwise by the air stream. The arming fork stem is thus unscrewed from the striker, which is then prevented from moving only by the creep spring.

15. The pistol is now armed, and when impact of the bomb occurs, the momentum of the striker overcomes the resistance of the creep spring, and the striker moves to hit and fire the detonator.

Note . . .

The pistol is armed after approximately 16½ turns of the arming fork.

Safety devices

16. The pistol has the following safety devices:—

(1) The safety plate, which prevents the arming fork from rotating during transit, storage and handling of the pistol, and until just prior to a tail unit being attached to the fuzed bomb. The safety plate is removed when the tail unit is attached, and the arming fork is then engaged by the locked mechanism of the tail unit.

(2) The creep spring, which prevents the striker from hitting the detonator, until impact of the fuzed bomb occurs.

(A.L.53, May 55)

Instructions for use, examination, tests, and safety precautions

17. Detailed fuzeing instructions, including the examination and testing of the pistol, are given in A.P.1661B, Vol. 1 (2nd Edn.), in Chap. 1 of the Section appropriate to the bomb being fuzeed. Before use, however, the following general information and inspectional requirements should be observed:—

(1) Remove the overseal press-cap and safety plate, and test the arming fork for freedom of movement by rotating it two turns anti-clockwise. If satisfactory, return the arming fork to its original position and put back the safety plate and press-cap.

(2) Ensure that the leather washer and tab locking spring are in position, and are serviceable.

(3) Ensure that the body screw thread is clean.

(4) The press-cap and safety plate must not be finally removed from the pistol until immediately before the tail unit is assembled to the fuzeed bomb.

(5) If the tail unit is subsequently removed from the fuzeed bomb the safety plate and press-cap must be immediately put back. Should, however the arming fork be found to be standing proud of the pistol body no attempt must be made to screw down the arming fork to enable the safety plate to be fitted until after the pistol has been unscrewed by hand, from the bomb.

PISTOL, No. 75, Mk. 2

Comparison with the Mk. 3 pistol

18. The Mk. 2 pistol (Stores Ref. 12G/1337) and the Mk. 3 pistol are similar in external appearance and in functioning characteristics, they differ only in the following respects:—

(1) The striker in the Mk. 2 pistol has only one longitudinal groove, whereas the striker in the Mk. 3 pistol has two grooves diametrically opposed.

(2) The Mk. 2 pistol has no vent holes in the web through which the arming stem is screwed, whereas the Mk. 3 pistol has two such holes to facilitate the discharge of gases from the bomb detonator.

19. The information otherwise contained in para. 1 to 17 is also applicable to the Mk. 2 pistol.

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Chapter 18

PISTOL, BOMB, NOSE, No. 76, Mk. I

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The No. 76, Mk. I pistol	1	Cutaway view of the pistol	2

Introduction (fig. 1)

1. Pistol, aircraft bomb, No. 76, Mk. 1 (Stores Ref. 12G/1316), is a direct-acting nose pistol providing the maximum degree of safety in handling compatible with very sensitive functioning. The design is such that a missile fitted with this pistol can be released safe into water.

2. A conical spring, supplied with the pistol, is to be used to support the detonator (which must be of the sensitive type), to ensure that it is in contact with the base of the striker guide when the pistol is inserted into a bomb.

3. The pistol is intended for use with the horizontal system of fuzeing, utilizing a horizontal pull-off of a safety wire to enable the pistol to be made live.

4. In addition to its normal use, the pistol has special operational uses, full particulars of which will be promulgated to the Units concerned.

Note . . .

The pistol is not to be used in H.C. bombs. Details of the pistols to be used in these bombs are given in Chap. 19.

General description (fig. 2)

5. The pistol consists, mainly, of a body, a striker guide, a diaphragm and striker assembly, a retaining disc, and a safety cap with arming vanes.

6. The striker guide is screwed into the pistol body, and houses the striker needle; a hole in the base of the guide is sealed with a paper disc.

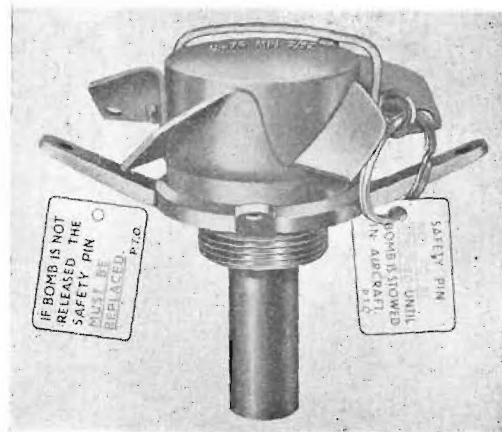


Fig. 1. The No. 76 Mk. I pistol

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7. The thin dished metal diaphragm is secured centrally to the non-pointed end of the striker needle, seats over a recess in the pistol body, and is retained in position by a perforated, screwed retaining disc. Vent holes in the recess beneath the diaphragm are provided to prevent air-cushioning of the diaphragm.

8. One end of a radiused collar on the striker needle abuts the underside of the diaphragm; the other end of the collar seats on the bevelled end of a sleeve secured to the striker

needle. This sleeve has an annular groove to engage a two-pronged, spring-loaded fork.

9. The fork is secured to a plunger which projects radially, through a hole in the upper screw threads on the pistol body, and is retained in engagement with the grooved sleeve by the safety cap.

10. The safety cap is screwed on to the pistol body, and to prevent them from binding, a stop pin in the safety cap registers against a stop pin projecting from the pistol body. Two of the arming vane blades each

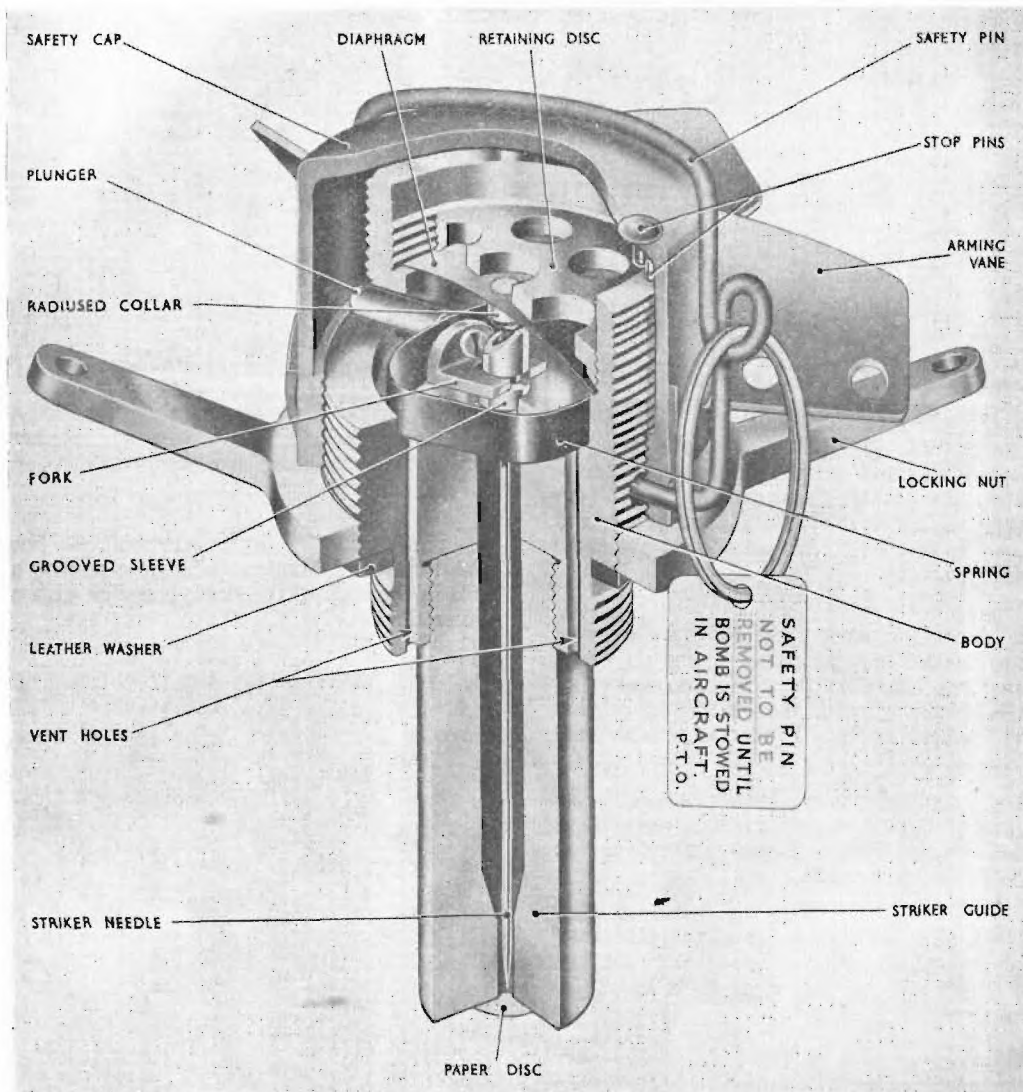


Fig. 2. Cutaway view of the pistol

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have two holes; one of the inner holes engages the U-shaped end of a safety pin, the other end of which passes through a diametrically opposite hole in the safety cap and engages a groove in the threads on the pistol body. A label bearing printed instructions, the wording on which is shown in fig. 1, is attached to the safety pin.

Note . . .

Some of these pistols may be found to have a blind hole, instead of a groove, to locate the end of the safety pin.

11. A locking nut, having four lugs, is provided for locking the pistol in position, after it has been screwed into a bomb. Each lug has a hole, one of which, depending on position, may be used in conjunction with one of the outer holes in the arming vane blades, as a guide for the safety wire used in horizontal fuzeing.

12. A leather washer on the lower screw threads of the pistol body forms a watertight seal between the pistol and the bomb.

Identification markings

13. The following information is stamped on the safety cap:—

- (1) The number and Mark of the pistol
- (2) The manufacturer's initials, or recognised trade mark.
- (3) The month and year of manufacture.

Functioning

14. When a bomb using this pistol is released ready to be made live from an aircraft, the safety wire is withdrawn by the fuze setting control links. Air pressure on the arming vanes rotates the safety cap which becomes unscrewed and falls away. Concurrently, under the action of its spring, the fork moves out of engagement with the sleeve, leaving the striker free to move. Just prior to impact, air pressure reverses the curvature of the diaphragm, so forcing the striker needle to hit and fire the detonator in the bomb.

Safety devices

15. The pistol has the following safety devices:—

- (1) The safety pin, which prevents rotation of the safety cap during transit, storage and handling.

Note . . .

The safety wire serves the same purpose, when it is substituted for the safety pin.

(2) The grooved sleeve and the fork, which in conjunction with the radiused collar, form a safeguard against the functioning of a pistol should the fuze bomb be accidentally dropped or otherwise receive a severe blow. In such an event the force of the blow is partly taken by the radiused collar which tends to slide or roll over on the inclined surface of the sleeve. The residual force is absorbed by the sleeve and fork, which are of sufficient strength to withstand the shock and so prevent the striker needle from moving.

Instructions for use, inspection, tests and safety precautions

16. Detailed fuzeing instructions, including the inspection and testing of the pistol, are given in the publication describing the bomb to be fuzeed. Before use, however, the following information and inspectional requirements should be observed:—

(1) Examine the paper disc on the base of the striker guide. If it is suspected that the disc has been punctured by the striker needle, the pistol must not be used, but must be set aside for A.I.S. inspection.

(2) Remove the safety pin and unscrew the safety cap sufficiently to expose the end of the plunger.

(3) Ensure that the fork freely disengages and engages the grooved sleeve.

(4) Screw the safety cap back to its original position, and put back the safety pin.

(5) Ensure that the leather washer is in position on the body screw threads.

(6) The safety pin must not be finally removed from the pistol until after the fuzeed bomb is secured to a carrier unit or a shackle.

(7) After detaching an unexpended bomb from a carrier unit or shackle, the safety pin must be put back in the pistol, immediately after the safety wire is withdrawn.

(8) Before inserting a detonator into a bomb using this pistol, place the conical spring, supplied with the pistol, over the detonator stem so that the small end of the spring abuts the underside of the detonator head.

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Supply

17. The pistol is supplied as follows:—

(1) Thirty-six pistols packed in Box, B.272A, Mk. 1 including 36 conical springs, 72, No. 1, Mk. 1 safety clips, and 36, No. 1, Mk. 1 safety wires. The stowage dimensions of the box are $31\frac{3}{8}$ in. $\times$ 14 in. $\times$ $9\frac{1}{2}$ in., and its filled weight is approximately 75 lb.

or

(2) Twenty-four pistols packed in Box, B.470, Mk. 1 including 24 conical springs, 48,

No. 1, Mk. 1 safety clips, and 24, No. 1 Mk. 1 safety wires. The stowage dimensions of the box are 25 in. $\times$ 13 in. $\times$ $11\frac{7}{8}$ in., and its filled weight is approximately 52 lb.

Storage

18. The boxes containing the pistols, can be stored in the same explosives storehouse as the filled bombs with which they are to be used.

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Chapter 20

PISTOL, BOMB, TAIL, No. 78, Mk. I

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The No. 78, Mk. I pistol	1	Cutaway view of the No. 78, Mk. I pistol	2

Introduction

1. The Pistol, bomb, tail, No. 78, Mk. 1 (Stores Ref. 12G/1336) is a multi-ways pistol used in low level bombing operations. It provides sensitive tail initiation and is to be used in conjunction with a No. 57, Mk. 2 (25/32 sec. delay) detonator.

General description

2. The pistol is approximately 4 in. in length and 2½ in. maximum dia., and consists mainly of a body, an arming fork, a retaining disc, an inertia ring, a sharp pointed striker, a creep spring, and a creep spring holder.

3. The body has a recessed head which houses the arming fork, inertia ring and the retaining disc. The inertia ring has a central countersunk hole which seats on the conical head of the striker, and is retained in position by the retaining disc. The retaining disc is supported in the body by a shoulder and is secured by three equi-spaced grub screws positioned transversely in the wall of the body.

4. The arming fork is secured to one end of a threaded stud which engages a tapped hole in the retaining disc and extends through the hole in the inertia ring to engage a tapped hole in the conical striker head.

5. A guide pin, projecting through the pistol body engages either of two diametrically opposed grooves in the striker head. This prevents rotation of the striker and facilitates the unscrewing of the arming fork but permits longitudinal movement of the striker when the pistol is functioned.

6. One end of the creep spring holder is housed in the lower end of the body; the other end protrudes from the body and is provided with four holes. The central hole houses the pointed end of the striker, the



Fig. 1. The No. 78, Mk. I pistol

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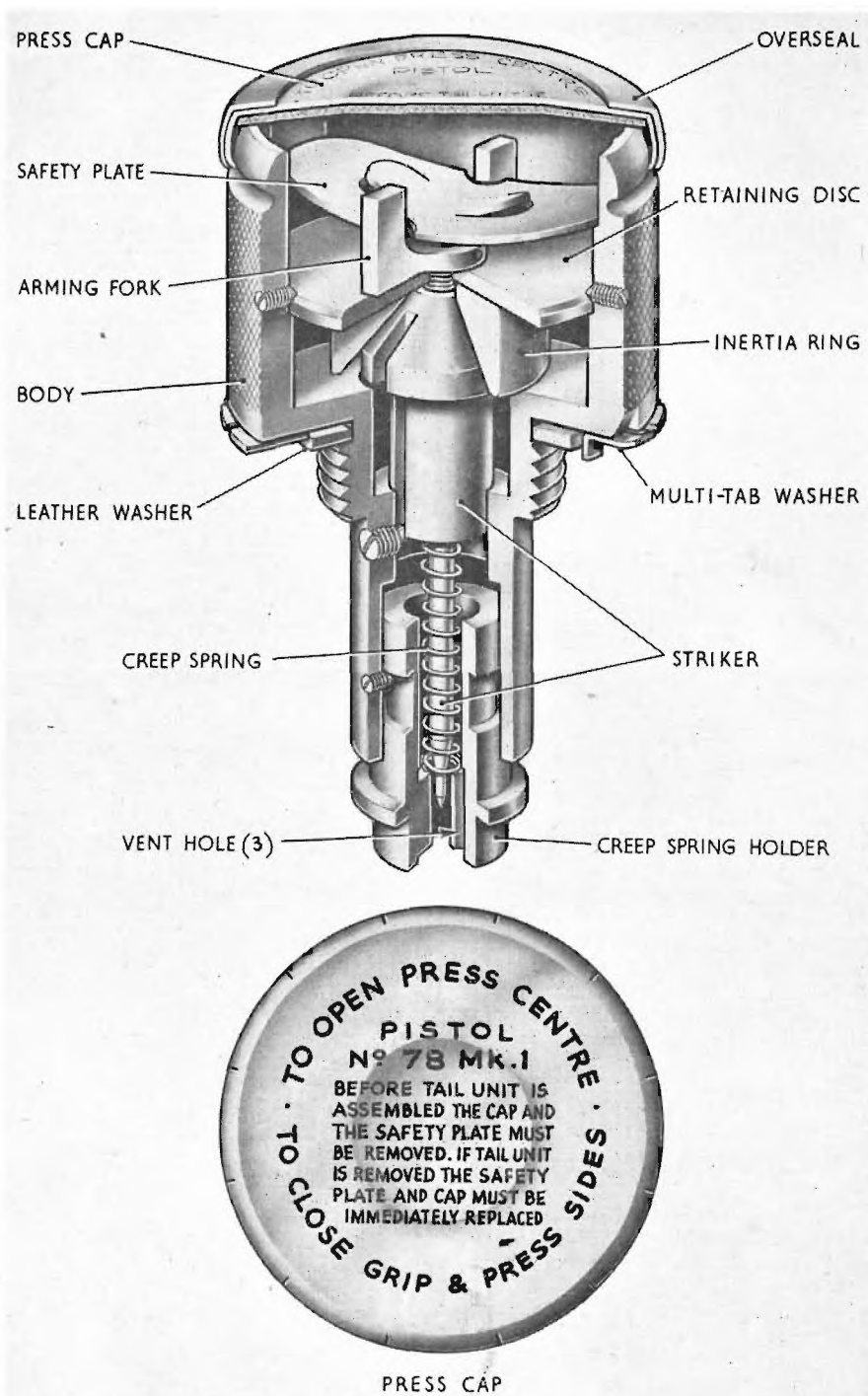


Fig. 2. Cutaway view of the No. 78, Mk. 1 pistol

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other three serve as vent holes and allow gases to escape when the detonator is fired.

7. Three equi-spaced locating screws project into the body and engage an annular groove in the creep spring holder to allow restricted longitudinal movement of the holder.

8. The creep spring is located between the creep spring holder and the head of the striker. It serves to prevent the striker moving on to the detonator, when the pistol is made live, until impact occurs, and also keeps the creep spring holder fully extended and in contact with the detonator. On impact, the momentum of the striker overcomes the resistance of the creep spring and the striker moves to hit and fire the detonator (para. 13 to 15); the movement of the striker, however, is limited by the creep spring holder, thus depth of penetration is controlled and eliminates the tendency of the striker to wedge in the detonator.

9. A safety plate, which engages the arming fork to prevent premature rotation of the fork, seats in two recesses in the head of the pistol. The safety plate is retained in position during transit, and storage by a press cap which closes the pistol head. The press cap is secured by an overseal.

10. An external thread, below the head of the pistol, allows for the pistol to be screwed into a bomb, and a leather washer ensures a water tight seal between the bomb and the pistol. A multi-tab washer allows the pistol to be locked in position in the bomb.

Identification markings

11. The following particulars are stamped on the pistol body:

- (1) The number and Mark number of the pistol.
- (2) The manufacturer's initials or recognised trade mark.
- (3) The month and year of manufacture.

12. The number and Mark number of the pistol are also printed on the press cap together with instructional information (fig. 2).

Functioning

13. When a prepared missile is released live from an aircraft, the arming fork is rotated in an anti-clockwise direction. This is

effected through the medium of the tail arming mechanism which is rotated by the air flow past its arming vanes. The arming fork, and stud is thus unscrewed from the striker head and retaining plate, and fall away leaving the striker supported only by the creep spring.

14. On normal impact, the momentum of the striker overcomes the resistance of the creep spring and the striker moves to hit and fire the detonator.

15. Should side impact occur, momentum causes the inertia ring to move radially across the pistol head with resultant wedge action between the retaining disc and striker, thus forcing the striker to move against the resistance of the creep spring and hit the detonator.

Safety devices

16. The pistol has the following safety devices:—

- (1) *The safety plate and press cap.*—The safety plate is retained in position by the press cap and prevents the arming fork rotating during transit, storage, and handling of the pistol and until the tail unit is attached to the fuzed bomb. When the tail unit is attached to a fuzed bomb, the safety plate is removed and the pistol arming fork is then engaged by the locked arming mechanism of the tail unit.
- (2) *The creep spring.*—This prevents the striker moving on to the detonator when the pistol is made live, until impact of the fuzed bomb occurs.

Instructions for use

17. Detailed fuzeing instructions, including the examining and testing of this pistol are given in A.P.1661B, Vol. 1, Chap. 1 of the Section appropriate to the bomb to be fuzeed. Before use, however, the following requirements are to be observed:—

- (1) Remove the overseal if in position, and then remove the press cap and the safety plate. Test the arming fork for freedom of movement by rotating it for not more than two turns anti-clockwise and then screwing it clockwise an equal amount. Replace the safety plate and press cap.

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- (2) Check that the striker point has not been damaged and that it does not protrude beyond the striker guide when the guide is compressed to the full limit against the creep spring.
- (3) Ensure that the leather washer and the multi-tab washer are serviceable and in position, and that the external body thread is clean and undamaged.
- (4) Maintain the press cap in position to avoid disturbance of the safety plate until immediately before the tail unit is assembled to the fuzed bomb.
- (5) Any pistol found to be faulty is to be set aside for A.I.S. inspection.

WARNING

If the tail unit is subsequently removed from a bomb, the safety plate and press cap must be put back on the pistol, immediately. If, however, after removing the tail unit, the arming fork is proud of the pistol body, so that the safety plate cannot be correctly fitted, the pistol must be removed from the bomb before any attempt is made to screw in the fork.

Supply

18. Eighteen pistols are accommodated in a tray which is packed in Box 651. The dimensions of the box are $23\frac{1}{2}$ in. $\times$ 18 in. $\times$ $7\frac{1}{2}$ in. and its filled weight is approximately 48 pounds.

Storage

19. The pistols may be stored boxed, or unboxed in trays, in the same explosive storehouses as the bombs with which they are to be used.

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Chapter 21

(Completely revised)

PISTOL, BOMB, TAIL, No. 79, Mk. 1 and 2**LIST OF CONTENTS**

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Pistol, No. 79, Mk. 2	1	Cutaway view of the No. 79, Mk. 2 pistol	2

Introduction

1. No. 79 pistols, with which No. 57, Mk. 2 detonators are the only detonators to be used, are long delay pistols of the arming fork type, the arming screws of which have left-hand screw threads. The pistols are, consequently, only to be used in conjunction with tails in which the arming vanes rotate anti-clockwise when a fuzed bomb is released from an aircraft, for example, tails No. 100 or No. 107.

2. Variants of both Mk. 1 and Mk. 2 pistols having successively longer delay times, are provided as follows:—

Mk. 1 pistol

Pistol No.	Delay time	Ref. No.
79	$\frac{1}{2}$ hr.	12G/1398
79A	1 hr.	12G/1399
79B	6 hr.	12G/1400
79C	12 hr.	12G/1401
79D	36 hr.	12G/1402
79E	72 hr.	12G/1403
79F	144 hr.	12G/1404

Mk. 2 pistol

Pistol No.	Delay time	Ref. No.
79	$\frac{1}{2}$ hr.	12G/1415
79A	1 hr.	12G/1416
79B	6 hr.	12G/1417
79C	12 hr.	12G/1418
79D	36 hr.	12G/1419
79E	72 hr.	12G/1420
79F	144 hr.	12G/1421

**Fig. 1. Pistol, No. 79, Mk. 2**

(A.L.71, May, 58)

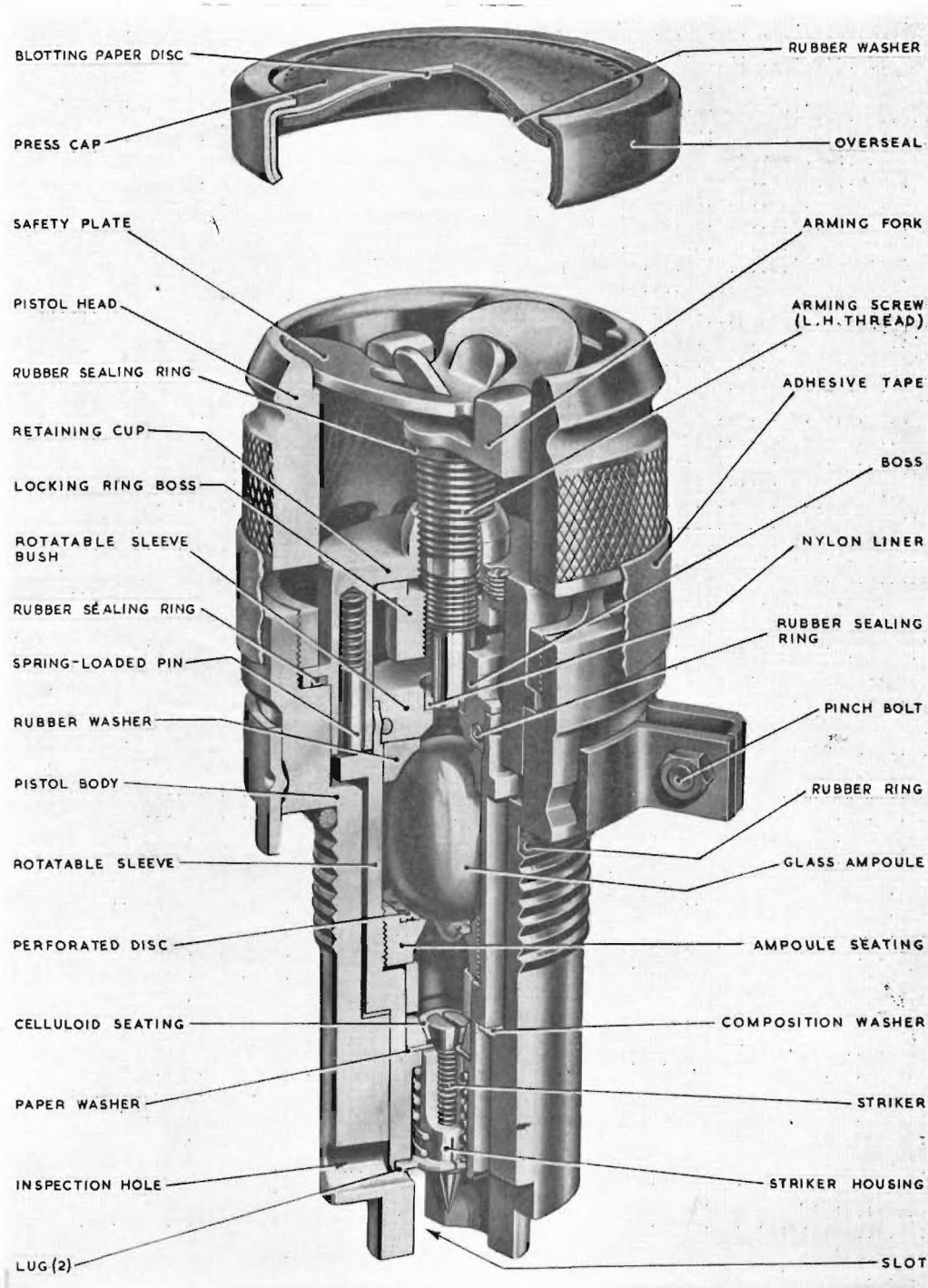


Fig. 2. Cutaway view of the No. 79, Mk. 2 pistol

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Note . . .

The times of delay are nominal and may vary appreciably as a result of manufacturing tolerances and the effect of temperature on the delay system.

3. The delay of the pistols is dependent upon the solvent action of acetone on celluloid. The acetone is contained in a glass ampoule and the celluloid, for the No. 79, Mk. 1 and Mk. 2 ($\frac{1}{2}$ hr. delay) pistol, is in the form of a seating in which the striker is embedded. For pistols with a delay time exceeding $\frac{1}{2}$ hr., the celluloid seating, in both the Mk. 1 and the Mk. 2 pistol, is augmented by one or more celluloid discs. The successively longer delays of the A to F pistols are obtained by varying the number of discs and strength of acetone used, during manufacture.

Description

4. The pistol consists mainly of a pistol head, and a pistol body housing an arming screw, a retaining cup, a locking ring, and a rotatable sleeve containing a glass ampoule and a striker assembly.

5. The pistol head screws into the upper end of the pistol body and is weakened immediately above its screw thread by four circumferential slots. Should severe side impact of a fuzed bomb occur, the pistol will fracture at the weak position and so lessen the risk of damaging the internal mechanism of the pistol.

6. The rotatable sleeve is retained in the body by the retaining cup, and this in turn is retained by the pistol head which seats on a flange around the retaining cup, and secures the cup against a shoulder in the pistol body; a rubber sealing ring between the flange and the shoulder prevents the ingress of water. The pistol head is locked in position with a grub screw.

7. The retaining cup has a central hole threaded to receive the arming screw at one end of which is the arming fork. The arming screw has two independent left-hand threads of different diameters; the larger thread screws into the hole in the cup and the smaller thread protrudes inside the cup and screws into a central hole through the locking ring from which projects a semi-circular boss.

8. On the arming screw, immediately beneath the fork, is a rubber sealing ring which, when the pistol is armed, is compressed

against the top of the retaining cup and prevents water from seeping along the screw into the interior of the pistol. This seal, in conjunction with the sealing ring under the retaining cup, renders the pistol watertight.

9. The rotatable sleeve, housing the ampoule and the striker assembly, is positioned beneath the arming screw and the boss on the locking ring. The sleeve is closed with a bush which is sealed with a rubber sealing ring to prevent loss of acetone when the pistol is armed. The central hole in the bush is fitted with a nylon liner which accepts the end of the arming screw, and projecting from the top of the bush is a semi-circular boss which registers against the similar boss on the locking ring so that rotary movement of the locking ring is transmitted to the sleeve.

10. During the arming of the pistol, the locking ring, and consequently the sleeve, are rotated by the arming screw until one end of a cutaway in a flange on the sleeve abuts a fixed locking pin in the rim of the retaining cup, and a spring-loaded pin, also in the rim of the retaining cup, abuts the other end of the cutaway. Thus, when the pistol is armed, the sleeve is locked against further rotation in either direction.

11. The glass ampoule, containing the acetone, is positioned immediately beneath the bush in the rotatable sleeve, and is supported on a perforated zinc disc resting on an ampoule seating; the top of the ampoule is cushioned with a soft rubber washer.

12. The striker assembly is located in the lower part of the sleeve and consists of a spring-loaded striker screwed into a striker housing, the tapered head of the striker being embedded in a celluloid seating. The seating is supported on a shoulder in the sleeve and retains the striker in the cocked position. The base of the striker is provided with two, diametrically opposed lugs.

13. When the pistol is in the safe condition, the lugs are positioned transversely to a slot in the base of the pistol body and so prevent the striker from functioning. When the sleeve is rotated the pistol becomes armed and the lugs are then in alignment with the slot, the striker being prevented from functioning only by the celluloid seating.

14. Two diametrically opposed holes, positioned at 90 deg. to the slot in the base of the pistol body, are provided for inspection

(A.L.72, Oct. 58)

purposes. When the pistol is in the safe condition the ends of the lugs on the striker assembly are visible through the holes.

15. The pistol body has an external screw thread for screwing into a bomb and a rubber sealing ring. A tab locking spring is provided for locking the pistol in a bomb, and because of the anti-clockwise rotation of the tail arming mechanism and pistol arming screw, with the consequent tendency of the pistol to become unscrewed from the bomb, the locking spring is provided with a pinch bolt to enable the spring to be tightened onto the pistol body.

16. A safety plate engages the arming screw fork and seats in two recesses in the pistol head to prevent premature rotation of the arming screw. The safety plate is retained in position by a press-cap secured by an over-seal, which close the pistol head. On the inside of the press-cap is a white blotting-paper disc which serves as a tell-tale; should the ampoule be inadvertently broken, the disc would show traces of red or amber stains.

Identification markings

17. The following information is stamped on the pistol body:—

- (1) The number, the Mark number, and where appropriate the suffix letter, of the pistol.
- (2) The manufacturer's initials, recognised trade mark, or approved inspection stamp.
- (3) The month and year of manufacture.
- (4) The Lot number.
- (5) The nominal delay time.

Functioning

18. When a fuzed bomb is released from an aircraft, anti-clockwise rotation of the pistol arming screw by the tail arming mechanism causes the arming screw, by reason of its left-hand thread, to travel through the nylon liner into the sleeve and so break the glass ampoule and release the acetone.

19. The locking ring also, rotates with the arming screw and, through the medium of the contacting surfaces of the projecting bosses, rotates the sleeve until one end of the cutaway on the sleeve abuts the fixed pin in the retaining cup, and positions the two lugs on the striker in alignment with the slot in the base of the pistol body, and so arms the pistol. The other end of the cutaway then abuts the spring-loaded pin in the retaining cup, thus locking the sleeve against further rotation in either direction.

20. The acetone dissolves the celluloid and, after the appropriate delay frees the striker which, under the pressure of its spring, hits and fires the detonator in the bomb.

Safety devices

21. The following safety devices are incorporated in the pistol:—

- (1) *The safety plate.*—This is retained in position by the press-cap and over-seal and prevents rotation of the arming screw during transit, handling, and storage. When a tail unit is fitted to a fuzed bomb, the safety plate is removed and the arming screw fork is then engaged by the locked arming mechanism in the tail.
- (2) *The two lugs on the striker assembly.*—These lugs prevent the striker from moving should the ampoule be accidentally broken and the celluloid be dissolved.
- (3) *The blotting-paper disc.*—The presence of either red, or amber, stains on this disc is definite evidence of a broken ampoule.

Instructions for use and safety precautions

22. Detailed fuzing instructions, including the examination of the pistol are given in A.P.1661B in the section appropriate to the bomb being fuzed. Before using a pistol, however, the following general information and precautions should be observed:—

- (1) Fuzing operations must only be undertaken by selected and fully instructed armament personnel under the supervision of a qualified armament N.C.O. conversant with this type of pistol.
- (2) Before use the pistol should be examined to ensure that the ampoule is not defective or broken. To do this, remove the over-seal and press-cap and examine the blotting-paper disc on the inside of the press-cap for traces of either amber or red acetone stains which may be present should the ampoule have been broken during transit or handling. In addition to this visual examination, the presence of acetone can often be detected by its characteristic odour.

WARNING

A pistol suspected of having a broken ampoule is to be set aside for A.I.S. inspection.

- (3) Ensure, by sighting through the inspection holes, that the lugs on the striker body are seated snugly in the small slots

RESTRICTED

in the base of the rotatable sleeve. If the lugs are standing proud of the sleeve, the pistol is not to be used.

- (4) If a pistol is accidentally dropped or receives a knock, it is to be regarded as suspect, due to possible fracture of the ampoule, and should be set aside for A.I.S. inspection. Similarly, if a fuzed bomb should be dropped or receive some other form of severe shock, it must be unfuzed taking such precautions as time and circumstances permit.
- (5) An unexpended fuzed bomb must be immediately unfuzed if, after examination, its pistol is suspected of having a broken ampoule.

No. 79, Mk. 1 PISTOL

Comparison with the No. 79, Mk. 2 pistol

23. The No. 79, Mk. 1 pistol is similar to the Mk. 2 pistol with the following exceptions:—

- (1) A Mk. 1 pistol does not incorporate the rubber sealing rings on the arming screw and under the retaining cup and, therefore is not watertight (*para. 8*).
- (2) Either blue or red acetone is used in a Mk. 1 pistol, instead of amber or red as in a Mk. 2.

24. The information, otherwise, given in para. 1 to 22 is also applicable to the Mk. 1 pistol.

This leaf issued June, 1949

A.P.1661C, Vol. I (2nd. Edn.)

SECTION 2

FUZES

SECTION 2

FUZES

LIST OF CHAPTERS

Note—A list of contents, where necessary, appears at the beginning of each chapter

- 1** General information on fuzes
- 2** Fuze, No. 42, Mk. 4
- 3** Fuzes, flare, mechanical, time, No. M111A1, M111A2 and M111A2*
- 4** Fuzes, aircraft bomb, AN-M120 and AN-M120A1
- 5** *Store disposed of*
- 6** Fuze, time, aircraft, No. 848, Mk. 7 (*Store obsolete*)
- 7** *Store disposed of*
- 8** *Store disposed of*
- 9** Fuze, percussion, aircraft bomb, No. 854, Mk. 4
- 10** Fuzes, aircraft bomb, nose, No. 873, Mk. 1 and 2
- 11** *Store disposed of*
- 12** *Store disposed of*
- 13** Fuzes, No. 908/1,800/2, Mk. 1 and No. 908/5,000/2, Mk. 1
- 14** Fuzes, No. 909/3,300/2, Mk. 1 and No. 909/4,700/2, Mk. 1
- 15** Fuze, No. 908, Mk. 2
- 16** Fuze, No. 909, Mk. 2
- 17** Fuzes, time, mechanical, No. 940, Mk. 1 and 2

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Chapter I

GENERAL INFORMATION ON FUZES

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Impact fuzes	6	Hydrostatic fuzes	9
Time fuzes	7		

Section 2. List of Chapters. Delete "(to be issued later)" after the titles of Chapters 1 and 3 and write "(A.L.4)" in the outer margin against each deletion. Insert these Chapters 1 and 3 to follow the List of Chapters. Record the incorporation of this A.L. in the Amendment Record Sheet.

Introduction

1. A fuze is a device containing its own means of initiation, which is used to bring about the functioning of other stores.

2. Fuzes are classified, according to their location in the fuzing system of a missile, as being either nose fuzes, or tail fuzes, while some (for example, the fuze No. 42, Mk. 4) can be used in either the nose or the tail position. Fuzes are further classified, according to their system of functioning, as impact, time, barometric, or hydrostatic. Each fuze is fully described in the relevant chapter of this section.

3. The fuze to be selected for a specified purpose will be determined by operational or training requirements.

4. A fuze is an intricate mechanism entailing the use of specialized equipment in its manufacture and assembly, and must, therefore, never be tampered with by Service personnel. To handle a fuze otherwise than in accordance with the published instructions may constitute a danger to the aircraft (carrying a fuzed missile) and its crew.

5. During the handling of a fuze, the magazine must always be directed away from the body and from other personnel in the immediate vicinity.

Impact fuzes

6. These fuzes function on impact of the fuzed missile, the shock of impact forcing a striker to hit and fire a detonator or percussion cap, the flash from which initiates the explosive train.

Time fuzes

7. The following types of time fuze are in present use:—

(1) Time fuzes having a mechanically-operated delay, usually a clockwork mechanism, which can be set to allow a period of time to elapse before initiation of the fuzed store commences.

(2) Time fuzes which utilize a pyrotechnic unit to provide the delay. These fuzes are designed to receive a capsule, selected to give the desired delay time before initiation of the fuzed store commences.

Barometric fuzes

8. A barometric fuze is one which is functioned when the fuzed missile reaches, during its descent, the region of barometric pressure at which the fuze has been set to function. The varying barometric pressure causes movement of a vacuum bellows, and concurrently with such movement, a striker becomes free to move and initiate the train of explosives.

Hydrostatic fuzes

9. These fuzes are used in under-water missiles and are pre-set to function when the fuzed missile has descended to a depth where the water pressure is equivalent to that at which the fuze has been set to function. The varying water pressure causes movement of a rubber bellows, and concurrently with such movement, a striker becomes free to move and initiate the train of explosives.

AIR MINISTRY

Chapter 2

FUZE, No. 42, Mk. 4

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General description	4	Instructions for use, inspection, tests, and safety precautions	15
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LIST OF ILLUSTRATIONS

	Fig.		Fig.
Part section through the Mk. 4 fuze	1	The No. 42, Mk. 4 fuze	2

Section 2. List of Chapters: delete "(to be issued later)" after the titles of Chapters 2, 5, and 6 and write "(A.L.5)" in the outer margin against each deletion. Insert this Chapter 2 to follow Chapter 1, and Chapters 5 and 6 to follow Chapter 3. Record the incorporation of this A.L. in the Amendment Record Sheet.

ARMAMENT

Introduction

1. This fuze is an air-burst fuze of the pull-percussion type and may be used either as a nose or a tail fuze. It is for use primarily with clusters and aircraft flares, although it may be used with other stores when directed.

2. The fuze, when prepared for use, is fitted with a delay capsule of the C-type. The period of delay provided by the capsule at ground level only, is indicated, in seconds, by the number following the letter C in the nomenclature of the capsule.

Note . . .

First issues of these delay capsules for use with this fuze were known as C6/10 and C10/27 capsules. The C6/10 capsule provides a delay of 15 sec. and is now known as the C15 capsule; the C10/27 capsule provides a delay of 21 sec. and is now known as the C21 capsule. The capsules are fully described in Sect. 4.

3. If the horizontal system of fuzing is required, a No. 4, Mk. I horizontal fuzing adapter is to be fitted to the fuze as part of the fuzing operation, unless some other approved form of guide is provided for the fuzing link. Details of the No. 4 adapter are given in Sect. 5.

General description (fig. 1 and 2)

4. The fuze is approximately 5½ in. in length and its maximum diameter is approximately 3 in. It consists of a body closed by a domed cap to which is attached a stem forming a striker housing and enclosing a pull-percussion arming mechanism. The delay capsule, when fitted to the fuze, is housed in the recess provided by the fuze body and the dome and, therefore, before a capsule can be inserted, the dome must first be removed from the fuze body as illustrated in fig. 2.

5. The body of the fuze is secured to a base plug by three screws. The base plug is threaded externally for screwing into the fuze adapter of the cluster, and contains a gunpowder-filled magazine which is closed at one end by a magazine cover, and at the other end by a waterproofed cover. The magazine cover is held in position between the base plug and a diaphragm which is an integral part of the fuze body. A hole in the magazine cover is closed by a paper seal primed with a few grains of gunpowder. The diaphragm has a central hole to receive one end of the delay capsule.

6. Equally spaced around the outer rim of the dome are three dimples which engage three bayonet slots in the fuze body to

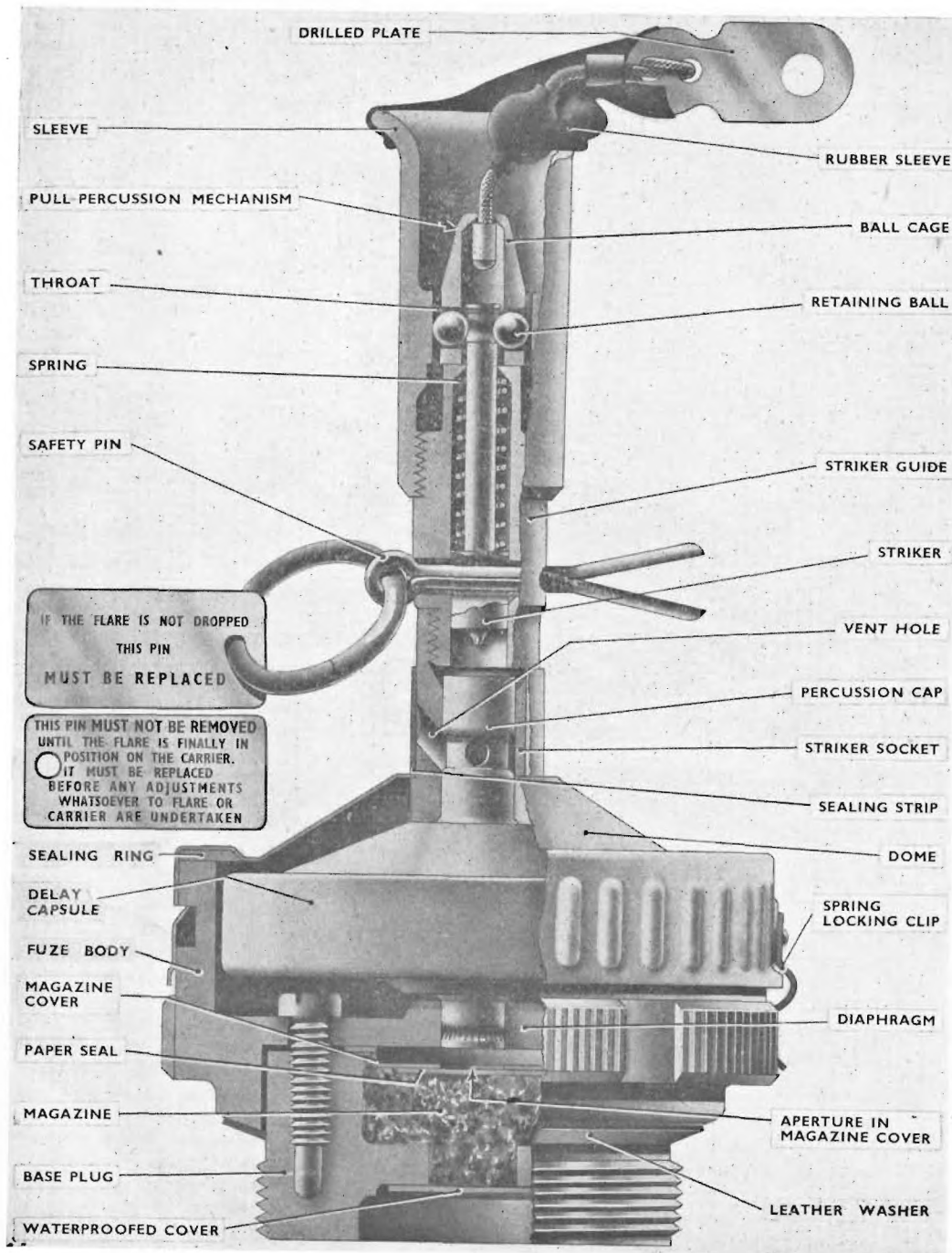


Fig. 1. Part section through the Mk. 4 Fuze

retain the dome in position on the fuze body. A spring locking clip riveted to the dome engages the milling around the fuze body. Two arrows and the words LOCK and UNLOCK are marked in red around the top of the dome. A rubber sealing ring inside the dome forms a seal against the ingress of moisture.

7. The stem of the fuze consists of a striker socket, a striker guide, and a sleeve having a throat and a bell-mouthed end. Fitted over the bell-mouthed end of the sleeve is a tapered black rubber sleeve to prevent moisture entering the stem. The striker socket is bored to receive the percussion cap portion of the delay capsule, and has a vent hole sealed by a red paper sealing strip.

8. The striker, which is shouldered at its lower end, is mainly housed by the striker guide, but extends, at its upper end, into the pull-percussion mechanism. This mechanism incorporates a ball cage having two diametrically opposed holes, each of which houses a retaining ball. The retaining balls are held in position between a groove in the upper end of the striker and the sides of the throat in the sleeve. A striker spring, which is compressed when the pull-percussion mechanism is pulled upwards, is located between the striker shoulder and a flange on the striker guide.

9. A flat drilled plate secured by a flexible wire to the ball cage protrudes from the rubber sleeve for connection to a fuze-setting control link.

10. A safety pin, which passes through the striker guide and striker, carries an instruction label, the lettering on which is shown in fig. 1. A rubber sleeve is fitted over the stem of the fuze just above the safety pin.

Identification markings

11. The following information is embossed or stamped on the bottom of the base plug:—

- (1) The number and Mark of the fuze
- (2) The manufacturer's initials or recognised trade mark
- (3) The month and year of manufacture
- (4) The Lot number.

Functioning

12. On release of the fuzed store from an aircraft, a pull on the drilled plate causes the

pull-percussion mechanism, together with the striker, to move upwards, the safety pin having been removed immediately before take-off. During this action, the striker spring is compressed and the retaining balls, after moving out of the throat, fall out of the cage into the bell-mouthed portion of the sleeve, thus releasing the striker. The striker then moves downwards, due to the recoil of its spring, to strike and fire the percussion cap of the delay capsule. Excess pressure generated in the percussion cap is released through the vent holes in the capsule and the vent hole in the striker socket, the paper sealing strip covering the hole in the socket being ruptured.

13. The capsule, after the appropriate delay, fires the gunpowder in the fuze magazine. The explosion of the gunpowder ruptures the waterproofed cover and the flash from the gunpowder initiates the fuzed store.

Safety devices

14. The fuze has the following safety devices:—

- (1) The safety pin.—This retains the striker and pull-percussion mechanism in the "safe" position during transit, storage, and handling.
- (2) The pull-percussion mechanism.—This mechanism, after removal of the safety pin, requires a pull of approximately 20 lb. to spring-load and release the striker.

Instructions for use, inspection, tests, and safety precautions

15. Detailed fuzing instructions are given in the appropriate publication describing the store to be fuzed. The following information should, however, be noted:—

- (1) The fuze must be inspected and tested before use as follows:—
 - (a) Ensure that the safety pin is properly in position.
 - (b) Check that the two rubber sleeves are properly fitted. If there is no rubber sleeve fitted around the stem of the fuze immediately above the safety pin, fit a rubber sleeve (Stores Ref. 12G/1194) as shown in fig. 2.

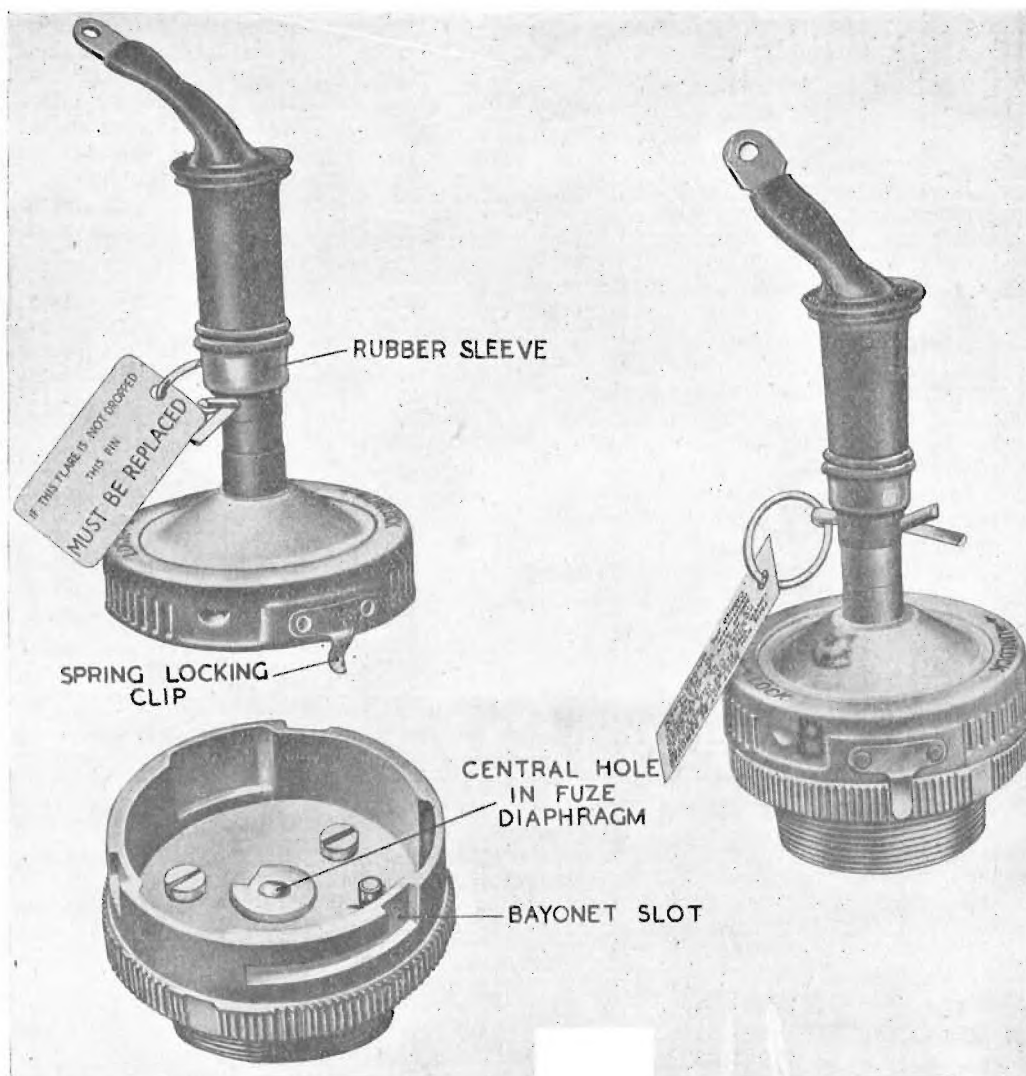


Fig. 2. The No. 42, Mk. 4 Fuze

- (c) Check that moisture has not penetrated to the interior of the fuze body, particular attention being given to an examination of the waterproofed cover at the bottom of the fuze body.
 - (d) Ensure that a leather washer is fitted over the threads of the fuze body; the washer should be supplied with the fuze. If there is no leather washer with the fuze, one taken from a No. 15 or No. 18 transit plug may be used.
 - (e) Examine the sealing ring inside the dome. If it is found to be a composition ring, it must be removed and a rubber ring (Stores Ref. 12G/1195) substituted.
 - (f) That the domed portion is properly locked to the fuze body. Proper locking is achieved provided that the spring locking clip has engaged at least three of the peripheral serrations on the fuze body.
- (2) The fuze safety pin must not be removed until just before the aircraft carrying the fuzed store takes-off. The safety pin must be replaced before unloading an unexpended store from the aircraft.

WARNING

After removal of the safety pin, the fuze is in a "live" condition. If any subsequent adjustment of the fuze, the store, or the carrier or shackle, is found to be necessary the safety pin must be replaced before any such adjustment is commenced.

Supply

16. The fuzes are packed singly in tinplate cylinders of various numbers and marks. The further packaging of these fuzes is into lots of either 24 or 18 cylinders respectively.

17. Twenty-four cylinders, each containing one fuze, are packed in a wooden box of American, Canadian, or British manufacture. The stowage dimensions of this type of container are approximately 31 in. × 13 in. × 9 in., and its filled weight is approximately 70 lb.

18. Eighteen cylinders, each containing one fuze, are packed in one of the following:—

- (1) Box, B.268—stowage dimensions 25 in. × 12 in. × 12 in., and filled weight approximately 60 lb.
- (2) Box, B.268F—stowage dimensions 25 in. × 12 in. × 10 in., and filled weight approximately 30 lb.
- (3) Box, B.462—stowage dimensions 25 in. × 12 in. × 12 in., and filled weight approximately 62 lb.

Storage

19. The fuze is classified, for storage purposes, in Group 6, Category X.

Chapter 3

FUZES, FLARE, MECHANICAL, TIME, M111A1, M111A2 and M111A2*

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Cut-away view of Fuze M111A2	1	Scrap view of the roller mechanism	4
Ancillary components for use with the M111A1 and M111A2 Fuzes	2	External views of the M111A1 fuze	5
External views of the M111A2 fuze	3	Keys for use with adapters	6
		External views of the M111A2* fuze	7

Introduction

1. These are air-burst fuzes of American manufacture and are made live by air pressure causing the arming vanes to spin. The fuzes incorporate a clockwork mechanism and a time setting device by which they can be set to function after a specified delay time.

2. Because of the probability of the fuzes breaking up on impact when released safe, the normal use of the fuzes is restricted as follows:—

- (1) Fuzes M111A1 are not to be used in stores exceeding 250 lb. in weight.
- (2) Fuzes M111A2 and M111A2* are not to be used in stores exceeding 140 lb. in weight.

3. When the fuzes are to be used in British stores within the weight limitations given in para. 2, an Adapter, No. 2, Mk. 1 or 2 (fig. 2) is to be used to enable the fuze to be screwed into the store; Key, No. 124, Mk. 1 can be used to tighten the Mk. 1 adapter, and Key, No. 89, Mk. 1, 2, or 3 can be used to tighten the Mk. 2 adapter.

4. When preparing one of these fuzes for use, a Safety Wire, No. 2, Mk. 1 is to be inserted in the appropriate hole, before the safety pin is withdrawn. This wire is subsequently replaced by a thicker wire, details of which are given in the publications describing the store to be fuzed.

5. An adapter, fuzing, fairlead, No. 5, Mk. 1 (Sect. 5) is to be used with an M111A series fuze if it is fitted to a missile to be released from a bomb carrier, unless the fuze is fitted with a No. 1, Mk. 2 supplementary safety device (Sect. 5, Chap. 6).

Note . . .

Because of the effects of moisture M111A1 and M111A2 fuzes which have been fitted to weapons and flown in aircraft but not released, must be removed from the weapons and destroyed as detailed in A.P.2608A. This restriction, however, does not apply to M111A2 fuzes which may be returned to store and clearly marked FOR FIRST ISSUE.*

(A.L.68, Apr. 57)

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FUZE, FLARE, MECHANICAL, TIME, M111A2**General description ((fig. 1)**

6. This fuze is approximately $4\frac{3}{16}$ in. in length and has a cylindrical body which is closed at one end by a gunpowder filled magazine which also houses a detonator. The other end of the body is closed by a setting ring, a part of which is housed in the fuze body. This setting ring is graduated in seconds of time and can be rotated to register against a setting line engraved on the fuze body. Delay periods ranging from 5 sec. minimum to 92 sec. maximum can be obtained.

7. Two small pegs in the setting ring register against a fixed stop which is integral with an arming pin bracket, and limit the extent of rotation in either direction. A spring ring presses against the setting ring and prevents excessive freedom of movement; it can be locked at a desired setting by a locking screw in the fuze body.

8. The setting ring houses a roller having a flat portion on which rests the shoulder of a spring-loaded striker which passes centrally through the fuze. The action of the spring tends to rotate the roller about its longitudinal axis; it is, however, held against such movement by a pin secured to the roller and engaging one end of a pivoted catch plate. The other end of this plate engages a pivoted pawl, the tail of which bears against the rim of a timing disc. When the fuze is functioned, the disc is rotated by a clockwork mechanism.

9. The clockwork is wound during manufacture and the timing disc is locked against premature rotation by a spring-loaded arming pin, one end of which engages a slot in the edge of the timing disc.

10. The arming pin is housed in a bracket secured to the fuze body, and is retained in position during transit and storage by a split pin. An additional small hole through the arming pin and bracket is provided to receive a No. 2, Mk. 1 safety wire as stated in para. 4.

11. Seated on ball bearings and supported by the setting ring is a sleeve to which is attached a combined two-bladed arming vane and safety wire guide. Screwed into the sleeve is the boss of a 33-toothed stationary gear wheel through which, in turn, is screwed the boss of the 34-toothed movable gear wheel. Both gears mesh with a pinion which is free to rotate on its spindle housed in the setting ring. Two lugs on the safety wire guide each have a hole and a slot which can be aligned with a corresponding hole and slot in the fixed stop.

12. A striker head is screwed on to the outer end of the striker and is locked in position by a nut which seats in a recess in the striker head. Beneath the striker head is a safety collar having a horseshoe-shaped slot which engages round the boss of the movable gear wheel. A slotted safety fork, inserted between the striker head and the safety collar, prevents accidental movement of the striker during transit and storage.

13. A sealing wire, to which an instruction label is secured, passes through the split pin in the arming pin, through the fixed stop for the setting ring, the safety wire guide and through the safety fork. The ends of the wire are secured in a lead seal.

14. The slot in the fixed stop and in the safety wire guide and the inner hole through the arming pin are to receive a No. 2, Mk. 1 safety wire, which is temporarily inserted

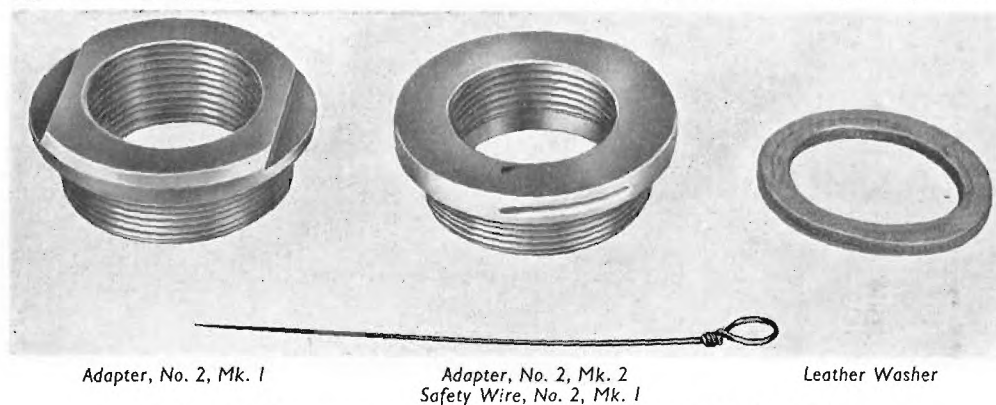


Fig. 2. Ancillary components for use with the M111A1 and M111A2 fuzes

before the split pin is withdrawn. The appropriate thicker safety wire is subsequently inserted through the outer hole in the arming pin, the circular hole in the fixed stop and through the circular hole in the arming wire guide, and the No. 2 safety wire is withdrawn.

Identification markings

15. The following American identification markings are stamped on the fuze body:—

- (1) The name and number of the fuze
- (2) The manufacturer's initials or recognized trade mark
- (3) The Lot number of the filled fuze
- (4) The month and year of filling.

Functioning

16. When a store using an M111A2 fuze is released from an aircraft, the safety wire is withdrawn and the arming vane and the sleeve to which it is attached are rotated by air pressure. Simultaneously, under the action of its spring, the arming pin is ejected and the clockwork causes the timing disc to commence rotating.

17. Rotation of the arming vane and its sleeve causes the stationary gear wheel, the pinion and the movable gear wheel to rotate. For every complete revolution of the stationary gear, the movable gear, having one more tooth, lags behind and becomes gradually unscrewed from the stationary gear. When a sufficient number of revolutions have been made, the boss of the movable gear has withdrawn from the safety collar, which is then thrown off by centrifugal force. The striker is now prevented from moving only by the roller and the catch plate.

18. The interval which elapses before the striker is freed is determined by the setting, which positions the tail of the pawl relatively to the slot in the rim of the timing disc. Thus when the timing disc has rotated to a position at which the slot is opposite the tail of the pawl, the pawl turns on its pivot and so disengages the catch plate which, in turn, disengages the pin in the roller. The pressure of the striker spring on the shoulder rotates the roller thereby freeing the striker which moves to hit and fire the detonator. The resulting flash fires the gunpowder in the fuze magazine.

Note . . .

Should the time mechanism fail to function, the fuze will function on impact, as all obstructions will be sheared.

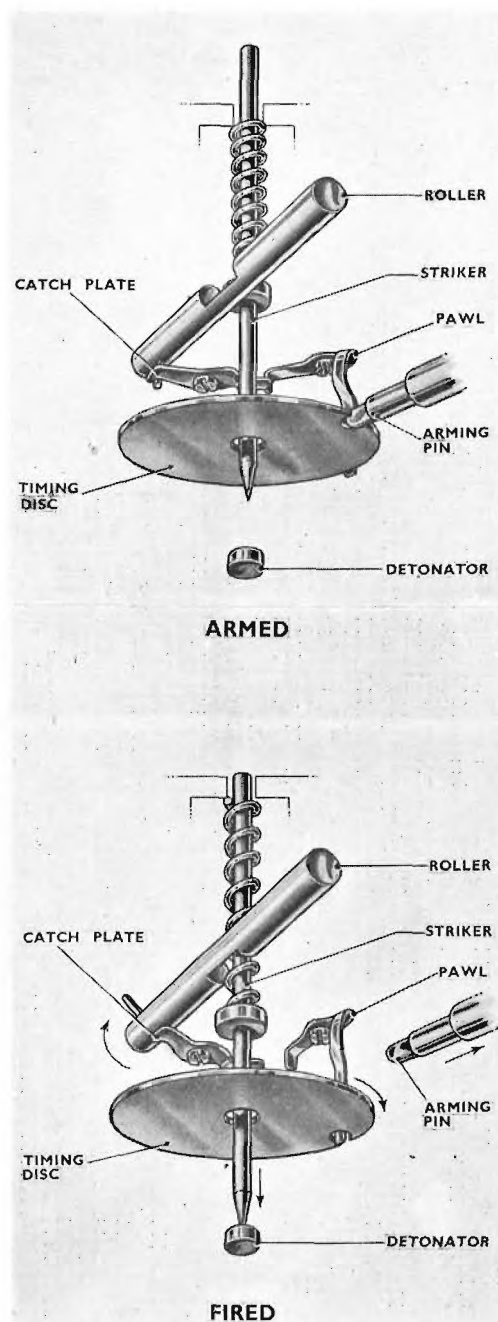


Fig. 4. Scrap view of the roller mechanism

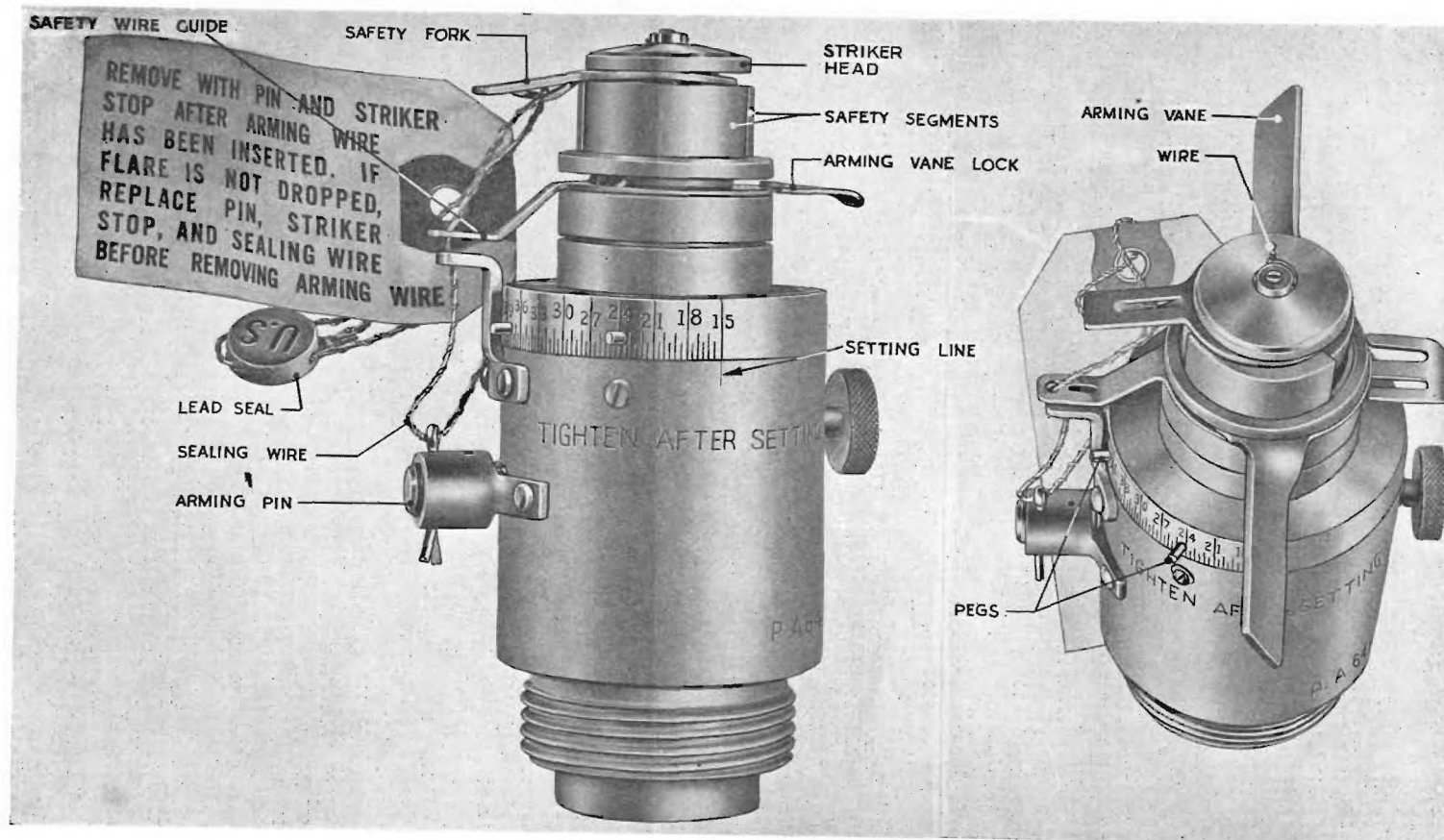


Fig. 5. External views of the M111A1 fuze

Safety devices

19. The fuze has the following safety devices:—

(1) The safety fork, which relieves the catchplate and pawl from prolonged pressure of the striker spring, thereby lessening the possibility of damage occurring to these parts during storage and transit.

(2) The safety collar, which, should the roller not be functioning as intended, prevents the striker from reaching the detonator. Also on arming of the fuze, the interval which elapses before the collar is thrown clear, ensures that a fuze store is well away from an aircraft before the striker can move towards the detonator.

(3) The arming pin, which prevents rotation of the timing disc. If the arming pin should be removed, the clockwork will unwind and render the fuze unserviceable.

(4) The split pin which retains the arming pin in position during transit and storage. When a fuze is prepared for use, a safety wire is substituted for the split pin.

(5) The sealing wire, which prevents loss of the split pin and safety fork and also prevents premature rotation of the combined arming vane and safety wire guide.

Instructions for use, inspection, tests and safety precautions

20. Detailed instructions for the fuzing of a store with this fuze are given in the publication describing the store to be fuzed. Before use, however, the fuze must be inspected and tested as follows:—

Before the fuze is removed from its cylinder

(1) The cylinder containing the fuze must be inspected to ensure that the seal is unbroken. Should the seal be faulty, the cylinder and its fuze must be set aside for A.I.S. inspection. In Naval Service, suspect fuzes are to be treated as detailed in B.R.862 or 863.

(2) The cylinder and its fuze must be inspected for evidence of the ingress of moisture, for example, rust, corrosion, or condensation. A fuze found to be affected is to be destroyed as detailed in A.P.2608A.

(3) The sealing wire should be in position with its lead seal unbroken.

After the fuze has been removed from its cylinder, or just prior to missile preparation

(1) Remove the lead seal and safety fork from the fuze, but DO NOT remove the split pin.

(2) Hold the fuze so that its arming vanes are uppermost and, through the slot in the safety collar, or between the safety segments in the M111A1 fuze (*para.* 23), observe the position of the arming sleeve which should be as follows:—

(a) In the M111A2 fuze, the top of the sleeve should be approximately $\frac{1}{16}$ in. below the top of the safety collar.

(b) In the M111A1 fuze, the top of the arming sleeve should be half way up the safety segments.

(3) If the position of the arming sleeve is incorrect the fuze is to be set aside as defective.

(4) If the position of the arming sleeve is correct, check that the clockwork mechanism has not functioned through incorrect assembly. This is to be done visually by observing the position of the striker head, as follows:—

(a) If the striker head is bearing hard on the safety collar, or the safety segments, as applicable, the fuze is to be regarded as unsafe. A length of wire or adhesive tape is to be wound around the collar or segments a minimum of two complete turns to retain the collar or segments in position. If wire is used the ends are to be twisted together. The fuze is then to be set aside as defective.

(b) If the striker head is CLEAR of the safety collar or segments, put back the safety fork and lead seal. The fuze is then to be regarded as serviceable.

21. Fuzes found to be defective are to be set aside for A.I.S. inspection.

22. A fuze which has been fitted to a missile and flown on an aircraft but not released, must be removed from the missile and destroyed. Similarly, a fuze which has not been expended within 14 days of opening the cylinder must be destroyed as detailed in A.P.2608A.

FUZE, FLARE, MECHANICAL, TIME, M111A1

Comparison with the M111A2 fuze

23. The M111A1 fuze closely resembles the M111A2 fuze in appearance and construction and differs only in the following respects:—

(A.L.68, Apr. 57)

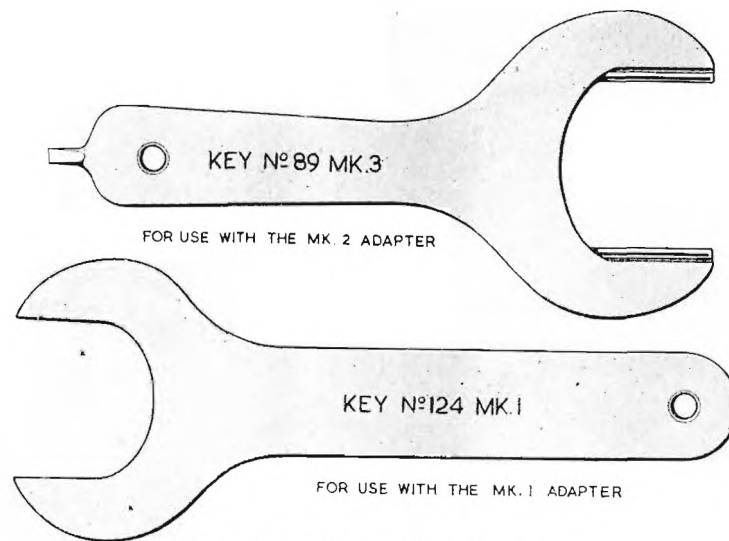


Fig. 6. Keys for use with adapters

(1) The gear wheels in the M111A1 fuze have 56 and 57 teeth while those in the M111A2 have 33 and 34 teeth.

(2) The minimum delay period obtainable with the M111A1 fuze is 8 sec.

(3) Instead of a safety collar, the M111A1 fuze has three safety segments.

(4) The M111A1 fuze has a less robust arming vane which is supplied separately from the fuze and is inserted above the arming vane lock when the fuze is being prepared for use.

(5) The arming vane lock of the M111A1 fuze has a W-shaped portion at one end, the outer limbs of which are bent slightly upwards to secure the arming vane in position after its insertion above the arming vane lock. By depressing the W-shaped portion, the arming vane can be withdrawn from the fuze.

(6) The striker head is a disc having a central boss and is secured by a wire which passes through a hole in the boss and the striker.

(7) The M111A1 fuze is 4 in. in length, while the M111A2 fuze is $4\frac{5}{16}$ in. in length.

24. The information contained in para. 15 to 22 is also applicable to the M111A1 fuze.

FUZE, FLARE, MECHANICAL, TIME, M111A2* Comparison with the M111A2

25. The M111A2* fuze is a modified M111A2 fuze, both having similar characteristics, therefore, para. 6 to 21 apply equally to the M111A2* fuze, but with the following exceptions:—

(1) A dished anti-icing flange which is attached to the safety collar of the M111A2* fuze and deflects the airstream, thus tending to prevent the formation of ice around the collar.

(2) Two throw-off pegs on the arming vane hub of the M111A2* fuze. These act on the anti-icing flange, thus preventing the collar slipping relative to the rotational speed of the arming vane, and obviates possible failure of the collar to be thrown off by centrifugal force (*para. 17*).

(3) The inversion of the split pin retaining the arming pin, and a different method of routing the sealing wire on the M111A2* fuze to prevent the possibility of the wire being parted and the split pin removed without breaking the seal.

(4) The incorporation in the M111A2* fuze of a 1.7 grain A detonator. This eliminates the need for a fuze to be destroyed if it has not been expended within the 14 days following its removal from its cylinder, or if it has been fitted to a missile which has flown on an aircraft but not released (*para. 22*). M111A2* fuzes which have been removed from their cylinders or which have been fitted to missiles, may be returned to store clearly marked FOR FIRST ISSUE.

(5) The setting line of the M111A2* fuze terminating in a dimple, both line and dimple being coloured red to make them more easily perceptible.

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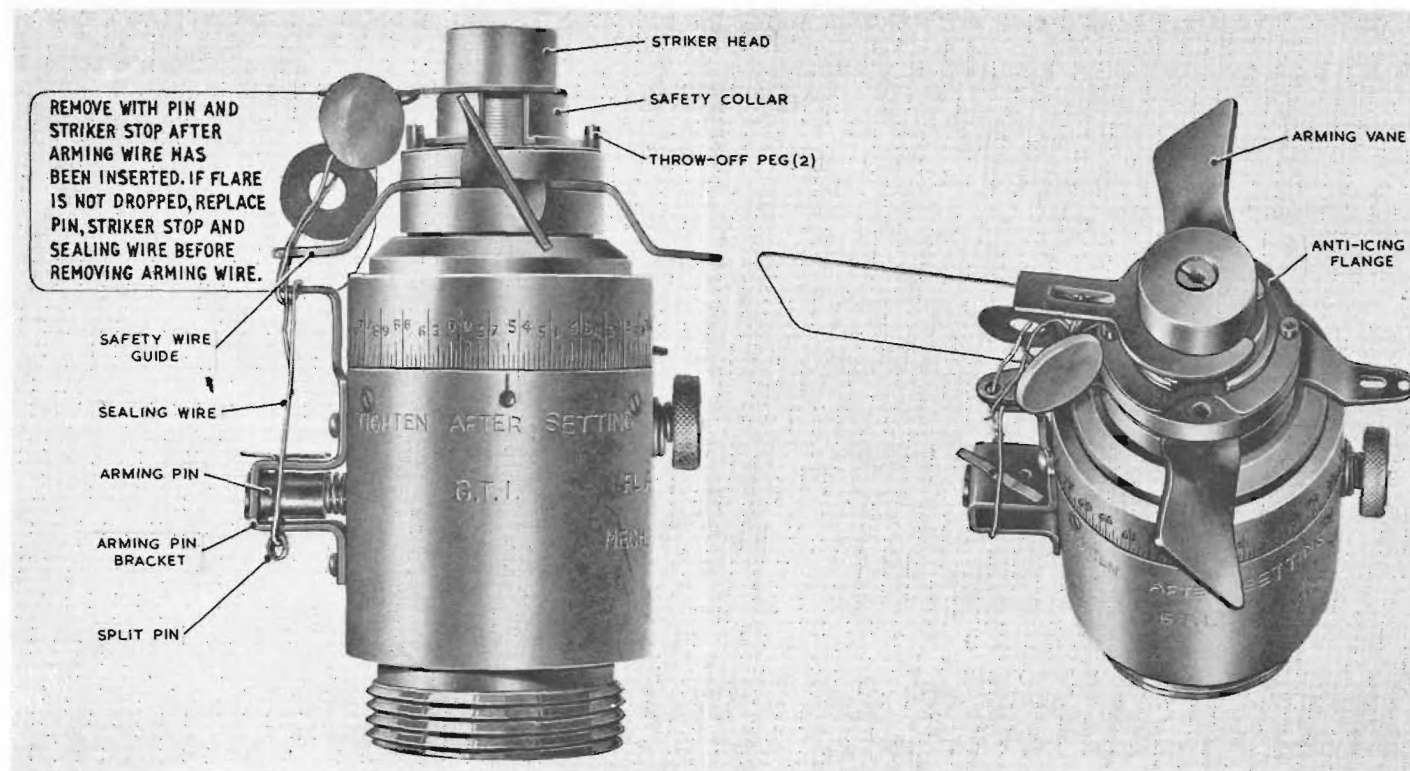


Fig. 7. External views of the M111A2* Fuze

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(A.L.73, Nov. 58)

AIR MINISTRY

Chapter 4

FUZES, AIRCRAFT BOMB, AN-M120, and AN-M120A1

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Fuze AN-M120A1	1	Cut-away views of fuze AN-M120A1	2

Introduction (fig. 1)

1. These fuzes, which are almost identical in appearance, construction, and functioning characteristics, are direct acting nose fuzes of American design. Both the AN-M120A1 and the AN-M120 fuzes incorporate a clock-work delay arming mechanism and differ mainly in respect of their arming delay times, the AN-M120A1 having a delay of approximately 1.9 sec. and the AN-M120 a delay of approximately 2.5 sec.

2. The fuzes are used only in the 19 lb. fragmentation bombs clustered in the 350 lb. Mk. 1 and 600 lb. Mk. 1 nose ejection clusters (A.P.1661J, Vol. 1, Sect. 4). When so used, the fuzes are modified by the addition of an auxiliary spring fitted externally under the striker plate. A Mk. 1 spring is used with the M120 fuze, and a Mk. 2 spring is used with the M120A1 fuze.

3. Arming of the fuzes is initiated by the pull-off of a safety wire which is withdrawn by the bomb parachute, when the parachute opens. Safety clips are *not* used with the safety wire. The fuzes function instantaneously on impact.



Fig. 1. Fuze AN-M120A1

FUZING COMPONENTS
This is Amendment List No. 33 to Air Publication 1661C,
Volume 1 (2nd Edn.)

Section 2, Chapter 4. Remove and dispose of the existing leaf bearing
para. 1 to para. 3 and substitute this leaf bearing para. 1 to para. 3.
Record the incorporation of this A.L. in the Amendment Record Sheet.

ARMAMENT

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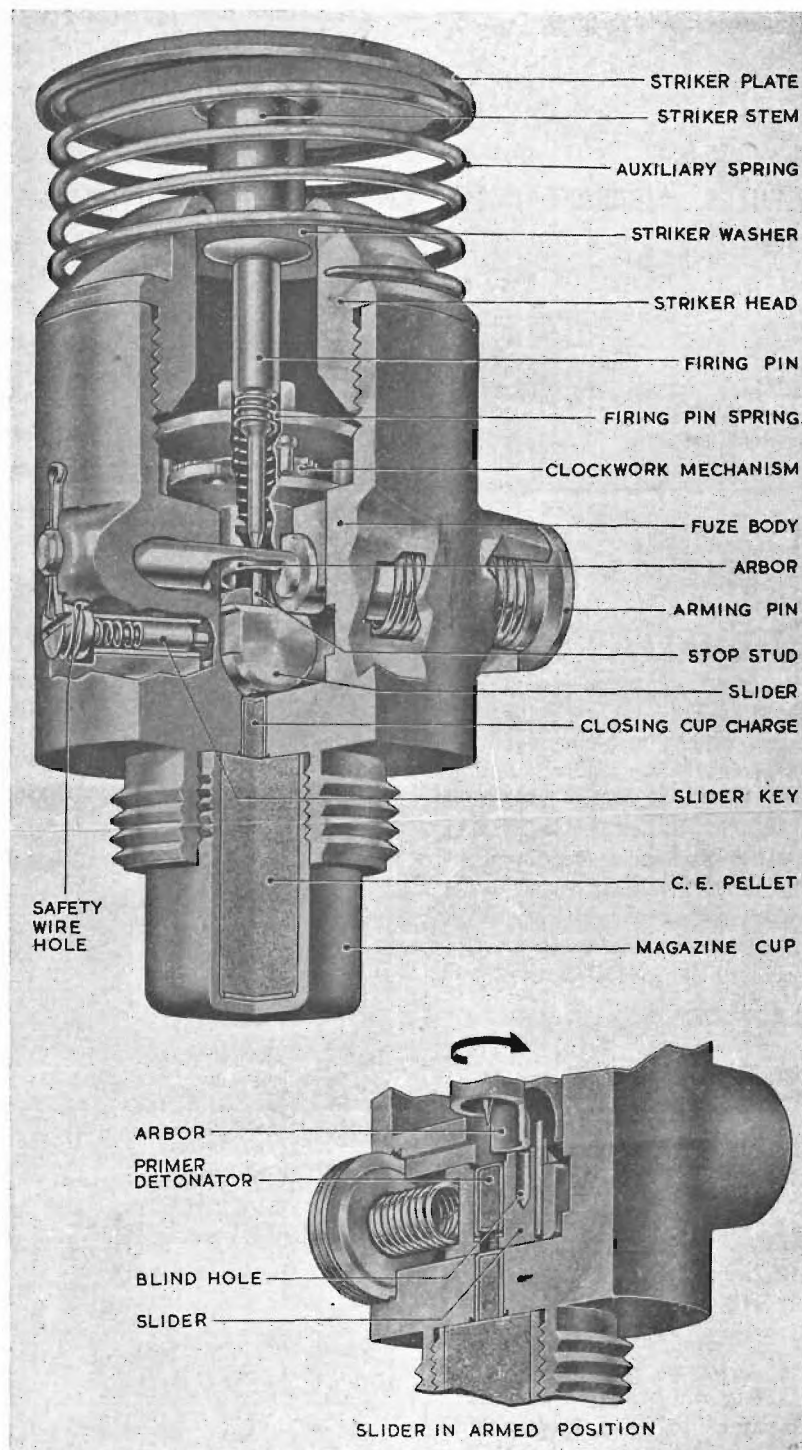


Fig. 2. Cut away views of fuze AN-M120A1

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FUZE AN-M120A1

General description (fig. 2)

4. The fuze is approximately $4\frac{1}{2}$ in. in length by $2\frac{7}{8}$ in. maximum diameter, and has a body which is closed at one end by a striker head and a striker assembly. The other end is closed by a magazine cup.

5. The striker assembly comprises a striker plate, stem, sleeve, and washer, which form an integral unit. The lower part of the assembly is housed in the striker head, and the upper part, including the striker stem and striker plate, protrudes above the striker head.

6. The fuze body houses a spring-loaded firing pin, a clockwork delay arming mechanism, a shuttered primer detonator assembly, and an explosive train.

7. The firing pin, which is held in light contact with the base of the striker assembly by a firing pin spring, passes through a bushing which extends into the arbor of the clockwork mechanism. This spring serves a dual purpose when the fuze bomb is released from the cluster and the fuze has become armed; by acting through the firing pin it exerts sufficient pressure to retain the striker assembly correctly positioned against the inside of the striker head, and it also retains the firing pin clear of the primer detonator, until impact occurs.

Note . . .

As the firing pin spring is weak in action, a Mk. 2 auxiliary spring is fitted externally between the striker plate and the striker head (fig. 1, when the fuze is used with British stores.

8. The clockwork, controlling the delay arming mechanism, is fully wound during manufacture, and through its arbor controls the movement of the shuttered primer detonator assembly. The clockwork is prevented from unwinding prematurely by a spring-loaded arming pin, which passes right through the fuze body and engages a cut-away portion on the arbor. The arming pin is retained in position by a safety pin inserted through a hole in its smaller end and through a boss projecting from the fuze body. A second hole in the arming pin and the boss is provided to receive a safety wire, when the fuze is being prepared for use.

Note . . .

The safety pin is not in position in the fuze when assembled in the clustered bomb. A safety wire is inserted in the appropriate hole and the safety pin is withdrawn by the assembly contractor, when a bomb is fuze prior to clustering.

9. The primer detonator forms part of the explosive train of the fuze, and is housed in a cylindrical spring-loaded slider. A stop stud which projects from the slider abuts the cut-away portion of the arbor and retains the slider in the safe position. When in the safe position, the primer detonator is off-set from the firing pin, and a blind hole in the slider is aligned under the firing pin. This hole is provided to receive the point of the firing pin, because the striker plate has to be depressed when the fuze bomb is clustered.

10. The cylindrical slider is prevented from rotating by a spring-loaded slider key which engages a key-way in the slider. When the slider is in the armed position, the key engages a notch in the key-way and so locks the slider.

11. A closing cup charge is centred in the base of the fuze body and aligns with a flash hole beneath the primer detonator, when the slider is in the armed position.

12. A magazine cup containing a C.E. pellet is screwed into the base of the fuze body, and the C.E. pellet is in contact with the closing cup charge.

Identification markings

13. The following American identification markings are stamped on the striker plate:—

- (1) The nomenclature and number of the fuze
- (2) The filled Lot number
- (3) The initials of the filling contractor
- (4) The month and year of manufacture

Functioning

14. When the safety wire is withdrawn from the fuze by the bomb parachute, the arming pin is ejected from the fuze by its spring and so releases the arbor. The clockwork mechanism is then free to operate and rotate the arbor; after a delay period of approximately 1.9 sec. it will have rotated sufficiently to disengage the stop stud on the primer

detonator slider. The slider is then free, and under the action of its spring, moves across the fuze body and aligns the detonator with the firing pin and closing cup charge. The fuze is now armed, and is locked in this position by the slider key, which engages the notch in the slider key-way.

15. On impact, the striker assembly is driven into the striker head, thus forcing the firing pin to hit and fire the primer detonator and so initiate the explosive train.

Safety devices

16. The fuze has the following safety devices:—

(1) The safety pin, which retains the arming pin in position and so prevents the fuze from becoming armed.

Note . . .

When the fuze is in a clustered bomb, a safety wire is substituted for the safety pin (para. 8).

(2) The clockwork delay mechanism, which after the release of the fuze bomb, allows a delay of 1.9 sec. so that the bomb can fall well clear of the aircraft, before the fuze becomes armed.

(3) The spring-loaded slider, which (when the fuze is unarmed) retains the primer detonator in a position off-set from the firing pin and the closing cup charge. Should, therefore, the striker assembly be accidentally depressed, the firing pin cannot hit the detonator. Further, should the detonator accidentally fire, the flash cannot fire the closing cup charge.

Instructions for use; inspection, safety precautions

17. Detailed instructions for the fuze of a bomb with this fuze are given in the publications describing the bomb to be fuze. Before use, however, the following general information and inspectional requirements should be observed:—

(1) Check that the body screw thread is clean.

(2) Ensure that the auxiliary spring is in position between the striker plate and striker head.

(3) Do not handle a fuze bomb by its parachute, rigging lines, or arming line, as this will withdraw the safety wire from the fuze and so release the arming pin.

WARNING

If the safety wire or safety pin has been accidentally withdrawn and the arming pin has been ejected from the fuze, great care must be exercised, as the fuze is fully armed and in a dangerous condition; a slight blow on the striker plate will cause the fuze to function.

(4) Should a fuze become fully armed, the fuze bomb, where practicable, is to be destroyed *in situ*. If this is not practicable, the bomb must be carried, nose upwards, to a suitable place and destroyed. In either instance the fuze bomb is to be destroyed as described in A.P.2608A.

Supply

18. The fuze is normally supplied with the bomb. It can, however, also be supplied separately. When supplied separately from the bomb, the fuze is packed in a metal cylinder bearing an American reference No. 76/1/279. Fifty cylinders, each containing one fuze, are packed in a wooden box. The stowage dimensions of the box are 17½ in. × 15½ in. × 11½ in., and its filled weight is approximately 98 lb.

Storage

19. For storage purposes, the fuze is classified in Group 6, category X.

FUZE AN-M120

Comparison with the fuze AN-M120A1

20. The AN-M120 fuze is almost identical with the AN-M120A1 fuze (*para. 1*). The information contained in *para. 1* to 19 inclusive is also applicable to the AN-M120 fuze, with the exception of the following differences:—

(1) The AN-M120 fuze has a delay time of 2.5 sec.

(2) A Mk. 1 auxiliary spring is used with the AN-M120 fuze.

Chapter 6

FUZE, TIME, AIRCRAFT, No. 848, Mk. 7

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General description	6	Safety devices	15
Identification markings	12	Instructions for use, inspection, tests, and safety precautions	16

LIST OF ILLUSTRATIONS

	Fig.		Fig.
Cut-away view of Fuze, No. 848, Mk. 7 (showing C-type delay capsule in position)	1	Fuze, No. 848, Mk. 7	2

Introduction (fig. 1 and 2)

1. This fuze must not be confused with the externally similar, but now obsolete, No. 848, Mk. 5 fuze.

2. The No. 848, Mk. 7 nose fuze is primarily for use with photographic flashes, certain types of reconnaissance flares (A.P.1661E, Vol. 1 (2nd Edn.)), and also with certain clusters (A.P.1661J, Vol. 1).

3. The fuze is an air-burst store, and is made live by the airstream acting on an arming vane. This vane is protected against damage and premature rotation by an arming vane cover, which seats on a platform. A brown paper seal is fixed around the cover and the platform and, while intact, provides evidence that the arming mechanism of the fuze has not been disturbed. A printed notice on the seal warns against its removal, and includes an instruction to reject a fuze if the seal is broken.

4. The fuze is fully described and illustrated in this chapter, which should enable personnel to understand both its construction and the sequence of operations which occurs when the fuze functions. There can be no excuse to strip or tamper with a fuze, and

any attempt to do so may constitute a danger to an aircraft and its crew.

5. Delay capsules of the "C" type are to be used with this fuze, and are fully described in Section 4. Tables listing the capsule to be selected for a specified purpose are included in those publications describing the stores which require the use of this fuze.

Note . . .

In an emergency, for example, should the capsule in a fuze become ignited inside an aircraft under conditions which make it impossible to release the fuze stores from the aircraft immediately, the fuze can be made safe by quickly removing the dome of the fuze and extracting the burning capsule. Speed of action is essential, as the capsule must be removed before it fires the gunpowder in the magazine.

General description

6. The fuze is approximately $6\frac{1}{4}$ in. long and 3 in. maximum diameter, and has a fuze body having a diaphragm to which a base plug is secured by three screws; a central hole in the diaphragm receives one end of a delay capsule. A leather washer over the thread of the base plug forms a seal against the ingress of moisture when a fuze is screwed into a store.

(A.L.61, June 56)

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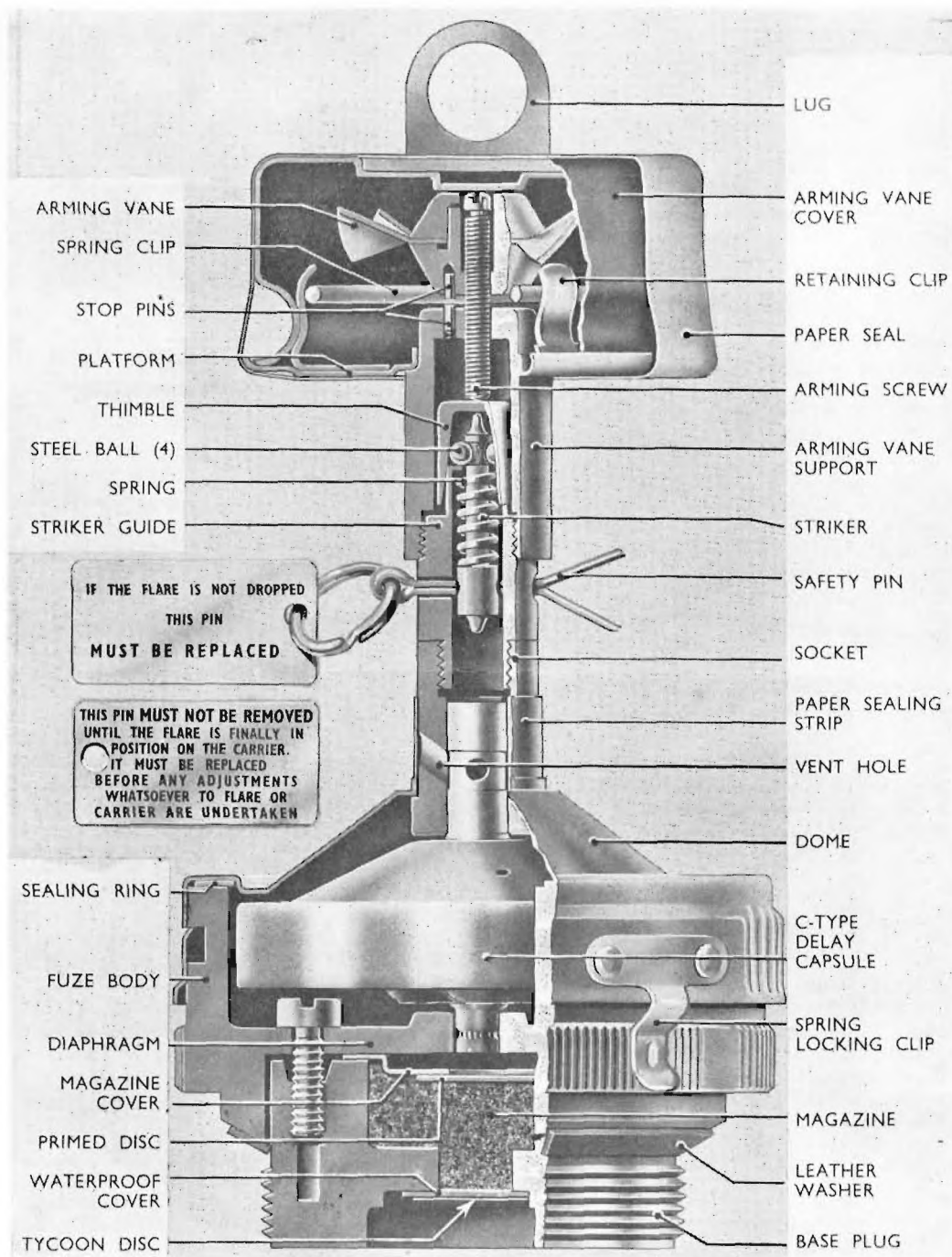


Fig. 1. Cut-away view of Fuze, No. 848, Mk. 7 (showing C-type delay capsule in position)

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7. The base plug is recessed to form a magazine containing gunpowder, and is closed at one end by a waterproof cover, and a disc of Tycoon paper. The opposite end of the magazine is sealed by a magazine cover having a central flash hole closed by a primed paper disc.

8. A domed portion, having a socket, is secured to the fuze body by three dimples engaging three bayonet type slots, and is locked by a spring locking clip. A sealing ring, inside the dome, prevents the ingress of moisture. The socket receives the other end of the delay capsule, which contains a percussion cap. A vent hole in the socket, closed by a paper sealing strip, allows gases to escape when the fuze functions.

9. The socket screws on to one end of a striker guide, which partly houses the striker mechanism. This mechanism has a spring-loaded striker, which is held in the "cocked" position by a ball-lock consisting of four steel balls. The balls seat on the striker guide and engage a groove in the striker. They are held in this position by a thimble having a tapered bore, the thimble being held against displacement by an arming screw. A positive lock to the striker is provided by a safety pin which passes through a hole in the guide and the head of the striker. An instruction label, the wording on which is shown in fig. 1, is attached to the safety pin by a split ring.

10. The other end of the striker guide screws into an arming vane support which is threaded to receive the arming screw carrying an arming vane. The arming vane has about $\frac{1}{2}$ in. "free travel" before locking against the head of the arming screw. A stop pin on the arming vane registers with a similar pin on the arming vane support, and prevents them from binding.

11. An arming vane cover, having a lug to which a fuze-setting control link may be attached, seats on a platform and is secured by three retaining clips, reinforced by a spring clip.

Identification markings

12. The following identification markings are embossed or stamped on the base plug:—

- (1) The number and Mark of the fuze.
- (2) The manufacturer's initials or recognised trade mark.
- (3) The month and year of filling.
- (4) The Lot number of the filled fuze.

Functioning

13. On release of a fuze store, ready to be made live, from an aircraft, the arming vane cover is snatched off by a fuze-setting control link and the No. 8 safety wire (which replaces the safety pin on preparing the fuze for use) is withdrawn from the striker. The air stream causes the arming vane to rotate and, after approximately $\frac{1}{2}$ in. of "free travel", it locks against the head of the arming screw. Both then continue to rotate until they become free of the store and fall away. The interval of "free travel" of the arming vane ensures that the fuze store is clear of the aircraft before the fuze begins to function.

14. With the removal of the No. 8 safety wire, the pressure exerted by the compressed spring is now free to be transmitted through the steel balls against the tapered bore of the thimble which, in consequence, follows the arming screw as it is withdrawn, until the steel balls are free to disengage from the striker groove. The striker is now unlocked, and under the pressure exerted by the spring, moves to hit and fire the percussion cap in the delay capsule which, after the appropriate delay period, fires the gunpowder in the magazine. This ruptures the waterproof cover, and the flash from the magazine initiates the fuze store.

Safety devices

15. The fuze has the following safety devices:—

- (1) The arming vane cover, which prevents accidental rotation of the arming vane, and thus of the arming screw. Evidence is provided by the unbroken paper seal that the cover has at no time been disturbed.
- (2) The safety pin. This provides a positive lock to the striker mechanism, and prevents the striker from moving, should it accidentally become uncocked.

Note . . .

The No. 8 safety wire serves the same purpose, when it is substituted for the safety pin.

Instructions for use, inspection, tests, and safety precautions

16. Detailed instructions for the fuzing of a store with this fuze, including the inspection and testing of the fuze, are given in the relevant publication describing the store to be fuzed. The following points should, however, be checked:—

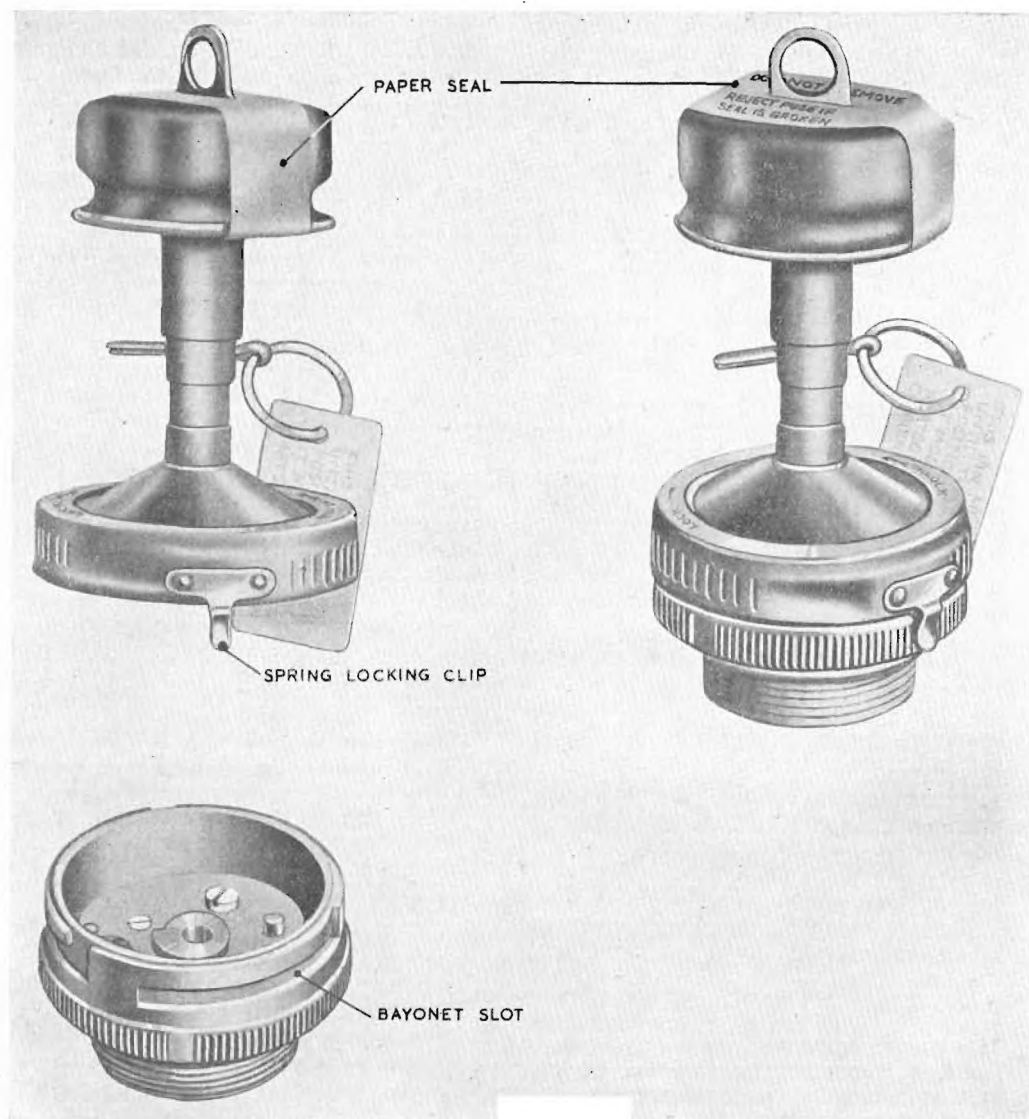


Fig. 2. Fuze, No. 848, Mk. 7

- (1) That care is taken when removing a fuze from its cylinder. The fuze should be so packed that the magazine is towards the open end of the cylinder. If incorrectly packed, and the arming vane cover is towards the open end, the cover must never be gripped to remove the fuze.
 - (2) That when handling a fuze, the magazine is directed away from the body and other personnel.
 - (3) That the arming vane cover is properly seated on the platform, and that the paper seal is unbroken. A fuze found to have a broken seal is to be set aside for A.I.S. inspection.
 - (4) That the safety pin is completely through the hole in the striker guide and striker head.
 - (5) That moisture has not penetrated to the interior of the fuze body, and that the waterproof cover in the base plug is intact and completely covers the hole.
 - (6) Examine the sealing ring inside the dome. If this is found to be of composition material, it must be replaced by a rubber ring (Stores Ref. 12G/1195).
 - (7) That the domed portion is properly locked to the fuze body. Proper locking is achieved provided that the spring locking clip has engaged at least three of the peripheral serrations on the fuze body.
 - (8) Ensure that a leather washer is fitted over the threads of the fuze body. If necessary, utilise the leather washer from the nose transit plug of the missile to be fuzed.
- 17.** Before use a fuze must be tested to ensure that the striker mechanism is correctly positioned. The dome portion should be removed from the fuze body, and held with the open end directed away from personnel. Withdraw the safety pin and if the striker does not move, tap the edge of the dome sharply against a bench, several times, taking care not to damage the locking clip. If the striker has still not moved, the striker mechanism may be assumed to be correctly positioned.
- 18.** Replace the safety pin, or, if a store is being fuzed, insert a No. 8 safety wire through the safety pin hole, and fit a Clip, safety, No. 2, Mk. 1, about 1 in. from the pointed end of the wire.

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(A.L.61, June 56)

Chapter 9

FUZE, PERCUSSION, AIRCRAFT BOMB, No. 854, Mk. 4

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LIST OF APPENDICES

Igniter, W.P.	App. 1 (to be issued later)
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Introduction (fig. 1)

1. The No. 854, Mk. 4 fuze (Stores Ref. 12G/1318) is an all-ways impact fuze. The fuze is for use in conjunction with an igniter, in long range drop tanks when filled with flame thrower fuel and used as fire bombs.

General description (fig. 2)

2. The fuze is approximately 1.9 in. in length and 1.9 in. maximum diameter, having a moulded plastic body which is recessed at one end to house a detonator sleeve, an inertia striker and creep spring, and a lead ball. The other end of the body has a flash hole leading into the base of the recess.

3. The sleeve has a detonator at one end, located directly above the flash hole, and also houses the creep spring and pointed stem of the inertia striker.

4. The striker head has a radiused surface to form a seating for the lead ball. The ball is retained on this seating by the conical undersurface of a plug which screws into and closes the body recess.

5. A spring-loaded safety pin passes diametrically through a hole in the fuze body and through the striker stem, and locks the striker in the safe position.

6. A spring loaded, transparent plastic safety cap encloses the upper portion of the fuze body, and retains the safety pin in position. The cap itself is retained in position by two No. 8 safety wires, which pass chord-wise through two holes in the cap, and beneath a shoulder on the fuze body. Each wire is secured with a No. 2 safety clip. The safety cap has three equi-distant slots round its base end, one of which can be selected to engage a locating pin projecting from the fuze body. The slot used, should so position the safety wires that a direct pull-off is obtained, and should also ensure an unrestricted release of the safety pin.

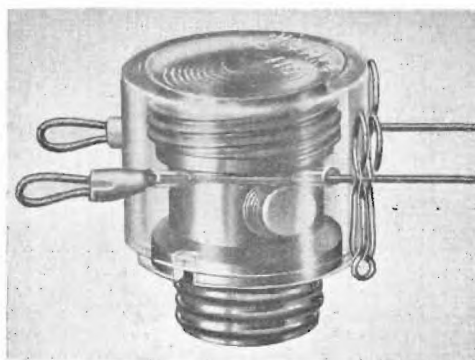


Fig. 1. The No. 854, Mk. 4 fuze

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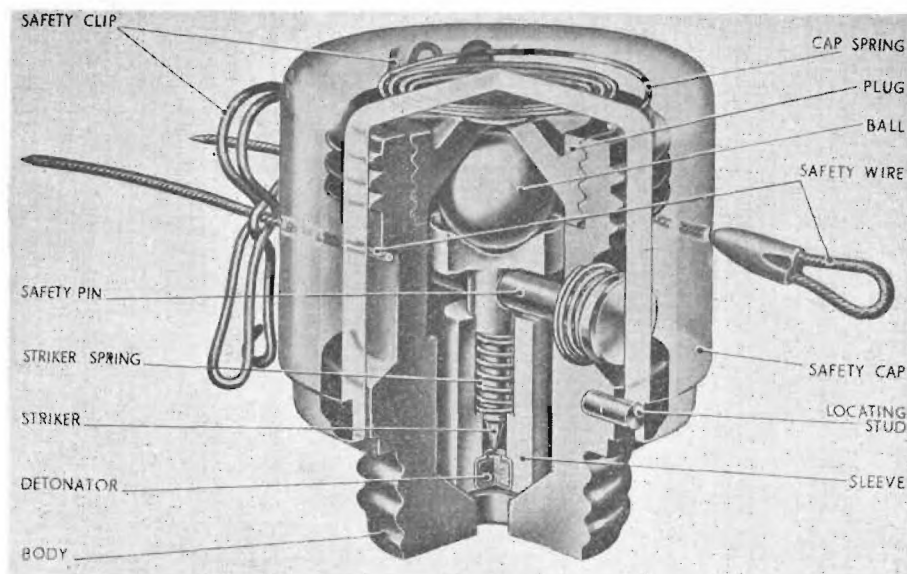


Fig. 2. Cutaway view of the No. 854, Mk. 4 fuze

WARNING

Should it be necessary to reposition the safety cap, care must be taken when the safety wires are being withdrawn, that the cap is not allowed to lift sufficiently to release the safety pin. Hands must be kept clear of the flash hole, which should be directed away from the body, and from other personnel.

7. The lower end of the fuze body has an external thread for screwing into a missile.

Note . . .

The screw threads on the upper part of the fuze body (enclosed by the plastic cap) were used with a different type of plastic cap, fitted to an earlier Mark of the fuze. They have no purpose in the Mark 4 fuze and should be disregarded.

Identification markings

8. The following information is embossed on the plastic cap of each fuze:—

- (1) The nomenclature of the fuze.
- (2) The manufacturer's initials or recognised trade mark.
- (3) The month and year of manufacture.

9. When the fuze is filled, the following additional information is stencilled, in red characters, on the plastic cap:—

- (1) The initials or recognised trade mark of the filling contractor, or monogram of the filling station.
- (2) The month and year of filling.
- (3) The filled Lot number.

Functioning

10. When a missile using this fuze is released from an aircraft, the two No. 8 safety wires are withdrawn from the fuze by the arming wire; concurrently, the plastic cap is forced off the fuze by its spring, and the safety pin is similarly ejected. The striker is then free to move, and is supported only by the creep spring.

11. On impact, the momentum of the lead ball and the striker overcomes the resistance of the creep spring, and the striker hits and fires the detonator. Should side impact occur, the sleeve will ride up the inclined surface in the base of the body recess, and so force the detonator on to the striker. In either instance the resulting flash passes through the flash hole and so fires the igniter, which, in turn, ignites the bomb fuel.

Supply

12. The fuzes are supplied packed 80 in Box, B.286, Mk. 4. Each fuze is fitted with two No. 8, Mk. 1 flexible safety wires and two No. 2, Mk. 1 safety clips. Included in the box are 160 non-flexible safety wires and 160, No. 1, Mk. 1 safety clips which may be used instead of the No. 8 safety wires and No. 2 safety clips, as and when directed. The stowage dimensions of the box are 24 in. × 12 in. × 11 in., and its filled weight is 56 lb., approximately.

Storage

13. For storage purposes, the fuze is classified in Group 6, Category X.

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Chapter 10

(This chapter supersedes that issued with A.L.8 and 35)

FUZES, AIRCRAFT BOMB, NOSE, No. 873, Mk. 1 and 2

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Introduction

1. Fuzes, No. 873, Mk. 1 and 2 are direct acting nose fuzes for use with 20 lb. fragmentation bombs.
2. The Mk. 1 fuze (*Stores Ref. 12G/N.I.V.595*) is used in conjunction with the No. 11, Mk. 1 conversion set (*A.P.1661K, Vol. 1, Chap. 4*) and is fitted only to the Mk. 4, 20 lb. F. bomb.
3. The Mk. 2 fuze (*Stores Ref. 12G/1377*) is used with the Mk. 5, 20 lb. F. bomb and may also be used with the Mk. 4 bomb after removal from the bomb of the fuze adapter, the 13 dram exploder pellet, and the felt disc, all of which constitute part of the No. 11, Mk. 1 conversion set.

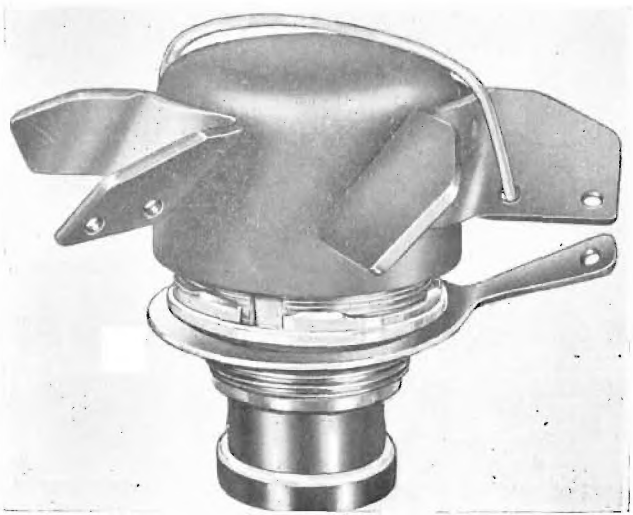


Fig. 1. Fuze, No. 873, Mk. 2

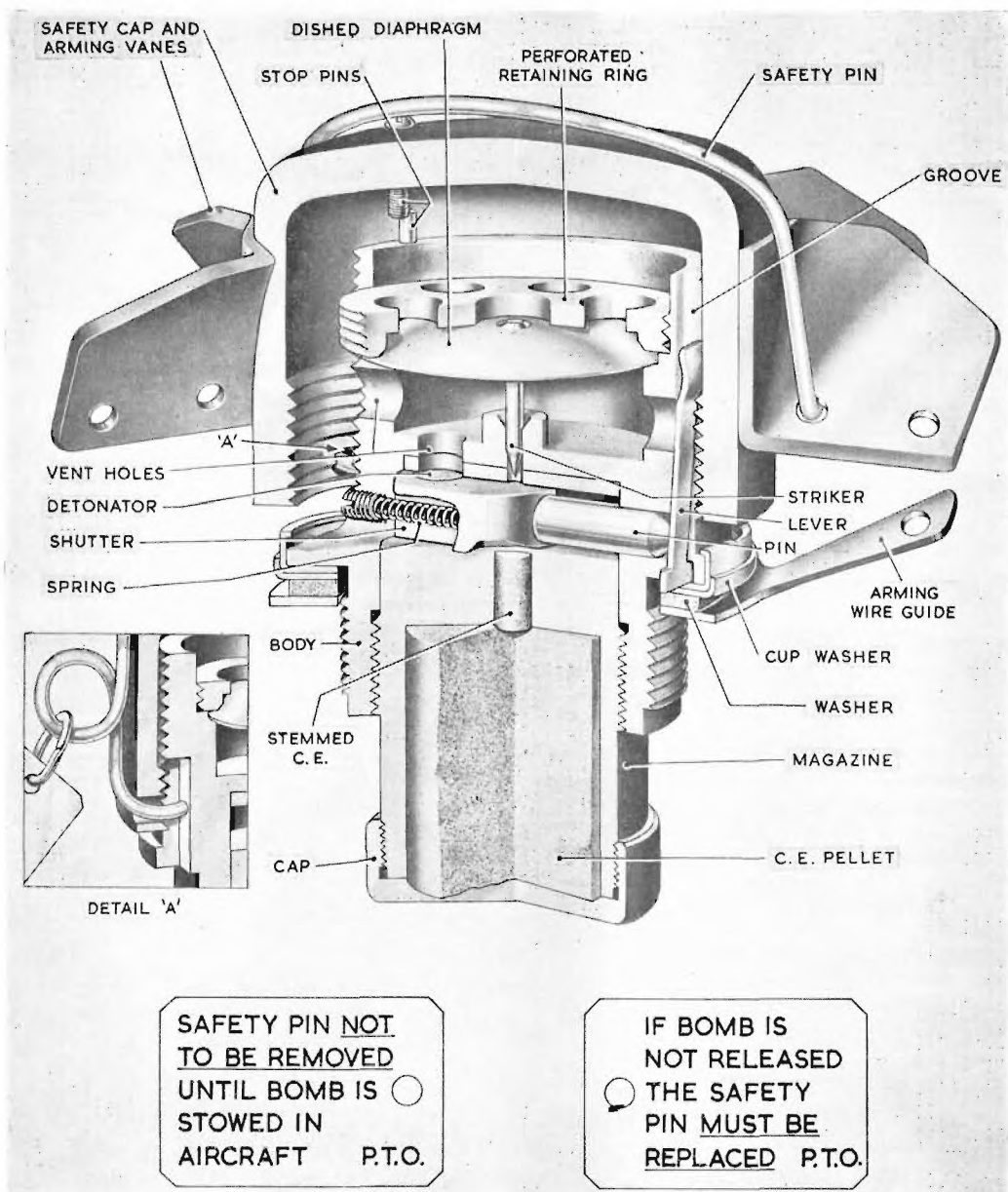


Fig. 2. Sectional view of fuze

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FUZE, NO. 873, MK. 2

Description

4. The fuze consists mainly of a body closed at one end by a safety cap and at the opposite end by a magazine.

5. The safety cap, to which either a five or six-bladed arming vane is secured, is screwed on to the fuze body. Two holes are in each of two non-adjacent blades of the five-bladed vane; two holes are also in each alternate blade of the six-bladed vane. Either of the inner holes is for a safety pin and either of the outer holes is for a No. 8 fuzing wire which is fitted during missile preparation (*para.* 12). The hole to be used in each instance is dependent upon the position of the safety cap and arming vane respectively.

6. Within the cap is a screw constituting a stop pin which abuts a mating pin in the body, thus preventing the cap being screwed too tightly on to the body and binding the threads.

7. A safety pin extends over the safety cap; one end of the pin engages a hole in a safety cap blade, the other end passes through the cap and engages a keyway in the body. The safety pin, which carries an instruction label (*fig.* 1) thus locks the cap on the body.

8. The fuze body has an integral transverse web dividing the body into an upper and lower compartment. The body houses a dished metal diaphragm, a sharp pointed striker, a screwed perforated retaining ring, and a spring actuated shutter housing a detonator.

9. The diaphragm which is secured to the non-pointed end of the striker, seats in a recess in the upper portion of the fuze body, and is retained in position by the retaining ring. The pointed end of the striker passes centrally through the fuze into a striker guide in the transverse web.

10. The detonator shutter is housed in the lower portion of the fuze body between the magazine and the web. It is retained in the safe position, against the action of a spring, by a pin projecting radially through a hole in the body and abutting a lever which is seated in a groove and retained by the safety cap; the spring is retained by a grub screw positioned radially in the wall of the fuze body. When the shutter is in the safe position, the detonator is off-set from the striker, but

is in alignment with a vent hole in the body web. Two other vent holes are in the wall of the body above the web.

11. A magazine containing a C.E. pellet and a small quantity of stemmed C.E. is screwed into the fuze body below the shutter. The stemmed C.E. is located in a blind hole, the closed end of which forms a septum adjacent to the shutter. The magazine is closed at its exposed end by a screwed cap.

12. An external thread on the fuze body is for screwing the fuze into a missile and carries a metal cup, which assists in retaining the lever (*para.* 10), a cup washer, a sealing washer, and a No. 2, Mk. 1 arming wire guide. The guide comprises a tab washer, the tab being bent to conform to the angle of the blade of the arming vane and having a hole in alignment with one of the outer holes of the safety cap so that during missile preparation a No. 8 fuzing wire may be inserted through both holes.

Identification markings

13. Stamped on the crown of the safety cap is the following:—

- (1) The number and Mark of the fuze.
- (2) The manufacturer's initials, recognized trade mark, or approved inspection stamp.
- (3) The date of manufacture (month and year).

14. In addition the following is stamped on one blade of the safety cap:—

- (1) The monogram of the filling station or filling contractor's initials or approved inspection stamp.
- (2) The date of filling (month and year).
- (3) The filled Lot number.

Functioning

15. After release of a fuzed bomb, the safety cap is rotated by pressure of air acting on the arming vanes; the cap unscrews and then falls away. The lever, no longer restrained by the safety cap, but under pressure of the shutter spring through the medium of the shutter and pin, falls clear and allows the ejection of the pin, and the shutter to move across the body. The detonator is thus aligned with the striker and stemmed C.E. Just before impact, air pressure reverses the

(A.L.67, Apr. 57)

curvature of the diaphragm, thus forcing the striker to hit and fire the detonator. This causes the septum to disrupt and ignites the stemmed C.E. which initiates the C.E. pellet.

Safety devices

16. The fuze has the following safety devices:—

- (1) The safety pin which prevents rotation of the safety cap and arming vanes during transit, handling, and storage of the fuze.
- (2) The spring actuated shutter and pin which in conjunction with the lever and safety cap, keeps the detonator remote from the striker when the fuze is safe, and eliminates the risk of inadvertent functioning of the fuze.
- (3) The vent hole in the body web which, should the detonator be fired when in the safe position, constitutes a safety vent and prevents the disruption of the septum and the initiation of the stemmed C.E. and pellet in the magazine.

Instructions for use and safety precautions

17. Detailed instructions for fuzing a missile are given in the publication describing the

missile to be fuzed. Before the fuze is used, however, the following are to be observed:—

- (1) Check that the cup, cup washer, sealing washer and arming wire guide are in position and serviceable.
- (2) Ensure that the lever is correctly positioned in the groove.
- (3) Check the safety cap for freedom of rotation by removing the safety pin and rotating the cap for not more than two turns, and then return the cap to its original position and fit the safety pin.
- (4) Ensure that the body thread is clean.

FUZE, NO. 873, MK. 1

Comparison with Fuze, No. 873, Mk. 2

18. The Mk. 1 and 2 fuzes are similar except for the following which are embodied in the Mk. 1 fuze:—

- (1) A different type of safety pin.
- (2) A multi-tab washer instead of the cup washer.
- (3) A Whitworth body thread instead of a unified body thread.

19. The information otherwise contained in para. 4 to 17 applies equally to the Mk. 1 fuze.

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AIR MINISTRY

Chapter 13

FUZES, No. 908/1,800/2, Mk. I
and No. 908/5,000/2, Mk. I

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Introduction

1. These nose fuzes are for use, primarily, in Clusters, projectile, aircraft, 18 in., No. 3, Mk. 2, and No. 1, Mk. 1, and in Bombs, T.1., 250 lb. They may also be used in other explosive stores, as and when directed.

2. Each fuze incorporates a 2 sec. delay, and a vacuum bellows which is functioned by atmospheric pressure. The vacuum bellows is set during manufacture to function at a specified height above sea level when the barometric pressure at sea level is 1,012 millibars. The No. 908/1,800/2, Mk. 1 fuze is set to function at 1,800 ft., and the No. 908/5,000/2, Mk. 1 fuze is set to function at 5,000 ft., above sea level. After the vacuum bellows has functioned at its pre-set height, a fuze missile continues to fall for a further 2 sec. while the delay is burning, before the missile is initiated.

3. A missile fitted with one of these fuzes, may, if necessary, be released from an aircraft flying at an altitude below that at which the fuze is set to function. In such an instance the vacuum bellows in the fuze will function



Fig. 1. Fuze, No. 908/1,800/2, Mk. I

This is Amendment List No. 30 to Air Publication 1661C, Volume I (2nd Edn.)

Section 2. List of Chapters: delete "(to be issued later)" after the title of Chapter 13 and write "(A.L.30)" in the outer margin against the deletion. Insert this Chapter 13 to follow Chapter 10. Record the incorporation of this A.L. in the Amendment Record Sheet.

ARMAMENT

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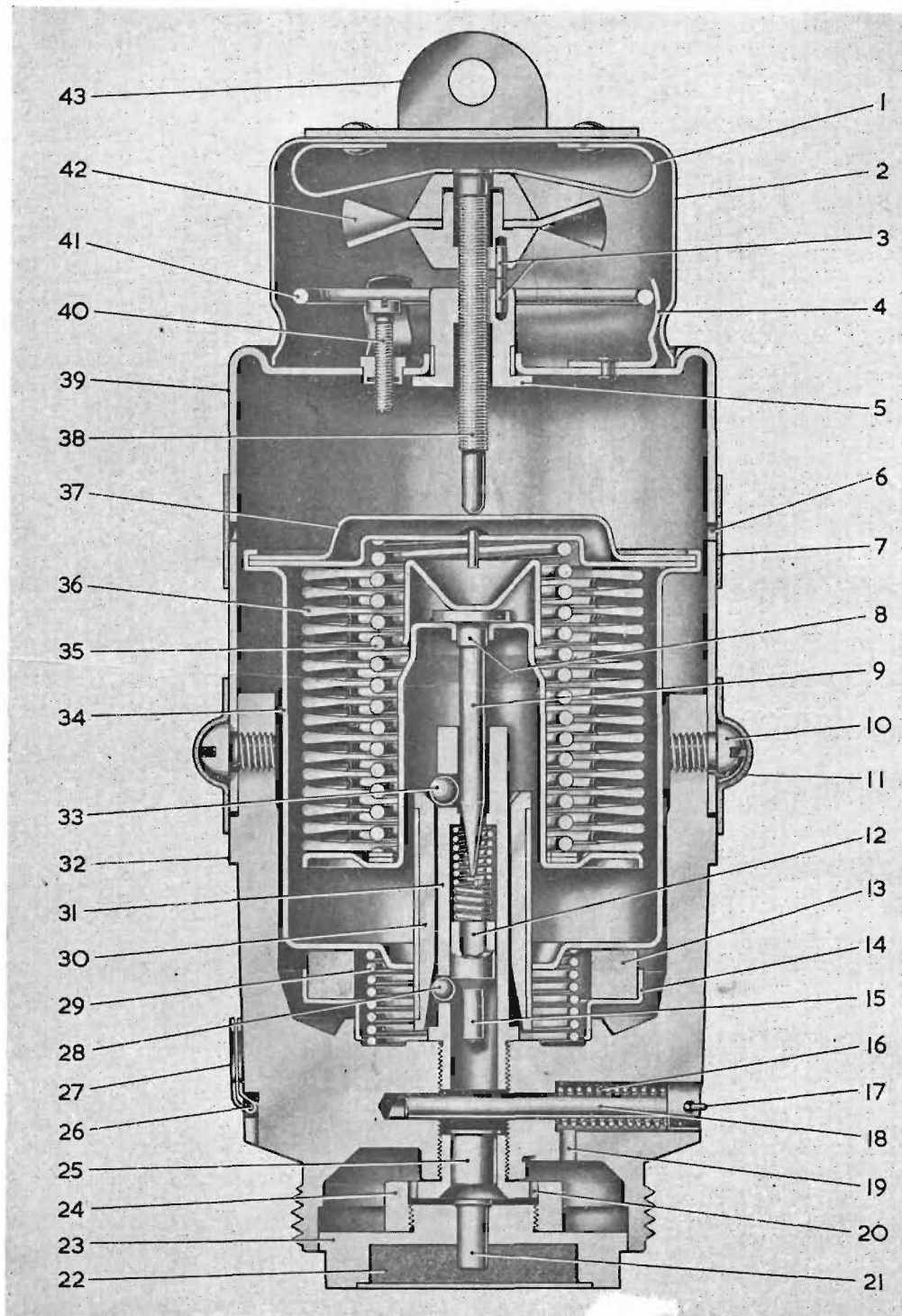


Fig. 2. Sectional view of the fuze

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KEY TO FIG. 2 (SECTIONAL VIEW OF THE FUZE)

- 1 VANE STOP
- 2 ARMING VANE COVER
- 3 STOP PINS
- 4 RETAINING CLIP
- 5 BUSH
- 6 VENT HOLE
- 7 WHITE ADHESIVE TAPE
- 8 BOSS
- 9 ARMING PIN
- 10 SCREW
- 11 RED ADHESIVE TAPE
- 12 BLIND HOLE
- 13 FELT WASHER
- 14 CUP
- 15 STRIKER
- 16 SPRING
- 17 SHEAR WIRE
- 18 SAFETY PIN
- 19 HOLE
- 20 VENT HOLE
- 21 2 SEC. DELAY
- 22 GUNPOWDER
- 23 MAGAZINE
- 24 ADAPTER
- 25 PERCUSSION CAP
- 26 SHEAR WIRE
- 27 CLIP
- 28 BALL (RETAINING)
- 29 ARMING SPRING
- 30 SLEEVE
- 31 STRIKER HOUSING
- 32 FUZE BODY
- 33 BALL (LARGER)
- 34 CYLINDER
- 35 BELLOWS SPRING
- 36 VACUUM BELLOWS
- 37 STOP PLATE
- 38 ARMING SCREW
- 39 OUTER COVER
- 40 SETTING SCREW
- 41 SPRING RING
- 42 ARMING VANE
- 43 LUG

immediately the missile is released, but, because of the 2 sec. delay, the missile will not be functional until it is well clear of the aircraft.

FUZE, No. 908/1,800/2, Mk. 1

General description (fig. 2)

4. The No. 908/1,800/2, Mk. 1 fuze (Stores Ref. No. 12G/1276) is approximately 7 in. in length by $2\frac{3}{4}$ in. diameter, having a body (32) which is closed at the base end with an adapter (24), and a magazine (23); the adapter houses a percussion cap (25), and the magazine contains a quantity of gunpowder (22) and a 2 sec. delay (21). Vent holes (20) in the adapter allow gases to escape (when the delay is burning), through a hole (19) leading into the housing of a spring-loaded safety pin (18).

5. The other end of the body is closed with an outer cover (39), secured by four screws

(10), the heads of which are covered with a strip of red adhesive tape (11). Four small vent holes (6) in the outer cover, provided for the equalisation of air pressure within the fuze, are sealed with a strip of white adhesive tape (7).

Note...

- (1) The RED tape, covering the screws heads, must NOT be removed.
- (2) The white tape MUST be removed after the fuze has been fixed on a carrier unit; the tape bears a printed instruction to this effect. In early issues of the fuze the reference to "FLARE", in the instruction, should be disregarded and the word STORE substituted.

6. A spring-loaded striker (15), located in a striker housing (31) screwed into the interior of the fuze body, is supported in the cocked position by three striker retaining balls (28) seated in three holes in the wall of the striker housing. These balls are retained against a bevelled shoulder on the striker, by the tapered bore in the lower end of a sleeve (30) surrounding the striker housing.

7. Three larger balls (33), seated in three further holes in the striker housing, abut the parallel portion of an arming pin (9), and bear against the bevelled upper end of the sleeve. The sleeve is thus locked against axial movement, and the striker is retained in the cocked position.

8. The fuze body, together with the outer cover, house a cylinder (34) containing a spring-assisted vacuum bellows (36), one end of which, together with a stop plate (37), form the closed end of the cylinder. The arming pin (9) is secured to a support attached to the other end of the bellows, which is free to expand and contract within the cylinder, according to the variation in atmospheric pressure.

9. The cylinder passes over the sleeve and seats on an arming spring (29); the arming pin enters the striker housing, and is thus poised immediately above the striker, the end of which has a blind hole (12) to clear the point of the arming pin in the event of the bellows becoming fully expanded.

10. The arming spring tends to force the cylinder towards a setting screw (40) secured in the top of the outer cover; it is, however, prevented from moving by an arming screw

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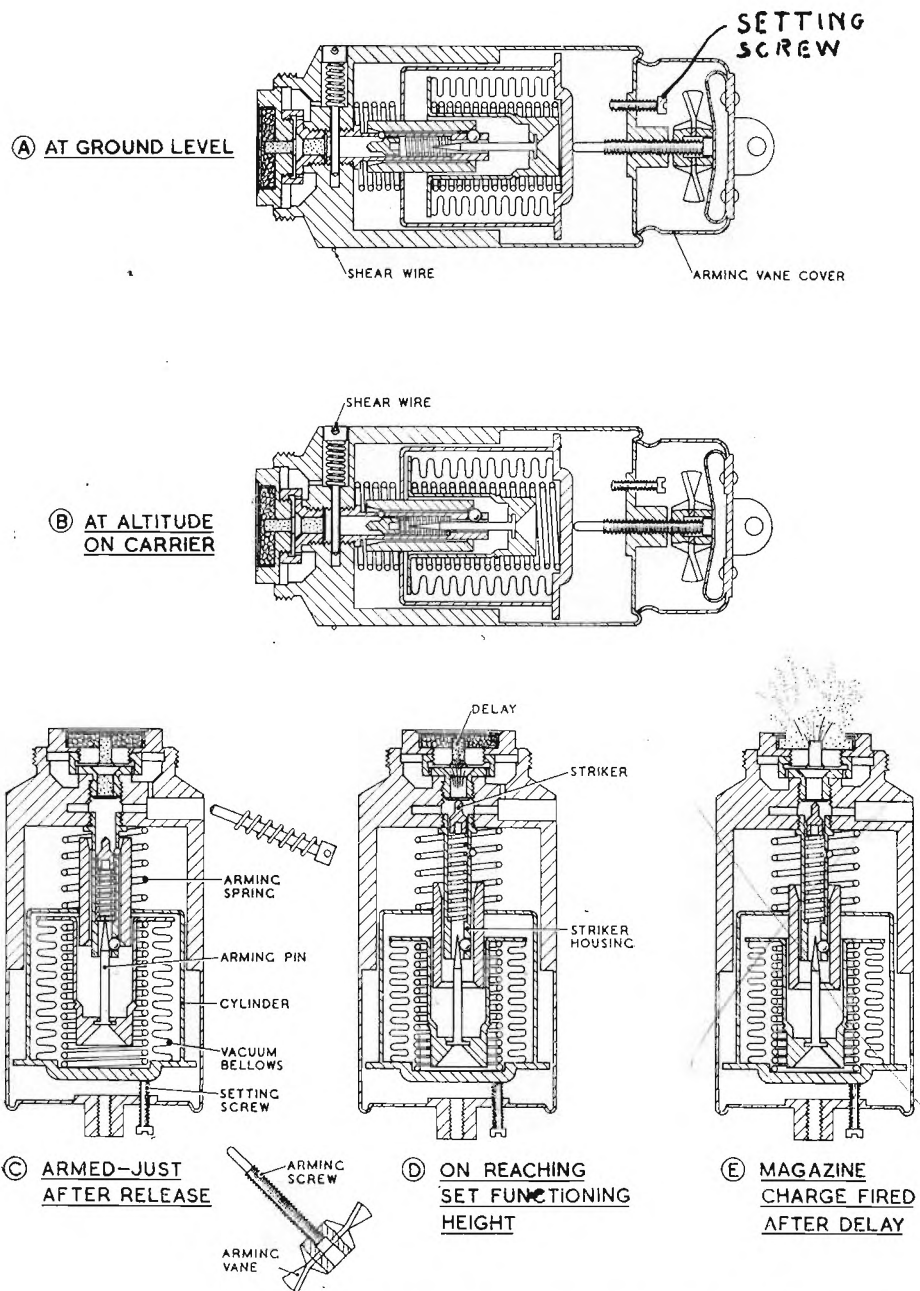


Fig. 3 Diagrammatic views showing operation of the fuze *N. 908 146 I*

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(38), one end of which carries an arming vane (42). The other end of the arming screw passes through a threaded bush (5) secured centrally in the top of the outer cover, abuts the stop plate, and retains the cylinder on a felt washer (13). The arming vane has approximately half-an-inch of free travel before it locks against the arming screw head.

Note . . .

The setting screw is adjusted by the fuze manufacturer and must NOT be tampered with.

11. Two stop pins (3), one projecting from the arming vane, and the other from the bush, prevent the arming vane from locking against the bush.

12. The arming vane and arming screw are protected against damage, and from freezing under icing conditions, by an arming vane cover (2) fitted with a lug (43) to which a fuze setting control link may be attached. The arming vane cover seats on the outer cover, their contacting surfaces being sealed with lutin, and is secured in position by three retaining clips (4), reinforced with a spring ring (41). A vane stop (1) secured in the arming vane cover, prevents rotation of the arming vane during handling and because of vibration.

WARNING

The arming vane cover must not be removed, nor the arming vane rotated by personnel.

13. The spring-loaded safety pin (18), located between the striker and the percussion cap, is retained in position with a shear wire (17) which passes through a hole in the head of the pin, and is secured round an annular groove in the fuze body.

Note . . .

The safety pin must NOT be removed.

14. A clip (27), having a hole to engage a flexible fuze link, is attached to the shear wire, and can be moved to a convenient position along the wire when the fuze link is being attached to the E.M. fuze unit on a carrier unit.

15. The fuze has an external thread for screwing into a missile, and a leather washer to form a water-tight seal when the fuze is screwed into the missile.

Identification markings

16. The following information is stamped on the fuze body:—

(1) The nomenclature of the fuze.

(2) The initials, or recognised trade mark of the filling contractor, or the monogram of the filling station.

(3) The month and year of filling.

(4) The filled Lot number.

Functioning (fig. 3)

17. When a missile fitted with one of these fuzes is released from an aircraft, the arming vane cover is snatched off thus exposing the arming vane to the air-stream, the shear wire is broken, and the safety pin is ejected by its spring. Air-pressure causes the arming vane to rotate freely until it becomes locked against the arming screw head; the arming screw then rotates with the arming vane until they become free from the fuze, and fall away. Concurrently, the cylinder containing the vacuum bellows and arming pin is forced by the arming spring to follow the arming screw, as it is being unscrewed, until its movement is arrested by the setting screw.

18. While the missile is falling, the fuze is subjected to increasing atmospheric pressure, and the vacuum bellows contract accordingly. When the region of pressure at which the fuze is set to function is reached, the arming pin will have moved to such a position that its tapered portion will be against the larger balls, and the balls will have moved inwards, clear of the sleeve.

19. The sleeve is thus free to move, and under the action of the spring-loaded striker and striker retaining balls, the sleeve is forced upwards, the retaining balls move outwards against the wider part of the tapered bore, and the striker hits and fires the percussion cap which ignites the delay; after a further two seconds, the burning delay ignites the gunpowder in the fuze magazine and so functions the missile.

Safety devices

20. The fuze has the following safety devices:—

(1) The safety pin, which prevents premature firing of the percussion cap.

(2) The shear wire, which retains the safety pin in position, until the fuze missile is released.

(3) The arming vane cover and vane stop, which prevent premature rotation of the arming vane and arming screw.

(4) The 2 sec. delay, which ensures that the fuze missile is clear of the aircraft before initiation occurs when the missile is released from a height below the set functioning height of the fuze.

Instructions for use, and safety precautions

21. Detailed instructions for the fuzing of a missile with one of these fuzes, are given in the publication describing the missile to be fuzed. Before use, however, the following should be observed:—

- (1) That the arming vane cover is firmly seated on the outer cover.
- (2) That the safety pin is in position and that the shear wire is properly secured.

Supply

22. The fuze is supplied, packed one, in a press-cap sealed metal Cylinder, No. 464. Twelve such cylinders, each containing a fuze

of the same height-setting, are packed in Box, B.550. The cylinders and the boxes are marked with the height-setting of the fuzes they contain. The stowage dimensions of the box are 27.9 in. × 11.0 in. × 10.5 in., and its filled weight is approximately 63 lb.

Storage

23. For storage purposes, Fuze, No. 908/1,800/2, Mk. 1 is classified in Group 6, Category X.

FUZE, No. 908/5,000/2, Mk. 1

Comparison with Fuze, No. 908/1,800/2, Mk. 1

24. Fuze, No. 908/5,000/2, Mk. 1 (Stores Ref. 12G/1277) is similar in appearance, construction, and functioning characteristics to the 908/1,800/2, Mk. 1 fuze, and differs only in the height at which it is set to function. The information otherwise contained in para. 4 to 23 inclusive, is also applicable to the 908/5,000/2, Mk. 1 fuze.

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Chapter 14

FUZES, No. 909/3,300/2, Mk. 1, and No. 909/4,700/2, Mk. 1

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Introduction

1. Fuzes, No. 909, Mk. 1, are barometric tail fuzes each incorporating a 2 sec. delay, and a vacuum bellows which is functioned by atmospheric pressure.

2. The vacuum bellows is set during manufacture to function at a specified height above sea level, when the barometric pressure at sea level is 1,012 millibars. The No. 909/3,300/2, Mk. 1 fuze is set to function at 3,300 ft., and the No. 909/4,700/2, Mk. 1 fuze is set to function at 4,700 ft. above sea level. After the vacuum bellows has functioned at its pre-set height, a fuzeed missile continues to fall for a further 2 sec., while the delay is burning, before the missile is initiated.

3. A missile fitted with one of these fuzes, may, if necessary, be released from an aircraft flying at an altitude below that at which the fuze is set to function, without risk of damage to the aircraft when the missile is initiated. In such an instance the barometric unit will function immediately the missile is released, but, because of the 2 sec. delay incorporated in the fuze, the missile will be well clear of the aircraft before initiation occurs.

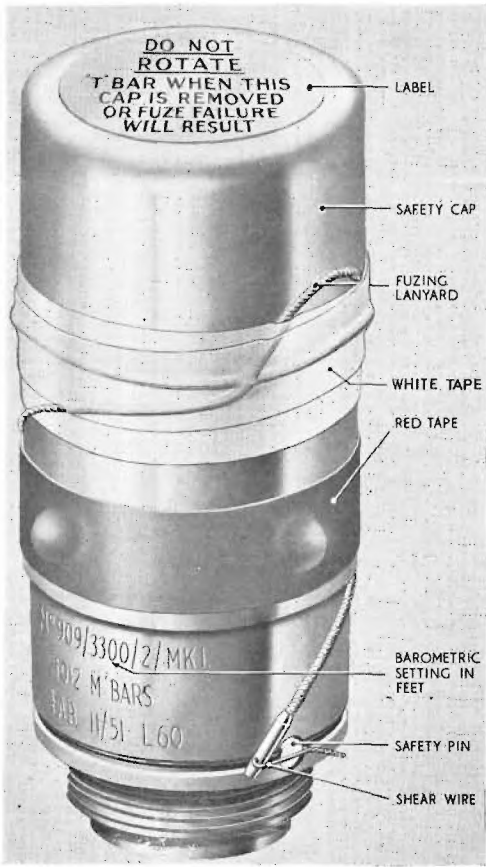


Fig. 1. Fuze, No. 909/3,300/2, Mk. 1
(A.L.65, Mar. 57)

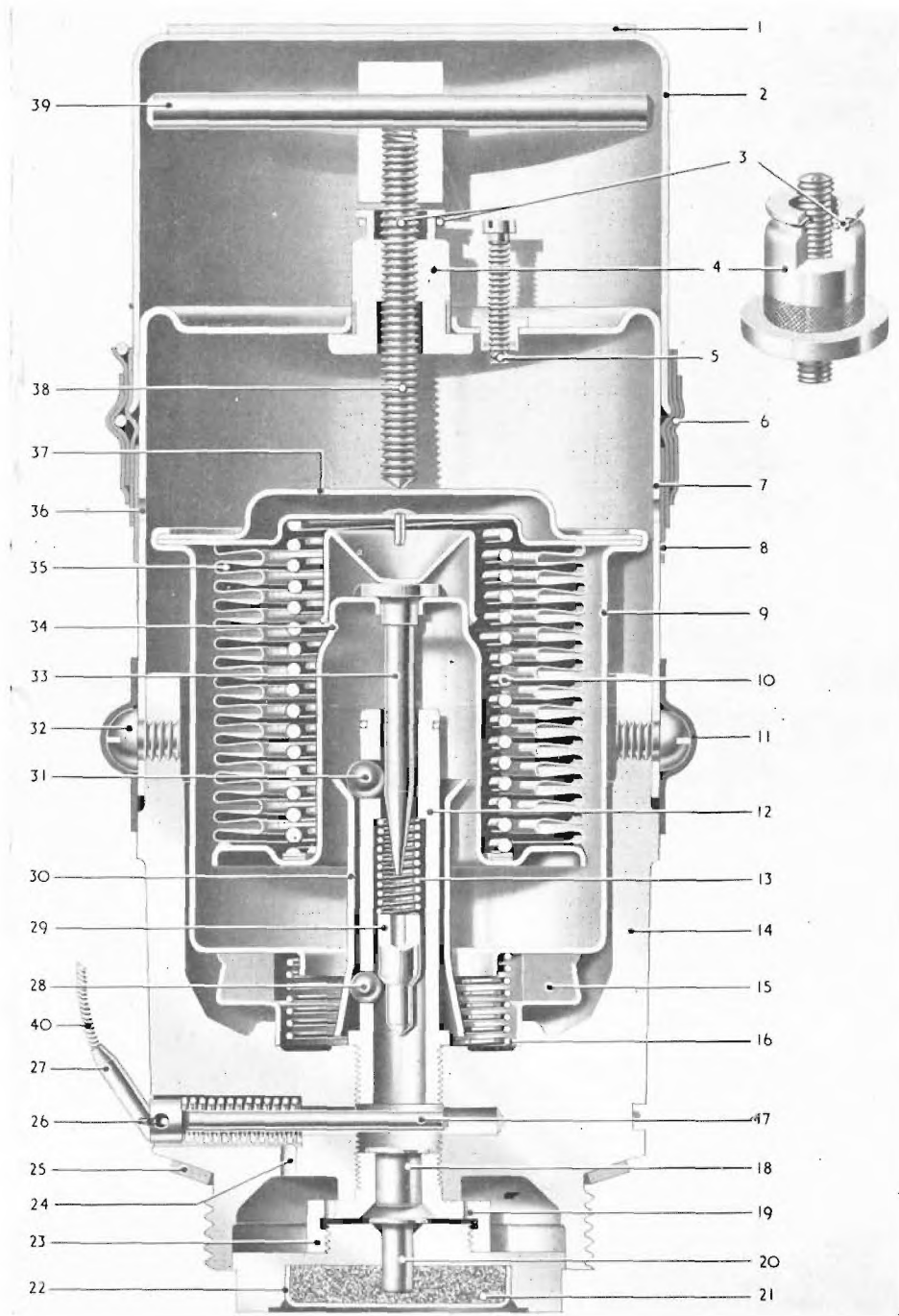


Fig. 2. Sectional view of the fuze

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KEY TO FIG. 2
(SECTIONAL VIEW OF THE FUZE)

1	LABEL
2	SAFETY CAP
3	FRICTION WIRE
4	BUSH
5	SETTING SCREW
6	RED ADHESIVE TAPE
7	OUTER COVER
8	WHITE ADHESIVE TAPE
9	CYLINDER
10	BELLOWS SPRING
11	RED ADHESIVE TAPE
12	STRIKER HOUSING
13	STRIKER SPRING
14	BODY
15	FELT WASHER
16	ARMING SPRING
17	SAFETY PIN
18	PERCUSSION CAP
19	VENT HOLE
20	2 SEC. DELAY
21	GUNPOWDER
22	MAGAZINE
23	ADAPTER
24	HOLE
25	LEATHER WASHER
26	SHEAR WIRE
27	FERRULE
28	BALL (RETAINING)
29	STRIKER
30	SLEEVE
31	BALL (LARGER)
32	SCREW
33	ARMING PIN
34	SUPPORT
35	VACUUM BELLOWS
36	VENT HOLE
37	STOP PLATE
38	ARMING SCREW
39	T-BAR
40	LANYARD

FUZE, No. 909/3,300/2, Mk. I

General description (fig. 2)

4. The No. 909/3,300/2, Mk. I fuze (Stores Ref. No. 12G/1300) is approximately 6 $\frac{5}{8}$ in. in length by 2 $\frac{3}{4}$ in. diameter, having a body (14) which is closed at the base end with an adapter (23), and a magazine (22); the adapter houses a percussion cap (18), and the magazine contains a quantity of gunpowder (21) and a 2 sec. delay (20). Vent holes (19) in the adapter allow gases to escape (when the delay is burning), through a hole (24) leading into the housing of a spring-loaded safety pin (17).

5. The other end of the body is closed with an outer cover (7) secured by four screws (32), the heads of which are covered with a strip of red adhesive tape (11). Four small vent holes (36) in the outer cover, provided for the equalisation of air pressure within the fuze, are sealed with a strip of white adhesive tape (8).

Note . . .

- (1) The RED tape, covering the screw heads, must NOT be removed.
- (2) The WHITE tape, sealing the vent holes, MUST be removed just before the tail unit is filled during missile preparation.

6. A spring-loaded striker (29), located in a striker housing (12) screwed into the interior of the fuze body, is supported in the cocked position by three striker retaining balls (28), seated in three holes in the wall of the striker housing. These balls are retained against a bevelled shoulder in the striker by the tapered bore in the lower end of a sleeve (30) surrounding the striker housing.

7. Three larger balls (31), seated in three further holes in the wall of the striker housing, abut the parallel portion of an arming pin (33), and bear against the bevelled upper end of the sleeve. The sleeve is thus locked against axial movement, and the striker is retained in the cocked position.

8. The fuze body together with the outer cover, house a cylinder (9) containing a spring-assisted vacuum bellows (35), one end of which, together with a stop plate (37), form the closed end of the cylinder. The arming pin (33) is secured to a support (34) attached to the other end of the bellows, which is free to expand and contract within the cylinder, according to the variation in atmospheric pressure.

9. The cylinder passes over the sleeve and seats on an arming spring (16); the arming pin enters the striker housing, and is thus poised immediately above the striker, the end of which has a blind hole to clear the point of the arming pin in the event of the bellows becoming fully expanded.

10. The arming spring tends to force the cylinder towards a setting screw (5) secured in the top of the outer cover; it is, however, prevented from moving by an arming screw (38), one end of which is fitted with a T-bar (39). The other end of the arming screw passes through a threaded bush (4) secured centrally in the top of the outer cover, abuts the stop plate, and retains the cylinder on a felt washer (15).

Note . . .

The setting screw is adjusted by the manufacturer and must NOT be interfered with.

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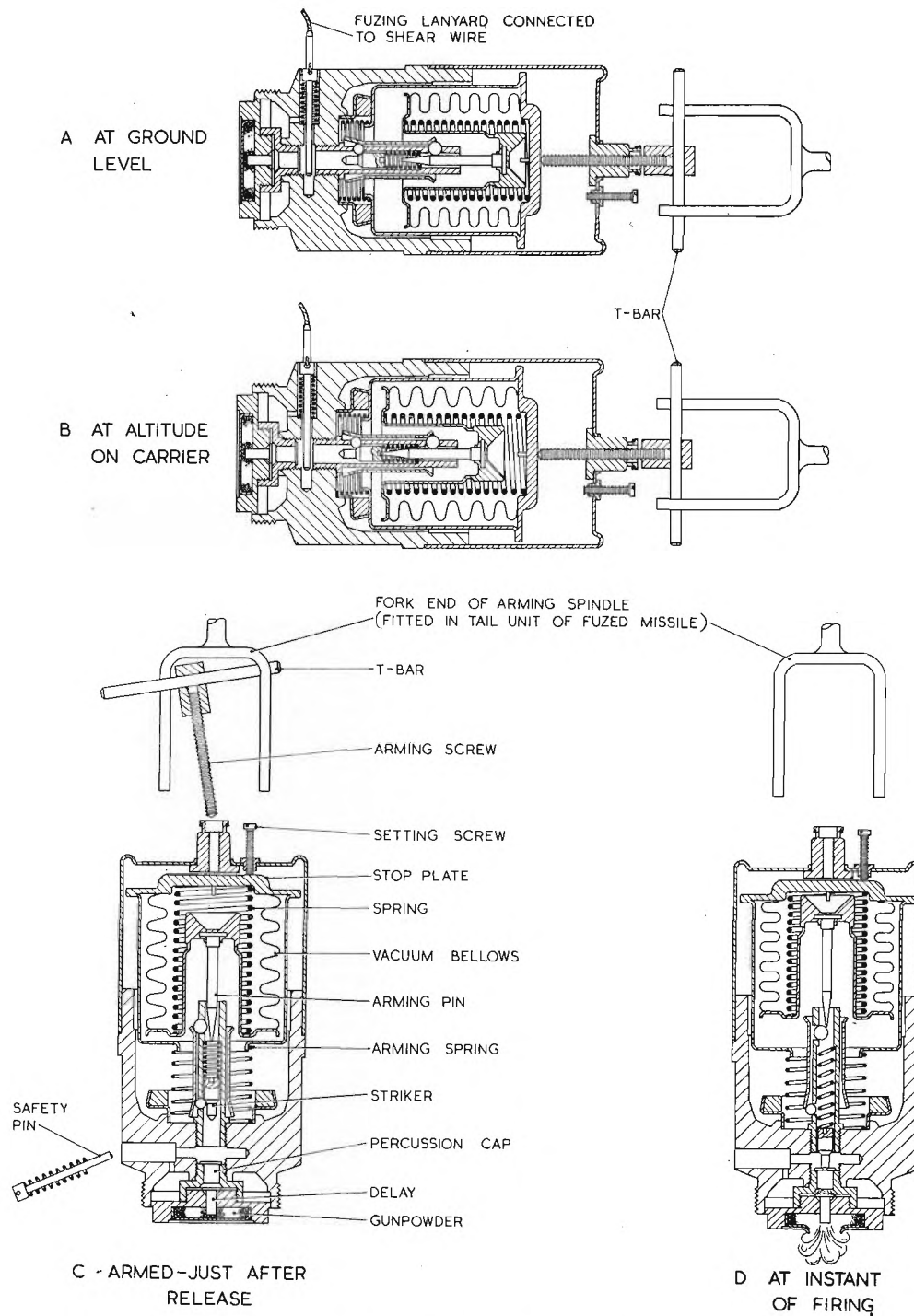


Fig. 3. Diagrammatic views showing operation of the fuze

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11. A friction wire (3) passes through a hole in the arming screw, and the ends of the wire are bent in opposite directions round a groove in the bush. This wire prevents the arming screw from being rotated, until air pressure on the arming vanes reaches a predetermined minimum strength. As such pressure can only be attained after the missile has cleared the aircraft, there is no possibility of the fuze functioning should the missile lodge in the bomb bay after being released.

12. A safety cap (2) fitted over the outer cover, and secured with ~~red~~ ^{white} adhesive tape, protects the arming screw during storage and handling. This ~~red~~ tape also secures the free end of a fuzing lanyard (40) (para. 14), and is affixed partly over the white tape sealing the vent holes in the outer cover (para. 5).

13. A spring-loaded safety pin (17), located is between the striker and the percussion cap, retained in position with a shear wire (26), which passes through a hole in the head of the pin, and is secured round an annular groove in the fuze body.

Note . . .

The safety pin must NOT be removed.

14. The fuzing lanyard is attached to the shear wire with a ferrule (27) which can be moved along the wire to a convenient position when the lanyard is being attached to the E.M. fuzing unit on a carrier unit. The lanyard is coiled round the fuze body and its free end is secured with ~~red~~ ^{white} adhesive tape (para. 12).

15. The fuze has an external thread for screwing into a missile, and a leather washer to form a water-tight seal when the fuze is screwed into the missile.

Identification markings

16. The following information is stamped on the fuze body:—

- (1) The full nomenclature of the fuze.
- (2) The initials, or recognised trade mark of the filling contractor, or the monogram of the filling station.
- (3) The month and year of filling.
- (4) The filled Lot number.

Functioning (fig. 3)

17. When a missile, fitted with one of these fuzes, is released from an aircraft, the shear wire is broken by the pull of the fuzing lanyard, and the safety pin is ejected by its spring. Air pressure rotates the arming vanes in the tail unit, and, consequently the arming screw, which becomes unscrewed from the fuze, falls away. Concurrently, the cylinder, containing the vacuum bellows and arming pin, is forced by the arming spring to follow the arming screw as it is being unscrewed, until the movement of the cylinder is arrested by the setting screw.

18. While the missile is falling, the fuze is subjected to increasing atmospheric pressure, and the vacuum bellows contract accordingly. When the region of pressure at which the fuze is set to function is reached, the arming pin will have moved to such a position that the tapered portion will be against the larger balls, and the balls will have moved inwards, clear of the sleeve.

19. The sleeve is thus free to move, and under the action of the spring-loaded striker and striker retaining balls, the sleeve is forced upwards, the retaining balls move outwards against the wider part of the tapered bore, and the striker hits and fires the percussion cap which ignites the delay; after a further two seconds, the burning delay ignites the gunpowder in the fuze magazine and so functions the missile.

Safety devices

20. The following safety devices are incorporated in the fuze:—

- (1) The safety pin, which prevents premature firing of the percussion cap.
- (2) The shear wire, which retains the safety pin in position until the fuzed missile is released.
- (3) The friction wire, which prevents rotation of the arming screw until the fuzed missile is clear of the aircraft.
- (4) The safety cap, which prevents rotation of the T-bar during handling and storage.
- (5) The 2 sec. delay, which ensures that the fuzed missile is clear of the aircraft before initiation occurs when the missile is released from a height below the set functioning height of the fuze.

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Instructions for use, and safety precautions

21. Detailed instructions for the fuzing of a missile with one of these fuzes, are given in the publication describing the missile to be fuzed. Before use, however, the following should be observed:—

(1) Ensure that the safety pin is in position, and that the shear wire is properly secured.

(2) Ensure that the friction wire is in position in the arming screw bush.

WARNING

When a tail unit, having a twin-pronged arming fork, is being attached to a missile fitted with one of these fuzes, the arming fork should be rotated to effect engagement. Do NOT rotate the T-bar.

Supply

22. The fuzes are supplied, packed one in a press-cap sealed metal Cylinder, No. 464. Twelve such cylinders, each containing a fuze of the same height-setting, are packed

in Box, B.550. The cylinders and the boxes are marked with the height-setting of the fuzes they contain. Also packed in the box are twelve Wires, safety, No. 1, Mk. 1, and twenty-four Clips, safety, No. 1, Mk. 1. The stowage dimensions of the box are 27.9 in. × 11.0 in. × 10.5 in., and its filled weight is approximately 63 lb.

Storage

23. For storage purposes, Fuze, No. 909/3,300/2, Mk. 1 is classified in Group 6, Category X.

FUZE, No. 909/4,700/2, Mk. 1

Comparison with Fuze, No. 909/3,300/2, Mk. 1

24. Fuze, No. 909/4,700/2, Mk. 1 (Stores Ref. 12G/1301) is similar in appearance, construction, and functioning characteristics to the 909/3,300/2, Mk. 1 fuze, and differs only in the height at which it is set to function. The information otherwise contained in para. 4 to 23 inclusive, is also applicable to the 909/4,700/2 Mk. 1 fuze.

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Chapter 15

FUZE, No. 908, Mk. 2

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Sectional view of cam setting wheel	3
Diagrammatic views showing operation of the fuze ...	4

Introduction

1. This nose fuze is for use, primarily, in Clusters, projectile, aircraft, 18 in., No. 3, Mk. 2, and No. 1, Mk. 1, and in Bombs, T.I., 250 lb. and 1,000 lb. It may also be used in other explosive stores, as and when directed.

2. Each fuze incorporates a 2 sec. delay, and a vacuum bellows which is functioned by atmospheric pressure. The vacuum bellows can be set to function the fuze at various heights above sea level. After the bellows has functioned, a fuze missile continues to fall for a further 2 sec. while the delay is burning, before the missile is initiated.

3. A missile fitted with one of these fuzes may, if necessary, be released from an aircraft flying at an altitude below that at which the fuze is set to function. In such an instance the vacuum bellows in the fuze will function immediately the missile is released, but, because of the 2 sec. delay, the missile will not be functioned until it is well clear of the aircraft.



Fig. 1. Fuze, No. 908, Mk. 2

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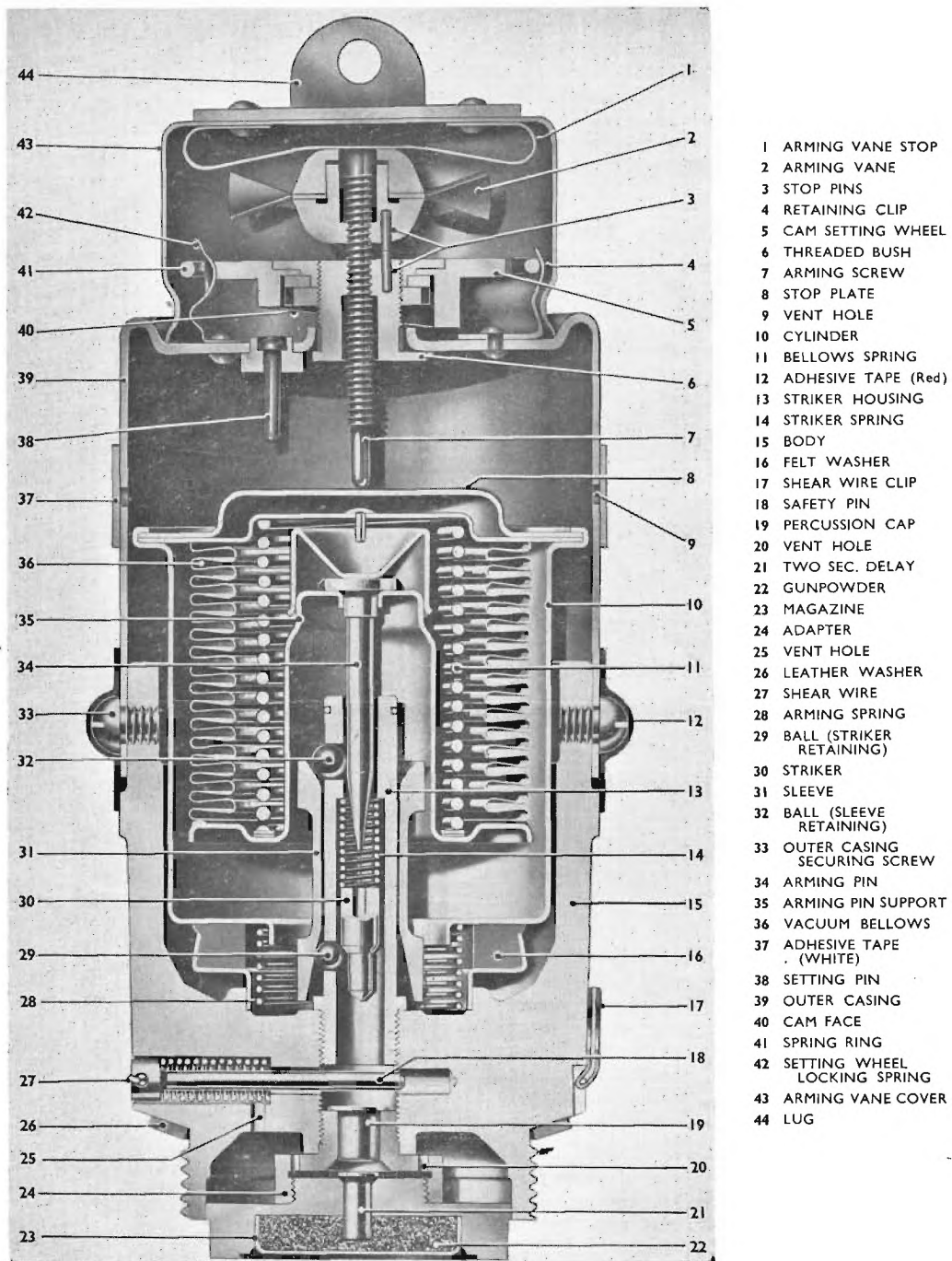


Fig. 2 Sectional view of the fuze

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General description (fig. 2)

4. The No. 908, Mk. 2 fuze (Stores Ref. 12G/1328) is approximately 7 in. in length by $2\frac{3}{4}$ in. diameter, having a body (15) which is closed at the base end with an adapter (24) and a magazine (23); the adapter houses a percussion cap (19), and the magazine houses a quantity of gunpowder (22) and a 2 sec. delay (21). Vent holes (20) in the adapter allow gases to escape (when the delay is burning), which then pass through another vent hole (25) leading into the housing of a spring-loaded safety pin (18), and so to atmosphere.

5. The other end of the body is closed with an outer casing (39), secured by four screws (33), the heads of which are covered with a strip of red adhesive tape (12). Four small vent holes (9) in the outer casing, and in the body, provide for the equalisation of air pressure within the fuze, and are sealed with a strip of white adhesive tape (37).

Note . . .

(1) The RED tape, covering the screws heads, must NOT be removed.

(2) The WHITE tape, covering the vent holes, MUST be removed after the fuzeed store has been fixed on a carrier unit; the tape bears a printed instruction to this effect.

6. A spring-loaded striker (30), located in a striker housing (13) screwed into the interior of the fuze body, is supported in the cocked position by three striker retaining balls (29) seated in three holes in the wall of the striker housing. These balls are retained against a bevelled shoulder on the striker by the tapered bore in the lower end of a sleeve (31) surrounding the striker housing.

7. Three sleeve retaining balls (32), seated in three further holes in the striker housing, abut the parallel portion of an arming pin (34) and bear against the bevelled upper end of the sleeve. The sleeve is thus locked against axial movement, and the striker is retained in the cocked position.

8. The fuze body, together with the outer casing, houses a cylinder (10) containing a spring-assisted vacuum bellows (36), one end of which, together with a stop plate (8), form the closed end of the cylinder. The arming pin (34) is secured to a support (35) attached

to the other end of the bellows, which is free to expand and contract within the cylinder, according to the variation in atmospheric pressure.

9. The cylinder passes over the sleeve and seats on an arming spring (28); the arming pin enters the striker housing and is thus poised immediately above the striker, the end of which has a blind hole to clear the point of the arming pin in the event of the bellows becoming fully expanded.

10. The arming spring urges the cylinder towards a setting pin (38) housed in a bush in the top of the outer casing; the cylinder, however, is prevented from moving by an arming screw (7). One end of the screw passes through a threaded bush (6) secured centrally in the top of the outer casing, abuts the stop plate, and retains the cylinder seated on a felt washer (16). The other end of the arming screw carries a threaded arming vane (2) which has approximately half-an-inch of free travel before it locks against the arming screw head.

11. The setting pin is a free fit in its bush, the head of the pin being located on the top of the outer casing, immediately beneath a cam (40) on the under surface of a rotatable setting wheel (5) positioned on the arming screw bush.

12. The cam setting wheel (fig. 3) has a serrated edge, indexed from 0 to 10. When the barometric pressure at sea level is 1,012 millibars, each serration represents 100 ft. and the index figures represent, in thousands of feet, nominal heights above sea level at which the fuze can be set to function.

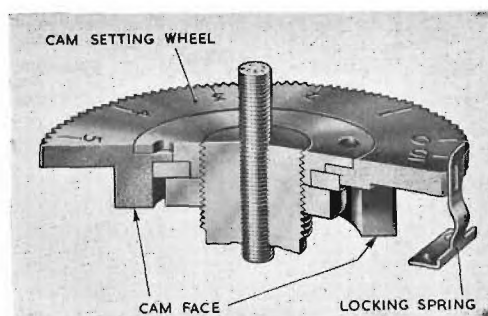


Fig. 3. Sectional view of cam setting wheel

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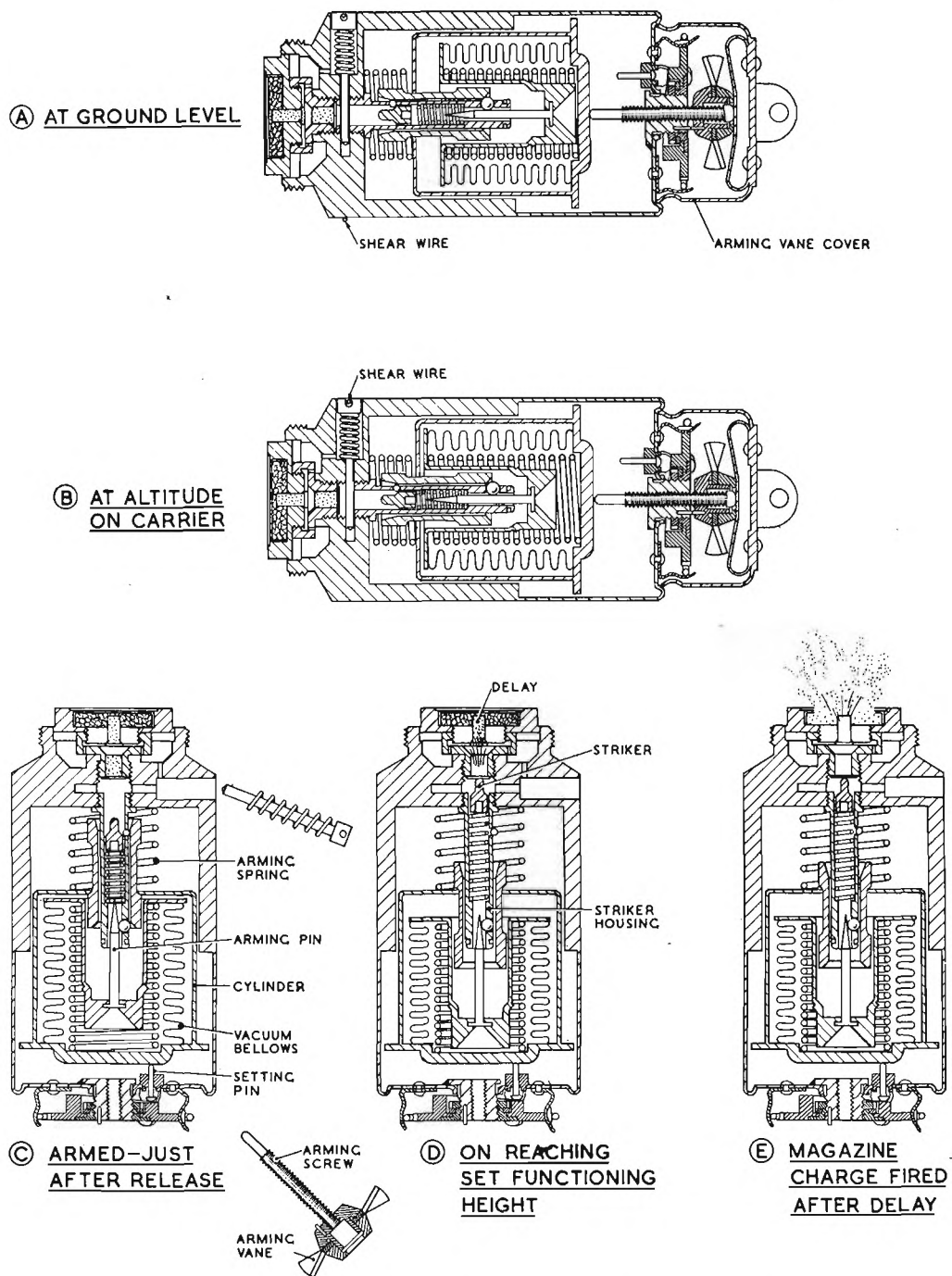


Fig. 4. Diagrammatic views showing operation of the fuze

RESTRICTED

13. A locking spring (42 in fig. 2) secured on the top of the outer casing, adjacent to the edge of the setting wheel, engages the serrations and locks the wheel at a selected height setting.

14. Two stop pins (3), one projecting from the arming vane and the other from the bush, prevent the arming vane from locking against the bush.

15. The arming vane and arming screw are protected against damage, and from freezing under icing conditions, by safety cap (43) fitted with a lug (44) to which a fuze setting control link may be attached. The safety cap seats on the outer casing, their contacting surfaces being sealed with luting, and is secured in position by three retaining clips (4), reinforced with a spring ring (41). A vane stop (1) secured in the safety cap, prevents premature rotation of the arming vane.

WARNING

The safety cap must not be removed, nor the arming vane rotated by personnel, except during missile preparation.

16. The spring-loaded safety pin (18), located between the striker and the percussion cap, is retained in position with a shear wire (27) which passes through a hole in the head of the pin and is secured round an annular groove in the fuze body.

Note . . .

The safety pin must NOT be removed.

17. A clip (17), having a hole to engage a flexible fuze link, is attached to the shear wire and can be moved to a convenient position along the wire when the fuze link is being attached to the E.M. fuze unit on a carrier unit.

18. The fuze has an external thread for screwing into a missile, and a leather washer is fitted to form a water-tight seal when the fuze is screwed into the missile.

Identification markings

19. The following information is stamped on the fuze body:—

- (1) The full nomenclature of the fuze.
- (2) The initials, or recognised trade mark of the filling contractor, or the monogram of the filling station.
- (3) The month and year of filling.
- (4) The filled Lot number.

Functioning (fig. 4)

20. When a missile fitted with one of these fuzes is released from an aircraft, the safety cap is snatched off thus exposing the arming vane to the airstream, the shear wire is broken, and the safety pin is ejected by its spring. Air-pressure causes the arming vane to rotate freely until it becomes locked against the arming screw head; the arming screw then rotates with the arming vane until they become free from the fuze and fall away. Concurrently, the cylinder containing the vacuum bellows and arming pin is forced by the arming spring to follow the arming screw, as it is being unscrewed, until movement of the cylinder is arrested by the setting pin.

21. While the missile is falling, the fuze is subjected to increasing atmospheric pressure and the vacuum bellows contract accordingly. When the region of pressure at which the fuze is set to function is reached, the arming pin will have moved to such a position that its tapered portion will be bearing against the sleeve retaining balls, and the balls will have moved inwards, clear of the sleeve.

22. The sleeve is thus free to move, and under the action of the spring-loaded striker and striker retaining balls, the sleeve is forced upwards, the striker retaining balls move outwards against the wider part of the tapered bore, and the striker hits and fires the percussion cap which ignites the delay; after a further two seconds, the burning delay ignites the gunpowder in the fuze magazine and so functions the missile.

Safety devices

23. The fuze has the following safety devices:—

- (1) The safety pin, which prevents premature firing of the percussion cap.
- (2) The shear wire, which retains the safety pin in position until the fuze missile is released.
- (3) The safety cap and vane stop, which prevent premature rotation of the arming vane and arming screw.
- (4) The 2 sec. delay, which ensures that the fuze missile is clear of the aircraft before initiation occurs when the missile is released from a height below the set functioning height of the fuze.

(A.L.49, Sept. 54)

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Instructions for use and safety precautions

24. Detailed instructions for the fuzeing of a missile with one of these fuzes are given in the publication describing the missile to be fuzeed. Before use, however, the following should be observed:—

(1) That the safety cap is firmly seated on the outer cover.

(2) That the safety pin is in position and that the shear wire is properly secured.

Supply

25. The fuze is supplied, packed one, in a press-cap sealed metal Cylinder, No. 464. Twelve such cylinders are packed in Box, B.550. The stowage dimensions of the box are 27·9 in. × 11·0 in. × 10·5 in., and its filled weight is approximately 63 lb.

Storage

26. For storage purposes, Fuze, No. 908. Mk. 2 is classified in Group 6, Category X,

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Chapter 16

FUZE, No. 909, Mk. 2

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Introduction

1. The No. 909, Mk. 2 fuze is a barometric fuze incorporating a 2 sec. delay, and a vacuum bellows which is functioned by atmospheric pressure.

2. The vacuum bellows can be set to function the fuze at various heights above sea level. After the bellows has functioned a fused missile continues to fall for a further 2 sec., while the delay is burning, before the missile is initiated.

3. A missile fitted with one of these fuzes may, if necessary, be released from an aircraft flying at an altitude below that at which the fuze is set to function, without risk of damage to the aircraft when the missile is initiated. In such an instance, the barometric unit will function immediately the missile is released, but, because of the 2 sec. delay incorporated in the fuze, the missile will be well clear of the aircraft before initiation occurs.

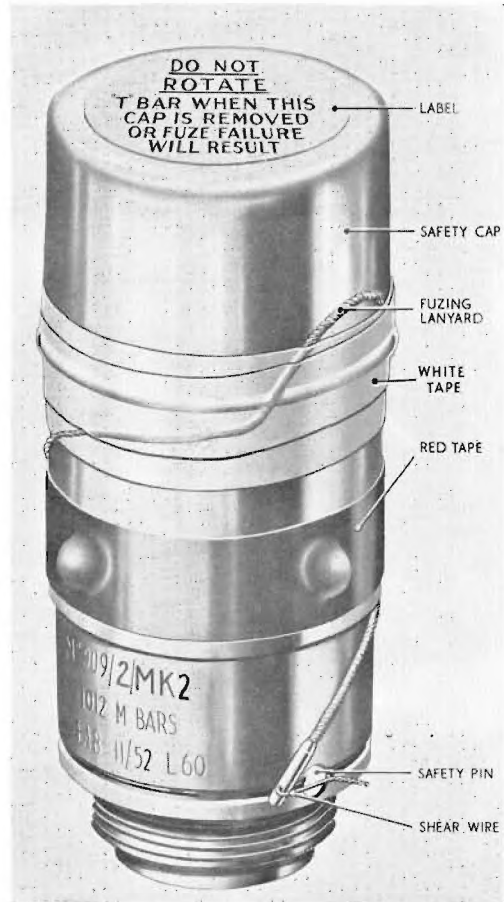


Fig. 1. Fuze, No. 909, Mk. 2

(A.L.65, Mar. 57)

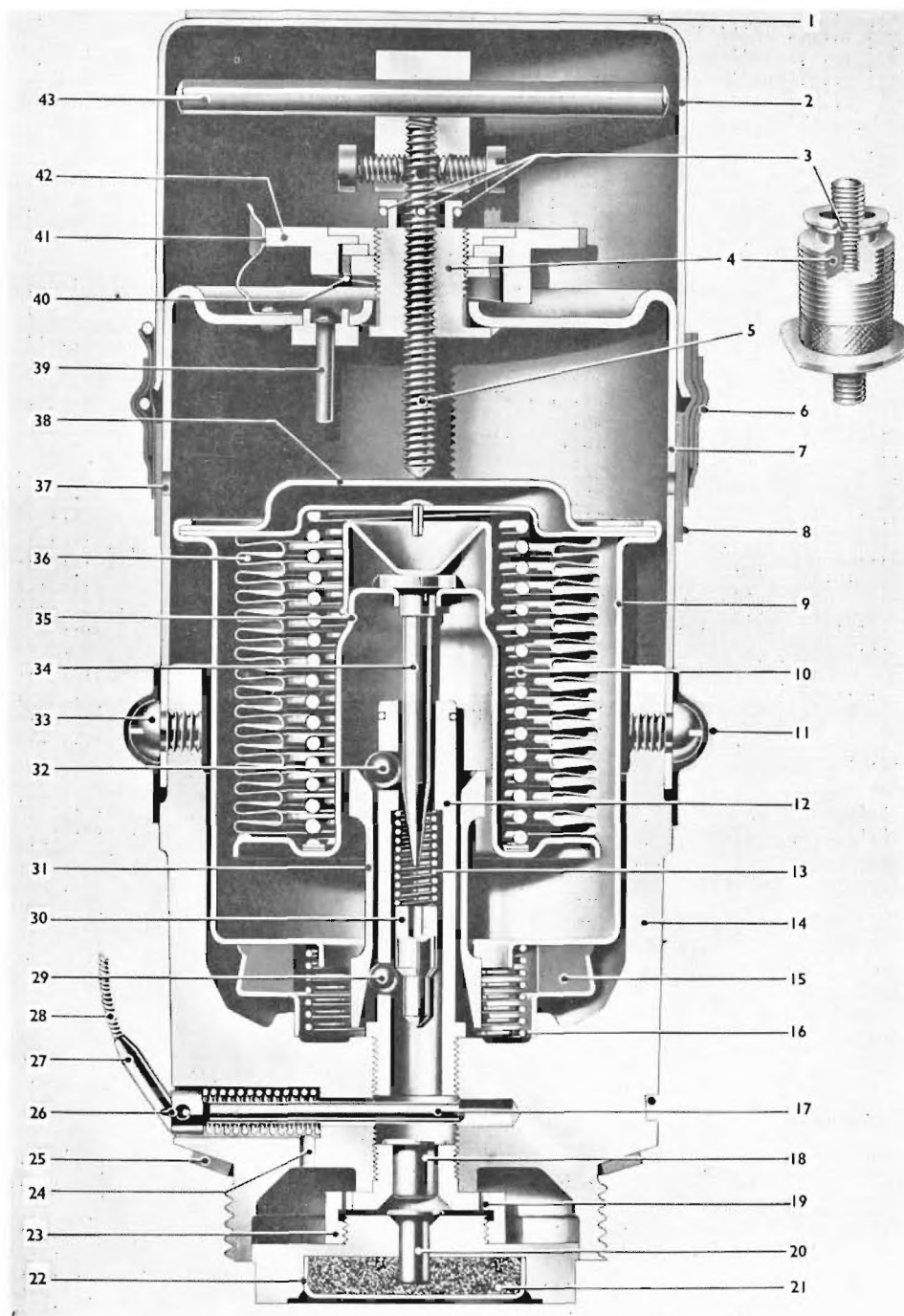


Fig. 2. Sectional view of the fuze

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KEY TO FIG. 2

- 1 LABEL
- 2 SAFETY CAP
- 3 FRICTION WIRE
- 4 THREADED BUSH
- 5 ARMING SCREW
- 6 WHITE ADHESIVE TAPE (PLAIN)
- 7 OUTER CASING
- 8 WHITE ADHESIVE TAPE (PRINTED)
- 9 CYLINDER
- 10 BELLOWS SPRING
- 11 ADHESIVE TAPE (RED)
- 12 STRIKER HOUSING
- 13 STRIKER SPRING
- 14 BODY
- 15 FELT WASHER
- 16 ARMING SPRING
- 17 SAFETY PIN
- 18 PERCUSSION CAP
- 19 VENT HOLE
- 20 TWO SEC. DELAY
- 21 GUNPOWDER
- 22 MAGAZINE
- 23 ADAPTER
- 24 VENT HOLE
- 25 LEATHER WASHER
- 26 SHEAR WIRE
- 27 FERRULE
- 28 LANYARD
- 29 BALL (STRIKER RETAINING)
- 30 STRIKER
- 31 SLEEVE
- 32 BALL (SLEEVE RETAINING)
- 33 OUTER CASING SECURING SCREW
- 34 ARMING PIN
- 35 ARMING PIN SUPPORT
- 36 VACUUM BELLOWS
- 37 VENT HOLE
- 38 STOP PLATE
- 39 SETTING PIN
- 40 CAM FACE
- 41 SETTING WHEEL LOCKING SPRING
- 42 CAM SETTING WHEEL
- 43 T - BAR

General description (fig. 2)

4. The No. 909, Mk. 2 fuze (Stores Ref. No. 12G/1330) is approximately $6\frac{3}{4}$ in. in length by $2\frac{3}{4}$ in. diameter, having a body (14) which is closed at the base end with an adapter (23) and a magazine (22); the adapter houses a percussion cap (18), and the magazine houses a quantity of gunpowder (21) and a 2 sec. delay (20). Vent holes (19) in the adapter allow gases to escape (when the delay is burning), which then pass through another vent hole (24) leading into the housing of a spring-loaded safety pin (17), and so to atmosphere.

5. The other end of the body is closed with an outer casing (7) secured by four screws (33), the heads of which are covered with a strip of red adhesive tape (11). Four small vent holes (37) in the outer casing, and in the fuze body, provide for the equalisation of air pressure within the fuze, and are sealed with a strip of white adhesive tape (8).

Note . . .

(1) The RED tape, covering the screw heads, must NOT be removed.

(2) The WHITE tape, sealing the vent holes, MUST be removed just before the tail unit is filled during missile preparation; the tape bears a printed instruction to this effect.

6. A spring-loaded striker (30), located in a striker housing (12) screwed into the interior of the fuze body, is supported in the cocked position by three striker retaining balls (29) seated in three holes in the wall of the striker housing. These balls are retained against a bevelled shoulder in the striker by the tapered bore in the lower end of a sleeve (31) surrounding the striker housing.

7. Three sleeve retaining balls (32), seated in three further holes in the wall of the striker housing, abut the parallel portion of an arming pin (34) and bear against the bevelled upper end of the sleeve. The sleeve is thus locked against axial movement and the striker is retained in the cocked position.

8. The fuze body, together with the outer casing, houses a cylinder (9) containing a spring-assisted vacuum bellows (36), one end of which, together with a stop plate (38), form the closed end of the cylinder. The

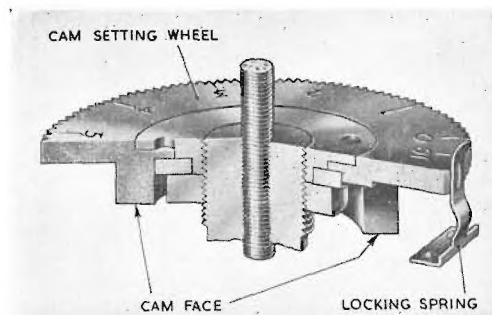


Fig. 3. Sectional view of cam setting wheel

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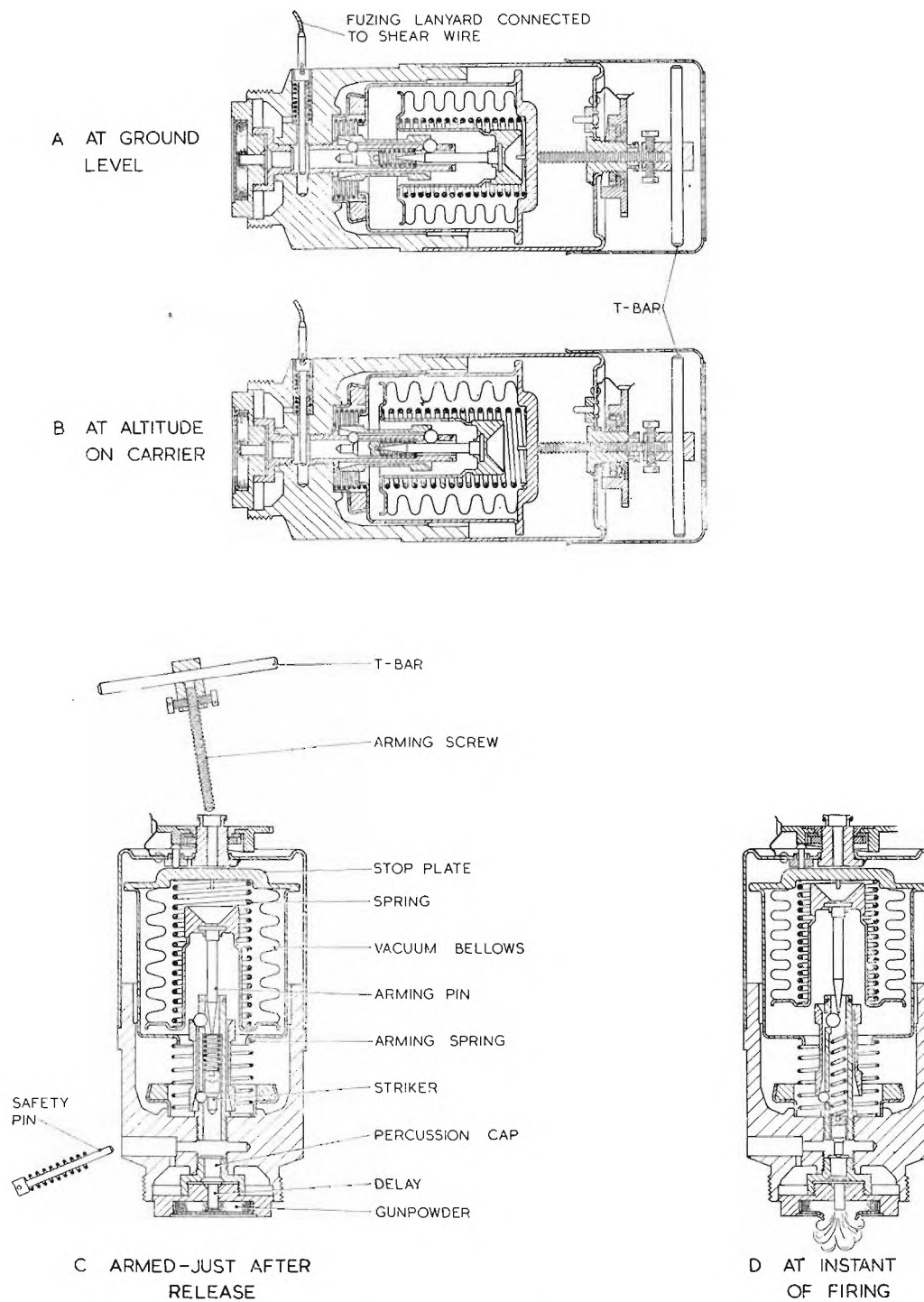


Fig. 4. Diagrammatic views showing operation of the fuze

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arming pin (34) is secured to a support (35) attached to the other end of the bellows, which is free to expand and contract within the cylinder according to the variation in atmospheric pressure.

9. The cylinder passes over the sleeve and seats on an arming spring (16); the arming pin enters the striker housing and is thus poised immediately above the striker, the end of which has a blind hole to clear the point of the arming pin in the event of the bellows becoming fully expanded.

10. The arming spring urges the cylinder towards a setting pin (39) housed in a bush in the top of the outer casing; the cylinder, however, is prevented from moving by an arming screw (5). One end of the screw passes through a threaded bush (4) secured centrally in the top of the outer casing, abuts the stop plate, and retains the cylinder seated on a felt washer (15). The other end of the arming screw is fitted with a T-bar (43) to engage the arming fork in a tail unit.

11. A friction wire (3) passes through a hole in the arming screw, the ends of the wire being bent, in opposite directions, around a groove in the bush. This wire prevents the arming screw from being rotated until air pressure on the arming vanes reaches a predetermined minimum strength. As such pressure can only be attained after the missile has cleared the aircraft, there is no possibility of the fuze functioning should the missile lodge in the bomb bay after being released.

12. The setting pin (39) is a free fit in its bush, the head of the pin being located on the top of the outer casing, immediately beneath a cam (40) on the under surface of a rotatable setting wheel (42) positioned on the arming screw bush.

13. The cam setting wheel (fig. 3) has a serrated edge, indexed from 0 to 10. When the barometric pressure at sea level is 1,012 millibars, each serration represents 100 ft. and the index figures represent, in thousands of feet, nominal heights above sea level at which the fuze can be set to function.

14. A locking spring (41 in fig. 2) secured on the top of the outer casing, adjacent to the edge of the setting wheel, engages the serrations and locks the wheel at a selected height setting.

15. A safety cap (2) fitted over the outer casing and secured with white adhesive tape, protects the arming screw during storage and handling. This tape also secures the free end of a fuzing lanyard (28) (para. 17) and is affixed partly over the printed white tape sealing the vent holes in the outer casing (para. 5).

16. A spring-loaded safety pin (17) located between the striker and the percussion cap, is retained in position with a shear wire (26) which passes through a hole in the head of the pin and is secured round an annular groove in the fuze body.

Note . . .

The safety pin must NOT be removed.

17. The fuzing lanyard is attached to the shear wire with a ferrule (27) which can be moved along the wire to a convenient position when the lanyard is being attached to the E.M. fuzing unit on a carrier unit. The lanyard is coiled round the fuze body and its free end is secured with adhesive tape (para. 15).

18. The fuze has an external thread for screwing into a missile, and a leather washer is fitted to form a water-tight seal when the fuze is screwed into the missile.

Identification markings

19. The following information is stamped on the fuze body:

- (1) The full nomenclature of the fuze.
- (2) The initials or recognised trade mark of the filling contractor, or the monogram of the filling station.
- (3) The month and year of filling.
- (4) The filled Lot number.

Functioning (fig. 4)

20. When a missile fitted with one of these fuzes is released from an aircraft, the shear wire is broken by the pull of the fuzing lanyard, and the safety pin is ejected by its spring. Air pressure rotates the arming vanes in the tail unit, and the arming screw thus becomes unscrewed from the fuze and falls away. Concurrently, the cylinder containing the vacuum bellows and arming pin is forced by the arming spring to follow the arming screw as it is being unscrewed, until the movement of the cylinder is arrested by the setting pin.

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21. While the missile is falling, the fuze is subjected to increasing atmospheric pressure and the vacuum bellows contract accordingly. When the region of pressure at which the fuze is set to function is reached, the arming pin will have moved to such a position that its tapered portion will be bearing against the sleeve retaining balls, and the balls will have moved inwards, clear of the sleeve.

22. The sleeve is thus free to move, and under the action of the spring-loaded striker and striker retaining balls, the sleeve is forced upwards, the striker retaining balls move outwards against the wider part of the tapered bore, and the striker hits and fires the percussion cap which ignites the delay; after a further two seconds, the burning delay ignites the gunpowder in the fuze magazine and so functions the missile.

Safety devices

23. The following safety devices are incorporated in the fuze:—

(1) The safety pin, which prevents premature firing of the percussion cap.

(2) The shear wire, which retains the safety pin in position until the fuze missile is released.

(3) The friction wire, which prevents rotation of the arming screw until the fuze missile is clear of the aircraft.

(4) The safety cap, which prevents rotation of the T-bar during handling and storage.

(5) The 2 sec. delay, which ensures that the fuze missile is clear of the aircraft before

initiation occurs when the missile is released from a height below the set functioning height of the fuze.

Instructions for use and safety precautions

24. Detailed instructions for the fuze of a missile with one of these fuzes are given in the publication describing the missile to be fuze. Before use, however, the following should be observed:—

(1) Ensure that the safety pin is in position, and that the shear wire is properly secured.

(2) Ensure that the friction wire is in position in the arming screw bush.

WARNING

When a tail unit, having a twin-pronged arming fork, is being attached to a missile fitted with one of these fuzes, the arming fork should be rotated to effect engagement. Do NOT rotate the T-bar.

Supply

25. The fuze is supplied, packed one, in a press-cap sealed metal Cylinder, No. 464. Twelve such cylinders are packed in Box, B.550. Also packed in the box are twelve Wires, safety, No. 1, Mk. 1, and twenty-four Clips, safety, No. 1, Mk. 1. The stowage dimensions of the box are 27.9 in. × 11.0 in. × 10.5 in., and its filled weight is approximately 63 lb.

Storage

26. For storage purposes, Fuze, No. 909, Mk. 2 is classified in Group 6, Category X.

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Chapter 17**FUZES, TIME, MECHANICAL, No. 940, Mk. 1 and 2****LIST OF CONTENTS**

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LEADING PARTICULARS

<i>Fuze, time, mechanical, No. 940, Mk. 1</i>	<i>Ref. No. 12D/1376</i>
<i>Fuze, time, mechanical, No. 940, Mk. 2</i>	<i>Ref. No. 12D/1381</i>
<i>Dimensions</i>	<i>7 in. × 3·5 in. × 3·75 in. approx.</i>
<i>Weight</i>	<i>2·5 lb. approx.</i>
<i>Fuze head</i>	<i>L.M.N.R. serium</i>
<i>Delay composition</i>	<i>Antimony potassium permanganate</i>
<i>Explosive charge</i>	<i>0·15 grain R.D.1308</i>
<i>Detonator</i>	<i>2·8 grains A.Z. mixture</i>
<i>Magazine charge</i>	<i>72 grains of G20 gunpowder</i>
<i>Spanner, fuze locking</i>	<i>Ref. No. 12D/1377</i>

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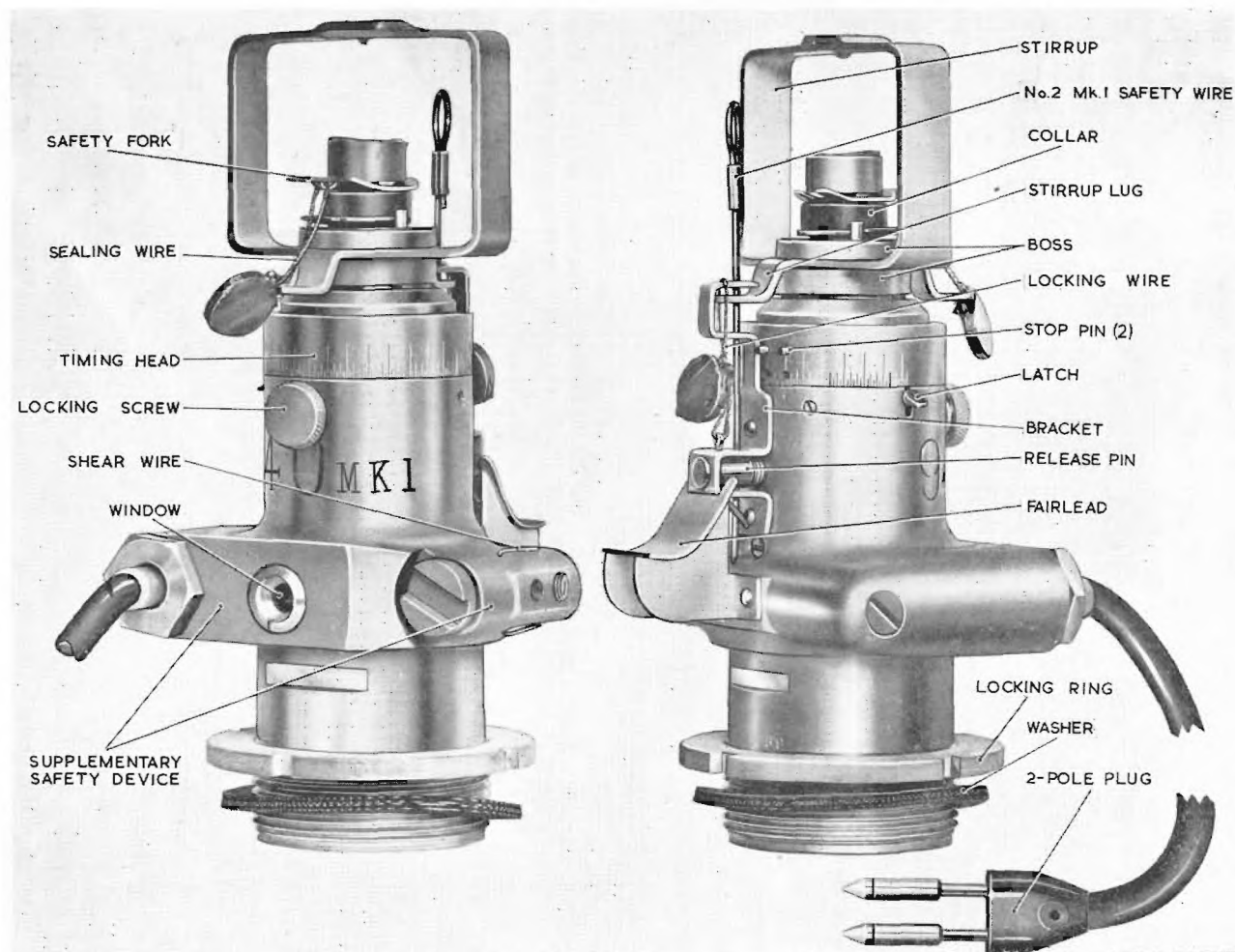


Fig. 1. External views of the No. 940, Mk. 1 and 2 fuzes

Introduction

1. Fuzes, time, mechanical, No. 940, Mk. 1 and 2 are used in conjunction with the No. 109 Mk. 3 tail unit, or the No. 111, Mk. 3 tail unit to initiate the Flash, photographic, 8 in. No. 2 Mk. 1.

2. The only difference between the Mk. 1 and 2 fuze is the electric cable. That of the Mk. 1 is 24 in. long and terminates in a 3-pole shrouded plug to enable the fuze to be used in a photographic flash carried in a container. The cable of the Mk. 2 fuze is 27 in. long and terminates in a 2-pole plug with waisted pins to enable the fuze to be used in a flash carried on a bomb carrier.

GENERAL DESCRIPTION

3. The fuze consists of a body which houses a magazine, shutter, timing mechanism, and a supplementary safety device.

Fuze body (fig. 1)

4. The lower end of the fuze body screws into the rear of the flash, and is tightened with the aid of two spanner flats situated above the threaded position of the fuze. The fuze is locked in the flash by a rubber insertion washer and a locking ring.

5. A window in the body gives a view of the shutter, and around the body is a housing which contains the supplementary safety device. Riveted to this housing is an arming wire fairlead and, adjacent to the fairlead, a bracket houses a spring-loaded release pin retained in position by a split pin.

6. Holes in the bracket enable a sealing wire to be fitted to secure the split pin and a stirrup. Other holes provide for the insertion of a No. 2, Mk. 1 safety wire through the stirrup, bracket, and release pin. A slot in the top of the body, houses a spring-loaded latch, and at 90 degrees to the latch is a locking screw.

Magazine (fig. 2)

7. The magazine screws into the body and consists of a metal cylinder containing gunpowder. A small hole in one end of the cylinder is closed by a septum 0.005 in. thick, the other end being closed by a foil disc and a screwed cap with a central hole.

Shutter

8. The shutter is spring-loaded, and rotates about a pivot located in a diaphragm in the

body. The shutter houses a detonator, which is held in the safe position by a spring-loaded arming pin holding the shutter so that the detonator is away from a striker hole in the centre of the diaphragm. A red cross on the shutter is visible through the window when the shutter has moved and positioned the detonator under the striker hole.

Timing mechanism (fig. 2)

9. The timing mechanism consists of a clock and a timing head. The clock, which is secured to the top of the diaphragm by three screws, is wound by the manufacturer, and drives a timing disc. The disc is prevented from rotating, until required, by a release pin engaging a slot in the disc.

10. The timing head closes the top of the fuze body, and is secured in position by a securing ring. The ring is located in two cannellures, one in the fuze body and the other in the timing head, and is held against the timing head by three grub screws.

11. The timing head is graduated in seconds of time, and can be rotated to register against a setting line engraved on the latch. Delay periods ranging from 8 to 92 seconds can be set on the timing head, which is locked in the position required by the latch engaging a rack in the head and by the locking screw. Two stop pins in the head contact the bracket and prevent over-rotation of the timing head.

Note . . .

Although the timing head is graduated from 5 to 92 seconds, the minimum setting must not be less than that of the fixed delay of the supplementary safety device, which is eight seconds, otherwise the fuze will be "blind".

12. A pawl and a catch plate, on the bottom of the timing head, are each located by a pivot screw. The pawl is cranked at each end, one end moves into the slot in the timing disc at the appropriate time, and the other engages one end of the catch plate. The other end of the catch plate is hook-shaped, and engages a pin set in a roller.

13. The roller, which is housed in the bottom of the timing head, has a flat at its centre, and a pin set at a right angle in one end. The shoulder of a spring-loaded striker, bearing on the flat, tends to rotate the roller about its longitudinal axis, but is prevented from doing so by the pin engaging the catch plate.

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14. The timing head houses two gear wheels and a pinion, and is closed by a plate which serves as a bearing for a stirrup boss. A bush, secured to the boss, carries on its inner end one gear wheel having 35 teeth, and a left-hand threaded sleeve, which passes through the bush, carries the other gear wheel which has 34 teeth. Both gear wheels engage the pinion and give a reduction of 34 to 1. The sleeve protrudes from the bush and engages a slotted safety collar; the slot in the collar is large enough to allow passage of the striker stem but not the sleeve.

15. Two pins on the stirrup boss engage a flange on the safety collar, and a safety fork is inserted between the collar and the enlarged head of the striker.

16. A stirrup, mounted on the boss, is provided with two lugs diametrically opposite each other. Each lug is provided with holes so that one lug can accommodate the No. 2, Mk. 1 safety wire and the locking wire, and the other a sealing wire which secures the safety fork to the stirrup.

Supplementary safety device

17. After the fuze has been dropped from an aircraft, the supplementary safety device gives a delay of approximately 8 seconds before allowing the shutter to move across the fuze, and position the detonator under the striker.

18. An electric cable from one end of the device terminates in either a 2-or 3-pole plug (*para. 2*). The other end of the cable is secured to the housing of the device by a plastic sleeve and a threaded bush. A resistor is connected to the leads of the cable, and a fuze head is in contact with a delay composition which terminates in a small explosive charge. A piston, secured in position by a shear wire, holds the arming pin against the shutter, and behind the piston is a cotton wool cushion.

Identification markings

19. The fuze carries the following markings:—

- (1) Number and Mark number.
- (2) Manufacturer's initials or recognised trade mark.
- (3) Lot number of the filled fuze.
- (4) Month and year of filling.

FUNCTIONING

20. To ensure that the fuze functions correctly, it must be prepared and fitted to the photoflash as detailed in *para. 26* to *36* and in A.P.1661E, Vol. 1 (*2nd Edn.*), Sect. 11.

21. When the photoflash is released from a bomb carrier, the 2-pole plug is withdrawn from its socket, and the unwaisted portions of the plug pins wipe across two contacts to complete the electrical circuit to the supplementary safety device. At the same time, the arming wire is withdrawn from the bracket, the stirrup lug, and the release pin.

22. When the electrical circuit is completed, the fuze head is initiated and ignites the delay composition. The composition burns for approximately 8 seconds then ignites the explosive charge. The pressure of the gases, generated by the burning compositions, causes the piston to shear the shear wire and move away from the face of the arming pin; any bounce of the piston being damped out by the cushion, and excess pressure dispersed by means of a blowout plug. The arming pin spring ejects the pin, and thus frees the shutter which moves across the fuze and positions the detonator underneath the striker hole in the diaphragm.

23. After the arming wire is withdrawn, the stirrup rotated by the arming fork of the tail unit, rotates the gear wheels. After approximately 300 revolutions of the stirrup, the sleeve is withdrawn from the safety collar into the timing head, and the collar is thrown off by centrifugal force. The striker is now prevented from moving only by the roller and the catch plate.

24. When the arming wire is withdrawn, the release pin is ejected by its spring to free the timing disc, at the same time giving the disc a flick to start the clock.

25. When the clock has rotated the timing disc for the number of seconds set on the timing head, the slot in the disc is positioned to accept the end of the pawl. The striker rotates the roller, the roller pivots the check plate which, in turn, pivots the pawl to place the end of the pawl in the timing disc slot. The striker now moves forward, under the impulse of its spring, to strike and fire the detonator, which ignites the gunpowder in the magazine. The flash from the gunpowder disrupts the foil disc and initiates the exploder of the photoflash.

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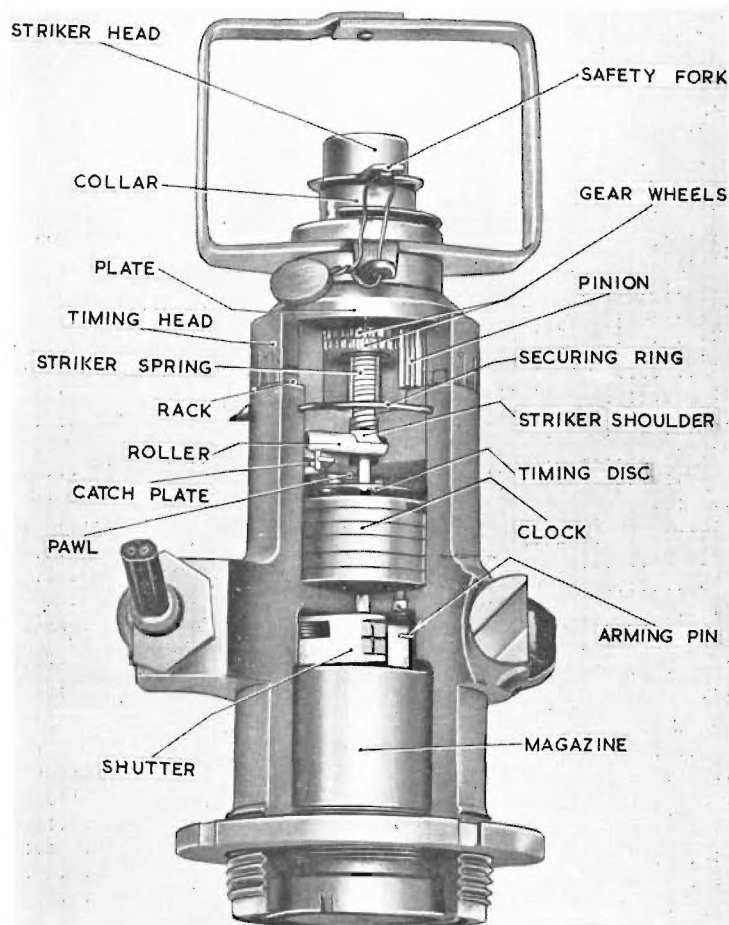


Fig. 2. Cutaway view of the No. 940, Mk. 1 fuze

PREPARATION FOR USE

26. Remove the fuze from its container.
27. Look through the window, and check that the red cross cannot be seen. If the cross is visible, the detonator shutter is in the armed position, and the fuze must not be used but is to be segregated for disposal in accordance with current instructions.
28. Check that the sealing wire and locking wire have not been tampered with.
29. Check that the safety fork, and the arming pin with its split pin are in position.

wire from the magazine end of the fuze and under the fairlead until it protrudes approximately 1 in. through the top of the bracket. It may be necessary to depress the release pin to enable the wire to pass through.

34. Fit a No. 2, Mk. 1 safety clip to the protruding end of the fuze arming wire.

35. Set the required delay by loosening the knurled-headed locking screw, depressing the latch, and rotating the timing head until the required figure, in seconds, registers with the red line on the latch. Lock the head by releasing the latch, ensure that it correctly engages the rack in the timing head then, with pliers, tighten the locking screw.

36. Remove the fuze locking ring and rubber washer, and assemble them to the fuze in the reverse order.

SAFETY PRECAUTIONS

37. Before the fuze is removed from its cylinder, check that the cylinder seal is undamaged. Should the seal be faulty, the cylinder and its fuze are to be set aside for A.I.S. inspection.

Before preparation for use

38. Before the fuze is prepared for use, check that the sealing wire and locking wire are not broken, and that their seals are undamaged.

39. Look through the window and, if the red cross can be seen on the shutter, the fuze is in a dangerous condition and is to be destroyed in accordance with current instructions.

40. Look through the slot in the safety collar, and note the position of the sleeve, the top of which should be approximately $\frac{1}{16}$ in. below the top of the collar. If the position of the sleeve is incorrect, the fuze is to be set aside for A.I.S. inspection.

41. If the position of the sleeve is correct, remove the safety fork, and check that the striker head is not bearing on the collar. If there is a small gap between the head and the collar, fit the safety fork. If the striker head bears on the collar, the clock has functioned, and the fuze is to be regarded as unsafe. The collar is to be secured in position by at least two turns of wire or adhesive tape, and the fuze set aside for A.I.S. inspection.

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SECTION 3

DETONATORS, AND DETONATOR BURSTERS

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SECTION 3
DETONATORS AND DETONATOR-BURSTERS

LIST OF CHAPTERS

Note.—*A list of contents appears at the beginning of each chapter*

- 1** General information on detonators and detonator-bursters
- 2** Sensitive type detonators
- 3** Detonator, No. 58, Mk. 1
- 4** Detonator-burster, aircraft bomb, No. 28, Mk. 2 and 3

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Chapter I

GENERAL INFORMATION ON DETONATORS AND DETONATOR-BURSTERS

LIST OF CONTENTS

	Para.		Para.
Introduction	1	Precautions when handling detonators and detonator-bursters	7
Detonators	3	Exposed life of detonators	13
Detonator-bursters	6		

Introduction

1. Detonators and detonator-bursters are devices which house a highly sensitive explosive composition and are fired by the combined effect of impact and friction. Detonators are used in high-explosive systems to provide the initial explosive charge of the explosive train. Detonator-bursters are for use in practice bombs and are initiated by the bomb striker; when functioned, they disrupt the bomb casing and so liberate the main filling of the bomb.

2. Detonators are classified as either instantaneous or delay. Detonator-bursters, however, always function instantaneously.

Detonators

3. Detonators are for use, in conjunction with a pistol, in British high-explosive bombs. The pistol incorporates the initiating mechanism for firing the cap composition of the detonator.

4. Formerly, there were two main types of detonator in use in the Service, namely, "anvil" and "sensitive". The anvil type detonator is now obsolete, and the sensitive type of bomb initiation, in which a sensitive type detonator is used in conjunction with a pistol having a sharp-pointed striker, is the only type of pistol/detonator combination now in use.

5. The explosive train of a typical sensitive type detonator consists of an initiating detonator containing cap composition, delay composition (except in instantaneous detonators) and detonating composition.

Detonator-bursters

6. Detonator-bursters are for use with practice bombs, which have a sharp-pointed striker. They consist of a head which houses an initiating detonator and a stem containing a number of C.E. pellets.

Precautions when handling detonators and detonator-bursters

7. Detonators (this term is used in para. 7 to 15 to include detonator-bursters) are filled with very sensitive high explosives which will explode if they receive a sudden shock or even a light blow, or are subjected to heat. Immersion in water will not destroy the explosive nature of the compositions used, and after they have dried they may become even more dangerous than before they were wetted. It is, therefore, essential that detonators be handled at all times with care, and not be exposed to the heat of the sun.

8. Ensure that the correct detonator is used with each type of pistol and for the particular operation.

9. Before a detonator is inserted into a bomb, the detonator cavity of the bomb must be gauged, using a detonator cavity gauge. The gauge is engraved to indicate the correct cavity depth of various bombs, and the appropriate engraved line should be flush with, or slightly below, the edge of the cavity. Force must not be used when inserting a detonator into a bomb; any detonator which is found to be oversized must be put aside for A.I.S. inspection.

This is Amendment List No. 39 to Air Publication 1661C, Volume I (2nd Edn.)

Section 3, Chapter I. Remove and dispose of the existing Chapter I and substitute this revised Chapter I. Record the incorporation of this A.L. in the Amendment Record Sheet.

10. When removing a detonator from a fuzed bomb, the appropriate detonator extractor must always be used. The use of improvised tools for extracting detonators is forbidden.

11. If a detonator shows any defects, no rectification is to be attempted.

12. During fuzing operations, detonators are to remain in their cylinders until immediately prior to their being inserted into the bomb.

Exposed life of detonators

13. Aircraft bomb detonators have an "exposed life" of 14 days from the date of the first opening of the detonator transit cylinder. In no circumstance is a detonator to be used when this life has expired. If a detonator's exposed life expires while it is in position in a fuzed store, the store is to be unfuzed and the detonator is to be destroyed (A.P.2608A). If required, the store is then to be fuzed, using a new detonator.

14. When fuzing a store, using a detonator, the following instructions are to be strictly adhered to:—

(1) When a detonator transit cylinder is first opened, the lid is to be clearly

marked with the date of first opening. When adding further markings to the cylinder, care is to be taken not to obliterate this date.

(2) When a detonator from a cylinder which has previously been opened is to be used, note the date of first opening marked on the lid. If 14 days or more have elapsed since this date, the detonators contained in this cylinder are not to be used but are to be destroyed (A.P.2608A). If less than 14 days have elapsed since this date, check that the period for which it is expected that a detonator from this cylinder will be in position in a fuzed store (for instance, in a fuzed-bomb area) does not, when added to the period which has elapsed since the cylinder was first opened, exceed 14 days; if the sum of these two periods exceeds 14 days, the detonator is either to be destroyed (A.P.2608A) or is to be used for fuzing a store which is expected to be expended within 14 days from the date of first opening of the cylinder.

15. If any detonators remain in a cylinder when the fuzing operation is completed, the cylinder is to be sealed and marked FOR FIRST ISSUE.

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Chapter 2

(Completely revised)

SENSITIVE TYPE DETONATORS

LIST OF CONTENTS

	<i>Para.</i>		<i>Para.</i>
<i>Introduction</i>	1	<i>Identification</i>	9
<i>Description</i>	3	<i>Functioning</i>	13

ILLUSTRATION

	<i>Fig.</i>
<i>Typical sensitive type detonators</i> ...	1

LEADING PARTICULARS

<i>Types of sensitive detonator</i>	(1)	<i>Delay</i>
	(2)	<i>Instantaneous</i>
<i>Nomenclature</i>		<i>Detonators, aircraft bomb</i>

Delay detonators

<i>Ref. No.</i>	<i>Det. No.</i>	<i>Delay</i>	<i>Colour band</i>
12G/1230	No. 50 Mk. 2	0.10 to 0.18 sec.	Brown
12G/1246	No. 51 Mk. 2	0.01 to 0.03 sec.	Black
12G/1232	No. 56 Mk. 2	0.04 to 0.06 sec.	White and Red
12G/1189	No. 57 Mk. 2	25 to 30 sec.	Blue and Yellow
12G/1256	No. 60 Mk. 2	0.06 to 0.08 sec.	White and Brown
12G/1385	No. 64 Mk. 2	0.075 to 0.125 sec.	Green

Instantaneous detonators

<i>Ref. No.</i>	<i>Det. No.</i>	<i>Colour Band</i>	<i>Remarks</i>
12G/842	No. 52 Mk. 3	White	For home use only
12G/841	No. 52 Mk. 3	White	
12G/1412	No. 52 Mk. 5	White	
12G/1444	No. 52 Mk. 6	White	

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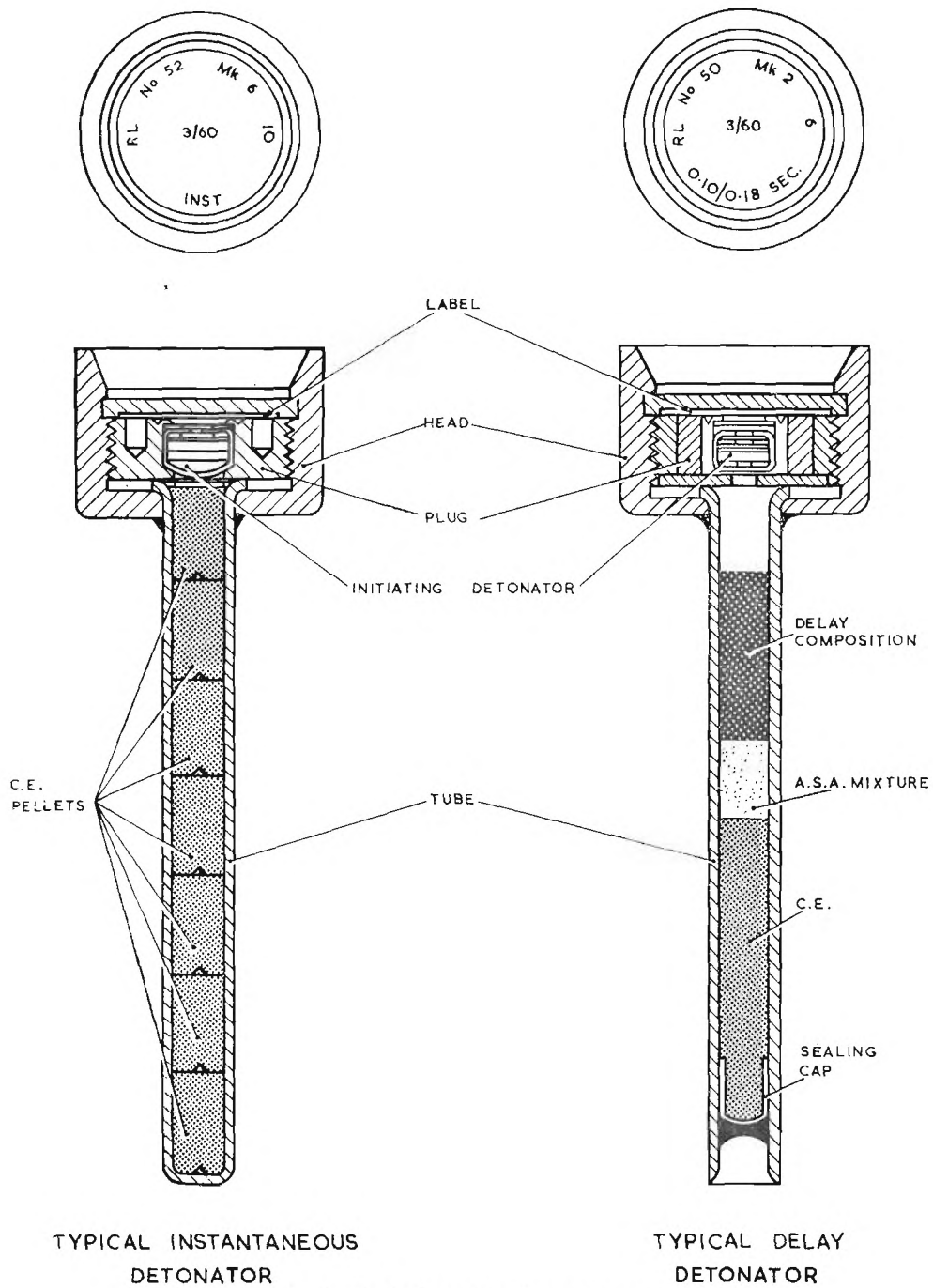


Fig. 1. Typical sensitive type detonators

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Introduction

1. General information, including the precautions to be observed when handling this type of detonator, are given in Chapter 1.

2. Sensitive type detonators are used with pistols having sharp-pointed strikers. This combination gives a more sensitive initiation than the now obsolete anvil type of detonator and blunt striker combination, as in the sensitive type the detonator is actually pierced by the point of the striker.

Description

3. The detonator, which is approximately 3.5 in. long, consists of a metal tube to one end of which is cemented a head. Screwed into the head is a detonator plug, the thread of which is coated with cement to secure the plug in position.

4. The detonator plug has a flash hole and a recess to accommodate a small initiating detonator, the edges of the recess being turned over to retain the detonator. Gas vents communicating with radial channels are provided in the plug. The wall of the head projects above the plug to protect the plug and detonator.

5. The initiating detonator consists of a metal cup containing detonating composition, which is covered by a metal disc, and one or more metal washers. The rim of the cup is either feathered, or has lugs, which are turned over to retain the components in position.

6. A paper label is secured to the plug with shellac, the label being protected with a coating of varnish.

7. The tube of the instantaneous detonator, one end of which is closed, contains a number of C.E. pellets and, in some detonators, a quantity of fulminate.

8. The tube of the delay detonator contains a quantity of delay composition, the amount being governed by the length of delay required, a quantity of A.S.A. mixture, and a quantity of C.E. The A.S.A. which is a highly sensitive mixture, ensures detonation

of the C.E. After the tube has been filled a sealing cap is cemented in position to close the end of the tube. This method of filling is known as "inverse loading".

Identification

9. Detonators of recent manufacture bear a white label, those of earlier manufacture bear a green label, while others, in addition to the green label may be painted green on the tube for about one inch from the bottom end.

10. Detonators are identified by the colour band or bands, as indicated in the Leading Particulars, the band or bands being painted on the head. The width of the single band is $\frac{3}{8}$ in. and when two bands are used the width of each is $\frac{3}{16}$ in. the bands being $\frac{1}{8}$ in. apart.

11. The label on the plug bears the following details:—

- (1) The No. and Mk. of detonator.
- (2) Monogram of filling station, or filling contractor's initials.
- (3) The date of filling (month and year).
- (4) The filled Lot number.
- (5) The delay in seconds or "INST" (instantaneous) as applicable.

12. The following markings are stamped on the underside of the detonator head.

- (1) The No. and Mk. of detonator.
- (2) The manufacturer's initials or recognised trade mark.
- (3) The date of manufacture (month and year).

Functioning

13. When a pistol in a bomb functions, the striker pierces the initiating detonator and fires the cap composition, the flash from which passes through the flash hole in the cap. In the instantaneous detonator, the flash initiates the detonating composition; in the delay detonator the flash ignites the delay composition, which, after the specified delay initiates the highly sensitive A.S.A. mixture, and this, in turn, initiates the detonating composition. In both instances the detonating composition initiates the exploder which detonates the main filling in the bomb.

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Chapter 3

DETONATOR, No. 58, Mk. 1

LIST OF CONTENTS

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General description	3	Instructions for use and safety precautions	8
Identification markings	6		

ILLUSTRATION

	Fig.
Sectional view of the No. 58, Mk. 1 detonator	1

LEADING PARTICULARS

Ref. No.		12D/1365
Dimensions		1.9 in. long $\times$ 0.25 in. dia.
Type		Instantaneous

Introduction

1. The No. 58, Mk. 1 detonator is used primarily in photographic flashes (*A.P.1661 E, Vol. 1 (2nd Ed.)*) in conjunction with a fuze approved for use with the particular store.

2. The detonator is normally inserted between the fuze and the exploder of the store with which it is used, and serves as a flash booster.

General description (*fig. 1*)

3. The detonator consists of a short tube closed at one end. An external sleeve is fitted over the other end of the tube, and both the tube and the sleeve are flanged outwards. A stop disc abuts the underside of the flange, and is retained in position by an embossed ring.

4. The detonator tube contains a filling of three C.E. pellets, each being of three grains, on top of which is a layer of eight grains of A.S.A. composition. To facilitate initiation, a central depression is formed in the surface of the A.S.A. composition.

5. The open end of the tube is sealed with a white paper disc bearing a central red spot.

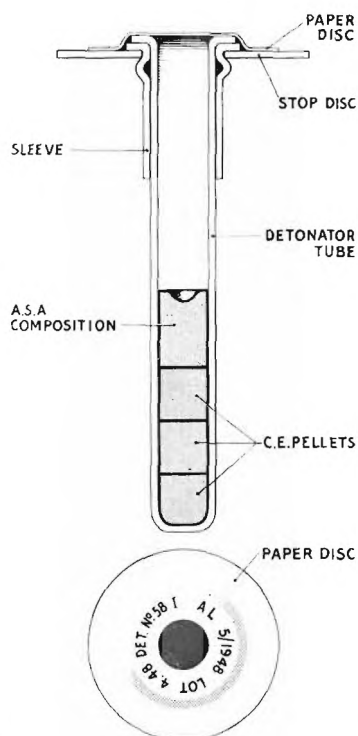


Fig. 1. Sectional view of the No. 58, Mk. 1 detonator

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Identification markings

6. The following identification markings are printed on the paper sealing disc:—

- (1) The nomenclature.
- (2) The manufacturer's initials or recognized trade mark, or the monogram of the filling station.
- (3) The month and year of manufacture.
- (4) The Lot number of the filling.

Functioning

7. The flash from the fuze magazine initiates the A.S.A. composition, which ignites the C.E. to function the exploder of the store.

Instructions for use and safety precautions

8. Detailed instructions for the use of the detonator are given in the publication

describing the store with which the detonator is used. The following information, however, should be noted:—

- (1) If a detonator has a punctured sealing disc, the detonator must not be used, but is to be destroyed as detailed in A.P.2608A.
- (2) When the detonator is being handled, the precautions detailed in Chapter 1 must be observed.
- (3) Before the detonator is inserted into a store, the detonator cavity must be gauged, using a No. 2, Mk. 1 cavity gauge with a gauge adapter for detonator No. 58, Mk. 1 (*Vol. 2, Part 1, Leaflet No. E3*).
- (4) When a detonator is being extracted from a store, a No. 4 detonator extractor is to be used.

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Chapter 4

(This chapter supersedes that issued with A.L. No. 52)

DETONATOR-BURSTER, AIRCRAFT BOMB, No. 28, Mk. 2 and 3

Introduction

1. Attention is directed to Chapter 1 in which general information and precautions applicable to detonator-bursters are given.

2. The No. 28 detonator-bursters are for use with practice bombs and, when pierced by the sharp-pointed striker of the bomb, function instantaneously.

General description (fig. 1)

Detonator-burster, No. 28, Mk. 3

3. The No. 28, Mk. 3 detonator-burster (Stores Ref. 12G/1376) is approximately 3.3 in. in length and consists of a stem which is closed at one end and has a head at the other end. Screwed into the head is a plug containing a 6.7-grain initiating detonator.

4. The stem houses a column of C.E. pellets and the uppermost pellet is covered by a thin batiste, or shalloon disc. The initiating detonator abuts the disc and consists of a metal cup containing three different layers, namely, an "A" mixture, lead azide, and C.E. The cup is tinned internally to prevent the formation of copper azide and is closed by a metal disc and a washer which are secured in position by small lugs. The plug which houses the initiating detonator has a central hole to receive the bomb striker.

Detonator-burster, No. 28, Mk. 2

5. The No. 28, Mk. 2 burster (Stores Ref. 12G/1145) is essentially the same as the Mk. 3 burster (*para. 3 and 4*) except that the cup of the initiating detonator of the Mk. 2 is untinned.

Identification markings

6. The following information is stamped on the head:—

- (1) The number and Mark of the detonator-burster.
- (2) The manufacturer's initials or recognised trade mark.
- (3) The month and year of manufacture.
- (4) The monogram of the filling station, or

the initials or recognised trade mark of the filling contractor.

- (5) The month and year of filling.

Functioning

7. On functioning, the bomb striker pierces and fires the initiating detonator which, in turn, fires the C.E. pellets. The resulting explosion disrupts the bomb casing and, consequently, liberates the main filling which, according to its nature, provides the appropriate indication of the position of impact.

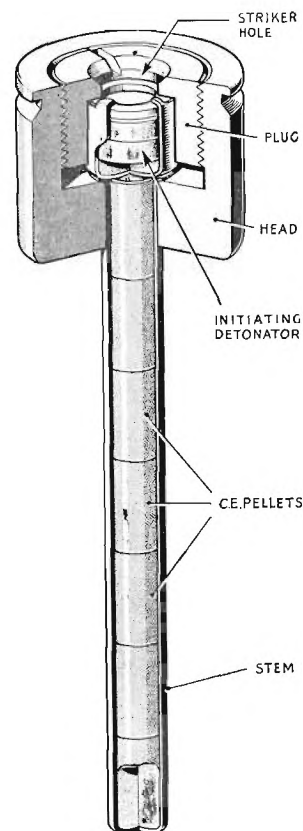


Fig. 1. Sectional view of the No. 28, Mk. 3 detonator-burster

(A.L.59, Oct. 55)

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This leaf issued June, 1949

A.P.1661C, Vol. I (2nd. Edn.)

SECTION 4

INTERMEDIARIES

SECTION 4
INTERMEDIARIES

LIST OF CHAPTERS

Note.—A list of contents appears at the beginning of each chapter

- 1 General information on intermediaries**
- 2 Burster (5 oz.), aircraft bomb, No. 1, Mk. 1, and
Burster (3 oz.), aircraft bomb, No. 2, Mk. 1**
- 3 Burster, H.E., ejection, aircraft bomb, No. 1, Mk. 1**
- 4 Burster, H.E., ejection, aircraft bomb, No. 2, Mk. 1 (*to be issued later*)**
- 5 Burster, H.E., ejection, aircraft bomb, No. 3, Mk. 1**
- 6 Bursters, ejection, No. 6, Mk. 1, and Mk. 2**
- 7 Bursters, ejection, No. 7, Mk. 1, and Mk. 2**
- 8 *Store disposed of***
- 9 Igniter, cluster, No. 1, Mk. 1, and Capsules, delay, No. Y.2 to Y.14**
- 10 Set, fuzing, No. 1, Mk. 1**
- 11 Capsule, delay, Type U**
- 12 Capsule, delay, Type C, Mk. 1 and 2, No. C6 to C50**
- 13 Capsule, delay, Type C, No. C2 to C5**
- 14 Capsule, delay, No. 3, Mk. 2 to No. 20, Mk. 2**
- 15 Burster, ejector, No. 8, Mk. 1**

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(A.L.56, June, 55)

AIR MINISTRY

Section 4. List of Chapters: delete "(to be issued later)" after the titles of Chapters 1, 2, 6, 7 and 8 and write "(A.L.12)" in the outer margin against each deletion. Insert these Chapters 1, 2, 6, 7 and 8 to follow the List of Chapters. Record the incorporation of this A.L. in the Amendment Record Sheet.

ARMAMENT

Chapter I

GENERAL INFORMATION ON INTERMEDIARIES

1. The term intermediaries refers to those components which have a separate identity and form part of the explosive train of a particular store but which are not directly functioned by the initiating mechanism of the pistol or fuze. They form a group of miscellaneous components and include exploders, bursters, adapters housing an explosive charge, igniters and some capsules (all capsules are not strictly intermediaries, as some contain a percussion cap fired by the initiating mechanism of the fuze). Some intermediaries are used to pick up the small but concentrated shock given by the initiator and transform it into an impulse sufficiently violent to detonate a main bursting charge of high explosive, others, such as ejection bursters, themselves burst a container, permitting the functioning of stores which are individually inert while housed in the container.

2. The use of each intermediary, its construction, supply, storage and any other information, are given in the appropriate chapter of this section.

Chapter 3

BURSTER, H.E., EJECTION, AIRCRAFT BOMB, No. 1, Mk. 1

LIST OF CONTENTS

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Sectional view of the No. 1, Mk. 1 burster	1

This is Amendment List No. 18 to A.P.1661C, Volume I (2nd Edn.)
Section 4. List of Chapters: delete "(to be issued later)" after the titles of Chapters 3 and 5 and write "(A.L.18)" in the outer margin against each deletion: Insert these Chapters 3 and 5 to follow Chapter 2. Record the incorporation of this A.L. in the Amendment Record Sheet.

ARMAMENT

Introduction

1. This ejection burster is for use primarily in exploding special kinds of aircraft bombs.

General description (fig. 1)

2. The burster consists of a cylindrical metal container approximately 7.2 in. in length and 1.85 in. in diameter having a hard paper liner. The lower half of the container houses a quantity of poured C.E./T.N.T. The upper half contains a paper-wrapped exploder consisting of one solid and two perforated C.E. pellets. A glazeboard disc is provided between the two fillings and a felt washer is located on the top of the exploder.

3. A metal lid closes the container and is sealed with adhesive tape. The lid has a circumferential ridge which prevents the burster from being inserted into the burster container of the bomb until the lid has been removed.

Identification colouring and markings

4. The burster is painted black and has the following information, stencilled in red:—

- (1) On the burster container appears:—
 - (a) The number and Mark of the burster.
 - (b) The monogram or initials of the filling station.
 - (c) The Lot number of the filled burster.
 - (d) The month and year of filling.

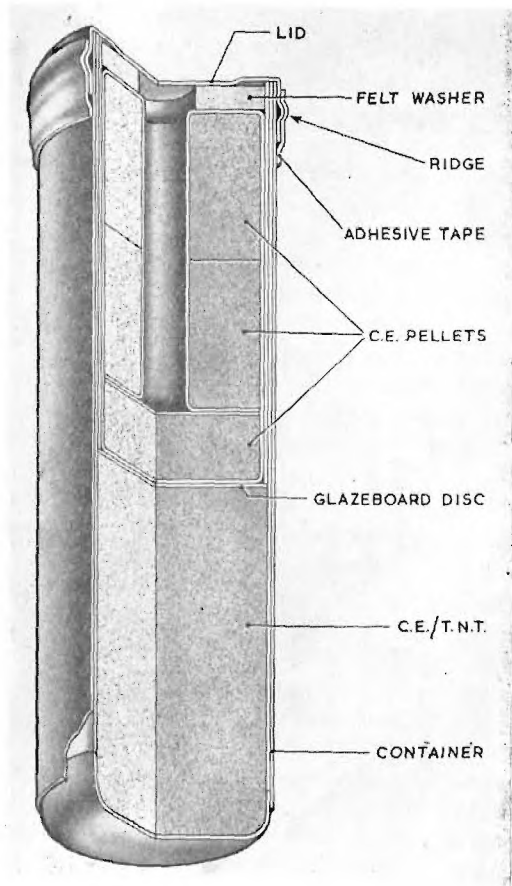


Fig. 1. Sectional view of the No. 1, Mk. 1 burster

R E S T R I C T E D

(2) On the container lid appears:—

- (a) BURSTER NO. 1 I.
- (b) The recognised trade mark or initials of the manufacturer of the empty burster.
- (c) The month and year of manufacture.

Supply

5. Forty bursters are supplied packed in Box B.415, Mk. 1. The stowage dimensions of the box are 28 in. × 18 in. × 10 in., and its filled weight is approximately 124 lb.

Storage

6. For storage purposes, the burster is classified in Group 1, Category **ZZ**.

R E S T R I C T E D

Chapter 5

BURSTER, H.E., EJECTION, AIRCRAFT BOMB, No. 3, Mk. I

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Sectional view of the No. 3, Mk. I burster	Fig. 1
--	--------

Introduction

1. This ejection burster is primarily for use in exploding certain aircraft smoke bombs.

General description (fig. 1)

2. The burster consists of a cylindrical metal container approximately 7.2 in. in length and 1.85 in. in diameter, having a hard paper liner. The lower half of the container houses a wooden distance piece, and the upper half houses a paper-wrapped, 5-oz., H.E. exploder, which consists of two perforated C.E. pellets. A felt washer is located on the top of the exploder.

3. A metal lid closes the container and is sealed with adhesive tape. The lid has a circumferential ridge which prevents the burster from being inserted into the burster container of a bomb, until the lid has been removed.

Identification colouring and markings

4. The lid of the burster is painted green and the container is painted black. The following information is stencilled, in red, on the container:—

- (1) The number and Mark of the burster.
- (2) The monogram or initials of the filling station.
- (3) The Lot number of the filled burster.
- (4) The month and year of filling.

Supply

5. Forty bursters are supplied packed in Box, B.415, Mk. 1. Also supplied in the box are forty Holders, detonator, aircraft bomb, No. 6, Mk. 1. The stowage dimensions of the box are 28 in. × 18 in. × 10 in., and its filled weight is approximately 115 lb.

Storage

6. For storage purposes, the bursters are classified in Group I, Category ZZ.

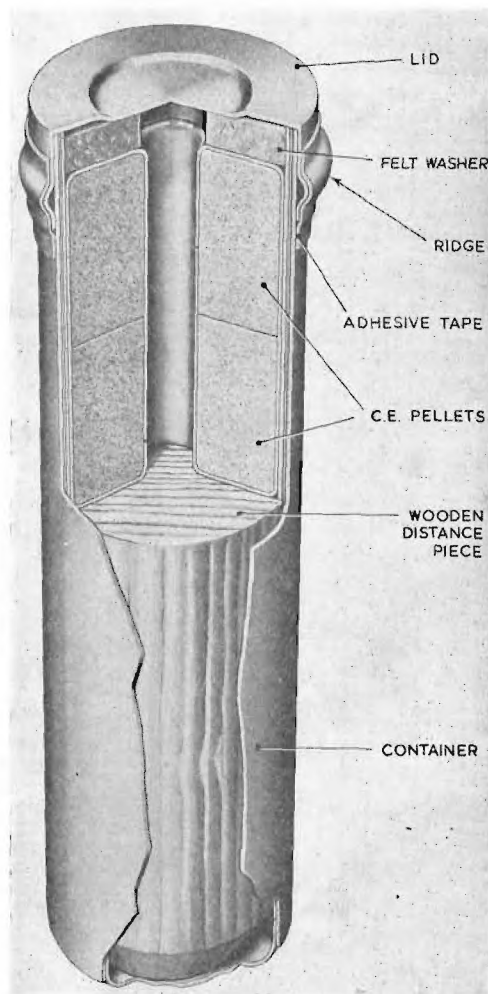


Fig. 1. Sectional view of the No. 3, Mk. I burster

R E S T R I C T E D

Chapter 7

BURSTERS, EJECTION, No. 7, Mk. 1 and Mk. 2

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Introduction

1. The No. 7 ejection burster is for use in nose ejection clusters weighing less than 500 lb., or when specifically ordered for use in other stores. Its function is to eject the faggot of "child" stores from the "parent" store.

General description (fig. 1)

2. The ejection burster consists of a transparent plastic cylinder, 1.75 inches in dia. by 1.04 inches in length, containing approximately 36 gm. of G.20 gunpowder. The Mk. 2 burster differs from the Mk. 1 burster in the type of plastic used in its construction and in the position and method of sealing of the joint, but operationally the two stores are interchangeable.

Instructions for use

3. For details of the fuzeing, loading, unloading and unfuzeing of stores using the No. 7 ejection burster, attention is directed to the relevant chapters of A.P.1661J, Vol. 1, Clusters. The burster is to be inserted into the burster pocket just before the fuze is fitted.

Note . . .

Particular care must be taken to ensure that the burster case is not cracked or distorted and is thoroughly clean and dry before the burster is inserted into the burster pocket.

Identification markings

4. Each burster bears a label containing the following information:—

- (1) The nomenclature of the store
- (2) The number and Mark

(3) The Lot number

(4) The month and year of filling.

Functioning

5. When the burster is ignited it explodes and produces sufficient pressure to eject the faggot of child stores from the parent cluster.



Fig. 1. Burster, ejection, No. 7, Mk. 1

Supply

6. The No. 7, Mk. 1 and Mk. 2 ejection bursters are supplied packed eight in Cylinder, No. 479, Mk. 1; eighteen of these cylinders are packed in Box, B.595, Mk. 1. The stowage dimensions of the box are 16.25 in. x 11.5 in. x 8 in., and its filled weight is 36 lb., approx.

Storage

7. For storage purposes, the bursters are classified in Group 1, Category ZZ.

RESTRICTED
AIR MINISTRY

Chapter 9

IGNITER, CLUSTER, No. 1, Mk. 1 and CAPSULES, DELAY,
No. Y.2 to Y.14

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Introduction

1. This igniter and the Y-type delay capsules are for use with 4.5 in. reconnaissance or target flares which are to be assembled into flare clusters No. 1, Mk. 1 and No. 2, Mk. 1 (*A.P.1661J, Sect. 10*).

General description

Igniter, cluster, No. 1, Mk. 1 (fig. 1)

2. This igniter is approximately 2.75 in. long, 3 in. in diameter, and 17 oz. in weight, and consists of a body secured to a base plug by three screws. The base plug is threaded externally for screwing the igniter into the nose of a flare, and contains a gunpowder-filled magazine. The magazine is closed at one end by a magazine cover and at the other end by a waterproof seal. The magazine cover is held in position between the base plug and a diaphragm formed on the fuze body, and has a central hole closed by a paper disc primed with gunpowder. The diaphragm has a central hole to receive the sleeve at one end of a Y-type delay capsule.

A (AL11)

3. A dome closes the body and on the upper surface of the dome are two red arrows and the words LOCK and UNLOCK in red letters. The dome is held in position on the body by dimples which engage three bayonet slots formed on the body, and is locked by a spring locking clip secured to the dome.

4. A funnel-shaped container housing a primed cambric tube is secured to the top of the dome and sealed with primed cambric and paper discs.

5. *Identification markings.* On the base plug is embossed or stamped the following:—

- (1) The filled Lot number of the igniter
- (2) The manufacturer's initials or recognized trade mark
- (3) The month and year of filling.

This is Amendment List No. 11 to A.P. Publication 1661C, Volume 1 (2nd Edn.)

Section 4. List of Chapters: delete "(to be issued later)" after the titles of Chapters 9, 11, 12 and 13 and write "(A.L.11)" in the outer margin against each deletion. Insert Chapter 9 to follow List of Chapters, and Chap. 11, 12 and 13 to follow Chap. 10. Record the incorporation of this A.L. in the Amendment Record Sheet.

ARMAMENT

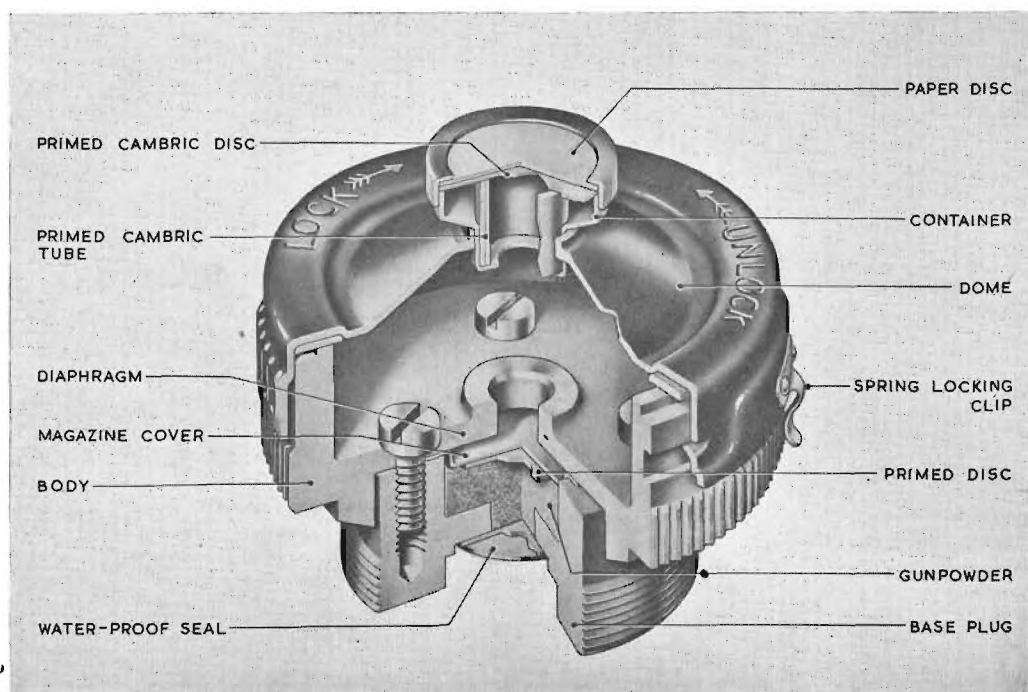


Fig. 1. Sectional view of igniter

Capsules, delay, No. Y.2 to Y.14 (fig. 2)

6. The Y-type capsules are manufactured as a series: Y.2, Y.4, Y.6, Y.8, Y.10, Y.12, and Y.14. The number after the letter Y indicates, in seconds, the period of time during which the capsule will burn at a height of 9,000 ft. above sea level.

7. The Y.6 to Y.14 capsules each consist of two overlapping domed metal covers with a length of Bickford delay fuze coiled inside. The ends of the fuze project through the covers, and are crimped into sleeves secured to the outside of the capsule. One of the covers has a larger domed surface than the other and is rolled or spun over the cover with the smaller dome.

8. The Y.2 and Y.4 capsules differ from the Y.6 to Y.14 capsules in that they have a sleeve containing pressed delay composition and two igniter pellets, instead of the Bickford delay fuze. The times of burning of the Y.2 and Y.4 capsules at ground level are 1.7 sec. and 3.2 sec. respectively.

9. When 4.5 in. reconnaissance or target

flares are to be clustered the appropriate capsules are to be fitted into the igniters of the flares to give the desired delays. Thus a selection of capsules might be chosen to initiate the flares at different heights and so give the appearance of a chain of lights in the sky.

10. Identification colouring and markings.—The Y-type delay capsules are painted white all over. On the larger domed surface of each capsule, stamped in black, is the type and number of the capsule. On the smaller domed surface is stamped the words OTHER SIDE UP to indicate the way in which the capsule is to be inserted into the igniter.

Functioning

11. When an igniter, fitted with a Y-type delay capsule, is included in a cluster and the fuze of the cluster is functioned, the flash from the magazine charge of the fuze ignites the primed cambric at the top of the funnel-shaped container. The flash from the primed cambric is conveyed by the primed cambric tube and ignites the outer end of the delay fuze, or the delay composition, in the capsule.

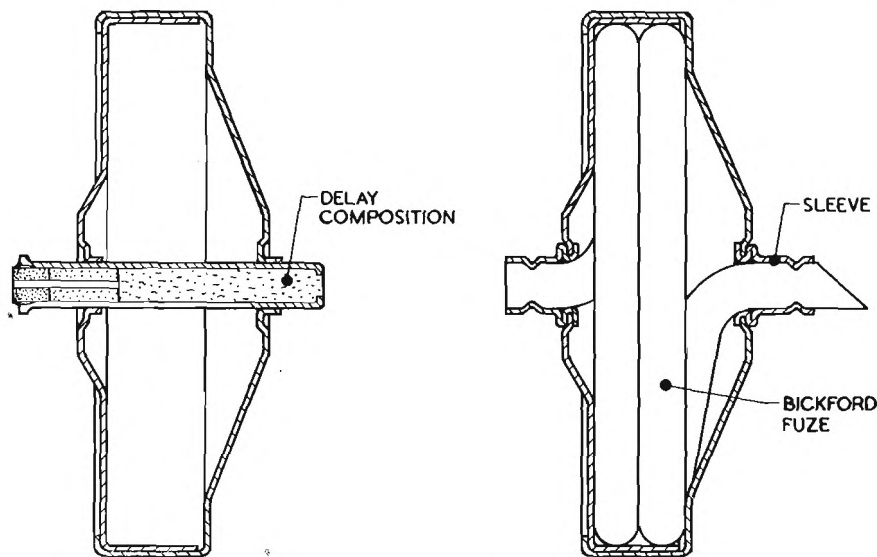


Fig. 2. Typical Y-type delay capsules

The delay fuze, or composition, ignites the primed paper disc over the magazine and the flash from the seal ignites the gunpowder in the magazine. The flash from the gunpowder initiates the flare.

Instructions for use

To insert a capsule into an igniter

12. When a capsule is to be inserted into an igniter, proceed as follows:—

- (1) Remove the dome from the igniter body by turning the dome anti-clockwise and withdrawing it.
- (2) Locate the capsule in the body of the igniter with the larger domed surface uppermost.
- (3) Replace the dome and lock it in position on the igniter body by locating the dimples on the dome in the bayonet slots on the igniter body and rotating the dome clockwise.

To remove a capsule from an igniter

13. If a capsule is to be removed from an igniter, proceed as follows:—

- (1) If the igniter is wet, dry its exterior with a cloth.
- (2) Remove the dome from the igniter body by turning the dome anti-clockwise.
- (3) Remove the capsule and, if the cluster has been taken into the air, destroy the capsule by burning.

- (4) Replace the dome and lock it in position on the igniter body by locating the dimples on the dome in the bayonet slots in the igniter body and rotating the dome clockwise. Return the igniter to its container and clearly mark the container FOR FIRST ISSUE.

Supply

14. Igniters, cluster, No. 1, Mk. 1 are supplied packed two in a box, tinplate, No. 452, Mk. 1. This is a tape-sealed cylinder, and eighteen cylinders, each containing, two igniters are packed in Box, B.513, Mk. 1.

15. Stencilled on the lid of each cylinder, in white, is the following information:—

- (1) The figure 2 indicating the number of igniters in the cylinder
- (2) IGNITER, CLUSTER, No. 1, Mk. 1
- (3) The Lot number of the igniters.

16. The Y-type delay capsules are supplied packed six all of the same delay in Box, 352, Mk. 3 which is a tape-sealed tinplate box. Twenty-six of these boxes are packed in Box, B.468, Mk. 1.

Storage

17. For storage purposes, the No. 1, Mk. 1 igniter and the Y.2 to Y.14 delay capsules are classified in Group 6, Category X.

Chapter 10

SET, FUZING, No. 1, Mk. 1

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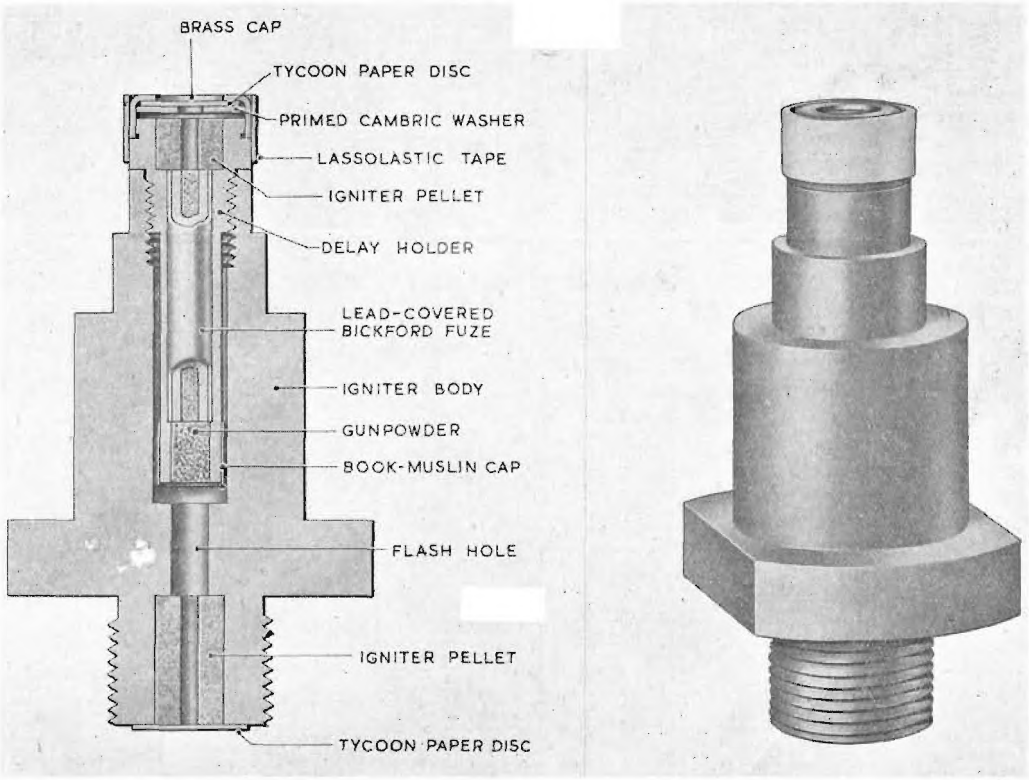


Fig. 1. Views of igniter

Introduction

1. The No. 1 fuzing set is for use with the No. 3, Mk. 2 cluster containing four 7-in. hooded flares (*A.P.1661J, Sect. 10*).

2. The fuzing set consists of four Igniters, delay, No. C.5, Mk. 1, one for each of the flares in the cluster, and one Charge, disintegrator, 80 grains G.20, No. 1, Mk. 1, for disintegrating the cluster.

General description

Igniter, delay, No. C.5, Mk. 1 (fig. 1)

3. The delay igniter consists of an igniter body into the top of which is screwed a delay holder housing an igniter pellet, a length of lead-covered Bickford fuze, and a quantity of G.20 gunpowder. The igniter pellet is located immediately above the Bickford fuze, in the outer end of the delay holder, which is closed by a brass cap. The cap is fitted with a primed cambric washer and a Tycoon paper disc, and is secured to the delay holder by a strip of Lassolastic tape. The gunpowder is located immediately below the Bickford fuze and the inner end of the delay holder is sealed by a book-muslin cap.

4. A flash hole extends between the inner end of the delay holder and an igniter pellet located in the bottom of the igniter body. The igniter body is threaded externally, to enable it to be screwed into the nose of a flare, and is sealed by a Tycoon paper disc. Two flats on the igniter body facilitate the assembly of the delay igniter to a flare.

Charge, disintegrator, 80 grains G.20, No. 1, Mk. 1 (fig. 2)

5. The charge consists of 80 grains of G.20 gunpowder contained in a circular muslin bag of approximately 1.5 in. diameter, and is supplied in a sealed cellophane envelope.

Identification markings

6. The fuzing set is supplied packed in a metal cylinder which bears the printed information shown in fig. 5. The cylinders are packed in a wooden box which bears the following information:—

- (1) The full nomenclature of the store
- (2) The Lot number of the fuzing set
- (3) The manufacturer's initials or recognized trade mark
- (4) The month and year of manufacture

Functioning

7. When the fuze of the cluster is functioned, the flash from the magazine charge of the fuze initiates the delay igniter pellet and

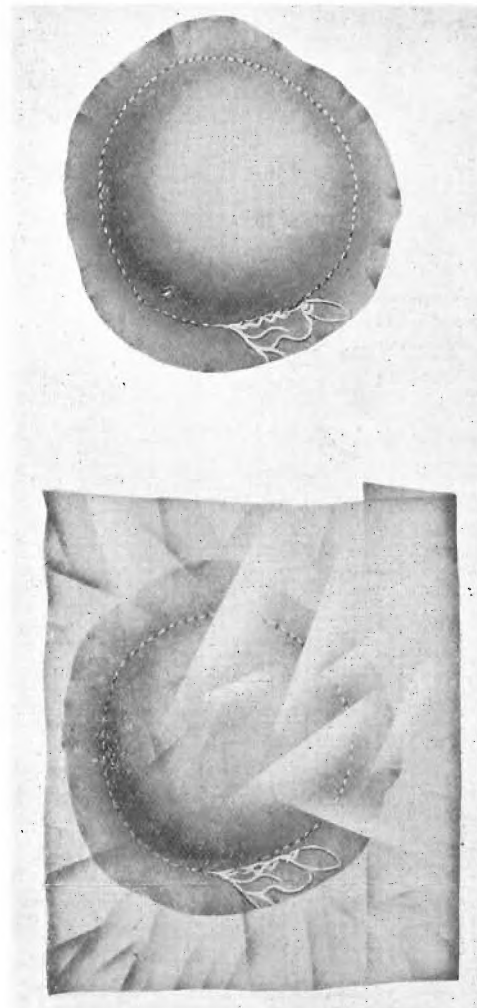


Fig. 2. Charge, disintegrator, No. 1, Mk. 1

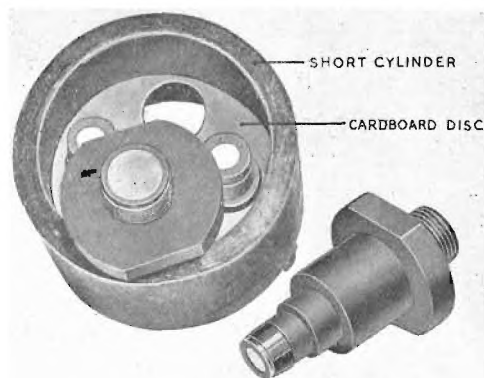


Fig. 3. Method of packing igniters in short cylinder

this, in turn, ignites the Bickford fuze. Simultaneously with the ignition of the igniter pellet, the disintegrator charge is also ignited, by the flash from the fuze magazine, and explodes to disintegrate the cluster. The flares are thus released to fall independently, and after approximately 5 sec. the Bickford fuze fires the gunpowder in the delay holder. The flash from the burning gunpowder passes through the flash hole to ignite the igniter pellet in the igniter body and this initiates the flare.

Supply

8. Sets, fuzing, No. 1, Mk. 1, are supplied packed in Cylinder, No. 476, Mk. 1. Each cylinder contains four igniters and one disintegrator charge. Eighteen filled cylinders are packed in Box, B.569, Mk. 1.

Note . . .

Fuzing sets were originally supplied packed one complete set in a tape-sealed tinplate Box, No. 401, Mk. 1. Twenty-six filled boxes were packed in Box, B.468, Mk. 1, and some of these packages may still be in Service use.

Cylinder, No. 476, Mk. 1

9. The cylinder is sealed by a press-cap and an overseal, and contains the following packings:—

(1) A long cardboard cylinder. This acts as an inner liner, and it seats on a rubber disc fitted in the bottom of the metal cylinder.

(2) A short cardboard cylinder housing a cardboard disc with holes in it to receive the ends of the igniters.

(3) Two cardboard distance tubes, located one at each end of the short cardboard cylinder.

(4) A millboard disc.

(5) A loose rubber disc.

10. *Method of packing.*—Care must be taken, when a fuzing set is to be repacked in its cylinder, to avoid damage to the taped ends of the igniters. Proceed as follows:—

(1) Remove the packings (except the rubber disc in the bottom) from the cylinder.

(2) Insert the four igniters into the short cylinder as shown in fig. 3.

(3) Insert the packed short cylinder into the long cylinder and, to centralize it, place a distance tube into each end of the long cylinder. Place the assembled cylinders into the Cylinder, No. 476.

(4) Insert the millboard disc into the distance tube at the top of the long cylinder, and then place the Charge, disintegrator (in its cellophane envelope) on top of the disc.

(5) Insert the rubber disc into the top of the long cylinder and then fit the press-cap and overseal to the metal cylinder.

Storage

11. For storage purposes, Sets, fuzing, No. 1, Mk. 1, are classified in Group 6, Category X.

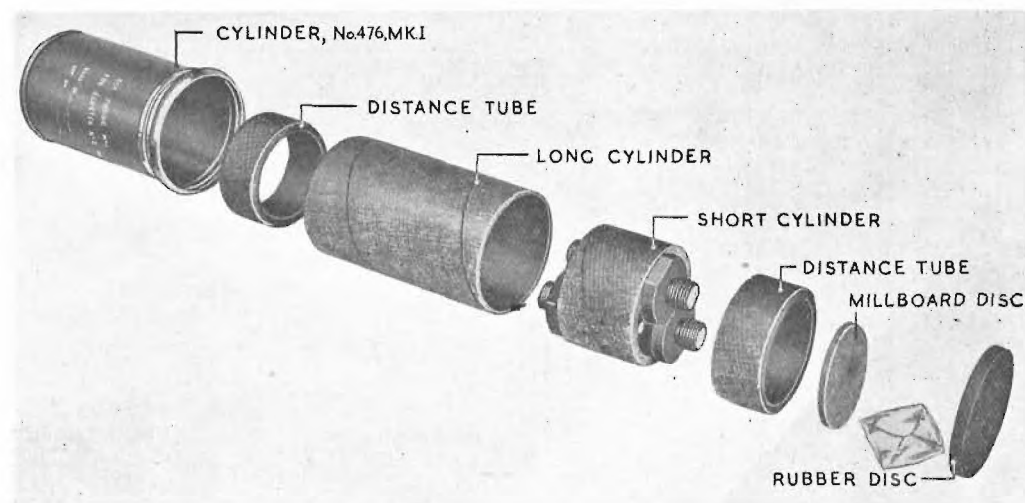


Fig. 4. Order of packing Cylinder, No. 476, Mk. 1



Fig. 5. Cylinder ready for closing

Chapter 11

CAPSULE, DELAY, TYPE U

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Introduction (fig. 1)

1. The U-type series of delay capsules may be used with the No. 848, Mk. 5 fuze, as detailed in Sect. 2, Chap. 5; they cannot be used with the No. 848, Mk. 7, or the No. 42, Mk. 4 fuzes, both of which use the C-type capsule.

2. The series includes capsules which may be used for fuzing stores to be released from high altitudes. Tables listing the delay capsule to be selected for a specified purpose are given in those publications describing the stores to be fuzed with a fuze using one of these capsules.

3. The capsule bears a letter "U" followed by a number which indicates, in seconds, the delay period applicable to the capsule, when burning at ground level. At heights above ground level the specified delay period is exceeded, due to the reduced atmospheric pressure and the consequent slower rate of burning.

4. The U-type delay capsule contains three igniter pellets to boost the flash from the percussion cap of a fuze and thus ensure that the Bickford fuze in the capsule is ignited. This is particularly important when the capsule is functioned at high altitudes.

5. In this respect the U-type capsule differs from the P-type capsule, which cannot be relied upon to function at heights above 20,000 ft.

6. When a fuzed store has been returned unexpended and unfuzing operations have been completed, the capsule must be extracted from the fuze and destroyed as stated in A.P.2608A, Chap. 19.

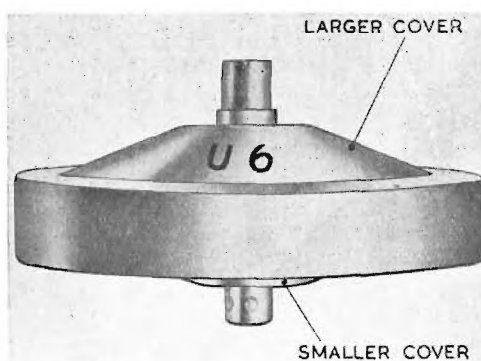


Fig. 1. Capsule, delay, Type U

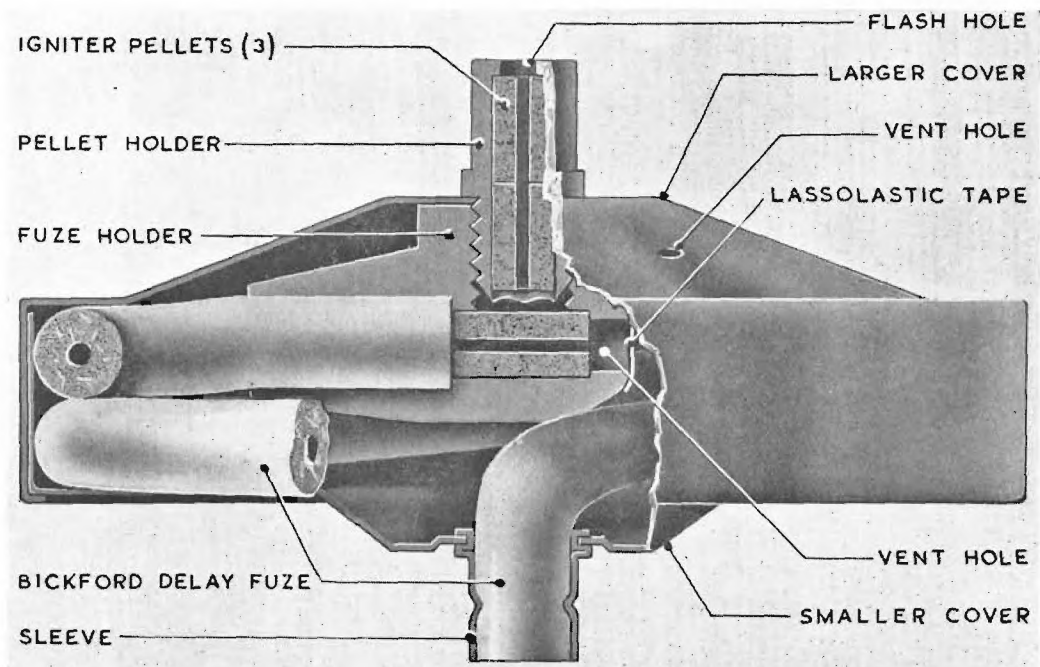


Fig. 2. Cut-away view of Capsule, delay, Type U

General description (fig. 2)

7. The capsule has two domed metal covers, the skirt of the larger cover being lapped over that of the smaller to form a closed container. A small vent hole is provided in each cover to allow gases to escape when the capsule functions.

8. A pellet holder, which houses two igniter pellets and has a flash hole at its outer end, enters a central hole in the larger cover and screws into a fuze holder located inside the capsule. The fuze holder contains one igniter pellet and houses one end of a length of Bickford fuze which is coiled inside the capsule, the other end being clinched into a sleeve which is secured to a central hole in the smaller cover. A vent hole in the fuze holder, normally closed by lassolastic tape, allows gases to escape when the pellets are ignited.

Identification markings

9. The capsule has the following identification markings stencilled on the larger cover:—

- (1) The type letter and number of the capsule
- (2) "For use with Fuze No. 848, Mk. 5".

Note . . .

Some earlier makes of U-type capsules may be found to be stencilled—"For use with Fuzes No. 848, Mk. 5, and No. 42, Mk. 2".

Functioning

10. The flash from the percussion cap of the fuze using this capsule ignites the pellets in the pellet holder. The burning pellets ignite the Bickford fuze, and after the specific delay period, the Bickford fuze ignites the gunpowder in the fuze magazine.

Supply

11. The U-type capsule may be supplied in either of the following:—

- (1) Six capsules of the same delay time, packed in tin plate Box, No. 352, Mk. 2. Twenty such boxes are packed in Box, B, 268D, Mk. 1. The stowage dimensions of the box are 25 in. $\times$ 13 in. $\times$ 9 in., and its filled weight is approximately 38 lb.
- (2) Four capsules of the same delay time, packed in tape-sealed Cylinder, No. 469. Twenty-four such cylinders are packed in Box, B.552. The stowage dimensions of the box are 28.3 in. $\times$ 12.2 in. $\times$ 8.2 in., and its filled weight is approximately 42 lb.

Storage

12. For storage purposes, the capsule is classified in Group 6, Category X.

Chapter 12

CAPSULES, DELAY, TYPE C, Mk. 1 and 2, No. C6 to C50

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Introduction

1. The C-type delay capsule has a percussion cap incorporated within itself and is, therefore, to be used with fuzes which have no percussion cap. In this respect it differs from the U-type capsule which has no percussion cap (*Chap. 11*).

2. The capsule has two igniter pellets to boost the flash from the percussion cap and will function satisfactorily at high altitudes. It is primarily intended for use with the No. 42, Mk. 4 and the No. 848, Mk. 7 fuzes, which are described in Sect. 2, Chap. 2 and 6 respectively.

3. The capsule bears a letter C followed by a number which indicates, in seconds, the delay period applicable to the capsule, when functioned at ground level. At heights above ground level, the nominal delay period is exceeded, due to reduced atmospheric pressure and the consequent slower rate of burning.

4. Tables listing the capsule to be selected for a specified purpose are included in those publications describing the store to be fuzed.
5. When a fuzed store, which has been airborne, is returned for unfuzing, and unfuzing operations have been completed, the capsule must be extracted from the fuze and destroyed as detailed in A.P.2608A, Chap. 19.

Note . . .
The capsules C15 and C21 were formerly listed as C6/10 and C10/27 respectively.

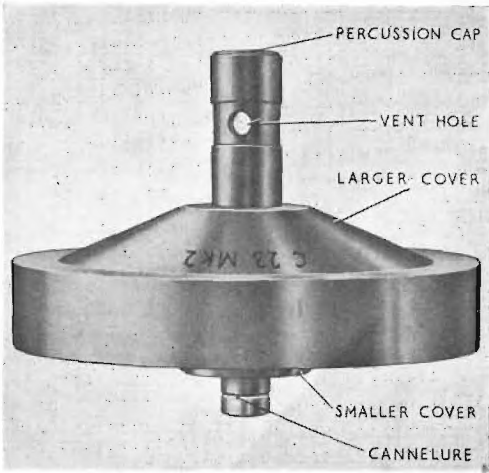


Fig. 1. Typical delay capsule, Type C, Mk. 2

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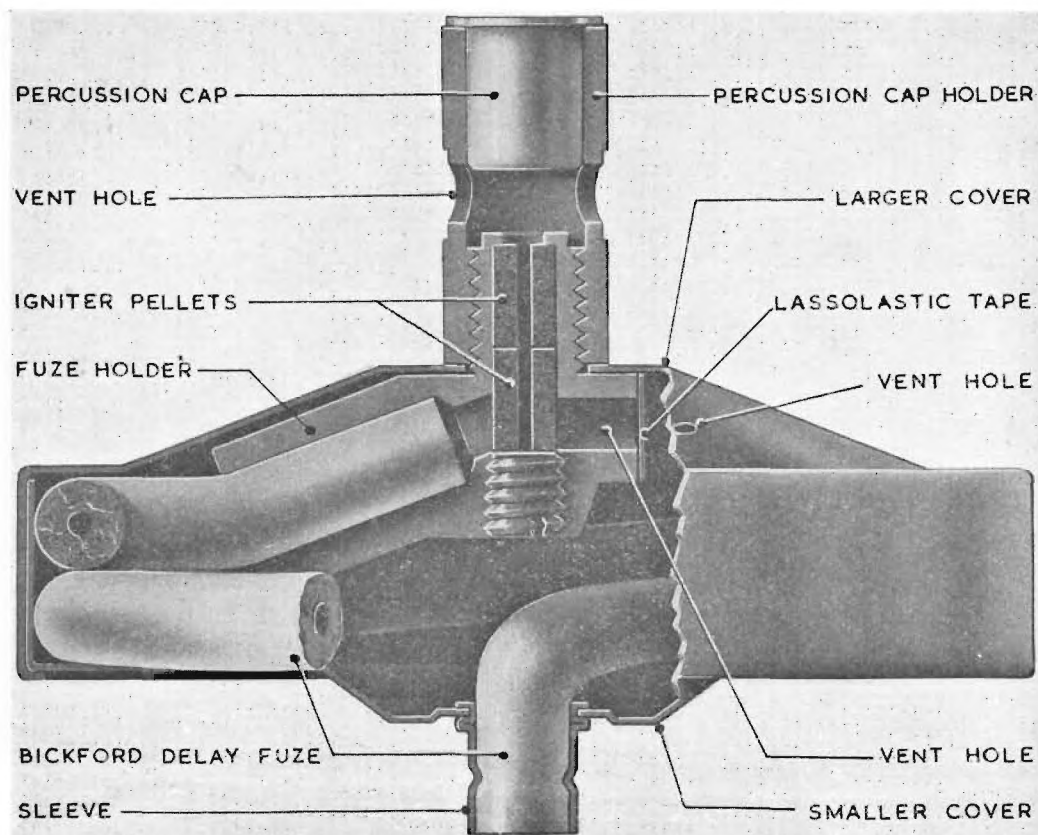


Fig. 2. Cut-away view of capsule, delay, Type C, Mk. 2

CAPSULE, DELAY, TYPE C, Mk. 2

General description (fig. 2)

6. The capsule has two domed metal covers, the skirt of the larger cover being lapped over that of the smaller to form a closed container. A small vent hole in the larger cover allows gases to escape when the capsule functions.

7. A percussion cap holder, having a percussion cap at its outer end, screws on to a fuze holder, located inside the capsule, and protruding through a central hole in the larger cover. The fuze holder houses two igniter pellets in conjunction with one end of a length of Bickford fuze, and has a vent hole normally closed by lassolastic tape. The Bickford fuze is coiled inside the capsule, and the other end is secured by a cannellure in a sleeve which is itself secured to a central hole in the smaller cover. Two holes in the percussion cap holder allow gases to escape when the cap is fired.

Identification colouring and markings

8. The capsule is painted a buff colour, and has the following identification markings stencilled in black on the larger cover:—

- (1) The type letter and number, and the Mark of the capsule.
- (2) The Lot number of the filled capsule.
- (3) The month and year of filling.

Functioning

9. On the functioning of a fuze using this capsule, the striker hits and fires the percussion cap in the capsule, the flash from which ignites the pellets in the fuze holder in the capsule. The burning pellets ensure ignition of the Bickford fuze, which after the specified delay period, ignites the gunpowder in the fuze magazine.

Supply

10. The Capsule, delay, Type C, Mk. 2, is supplied in a press-cap sealed Cylinder, No.

R E S T R I C T E D

470, Mk. 1, containing three capsules of the same delay period. Twenty-four such cylinders are supplied in Box, B.552, Mk. 1. The stowage dimensions of the box are 28.3 in. $\times$ 12.2 in. $\times$ 8.2 in., and its filled weight is approximately 42 lb.

Storage

11. For storage purposes, the capsule is classified in Group 6, Category X.

CAPSULE, DELAY, TYPE C, Mk. 1

Comparison with Capsule, delay, Type C, Mk. 2

12. The Mk. 1 capsule is similar in appearance, and in functioning to the Mk. 2 capsule.

13. An important difference, however, is that the Bickford fuze in the Mk. 1 capsule is secured in the sleeve by four dimples (fig. 3), whereas in the Mk. 2 capsule it is secured in the sleeve by a cannellure (fig. 1).

CAUTION

In the Mk. 1 capsule, the securing of the Bickford fuze in the sleeve by four dimples, has been found unsatisfactory.

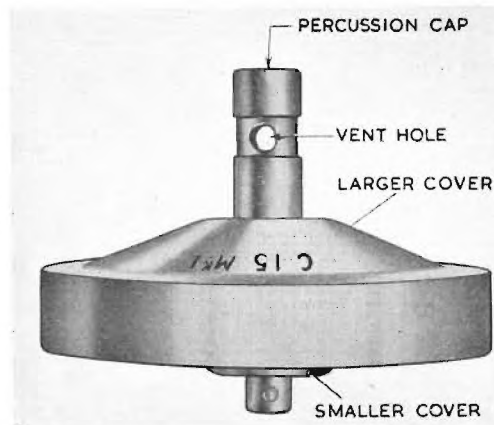


Fig. 3. Typical delay capsule, Type C, Mk. 1

Therefore, before using a Mk. 1 capsule, it is essential that a cannellure should be crimped in the sleeve by using a hand crimping tool, No. 2, Mk. 1 (Stores Ref. 12G/1303).

14. The information otherwise contained in para. 1 to 11 is also applicable to the Mk. 1 capsule.

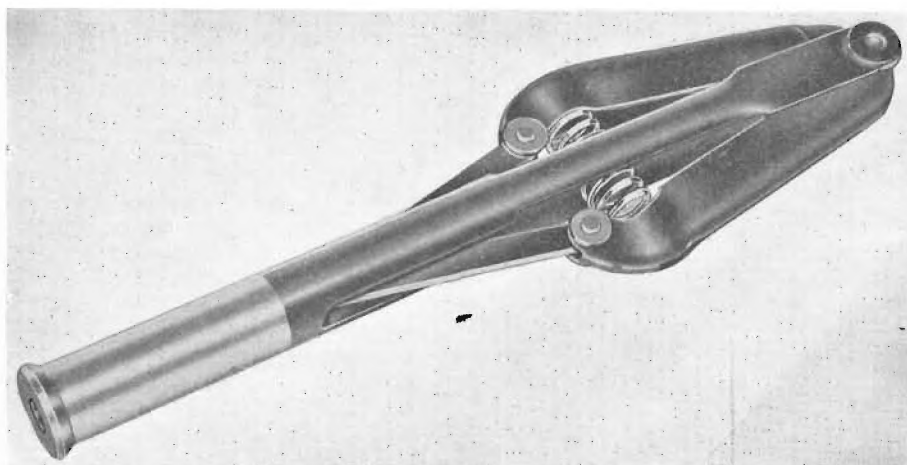


Fig. 4. Crimping tool, No. 2, Mk. 1

R E S T R I C T E D

Chapter 13

CAPSULE, DELAY, TYPE C, No. C2 to C5

LIST OF CONTENTS

	Para.		Para.
Introduction	1	Functioning	9
General description	6	Supply	10
Identification markings	8	Storage	11

LIST OF ILLUSTRATIONS

Capsule, delay, Type C2 to C5	Fig. 1	Cut-away view of Capsule, delay, Type C2 to C5	Fig. 2
--------------------------------------	--------	---	--------

Introduction (fig. 1)

1. This capsule is for use primarily with the No. 42, Mk. 4 and the No. 848, Mk. 7 fuzes (Sect. 2).

2. Externally the capsule closely resembles the No. C6 to C50 capsule (Chap. 12) and differs only by its internal construction which, due to the shortness of the delay period, incorporates a delay sleeve containing quick-burning compound instead of the Bickford fuze as used in the No. C6 to C50 capsule.

3. The capsule bears a letter C followed by a number which indicates in seconds the delay period applicable to the capsule, when burning at ground level. At heights above ground level the delay period is exceeded due to reduced atmospheric pressure and the consequent slower rate of burning.

4. Tables listing the capsule to be selected for a specified purpose are included in those publications describing the store to be fuzed.

5. When a fuzed store which has been airborne is returned for unfuzing, and after unfuzing operations have been completed, the capsule must be extracted from the fuze and inspected for signs of damage and/or moisture.

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If it is found to be in a serviceable condition, replace it in a container No. 470, mark the container clearly FOR FIRST ISSUE and return it to stores. If the capsule is considered to be unserviceable, it must be destroyed as detailed in A.P.2608A, Chap. 19.

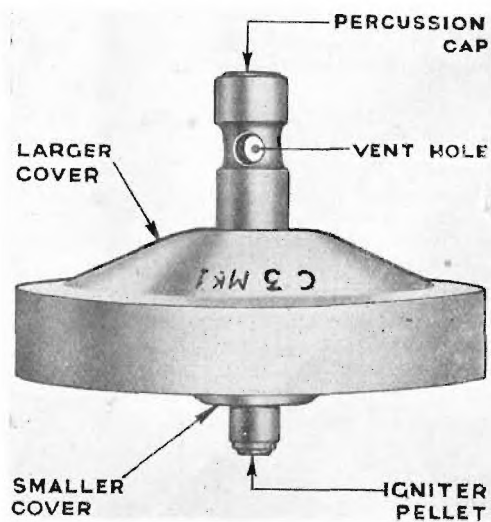


Fig. 1.—Capsule, delay, Type C2 to C5

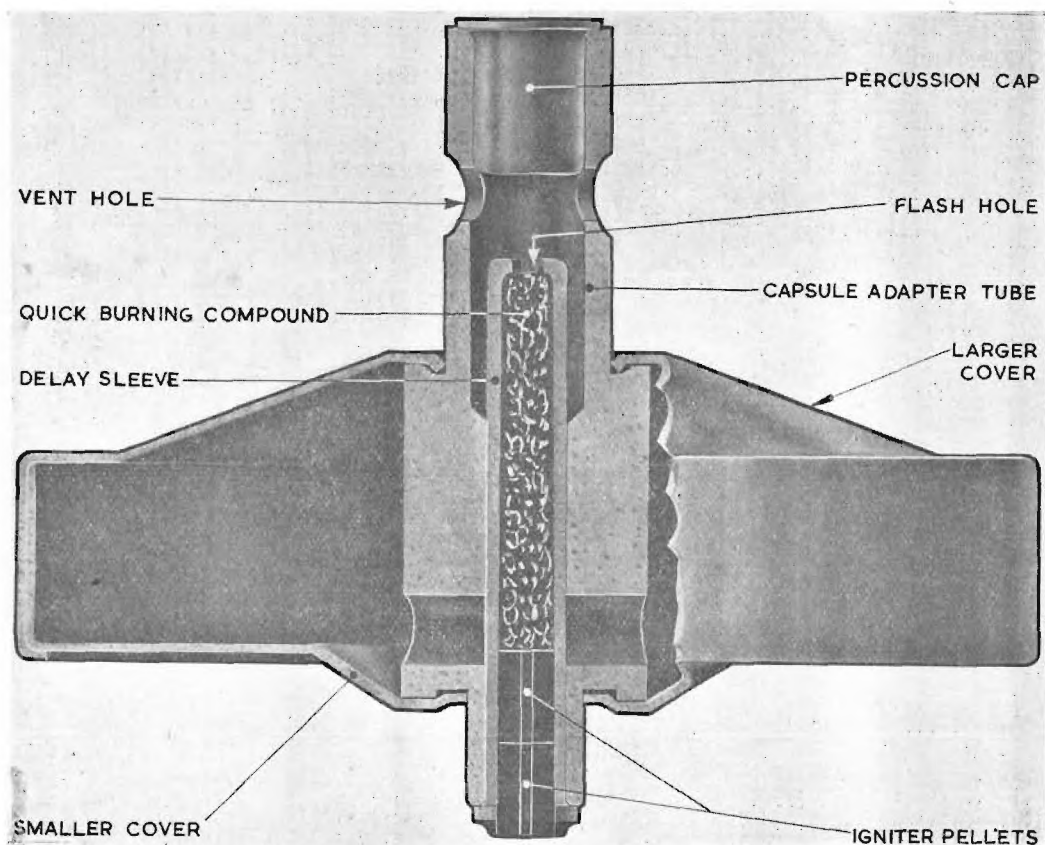


Fig. 2.—Cut-away view of Capsule, delay, Type C2 to C5

General description (fig. 2)

6. The capsule has two domed metal covers, the skirt of the larger cover being lapped over that of the smaller cover to form a closed container. A small vent hole in each cover is optional and may or may not appear.

7. A capsule adapter tube passes centrally through the capsule, the ends of the tube forming external projections from the larger and smaller covers. The upper projection is closed by a percussion cap and the remaining portion of the tube, including the lower projection, houses a delay sleeve charged with a quick-burning compound. This sleeve has a flash hole at one end, the other end being closed by igniter pellets which may protrude slightly beyond the end of the sleeve. Two vent holes in the adapter tube allow gases to escape when the percussion cap is fired.

Identification markings

8. The capsule bears the following identification markings stencilled in black on a white background on the larger cover:—

- (1) The type letter and number of the capsule
- (2) The Lot number of the filled capsule
- (3) The month and year of filling.

Functioning

9. On the functioning of a fuze using this capsule, the striker hits and fires the percussion cap in the capsule, the flash from which ignites the quick-burning compound in the delay sleeve. After the specified delay period, the burning compound ignites the igniter pellets and the resulting flash fires the gunpowder in the fuze magazine.

Supply

10. The capsule, delay, Type C is supplied in a press-cap sealed Cylinder, No. 470, Mk. 1 containing three capsules of the same delay period. Twenty-four such cylinders are supplied in Box, B. 552, Mk. 1. The stowage dimensions of the box are 28.3 in. × 12.2 in. × 8.2 in., and its filled weight is approximately 42 lb.

Storage

11. For storage purposes, the capsule is classified in Group 6, Category X.

Chapter 14

CAPSULE, DELAY, No. 3, Mk. 2 to No. 20, Mk. 2

LIST OF CONTENTS

	Para.		Para.
Introduction...	1	Functioning ...	7
General description ...	5	Supply ...	8
Identification markings ...	6	Storage ...	9

LIST OF ILLUSTRATIONS

Typical delay capsule, No. 3, Mk. 2 to No. 20, Mk. 2

Fig.
1

Introduction

1. These capsules are for use in the No. 848, Mk. 5 fuze. They must not be used in the No. 848, Mk. 7 or the No. 42, Mk. 4 fuzes, both of which use the C-type capsule (*Chap. 12 and 13*).

2. The capsules must not be used with stores which are to be released at heights exceeding 20,000 ft. With such stores, the appropriate U-type capsule should be used (*Chap. 11*).

3. Each capsule bears a numeral which indicates the number of the capsule in the series. Details of the delay times applicable to the capsules when burning at ground level, are as follows:—

Capsule	Delay time in sec.
No. 3, Mk. 2	4.0
No. 4, Mk. 2	7.2
No. 6, Mk. 2	12.8
No. 8, Mk. 2	17.0
No. 10, Mk. 2	20.6
No. 12, Mk. 2	23.0
No. 14, Mk. 2	25.0
No. 16, Mk. 2	27.5
No. 18, Mk. 2	30.5
No. 20, Mk. 2	32.5

At heights above ground level, the reduced atmospheric pressure causes a slower rate of burning, and the nominal delay times, are consequently, exceeded.

4. When an unexpended fuzeed store is returned, and unfuzing operations have been completed, the capsule must be extracted from the fuze and destroyed as detailed in A.P.2608A.

General description

5. The capsule has two domed metal covers, the skirt of the larger cover being lapped over that of the smaller cover to form a closed container. A small vent hole in the container allows gases to escape when the capsule is ignited. Each cover has a central external sleeve. Coiled inside the container is a length of Bickford delay fuze, the ends of which are clinched, one in each sleeve. The length of the Bickford fuze is varied during manufacture, according to the delay time of the capsule.

Identification markings

6. The capsule has the following identification markings stencilled on the container:—

- (1) The number of the capsule
- (2) The filled Lot number

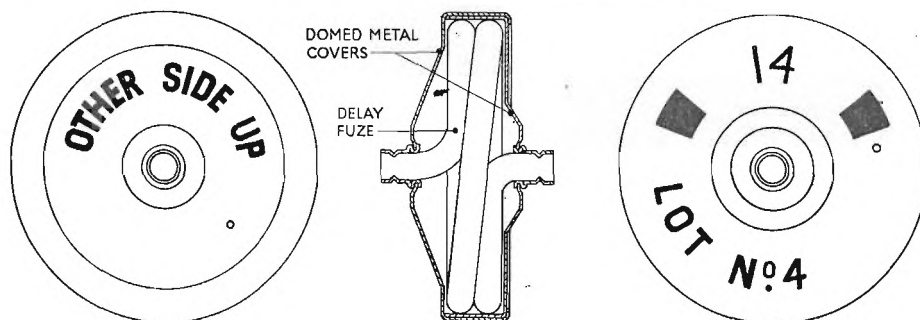


Fig. 1. Typical delay capsule, No. 3, Mk. 2 to No. 20, Mk. 2

Functioning

7. The flash from the percussion cap of a fuze using this capsule, ignites the Bickford fuze in the capsule. After the relevant delay period the Bickford fuze ignites the gunpowder in the fuze magazine.

Supply

8. The capsules are supplied packed six in a tinplate Box, 352, Mk. 2. Twenty

such boxes are packed in Box, B.268D. The stowage dimensions of the box are 25 in. × 13 in. × 9 in., and its filled weight is approximately 38 lb.

Storage

9. For storage purposes, the capsule is classified in Group 6, Category X.

Chapter 15

BURSTER, EJECTOR, No. 8, Mk. 1

Introduction

1. Bursters, ejector, No. 8, Mk. 1 (Stores Ref. 12D/1343) in sets of four, are for use with Clusters, aircraft, projectile, 18 in., No. 1, Mk. 1, and 12 in., No. 2, Mk. 1. The function of one burster of the set is to boost the flash from the fuze magazine to the igniter, and of the other three bursters to operate pistons which control the mechanism governing the disintegration of a cluster.

General description

2. Each burster, ejector, No. 8, Mk. 1 consists of a charge of 20 to 22 grains of G.20 gunpowder, contained in a muslin bag securely tied with stout twine. The burster for use in the cluster fuze adapter has its muslin bag securing twine cut to leave about $2\frac{1}{2}$ inches on each side of the neck. The ends

of the securing twine of the other three bursters of a set are cut close to the neck of the bag.

Instructions for use

3. Details of the preparation of stores using these bursters are given in the relevant chapters of A.P.1661J, Vol. 1.

Functioning

4. When the burster housed in the cluster fuze adapter is ignited, it boosts the flash from the fuze magazine through the flash tubes and initiates the other three bursters which then force the pistons out of their housings, thus operating the cluster disintegration mechanism.

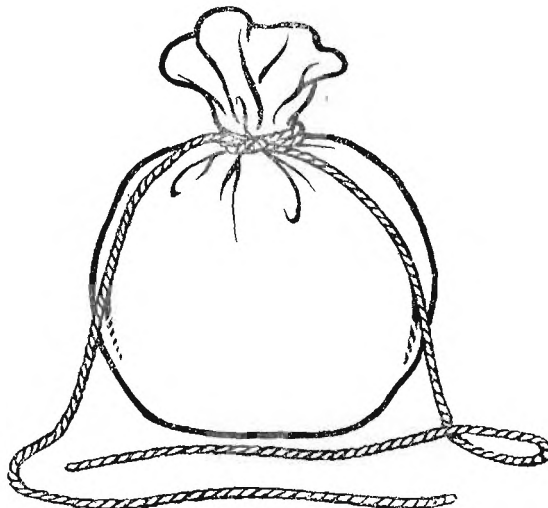


Fig. 1. Burster, ejector, No. 8, Mk. 1

(A.L.56, June, 55)

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A.P.1661C, Vol. I (2nd. Edn.)

SECTION 5

MISCELLANEOUS COMPONENTS

SECTION 5

MISCELLANEOUS COMPONENTS

LIST OF CHAPTERS

Note.—A list of contents, where necessary, appears at the beginning of each chapter

- 1 Valve, time, No. 1, Mk. 2, 6 hr. variable delay**
- 2 Safety wires and safety clips**
- 3 Device, safety, supplementary (5 sec. delay)
No. 1, Mk. 2**
- 4 Attachment, wire fuzing assembly, No. 1**

(A.L.69, Aug. 57)

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Chapter 1

VALVE, TIME, No.1, Mk.2, 6 HR. VARIABLE DELAY

LIST OF CONTENTS

	Para.		Para.
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General description ...	3	Functioning ...	8
		Instructions for use...	10

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	Fig.		Fig.
Valve, time, No. 1, Mk. 2, with winding key ...	1	Time-setting end of Valve, time, No. 1, Mk. 2, and sealing disc ...	2

LEADING PARTICULARS

Overall length, with sealing disc ...	2 $\frac{3}{8}$ in. approx.
Maximum diameter ...	2 $\frac{3}{8}$ in. approx.
Weight ...	18 oz. approx.
Range of delay ...	0 to 6 hours
Stores Ref. Valve, time, No. 1, Mk. 2 ...	12D/1287

Introduction

1. The valve, time, No. 1, Mk. 2, is a mechanically-operated valve having a clockwork mechanism which admits water to a store fitted with the valve after a pre-set delay period.

2. The valve is for use with a store which is functioned by water entering its interior, and is primarily for use with the Marker, marine, aircraft, 21 lb., No. 3, Mk. 1, which is described in A.P.1661E, Vol. 1 (2nd Edn.), Sect. 3.

General description

3. The valve has a cylindrical body with

two rubber bands partially inset on the exterior, and with an internal flange at approximately halfway along its length. Housed in one end of the body is the clockwork mechanism which is held against the flange by a screwed ring. The mechanism is hand-wound with a winding-key, and when fully wound will run for 18 hours.

4. The opposite end of the body gives access to a time-setting mechanism. Delay periods within a range of 0 to 6 hours may be pre-set by turning a setting handle in the direction of two arrows engraved on it. The setting handle rotates a dial graduated from 0 to 6

(A.L.69, Aug. 57)

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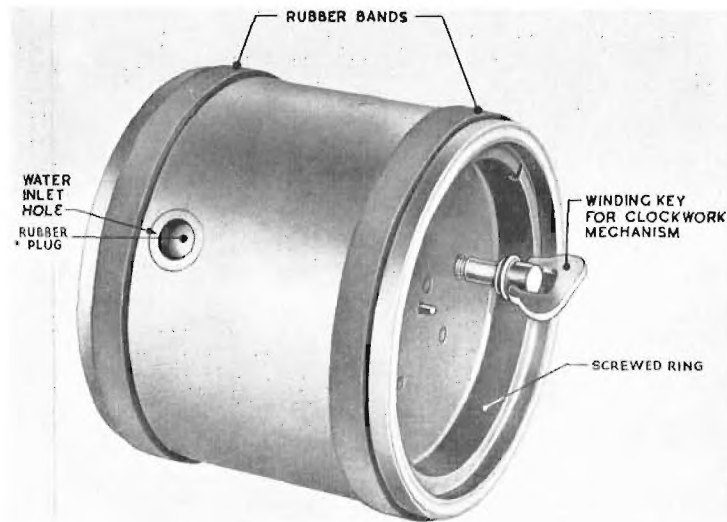


Fig. 1. Valve, time, No. 1, Mk. 2, with winding key

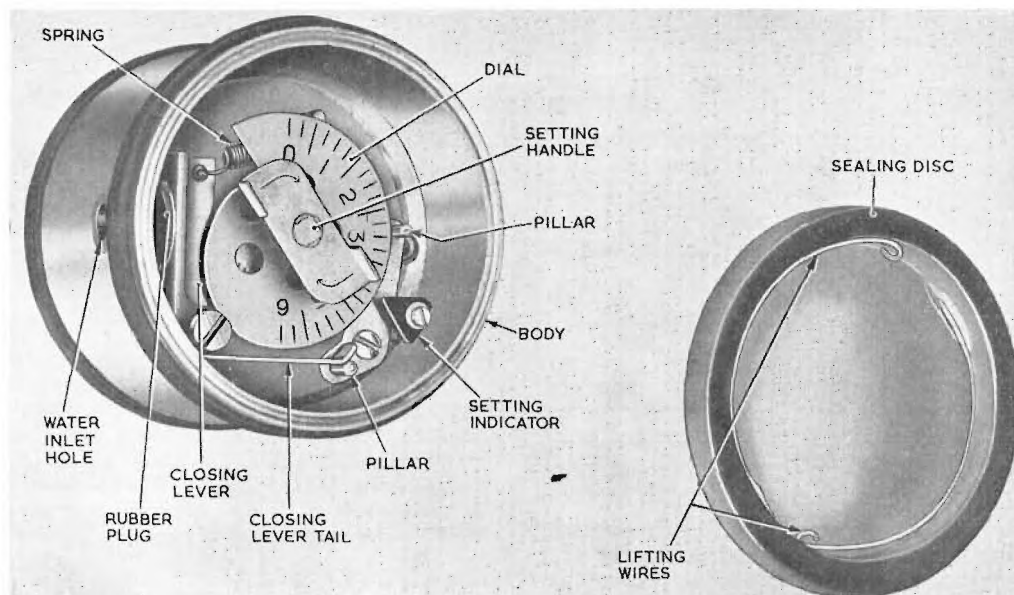


Fig. 2. Time-setting end of valve, time, No. 1, Mk. 2, and sealing disc

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hours at intervals of 15 minutes, the graduations registering against a setting indicator fixed to the flange.

Note . . .

The setting handle must never be turned in the opposite direction to that indicated by the arrows.

5. The edge of the dial forms a cam and controls the movement of a bell-crank lever having a vertical pillar at each end. One pillar is in contact with the cam edge of the dial while the other bears on the tail of a closing lever which carries a synthetic-rubber plug at its opposite end. The plug closes a water inlet hole in the valve body once a delay has been set. A return spring attached to the closing lever withdraws the plug from the inlet hole when the delay period has expired, and the fullest possible opening of the water inlet hole is permitted by the bent portion at the extreme end of the closing lever tail.

6. The time-setting end of the valve body is closed by a detachable sealing disc having a rubber washer, which, under the pressure of a nose cover, forms a watertight joint when the valve is inserted into a store. Two lifting wires secured to the sealing disc facilitate its removal when the delay needs setting or adjusting after the valve has been inserted into a store.

Identification markings

7. The following are stamped on the valve body:-

- (1) The number and mark of the valve.
- (2) The trade mark of the manufacturer.
- (3) The Lot number or year of manufacture.
- (4) The valve serial number.

Functioning

8. Immediately before release of the parent store from an aircraft the valve is so set that a selected delay is registered on the dial against

the setting indicator. After release of the store the wound clockwork mechanism in the valve rotates the dial until the pre-set delay period has expired. At that instant zero is registered by the setting indicator, and a step in the cam is aligned with the pillar bearing on the dial. Both the closing lever and the bell-crank lever are free to rotate under the action of the return spring until arrested by the bell-crank lever meeting the wall of the valve body. Rotation of the closing lever withdraws the plug from the inlet hole, and water, into which the store has been dropped, enters the valve body and passes through the clockwork mechanism into the interior of the store.

9. Any delay within the 0 to 6 hours range may be obtained by setting the appropriate graduation on the dial against the setting indicator.

Instructions for use

10. Detailed instructions for preparation of the valve and for its insertion into a store are given in the publication relevant to the store. In addition the following should be noted: --

- (1) The clockwork mechanism must be fully wound and positively started.
- (2) When the mechanism has been wound the key must be removed and placed in the empty valve cylinder.
- (3) The setting handle must never be rotated against the direction indicated by the arrows, and should it be necessary to increase the delay, the handle must be further rotated in the direction of the arrows until the new setting is reached.
- (4) When a valve which has been wound and inserted into a store is being set, the maximum delay can only be obtained if, at the time of setting, the mechanism has not been running for more than 12 hours.

Chapter 2

SAFETY WIRES AND SAFETY CLIPS

General

1. Safety wires are used in fuzes and pistols to prevent them from functioning until after a fuzed missile is released, 'live', from an aircraft. The wires are also used in tail units fitted to fuzed missiles to prevent the tail unit arming mechanism from functioning until after a tail fuzed missile is similarly released.

2. Normally, the wires are inserted during preparation for use immediately the transit safety pin is removed from the fuze or pistol. In tail units, the wires are inserted immediately the tail unit is secured to the fuzed missile. Detailed instructions covering a specified missile are, however, given in the fuzing appendices in the relevant A.P.

3. When an aircraft is loaded with a fuzed missile, the looped end of the safety wire is connected by one or more fuze-setting control links to the fuzing unit in the aircraft, or is attached to the clip on the end of the arming wire in the fuzing unit, as applicable.

4. Safety clips are used with safety wires and are secured to the protruding plain ends of the wires after they have been inserted in a fuze or pistol, or in a tail unit arming mechanism, to prevent inadvertent withdrawal of the safety wire.

5. The safety wires and safety clips at present in Service use are shown in fig. 1; details are given in the following table:—

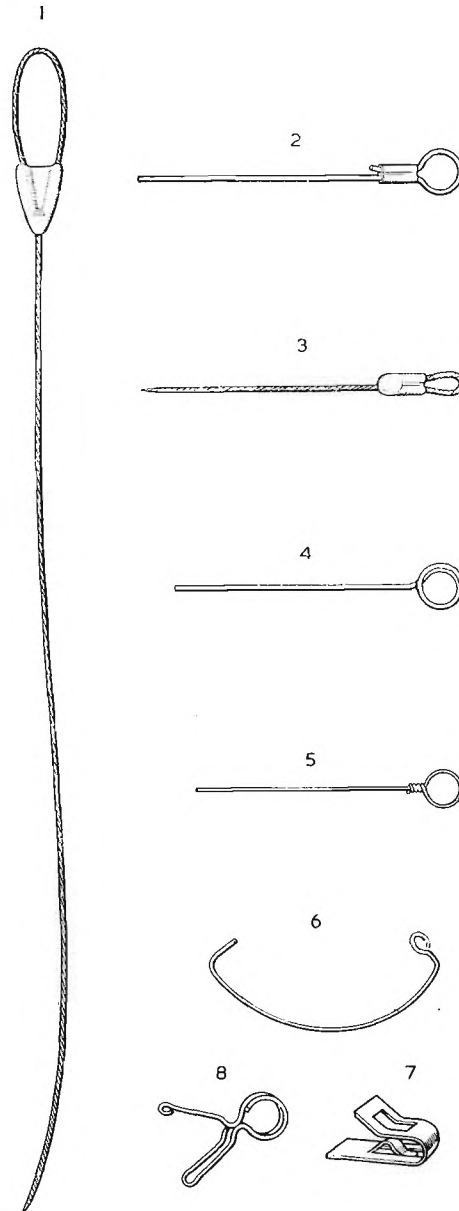


Fig. 1. Safety wires and safety clips

(A.L.69, Aug. 57)

Item No.	Nomenclature	Scores Ref.	Details
1	Wire, safety, No. 9, Mk. 1	12G/1357	Stranded phosphor bronze wire, flexible, 30 in. long $\times$ $\frac{1}{16}$ in. dia.
2	Wire, safety, No. 1, Mk. 1	12G/807	Phosphor bronze wire, non-flexible, 8 in. long $\times$ $\frac{1}{16}$ in. dia.
3	Wire, safety, No. 8, Mk. 1	12G/1088	Stranded steel wire, flexible, pointed at one end, cadmium coated, 6 in. long $\times$ $\frac{1}{16}$ in. dia.
4	Wire, safety, No. 1, Mk. 3	12G/1275	Stainless steel wire, non-flexible, cadmium coated, $4\frac{3}{8}$ in. long $\times$ $\frac{1}{16}$ in. dia.
5	Wire, safety, No. 2, Mk. 1	12G/822	Copper wire, non-flexible, $4\frac{1}{2}$ in. long $\times$ $\frac{1}{32}$ in. dia.
6	Wire, safety, No. 14, Mk. 1	12G/1269	Phosphor bronze wire, $\frac{3}{64}$ in. dia. (crescent-shaped)
7	Clip, safety, No. 1, Mk. 1	12G/806	Phosphor bronze flat strip, $\frac{3}{8}$ in. wide $\times$ 0.024 in. thickness
8	Clip, safety, No. 2, Mk. 1	12G/1068	Steel wire, copper plated, $\frac{1}{16}$ in. dia.

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Chapter 3

DEVICE, SAFETY, SUPPLEMENTARY, (5 sec. delay) No. 1, Mk. 2

Introduction

1. The Supplementary safety device, No. 1, Mk. 2 (Ref. No. 12G/1405) consists of an explosive unit carried by a clip assembly, and is used with the M.111A2* fuze fitted to the 4.5 in. reconnaissance flare when loaded on to the Mk. 15 light series carrier carried in Canberra B.2 and B.6 aircraft.

2. The function of the device is to improve the safety of the fuze, and by preventing the rotation of the arming vanes through the medium of a stop pin until after a missile has been released, to eliminate the possibility of the fuze becoming prematurely armed.

3. The device is to be assembled to the fuze at missile preparation (*A.P.1661E, Vol. 1 (2nd Edn.), Sect. 10, App. 4*) with the cable of the device strapped to the missile in such a way that, while there is no possibility of movement of the cable by air turbulence, insertion of the pull-out plug into the No. 1 fuzing connector on the carrier may be readily made.

Description (fig. 1 and 2)

4. The explosive unit consists mainly of a metal sleeve containing a 5 sec. pyrotechnic delay unit above which is a solid cylindrical shear-piece. The shear-piece has a transverse hole through which passes a split pin securing the stop pin to the outside of the sleeve. Above the shear-piece the sleeve is closed by a screwed plug. A wiring block, housing part of the delay unit, is housed below an insulator in the lower part of the sleeve which is closed by a polythene bush. A length of Dupren-sheath electric cable passes through the bush and is connected, through the medium of the wiring block, which incorporates a resistance winding, to a fuzehead housed within the delay unit. To the free end of the cable is connected a pull-out plug, and the free length of the cable between the polythene bush and the pull-out plug is between $12\frac{1}{4}$ and $12\frac{3}{4}$ inches. The resistance winding is incorporated in the circuit to limit the current to

2 amps should an electrical short develop in the aircraft supply.

5. The clip assembly comprises a body clip integral with which are a clip to house the explosive unit, and a safety wire guide. The guide is similar in shape to the fairlead of the Adapter, fuzing, fairlead, No. 5, Mk. 1 (*A.P.1661K, Vol. 1, Chap. 4*) which is superseded by the supplementary safety device when the device is used as detailed in para. 1. Two lugs on the guide locate the body clip on the fuze by engaging the arming pin bracket, the clip being clamped to the fuze by a nut and bolt. A slot in the clip, housing the explosive unit, serves to locate the unit by engaging a projecting locating pin, thus positioning the stop pin of the unit so that it prevents rotation of the arming vane of the fuze.

Functioning

6. Immediately after release of the missile from the aircraft the pull-out plug is withdrawn from the No. 1 fuzing connector and electrical circuit is made by the contact plungers of the plug brushing against spring contacts of the connector. This fires the electric fuze-head within the delay unit and the flash ignites the delay which burns for approximately 5 sec. before initiating an explosive composition. The resultant explosion shears the split pin retaining the stop-pin which falls away. The arming vane, thus free from the restraint imposed by the stop-pin, starts to rotate to initiate the functioning process of the striker mechanism, by which time the clockwork mechanism of the fuze will have run for approximately 5 sec., the fuze safety wire having been withdrawn on release of the missile.

Precautions

7. Because of its explosive content the device should be carefully handled and, as it is electrically initiated, the two pole plug must be kept clear of any source of electrical supply.

(A.L.75, Jan. 59)

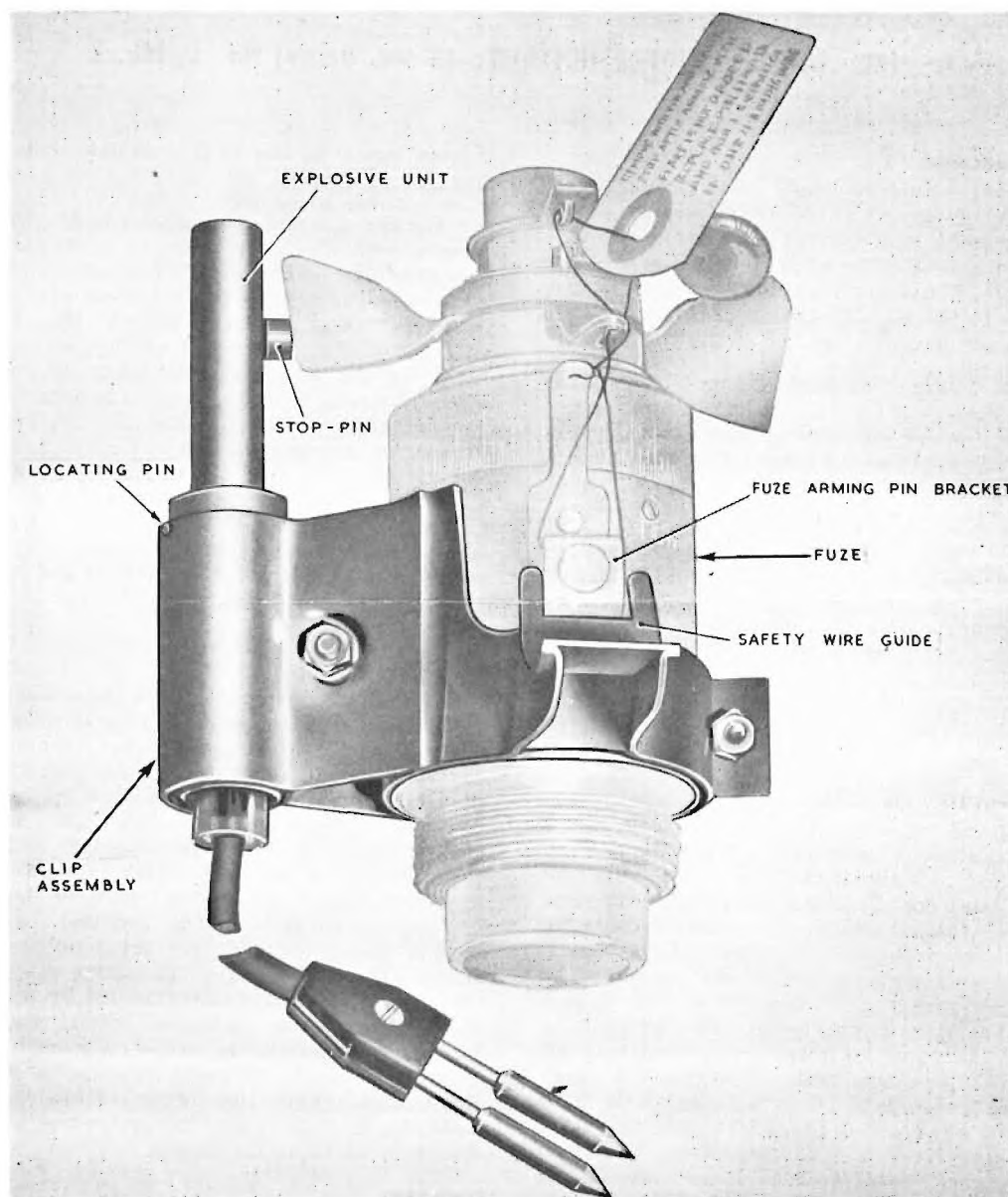


Fig. 1. Supplementary safety device, No. 1, Mk. 2

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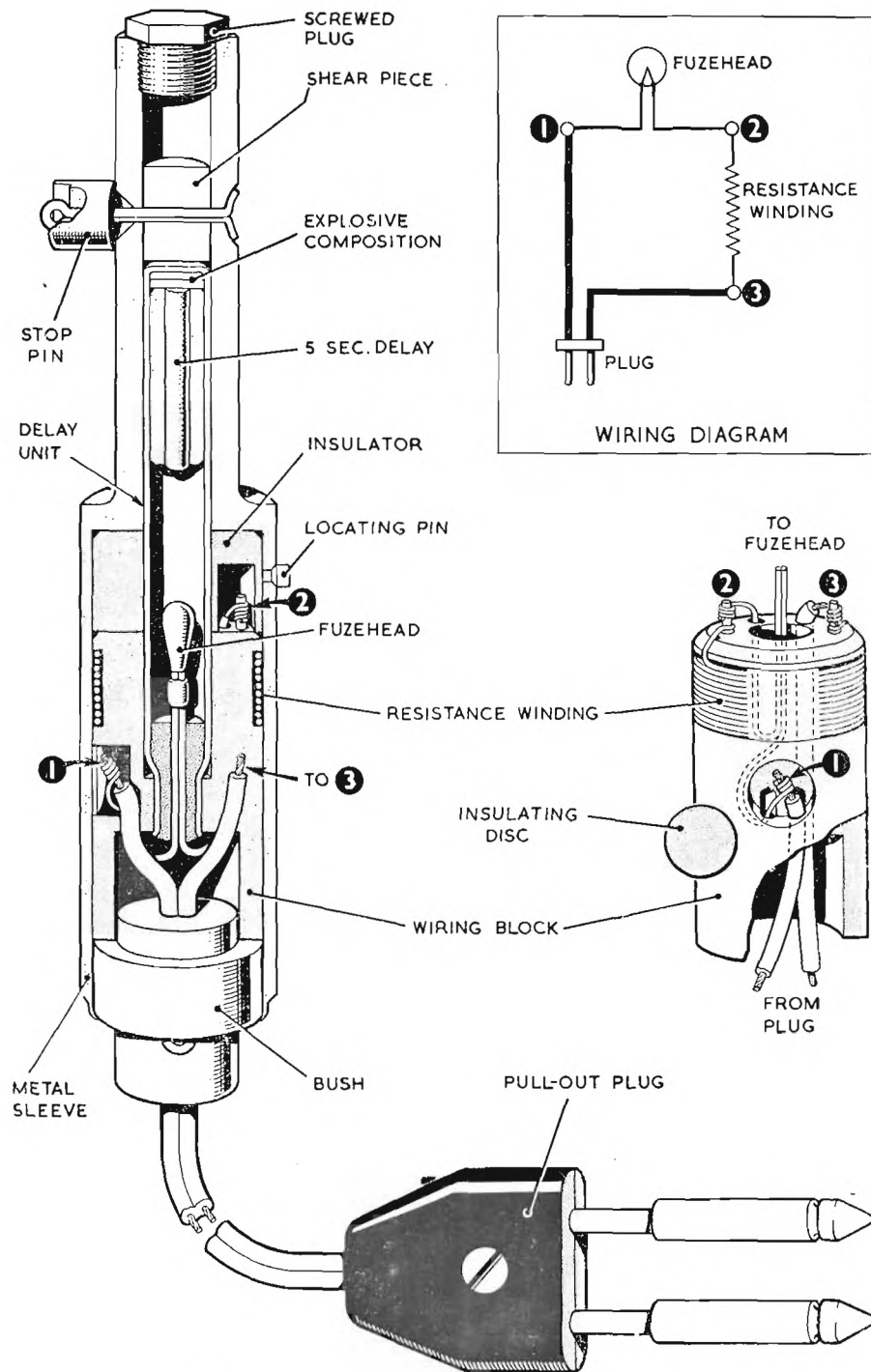


Fig. 2. Explosive unit of supplementary safety device

(A.L.69, Aug. 57)

Chapter 4

ATTACHMENT, WIRE FUZING ASSEMBLY, No. 1

LIST OF CONTENTS

	Para.		Para.
Introduction...	1	Fitting the attachment	6
General description	2	Function	11

LIST OF ILLUSTRATIONS

	Fig.		Fig.
Components of the attachment, wire fuzing assembly, No. 1	1	The attachment fitted to a bomb	2

LEADING PARTICULARS

Dimensions

Anchor wire	16 S.W.G. × 18 in. approx.
Spring	0.84 in. o/dia. × 3 in. long. approx.
Retaining sleeve	0.55 in. × 0.775 in. × 1.0 in. approx.
Safety wire, No. 1, Mk. 3	0.0625 in. dia. × 4.625 in. long. approx.

Stores Ref.

Attachment, wire fuzing assembly, No. 1	12G/1413
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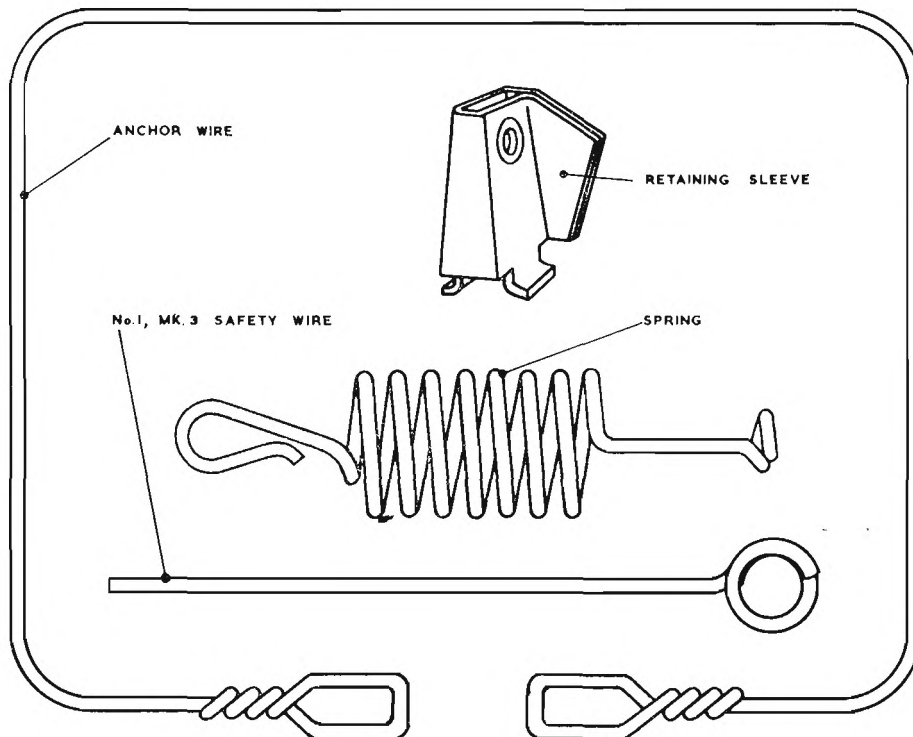


Fig. 1. Components of the attachment, wire fuzing assembly, No. 1

(A.L.69, Aug. 57)

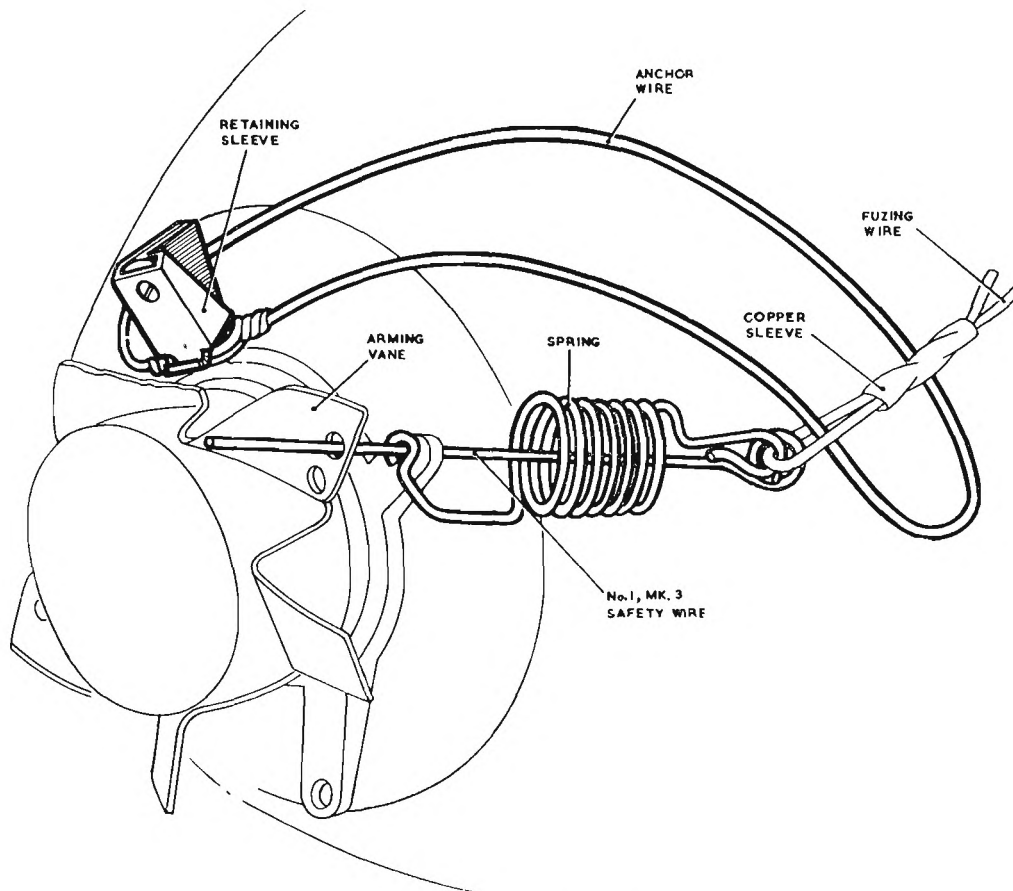


Fig. 2. The attachment fitted to a bomb

Introduction

1. The No. 1, fuzing wire assembly attachment is used with No. 44, Mk. 5 and No. 76, Mk. 1 bomb nose pistols to provide a means of securing the fuzing wire of the No. 3, Mk. 1 fuzing unit to the bomb when the bomb is dropped 'live', and thus eliminates fuzing and safety wires trailing from the bomb carrier.

General description (fig. 1)

2. The attachment consists of an anchor wire, a retaining sleeve, a spring, a 4 B.A. csk/hd. bolt and nut, and a No. 1, Mk. 3 safety wire (*Chap. 5*).

3. The anchor wire consists of a length of 16 S.W.G. spring steel wire having a loop at each end, and an overall length of approximately 18 inches.

4. The retaining sleeve, which is shaped to fit over a lug of the pistol locking ring, has two lugs at one end, and an angular projection to bear against the nose of the bomb.

5. The spring has an eye at one end and a hook at the other and, under a load of between 23 and 27 lb., extends to approximately 4.5 inches.

Fitting the attachment (fig. 2)

6. Tighten the pistol locking ring so that one of its lugs is set at approximately 45 deg. to starboard of the bomb suspension lug.

7. Pass the loops of the anchor wire over the locking ring lug (*para. 6*) with the bight of the wire over the bomb.

8. Fit the retaining sleeve to the locking ring lug with the projection bearing against

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the nose of the bomb and the lugs of the sleeve against the anchor wire loops. Secure the sleeve in position by the 4 B.A. csk/hd. bolt and nut.

9. Pass the No. 1, Mk. 3 safety wire through the coils of the spring from the hook end, through the hole in the locking ring lug adjacent to the port side of the sleeve, through the eye of the spring, and through the hole in one of the pistol arming vanes.

10. Pass the end of the fuzing wire from the No. 3, Mk. 1 fuzing unit through the copper sleeve of the fuzing wire, through the hook of the spring, the loop of the No. 1, Mk. 3 safety wire, and the bight formed by the anchor wire, and the end of the fuzing wire again through the copper sleeve, then crimp the sleeve to secure the loop, thus formed, in the fuzing wire.

Function

11. When the bomb is released 'live', the fuzing wire extends the spring and withdraws the safety wire from the arming vane. Then, by exerting a pull of more than 70 lb., the anchor wire withdraws the fuzing wire from the fuzing unit, and the fuzing wire falls with the bomb.

12. When the bomb is released 'safe', the spring is not extended as the pull of 23 to 27 lb. required to extend the spring sufficiently to withdraw the safety wire from the arming vane is greater than the 10 to 14 lb. pull required to remove the fuzing wire from the fuzing unit in the safe condition. Therefore, the safety wire continues to engage the vane, whilst the fuzing wire is withdrawn from the fuzing unit and falls with the bomb.

