

AMMUNITION BULLETIN Nº 32.

ITEM 635-685

SECURITY

THIS DOCUMENT IS THE PROPERTY OF U.S.M. GOVERNMENT, and is issued for the information of officers and responsible officials.

The officer or official in possession of the document will be responsible for its safe custody and that its contents are not disclosed to any unauthorized person.

The document will be kept under lock and key when not in actual use.

Officers commanding units and establishments, etc., are responsible that appropriate circulation is given to this document.

Any person other than the authorized holder upon obtaining possession of this document by finding or otherwise should forward it, together with his name and address, in a closed envelope to the Secretary, Ministry of Supply, Aden, with letter postage need not be prepaid; other postage will be refunded.

All persons are hereby warned that the unauthorized retention or destruction of this document is an offence against the Official Secrets Acts, 1911-1920.

MARCH 1943

PRINTED & ISSUED BY
THE CHIEF INSPECTOR OF ARMAMENTS.

FOREWORD

Attention is drawn to the change of title of this publication, which was formerly designated the I.O.Cs. Ammunition Bulletin but which will in future be designated the M. of S. Ammunition Bulletin.

The change arises from the extension of distribution of the Bulletin. In the earlier issues this was confined mainly to I.O.Cs. but it is now supplied to all Services, Dominions etc. It was also used as a medium for conveying instructions to I.O.Cs., an arrangement no longer necessary as War Office now undertake this.

For convenience, it has been decided to confine the change to the title only and to continue the present sequence of numbering the Bulletins, the items, and the figures to facilitate references to back numbers and to enable those who have set up an index to carry this on without disturbance.

All communications in connection with the Bulletin should be addressed to C.I.A.(I), Gordon Schools, Eltham, S.E.9.

MINISTRY OF SUPPLY
AMMUNITION BULLETIN NO. 32

SECURITY.

ISSUED BY :-

CHIEF INSPECTOR OF ARMAMENTS,

CONTENTS ITEMS 635 - 685.

- 685. Amendments.
- 642. B.L. Cartridge Bags - Materials.
- 639. Bombs, 3 inch M/L. Mortar - Storage.
- 657. Bomb, S.B., H.E.A.T. 3 inch Gun. (Fig.268)
- 652. Cartridge, S.A. Ball, 9 m.m. Mk.IZ.
- 658. Cartridge, Q.F. 12 pdr. 12 cwt. - Plastic lid.
- 660. Chemical Stores.
- 643. Covers, fuze, Nos.5 and 6.
- 636. Decoupling materials.
- 645. Fuzes, Lacquering of.
- 646. Fuzes, Mortar.
- 651. Fuze, percussion, No.283 Mk.II.
- 654. Fuze, percussion, No.244 Mk.II and III.
- 683. Fuze No.151 and 152.
- 649. Grenado, hand, No.74, A.T. Mk.II. (Fig.267)
- 634. Grenade, Hand, No.75, A.T. Mk.I - Markings.
- 637. Grenade, Hand, No.79 Smoke, Mk.I (Fig.265).
- 656. Grumets.
- 659. Marking - Q.F. 40 m.m. Ammunition.
- 648. Nitro-cellulose powders.
- 661. Packages for fuzes.
- 653. Pellets, C.E. - varnishing.
- 644. Pentolite fuze pellets.
- 635. Propellants - Nomenclature and composition of.
- 663. Primers - stabbing of.
- 655. Q Primers.
- 640. Rocket, 'U' 3 inch, Mk.I. Tail propelling.
- 647. Rocket, 'U' Mk.II. Tail, drill.
- 682. Rustproofing - Fuzes and Gainses.
- 665. Shell - Method of Filling.
- 638. Simulators, Gun flash. (Fig.266).
- 654. Smoke weapons.
- 679. Statement of Ammunition - Q.F. 2 pdr. Mk.IX - XI.
- 680. -do- Q.F. 6-pdr. 7-cwt.
- 681. -do- Q.F. 17 pdr.
- 641. Tubes, percussion, S.A.
- 650. Tracers.
- 662. Tinfoil - Cartridge Q.F. 17-pdr.

ENEMY AMMUNITION

- 666. Italian Markings on A.P., H.E. Hollow Charge & Shrapnel Shell (Fig.269)
- 667. Italian Primer, Percussion, Q.F., Cartridge, Model 35 (Fig.270).
- 668. Italian Gainses for H.E. and Piercing Shell (Fig.271).
- 669. German Gainses for H.E. and Smoke Shell (Fig.272).
- 670. German Tracers for Base Fuzes (Fig.273).
- 671. German Primer, Percussion, Q.F. Cartridge, C/13mi. (Fig.274).
- 672. German Primer, Percussion, Q.F. Cartridge, C/33. (Fig.275)
- 673. German 8 c.m. H.E. Mortar Bomb (Fig.276).
- 674. Japanese, H.E. Hand Grenade, Type 91 (Fig.277).
- 675. Japanese, 50 m.m. H.E. Mortar and Hand Grenade, Type 97. (Fig.278).
- 676. Japanese, H.E., Stick Grenade. (Fig.279).
- 677. Japanese, 7 c.m. H.E. Shell. (Fig.280).
- 678. Japanese 7.5 c.m. H.E. Shell. (Figs.281 and 282).

635. NOMENCLATURE AND COMPOSITION OF PROPELLANTS.

The following notes on propellants brings the subject up to date:-

PART I - Propellants for Gun Ammunition.A. - Nomenclature to denote composition of Cordite.

Nomen- clature	C O M P O S I T I O N per cent				Specifi- cation Number.
	Nitro- glycerine	Nitro- cellulose	Mineral Jelly	Carbamite	
Mk. I	58	37	5	-	P/148 U.
M.D.	30	65	5	-	P/270 E. P/294.
M.D.C	-	-	-	-	-
M.C.	30	65	5	-	-
R.D.B.	42	52	6	-	P/275 A.
C.D.	30	65	4.5	0.5	+P/299
W.	29	65	-	6	P/292 J.
W.M.	29.5	65.0	3.5	2.0	P/293
S.C.	41.5	49.5	-	9.0	P/286.B.
H.S.C.T.	47.0	49.5	-	3.5	P/286.B.
S.U.	41.5	49.5	-	9.0	+P/303
N. or R.D.N.	-	-	-	-	-
N.Q. or R.D.Q.	-	-	-	-	-
A.N.	-	-	-	-	-
A.N.S.	-	-	-	-	-

+ Specifications not yet approved.

NOTES:-

1. Cordite Mk. I, the first cordite manufactured, was originally known as "Cordite".
2. Cordite M.C. is manufactured with cracked mineral jelly.
3. Cordite S.C., S.U. and H.S.C. are made by the solventless process, the letter "S" in this instance denoting solventless.
4. Cordite S.U. is used for Tail propelling rockets "U" only.
5. The letter "H" when preceding the nomenclature of a cordite, indicates that the composition is "hotter", i.e. the Cal. value is greater.
6. N. is now the generic letter for flashless cordite. Early lots of N. and N.Q. were nomenclatured R.D.N. and R.D.Q. respectively.
7. M.D.C. is M.D. reworked with Carbamite and is used chiefly in India.

B. Nomenclature to denote composition of N.C. Powders.

Nomenclature	C O M P O S I T I O N				
	Nitro- glycerine	Nitro- cellulose	Di-nitro- toluene	Di-pheny- lamine	Di-butylph- thalate
N.C.T.	-	99.5	-	0.5	-
N.H.	-	86	10	3	1
F.N.H.	-	84	10	5	1
FNH/DB.	20	75.5	1.0	0.75	Barium Nitrate 1.0 Potassium Nitrate 1.0

NOTE:-

1. The nomenclature N.C.T. is confined to Nitrocellulose Powder of 1914-1918 manufacture.
2. D.B. refers to "Double Base", in the powder FMH/DB. In reality this propellant is a cordite.
3. The Nomenclature N.H. means "Non-hygroscopic" N.C. Powder and F.N.H. "Flashless Non-hygroscopic" powder.

C. Nomenclature to denote composition of other Propellants.

Nomenclature						SPECIFICATION
	Nitro-glycerine	Nitro-cellulose	Carbamite.	Diphenylamine	Other Ingredients.	
Bofors Cordite	24.7	67.8	1.6	0.85	Diamyl-phalate 5.05	-
Ballistite B.16	38	60	0.5	-	Potassium Nitrate Graphite	(P.285 B
N.C.(Z)	-	92.4	-	0.6	Dinitro-toluene 6.5 Graphite	(P.223
N.C.(Y)	-	78	-	-	Potassium Nitrate 3 Barium Nitrate 12 Mineral Jelly 3 Starch 1.5 Woodmeal 0.2 Camphor 1.5	P.278

D. Nomenclature to denote shape of Cordite.

These letters follow the nomenclature given in Part I.A above.

(No letter)		Cord
T.		Tubular Propellant
M.		Multi-tubular Propellant
S.		Slotted Tube
R.		Ribbon Cordite
D.		Drilled
G.		Groove

) in the case of S.V. Cordite only.

E. Additional Nomenclature.

The following additional letters are used with flashless cordite to indicate the addition of particular ingredients to reduce the flash.

- /P When Potassium Sulphate is added.
 /K " Potassium Cryolite is added.
 /Q " Natural Cryolite (e.g. Sodium Cryolite) is added.

F. Designation of Cordite size.

The size is expressed in thousands of an inch for Carbamite Cordites and in hundredths of an inch for Mineral Jelly Cordites, the external diameter of the dry cordite being given in carbamite but the diameter of the die used being given in the Mineral Jelly cordites. For Tubular propellants two

-5-

dimensions are given, separated by a hyphen, indicating the external and internal diameter.

Multi-tubular Propellants - designated according to the thickness of the web, i.e. the material between two adjacent holes, expressed in thousandths of an inch.

Ribbon Propellant - Only Carbamate cordites have been used, they are designated by the thickness followed by the width of strip, each figure expressed in thousandths of an inch and separated by a multiplication sign, e.g. 014 x 048.

- (i) The size follows the nomenclature for composition and shape in the case of cordite.
- (ii) The length of the cords or tubes is expressed in inches and this figure follows the dimension of size, e.g. 316 - 100/21.

Nitro-Cellulose Powders. The size of Nitro-Cellulose powders is not always expressed, but when given, as these powders are all multi-tubular, it is in thousandths of inches of web thickness.

PART II - Propellants for Small Arms Ammunition.

(a) Cordite:-

Cordite Mkt. I is not now used in Service Ammunition, but is supplied for certain special purposes such as proof cartridges. It is also used for blank cartridges in the sliced form and known as 20 Sc. (Sc. referring to Sliced and 20 representing the diameter in 1/100 inch.).

Cordite M.D.) in tubular form - M.D.T., C.D.T.
Cordite C.D.)

These are the standard cordites for Small Arms, and are supplied to the filling factories in the form of "rope" made up of a number of individual tubes. The actual thickness and stranding of the rope varies according to the filling technique, and has now been correlated into two main classes for the 5-2 size of Cordite, used for .303 ammunition.

e.g. Type A, has a nominal 45 strand.
" B, " " " 51 "

Each Type of rope has to pass a definite gauge and weight.

(Note - For the Composition of these Cordites see Part I (A)).

The following list show the types of cordite supplied and their uses in Small Arms:-

(i) Cordite Mkt. I:-

Use	Propellant
1 inch Aiming Rifle and .303 inch proof cartridge.	Size 3
0.303 inch L.Mk.V blank cartridge.	" 20 Sc.

(ii) Cordite M.D. and C.D. :-

Ammunition	Propellant
0.303 inch G. tracer	M.D.T. or C.D.T. 5 - 2
0.303 inch A.P.	-do-
0.303 inch Mk.VII.	-do-
0.5 inch A.P. and A.P.T.	M.D.T. or C.D.T. 7 - 2
0.55 inch (Boys) A.P.	-do-

(b) N.C. Rifle Powders:-

These are mainly all gelatinised powders made from Nitrocellulose and containing Diphenylamine as a stabiliser and coated with graphite.

The following powders are coated on the surfaces with various moderating agents, prior to graphiting, in order to obtain the correct ballistic requirements:-

N.R.N. No. 12	consisting of small square flakes.
N.R.N. No. 122	" " medium " "
N.R.N. No. 121	" " Short Tubes.
American N.C.	" " " "

The following powders are not surface moderated:-

Nobel Cadet Neonite	consisting of small square flakes.
Nobel Revolver Neonite	" " " " "
Nobel Rim Neonite	" " " " "

The trade name N.R.N. (Nobel Rifle Neonite) and the expression American N.C. are generic terms, and so for small arms powders it is generally necessary to quote the particular type of ammunition in order to describe a powder fully. Thus in the case of N.R.N. No. 12 several different ballistic levels are supplied, the ballistics required for the different ammunition being obtained by varying the amount of surface moderation.

The following list shows the main types of N.C. powder supplied and their uses:-

<u>Ammunition.</u>	<u>Propellant</u>
0.30 inch (American)	American N.C.
0.303 inch E. Mk. IV Z.	N.R.N. No. 12 or American N.C.
-do- VI Z.	-do-
-do- VII Z.	-do-
0.303 inch Mk. VIII Z.	-do-
7.92 mm. F. Mk. I Z.	-do-
0.5 inch F. Mk. I Z.	N.R.N. No. 12.
0.5 inch Colt.	American N.C.
15 m.m. B.E.S.A.	N.R.N. No. 121.
20 m.m. H.S.	-do-
20 m.m. Oerlikon.	N.R.N. No. 122 or American N.C.
0.22 Pimfire.	Nobel Rim Neonite.
9 m.m. Parabellum.	Nobel Revolver Neonite.
0.38 inch Revolver.	Nobel Cadet Neonite.
0.455 inch Revolver (Mk. VI and S.L.)	-do-

PART III - Factory Initials and Code Letters.

- (a) Factory Initials. The factory of origin of propellant is indicated by one or more letters prefixing the lot number. (These should not be confused with Station Monograms).

The following letters are used for factories in this country:-

<u>Factory</u>	<u>Initial used.</u>
<u>Land Service</u>	
Waltham Abbey	W.A. — Check
Bishopton	B.S. Check
Wrexham	X.
Ranskill	R.
Ardeer	D.
Dalbeattie	T.
Powfoot	Z.
Wigtown	W.
<u>Naval.</u>	
Holton Heath (R.N.C.F.)	H.N.
Caerwent. (R.N.P.F.)	C.T.

- (b) Code Letters. In the Land Service the following Code letters (within a rectangle) are used on packages containing gun or how. ammunition to denote the type of propellant:-

- A. - Flashless Cordite N. or N.Q.
- B. - Ballistite.
- C. - Cordite R.D.B. in Cord or Tube.
- D. - " M.D., M.C. or M.D.C. in Cord or Tube.
- E. - " W. or W.M.
- F. - " M.D. or R.D.B. in Flake.
- H. - " H.S.C.T.
- J. - " Bofors.
- K. - F.N.H./D.B. Powder.
- L. - F.N.H. Powder or F.N.H./P. Powder.
- M. - M 4 X
- N. - N.C.T. of 1914 - 1918 manufacture.
- O. - N.H. Powder.
- S. - Cordite S.C. or S.U.

The Code letter is stencilled on the ends and sides of the package, also on the side of Q.F. Cartridge cases by the silver nitrate or other approved process and on B.L. Cartridge bags, but always within a rectangle, thus **A**

In the case of S.U. Cordite used for Rockets, the code letter may be followed by the following letters enclosed in a circle:-

- D. - if the cordite is drilled.
- G. - if the cordite is grooved.

PART IV. Characteristics.

Hitherto, it has been customary to assume that Cordite is not affected by moisture and although this is not strictly true, care must be taken not to assume that cordite in ordinary storage is likely to deteriorate as experience has proved that it does not, the point is that prolonged storage in damp conditions is harmful. Flashless Cordites, however, are more susceptible to such conditions than other Cordites and in the worst circumstances they may disintegrate. Dampness does not render cordite dangerous or inert.

Nitro cellulose powders of the N.C.T. type are liable to absorb moisture and this affects the ballistics usually giving high pressures. The N.H. and F.N.H. types are less susceptible to moisture but they are not immune.

The same general considerations apply to the other propellants.

Carbamite and Flashless Cordites are more stable than Mineral Jelly Cordites.

Carbamite and Flashless Cordites are cooler than Mineral Jelly Cordites and therefore wear the gun less, so giving the rifling a longer life.

Carbamite and Flashless Cordites, being cooler, require a heavier charge than Mineral Jelly Cordites to produce the same ballistics.

Carbamite and Flashless Cordites bulk larger than Mineral Jelly Cordites for the same weight. This affects the work of making up cartridges.

Carbamite and Mineral Jelly Cordites give a bright muzzle flash but little smoke. Flashless Cordites give very little flash but produce smoke.

Carbamite and Mineral Jelly Cordites are colloidal but N. and N.Q. Flashless are not colloids.

Cordite should not be stored in unconditioned underground storage sites as the humidity is usually high in such places.

DECOPPERING MATERIALS.

Hitherto tin-foil (60/40 tin-lead foil) has been used to prevent coppering or to decopper guns. In future Commercial lead foil .002 inches thick, will be used as an alternative to tin-foil.

637. GRENADE HAND NO. 79, SMOKE, MARK I, Fig. 265.

This grenade has a cylindrical tin-plate body, the lid being soldered in one or two places to the body and further secured by adhesive tape. The body is closed by a disc, pressed in and fitted with a container for the igniter whilst the lid carries a screwed socket for the No. 247 fuze (see Fig. 201 Bull. No. 28).

The grenade is filled with one of the following Smoke compositions, P.N. 317, P.N. 411, P.N. 83, or P.N. 83 M, and the igniter container with Composition P.N. 227. A gunpowder primed cambric disc is fitted above the container to pick up the flash from the fuze and ignite the P.N. 227.

The fuze cap is retained in position by a strip of adhesive tape attached to cap and grenade.

The grenade is coloured Light Green, and is marked as shown. The filled and fuzed weight with P.N. 317 or P.N. 411, is 1 lb. 12 ozs, whilst with P.N. 83 or P.N. 83 M, it is about 6 ozs. lighter.

Action. The adhesive tape is removed also the cap of the fuze. The grenade is thrown, the tape of the fuze unwinds and withdraws the safety pin. On impact the fuze functions igniting the cambric disc and filling. Smoke emission commences about 5 seconds later and continues for from 40 to 60 seconds.

Packing. 24 grenades are packed in a B.166 Box in two tiers. The grenades are placed in two cardboard packing pieces, each holding 12 grenades as shown in Fig. 265. The box is painted green and carries the usual markings, together with the P.N. filling used.

638. SIMULATORS GUN FLASH. (Fig. 266).

Simulators gun flash Nos. 3, 4, 5 and No. 1 Mk. II have recently been introduced to provide a more realistic flash than that obtained by the earlier types.

Fig. 266 conveys a comprehensive picture of the Simulators from which it will be seen that No. 3, 4 and 5 are made of a bakelite material with inner and outer containers. The inner container is filled with a flash composition S.R. 801 A and the outer container is partly filled with aviation spirit. No. 1 Mk. II Simulator is made of paper and millboard and consists of one container which is filled with S.R. 801 A.

Simulators 3, 5 and No. 1 Mk. II are functioned with an electric detonator No. 49 or by a Commercial lead azide detonator No. 3, with a length of Safety fuze, whilst the No. 4 Simulator is functioned by a low tension electric fuze of the Nobel type.

No. 1 Mk. II	is for general training purposes.
No. 2	- do -
No. 3	represents the 3.7" or 4.5" Q.F. guns.
No. 4	" " 40 m.m. gun.
No. 5	" " 25 pr. Q.F. or 155 m.m. how.

For Storage, the Simulators are in Group IX, Category X. It was originally intended to issue the Simulators with the aviation spirit in them, but this is now to be superseded by the issue of separate capsules, the Simulators being filled by the user. There are two types of capsules, one to contain 5 c.c.s, the other 35 c.c.s. Two of the latter would be required for the No. 3 Simulator (contents 70 c.c.s) and one for the No. 5 Simulator (contents 35 c.c.s), whilst one of the former will satisfy the No. 4 Simulator (contents 5 c.c.s). The question of whether these capsules are to be carried in the same package as the Simulators or issued separately, is still under discussion. The packing of the Simulators is not yet clear.

639. STORAGE F 3 INCH M.L. MORTAR BOMBS.

Bombs fitted with cast iron nose containers without waxed paper tubes may corrode in storage and in time become unserviceable. The practical storage life depends upon whether the containers are varnished or unvarnished. If varnished a storage life of 3 years is permissible but if they are unvarnished a storage life of two years is permissible.

640. TAIL, PROPELLING, ROCKET, U. 3 INCH MM. I.

Approval has been given for the closing discs of this tail propelling to be waterproofed by a coating of paraffin wax in lieu of shellac varnishing.

641. TUBES PERCUSSION, S.A.

These tubes will be stabbed with three centre punch marks equally spaced near the base of the tube to prevent the gas seal moving forward.

642. B.L. CARTRIDGE BAGS - MATERIALS.

1. The following materials may be used for the manufacture of B.L. Cartridge bags.

- | | | |
|-------|--|---|
| (i) | Silk cloth class O.
Mixture cloth class Z
R.C.R. cloth A. | Any bag filled either cordite or N.C. powder for which the nominal weight does not exceed 10 lb. |
| (ii) | Silk cloth class I.
Mixture cloth class A.
R.C.R. cloth class A. | Any bag filled either cordite or N.C. powder for which the nominal weight lies between 10 lb. (excl.) and 25 lb. (incl.) |
| (iii) | Silk cloth class 2.
Mixture cloth class B.
R.C.R. cloth class B. | Any bag filled either cordite or N.C. powder for which the nominal weight lies between 25 lb. (excl.) and 100 lb. (incl.) |
| (iv) | Silk cloth class 3.
Mixture cloth class B.
R.C.R. cloth class B. | Any bag filled cordite or N.C. powder for which the nominal weight exceeds 100 lb. (excl.) |

2. Cream Serge and worsted cloth (shalloon) may be used in special circumstances.

3. Igniter bags will be made of worsted cloth No. 1 dyed red, with mixture cloth class A and R.C.R. cloth class A, dyed red in each case, as alternatives.

4. Cotton cambric will be used as heretofore.

5. Cotton sewing, silk sewing and linen thread are alternatives.

6. Webbing (formerly known as braids). Special treated R.C.R. webbing may be used alternatively with either silk or worsted webbing.

7. Mineral Jelly will no longer be used for treating Cotton sewing.

Note: R.C.R. = Regenerated Cellulose Rayon.

643. FUZE COVERS NO. 5 AND 6.

These covers may be made of steel, .013 and .022 inch thick, suitably rustproofed and painted yellow.

644. PENTOLITE FUZE PELLETS.

Pentolite is approved as an alternative explosive for pellets used in fuzes. No special marking is contemplated.

645. LACQUERING OF FUZES.

The lacquering of the non-ferrous components of fuzes, except those parts in contact with gunpowder in the magazines, will be discontinued.

646. MORTAR FUZES.

Re bullet 33
The ²⁴⁷~~245~~ fuze has been declared obsolete for use with the 3 inch S.B.

647. TAIL, DRILL, ROCKET, U. MK. II.

The tail is usually made up of rejected components of the service tail, and may or may not have a venturi fitted. An internal balance weight is secured about the centre. Contacts are fitted, also fins. The exterior is painted white with the word "DRILL" in black near the top.

648. NITRO-CELLULOSE POWDERS.

The Smokeless N.C.(Y), is to be known in future as N.C.(W). The explosive is to be dyed ~~brilliant~~ green.

649. GRENADE HAND NO. 74 A.T. MK. II. (Fig. 267)

The Mark II grenade is designed to improve certain features of the Mark I (item 184 of bulletin 16) which are liable to cause accidents.

374

23

The operational use remains the same as does the filling, packing and storage.

The flask is of a moulded material formed in two halves, secured by flanges and an approved adhesive. A boss formed on one half is threaded internally to take the sealing plug and handle, whilst two radial recesses received projections on the case.

The case differs from Mk. I in the method of securing it to the flask. Each half is necked and fits round and in the boss of the flask where it is retained by a spring clip, removed before throwing.

After filling, the flask is closed by the aluminium primer tube containing a perforated C.E. pellet, sponge rubber washer and grip washer. The moulded sealing plug is screwed home on a rubber sealing ring. The plug is prepared centrally to receive the detonator assembly as used with the Mk. I grenade, i.e. with 5 seconds delay, and has its outer end reduced and splined externally. For transit a cardboard dust cover with loop fits on the outer end of the flask.

The handle assembly is generally similar to that of the Mk. I except that it screws into and not over the neck of the flask.

The preparation of the grenade is done by removing the dust cover, inserting the detonator assembly and screwing the handle assembly fully home.

To throw, the spring clip is withdrawn when the case falls clear, then the safety pin, whilst holding the trigger and handle firmly, after which the grenade can be thrown to function as described for the Mk. I.

II.

650. TRACERS.

A. The policy of providing shell with some visible indication of their flight through the air in order to assist observation by the gunner has developed considerably and the following list shows the position to date.

Number	Type	Filling	Use	Mean Time	Colour
1 Mk. IV	Shot & Shell External. Night only.	A	2 Pr. and 3" A.A. shrap. etc.	7.5 secs.	Greenish White
V	Day & Night	B		do.	do.
2 IV	Shell or Shot Internal Night only.	IV & C VII	18 Pr., 25 Pr. A.P. Shot etc.	8 secs.	do.
VI, VII	Day & Night	VI B Paper Tube → designs	VI 75 m/m. S.A.P.		
3	Naval Service				
4	do.				
5	do.				
6 I	Shell, External	D	With Fuze Percussion Base	2.5 secs.	Greenish White.
II		B	No. 281 Type, e.g. in 2 pr. tank gun for A.P. shell or Practice Shot.		
7 I	Tracer & Igniter Shell, Internal.	E Paper tube for filling	2 Pr.	6.0 secs. to	Red
II	" " "	Cap Ignition		S.D.	
IV & IVR.	" " "			6.25 secs. to S.D.	
Identical with No. 12 II except in external diameter.					
8	Naval Service used in L.S. Coast Arty. (See Bulletin No. 29, Item 539).				
9	Naval Service		5.25" S.A.P.		
10 IV, IVR	Tracer & Igniter Shell, Internal	F Paper Tube	2 Pr.	6.25 secs. to S.D.	Red

(Cont'd.)

Number	Type	Filling	Use	Mean Time	Colour
11	I, II, Tracer & IIR, III, Igniter IIIR. Shell Internal.	F II Brass Disc III Celluloid Cup.	40 m.m.	6.25 secs. to S.D.	Red
12	I & II Tracer & Igniter Shell Internal.	E Cap Ignition	40 m.m.	6.25 secs. to S.D.	Red
13	I. Tracer Shell External.	G Paper Tube	6 Pr. 10 cwt. 6 Pr. 7 cwt.	6.5 secs.	Red
14	I & II. Tracer & Igniter Shell Internal	F Paper Tube.	6 Pr. 6 cwt. III A.A. 40 m.m.	10 13.5 secs. to S.D.	Red
15	I. Tracer Shell External.	H Paper Tube	2 Pr. A.T.Shell for Tank Gun.	2 secs.	Red

S.D. = Self destroying. R after mark indicates tracer body of lead bearing steel.

B. There is a variety of mixtures used for filling tracers to meet the needs of each specific type, i.e. day or night, long or short, white or red. The details of these are shown in the following table.

	Priming	Tracer Compo.	S.D. filling	Cap Filling
A.	S.R.190.P and S.F.G.2	S.R.190		
B.	S.R.261.P "	S.R.261.C		
C.	S.R.247.P "	S.R.247		
D.	S.R.261.P "	S.R.261		
E.	S.R.399 "	S.R.372	G.20	B.mixture
F.	S.R.399 only	S.R.372	S.R.227.A or G.36	
G.	" "	S.R.372		
H.	" "	S.R.372		

C. The following explanatory notes are included.

Four types of stores are to be distinguished:-

1. Tracer Igniters.
 2. Tracers.
 3. Tracers and Igniters Shell
 4. Igniters Shell.
- } Shown in the Table.

Stores in group one are employed solely to ignite tracing composition or the priming for tracing composition, e.g. Tracer Igniter 40 m/m Bofors. These give no light.

Tracers are designed to give light and smoke for night and day observations. They may be internal or external. All external tracers are ignited by the flash from the propellant charge. Internal tracers may be ignited by propellant flash (e.g. No. 14) or by a cap (e.g. No. 7 or 12).

Tracers and Igniters shell are designed to give a luminous smoke trace and to ignite a powder pellet or detonator to destroy the shell at the end of the trace.

Igniters shell cause destruction of the shell after a fixed period of time. They give no trace, and are employed by the Naval Service.

The fillings were formerly pressed using a serrated flat punch - more satisfactory "takeover" from one pressing is said to be achieved by the recently introduced stepped drift (American Practice).

The last pressing may be loaded with a waxed hard paper sleeve. This prevents propellant gases from blowing up the side of the filling between the composition and internal wall of the tracer, causing short burning times and possible prematures with Tracers and Igniters Shell.

These stores may be closed by means of a screwed plug and thin brass disc, which is destroyed by the propellant gases or by a celluloid disc or cup, to facilitate production. The celluloid disc may have to be protected from the action of N.G. and carbamite vapours from the propellant. A bakelised paper disc is used. The vapours soften and distort the celluloid, allowing it to fall down into the cartridge if Q.F. fixed. The propellant is then liable to suffer deterioration from contact with the tracing or priming composition.

651. FUZE BASE PERCUSSION NO. 283 MK. II.

The first issues of this Mark differ from the Mark I in having a shutter spring of a double action type, so that on set back, the detent releases the shutter which flies into position with the detonator aligned to the striker, the double action shutter spring forcing the shutter forward into the recess of the trapping disc locking it in position. The final issues have the ordinary design of shutter spring with two legs, i.e. not double action. The trapping disc is omitted and replaced by a trapping tube in the diaphragm in the disc, but fitted with a septum, which acts in the same way as a disc with diaphragm. The trapping tube moves forward locking the shutter in position.

652. CARTRIDGE S.A. BALL 9 M.M. MARK I.Z.

This cartridge is for use in Stan Lanchester or Smith and ^{Vescon} Weston Machine Carbines.

It comprises a blunt nosed bullet having a lead and antimony core in a gilding metal envelope, (alternatively steel coated with cupro nickel may be used).

The charge is 4.8 grains of nitro-cellulose.

The weight of the bullet is 115 grains and of the complete cartridge 185 grains.

The base is marked 9 M.M.I.Z., together with maker's initials and year of filling, whilst the annulus is coloured dark purple.

Packing. Box A.S.A.H.29 contains 50 cartons No. 16, each with 50 cartridges (hand packed) or 48 cartridges (machine packed), i.e. 2500 or 2400 cartridges per package, respectively. Length 16.9", width 10.75", height 9.25", weight 2500 rd. box 85 lbs., 2400 rd. box 69½ lbs.

Markings. The package has the usual Labels in green print, on a white ground, also 1½ inch blue bands round the centre of the box at right angles, and a diamond block at each end.

653. C.E. PELLETS, VARNISHING.

In future C.E. pellets for fuzes of all weights up to 5 drams, (136.8 grains) will be varnished instead of being wrapped, as hitherto. This change is intended to minimise the risk of dermatitis on factory personnel.

654. FUZE PERCUSSION NO. 244. MK. II AND III.

These designs differ from the Mark I (See Bull. 21, Item 304) in the shutter arrangements. The shutter bore in the magazine of the Mk. III is concentric, whereas that of the Mks. I and II are eccentric. The Mk. II and III have a different design of shutter and spring from the Mk. I, the former to open between 6000 - 9000 r.p.m., the latter between 6000 - 8000.

These fuzes are used with the 6 Pr. Q.F. 7 cwt. and 10 cwt.

655. Q. PRIMERS.

All 3.7" A.A. cartridges made up in Canadian Factories are fitted with Q. primers, but the packages are not marked externally with the letter Q.

656. GRUMMETS.

The packing of grummetts in packages containing A.P. shot for the Q.F. 25 pr. will be discontinued.

657. BOMB S.B. HIGH EXPLOSIVE A.T. 3 INCH GUN. (Fig. 268)

This is a streamlined hollow charge design, the bomb body being bored and threaded at the base to take the 284 fuze. The head is flat and threaded externally to take the collar securing the internal cup and the impact cap or external cup. The bomb may be filled with T.N.T., Pentolite, or P.E. to design D.D.(L) 13476. The T.N.T. and Pentolite fillings are cast, the P.E. filling is pressed. A cavity formed at the base is lined with a paper tube the depth being 1.53 inches for Pentolite and P.E. fillings to take the fuze only, and 2.52 inches for T.N.T. fillings to take an 8 dram C.E. exploder pellet in addition to the fuze.

The Mark I bomb is of cast iron and weighs 5 lb. 7 oz. 11 dr. when filled P.E. or 5 lb. 7 oz. 14 dr. when filled Pentolite. It is not filled with T.N.T.

The Mark II bomb is of steel and weighs:-

lb.	oz.	dr.	
6	8	2	filled P.E.
6	8	8	filled Pentolite
6	7	14	filled T.N.T.

The body is unpainted, but is rustproofed and is marked with the usual Red filling ring. In addition, when filled T.N.T. there is a green band with the letters T.N.T. in black, when filled Pentolite, there is a green and black band, and when filled P.E. one green band with the letters P.E. in black. The calibre and Mark, Series No., in ring, and Monogram of filler is stencilled in white.

Fuze Percussion base No. 284 Mk. I.

The fuze comprises a body, needle, ball, detont arrangement, detonator with holder and plug, magazine and vanes.

The body is of steel or brass reduced in diameter and threaded at

the front end to a $\frac{3}{4}$ inch gauge to enter the bomb body, whilst the rear end is also reduced and bored transversely to enter the tail and receive a shearing pin by means of which the tail is attached. The body is bored centrally from the front to receive the striker, the outer portion being threaded for the detonator holder, whilst a side channel accommodates the detent, detent spring, detent pin and detent plug. An inclined transverse hole receives a steel safety ball and closing plug. Two holes on the exterior provide for the attachment of the vanes which are indented into these holes.

Steel bodies have a hole drilled between the detent and needle recesses, to facilitate rustproofing.

The steel needle has a circular external groove to take the steel ball, the ball being retained in the safe position overlapping the needle by the detent.

The detonator contains 3 grains of lead azide with 2 grains of detonating composition and is held in the holder by the detonator plug whose fire channel is stemmed with C.E., whilst the brass magazine is screwed to the detonator holder and contains a C.E. pellet and paper disc.

The vanes, of steel, are a built up arrangement comprising a tube and four blades, which is placed over the fuze body from the front to rest on a shoulder at the rear of the fuze to which it is attached by indenting at two places.

The Cartridge comprises a built up steel plate container, differing from that described at item ²⁶⁴₃₄₂ of Bulletin ¹⁹₂₂ by the addition of a thrust plate, cartridge adapter, spring and shear pin, which are assembled as shown in fig. 268. These fittings are required to accommodate a streamlined projectile.

The charge is 430 grains Cordite W.O16 or W.M.O17, cut in short lengths and arranged between a paper diaphragm and a primer tube, the latter having 55 grains of G.20 powder. The igniter is similar to that shown in Fig. 123, Bulletin No. 22.

The cartridge is attached to the fuze by the shearing pin which passes through the adapter and fuze body.

The complete round is issued fuzed as shown in the fig. 268, a space, it will be noted, being left between the cartridge adapter and the rear face of the fuze.

Action.

The breech being closed and the striker functioned the flame from the igniter fires the gunpowder priming and thence the Cordite. The bomb, with fuze and front portion of the cartridge travels up the bore, the latter acting as a gas check, whilst the rear portion of the cartridge acts as an obturator.

On first movement of the cartridge the inertia of the bomb breaks the shear pin and compresses the spring between screw and fuze. When contact is made with the fuze the whole assembly moves clear of the mortar.

When the bomb moves the detent sets back clear of the ball which enters the detent channel and frees the striker.

On acceleration ceasing, the spring pushes the cartridge clear of the bomb which travels on. The detent spring pushes the detent forward after the ball.

On impact, the striker moves forward, piercing the detonator and detonating the filling. The impact cap of the bomb is spaced suitably from the hollow charge to ensure the maximum penetrative effect from the filling.

Packing.

Each complete round is packed into a paper "Container, Ammunition No. 51" fitted with steel plate end caps secured by spinning the edge into the

the container body. A 14 inch length of whipcord is attached to a rustproofed steel guard pin which is inserted between the fuze body, round its projecting portion, and the adapter to protect the shear pin in transit.

Five rounds, in containers, are packed in a wood "Box Ammunition S.B. 3 inch Gun C.271", having the lid secured in the usual way for mortar ammunition, i.e. swinging clamps with keep pin and tarred securing string. The dimensions of the package are 21.9 inches long, 14.80 inches wide and 5.95 inches deep. The filled weight is 56 lbs.

Marking follows the usual lines.

658. CARTRIDGES Q.F. 12 PR. 12 CTT.

Lids made of plastic material have been approved for the above mentioned cartridges, in lieu of the existing pattern of ~~tin~~, as a war measure. ^{white metal} As the tin pattern lid provided a decoppering agent it is now necessary to include a decoppering charge in the make up of the cartridge. Consequently 2/3 ozs. of tin foil or a corresponding amount of lead foil is inserted when a plastic lid is fitted.

659. MARKING. Q.F. 40 M/M. AMMUNITION.

Q.F. 40 m.m. Ammunition fitted with self-destroying tracers, will be marked with the number indicating the time, in seconds, to self destruction, the number to be enclosed within a circle, thus $\textcircled{12}$ = 12 seconds.

This symbol will be marked on the shell, on the cartridge case in silver nitrate and in yellow on the exterior of the package. The marking on the shell will be in red and must not be confused with the Series No. in a circle. The present symbol $\sqrt{12}$ will be omitted in such instances.

660. CHEMICAL STORES.

The following articles have been declared obsolete:-

Bomb M.L. Chemical, 3 inch Mortar, 10 lb. Mk. I.

Bottle, stone, screw-stoppered "Z" Mixture - $\frac{1}{2}$ gallon.

Crate Z Mixture M.72.

Shell B.L. Chemical, bursting, 6 inch howitzer light
Mks. XI, XII/V and XIII/IX.

Shell Q.F. Chemical, B.E. Streamline Mk. I.D.
bursting, streamlined 25 Pr.
Mk. I.D.
Mk. II.D.

Shell, bursting, 4.5 inch howitzer Mk. XII.

661. PACKAGES FOR FUZES.

The case, wood, packing, E.26, Mk. I has been modified to take 4 boxes, fuze F.24/31 R.Y.G. thus containing 48 fuzes No. 24/31, M.46 or M.47.

662. TINFOIL.

The tinfoil in Q.F. 17 Pr. Cartridges has been increased from 6 drms. to 12 drms. for full charge only.

663. PRIMERS, STABBING OF.

The procedure of stabbing primers in position, hitherto confined to cartridges not fitted with clips, has now been extended to cover all Q.F. Cartridges whether fitted with clips or not.

664. SMOKE WEAPONS.

With further reference to item 622, Smoke weapons containing titanium tetra chloride will have the letters F.M. included in the primary nomenclature and those containing chloro-sulphonic acid will have the letters C.S.A. or C.S.A.M. included.

As the packages carry Group XI labels whereas transport conditions by road, rail or sea call for Group XIII Conditions, it is imperative that these letters should be shown in the designation column of Carriers Notes and Shipping Notes whilst the Group column should show Group XIII.

665. SHELL - METHOD OF FILLING.

M. of F. D.D.(L) 4052 has been extended to cover Shell B.L. H.E. 9.2 inch gun, heavy, Mk. XIII A and XVII B, when filled T.N.T. or Lyddite, using fuze 199, 230 or 230.P, Gaine No. 9 or 10 and Pellet exploder 26 drs. It is also used with Shell B.L. H.E. 6 inch gun. Mk. XXVI/XX B., XVII A.Q. and XXIX B, when filled T.N.T. or Lyddite for fuze 230, Gaine No. 9 and Pellet exploder 26 drs. or Fuze 45.P, Gaine No. 9, Adapter No. 26 and Pellet exploder 26 drs. The depth of cavity is 4.62 inches. 6 inch shell, without plug, but allowing 2 lb. 5 ozs. for fuze 230.P which weight 101 lb. 15 ozs. + $1\frac{1}{2}$ ozs. will be stencilled "Dead Weight", as will 9.2 inch shell weighing 380 lb. + 6 ozs. under the same conditions as to fuze and plug. Plug fuze hole 2 inch No. 15 Mk. I is used on a washer, leather, lubricated 2.35 inch. A drawing of the design appears in R.A.O.S. Part II.

666. ITALIAN MARKINGS ON A.P., H.E., HOLLOW CHARGE & SHRAPNEL SHELL. Fig. 269.

The following markings have been met with in the course of examining captured Italian shell of the above-mentioned types. The types bearing these markings are of recent manufacture. The marking of earlier types do not always conform to the system.

Basic colours of body.

With each of the types the body of the shell is pale blue (almost a light grey) and the head (i.e. from nose to just above the shoulder) is red. When a cap is fitted to the shell the cap is red. The 100/17 hollow charge shell is an exception in that the cap is orange. Whether this is by design or is due to a variation in the shade of the colour is not yet clear. These basic colours are normally applied by a process similar to sherardizing instead of by painting. The result is a flat finish and the absence of an obvious coating.

Bands.

A green band immediately above the driving band is found on shell both of the piercing type and normal nose fuze H.E. type when filled T.N.T. or Amatol.

A brown band immediately above the driving band is found on shrapnel shell.

A white band appears to be the distinguishing marking of shell designed for the attack of armour. With armour piercing shell the band is at the approximate centre between the shoulder and the driving band. With hollow charge shell the band is immediately above the driving band.

Stencilling.

The following particulars regarding the shell are normally stencilled in black between the shoulder and the driving band:-

- (a) Weight of filled shell in kilograms.
- (b) Nature of bursting charge. Shell filled with cast T.N.T. either by the pouring process or in the form of blocks are stencilled "TRITOLO". Shell filled Amatol are stencilled "AMATOLO". Those filled cyclonite/T.N.T. are stencilled "TRITOLITE".
- (d) Letters indicating the filling factory followed by the last three figures of the year of filling.
- (e) The calibre of the equipment in millimetres followed by an oblique stroke and the length of the piece expressed in terms of calibres.

The marking "Mgl" indicates a modified design.

667. ITALIAN PRIMER, PERCUSSION, Q.F., CARTRIDGE, MODEL, 35. Fig. 270.

The primer body is of brass with a flange at the base and is screw-threaded externally for insertion in the cartridge case. The diameter of the threaded portion is approximately .55 inches. The interior of the body has a small recess near the base to accommodate the initiator capsule and is screwthreaded to receive the magazine.

The initiator capsule is of copper and contains a brass anvil with a conical flash hole and .86 grains of initiator composition. The composition consists of mercury fulminate 51.9%, potassium chlorate 32.4%, antimony sulphide 32.6% and ground glass 3.1%. The composition

is protected by varnish but there is no foil disc.

The brass magazine is in the form of a cup with a flash hole in the base and an external screwthread for assembly in the body. The magazine contains a 14.2 grain pellet of gunpowder with a central perforation.

The primer is closed by a brass disc over which the mouth of the body is turned and the closing sealed with varnish.

Action.

When the base of the primer is struck centrally the initiator composition is crushed on the anvil and initiated by mechanical shock. The flash produced by the composition passes through the flash hole in the anvil and the magazine and ignites the powder pellet. The explosion of the powder pellet blows out the closing disc and ignites the propellant charge. The escape of propellant gases over the primer is prevented by the expansion of the body in the primer boss. Internal sealing is provided by the base of the primer.

668. ITALIAN GAINES FOR H.E. & PIERCING SHELL. Fig. 271.

The following types of gaine are used in conjunction with igniferous fuzes to obtain detonation of the bursting charge in H.E. shell and piercing shell:-

.89 gram Cyclonite Gaine.

The gaine is used with nose fuzes and base fuzes.

When used in conjunction with a base fuze the gaine is fitted to the fuze either by means of a screwed adapter (Fig. 271.A) or by being screwed directly into the head of the fuze.

When the gaine is used with a nose fuze it may be screwed into the base of the fuze or it may be fitted with a plain flanged adapter (Fig. 271.B) and inserted in the mouth of the exploder container in the shell.

The filling of the gaine is contained in an aluminium capsule 1.28 inches long and .29 inches in diameter. The capsule is open at one end with an external flange and, at the other end, has a concave base. The main filling consists of 13.7 grains (.89 grams) of cyclonite and above this is an initiator in the form of an inverted cup containing 6.6 grains of lead azide lead styphnate (55%/45%). The cup has a hole in the base which is lightly closed by two discs of white silk. The capsule is closed at the mouth by a perforated cup which in some instances contains a 2.2 grain perforated pellet of gunpowder.

2.3 gram Ballistite Gaine (Fig. 271.C)

The gaine is used in H.E. shell under the Inneschi graze fuze with a ballistite exploder. The screwthreaded steel body is .97 inches in diameter and has approximately 11 threads to the inch.

The filling consists of 35.4 grains (2.3 grams) of ballistite and is contained in the cup shaped interior of the gaine which has a flash hole at the base lightly closed by a gauze disc. The gaine is closed at the head by a steel screwed plug with central flash hole. The hole is closed by a paper disc adhering to its underside. The ballistite contains approximately 45% of nitroglycerine and the nitrocellulose has a 12.5% nitrogen content.

1.8 gram Cyclonite Gaine (Fig. 271.D)

The gaine is used in H.E. shell under the Inneschi graze fuze with a T.N.T. exploder. The diameter and number of threads to the inch are the same as with the ballistite gaine.

The aluminium body is screwthreaded over the whole of its length and is solid at the base. The filling consists of 27.8 grains (1.8 grams) of cyclonite under an inverted aluminium cup containing 10 grains of lead azide/lead styphnate (40.1%/59.9%). The base of the cup has a central flash hole closed by a fabric disc. The gaine is closed by a similar cup, inserted base downwards with a paper washer beneath it.

569. GERMAN GAINES FOR H.E. & SMOKE SHELL.
(Zündladung "A", "B" & "C/98")

Fig. 272.

1. The gaines used beneath nose fuzes of the igniferous type in H.E. shell and smoke shell are in the form of aluminium or brass cylinders which contain an H.E. filling and are fitted with a detonator inside the forward end. This end is fitted with an external leather washer. The filling may be picric acid, P.E.T.N./Wax or R.D.X./Wax. The detonator filling may be P.E.T.N. or R.D.X. with a priming layer of lead azide/lead styphnate or, in the case of gaines filled with picric acid, the detonator filling is in mercury fulminate. The picric acid filling is in the form of powder, the P.E.T.N./Wax filling is tinted pale pink and the R.D.X./Wax filling is tinted pale blue or a blue-green. Gainies containing P.E.T.N./Wax fillings have been found with the marking "Np" after the designation marking, e.g. "Zdlg C/98 Np". These are the letters normally used by the Germans to indicate P.E.T.N.

A brass gaine, filled picric acid, is shown in Fig. 8, in Bulletin No. 7. Aluminium gainies filled P.E.T.N./Wax are shown in Figs. 169 and 170 in Bulletin No. 26.

The following types have been identified as being marked in a lettered series:-

2. Gaine "A" (Zdlg "A")

The gaine consists of an aluminium body 2.95 inches long and .83 inches in diameter, filled with a pressed pellet of R.D.X./Wax 92/8, weighing 577 grains, density 1.61. The R.D.X./Wax mixture is tinted pale blue by the addition of a small quantity of dyestuff. A cavity is formed at the head end to receive the detonator which is enclosed in an aluminium tube. The detonator contains 6.5 grains of R.D.X. under 6.3 grains of lead azide/lead styphnate (58.8%/41.2%). A disc of aluminium, with a central hole, holds the detonator tube firmly in its cavity and is itself held by a leather washer. An aluminium ring completes the closure by being folded over the lip of the body. The body is marked "Zündladung "A" or "Zdlg A".

3. Gaine "B" (Zdlg "B")

This gaine is 4.7 inches in length and has the same diameter as the "A" gaine. The R.D.X./Wax pellets are enclosed in two separate aluminium containers which slide into the aluminium body. The lower container holds two pressed pellets of R.D.X./Wax 92/8 each weighing 232 grains, density 1.59. The container is sealed by pressing the lip over two aluminium discs. The upper container holds a single pellet of R.D.X./Wax, weighing 324 grains and the detonator unit and is closed by a perforated aluminium disc spun in. The detonator contains 6.9 grains of R.D.X. under 5 grains of lead azide/lead styphnate (68.6%/31.4%). The whole assembly is retained in the aluminium body by a leather washer and an aluminium securing ring as in the "A" gaine.

4. Gaine "C/98" (Zdlg C/98)

This type exists in two sizes. The small size, "Kz. Zdlg C/98", used in smoke shell, is 1.6 inches in length and the large size "Gr. Zdlg C/98" used in H.E. shell, is 5 inches in length. The diameter of both sizes is .87 inches.

The small gaine, with a filling of P.E.T.N./Wax, is shown in Fig. 169 in Bulletin No. 26. The large gaine, also with a filling of P.E.T.N./Wax is shown in Fig. 170 in Bulletin No. 26.

As with the other types, these may be of brass and may also be filled with picric acid or R.D.X./Wax.

670. GERMAN TRACERS FOR BASE FUZES.

The base fuze shown in Fig. 151 in Bulletin No. 25 is typical of the fuzes met with in 7.5 cm, 8.8 cm and 10.5 cm armour piercing shell and has a screwthreaded recess in the base of the body in which a tracer is screwed. The following types of tracers have been met with:-

The type shown in Fig. 273.A consists of a steel body in the form of a hollow cylinder with an external screwthread for insertion in the fuze. The body contains an inverted cup of copper plated steel. The cup contains 179 grains of tracing composition primed with 30 grains of priming composition. The tracing composition is pressed in three increments. Both the tracing and priming compositions are pressed with a serrated drift. The tracing composition consists of beeswax, barium nitrate and magnesium and produces a brilliant white trace. The priming composition consists of barium peroxide, barium carbonate and magnesium. The tracer is lightly closed at the base by a convex celluloid disc held between an internal flange in the body and the mouth of the cup.

The weight of the filled tracer is approximately 3 oz. 6 dr.

The type shown in Fig. 273.B has the body closed at the front end by a steel disc and is fitted with a steel liner instead of a cup. The tracing composition, with a weight of 185 grains, is pressed in two increments and contains shellac instead of beeswax. The 62 grain priming composition is pressed in two increments and has the same composition as that in the first type. The tracer is closed by a flat celluloid disc let into an undercut recess.

The weight of the filled tracer is approximately 3 oz. 7 dr.

The type shown in Fig. 273.C consists of a steel body in the form of an inverted flanged cup with an external screwthread for insertion in the fuze. The body contains an inverted steel cup containing 157 grains of tracing composition pressed with a serrated drift and 46 grains of priming composition pressed with an eight-sided tapering drift. The tracing and priming compositions are the same as those given for the first type. The body is closed by a flat celluloid disc secured by a steel collar screwed into the body.

The weight of the filled tracer is approximately 4 oz. 5 dr.

671. GERMAN PRIMER, PERCUSSION, Q.F. CARTRIDGE, C/13na.

Fig. 274.

The brass body of the primer is .56 inches long and has a diameter of 5.2 inches at the screwthreaded portion. Three equi-spaced recesses for the primer key are formed round the circumference of the base. The model number, C/13, followed by the letters "na" indicating new pattern, is stamped in the base.

The brass cap is positioned inside the base of the body, under the anvil, and is not visible from the exterior. The cap contains a .33 grain filling consisting of mercury fulminate 52%, potassium chlorate 23%, antimony sulphide 19.7% and grit 5.3%. The composition is sealed by a covering of varnish without the addition of a foil disc.

The brass anvil plug is screwed into the body and is shaped at the base to receive the cap. A flash channel is formed through the centre of the plug.

The magazine formed in the upper part of the body contains 8.7 grains of pressed gunpowder covered by a paper disc. The magazine is closed by a brass washer covered by a plastic disc. The disc is secured by the rim of the body being turned inwards.

672. GERMAN, PRIMER, PERCUSSION, Q.F., CARTRIDGE, C/33.

Fig. 275.

The brass body of the primer is .55 inches long and has a diameter of approximately .5 inches at the screwthreaded portion. Two key flats are formed in the base which is stamped with the model number "C/33."

The brass cap is positioned inside the base of the body, under the anvil, and is not visible from the exterior. The cap contains a .37 grain filling consisting of mercury fulminate 24.6%, potassium chlorate 37.6%, antimony sulphide 29.6% and ground glass 8.2%. The filling is covered by a disc of tinfoil without varnish.

The anvil plug is of brass and is screwed into the body over the cap. A screw slot is cut in its front face and two slots are formed, diametrically opposite, down the side to provide flash channels.

The magazine formed in the upper part of the body contains a 2 grain filling of granular gunpowder immediately above the anvil plug over which is a 6 grain pellet of gunpowder. The pellet is covered by a paper disc and the magazine closed by a plastic disc inserted over a brass washer. The closing disc is held by the turned in rim of the body.

673. GERMAN 8 CM H.E. MORTAR BOMB.
(8 cm Wurfgranate 34)

Fig. 276.

1. This bomb can also be fired from the Italian 81 m.m. Mortar.

The bomb is painted a dull red and stencilled in black. The overall length is 12.95 inches, the maximum diameter 3.18 inches and the weight, filled and fuze, is approximately 7.75 lb.

2. Bomb and bursting charge.

The construction of the bomb is similar to that of the 5 cm type shown in Bulletin No. 24, Fig. 144 but the cartridge container is fitted with twelve vanes instead of eight and has four rows of perforations for the escape of pressure. Also, the guide band or parallel portion of the body has four grooves. The body is made of cast iron.

The bursting charge consists of approximately 1.1 lb. of T.N.T., and has a cavity below the fuze hole for reception of the steel container which holds the gaine.

3. Gaine.

The gaine has a cylindrical body of aluminium containing a 535 grain filling of P.E.T.N./Wax (87.8/12.2%) and a detonator assembly. This assembly, fitted in the head of the gaine, consists of a flanged detonator shell which fits into a cavity in the gaine filling and closes the head of the gaine. The detonator contains 7.5 grains of lead azide and lead styphnate (63.2/36.8%) over 7.7 grains of P.E.T.N. The flanged mouth of the detonator is closed by an aluminium flanged cup with five holes in its base. An aluminium washer between two paper discs and surmounted by a leather washer is fitted in the head of the gaine and secured by the turned in rim of the body. The approximate dimensions of the gaine are:- Length 3 inches, diameter .9 inch.

4. Fuze. (Wurfgrate Zunder 38)

The fuze bears the same number as that used in the 5 cm bomb, i.e. Wgr. Z. 38.

5. Cartridges, primary and augmenting.

The propellant charge consists of a primary cartridge, carrying its own means of ignition, and three secondary charges. The primary cartridge is placed in the cartridge container of the bomb where it is secured by a screw in the container and a bulge formed in the rolled paper body of the cartridge. The augmenting charges are fitted round the cartridge container in front of the vanes.

The primary cartridge (Fig. 276) is of the 12 bore sporting type and consists of a rolled paper body and liner containing 152 grains of graphited flake propellant and fitted with the usual type of cartridge head which is considerably reinforced. The dimensions of the flake are .04 x .04 x .009 inches. The copper cup and wads at the front end are presumably intended to hold the pressure momentarily and ensure better ignition of the augmenting charges.

The augmenting charges each consist of four and a half rings of annular sheet propellant covered with cambric and are provided with a radial slit for assembly round the cartridge container. The sheet propellant is .017 inches thick and the weight of each charge is 138 grains.

674. JAPANESE, H.E., HAND GRENADE, TYPE 91.

Fig. 277.

The cylindrical body of the grenade tapers near the base and head, is grooved for fragmentation and contain a 2 oz. bursting charge of T.N.T. The striker, forming part of the igniter set, protrudes from the head of the body and is covered by a brass cap secured by a safety pin. The igniter set is of the time type with a delay of approximately 4.5 seconds and is initiated by a blow immediately before throwing. The grenade is 3.78 inches in length, has a maximum diameter of 1.97 inches and has a filled weight of approximately 1 lb. The grenade is marked at the head with a red disc surrounded by a black circle.

The body is of cast iron with a cup shaped interior and is screwthreaded internally at the mouth to receive the closing plug. The bursting charge has a central cavity throughout its length to receive the detonator and igniter set and is topped by a washer before the insertion of the closing plug. The central cavity is provided with a liner which contains a wad at its base end for the detonator whilst its front end fits into a central hole in the underside of the closing plug.

The detonator consists of a cylindrical shell which is solid at the base, lightly closed at the head and contains an initiating composition of which details are not yet available. A perforated steel disc is positioned between the detonator and the igniter set.

From the incomplete information and the sketches at present available the igniter set consists of a brass body fitted with the striker, a percussion cap and a delay filling, and a container with a perforated filling which is fitted below the body.

The brass body is screwthreaded for insertion in the closing plug and is cannellured near the top to receive a similar cannellure formed in the safety cap. Above the cannellure two holes are formed for the insertion of the safety pin. A recess is formed in the head of the body to receive the striker assembly which consists of a protruding pellet fitted with a screwed needle and supported by a helical spring and the safety pin. At the base of the recess a percussion cap is fitted over a channel filled with a delay composition which extends through the body and is provided with a radial channel just below the cap for the escape of pressure.

The brass safety cap is split and cannellured for assembly and functioning and is perforated to coincide with the body for the insertion of the safety pin.

The container below the body serves as a priming to amplify the ignition from the delay filling to bring about the initiation of the detonator. Details of the filling are not available.

Action.

After removing the safety pin the safety cap is given a sharp blow on the head before throwing the grenade. The blow forces the cap down over the igniter body and drives the needle into the percussion cap. The flash produced by the cap filling ignites the delay filling which ignites the composition in the radial vent and with the pressure set up by the combustion escaping through the vent the delay composition burns steadily through to the priming composition. The ignition of the priming composition brings about the initiation of the detonator which in turn detonates the bursting charge.

675. JAPANESE, 50 M.M., H.E. MORTAR AND HAND GRENADE, TYPE 97.

Fig. 278.

The grenade may be used with the 50 m.m. grenade thrower and differs from the hand grenade shown in Fig. 277 in having a slightly heavier body - 1 lb. 2½ ozs. compared with 1 lb. - and in being fitted with a propellant container which also carries the means of ignition.

The container consists of a mild steel cylinder 1.22 inches long and 1.02 inches in diameter which is screwed into a recess in the base of the grenade and has six radial perforations for the escape of pressure. The container is closed at the base by a steel plug fitted with a percussion primer.

The filling of the container consists of a 16.2 grains propellant charge of nitrocellulose flake in an inverted copper cup. The mouth of the cup is closed by a steel washer with a paper disc on its inner side. The propellant contains over 95% of nitrocellulose (nitrogen content 13%) and is stabilized with diphenylamine. Graphite is distributed irregularly over the surface of the rectangular flakes.

The primer is carried in a recess in the inner face of the base plug and is covered by a paper disc. The filling consists of 11.75 grains of gunpowder. A cap chamber with anvil in the base contains a percussion cap. The cap composition consists of mercury fulminate 32%, potassium chlorate 36% and antimony sulphide 32%.

Action

With the safety pin removed before firing, the needle pellet is supported only by the helical spring. On acceleration the pellet sets back and the needle pierces the detonator. The subsequent action is the same as that of the hand grenade.

676. JAPANESE, H.E., STICK GRENADE.

Fig. 279.

The grenade has a cylindrical body of cast iron containing a bursting charge of lyddite and fitted with a wooden handle which contains a friction igniter. The igniter is operated by removing the end cap and pulling a wire ring attached to a cord at the end of the handle. The grenade is 8 inches in length and weighs approximately 1 lb. 3½ oz.

The cup shaped cast iron body contains a 2 oz. bursting charge of lyddite and is closed at the mouth by the large diameter end of the handle. The body is secured to the handle by a number of screws. The bursting charge is provided with a central cavity throughout its length for the reception of the detonator. The body is 3 inches long, 2 inches in diameter and has a wall .25 inches thick.

The wooden handle has a central channel for the friction igniter and is enlarged at one end to form a closing plug for the body. The outer end of the handle is recessed to hold the wire ring and coiled length of the igniter cord and is closed by a metal cap. The length of the exposed portion of the handle is 5 inches.

Details of the friction igniter and the detonator are not available but apparently the cord is attached to a pull-wire embedded in friction composition which is initiated by pulling the cord and ignites a delay composition which in turn ignites the composition in the detonator. The delay is approximately 4.5 seconds.

677. JAPANESE 7 CM H.E. SHELL.

Fig. 280.

The filled shell, without the fuze, weighs 7 lb. 15 oz. 8 drams and is 8.9 inches in length.

The shell has a comparatively thin wall and is fitted with a copper driving band. There is no base plate.

The bursting charge consists of 1.25 lb. of pressed T.N.T. which in quality corresponds approximately to "Grade 2". A cavity is formed in the charge to receive the steel burster container which is screwed into the fuze-hole.

The burster container has a felt disc at the bottom and contains an exploder consisting of a perforated picric acid pellet over two solid pellets of the same nature. These are enclosed in a paper container. The weight of the exploder is 22.7 drams.

A copper container, to receive the magazine of the fuze, is inserted above the burster container and fits into the perforated pellet at the top of the exploder.

The weight of the empty shell is 6.1 lb.

Details of markings are not available.

678. JAPANESE 7.5 CM H.E. SHELL.

Two types are shown in Fig. 281 and Fig. 282. Details of markings are not available.

The type shown in Fig. 281 without fuze is 12 inches in length and has a filled weight of 9 lb. 12 oz. 8 dr.

The shell has a comparatively thin wall and is fitted with a copper driving band. There is no base plate. A fuze-hole adapter is inserted at the nose.

The bursting charge consists of 2.3 lb. of pressed T.N.T. which in quality corresponds approximately to "Grade 2". A cavity is formed in the charge to receive the steel burster container which is screwed into the fuze-hole adapter. A felt washer is inserted on top of the filling.

The burster container has a filling of pressed picric acid in which a cavity is formed to receive the lower portion of a lightly constructed container which closes the burster container. The filling of the burster

container weighs 14.2 drams and is topped by a felt washer.

The light container closing the burster container is of the two diameter type and is apparently intended to receive the lower portion of the fuze and a gaine.

The weight of the empty shell is 7 lb.

The second type of shell, shown in Fig. 282, is 11.5 inches in length without fuze, and has a head of smaller C.R.H. The weight of the filled shell without fuze is 12 lb. 14 oz. 8 dr.

The details of the method of filling are the same as those given for the 7 cm H.E. shell, except that the bursting charge is cast T.N.T. and weighs 1.9 lb.

The weight of the empty shell is 10.5 lb.

STATEMENT OF AMMUNITION

679. CARTRIDGES Q.F. 2 PR. MKS. IX - XA.

Nature and Mark	MAIN COMPONENTS							Complete Round			Package Nomenclature & Mark
	Case	Charge	Primer	Projectile	Tracer	Fuze	Clip	Length (inches)	Weight (Approx)		
		lb.oz.dr.							lb.oz.dr.		
Shell H.E., H.V. Mk.II, Foil.	No.2 Mk.I.	- 10 13 N.H.025	Perc.No.12 Mk.I or II	Shell H.E. H.V.Mk.II.	No.7 Mk.I II or IV	Perc.D.A. No.243 Mk. I or II.	Ctge.No.30	17.577	4 2 2	Box Ammn. C.198 Mk. I or C.207 Mk. I or II, or C.289 Mk. I containing 16 Rounds packed 8 rds per contain- er Ammn. I or II each round enclosed in container Ctge.No.74.	
Shell H.E., H.V. Mk.III Foil	-do-	- 10 15 F.N.H.023	-do-	-do-	-do-	-do-	-do-	-do-	4 2 4		
Shell H.E. H.V. Mk. IIII Foil.	-do-	- 10 10 N.H.025	-do-	Shell H.E. H.V.Mk.III	-do-	-do-	-do-	-do-	3 15 3		
Shell H.E. H.V. Mk.IV Foil.	-do-	- 10 12 F.N.H.023	-do-	-do-	-do-	-do-	-do-	-do-	3 15 5		
A.P.Shell Mk. I.T. Foil.	-do-	- 8 15 WT.144-048 or WMT.148-048	-do-	Shell A.P. Mk.I	Nil	Perc.Base Tracer No. 281 Mk.I or II	-do-			Box Ammn. C.198 Mk. I or C.207 Mk. I or II or C.289 Mk. I. Containing 16 Rounds packed 8 rds per contain- er Ammn. I or II, each rd. enclosed in container	
A.P.Shot Mk. I.T Foil.	-do-	- 9 0½ WT.144-048 or WMT.148-048	-do-	Shot A.P. Mk. II, III IIII, IVT, VT VIT, VIIT or VIIIT.	Stemmed Tracer Cavity filling	Nil	-do-	16.732	4 8 0		
A.P.Shot Mk. III Foil.	-do-	- 10 0½ NQ/T 144-040	-do-	-do-	-do-	-do-	-do-	-do-	4 9 0		

H.V.A.P. Shot Mk.IT Foil	-do-	- 9 12 WMT. 148-048	-do-	-do-	-do-	-do-	-do-	-do-	4 8 4	Ctge. No.9 Mk. I, II or III.
A.P.C.B.C. Shot Mk.IT Foil.	-do-	- 9 9½ WMT 148-048	-do-	Shot A.P.C. B.C. Mk.IX B.T.	-do-	-do-	-do-	18.69-	4 14 0½	* See Footnote
Practice Mk. I.T. Foil.	-do-	- 8 15 WT. 144-048 or WMT. 148-048	-do-	Shot Prac- tice Mk. VIT.	No. 6 Mk. I or II.	-do-	-do-	16.73	4 4 14½	Box Ammn. C. 198 Mk. I... or C. 207 Mk. I or II or C. 289 Mk. I containing 16 Rounds, packed 8 Rds. per container Ammn. Mk. I or II each Rd. enclosed in container ctge. No.9 Mk. I, II or III.
Practice Reduced Mk. I.T. Foil	-do-	2,200 Grns W. 040	-do-	-do-	-do-	-do-	-do-	-do-	4 0 15	
Practice Reduced Mk. IIT Foil.	-do-	2,100 Grns M.D. 4½	-do-	-do-	-do-	-do-	-do-	-do-	-do-	
Practice Reduced Mk. IIIT Foil.	-do-	-do-	-do-	-do-	-do-	-do-	-do-	-do-	-do-	
Practice Mk. IIIT Foil	-do-	- 9 0½ WT. 144-046 or WMT. 148-048	-do-	Shot Prac- tice Mk. VIIT IXT, XT or XIII.	-do-	-do-	-do-	-do-	4 4 15½	
Practice Mk. IIIT Foil.	-do-	- 10 0½ NQ/T 114-040	-do-	Shot Prac- tice Mk. VIIT XT or XIIIT	-do-	-do-	-do-	With Shot Prac- tice Mk. VIIT. 16.73; Shot Prac- tice Mk. IXT, XT, or XIIIT. 16.79½	4 5 15½	

CARTRIDGES G. F. 2 PDR. MKS. IX-XA (CONTD.)

Nature & Mark.	MAIN COMPONENTS							Complete Round		Package Nomenclature & Mark.
	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Fuze	Clip	Length (inches)	Weight (approx) lb. oz. dr.	
Practice Reduced Mk. IVT Foil.	No. 2 Mk. I	2,200 Grns W. O. 0 or W. M. O. 42	Perc. No. 12 Mk. I or II	Shot Practice Mk. VII. T.	No. 6 Mk. I or II	Nil	Ctge. No. 30	X See previous note	4 0 15	} See Previous note.
Practice Flat-headed Reduced Mk. IT Foil.	-do-	- 6 3 WT. 144-O. 8	-do-	Shot Practice, Flat-headed Mk. IT.	-do-	-do-	-do-	15.45	4 1 14	
Practice Flat-headed Reduced Mk. IIT Foil.	-do-	- 6 5 WT. 144-O. 8 or WMT. 148-O. 8	-do-	-do-	-do-	-do-	-do-	-do-	-do-	
Practice Flat-headed Reduced Mk. IIIT Foil.	-do-	4 3 350 grs 4 3 350 Grns M. D. 4 1/4.	-do-	-do-	-do-	-do-	-do-	-do-	4 0 9	
Practice Flat-headed Reduced Mk. IVT Foil.	-do-	-do-	-do-	Shot Practice, Flat-headed Mk. IIT. Foil.	Stomped Tracer cavity.	-do-	-do-	-do-	-do-	

Practice Flat-headed Reduced Mk. VT. Foil.	-do-	42,350 grs. 550 Grns R.D.B. 4 $\frac{1}{4}$.	-do-	Shot Prac- tice, Flat- headed Mk. IT.	No. 6 Mk. I or II.	-do-	-do-	-do-	-do-
Practice Flat-headed Reduced Mk. VIT. Foil.	-do-	-do-	-do-	Shot Prac- tice, Flat- headed Mk. IIT.	Stemmed Tracer cavity	-do-	-do-	-do-	-do-
Practice Flat-headed Reduced Mk. VIIT. Foil.	-do-	2,200 Grns W. 040 or W. M. 042	-do-	Shot Prac- tice, Flat- headed Mk. IT.	No. 6 Mk. I or II.	-do-	-do-	-do-	-do-
Practice Flat-headed Reduced Mk. VIIT. Foil.	-do-	0 6 5 WT. 144-048 or WMT. 148-048	-do-	Shot Prac- tice, Flat- headed Mk. IIT or IIIT.	Stemmed Tracer cavity	-do-	-do-	-do-	4 1 14
Practice Flat-headed Reduced Mk. IXT. Foil.	-do-	2,200 Grns W. 040 or W. 042.	-do-	-do-	-do-	-do-	-do-	-do-	4 0 9
Practice Flat-headed Reduced Mk. IXT. Foil.	-do-	0 6 5 WT. 144-048 or WMT. 148-048	-do-	Shot Prac- tice, Flat- headed Mk. VIIT.	-do-	-do-	-do-	-do-	4 1 14

Box Ammn.
C.198 Mk.I
or C.207
Mk.I or II
containing
16 Rounds
packed 8
Rds. per
container
Ammn. Mk.I.

CARTRIDGES, C.F. 2 PDR. MKS. IX-XA (CONTD.)

Nature & Mark	Case	MAIN COMPONENTS						Complete Round		Package
		Charge lb., oz., dr.	Primer	Projectile	Tracer	Fuze	Clip	Length (inches)	Weight (approx) lb., oz., dr.	
Practice Flat- headed Reduced Mk. XII. Foil.	No. 2 Mk. I.	2,200 Grns W.O.40 or W.M. 042	Perc. No. 12 Mk. I or II	Shot Prac- tice, Flat- headed Mk. VIIT.	Stemmed Tracer cavity.	Nil	Ctge. No. 30	15.45	4 0 9	Box Ammn. C.198 Mk. I or C.207 Mk. I or II containing 16 rounds, packed 8 Rds. per container Ammn. Mk. I.

A.P.C.B.C. Shot Mk. IT. foil * Box Ammn. C.289 Mk. I containing 16 Rounds, packed 8 Rds. per container Ammn. I or II each
rd. enclosed in Container Ctge. No. 66 Mk. I or Box B.167.A containing 12 Rounds each
rd. enclosed in container Ctge. No. 66 Mk. I.

Approximate weight, in lbs, per Box filled with complete Rounds and internal
packing containers.

Stowage dimensions (Inches)

Box	Contents	Weight lbs.
C.198. I.	Rounds with Shell H.E. H.V. Mk. I & Charges N.H.025 or F.N.H.023	113
-do-	" with Shell H.E. H.V. Mk. II & Charges N.H.025 or F.N.H.023.	110
-do-	" with A.P. Shot & Charges WT.144-048 or WMT.148-048.	117½
-do-	" with A.P. Shot & Charges NQ/T.114-040	118½
-do-	" with Shot A.P.C.B.C. & Charge WMT.148-048.	124½
-do-	" with Shot Practice & Charge NQ/T.114-040.	116½
-do-	" with " " & Charge WT.144-048 or WMT.148-048.	115½

Box C.198 I.	14.350 x 14.125 x 19.70
" C.207 I.	17.80 x 11.70 x 13.35
" C.207 II.	13.20 x 12.10 x 18.40

-do-	"	with Shot Practice & Charge W.040 or WM.042 or M.D. or R.D.B.4 $\frac{1}{4}$.	111 $\frac{1}{2}$
-do-	"	with Shot Practice Flatheaded & Charge WT.148-048, WMT.148-048.	104
-do-	"	with Shot Practice Flatheaded & Charge M.D.4 $\frac{1}{4}$ or R.D.B.4 $\frac{1}{4}$.	103
C.207 Mk.I	"	with Shell H.E. H.V. Mk. I & Charges N.H.025 or F.N.H.023	107
-do-	"	with Shell H.E. H.V. Mk. II & Charges N.H.025 or F.N.H.023.	104
-do-	"	with A.P. Shot & Charges WT.144-048 or WMT.148-048	111 $\frac{1}{2}$
-do-	"	with A.P. Shot & Charges NQ/T.114-040	112 $\frac{1}{2}$
-do-	"	with Shot A.P.C.B.C. & Charges WMT.148-048	118 $\frac{1}{2}$
-do-	"	with Shot Practice & Charges NQ/T.114-040	110 $\frac{1}{2}$
-do-	"	with Shot Practice & Charges WT.144-048 or WMT.148-048.	109 $\frac{1}{2}$
-do-	"	with Shot Practice & Charges W.040 or WM.042 or M.D. or R.D.B.4 $\frac{1}{4}$.	111 $\frac{1}{2}$
-do-	"	with Shot Practice Flatheaded & Charges WT.144-048 or WMT.148-048.	98
-do-	"	with Shot Practice Flatheaded & Charges M.D.4 $\frac{1}{4}$ or R.D.B.4 $\frac{1}{4}$.	97

N.B. When Box Ammn. C.207 Mk. II are used deduct 1 lb. from the above weights.

STATEMENT OF AMMUNITION

680. CARTRIDGES Q.F. 6 PR. 7 CTT.

Nature & Mark	MAIN COMPONENTS						Complete Round		Package	
	Case	Charge lb.oz.dr.	Primer	Projectile	Tracer	Fuze	Clip	Length (inches)	Weight (approx) lb.oz.dr.	Nomenclature & Mark
Shot A.P. Mk. IT Foil.	Mk. I or Mk. I.M.	1 13 8 Cordite WT.206-100 or WMT.211-100	Perc. No. 15 Mk. II	Shot A.P. Mk. IT, IIT IIT or IVT.	Stemmed Tracer cavity filling	Nil	Ctge.No.36	23.48	12 1 14	Box Ammn. C.263 Mk. I or Box Ammn. C.264 to hold 4 in Container Ctge. No. 42 I or II to hold 1.
Shot A.P. Mk. IIT. Foil.	-do-	2 5 6 N.H.033.	-do-	-do-	-do-	Nil	-do-	-do-	12 9 12	-do-
Shot H.V. A.P. Mk. IIT. Foil.	-do-	2 7 0 N.H.033	-do-	-do-	-do-	Nil	-do-	-do-	12 12 2	-do-
Shot A.P. Mk. IIT Foil.	-do-	1 13 8 Cordite WT.206-100 or WMT.211-100	-do-	Shot A.P. Mk. VT, VIT or VIIT.	-do-	Nil	-do-	-do-	12 1 14	-do-
Shot A.P. Mk. IVT. Foil.	-do-	2 5 6 N.H.033	-do-	-do-	-do-	Nil	-do-	-do-	12 9 12	-do-
Shot H.V. A.P. & IIT Foil.	-do-	2 7 0 N.H.033	-do-	-do-	-do-	Nil	-do-	-do-	12 12 2	-do-

Shot A.P.C Mk. IT. Foil.	-do-	1 13 8 Cordite WT. 206-100 or WMT. 211-100	-do-	Shot A.P.C Mk. VIIT.	-do-	Nil	-do-	23.44	12 1 14	-do-
Shot A.P.C Mk. IIT. Foil.	-do-	2 5 6 N.H. 033	-do-	-do-	-do-	Nil	-do-	-do-	12 9 12	-do-
Shell H.E. Mk. IT. Foil.	-do-	2 5 4 N.H. 033	-do-	Shell H.E. No. 13 6 Pr. Mk. VIIT	Fuze Perc. DA. No. 331-1-7-1. Mk. I, II or III.	-do-	24.69	12 9 12	Box Ammn. C. 263A. Mk. I to hold 4 in container No. 49 to hold 1.	
Shell H.E. Mk. IIT. Foil.	-do-	-do-	-do-	Shell H.E. 6 Pr. Mk. XT.	-do-	-do-	-do-	-do-	12 9 12	-do-
Shell H.E. Mk. XT.	-do-	-do-	-do-	Shell H.E. Mk. IT. Foil.	Fuze Perc. DA. No. 370	-do-	-do-	-do-	Box Ammn. C. 264.	
Practice Mk. IT. Foil.	-do-	2 5 6 N.H. 033	-do-	Shot Prac- tice Mk. IT or IIT.	Stemmed Tracer cavity filling	Nil	-do-	24.12	12 8 0	Box Ammn. C. 263A Mk. I with container Ammn. No. 59 Mk. I
Practice Mk. IIT. Foil.	-do-	1 13 8 Cordite WT. 206-100 or WMT. 211-100	-do-	Shot Prac- tice Mk. IIT.	-do-	Nil	-do-	-do-	12 0 2	-do-
Practice Mk. IIT. Foil.	-do-	2 5 6 N.H. 033	-do-	Shot Prac- tice Mk. IIT, IIT, VT, or VI	-do-	Nil	-do-	-do-	12 8 0	-do-

Deleted
100 Bullets
100 32

CARTRIDGES Q.F. 6 PR. 7 CWT. - CONTD.

Nature & Mark	MAIN COMPONENTS							Complete Round		Package
	Case	Charge lb. oz. dr.	Primer	Projectile	Tracer	Fuze	Clip	Length (inches)	Weight (approx) lb. oz. dr.	Nomenclature & Mark.
Practice IVT Foil.	Mk. I or Mk. I. M.	1 13 8 Cordite WT. 206-100 or WMT. 211-100	Perc. No. 15 Mk. II	Shot Prac- tice Mk. IIIT IVT, VT or VIT.	Stemmed Tracer cavity filling	Nil	Otge. No. 36	24.12	12 0 2	Box Ammn. C. 263A Mk. I w/contain- er Ammn. No. 59 Mk. I
Practice Flat- headed Reduced Mk. IT Foil.	-do-	1 1 6 Cordite WM. 061	-do-	Shot Prac- tice Flat- headed Mk. IT, IIT, IIIT or IVT.	-do-	Nil	-do-	23.05	11 5 12	Box Ammn. C. 236 Mk. I w/contain- er Otge. No. 61.
Practice Flat- headed Reduced Mk. IIT Foil.	-do-	1 5 0 N. H. 025	-do-	-do-	-do-	Nil	-do-	23.05	11 9 6	-do-

Box 263 or 263A	W.T. 206-100 or W.M.T. 211-100	Weight lbs.	72.	Stowage dimensions	27.50 x 8.50 x 8.00
-do-	N.H. 033	"	lbs. 74	-do-	
-do-	W.M. 061	"	lbs. 69	-do-	
-do-	N.H. 025	"	lbs. 70	-do-	

681. CARTRIDGES Q.F. 17 PR.

A.P. Shot Mk. II Foil.	Mk. I	8 2 0 N.H. 055	Perc. No. 9 Mk. III	Shot A.P. Mk. IIT or IIIT	Stemmed Tracer Cavity	Nil	No. 37 Mk. I or Mk. II.	32.74	35 8 0	Box Amm. C. 274 Mk. I to hold 2.
A.P.C. Shot Mk. IT Foil.	-do-	-do-	-do-	Shot A.P.C. Mk. IT or IVT.	-do-	Nil	-do-	32.31	-do-	-do-
Shot Prac. Mk. IT Foil.	-do-	7 14 0 NCT 065	-do-	Shot Prac. Mk. IT, IIT, IIIT, IVT, VT or VIT.	-do-	Nil	-do-	32.69	33 15 9 35 4 0	-do-
Mk. V Shot. Mk. VI Shot.										
Practice Flat- headed Reduced Mk. IT Foil.	-do-	3 9 0 N.H. 033	-do-	Shot, Prac. Flatheaded Mk. IT, IIT, IIIT or IVT.	-do-	Nil	-do-		31 1 0	-do-

Box C. 274-I. Stowage dimensions. 36.375" x 15.00" x 8.80".

"	"	Approximate weight filled with A.P.C. or A.P. Shot	-	102-lb.
"	"	" " " " Shot Practice Mk. V	-	99-lb.
"	"	" " " " Mk. VI	-	101½-lb.
"	"	" " " " Flatheaded	-	93½-lb.

682. RUSTPROOFING - FUZES AND GAINES.

The surfaces of fuzes and gaines not in contact with explosives may be rustproofed by electro plating with zinc and this process may also be used with surfaces in contact with T.N.T. R.D.X./T.N.T., R.D.X./B.W.X. or C.E.

683. FUZES NO.151 AND 152.

To facilitate factory assembly of these fuzes the locating pin and corresponding slots in septum and disc will be omitted with No.151 fuzes. In addition, copper septums will no longer be used with either No.151 or 152 fuzes, being replaced by tinplate septums in future.

684. GRENADE, HAND, NO.75, ANTI-TANK MK. I - MARKINGS.

Reference Bulletin No.23, Item 373. For the detail under sub-heading "Markings" substitute the following :-

"The presence of the H.E. filling is indicated by the buff coloured body and the red ring around the neck.

When filled Ammonal or Burrowite the top of the screw cap is painted pink. Grenades filled Ammonal will have the letter 'A' stencilled on the side opposite to that carrying the striker plate and will be known as No.75A grenades (see Bulletin No.25, Item 429).

The following details are stencilled on the base of the grenade:-

"704B" when filling consists of this explosive only.

"704B and 4 Exprs" when thus filled.

"4 Exprs" when filled Ammonal.

"BUR & 4 Exprs" when filling comprises Burrowite and 4 exploders.

Monogram of firm or filling station.

Month and year of filling.

Lot number. "

~~685~~ AMENDMENTS.

Bulletin No.23, Item 373. After line 22 insert "(d) Burrowite and 4 Exploders" line 26 (as amended by Bulletin No.24, Item 410).

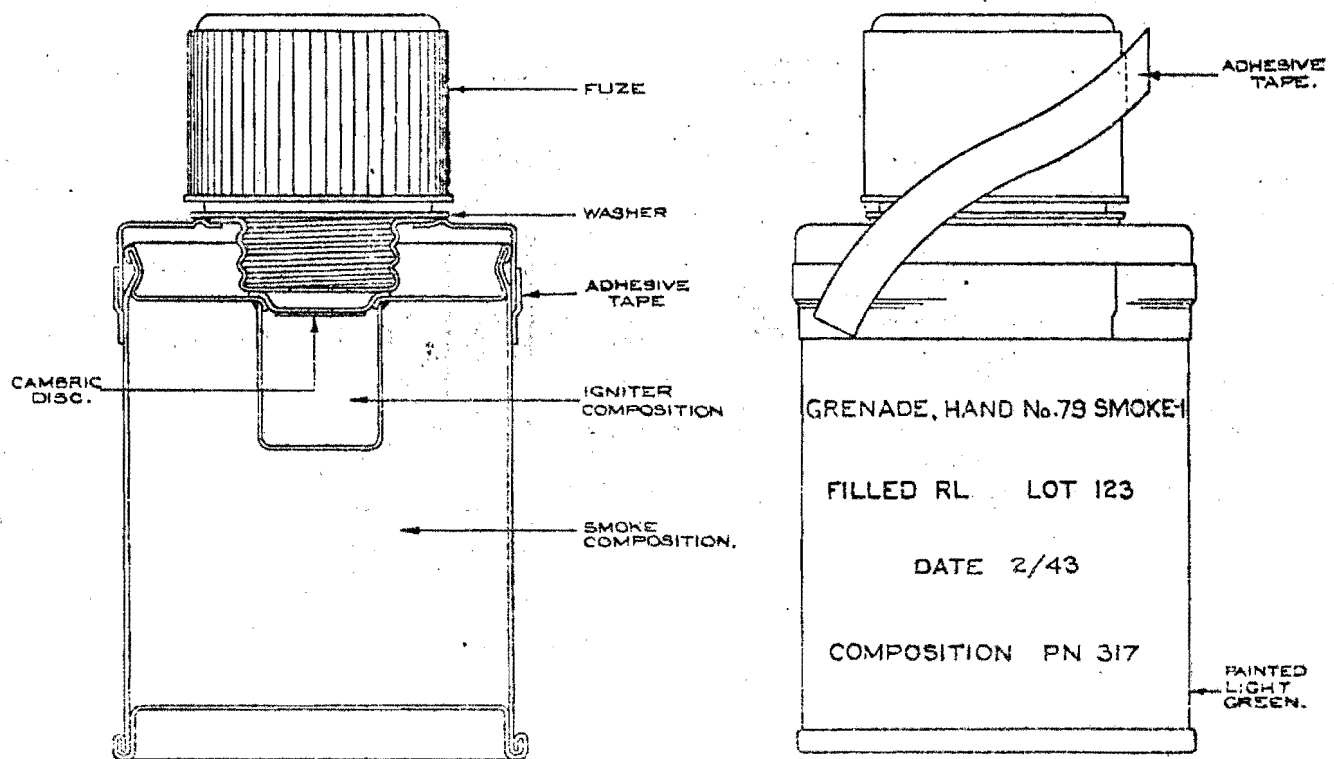
Delete "2 lb. 4 ozs." and substitute "2 lb. 2 ozs."

✓ Line 27 "Markings". Delete detail and substitute "See Bulletin No.32 Item 684".

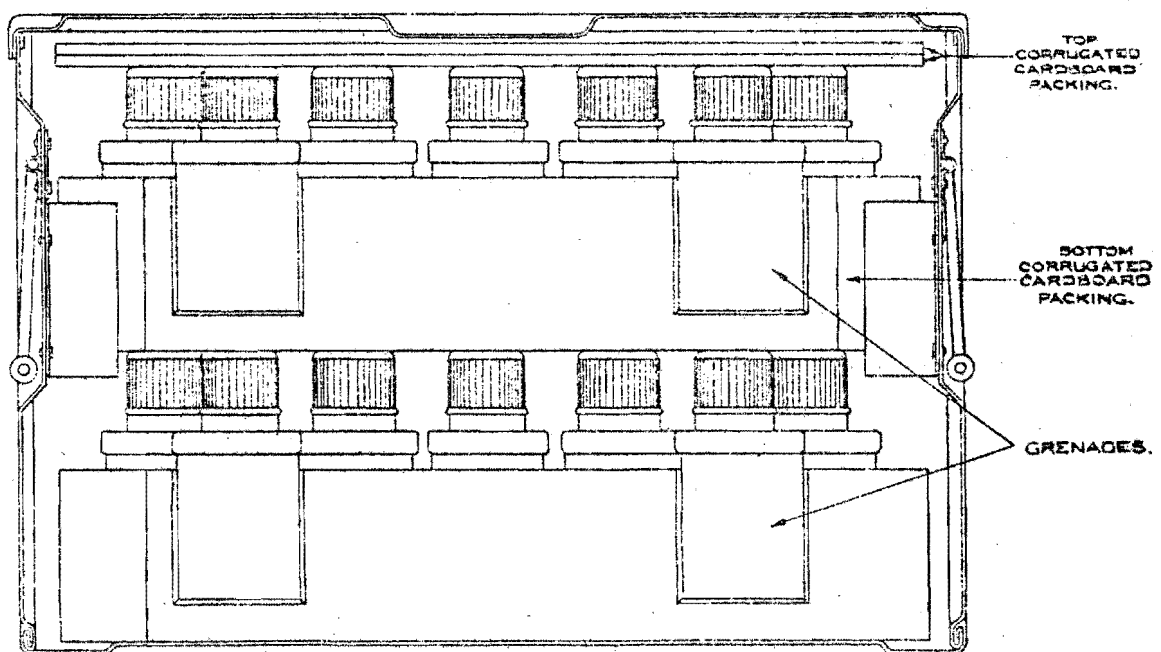
✓ Page 15, line 6. (as amended by Bulletin No.24, Item 410) Delete "40 lb. and substitute "31 lb."

Bulletin No.31, Fig.259. ✓ Arrow indicating "Stg ":- delete lettering "Cast iron shell" and substitute "Cast steel shell".

FIG. 265. (ITEM 637.)
HAND GRENADE No. 79.



Scale, $\frac{1}{2}$

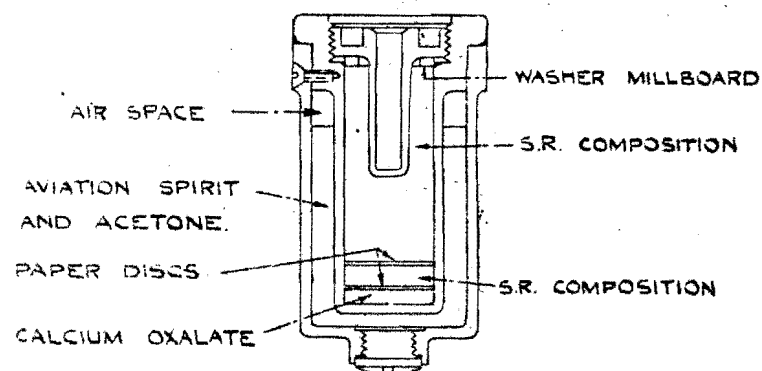


Scale $\frac{1}{4}$

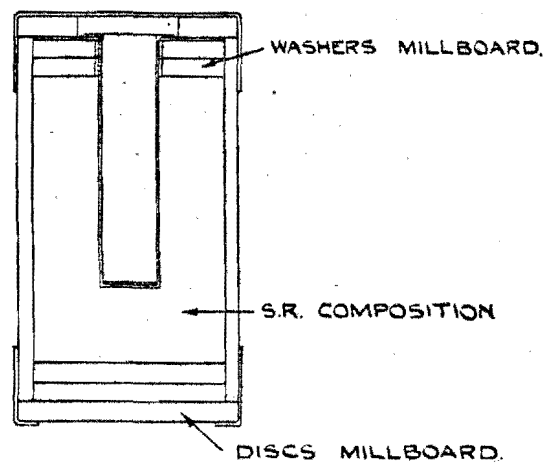
METHOD OF PACKING L. BOX B.166 MK II.

STOWAGE 19.7" x 13.0" x 13.2" DEEP.
 PAINTED GREEN.

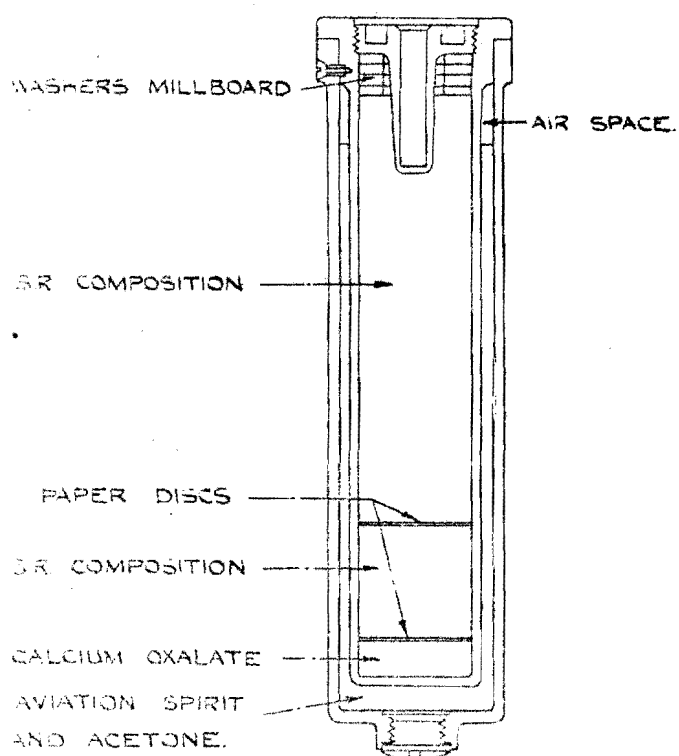
SIMULATOR GUNFLASH N°5



SIMULATOR GUNFLASH N°1 M^KII



SIMULATOR GUNFLASH N°3



SIMULATOR GUNFLASH N°4

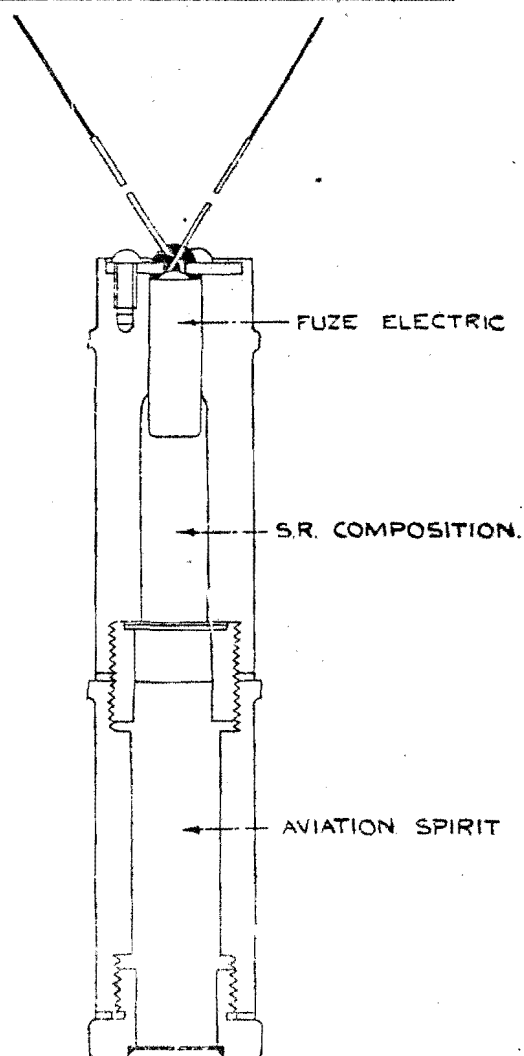
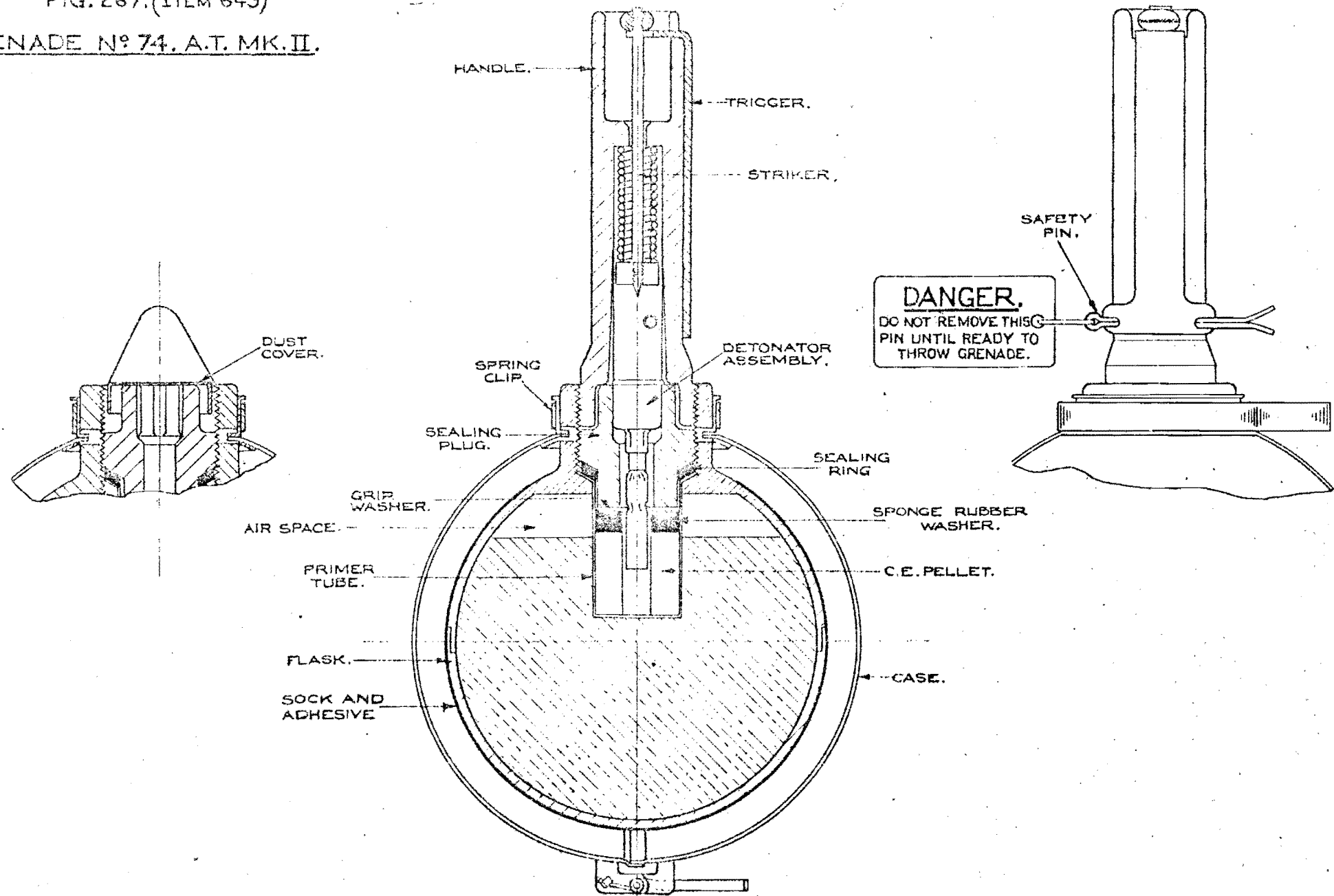


FIG. 267. (ITEM 649)

HAND GRENADE N° 74. A.T. MK. II.



BOMB S.B. H.E. ANTI-TANK 3 INCH GUN COMPLETE ROUND

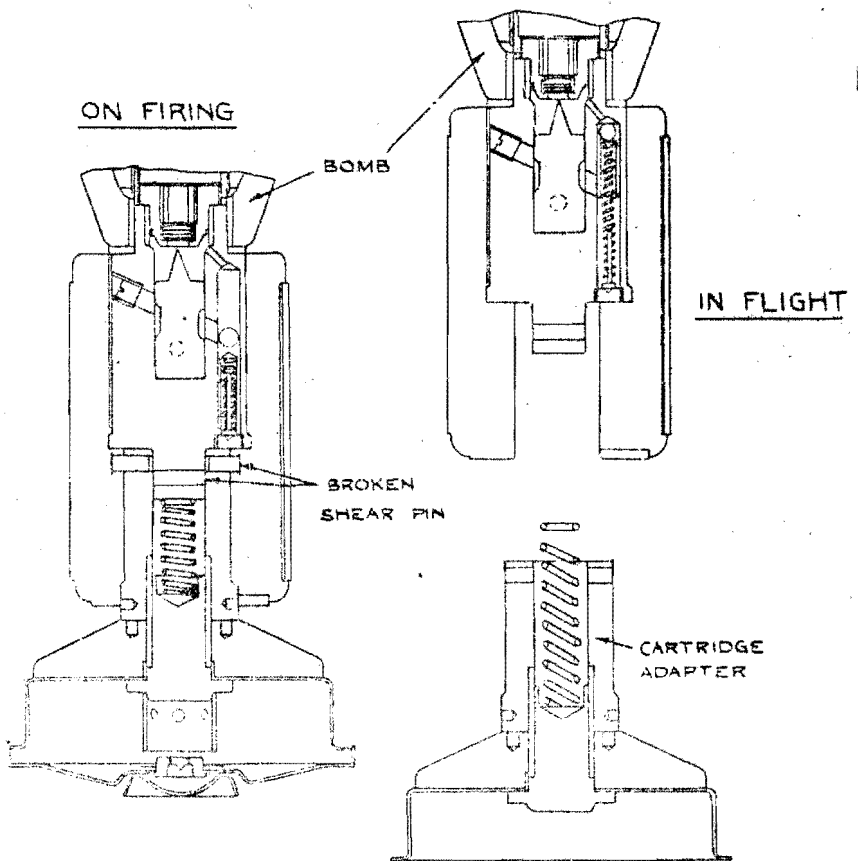
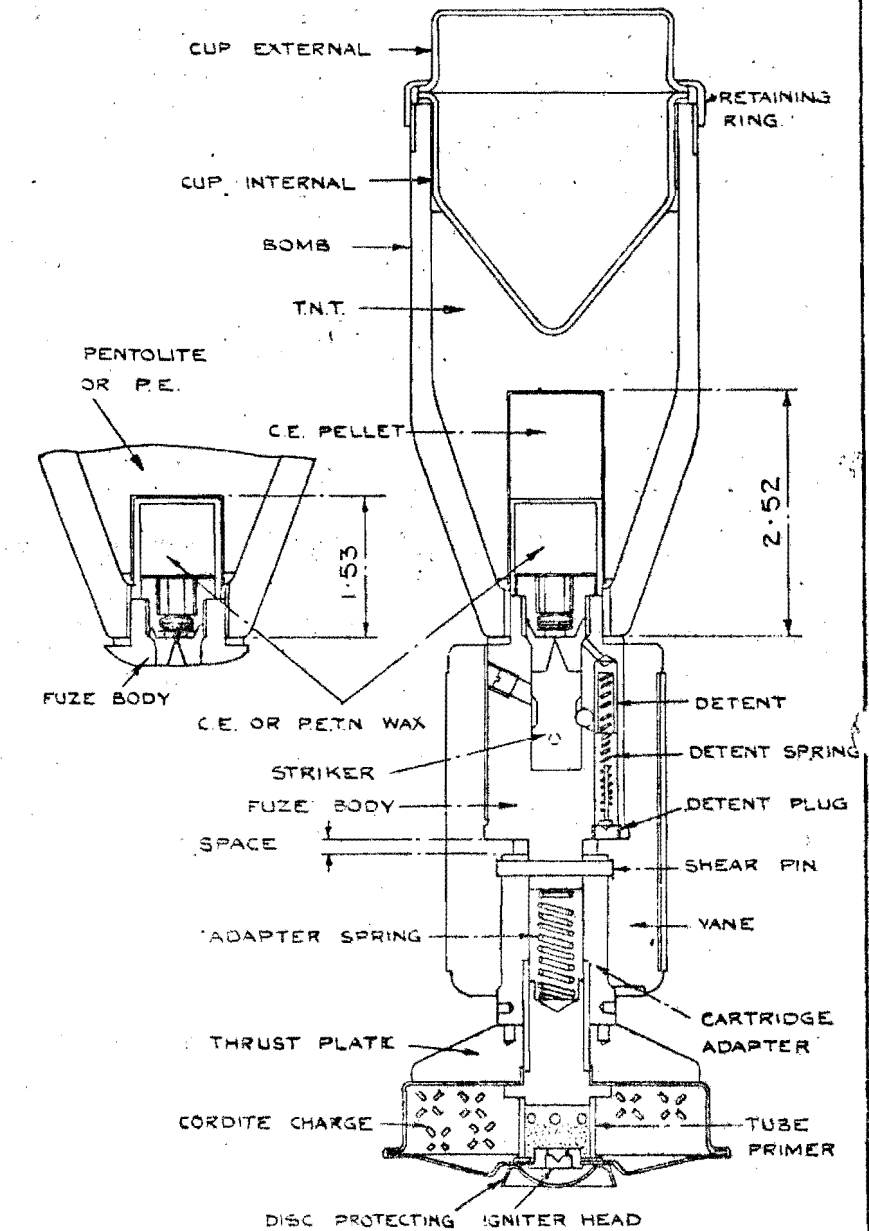
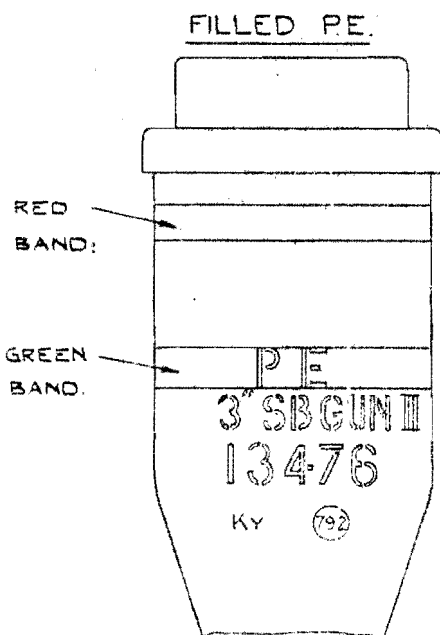
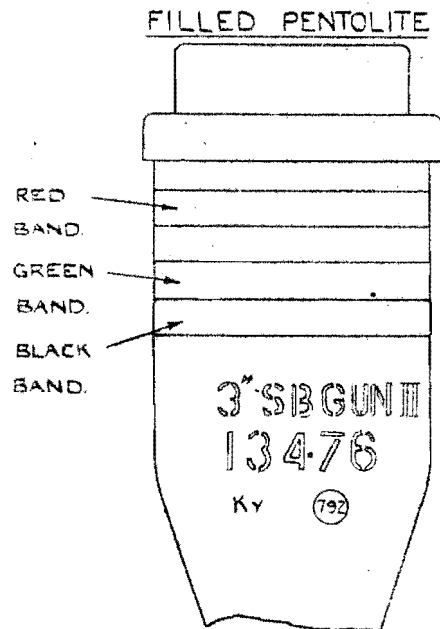
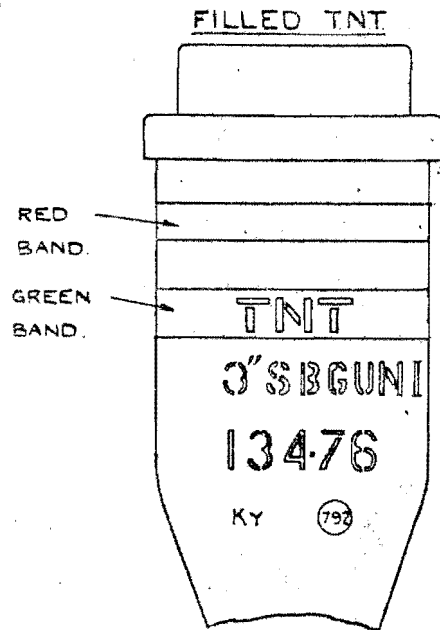


FIG. 269 (ITEM 600)
ITALIAN SHELL TYPICAL MARKINGS.
 (FOR 100/17 HOLLOW CHARGE SHELL SEE BULLETIN N° 30 FIG. 243.)

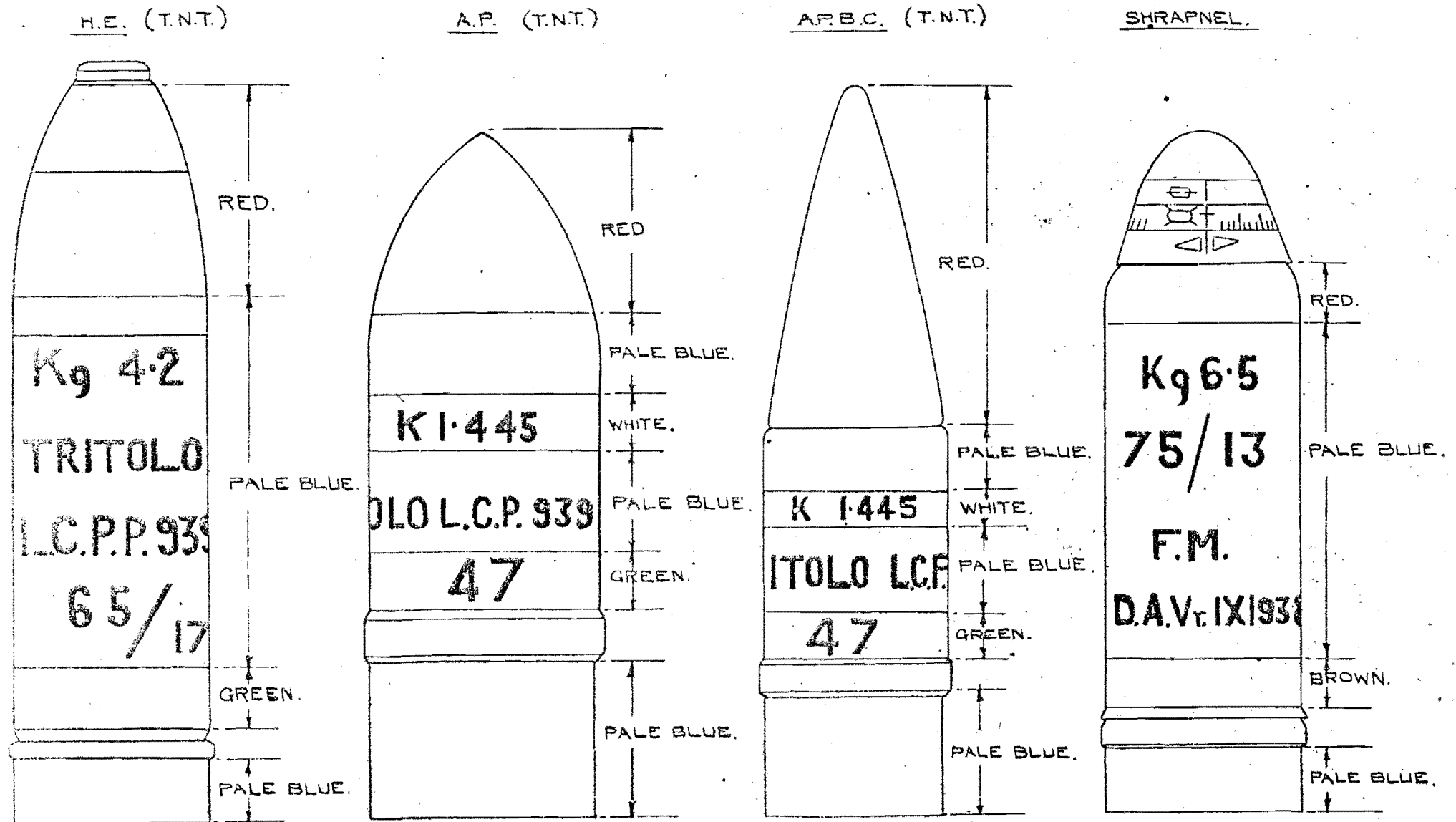


FIG. 270 (ITEM 667.)

ITALIAN, PRIMER, PERCUSSION, Q.F. CARTRIDGE, MODEL 35.

BASE STAMPINGS.

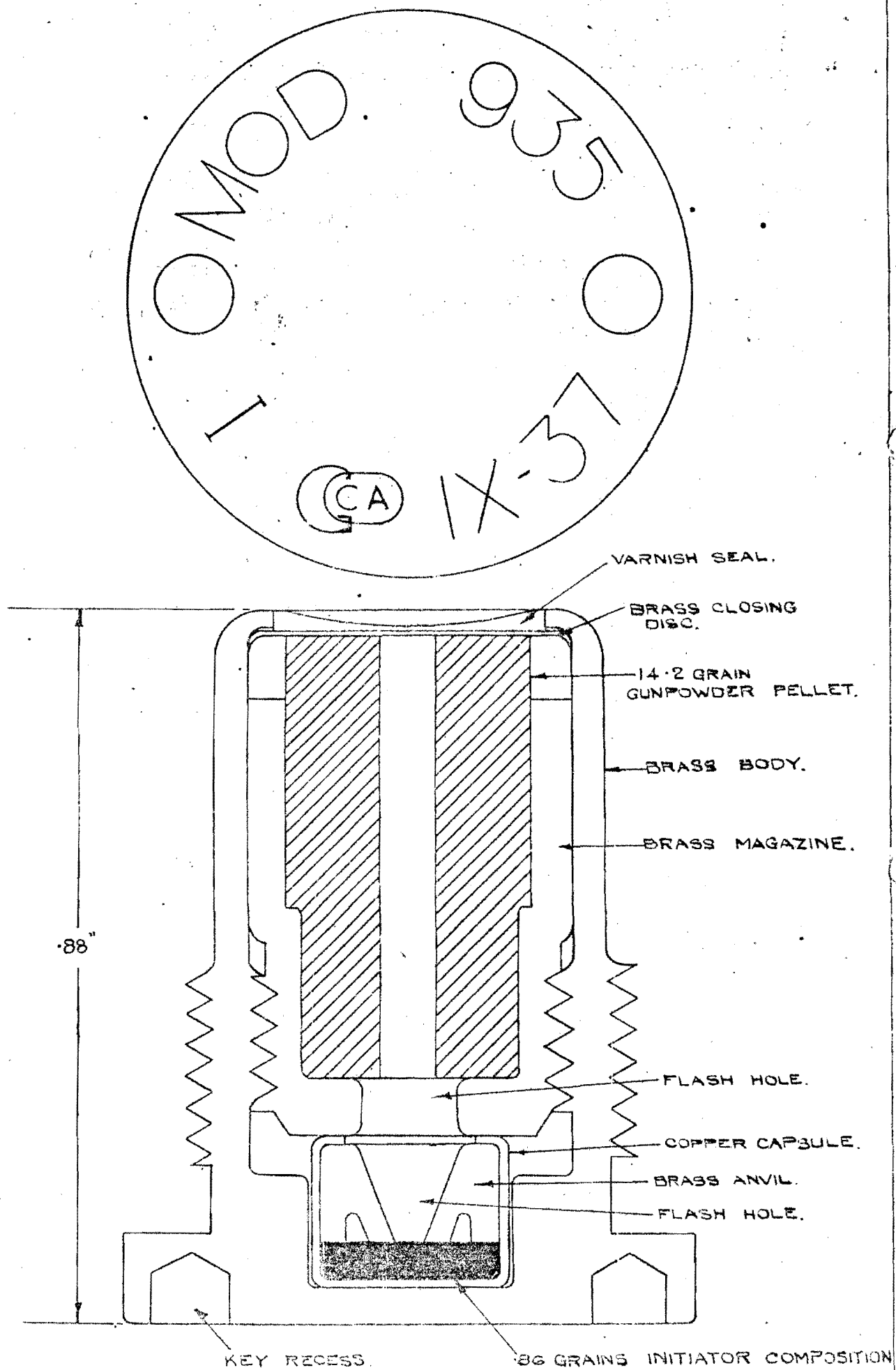


FIG 271 (ITEM 008.)
ITALIAN GAINES FOR H.E. & PIERCING SHELL.

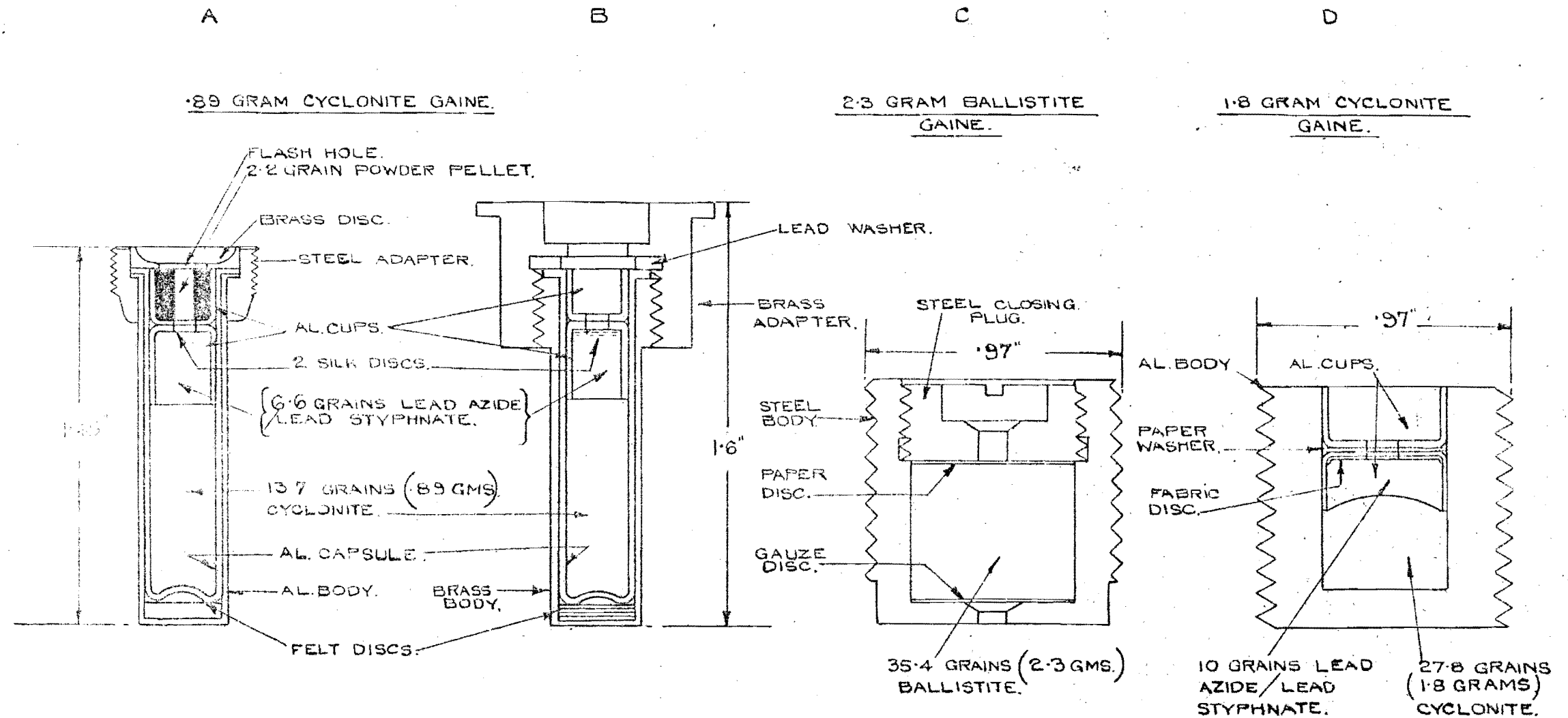
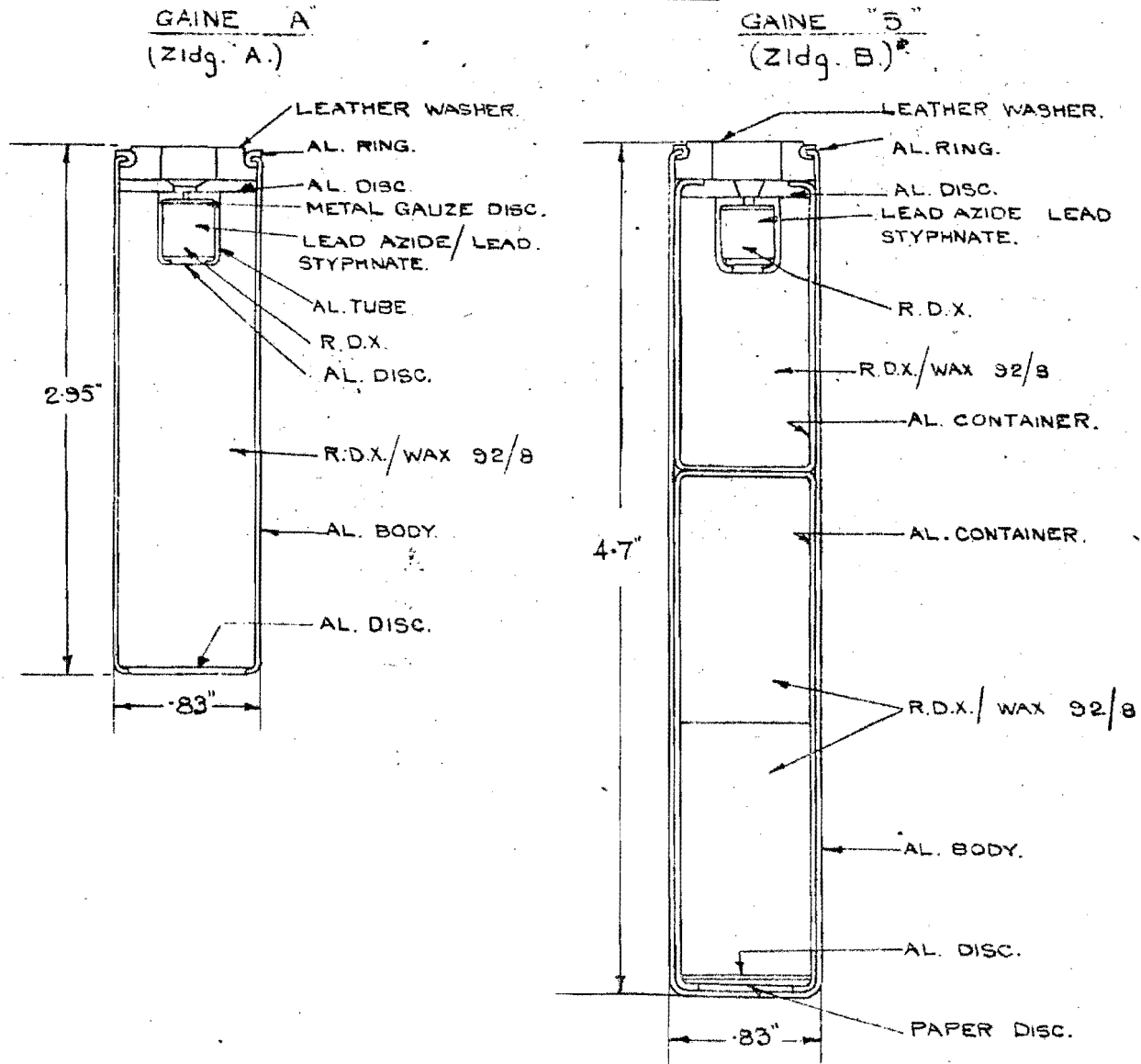


FIG. 272 (ITEM 669.)
GERMAN GAINES



DETONATOR OF GAINE "A."

DETONATOR OF GAINE "B."

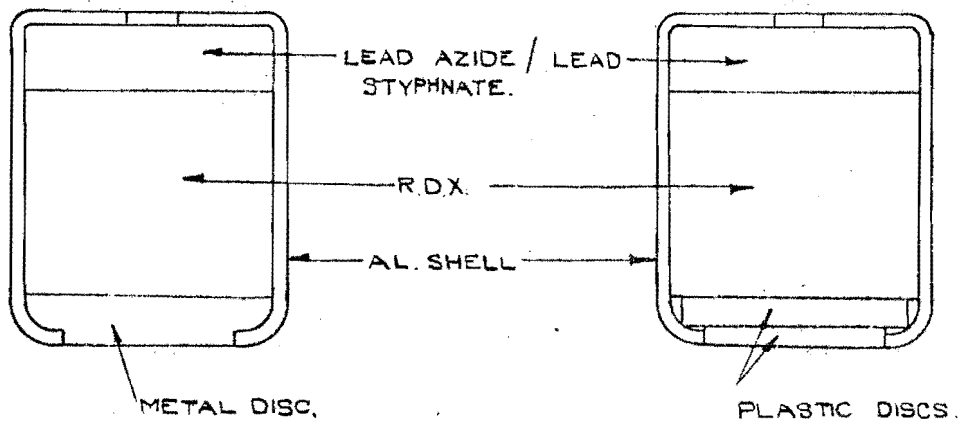


FIG.273.(ITEM 670)
GERMAN TRACERS FOR BASE FUZES.

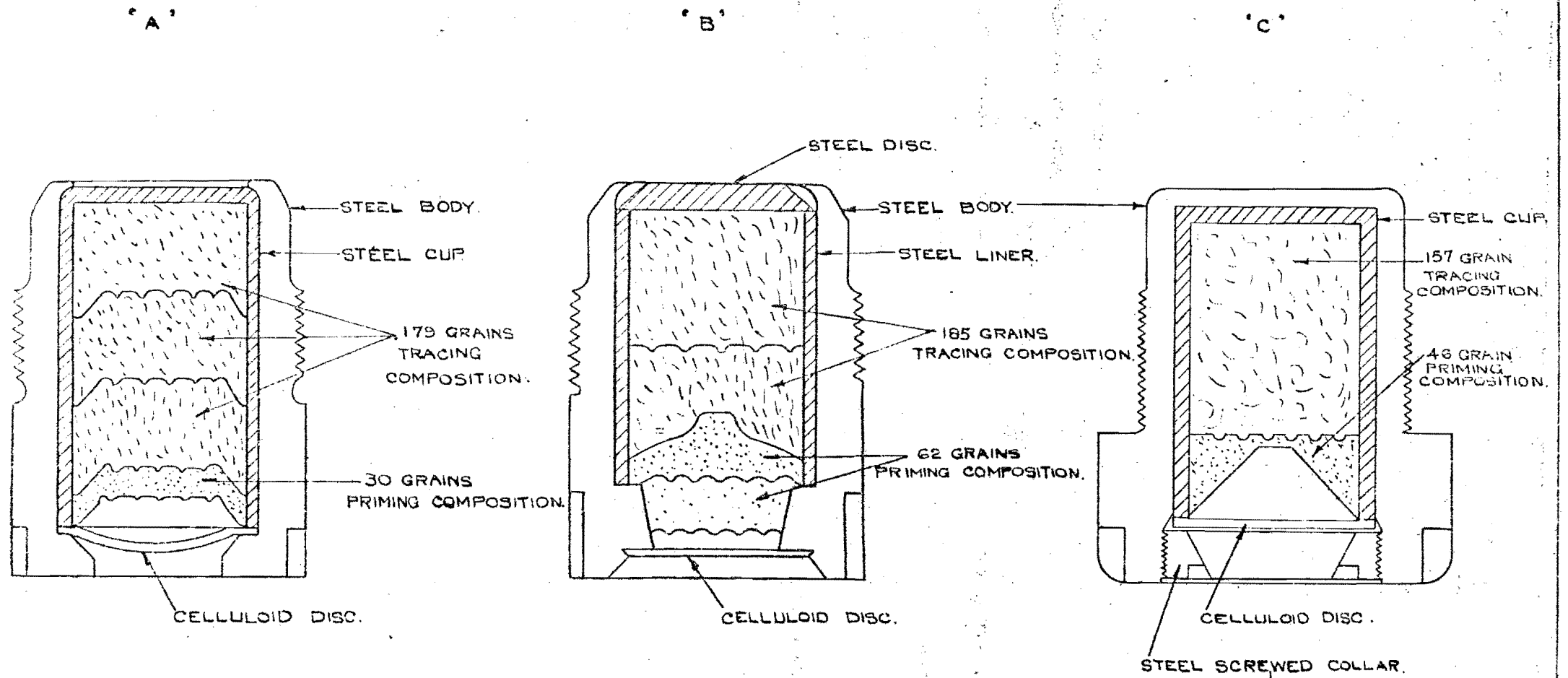
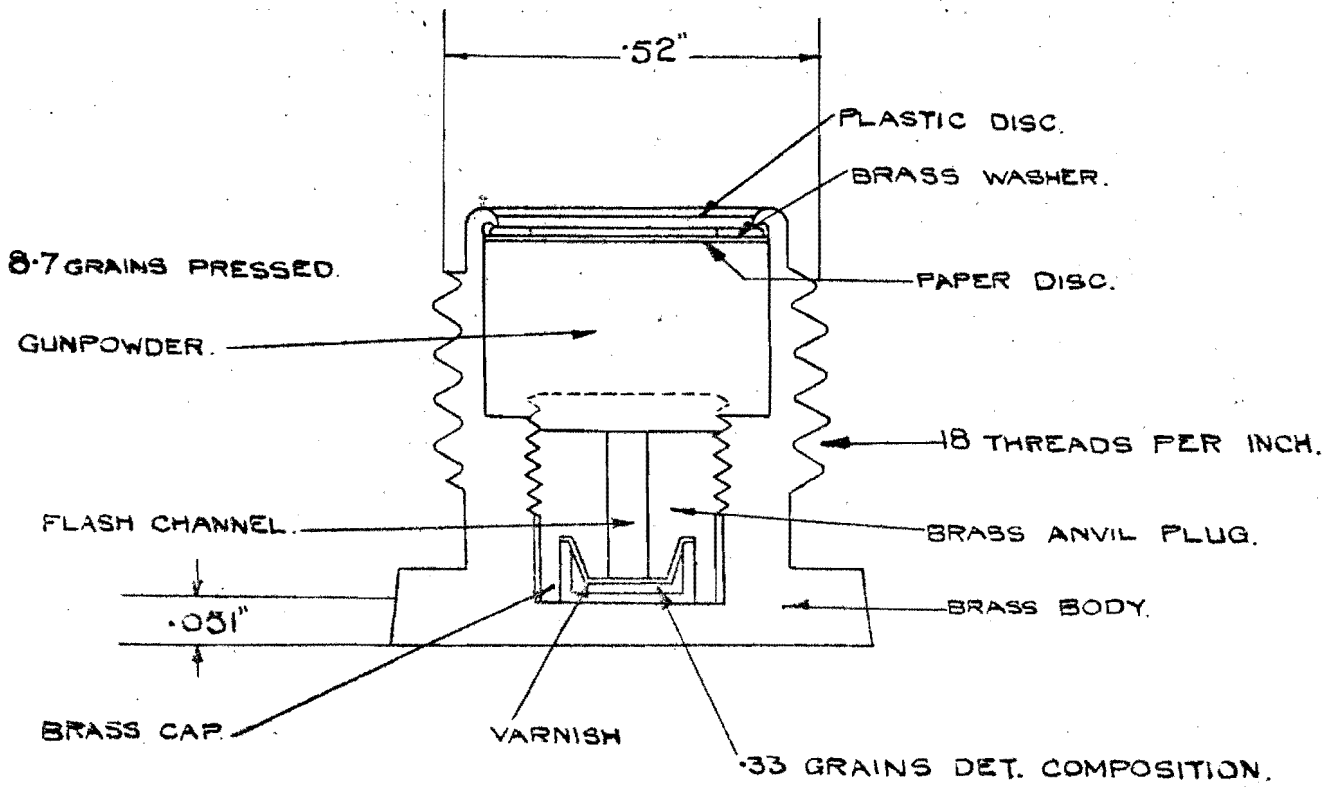


FIG. 274 (ITEM 671)

GERMAN PRIMER, PERCUSSION, Q.F., CARTRIDGE, C/13 n A.



BASE STAMPINGS.

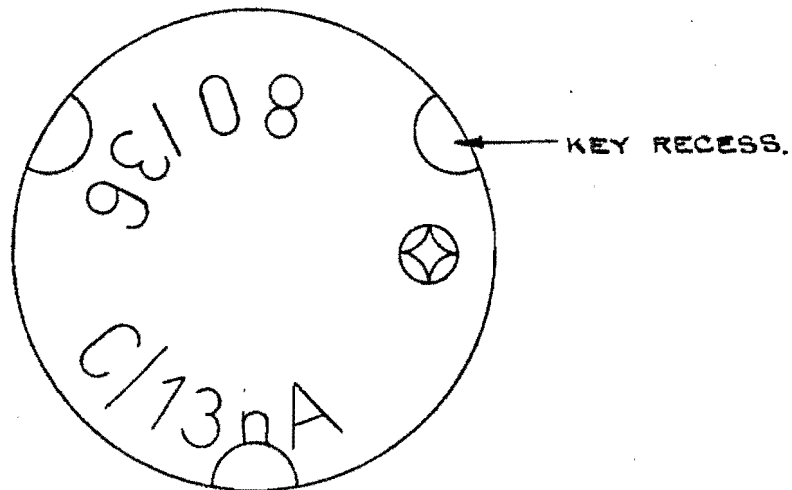
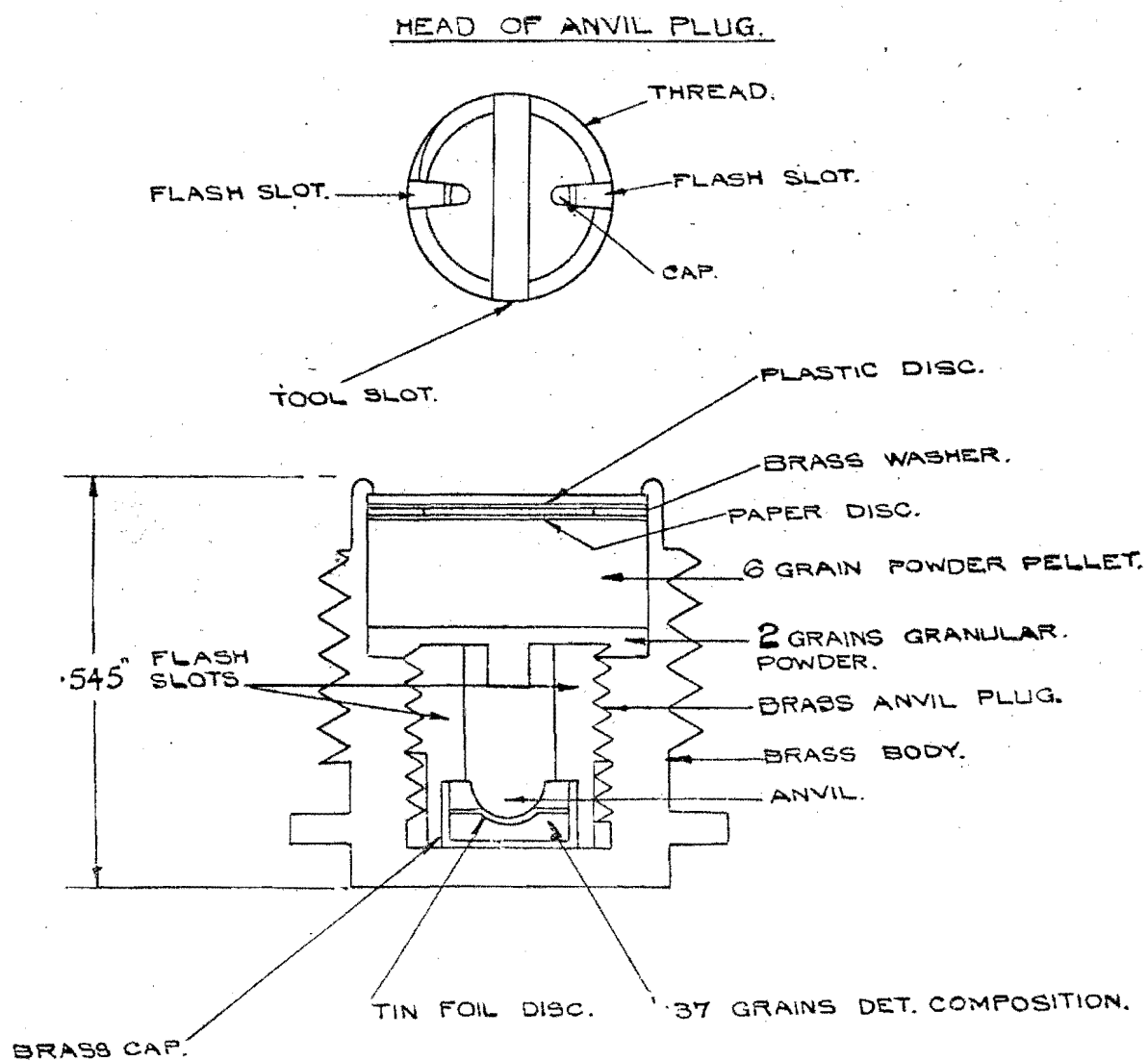


FIG. 275 (ITEM 072)
GERMAN PRIMER, PERCUSSION, Q.F. CARTRIDGE C/33.



BASE STAMPINGS.

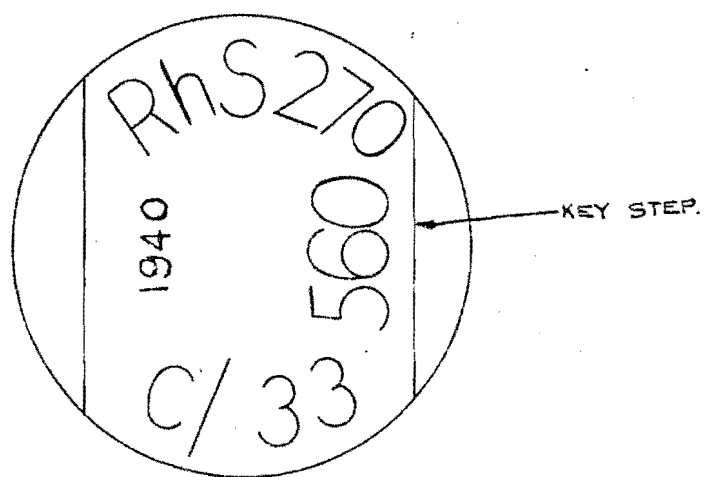


FIG. 279 (ITEM 676)
JAPANESE H.E. STICK GRENADE.

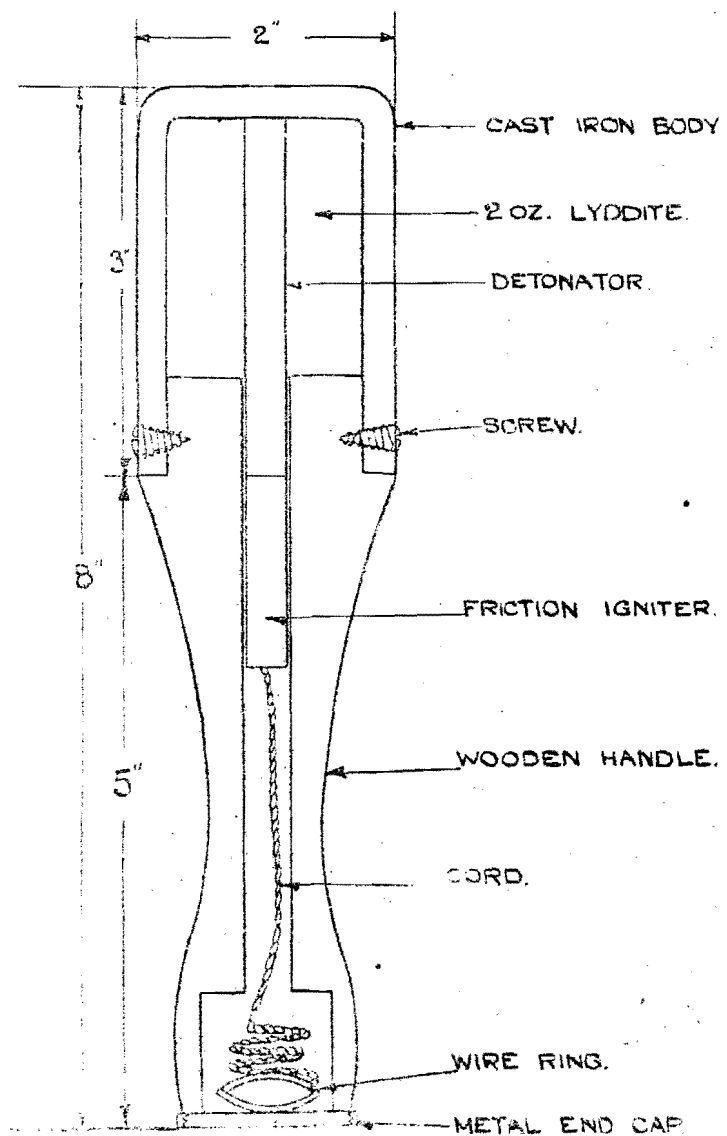


FIG. 280 (ITEM 677)
JAPANESE 7 cm. H.E. SHELL.

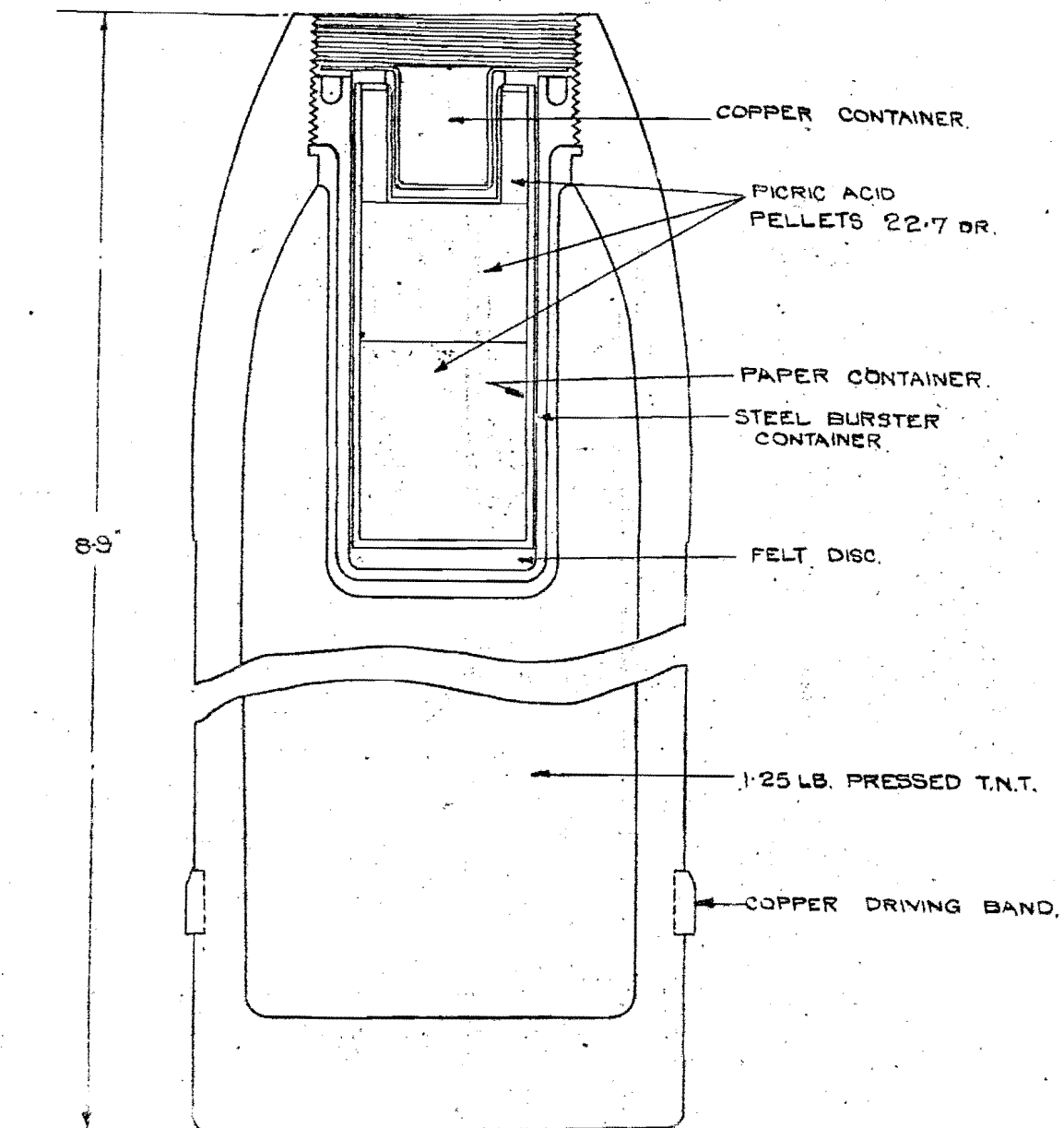


FIG. 28). (ITEM 678)
JAPANESE 7.5 cm. H.E. SHELL.

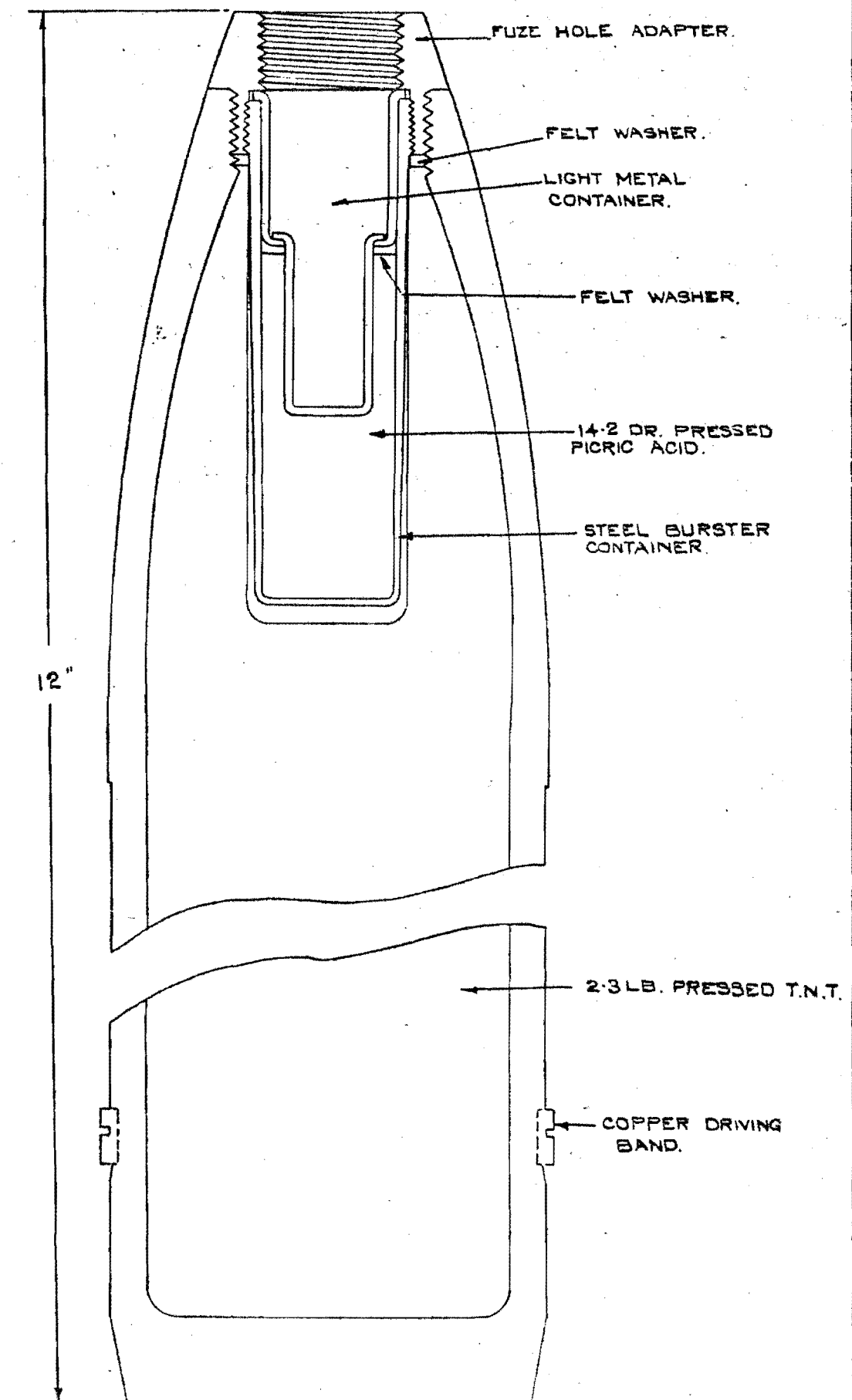


FIG. 277 (ITEM 674.)

JAPANESE H. E. HAND GRENADE.
THESE CHARACTERS INSCRIBED ON TUBE:-
"CH ⑤ 東☆3大 + 17 1/2"
(CH ⑤ TOKYO ☆ MARCH 1941.)

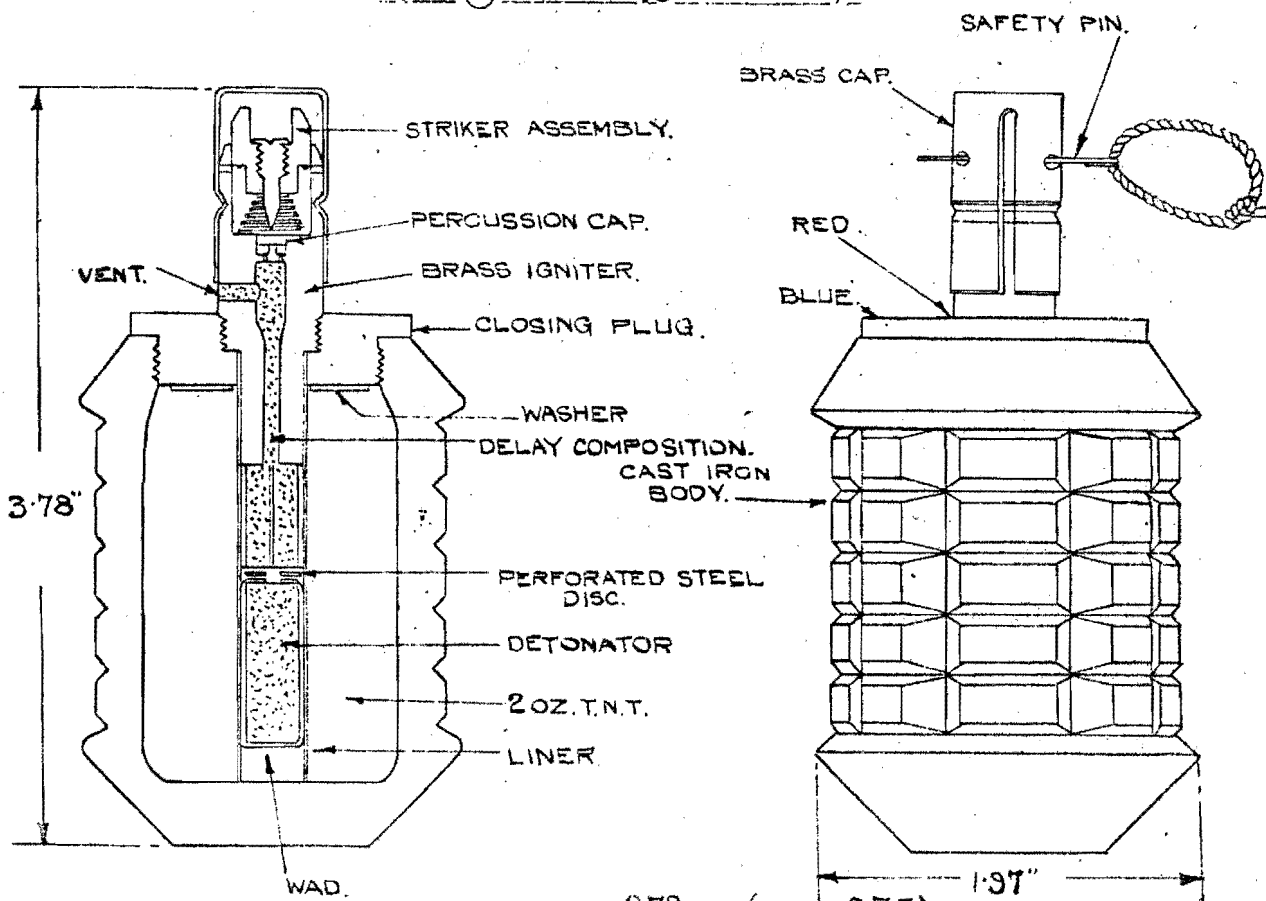


FIG. 278 (ITEM 675)

JAPANESE 50mm. H.E. MORTAR GRENADE.

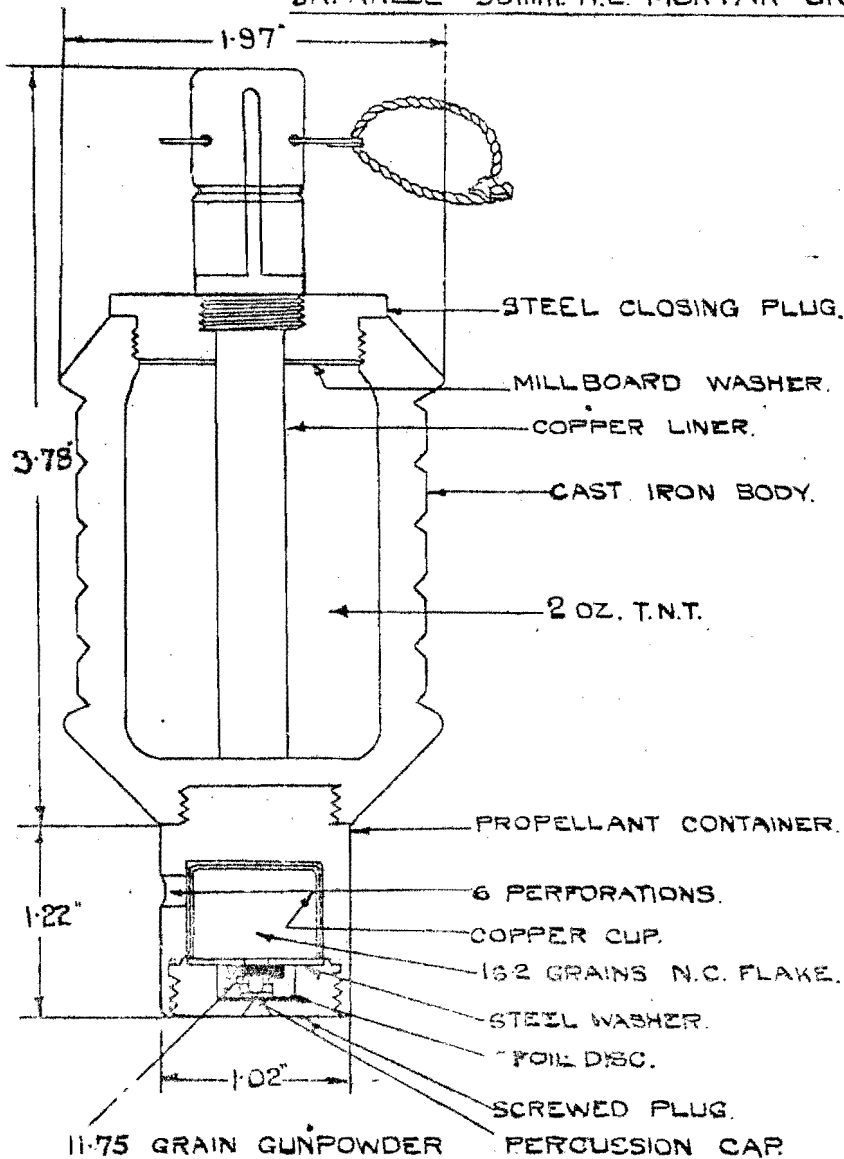


FIG. 282 (ITEM 678)
JAPANESE 7.5 cm. HE. SHELL.

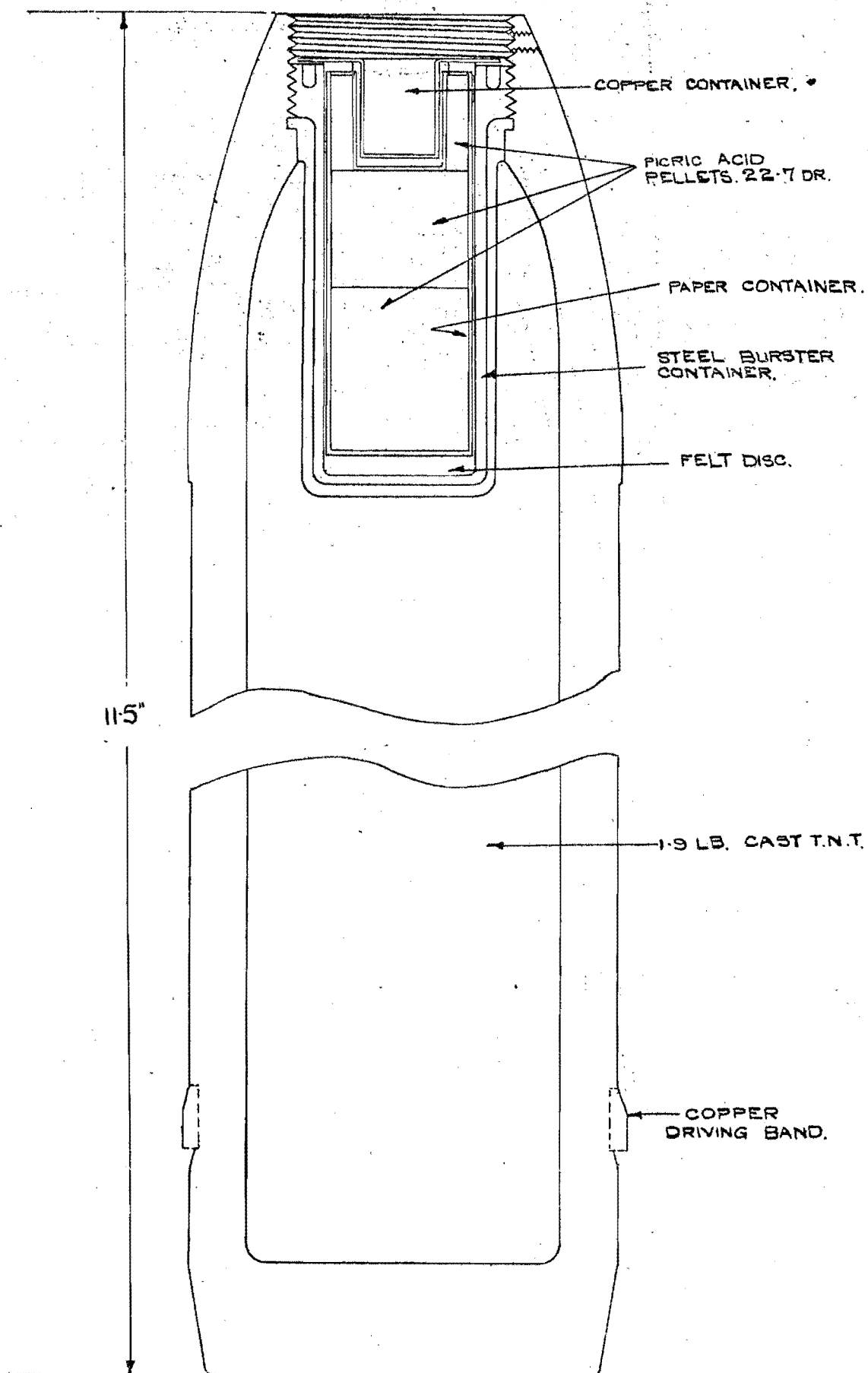


FIG. 278 (ITEM 873)

GERMAN 8cm. H.E. MORTAR BOMB AND CARTRIDGES.

