

AMMUNITION BULLETIN Nº 36

ITEMS 845-888

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THE CHIEF INSPECTOR OF ARMAMENTS

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ITEM NO.

- 870 Grenade, hand, No.77 Mks. I & II - Fuze.
861 Grenade, hand, No.79, Smoke.
877 H.C. Powder for various types of S.A.A. 1943.
868 Primers for Q.F. Ammunition.(FIGS.338 - 341).
855 Projectile, practice, Q.F. Anti-tank, 40 m.m. Mk.IV.
859 Shell, Q.F. H.E. 17 pr. Method of Filling.
852 Shell, Q.F. H.E., 25 pr. Fillings.
872 Shell, B.L., H.E. Streamline 5.5 in. 80 lb.
847 Tracers and Igniters, Shell, No's 10 to 15 inch.

ENEMY AMMUNITION.

GERMAN

- 881 Fuze and main detonator for teller mine 42.(FIG.344).
882 Teller mine 35, main detonator and functioning load. (FIG.345).
883 13.5 Kg. demolition charge with hollow charge.(FIG.346).
884 3 Kg. magnetic hollow charge.(FIG.347).
885 10 cm. K18, Q.F. cartridge.(10.5 cm gun-how).
886 3.7 cm Cartridge, Q.F.,A.P.C.with fuze B.Z.15 (Czech origin).
(FIGS.348 & 349).
887 Primer, percussion, Q.F. Cartridge, Vz 33 (Czech origin).(FIG.350).

ITALIAN

- 888 75/27 C.K. and 75/27 A.V. cartridge, Q.F.,H.E.,fragmentation.
(FIG.351).

AMENDMENTS.

- Bulletin No. 34. Item 762. Line 5. Delete "No.831" and substitute "No.83"
" " 35. " 828. Line 2. Delete "emission" and substitute
"ejection"
" " 35. " 835. Page 10. Under list of guns COAST ARTILLERY.
B.L.9.2 in. Mks.X, Kv, and X*. Col.2.Delete
".5 inch" and substitute ".4 inch".
" " 35. " 836. Page 13. Line 8. Delete "composition 252" and
substitute "composition 585".

845. CE/TNT SLABS.

The Slab, Demolition, CE/TNT Mark I has been approved. It is rectangular in shape and consists of approx. 1 lb. CE/TNT. 70/30 in a waxed cardboard container. Two primer sockets are provided and the container is marked "SLAB CE/TNT I" with Contractor's Initials or recognised Trade Mark and Year of Manufacture. Dimensions are $4\frac{1}{2} \times 2\frac{1}{4} \times 1\frac{3}{4}$ inches.

For details of packing see Bulletin No.34 Item No.756.

846. COVER, 2 in. TIME OR T. & P. FUZE, NO. 5 & 6.

A new design of securing band (Phoenix type) which dispenses with the use of a securing wire, has been approved for the abovementioned fuze covers.

The new design of band will be designated "Band securing fuze cover No.2."

847. TRACERS AND IGNITERS, SHELL, NO's 10 to 15 inch.

The bodies of the above quoted tracers will, in future, be made from V.I.B. steel and will have the letter 'B' added after the mark.

848. CARTRIDGES, M.L., 3 inch MORTAR.

The following combinations of primary and secondary charges for 3 inch M.L. Mortar have been approved:-

1. Primary for filling in Gt. Britain

Mk.IX type filled 90 grs. Ballistite B.16 and primed 10 grs.N.C.(Y).

2. Primary for filling in Canada.

Mk.IX type filled 91 grs. 81 mm. Hercules powder 0.005 inch thick (graphited) and primed 10 grs. N.C.(Y).

6 secondaries for use with either of the above primary charges, each filled 180 grs. 0.303 inch Canadian N.C. rifle powder Mk.VIII, uncoated, in celluloid containers.

3. The primary and secondary charges quoted above for filling in Canada are made from propellants of Canadian manufacture. It has been found that the use of N.C.(Y) for priming increases the pressure and improves smokelessness. To obtain more satisfactory combustion of the secondaries when using the above primary charges the wood plug is removed from the bomb tail, the primary charge being retained by a safety pin instead of by the wire method, where the wire is secured in the bomb tail by the wood plug.

849. BOX, AMMUN. S.B., M.L., 4.2 in. MORTAR, B.182 MK.I.

The abovementioned steel box has been approved. It is designed to hold 4 chemical bombs with tail covers and springs retaining augmenting cartridges, in 2 carriers No.6; and 4 primary and 24 augmenting cartridges in 2 steel plate boxes.

Stowage dimensions are 27.0 x 11.35 x 11.875 inches.

850. EXPLOSIVES LABELS.

A stencilled Government Explosives label of the same design as the printed label may, in emergency and subject to the approval of the Inspection Department, be used by Filling Factories instead of the printed label.

The label is affixed to Service packages containing explosives which are the property of the Government and indicates the particular Service for which intended and the Storage Group classification.

851. CARTRIDGE, DRILL, Q.F. 3.7 in. GUNS.

A drill cartridge for the Mk.I to III guns has been approved. It comprises a wood filled Mk.I brass cartridge case with an adapter consisting of a modified No.1 Mk.I primer screwed into the base, and an empty H.E. Mk.Ic shell.

Fitted centrally in the cartridge case and screwed into its base is a steel bolt to the opposite end of which the shell is screwed and secured by a nut. The shell is further secured by indenting and coning the cartridge case.

Overall length of complete cartridge is 38.5 inches. The shell is painted black and marked in white with the word "DRILL" which is also marked on the base of the cartridge case.

852. SHELL, Q.F., H.E., 25 pr. FILLINGS.

The use of Grade II T.N.T. with Amatol 40/60 in fillings for the above-mentioned shell, provided C.E. exploders are available, has been approved.

853. CARTRIDGE, M.L., 3 in. MORTAR, AUGMENTING, 210 grain N.C.(Y). BULK PACKING.

Approval has been given for the bulk packing of the abovementioned cartridge in case E.24. Stowage dimensions of this wood case are 23 x 15.25 x 9.875 inches.

854. CORDITE AN. CODE LETTER.

The letter "X" has been adopted as the propellant code letter for Cordite AN.

855. PROJECTILE, PRACTICE, Q.F. ANTI-TANK, 40 mm. MK.IV T.

Ref. Bulletin No.33, Item 733, page 32, Col. 6. Tracer and igniter No.12 has been approved for use in the abovementioned projectile, instead of Tracer and igniter No.11.

856. BOMBS, M.L., 3 inch MORTAR, H.E. MK.III.

The abovementioned bombs fuze No.152, and bearing American markings, may be met with. Details of markings are as follows:- Both bomb and tail unit are painted buff colour, the body bears the normal red filling ring and a green band. The exploder container at the nose is painted black.

The following particulars are stencilled on the bomb:- "3 MOR"; Design No; Initials of filling station and month and year of filling; Lot No.

Carriers are the normal type bearing an orange identification band. The package is the B.166 Mk.II box which is painted Service green and stencilled in yellow.

857. BOX, AMMUNITION, S.A. H.29 MK.II.

Design of the abovementioned box has been provisionally approved. The box is fitted with "V" type battens and stowage dimensions are L.16.9, W.11.25, H.9.5 inches.

858. EXPLODER, BAGS, SHELL, T.N.T. OR C.E.

The following list of designs have been amended to include a weight of T.N.T. or C.E. filling, as indicated, to ensure a standard weight of filling in each exploder bag:-

Design No.	Nomenclature	Filling	Weight of filling.
S.D.1063	Exploder, Shell "A" Mk.VII.	T.N.T.	462 $\pm$ 13 $\frac{1}{2}$ grains
		C.E.	435 $\pm$ 13 $\frac{1}{2}$ "
" 1056	" " "A" Mk.VIII.	T.N.T.	462 $\pm$ 13 $\frac{1}{2}$ "
		C.E.	435 $\pm$ 13 $\frac{1}{2}$ "
" 1064	" " "B" Mk.VII.	T.N.T.	408 $\pm$ 13 $\frac{1}{2}$ "
		C.E.	380 $\pm$ 13 $\frac{1}{2}$ "

Design No.	Nomenclature	Filling	Weight of Filling
S.D.1057	Exploder, Shell "B" Mk.VIII	T.N.T. C.E.	408 $\pm$ 13 $\frac{1}{2}$ grains 380 $\pm$ 13 $\frac{1}{2}$ "
" 1065	" " "C" Mk.VII.	T.N.T. C.E.	341 $\pm$ 13.6 " 313.5 $\pm$ 13.6 "
" 1058	" " "C" Mk.VIII	T.N.T. C.E.	341 $\pm$ 13.6 " 313.5 $\pm$ 13.6 "
" 1066	" " "D" Mk.VII.	T.N.T. C.E.	263.5 $\pm$ 13.6 " 249 $\pm$ 13.6 "
" 1059	" " "D" Mk.VIII.	T.N.T. C.E.	263.5 $\pm$ 13.6 " 249 $\pm$ 13.6 "
" 1067	" " "F" Mk.VIII.	T.N.T. or C.E.	110 $\pm$ 7 "
" 1060	" " "F" Mk.IX.	T.N.T. or C.E.	110 $\pm$ 7 "
" 1150	Exploder "R" C.E. Mk.I	C.E.	281 $\pm$ 13.6 "
" 1068	Exploder, Shell "S" Mk.VII	T.N.T. or C.E.	183 $\pm$ 13.6 "
" 1061	" " "S" Mk.VIII	T.N.T. or C.E.	183 $\pm$ 13.6 "
" 1080	" " "Y" Mk.I.	C.E.	707 $\pm$ 13.6 "
" 1079	" " "W" Mk.II	C.E.	707 $\pm$ 13.6 "
" 1069	" " "Y" Mk.III	C.E.	211.5 $\pm$ 13.6 "
" 1062	" " "Y" Mk.IV.	C.E.	211.5 $\pm$ 13.6 "
DD/L/9547	Exploder, Shell T.N.T.or C.E:- "A" Bag	T.N.T. C.E.	462 $\pm$ 13 $\frac{1}{2}$ grains 435 $\pm$ 13 $\frac{1}{2}$ "
	"B" "	T.N.T. C.E.	408 $\pm$ 13 $\frac{1}{2}$ " 380 $\pm$ 13 $\frac{1}{2}$ "
	"C" "	T.N.T. C.E.	341 $\pm$ 13.6 " 313.5 $\pm$ 13.6 "
	"D" "	T.N.T. C.E.	263.5 $\pm$ 13.6 " 249 $\pm$ 13.6 "
	"F" "	T.N.T. or C.E.	110 $\pm$ 7 "
	"K" "	T.N.T.	82.5 $\pm$ 7 "
	"S" "	T.N.T. or C.E.	183 $\pm$ 13.6 "
	"Y" "	C.E.	211.5 $\pm$ 13.6 "

859. SHELL, Q.F. H.E., 17 pr. - METHOD OF FILLING.

The H.E. shell Mk. I T and II T of this fixed Q.F. round are filled to the following Designs:-

Mark I T. (DD(L)15762)

The bursting charge of T.N.T. Grade I is sealed by a waxed felt washer. The 3.6 in. cavity accommodates Fuze No. 244 and a "B" exploder of C.E. in a paper tube. Two tracing cloth or manilla paper discs are inserted between the exploder and fuze. If plugged the plug, fuze-hole No. 1 Mk. I is used.

The shell is fitted with a driving band to Design DD(L)12304/7 and a No. 13 Tracer. If without tracer, the plug base, shell No. 8 is used.

Weight of shell, filled and fuzed is approx. 15 lb. 6 oz. 8 dr. The overall length of the complete round, with Fuze No. 244, is 35.07 inches.

Mark II T. (DD(L)15716)

This is a shorter shell than the Mark I. The bursting charge is T.N.T. Grade I while the details of fuze, exploder, driving band and tracer are also similar to the Mark I.

Weight of shell, filled and fuzed is approx. 13 lb. 6 oz. 6 dr. The overall length of the complete round, with Fuze No. 244, is 31.68 inches.

860. GRENADE, HAND NO. 77.

Reference Bulletin No. 28, Item 504. The designs of packages for the above-mentioned grenade have been amended to provide for 17 detonators, in lieu of 18, to be packed in each of the two tinned plate cylinders, the extra detonators being no longer required.

861. GRENADE, HAND, NO. 79, SMOKE.

Reference Bulletin No. 32, Item 637. Approval has been given for the use of smoke composition P.N. 398 or P.N. 436 as a filling in this grenade.

862. CONVEYANCE OF AMMUNITION BY SEA.

This is dealt with in accordance with the Special Regulations issued by the Ministry of War Transport which have been drawn up by the Explosive Storage and Transport Committee.

The first issue of these Regulations dated 1942 has been superseded by the 1943 edition and as there are some changes in stowage details it is considered desirable to draw general attention to them in case any reference has been included in other publications or instructions.

In para. 27 of the 1942 edition the stowage was dealt with as follows:-

<u>Type of Stowage</u>	<u>Code letters in App. I.</u>
1. Ammunition Stowage	A.S.A.
2. Magazine Stowage "A"	M.S.A.
3. Magazine Stowage "B"	M.S.B.
4. Special Ammunition Stowage "C"	C.S.A.
5. Special Ammunition Stowage "D"	D.S.A.
6. Deck Stowage, if necessary.	(D)
7. Lead free stowage	M.S.L.
8. Pyrotechnic Stowage	A.S.P.
9. Above coal stowage, if necessary.	(C)

Whereas in para. 24 of the 1943 edition the stowage is set out thus:

2. Magazine Stowage "A"	M.S.A.
3. Magazine Stowage "B"	M.S.B.
7. Magazine Stowage "Lead Free"	M.S.L.
5. Magazine Stowage "D"	M.S.D.
1. Ordinary Ammunition Stowage	O.A.S.
8. Pyrotechnic Stowage	A.S.P.
4. Special Ammunition Stowage	S.A.S.
6. Deck Stowage, if necessary.	(D)
9. Above Coal Stowage, if necessary.	(C)
Respirators to be provided.	(R)

The numbers indicate the same kind of stowage in both editions.

863. GENERATORS, SMOKE, NO.24 MK.III.

Reference Bulletin No.33, Item 728. The design of this grenade has been amended to provide for the hole in the centre of the plate securing igniter cup to be formed with a flange on its underside to give a more secure soldered joint between igniter cup and plate, and prevent leakage of the composition.

864. GENERATOR, SMOKE, NO.26 MK. I.

Reference Bulletin No.34, Item 795. The times of burning of the smoke compositions filled in the abovementioned generator have now been specified as follows:-

Red smoke	15-30 secs.
Green smoke	10-20 secs.
Blue smoke	10-20 secs.
Yellow smoke	15-20 secs.

Para. 7 of Item 795 should be amended accordingly.

865. BOXES, A.S.A. H.29.

The following decisions have been given in connection with the above-mentioned box :-

Blue bands will be omitted from boxes containing 9 mm. ammunition and the H.29 (Modified) used for packing this ammunition is dispensed with.

A new design will be produced and the box known as "Box A.S.A. H.29 Mk.III" and differing from the Mark II (see Item 857 this Bulletin) in being fitted with horizontal battens on the end of the box instead of "V" type battens. The box will be stained yellowish green. Stowage dimensions are the same as for the Mk.II i.e. L.16.9, W.11.25, H.9.5 inches.

866. CORDITE H.S.C.T/K. CODE LETTER.

"HK" has been adopted as the propellant code letter for cordite H.S.C.T./K..

867. CARTRIDGES, Q.F. 2 pr. MKS. IX TO XI GUNS, FOR H.V., H.E. MK. II T SHELL.

Approval has been given for a charge of 8 oz. 4 dr. Cordite W.M.T. 124-040 for the H.V., H.E. Mk.II T shell to be filled without proof and adjustment as a temporary measure pending final determination of charge for this projectile.

The use of FWH propellant in the abovementioned cartridge has been declared obsolete.

868. PRIMERS FOR Q.F. AMMUNITION (Figs. 338-341)

Primers are the means employed for initiating the propellant charge in Q.F. guns. There are two types, percussion and electric, the former being the normal.

Percussion primers can be sub-divided into three main elements

- (a) The Cap
- (b) The Obturation
- (c) The Magazine

The cap is a small copper cup containing about 1.2 grains of cap composition which is pressed in under a load of 7 to 8 tons per sq. inch and is covered with a lead or tin foil disc pressed under a load of 3 - 4 tons. The open end of the cap is assembled towards the magazine, close to the anvil. Originally the caps were filled with a composition known as Q.F. Cap composition. About October 1938 a change took place to a more sensitive composition known as "A" composition, which held the field until 1940 when in consequence of a number of accidents in loading, particularly in rounds which had been rammed previously, a general reversion to the Q.F. Composition occurred in August 1940. Since then, however, certain primers have been again charged with the "A" composition, i.e. No.12 Mk.III and No.18 Mk.I & II.

All primers filled during the war period with Q.F. composition have the letter Q stamped on the base and the same letter stencilled on the packages, and instructions have been issued to the effect that cartridges which are not fitted with Q primers are not to be power rammed a second time, so that if such cartridges are removed from the gun, i.e. not fired, the primer must be changed before they are reloaded. This procedure is extremely important as the jar of a first ramming may cause slight disturbance of the cap filling. This may function prematurely when again subjected to a similar jar and cause a serious accident. Steps have been taken to issue new pattern primers filled Q.F. composition, i.e. marked Q, in replacement of the more sensitive "A" Composition primers, which will be removed, but this change over may not yet be complete and therefore primers used with guns fitted with power ramming should be carefully examined and the above instructions observed.

The obturation or prevention of gas escape through or around the primer is necessarily an important feature as a gas wash of this description may cause very serious damage to the breech mechanism of the gun. External gas escape is usually prevented by forming the forward end of the primer body somewhat light in section so that the explosion of the magazine forces expansion and a close grip on the case, an arrangement shown by long experience to be most effective. Internal gas escape is prevented by various devices, viz:

- The cap only
- A ball seal
- A cone seal.

Until recently the ball seal was commonly used and the arrangement comprised a loose copper ball set in the interior recess of the anvil, the "open" end of the anvil being closed by a screwed plug. Fire holes pierce the anvil and plug and permit the flame to pass from cap to magazine round the loose copper ball, but the back pressure from the magazine carries the ball into the shaped recess in the anvil to seal the fire channels. The cone system is of a somewhat similar though, on the whole, a more effective type and is now largely superseding the ball seal. The cap system is found in some of the smaller primers.

The Magazine may be formed in the body of the primer or it may be a separate screwed fitting. It is charged with a fine grain gunpowder and is provided with flash holes or weakened metal closing discs to avoid break up into small pieces which may cause a jam in loading or other troubles. Gunpowder being highly susceptible to moisture which may render it useless, special protective measures are necessary to keep the powder dry, but this is not a simple matter, although no serious trouble has been experienced with the present methods provided the normal storage precautions are taken.

Primers are usually screwed into the cartridge case but there are several plain primers which are pressed into the case, this is a common feature of French and U.S. primers.

The screwed primers are inserted into the case using Mark IV Luting (thick) as a sealing medium. They are screwed home tightly and must be flush with the case or very slightly below this line. Any primer screwing too far below this line is removed and re-inserted with one or more brass washers to bring it within the approved acceptance limits.

Primers are issued to the Service screwed into the cartridge case. In addition a small percentage of spare primers are issued to units in small tin packages having soldered or tape banded lids, each package containing 4 primers. These are to provide for replacing defective primers at the gun position. A key removing primer and a key inserting primer being issued also on a suitable scale. Care must be taken when inserting such primers that they are screwed at least flush with the cartridge case, using Mk.IV Luting, and that they do not lie much below the base of the case. Washers are not issued.

Care and preservation of primers is bound up with the care and preservation of the round which should be kept out of the sun, dry and clean, special care being taken to avoid striking the cap by, or on, any hard substance. In A.F.V's and with certain gun equipments the cartridges should be fitted with clips to protect the cap.

Primers are screwed in tightly at the factory and as a rule remain in this position. Instances do occur where travelling conditions cause the primer to work loose and therefore render it necessary for care to be taken, in action, to see that the primer is flush with the case before loading as, if not, there is some risk of jamming the breech mechanism. Cartridges leaving the filling factories now have the primers stabbed at two places to prevent unscrewing.

Primers can be readily repaired and refilled after firing. The first instance of this is indicated by the addition of the letter M and the second instance by the letters M.R. to the Mark.

The following Table covers the position of manufacture and issue to date and diagrams of typical primers are at Figures 338-341.

Primer No.	Cap Filling	Anvil	Method of Sealing	Magazine	Magazine Filling	Remarks and Use.
No.1 Mk.I.	I st , III, IV, VI & VII.					OBSOLETE. (Mk.V "Cancelled") Mk.I & III for drill Mk.VII - Naval.
" Mk.II.	Q.F. Comp	2 Fire holes	Copper ball	Powder chamber in body	50 Grns.G.12	Used in Q.F. 4.5 in. and 3.7 in. How.13 pdr.18 pdr., 25 pr. and 3 in Guns. 95 m.m. H.E.A.T.
" Mk.II M.	-do-	-do-	-do-	-do-	45 Grns.G.12.	(Mk.III - repaired Mk.II)
No.2 Mk.I & II	-	-	-	-	-	OBSOLETE. No.2 Mk.I for drill
" Mk.III	Q.F. Comp.	2 Fire holes	-	Screwed mag	2 powder pellets About 30 grains	OBSOLETE.
" Mk.IV.	A.I. Mixture	3 Fire holes	Copper ball	-do-	-do-	OBSOLESCE. } Used in
" Mk.VII	Q.F. Comp.	-do-	-do-	-do-	-do-	Q.F. 6 pdr. & 3 pdr.
" Mk.VII M.	-do-	-do-	-do-	-do-	-do-	Repaired Mk.VII }
No.3 Mk.I	-	-	-	-	-	"Cancelled"
No.4 Mk.I.	-	-	-	-	-	OBSOLETE for Imperial Service.
No.5 Mk.I	-	-	-	-	-	Air service.
" Mk.II	Q.F. Comp.	3 Fire holes	Copper Ball	Powder chamber in body	5 Grns.G.12	OBSOLESCE. Used in Q.F. 2 pr & Q.F. 2 pdr. S.C. Mk.I Gun
No.6 Mk.I	-	-	-	-	-	} Naval Service
No.7 Mk.I	-	-	-	-	-	
No.8 Mk.I	-	-	-	-	-	Proof and experimental work only.

Primer No.	Cap Filling	Anvil	Method of Sealing	Magazine	Magazine Filling	Remarks and Use.
No.9 Mk.I	Q.F.Comp	3 Fire holes	Copper ball	Screwed mag.	16 Drms.G.12	(Mks.I & II OBSOLESCE)
" Mk.II	-do-	2 Fire holes	Coned plug	-do-	-do-	Used in Q.F.3 in, 17 pr.H.V.& 4.5 in Gun.
" Mk.III	-do-	-do-	-do-	-do-	-do-	
No.10 Mk.I	-	-	-	-	-	Naval service.
No.11 Mk.I	Q.F. Comp	3 Fire holes	Copper ball	Screwed mag.	6 Drms.G.12	(Mks.I & II OBSOLESCE)
" Mk.II	-do-	2 Fire holes	Coned plug	-do-	-do-	Used in Q.F. 18 pr., 25 pr. & 3.7 in Guns.
" Mk.III	-do-	-do-	-do-	-do-	-do-	Can be used as temporary measure in Q.F. 4.5 in.
No.12 Mk.I	-do-	-do-	Copper ball	-do-	64 Grns. G.12	(Mk.I OBSOLESCE for Land Service. Used in Q.F.1 $\frac{1}{2}$ pr. & 2 pr. Guns (except 2 pr.H.V.) Used in Q.F.1 $\frac{1}{2}$ pr. & 2 pr. Guns
" Mk.II	-do-	-do-	Coned plug	-do-	-do-	
" Mk.III	A.1 Mixture	-do-	-do-	-do-	-do-	
No.13 Mk.I	-	-	-	-	-	Naval Service
No.14 Mk. I, II & III.	-	-	-	-	-	Naval Service
No.15 Mk.I	Q.F. Comp.	3 Fire holes	Copper ball	Screwed mag.	82 Grns.RFG.2 or G.12	(Mk.I OBSOLESCE)
" Mk.II	-do-	2 Fire holes	Coned plug	-do-	82 Grns.G.12	Used in Q.F. 6 pr.10 cwt., 6 pr. 7 cwt.6 pr.S.C. and 3 pr. S.C.
No.16 Mk.I	-do-	-do-	-do-	Powder chamber in body	5 Grns. G.12	(Mks.I & III OBSOLESCE)
" Mk.II	-	-	-	-	-	Mk.II - Naval.
" Mk.III	Q.F. Comp	2 Fire holes	Coned plug	Powder chamber in body.	5 Grns.G.12	Used in Q.F. 2 pr. & 37 m.m. Mk.VII Guns. 2 pr. S.C. Mk.I.

Primer No.	Cap Filling	Anvil	Method of Sealing	Magazine	Magazine Filling	Remarks and Use.
No.17 Mk.I & IIM.	Primer, electric, Q.F.	Cartridge		Screwed mag.	415 grns.G.12	Naval. Used in 5.25 in. A.A. for Land Service.
No.18 Mk.I & II. " Mk.III & IIM.	A.I. Mixture	1 Central Fire hole	Sheet brass cup holder	Powder chamber in body	3.5 Grns. powder.	(Mk.I OBSOLETE) Used in Q.F. 40 m.m.
	-do-	-do-	-do-	-do-	-do-	
No.19 Mk.I	-	-	-	-	-	Naval.
No.20 Mk.I	Q.F.Comp	3 Fire holes	Copper ball	Powder Chamber in body	5.5 Grns. G.12	Used in Q.F. 6 pr.10 cwt. Blank.
No.21, 22 & 22M	-	-	-	-	-	No.21 & 22 - Naval No. 22M - American
No.23 Mk.I	Q.F. Comp	3 Fire holes	Anvil incorporated in body. No seal or plug	Powder Chamber in body.	5.5 Grns.RFG.2 or G.12	Used in Q.F. 6 pr. & 3 pr. blank.
No.24, 25 & 26	-	-	-	-	-	Naval
No.27 Mk.I	Q.F. Comp.	2 Fire holes	Coned plug	Powder chamber in body.	10 Grns.G.12	Used in Q.F. 2 pr. & 2 pr. S.C. Mk.I. (Alternative to No.5 Mk.II & No.16 Mk.III)
No.28 Mk.I	1.2 grn.Comp special cap.	Anvil fitted in cap recess in body with firing plug in rear.	Cap	Powder chamber in body and screwed mag.	3 Grns G.12 in body chamber 72 Grns. G.7 in magazine.	Used in Q.F. 75 m.m. Cap lacquered BLUE.
No.29 Mk.I	Q.F. Comp	2 Fire holes	Coned plug	Screwed mag.	12 Grns.G.12 in mag.plug & 910 Grns.WO16 or W.M.O17 in magazine.	Used in Q.F. 3 in. How.

Primer No.	Cap Filling	Anvil	Method of Sealing	Magazine	Magazine Filling	Remarks and Use.
No. 30 Mk. I	Q.F. Comp.	2 Fire holes	Coned plug	Powder chamber in body.	15 Grns. G. 12	Used in Q.F. 3 in Tk. How.
Primer Percn. Blank, 100 Grs. Mk. I.	Q.F. Comp.	3 Fire holes	Copper ball	Powder chamber in body.	100 Grns. R. F. G. ² or G. 12.	Used in enclosed buildings with empty Q.F. Cartridges taking No. 1 Primer.
Primer, Percn. Blank, 350 Grs. Mk. I.	-do-	-do-	-do-	-do-	350 Grns. R. F. G. ² or G. 12.	-do-

869. BATCHING OF AMMUNITION.

The following resume on this subject will, it is hoped, remove a number of misconceptions which have arisen.

Batching was introduced primarily to provide a ready means of locating component lots although it possesses certain ballistic advantages and also leads to a reduction in stenciling.

The system is confined to Fixed Q.F. and Mortar Ammunition.

A. Fixed Q.F. Ammunition.

Originally batches consisted of approximately 1000 complete rounds and were made up from sub. components of the same lot so that there was thus no sub-batching. The number of units in a lot varied with each sub. component thus rendering it impracticable to obtain complete homogeneity in the batch, with the result that this arrangement did not last for very long.

Later, the ballistic aspect came into the foreground with the result that the propellant charge came to be regarded as the main unit in the complete round and was adopted as the basis of batching, so that every round in the batch contained the same lot of propellant although other components were not necessarily of the same lot. The batches still remained at approximately 1000 rounds, and they were numbered serially. This arrangement indicated to the user that rounds of the same batch were equal ballistically but it provided no clear indication of the ballistic relations between different batches, although a number of consecutively numbered batches would necessarily have the same propellant charge lot and would therefore be equal ballistically.

As anti-aircraft gunnery is based ballistically on the fuze and not on the propellant, the fuze is the basic unit in batching this ammunition when combustion time fuzes are fitted. Now the number of combustion type fuzes in a lot is approximately 2000, consequently the size of the batch was stepped up to this figure with such fuzes.

The ballistic principle and not the keeping of records thus became the principal aim of batching and this is still the current principle.

When mechanical time fuzes are used the batch may consist of any number between 700 and 4000, but batching is on the propellant lot.

The existing procedure therefore is as follows:-

- (a) Anti-aircraft Fixed Q.F. Ammunition, when combustion Time fuzes are fitted, is batched on the Fuze Lot.
- (b) All other Fixed Q.F. Ammunition is batched on the Propellant Lot.

from which it follows that the Batch is not only a unit for record and storage purposes, but is also ballistically uniform and is therefore of great importance to the user. It will be apparent that an (a) batch will have all its fuzes from the same lot, whilst a (b) batch will have all the propellant charges of the same lot.

With small calibre guns the number of rounds in a (b) batch may be very great, so from the purely record point of view it was decided to divide the batch into sub-batches on the basis of the next important component which, in the case of an (a) type batch is the propellant and in the (b) type batch the fuze, which brings us to the final statement of the existing position viz:

- (a) Anti-aircraft Fuzed Q.F. Ammunition, when fitted with combustion time fuzes, is batched on the fuze and sub-batched on the propellant.
- (b) All other Fixed and Fuzed Q.F. Ammunition is batched on the propellant charge and sub-batched on the fuze.
- (c) All Fixed Q.F. Ammunition, not fitted with fuzes, is batched on the propellant charge and sub-batched on the next important item, which may be the primer, tracer or shell.

To convey this information to the user, it is necessary to mark the cartridges and their packages. The following is the arrangement:-

1. The type of cartridge is indicated by a letter stencilled on the package and the cartridge case. The following have been allocated to date:-

Service Ammunition

<u>Full Charge</u>	<u>Reduced Charge</u>
A. Shrapnel	L. Shrapnel
B. H.E.	M. H.E.
C. Smoke	
E. A.P., S.A.P., and Steel	
F. Target	
H. H.E. Streamline	
J. Smoke Streamline	

Practice Ammunition

N. H.E.	U. Practice projectile (filled)
P. A.P.	X. Flat headed Shot and
Q. Common (base fuze)	Practice pointed shot
R. Common (nose fuze)	
S. Practice projectile (filled)	
T. Practice (weighted and	
Practice shot, Practice and	
sub-calibre)	

Practice burst short Ammunition

- V. Shrapnel
- W. Practice Projectile (filled)
- Y. H.E., B.S.C.

2. Until 1942 the word "BATCH" was stencilled on the package before the cartridge letter and also on the cartridge case, but since that date the word "BATCH" is omitted both from cartridge case and package.
3. Each Batch is allotted a serial number, in sequence, by the Inspection Department and this number is stencilled on both cartridge case and package after the word "BATCH" or after the cartridge letter where the word "BATCH" is omitted.
4. Each sub-batch, within a batch, is allocated a serial letter (the letters I and O are not used) in succession, and this letter is stencilled after the Batch No.

The stencilling is in Yellow on the package, but Silver Nitrate is used on brass cartridge cases, and silver fluoride on brass plated steel cartridge cases.

Therefore, the legend "BATCH B 204 B" indicates a service full charge cartridge fitted with H.E. Shell, filled before 1942 and of the second sub-batch.

Therefore it can be stated that all cartridges bearing the same cartridge letter and batch number are ballistically homogeneous, and are therefore of equal value to the user whilst the sub-batch forms a more suitable quantity to deal with so far as records are concerned. Storage of these types of ammunition must be based on the Sub-Batch, but where practicable, the complete batch should be stored in the same building by sub-batches.

Prior to 1940 the letter 'A' was allocated to the second Sub-Batch in a Batch, the first sub-batch being given the Batch number only. This is not a satisfactory arrangement and as described above, has now been changed.

The number of rounds in a Batch or Sub-Batch may not divide equally into the packages so that the last package is not full. Until recently this package was issued partly filled and carried the legend FRACTION, but now the rule is to complete the package with rounds from the next Batch or Sub-Batch and stencil the two batch numbers on the box.

Ammunition batched on the fuze will only be sub-batched on a change of propellant lot.

The following examples will illustrate the working of the system:-

- (a) Ammunition based on Fuzes, full charge, H.E.

<u>No. of Rds.</u>	<u>Fuze Lot</u>	<u>Propellant Lot</u>	<u>Batch</u>	<u>Sub-Batch</u>	<u>Stencils</u>
2000	200	100	1	-	B.1
2000	201	100	2	-	B.2
2000	202	100	3	-	B.3
1200	203	100	4	A.	B.4 A
800	203	101	4	B.	B.4 B
2000	204	101	5	-	B.5
2000	205	101	6	-	B.6

(b) Other Ammunition, reduced charge H.E.

<u>No. of Rds.</u>	<u>Propellant lot</u>	<u>Fuze Lot</u>	<u>Batch</u>	<u>Sub-Batch</u>	<u>Stencilling</u>
2000	300	700	1	A.	M.I.A.
2000	300	701	1	B.	M.I.B.
2000	300	702	1	C.	M.I.C.
1000	300	703	1	D.	M.I.D.
1000	301	703	2	A.	M.2.A.
2000	301	704	2	B.	M.2.B.

The practical deduction from the above is that Batched Ammunition should be stored and issued in Sub-Batches but that to the user the Batch is the ballistic unit.

For record purposes, each package is given a serial work number, related to the Batch or Sub-Batch as convenient, and the Inspection Department has a complete record of the exact items forming the complete round in each package, so that when the Letter, Batch and Sub-Batch is quoted, together with the serial number of the package, every detail of the round and its manufacturing history can be traced. This is of the greatest value when accidents or errors arise and enables all doubtful items to be located, in normal conditions, by simple reference to the Batch letters and numbers. Therefore the amount of stencilling on the packages can be substantially reduced with a consequent saving in production without detriment to the Storeholder or user. In peace, full details of the composition of Batches are issued to I.O.O.'s on Batch History Sheets, but this procedure has been found to be impracticable in war and has therefore been discontinued.

Every package has a Batch label shellacked on the inside giving full details of each component in the package. When difficulties arise the return of the Batch Label with the report of the circumstances is of very great assistance.

B. MORTAR AMMUNITION

Batching of Mortar Ammunition follows the same general principles as Fixed Q.F., but is not applied to all types.

- (a) Mortar Ammunition is batched on the Fuze Lot but is not sub-batched.
- (b) 3 inch Mortar Star Ammunition is not batched.
- (c) 2 inch Mortar Smoke Ammunition is not batched, except when fuzes are fitted, when batching is on the fuzes.
- (d) 3 inch Mortar Smoke emission Ammunition is batched on the propellant and sub-batched on the primer.
- (e) 3.7" Mortar and 3" How. batching is on the propellant, sub-batching on the fuze.
- (f) "Fraction" boxes will not be packed for 2 inch and 3 inch. Residual bombs are set aside until a complete box can be made up, which will be similarly marked, to indicate all the contents.
- (g) The cartridge letters are as for Fixed Q.F.

C. PLUGGED ROUNDS

Fixed Q.F. Ammunition and Mortar Ammunition is sometimes issued from the factories fitted with plugs in lieu of fuzes when the latter are not yet available. These are placed temporarily in a plugged series but they are fuzed and properly Batched before issue to Units.

D. IN SERVICE

When any component is removed from a batched round and replaced by a component of another lot, the letter 'X' is stencilled on the exterior of the package and the Batch label suitably amended. Where a component concerned is a fuze the letter 'X' is stencilled on the case also.

870. GRENADE, HAND NO. 77 MKS. I & II - FUZE.

The original design of the No. 247 fuze provided for a spigot at the base of the mechanism holder. In screwing the fuze fully home in the above-mentioned grenade this spigot protrudes into the detonator pocket and, with the detonator in position, may result in the premature functioning of the detonator.

In fuzes of later manufacture the spigot is omitted and it has been forbidden to use the earlier type of fuze (with spigot) with the No. 77 Grenade.

871. CARTRIDGE, 2 in M.L. MORTAR, 55 GRAIN BALLISTITE

To achieve a reduction in propellant smoke, approval has been given for the abovementioned 2 in. Mortar cartridge to be filled 50 grains Ballistite instead of 55 grains and for the priming to be 10 grains N.C. (Y) instead of 10 grains gunpowder G.20.

872. SHELL, B.L., H.E., STREAMLINE 5.5 in. 80 lb.

In order to distinguish it from the 100 lb. shell, the abovementioned 80 lb. shell will have the whole of its area to the rear of the driving band painted black.

873. CORDITE ON DRUMS FOR CARTRIDGES, S.A.A. MARKING OF PACKAGES.

In future, the gross weight of the whole package, including filled drum, will be stencilled on cases or barrels containing cordite wound on drums for Cartridges, S.A.A.

874. CARTRIDGES, M.L. 3 in MORTAR, AUGMENTING, 277 GRAINS NEONITE, NO. 12 MKS. I & II.

The abovementioned cartridge, to M. of F. design DD(L)16773, has been approved.

The celluloid container of the Mark I cartridge is of the built up type while that of the Mark II is of the moulded type.

875. FUZE, PERCUSSION, D.A. NO. 250.

This fuze has been declared "Obsolete".

876. BOX, AMMUNITION, Q.F. 17 pr. C.310 Mk.I.

The abovementioned wood box, with packing pieces, is designed to hold 2 rounds with H.E. Shell Mk.I T. It is fitted with two iron swing clamps and two galvanised iron wire lifting handles. Stowage dimensions are 39.86 x 15.0 x 8.8 inches.

877. N.C. POWDER FOR VARIOUS TYPES OF S.A.A. 1943.

Reference Bulletin No. 32, Item 635, page 6. The following list indicates the N.C. powder issued for the various types of S.A.A. in current supply.

With certain new types introduced it is not possible to obtain the specified ballistics under the normal loading conditions with a nitrocellulose powder. For this reason relaxed ballistics have been sanctioned with the 0.303 inch and 7.92 mm incendiary rounds. With such types it is necessary to use powder of high bulk density to obtain even the reduced ballistics; consequently American tubular powder is reserved for the purpose. For other types of long standing, such as 0.303 inch Mk.VIII and 7.92 mm. ball a lower bulking powder is satisfactory and British flake powder, Nobel Neonite No.12, should be used.

<u>Ammunition</u>	<u>Propellant</u>
0.303 inch B. Mk.IV Z.	N.R.N. No.12 for 0.303 inch B Mk.IV Z. VI Z or VII Z.
" B. Mk.VII Z.	American 0.303 inch Mk. VIII Z N.C.
" Mk. VIII Z.	N.R.N. No.12 for 0.303 inch Mk.VIII Z.
7.92 mm. Ball and Tracer	N.R.N. No.12 for 7.92 mm.
" Incendiary	American 0.303 inch Mk. VIII Z N.C. or other special types.
" A.P.	American 7.92 mm. H.C.
9 mm. Parabellum	Revolver Neonite or American 9 mm. H.C.
0.5 inch Vickers S.A.P. and S.A.P.T.	N.R.N. No.12 for .5 inch Vickers.
" Incendiary	-ditto-
0.5 inch Colt Incendiary and Tracer	American .5 inch Colt N.C.
15 mm. B.E.S.A.	N.R.N. No.121 for 15 mm. B.E.S.A.
20 mm. H.S.	N.R.N. No.121 for 20 mm. H.S. or American 20 mm. H.S. N.C. as supply considerations require.
20 mm. Oerlikon	N.R.N. No.122 or American 20 mm. Oerlikon H.C. as supply considerations require.

878. FUZE D.A. AND PERCUSSION NO. 119

(FIG.342)

This is a dual purpose fuze capable of functioning either as D.A. or graze and is used with a variety of equipments for H.E. bursting smoke or chemical shell. It is of same external contour as the 117 fuze from which it is distinguished by a milled ring round the body, whilst a black band above this ring distinguishes it from the 117C.

The graze action permits the fuze to function at angles of arrival down to 4°. The fuze is not so rapid as the 117.

The head of the fuze is closed by a thin Brass cover which protects the striker during flight and by a steel safety cap which protects the striker during transport. The thin brass cover must never be removed as this will cause a premature outside the gun. The safety cap, however, must be removed if Direct Action is required but must not be removed if graze action is required.

There are two detonators. One of these, a 3 grain D.C.A. type in the earlier marks or a 5 grain composite D.C.A./Lead azide or 4.8 grain D.C.A. type in the later marks, functions a 5 grain A.S.A. composition detonator in the holder which communicates with the C.E. or Pentolite Magazine by stemmed channels in the shutter and magazine.

The safety arrangements comprise a spring loaded shutter which requires from 1300 to 1700 R.P.M. to open. The shutter prevents the detonator functioning the fuze whilst closed. The needle and pellet are "loose" fittings, and are separated by a creep spring during flight, whilst a centrifugal bolt, backed by a detent and spring keeps them apart until the gun is fired.

The action of the fuze, therefore, is that when D.A. action is required the safety cap is removed before loading. On firing the detent sets back clear of the centrifugal belt whilst the striker sets back on to the bolt. During acceleration up the bore, this position is maintained, i.e. the shutter is closed and the bolt held by the striker. On deceleration the creep of the striker and the rotation of the shell moves the bolt clear of the striker, and the shutter clear of its spring, bringing the central stemmed channel into line with detonator and magazine. On impact the needle is driven on to the detonator in the pellet. If graze action is desired, the safety cap is not removed and the action on graze is that the striker, being protected, the inertia pellet carries the detonator on to the needle. Fig. 342 illustrates the B. Mark IV fuze.

The following variations occur in the Marks:-

Mk.I. Obsolescent.

The main components were of brass but the magazine could be of aluminium alloy or mazak and the bottom cap of steel, mazak or aluminium alloy.

The shutter was stepped to provide room for gas expansion in the case of premature functioning of the detonator.

The striker suffered a number of modifications :-

- (A) With a waisted head secured by a split pin.
- (B) In one piece without a head.
- (C) In two pieces the forward being shaped like a nail and fitting loosely in the striker body.
- (D) As (C) but the nail portion formed with a larger head.

Mk.IA - Obsolescent

As Mk.I, but striker of type (A) with longer and narrower head or type (D) with nail portion of larger diameter head and shank.

Thickness of magazine diaphragm was reduced from .015/.008 to .008/.003 except when the material is aluminium alloy.

Mk.IB. - Obsolescent

This mark was not formally approved, but was as the Mk.I with one piece striker and a steel disc soldered to the end of the striker cover.

Mk.II -

As Mk.IA but with :-

- (i) Mazak die-cast body.
- (ii) Reduced diameter of striker cover to strengthen the body.
- (iii) Magazine and bottom cap of mazak only.
- (iv) Alternative shutters of brass or mazak with steel insert without the step on the upper face.
- (v) Weaker detent spring (2 lbs. 8 ozs. instead of 3 lbs. 6 ozs.)
- (vi) Magazine set screw with a plain pilot instead of a point.
- (vii) Diameter of striker head reduced to fit the striker cover.

Mk.III - Obsolescent

As Mk.I, but with:-

- (i) Increased diameter of magazine upstands to prevent jamming of the shutter on assembly.
- (ii) Unstepped shutter.
- (iii) Weaker detent spring as for Mk.II.
- (iv) Type (D) striker only.

Mk.IIIA - Obsolescent	As Mk.III, but with larger diameter shank to the nail part of the striker.
Mk.IIIB - Obsolescent	As Mk.III, but with a one piece striker and a steel disc soldered to the top of the striker cover.
Mk.IV	As Mk.IIIA, but also with Type A striker, without the waist on the head, as an alternative.
Mk.V - Not sealed	This was a design having a flanged type of main detonator holder recessed into the body.
Mk.VI - Not sealed	As Mk.V, but with die-cast mazak body.
Mk.VII	As Mk.IV but for U.S.A. manufacture only with shortened striker point and inertia pellet plug to take a 5 gr. A.Z. detonator.
Mk.VIII	As Mk.VII, but for Canadian manufacture only with zinc base alloy body and nail type striker only. The striker cover and head are smaller in diameter to strengthen the body.
Mk.IX - Not sealed	As Mk.VII but for Canadian manufacture only and with nail type striker only.
B Mk I - Obsolescent	As Mk.IV, but with still weaker detent spring (2 lbs. 1½ ozs.)
B Mk.II	As Mk.II, but with still weaker detent spring and without the alternative nail type striker.
B Mk.III - Not sealed	Design with steel body.
B Mk.IV.	As Mk.IV but with (i) the 2 lb. 1½ oz. detent spring (ii) a stronger creep spring of 20 ozs. instead of 10 ozs. (iii) a flanged detonator holder to bring the 5 gr. A.S.A. detonator close to the shutter and omit the C.E. stemming (iv) a packing washer above the detonator holder. (v) a shortened inertia pellet plug to accommodate a 5 gr. D.C.A/Lead azide detonator. (vi) Type A striker only with shortened point. (vii) the stemmed channel in the shutter enlarged in diameter except at the top face.
B Mk.V. - Non-existent.	
B Mk.VI - Non-existent.	
B Mk.VII - Not sealed.	As Mk.VII but with weaker detent spring and stronger creep spring.
B Mk.VIII	As Mk.VII but with weaker detent spring and stronger creep spring.
B Mk.IX	As Mk.IX but with weaker detent spring and stronger creep spring.

Between 1/11/40 and 16/10/42 a fillet of R.D.1154 was applied between the striker cover and fuze body.

Prior to 27/8/42 instruction label, L.508, was fixed round the safety cap. It stated "Removal of this cap gives direct action: it may be left on for rapid firing at short ranges: it MUST be left on for targets behind light cover".

After 13/10/42 the words "Do not remove" were embossed on the striker cover instead of label, L.139.

879. FUZE PERCUSSION D.A. NO.117C.

Due to a shortage of 117 fuze bodies a number of 119 fuze bodies have been fitted up as 117 fuzes by omitting the inertia pellet and the substitution by a fixed plug carrying a 6 gr. A Z detonator and a C.E. stemmed channel.

The Marks of the fuze corresponds to the 119 from which converted.

The body has the usual knurled ring but has a yellow band above the knurled ring to distinguish the fuze from the 119.

The instruction label on the cap was omitted on 27/8/42.

The fuze became obsolescent in June 1943.

880. FUZE PERCUSSION D.A. NO.117 (Fig.343).

The latest Mark of this fuze is shown on Fig.343.

The MK.VII detonator is 6 gram DCA/Lead Azide/C.E. the earlier Marks have a 5 gram DCA/Lead Azide detonator.

This fuze functions satisfactorily at angles of arrival as low as 7 degrees and is extremely rapid in action. It is used in a variety of equipments with H.E., bursting smoke or chemical shell.

The safety arrangement is interesting and centres round the displacement of the composite detonator from the central channel leading to the magazine until the shell has left the gun thereby eliminating, theoretically, any risk of premature action until that point is reached. The detonator, it will be seen, is housed in a centrifugal shutter and is locked in the closed or safety position by a locking weight backed by a spring which requires a rotation of between 1800 and 2200 revolutions per minute to cause it to open, whilst as a further safety precaution the point of the striker engages the locking weight and retains it positively until the shell has been fired. The striker in turn is held in this position by a sleeve and segments which together fill the space between the striker guide and shoulder on the striker. An arming sleeve is supported on a spring to retain the segments in position until the gun is fired.

The striker head is protected by a metal cover which is sprung into position and which MUST ON NO ACCOUNT be removed, as a premature outside the muzzle will most likely be the result of doing this. A safety cap is screwed on to the nose of the fuze for transport and this MUST BE REMOVED before loading, otherwise the fuze may be blind on impact.

A very interesting feature of the fuze is the arming sleeve which at first sight might be integral with the striker. Actually, it is important to keep the two functions separate as a lighter striker can be used which is the cause of the rapid action on impact.

The exterior of the body is plain.

The action of the fuze is therefore as follows:- Before loading, the safety cap is removed, the striker cover is NOT REMOVED. On firing, the arming sleeve sets back, releasing the segments which fly clear on rotation of the shell. Whilst the shell is accelerating in the bore the

striker remains in the locking weight thereby maintaining the detonator clear of the magazine. After leaving the gun, the deceleration of the shell permits the striker spring to function, drawing the striker clear of the locking weight and rotation of the shell causes the weight to release the shutter which swings until the detonator is aligned with the Magazine. The arming sleeve creeps forward during flight. On impact the striker is driven through the arming sleeve on to the detonator.

The following variations occur in the Marks of this fuze.

Mk. I was never produced for service use.

Mk.II obsolescent. Striker, striker head, safety cap, springs and gun-screws are of steel. The magazine cap may be of brass, aluminium alloy or steel: the magazine and locking weight may be of brass or mazak, other components are brass.

Mk.III Obsolescent. As Mk.II but :- Shape of shutter amended and may be of mazak with a brass insert. Body may be of zinc base alloy, has small alterations to dimensions and omission of upstand round forward end of striker hole.

Mk.III.A. As Mk.III but a second distance pin in the magazine recess was added.

Mk.IV. As Mk.III.A. but :- With steel, magazine, guide bush and body.

Mk.V. Cancelled.

Mk.VI As Mk.IV but:- With cast iron body and mazak ring screwed under the flange, making a shorter magazine recess. With shorter magazine taking a shorter and narrower pellet. With a longer striker below the flange. With shorter magazine set-screw.

Mk.VII As Mk.III.A. but with a modified shutter to accommodate a 6 gr. detonator filled D.C.A/lead azide/C.E. (F.D.2154).

Fuzes filled prior to 5.8.40 had the letter "Z" stamped after the Mark. Between 1.11.40 and 16.10.42 a fillet of R.D.1154 was applied between the striker cover and guide bush.

Prior to 27.8.42 label L.1914 was fixed round the safety cap to indicate its removal only.

After 30.1.43 the bottom of the striker bore in the body was made conical to facilitate correct assembly.

The fuze is issued in the shell with the lighter equipments and is hermetically sealed in cylinders No.101F with other equipments. 20 of these are packed in a case packing fuzes No. F.101 Mk.I., stowage dimensions of which are 18.25 x 13.625 x 11.1 inches.

The Storage Group is VI and the Ship Stowage is O.A.S.

881. GERMAN FUZE AND MAIN DETONATOR FOR TELLER MINE 42

(Fig. 344)

Reference Bulletin No. 34, Item 801.

The fuze has a cylindrical body, approximately 1.5 inches in length and .87 inches in diameter, from the head of which the hemispherical end of the striker, with its supporting shearing pin protrudes. At the base end, the main detonator for the mine is attached by means of a screwed adapter sleeve. The fuze is painted the normal dark olive green.

The body is of steel and is in the form of an inverted cup with a hole at the head through which the outer end of the striker protrudes. The base is closed by the cap holder which is secured by the body being turned inwards under its flange.

The steel striker has a central striking projection at its inner end where it is flanged to engage one end of the steel spiral spring. A slot, for the escape of air during the functioning of the striker, is cut through the flange. The spiral spring is held in compression between the flange and the upper end of the body by a mild steel shearing pin. The pin is fitted in a lateral channel in the striker from which the ends protrude and bear on the recessed top of the body. The diameter of the pin is .079 inch and the V.D.Hardness figure is 232.

The cap holder contains a percussion cap and anvil assembly in a central channel and is screwthreaded externally to receive the adapter for the attachment of the main detonator.

The cap and anvil assembly is contained in a copper sheath. The cap is of copper and contains a .77 grain filling consisting of 40.8 per cent of lead styphnate, 40.7 per cent of barium nitrate, 2.9 per cent of antimony sulphide and 15.6 per cent of calcium silicide. The filling is partly covered by a paper washer, varnished on both sides, and is pressed to form a central cavity to fit over the anvil. The cavity is also varnished.

The anvil consists of a brass strip shaped to fit into the mouth of the cap with clearance for the passage of the flash at each side of the strip. Projections at the base ends of the strip are bent to form a ring, under which the wall of the copper sheath is turned inwards.

The screwed adapter sleeve is of very light construction and has an internal flange at the base to engage a corresponding flange on the main detonator.

The light metal body of the main detonator is cylindrical with an external flange at its open upper end. The filling comprises 12 grains of P.E.T.N. with an initiator topping consisting of lead azide 58.9 per cent, lead styphnate 39.2 per cent and graphite 1.9 per cent. The composition is contained in an inverted light metal capsule which is pressed down into the mouth of the body. A central flash hole in the capsule is closed at the underside by a disc of black gauze material.

Functioning load

The load required to actuate the fuze in the mine varies between 570 and 580 lb. if applied to the cover plate above the fuze. With the load applied near the outer edge of the main cover plate the lever effect reduces the required load which may be as low as one half of this amount.

With the fuze removed from the mine, so that the resistance of the spring under the cover plate is excluded and only the shearing pin has to be severed, the load required is 495 lb.

882. GERMAN TELLERMINE 35. MAIN DETONATOR AND FUNCTIONING LOAD

Descriptions of the 1935 model of the tellermine and its fuze are given in Bulletin No.33. Since that Bulletin was published, further details of the main detonator have become available and, as the result of further trials, the functioning load has been found to be subject to variation.

Main Detonator (Fig. 345)

The brass body of the detonator, in the form of a cylindrical cup, is plated internally and has a plated brass flange soldered externally at the mouth. A cardboard washer carrying a washer of aluminium alloy, a closing disc of red paper and a fibre washer, all secured by a colourless adhesive, is fixed to the top of the flange.

The filling consists of 9.7 grains of T.N.T./C.E. 60/40 over which a brass inverted capsule is inserted with a 15.8 grain filling of mercury fulminate. A central hole in the capsule is closed on the inside by a disc of black gauze material. The body is closed at the mouth by another brass capsule, inserted base downwards. This capsule also has a central hole and is lacquered.

Functioning Load.

The following loads, lower than those given in Bulletin No.33, have been arrived at :-

- (a) Load required to actuate fuze in the mine varied from 305 to 310 lb. The load required is appreciably affected by the degree of airtightness of the fuze fitting and the amount of "slack" in the rubber skirting. The depression required was 4 mm.
- (b) Load required to actuate the fuze alone varied from 210 to 215 lb. with the three fuzes used in the test.

883. GERMAN 13.5 Kg. DEMOLITION CHARGE WITH HOLLOW CHARGE.

(Fig. 346)

The demolition charge is approximately hemispherical in shape with three hinged telescopic legs fitted to the hollowed base and a cylindrical projection, closed by a perforated coned cap, at the top. A fabric lifting handle is attached to the side. The exterior is painted the normal deep olive green. The complete charge weighs 30.5 lb. and has a diameter at the base of 13.5 inches.

Charge Container.

The charge container consists of the cavity liner, the base ring (carrying the telescopic legs), the cover and the cap.

The cavity liner is hemispherical with an internal radius of 4.92 inches and consists of 4 superimposed close-fitting domes. The domes are spun to shape from .04 inch sheet steel and are drilled at the vortex for attachment by a deposit of weld metal. They are also attached by spot welding at two points, diametrically opposite, near the base. This 4-ply construction of the liner has advantages over one of single sheet construction both for production and for the perforation performance of the charge. Failure of the domes to fit closely together may, however, affect the direction of the pressure and result in a perforation of an irregular shape.

The base ring is of .02 inch sheet steel and is soldered to the base of the cavity liner in the form of a flange. Three telescopic legs of strip steel are attached to the underside of the ring at equally spaced positions. The lengths of these legs are adjusted to position the charge, relative to the surface to be perforated, so that the maximum effect is obtained. The legs can be extended to 13.2 inches from the base ring.

The cover is almost hemispherical in shape and has a hole with a short cylindrical rim at the top. The sheet steel from which it is spun is .02 inches thick.

The cap is spun from .02 inch sheet aluminium and fits over the rim on the top of the cover. A central perforation is formed in the top of the cap for the insertion of a detonator.

The weight of the empty container is 9.05 lb.

Method of Filling.

The main filling consists of 21 lb. 3 oz. of R.D.X./T.N.T., 50/50, filled to a density of 1.66 by the "biscuit" filling process (i.e. cast, including broken slab). A cavity formed in the top of the main filling contains a perforated 27 dr. primer pellet of Cyclonite/Wax 95/5. The density of the pellet is 1.63.

Perforation of Armour.

With the legs fully extended and the charge fired at the normal to a 9 inch face-hardened plate the main dimensions of the perforation obtained were as follows:-

Aperture at surface of the plate 1.5 x 3.15 inches

Aperture at back of the plate 3.5 x 2.75 inches

Disintegrated area surrounding aperture in back of plate 15 x 15 $\frac{1}{2}$ inches.

884. GERMAN 3 KILOGRAM MAGNETIC HOLLOW CHARGE (Haft Hohl Ladung Drei Kg.) (Fig. 347)

The charge container is in the form of an inverted funnel (i.e. a cone with a cylindrical stem) which is painted the usual deep olive green and is mounted on a pentagonal plate of plastic. The plate has a large central hole, corresponding with the liner of the "hollow" in the filling, and has three magnets fitted in equally spaced positions on the underside. The stem portion, at the top, is designed for the insertion of a detonator and the fitting of an igniter. The overall height without the igniter is 10.7 inches and the weight, 7 lb. 11 oz. The total weight of explosive is 1 lb. 12 oz. 11 dr.

Charge Container.

The container is of light steel construction and is in the form of a cone fitted with a cylinder at the top. The base of the container is flanged to engage with the overlapping base ring bolted to the plastic plate. The base ring also engages the steel cavity liner which forms the inner wall of the charge container. The liner is a simple 60 degree cone and is of mild steel with a thickness of .079 inches.

The cylindrical portion has a screwthread formed near the top end to receive a steel closing cap which has an igniter socket held in a central hole by a steel securing ring. The socket has a short internal screwthread for the reception of the igniter and has a detonator pocket secured to a flange at its base. According to reports, the igniter B.Z.24 and the No.3 detonator are used. Details of the B.Z.24 are included in the description of the stick hand grenade in Bulletin No.28.

The three magnets fitted to the plastic plate each consists of two pole pieces connected near the top by a rectangular permanent magnet and bent at the base ends to leave only a small gap between the poles. Each of the pole pieces is secured to the plastic plate by a screw. The permanent magnet is held in position by two brass bolts. Keepers for the preservation of the magnets, by connecting the lower ends of the pole pieces are reported to be in use but these are not yet available. The magnetic assemblies are each capable of lifting about 14 lb.

Method of filling.

The main filling, contained between the cavity liner and the conical part of the container and also in the lower part of the cylindrical portion, consists of 1 lb. 9 $\frac{1}{2}$ oz. of cyclonite/wax 50/50 cast to a density of 1.67. The primer, contained in the cylindrical portion, consists of a 3 oz. 3 dr. pellet of P.E.T.N./Wax 90/10 pressed to a density of 1.58. The pellet is pink in colour and has a cavity for the igniter socket and the detonator pocket. A packing of corrugated paper is inserted between the pellet and its container.

Perforation of armour plate.

The charge is held in position on the armour plate by the magnets and may be thrown from a short distance. Trials at a distance of 16 feet have proved the magnets to be unreliable in holding the charge on a tank suspension. Using the friction igniter B.Z.24 as the initiator, the delay between the pulling of the igniter twine and the detonation of the charge would be 4 $\frac{1}{2}$ seconds.

It is estimated that the charge will perforate a 110 mm. homogenous plate and retain enough energy to have good effect behind the plate. The cavity liner of 2 mm. mild steel will give some fragments behind the perforation.

885. GERMAN s10 cm Kl8 (10.5 cm calibre) Q.F. CARTRIDGE.

The cartridge is of the separate loading Q.F. type and is used in the 10.5 cm gun-howitzer "s10 cm Kl8". The case, 17.5 inches in length, is fitted with a C/12 nA percussion primer and normally contains sections No.1 and No.2 of the propellant charge, the mouth being closed for packing and transport by a grey steel cap. A super charge, numbered "3DR", is packed separately in a container marked "Sonder Kart. 3 s10cm Kl8" and is used in the case in place of sections 1 and 2 when required. The model number of the case, 6349, and the abbreviated designation of the equipment, "s10cm Kl8", are stamped in the base of the case. The marking "P.T. + 25°C", indicating the standard charge temperature on which the weight of the charge is based, is stencilled in red on the base of the case.

Propellant Charge

Sections 1 and 2 of the propellant are each contained in a bag of artificial silk. The two bags, arranged side by side, protrude from the mouth of the case and are choked at the neck. The bag containing No.1 section has a comparatively large igniter sewn lightly to the base. The numerals of the sections are marked prominently in black near the top of each of the bags. The bag of No. 1 section, which is the larger of the two, bears the following markings in black: - "s.10 cm K.18 2,375 Kg Digl.R.P. - GO,5 - (450 - 3,1/1,5)" and, in red, "P.T. + 25°C". The markings on bag of No. 2 section differs only in the weight of the section which is "910g" instead of "2,375 Kg."

The propellant, as indicated by the markings, is of double base composition (nitrocellulose and diethylene - glycoldinitrate) in tubular form. The dimensions of the tubes being, length 17.7 inches, external diameter .122 and internal .059 inches. The charge weights being, section No. 1 5 lb. 3 oz. 11 dr. and section No. 2 2 lb. 0 oz. 1 $\frac{1}{2}$ dr.

The igniter, attached to the base of No. 1 section by a few stitches, is sufficiently large in diameter and is attached in such a way, that it also fits under the base end of No. 2 Section. The following marking appears on the igniter: - "S.10 cm K.18, 40g Nz Man NP (1,5 - 1,5) 35 g Ngl. Bl.P. - 12.5 - (40.40.0,2)". These markings indicate a filling consisting of 1 oz. 6 $\frac{1}{2}$ dr. of nitrocellulose powder. (including potassium nitrate) and 1 oz. 3 $\frac{3}{4}$ dr. of double base (nitroglycerine and nitrocellulose) propellant. The N.C. powder is in the form of granular cylindrical pellets .06 inches long and .06 inches in diameter. The double base propellant

is in the form of square flake, the dimensions being 1.6 x 1.6 x .08 inches. The two fillings are separated by a disc of artificial silk sewn between the upper and lower discs of the igniter, the W.C. powder being nearest the primer. In some instances the igniter contains only the 1 oz. 6½ dr. filling of W.C. powder and the marking relating to the double base composition does not appear on the base.

The transit cap fitted over the protruding charge sections and the mouth of the case has two paper labels at the top. One is worded to the effect that the igniter with an additional filling is sewn to No. 1 section of the charge. The other gives the weight, nature and size of the propellant charge and the igniter filling. Stencilling in white on the side of the cap is to the effect that the cap is not for firing and, in some instances, that the cap is only for brass cases. The standard charge temperature is also stencilled in red on the side of the cap.

Super Charge (Sonderkart 3)

This charge is packed in a cylindrical container made of rolled paper and is inserted in the case in place of sections No.1 and No.2 when required. The white artificial silk bag containing the charge is approximately 30 inches long and 4 inches in diameter with an igniter at the base. The bag is choked at the top and is marked prominently in black "3 DR (gr Ldg)." The following markings relating to the propellant charge are also black but in smaller lettering :- "s 10 cm Kl8 5800 Kg, Digl R.P. - G2 - (750 x 5,9/3). The marking "P.T. + 25°C is also on the side of the bag in red.

The 12 lb. 12 oz. 8 dr. propellant charge, as indicated by the markings, is a double base composition consisting of diethylene glycoldinitrate and nitrocellulose and is in tubular form. The dimensions of the tubular cords are :- length 29.53 inches, external diameter .232 inches, internal diameter .118 inches.

The flat circular igniter stitched to the base of the bag is marked "s 10 cm.Kl8. Lg 10 cm.K.T., 35 g Ngl. Bl.P. - 12,5 (40 x 40 x 0,2)", indicating a filling of the same weight and composition as that of the square flake in the igniter attached to No. 1 section.

886. GERMAN 3.7 cm CARTRIDGE, Q.F., A.P.C. OF CZECH ORIGIN.

(Fig. 348)

The fixed Q.F. round is a Skoda production and is 14.85 inches long. The weight of the complete round is 3 lb. 2 oz. 12 dr. The cap of the shell is black but the body is unpainted and is stencilled in red. The stencilling includes the letters "PL" to indicate the bursting charge of P.E.T.N./T.N.T., the Skoda symbol followed by the letter "D" to indicate the filler and place of filling and a letter and numerals indicating the serial and number of the filled lot. The copper driving band has three cannellures. The brass case is 10.55 inches in length and has stamped in the base the designation "3.7 cm VZ 34". The stencilling "P.P. Vz 36S", relating to the propellant is found in black on the base of the case.

The complete round consists of the following components:-

- (a) Armour piercing shell fitted with a penetrative cap and filled P.E.T.N./T.N.T. 30/70.
- (b) Skoda base fuze B.Z.15.
- (c) Brass case, 3.7 cm. VZ 34.
- (d) 7 dram propellant charge of double base composition in strip form with a decoppering agent.
- (e) Medium percussion primer, VZ 33 s.v.

Shell

The steel body is machined from rolled bar and has a hardened head. The V.D. Hardness figure for the head averages about 800. The cavity for the bursting charge is of the small size characteristic of piercing shell and is closed at the base by the fuze with a copper washer. A copper driving band with three cannellures is fitted and the body near the base, is streamlined.

The steel penetrative cap tapers towards its nose which is circular and rises slightly to form a point at its centre. The cap is machined from bar, hardened throughout and is attached by a soldering process. The V.D. Hardness figure averages about 675.

The weight of the empty shell is 1.76 lb.

The bursting charge consists of 5 drams of P.E.T.N./T.N.T, 30/70, in the form of two pressed pellets in a cardboard carton. The upper pellet is solid, the lower being in annular form to receive a brass liner which fits over the gaine carried by the base fuze. The carton is closed at the base by a cardboard washer and has a solid block of the bakelite type at the top which is shaped to fit the small end of the shell cavity.

The weight of the shell filled and fuzed is 1 lb. 13 oz. 13 dr.

A similar shell with the remnants of a cap and filled T.N.T. is described in Pamphlet No.2.

Fuze (Fig. 349)

The Skoda base fuze BZ.15 is a detonating fuze of the graze type with the inertia pellet, carrying the needle, held off the fixed detonator by a creep spring and two steel balls. The balls are thrown clear of the pellet by centrifugal force during deceleration when the pellet moves slightly forward.

Cartridge case.

The brass case is 10.55 inches in length and has a shoulder formed by an increase in the taper near the mouth. The primer hole is screw-threaded to a diameter of .66 inches.

Propellant Charge.

The charge is in the form of long thin flexible strips with a smooth surface and has a paper label attached which reads "152g. 06/6/210 P.P. V.Z. 36S 50/37". This indicates the charge weight in grams (4 oz. 5 dr), the dimensions of the strip in millimetres (thickness .024 inches, breadth .236 inches, length 8.28 inches), the shape (P.P. denotes strip), the nature (V.Z.36S) and the lot. The propellant consists of 63.96 per cent of nitrocellulose, (nitrogen content 12.3 per cent), 30.06 per cent of nitroglycerine and 5.98 per cent of centralite.

The decoppering agent, included with the charge, is a 3.9 inch metal strip, .24 inches wide and .13 inches thick. The strip weighs 5 oz.13 dr. and consists of 60.4 per cent of tin, 37.8 per cent of lead and 1.8 per cent of bismuth. There is also a trace of antimony.

Primer

The percussion primer VZ.33 sv is the medium size of the VZ.33 type and differs from the VZ.33 dv, described in this Bulletin, in the length of the magazine which is 1.35 inches instead of 1.97 inches. The designation of the primer is stamped in the base.

387. GERMAN PRIMER, PERCUSSION, Q.F. CARTRIDGE, VZ.33 OF CZECH ORIGIN.

(Fig. 350)

The VZ.33 percussion primer is a Skoda design of which there are three sizes, i.e. VZ.33 dr (long), VZ.33 Sv (medium) and VZ.33 Kv (short). These sizes can be identified by the designations stamped in the base of the primers. The long primer differs from the medium, in the length of the magazine which is 1.97 inches instead of 1.35 inches. Details of the short primer are not yet available.

The primer shown in the drawing is the VZ.33 dv. with the long magazine. The cap and the percussion arrangement, located inside the brass body, are of an unusual design. The copper cap is enlarged in diameter near the mouth to accommodate the brass anvil and contains the initiating composition in the smaller portion at the base. The composition consists of mercury fulminate 29.9 per cent, potassium chlorate 23.5 per cent, antimony sulphide 35.7 per cent and 10.9 per cent of ground glass. The .5 grain pressing of the composition is shaped on the surface to conform with the anvil and is covered by a tinfoil disc without varnish. The anvil consists of a brass circular disc with a central protruberance underneath and a recess in the top. Four radial slots for the passage of the flash are formed around the protruberance. The cap is held between a brass closing plug, with a central flash hole, and the percussion arrangement.

The percussion arrangement consists of a steel ball supported in a brass holder by a plated steel disc. The holder is cylindrical with a recess at the top to receive the cap and another at the base into which the disc is sprung. The ball is located in a channel between the two recesses where it is held between the base of the cap and the spring disc.

Action.

When the diaphragm at the base of the primer is forced in by the striker of the firing mechanism, the ball is driven against the base of the cap and crushes the initiating composition on the anvil. The flash passes through the slots in the anvil and through the hole in the closing plug to the powder in the magazine. The use of the ball for transmitting the striker blow to the cap ensures a central blow on the cap even if the striker of the firing is not concentric.

388. ITALIAN 75/27 C.K. & 75/27 A.V. :- Cartridge, Q.F., H.E., Fragmentation

(Fig. 351)

The shell, fitted with a 10.9 inch brass cartridge case carrying a Model 35 percussion primer and a double base propellant charge forms a fixed Q.F. round for the 75 mm 27 calibre C.K. and A.V. anti-aircraft guns. The shell is fuzeed with a time fuze and, excepting a rust-proofed band near the shoulder, has either a pale blue or blue body with a .6 inch darker blue band painted .8 of an inch above the driving band. Blue shell of this type without a band marking have also been met with. The fuze-hole adapter, forming the head of the shell, has a marked reduction in diameter forming a cylindrical neck immediately below the fuze. The head of the shell (i.e. the adapter and the forward end of the body) is painted an orange red. The following details are stencilled on the body in black:- "Kg 6.3, TRITOLO" (enclosed in rectangle) "75/27 C.K, 75/27 A.V." The time fuze is marked with a red "T" on the cap and may be fitted with a brass cover secured by a tear-off strip with finger ring. The cover also bears the red "T" and an arrow with the marking "TIRARE." The length of the complete round is 20.5 inches. The fuzeed shell is 11.2 inches in length and when filled and fuzeed weighs approximately 14 lb.

Shell.

The cylindrical shell body is of forged steel with a comparatively thin wall and is fitted with a copper driving band. The forward end is screwthreaded internally to receive the adapter. The body contains a fragmentation cylinder machined from grey cast iron which is grooved along its length and circumferentially on the exterior to assist fragmentation. A channel is formed through the centre of the cylinder to accommodate the bursting charge. Red lead is inserted between the exterior of the cylinder and the wall of the shell and in the fragmentation grooves. The fuze-hole adapter is machined from grey cast iron and is screwthreaded internally to two diameters to receive the gaine and fuze respectively. The exposed portion of the adapter forms the head of the shell and is shaped to form a sloping shoulder with a cylindrical neck. The base of the adapter is recessed to fit over the forward end of the bursting charge.

The weights of the shell components are as follows:-

Body	6.98 lb.
Fragmentation cylinder	3.85 lb.
Adapter	1.87 lb.
Total	12.6 lb.

Bursting Charge.

The bursting charge consists of approximately 4 oz. 2 dr. of cast T.N.T. in a cardboard carton. A cavity formed in the head of the charge to accommodate the exploder is lined with a cardboard tube. A felt washer is inserted between the top of the filling and the base of the adapter and gaine and a felt disc is inserted in the bottom of the exploder cavity.

Exploder.

The exploder consists of 5.5 drams of ballistite flake in a cylindrical brass body. The body is approximately 3.1 inches in length with a small central hole at each end, closed on the inside by a fabric disc.

Gaine

The 2.3 gram ballistic gaine used below the time fuze is described in Bulletin No.32.

Fuze.

The combustion type of time fuze, graduated to 59, is described in Bulletin No.35.

Propellant Charge.

The propellant charge is contained in a bag with a red igniter bag of gunpowder approximating to G20 tied at the base. Charges of two types are used, both being of double base propellant. One consists of 1 lb. 3 oz. 5 dr. of a ballistite in strip form, the dimensions of the strips being 8.3 x .4 x .038 inches. The composition of the propellant, as found by analysis is:- nitrocellulose (including inorganic matter) 60.29 per cent, nitroglycerine 25.54 per cent, and dinitrotoluene 14.17 per cent. The bag containing the charge is marked "Ballistite Attenuata In Piastrino 1 x 10 x 210". The igniter bag contains 6 oz. 5 dr. of gunpowder and is marked "10 Gr." The other type of charge consists of 1 lb. 3 oz. 11³/₄ dr. of a cordite in tubular form, the external and internal diameters of the 8.05 inch tubes being .131 and .042 inches respectively. The composition of the propellant, as found by analysis is :- nitrocellulose (including inorganic matter) 71.53 per cent, nitroglycerine 23.73 per cent and mineral jelly 4.74 per cent. The bag containing the

charge is marked "P0.508,008 DEU 1933" (these markings are very indistinct). The igniter bag contains 5 oz. 9 dr. of gunpowder.

Primer.

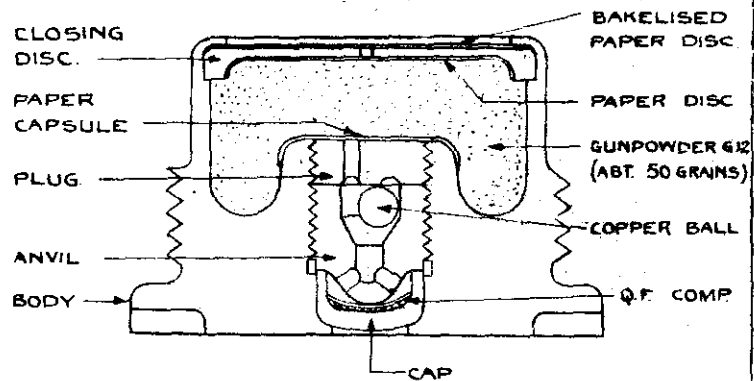
A description of the percussion primer, model 35, is given in Bulletin No. 32.

Fragmentation.

As the result of trials it has been found that the break up of the fragmentation cylinder generally follows the lines of weakness as designed by the grooving but the segments also undergo considerable fragmentation. The dispersion of the fragments is mainly lateral.

FIG. 338 (ITEM 868).
PRIMERS, PERCUSSION, Q.F., CARTRIDGE.

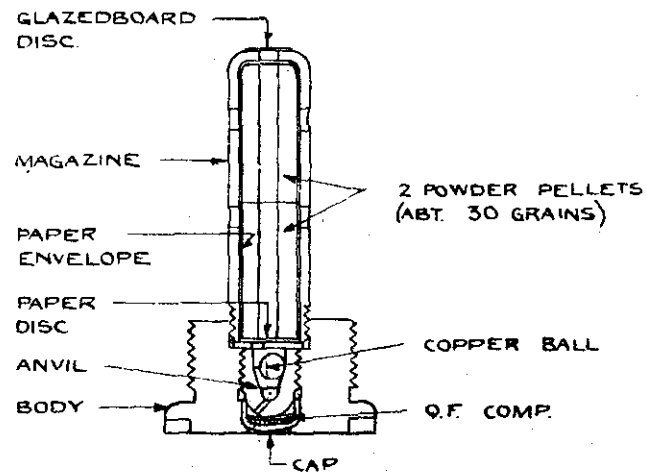
PRIMER, PERCUSSION, No 1 Mk. II



RL 150318 (1)

NOT TO SCALE.

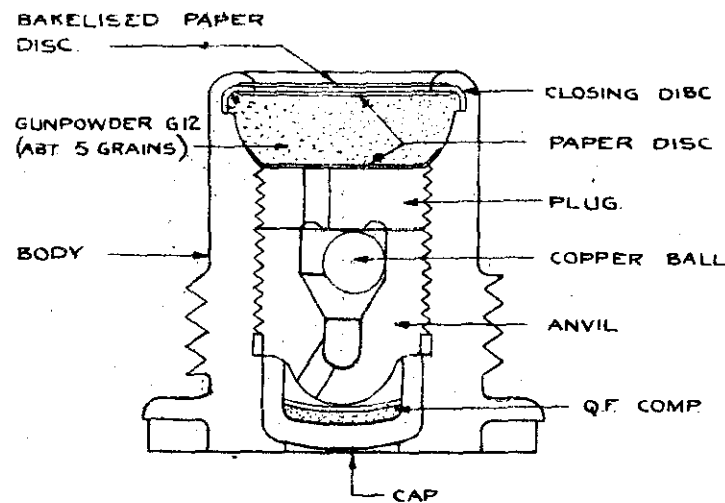
PRIMER, PERCUSSION, No 2. Mk. VII.



D.D. (L) 636

SCALE 1/1

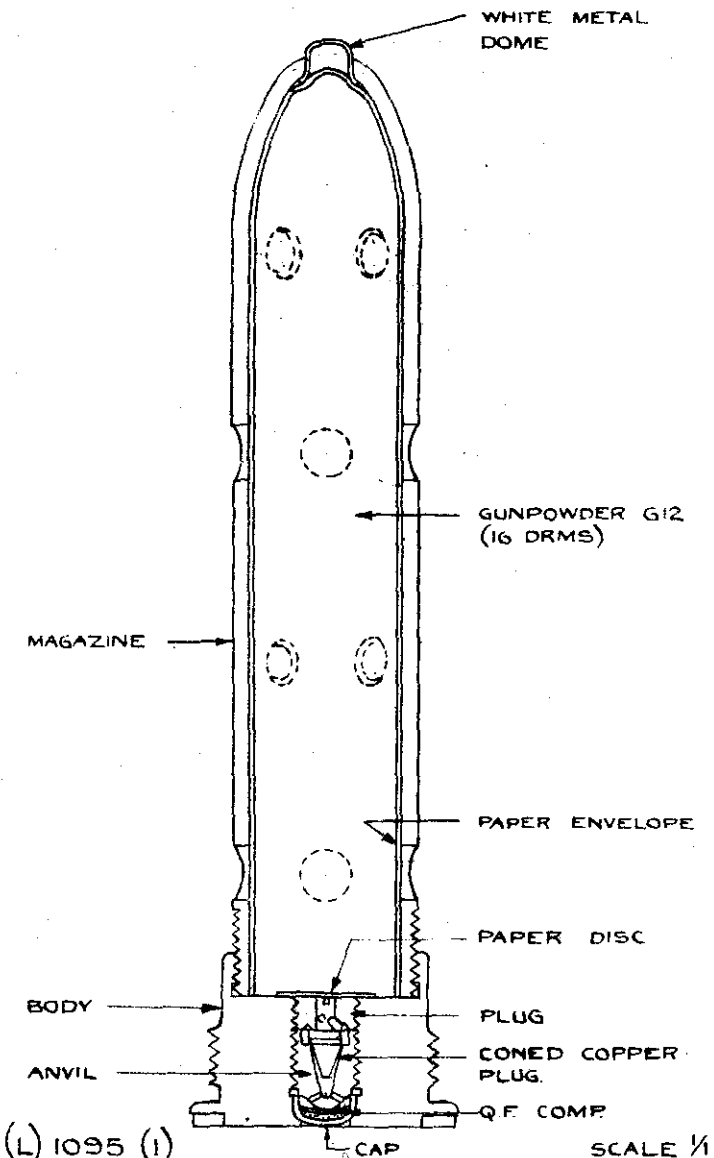
PRIMER, PERCUSSION, No 5 Mk II



D.D. (L) 1739

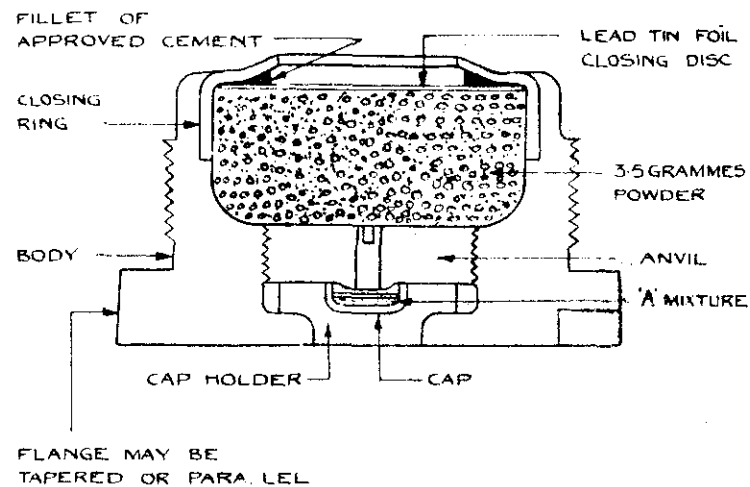
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PRIMER, PERCUSSION, No 9 Mk. III



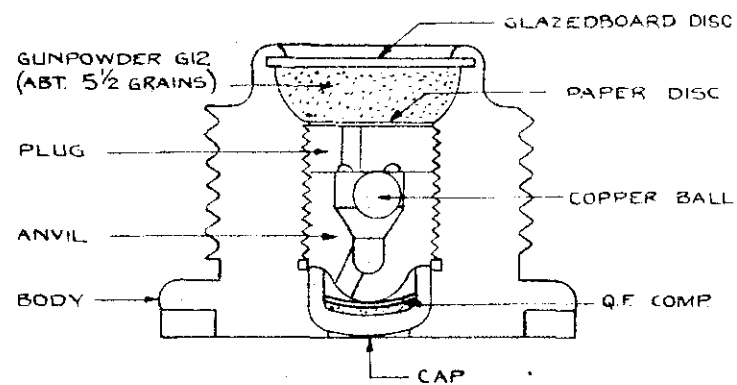
D.D. (L) 1095 (1)

SCALE 1/1

PRIMERS, PERCUSSION, QF CARTRIDGE.PRIMER, PERCUSSION, No 18 Mk II

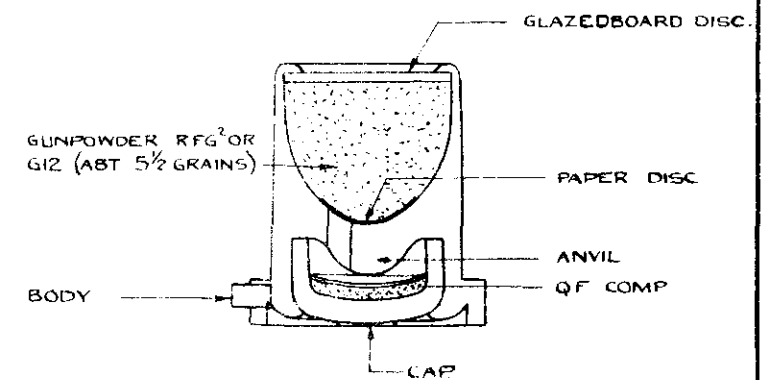
CIA (A) 314

SCALE 2/1

PRIMER, PERCUSSION, No 20 Mk I

D.D (1) 8503

NOT TO SCALE

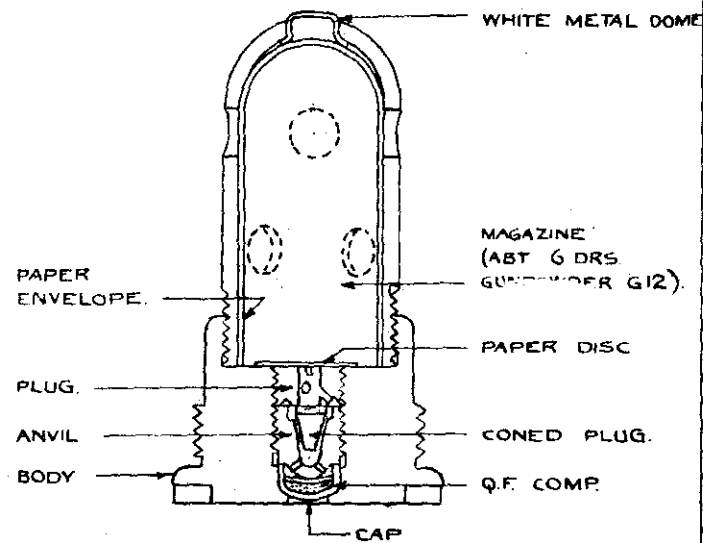
PRIMER, PERCUSSION, No 23 Mk I

D.D (L) 829

NOT TO SCALE

PRIMERS, PERCUSSION, Q.F. CARTRIDGE.

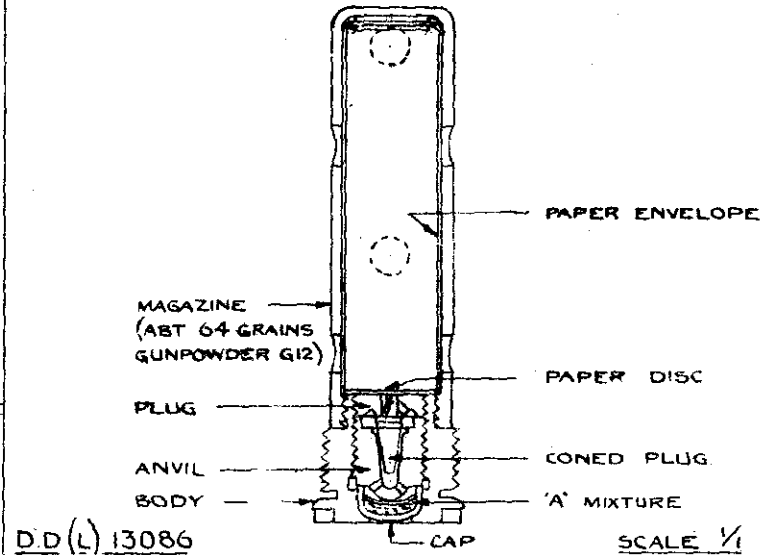
PRIMER, PERCUSSION, No. 11 Mk. III



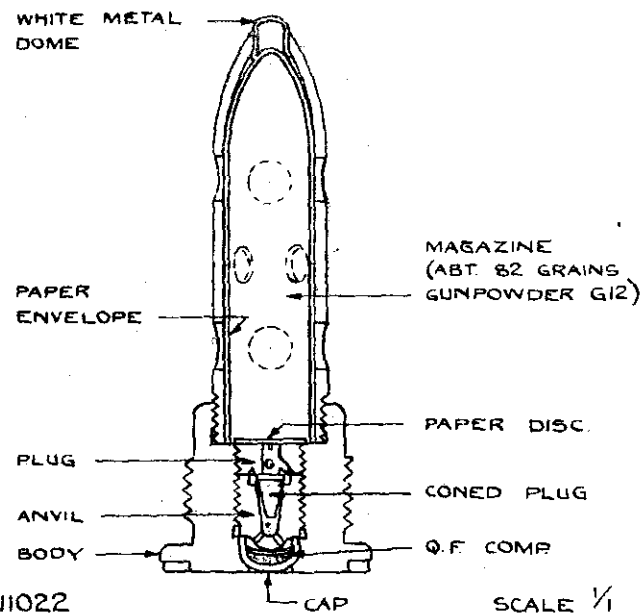
D.D. (L) 10966

SCALE 1/1

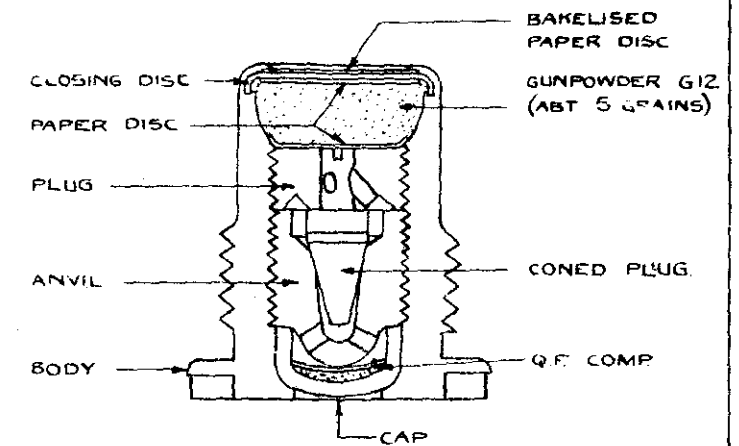
PRIMER, PERCUSSION, No. 12 Mk. III



PRIMER, PERCUSSION, No. 15 Mk. II

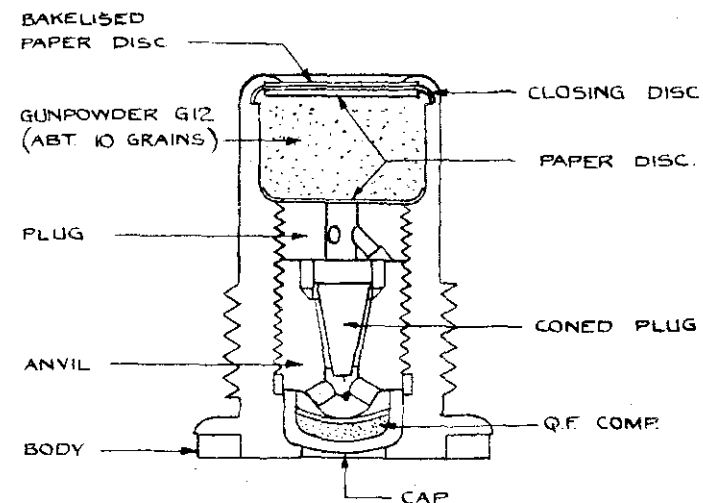


PRIMER, PERCUSSION, No. 16 Mk. III



PRIMERS, PERCUSSION, Q.F. CARTRIDGE.

PRIMER, PERCUSSION, No 27 Mk. I

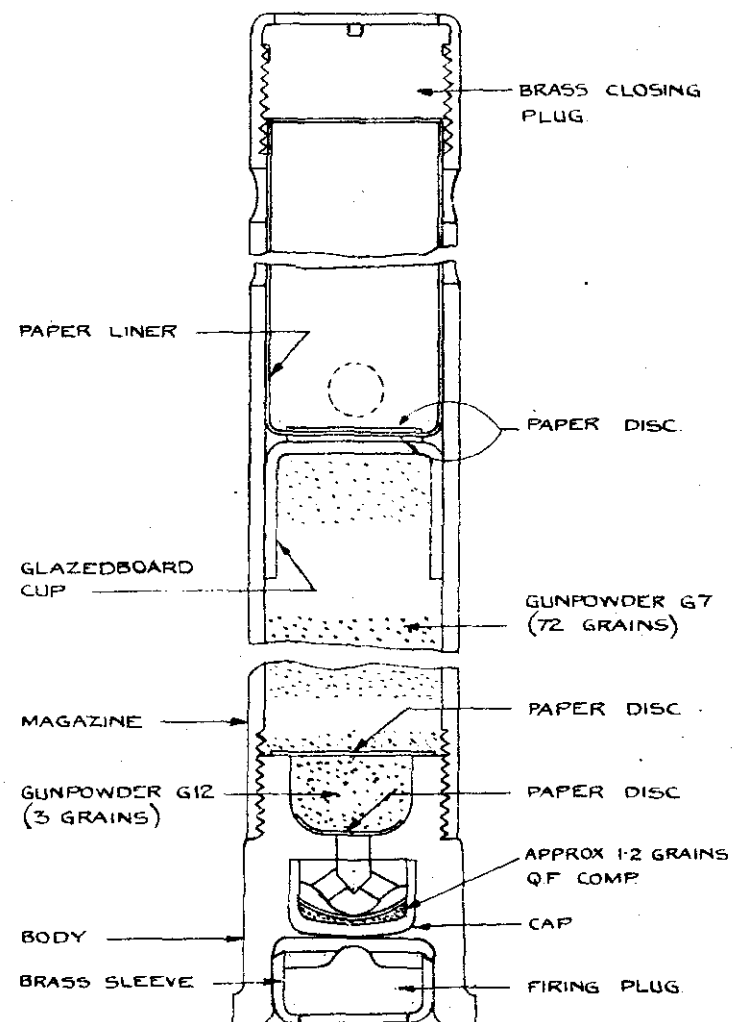


D.D. (L) 8553 B

NOT TO SCALE

PRIMER, PERCUSSION, No 28 Mk I

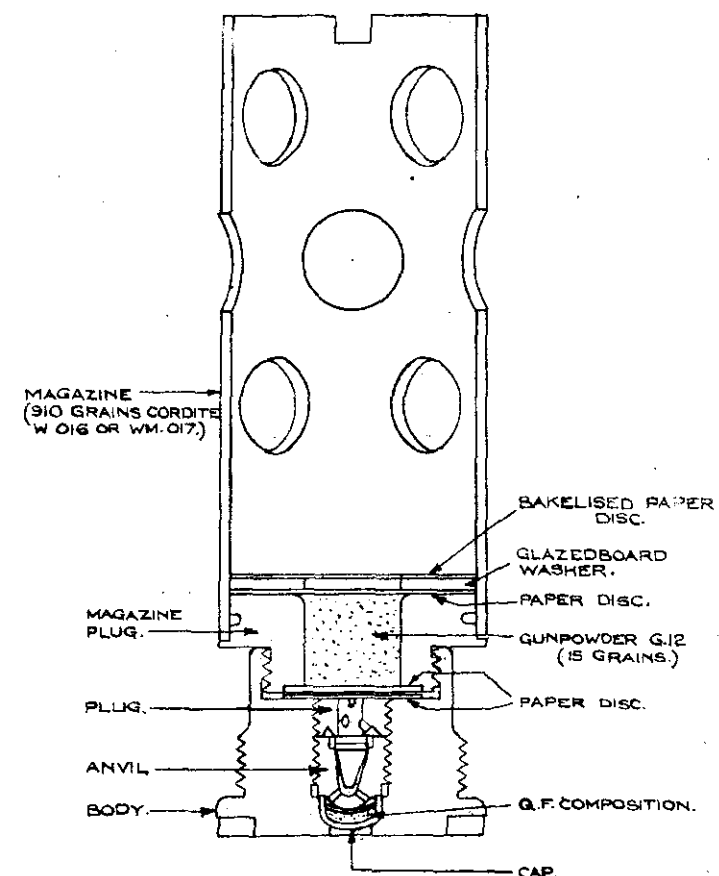
(Overall Length 7.68 inches)



D.D. (L) 12144

NOT TO SCALE

PRIMER, PERCUSSION, No.29 Mk. I.

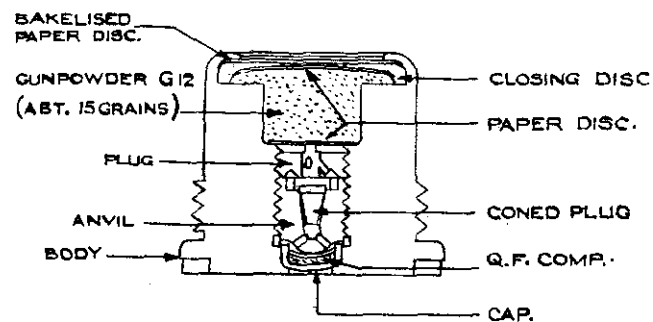


D.D. (L) 16202

SCALE 1/1

FIG. 341/1 (ITEM. 868).
PRIMERS, PERCUSSION Q.F. CARTRIDGE.

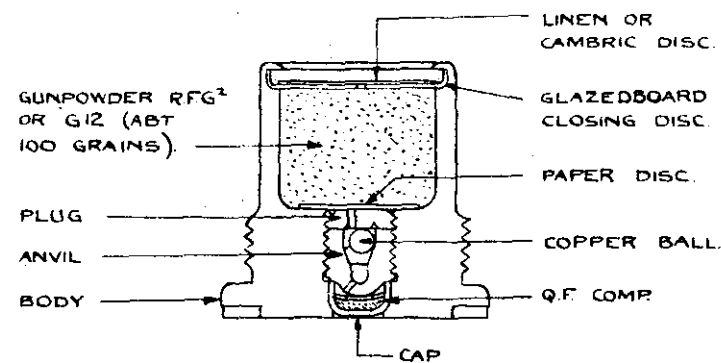
PRIMER, PERCUSSION No. 30 Mk. I



D.D.(L) 15599

SCALE 1/1

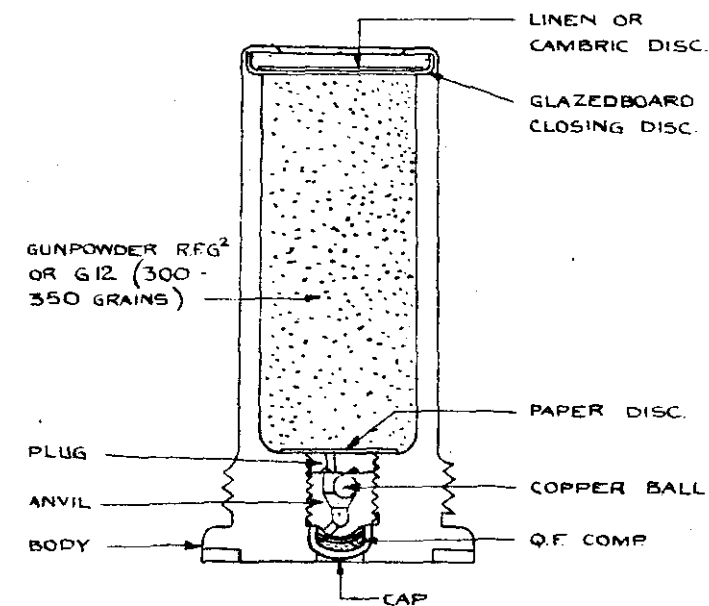
PRIMER, PERCUSSION, BLANK, 100 GRS. Mk I



D.D.(L) 1842

SCALE 1/1

PRIMER, PERCUSSION, BLANK, 350 GRS. Mk I



D.D.(L) 762A (1)

SCALE 1/1

FIG. 342 (ITEM 878)
FUZE, D.A. AND PERCUSSION, No. 119 B. MK. IV.

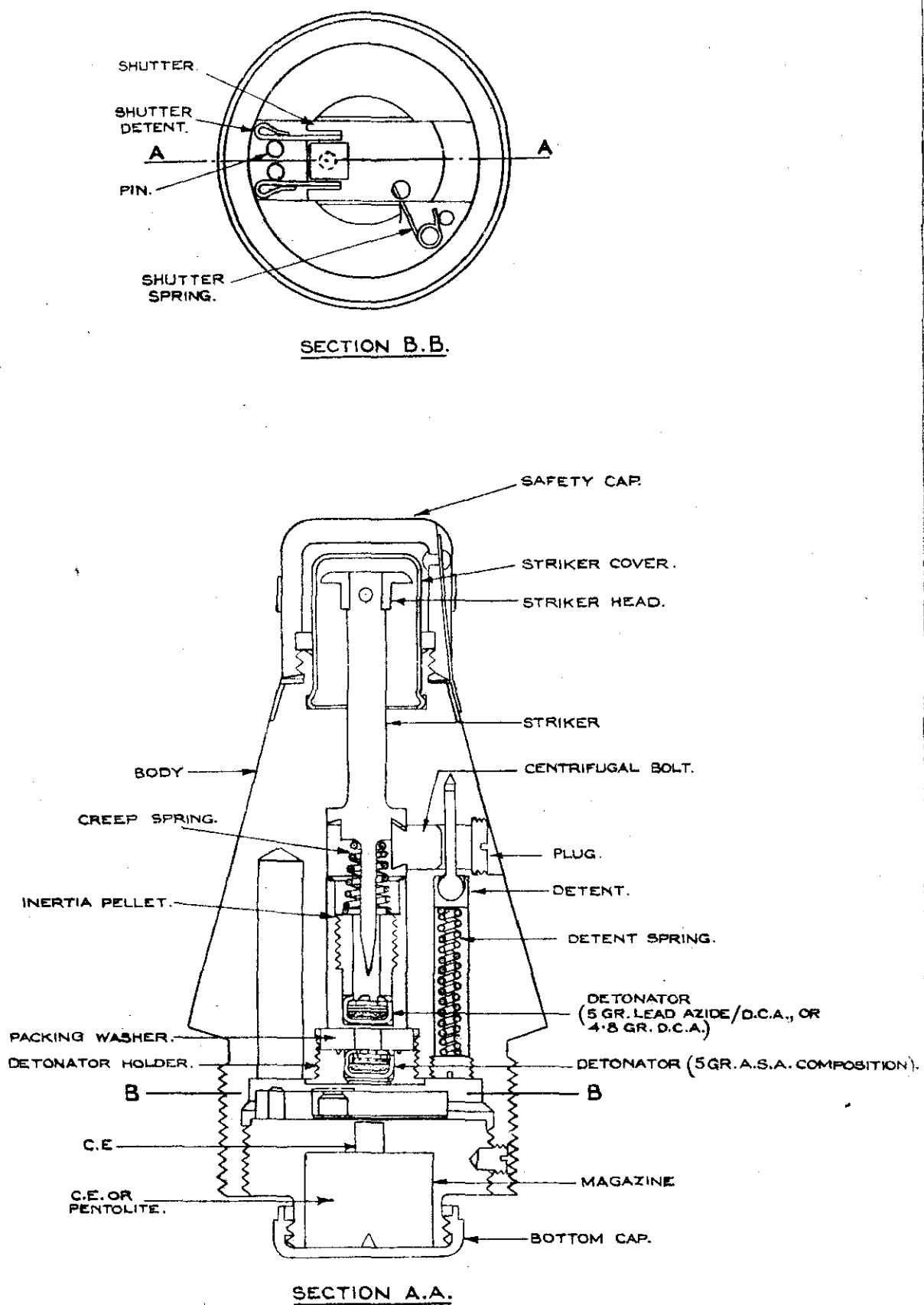
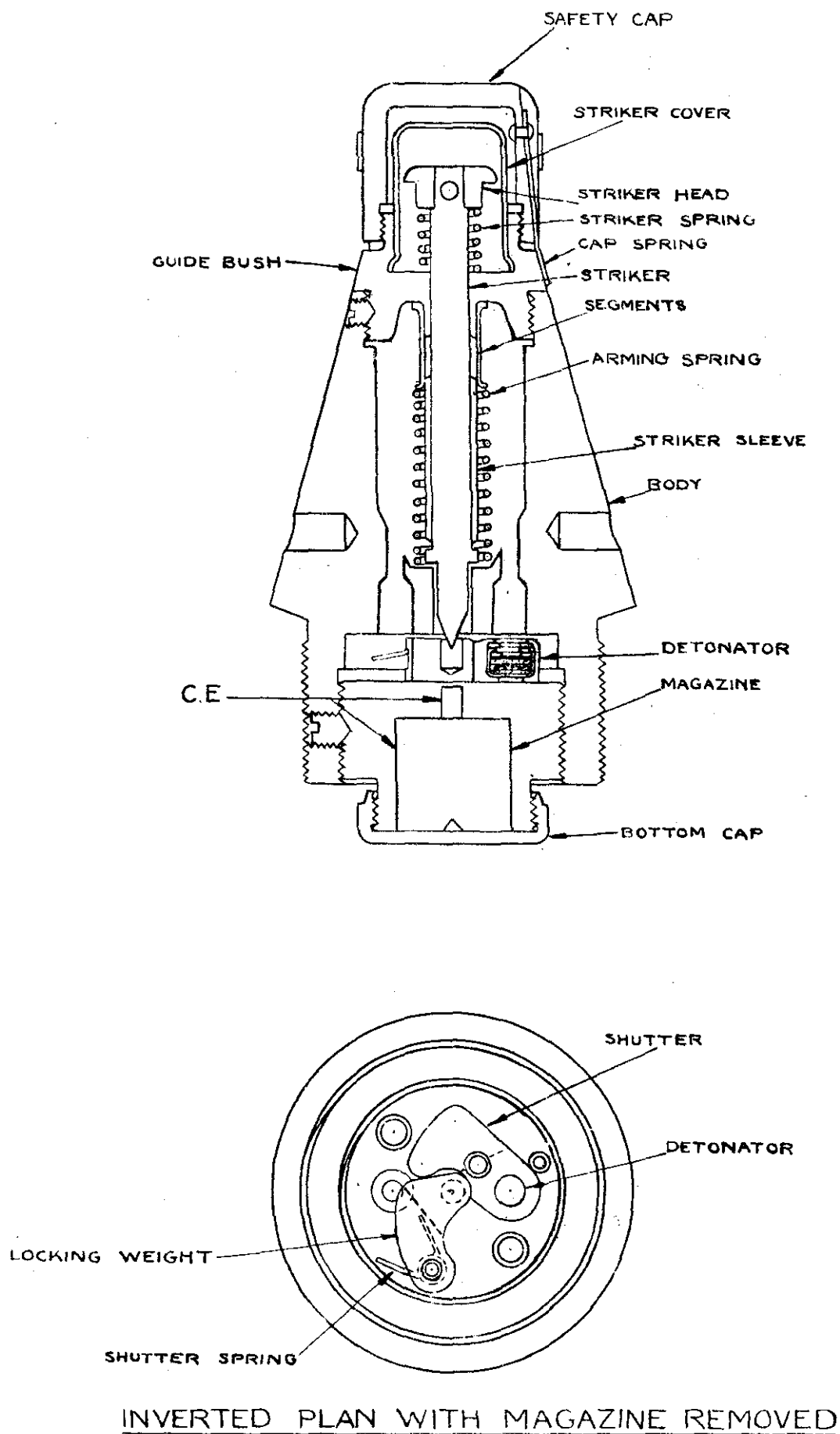


FIG. 343 (ITEM 880)

FUZE, PERCUSSION, D.A. N° 117 M^K VII/L



GERMAN FUZE FOR TELLER MINE 42.

FIG. 344 (ITEM 881).

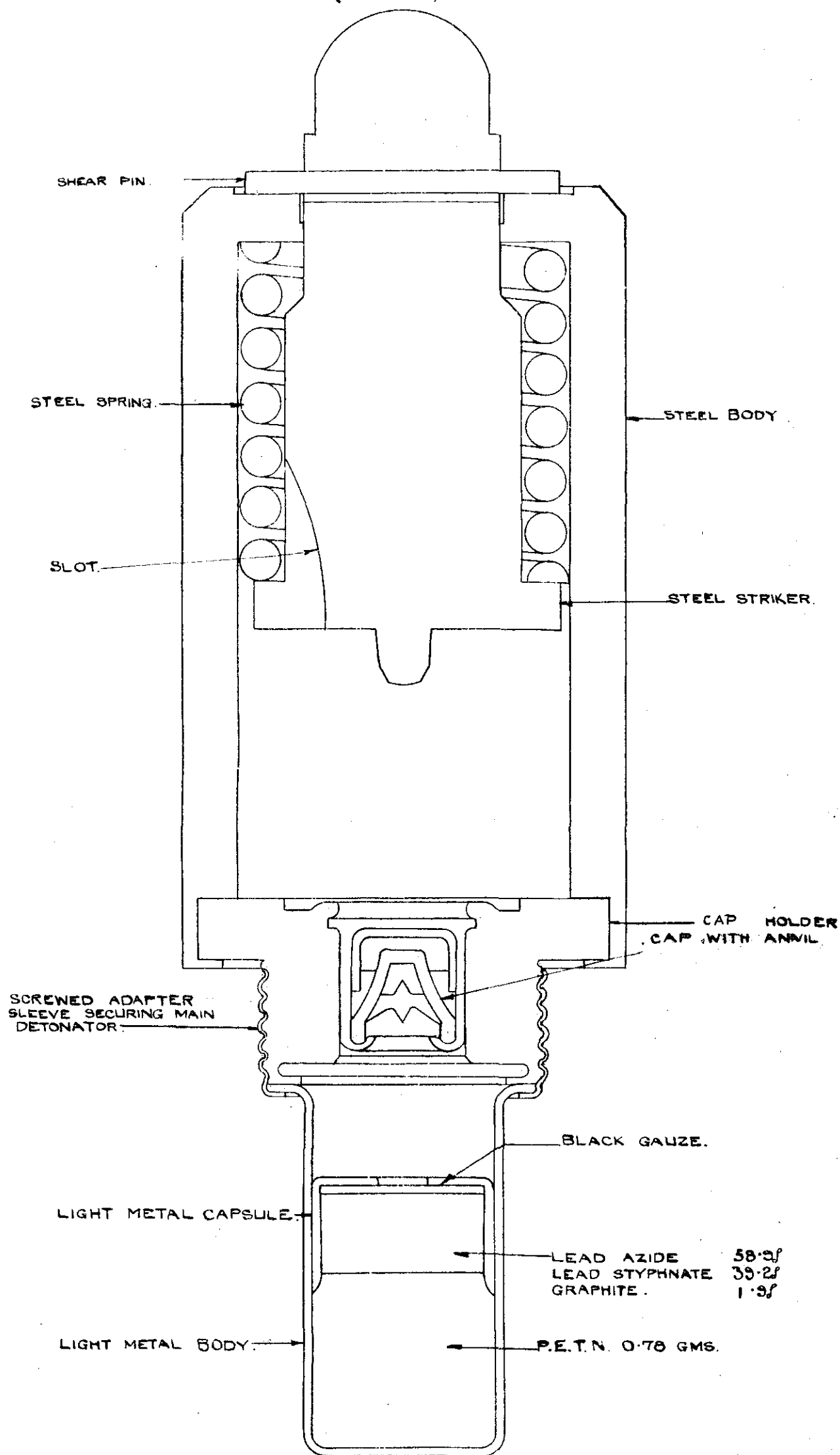
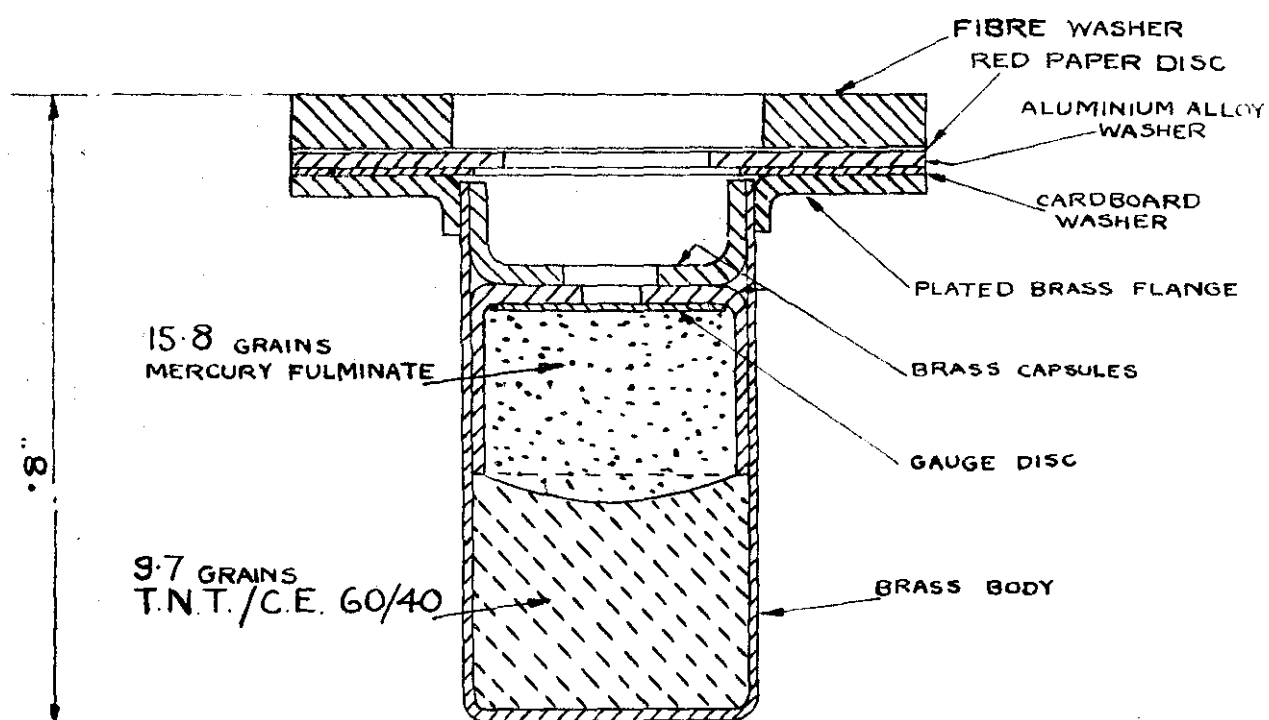


FIG. 345 (ITEM. 882)

GERMAN TELLER MINE 35

MAIN DETONATOR



BASE

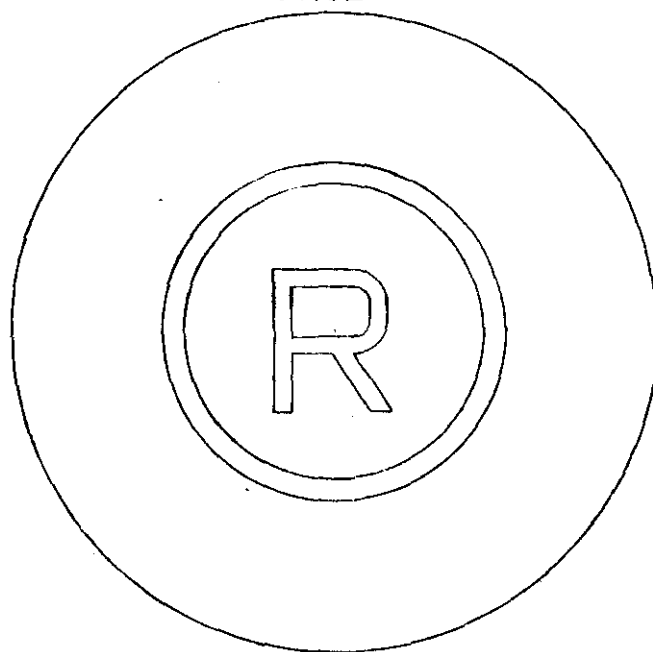


FIG. 346. (ITEM B83)

GERMAN 13.5 Kg. DEMOLITION CHARGE WITH HOLLOW CHARGE.

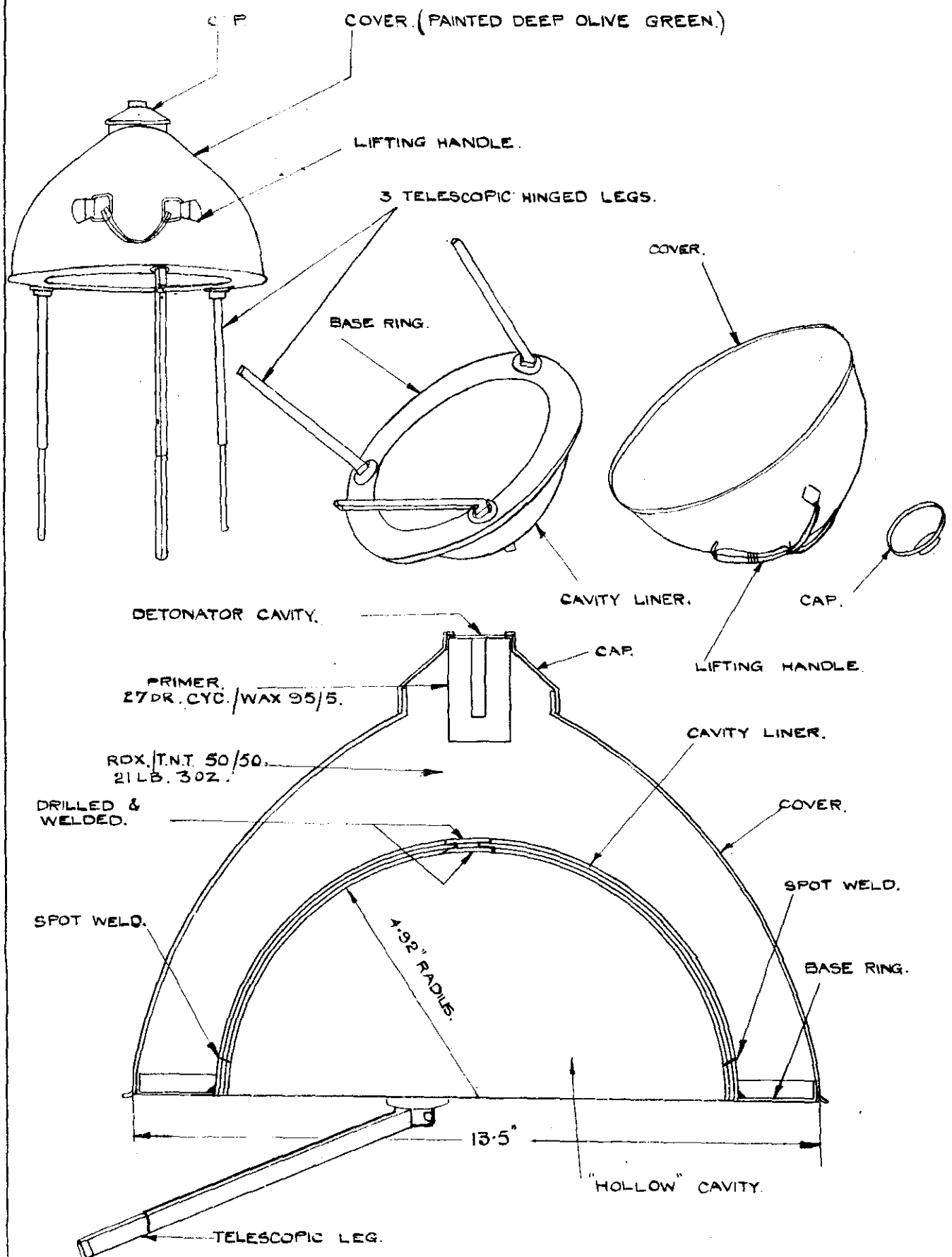


FIG. 347. (ITEM 884)
GERMAN 3 Kg. MAGNETIC HOLLOW CHARGE.

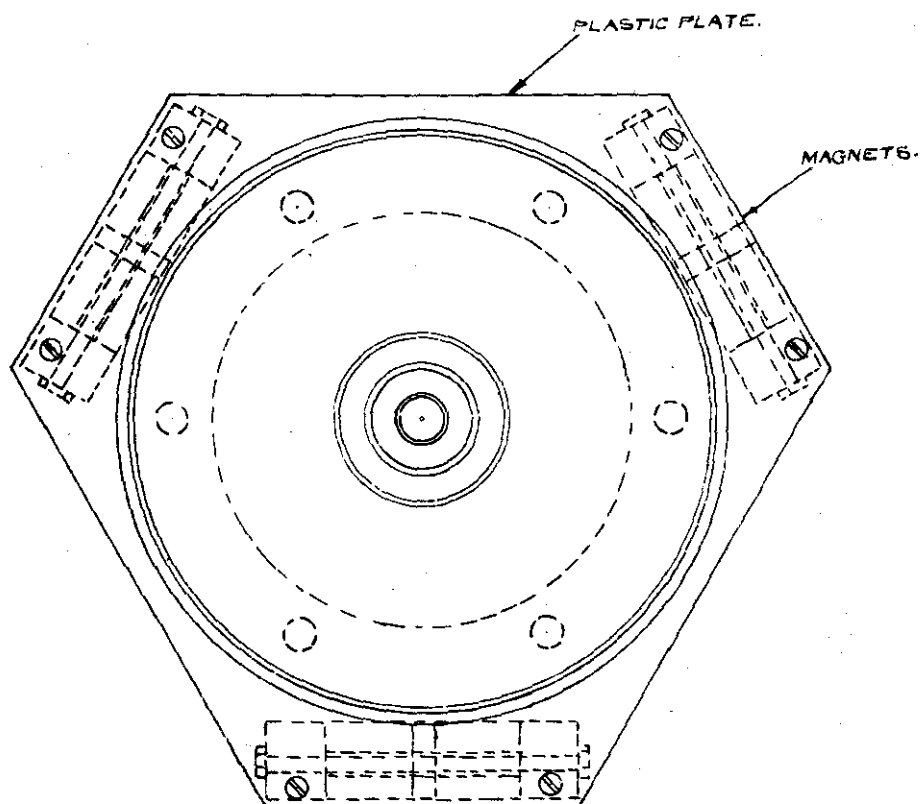
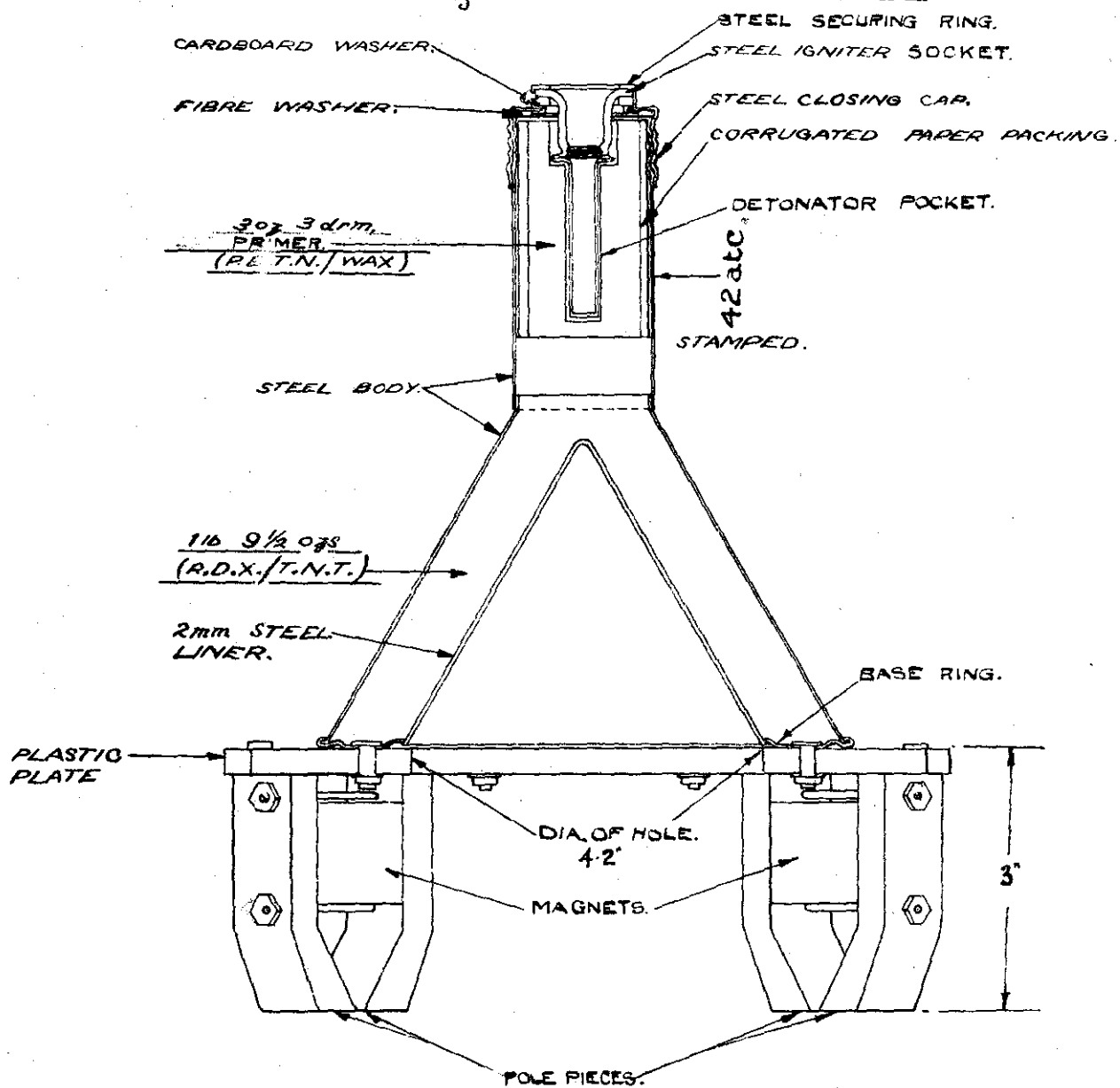
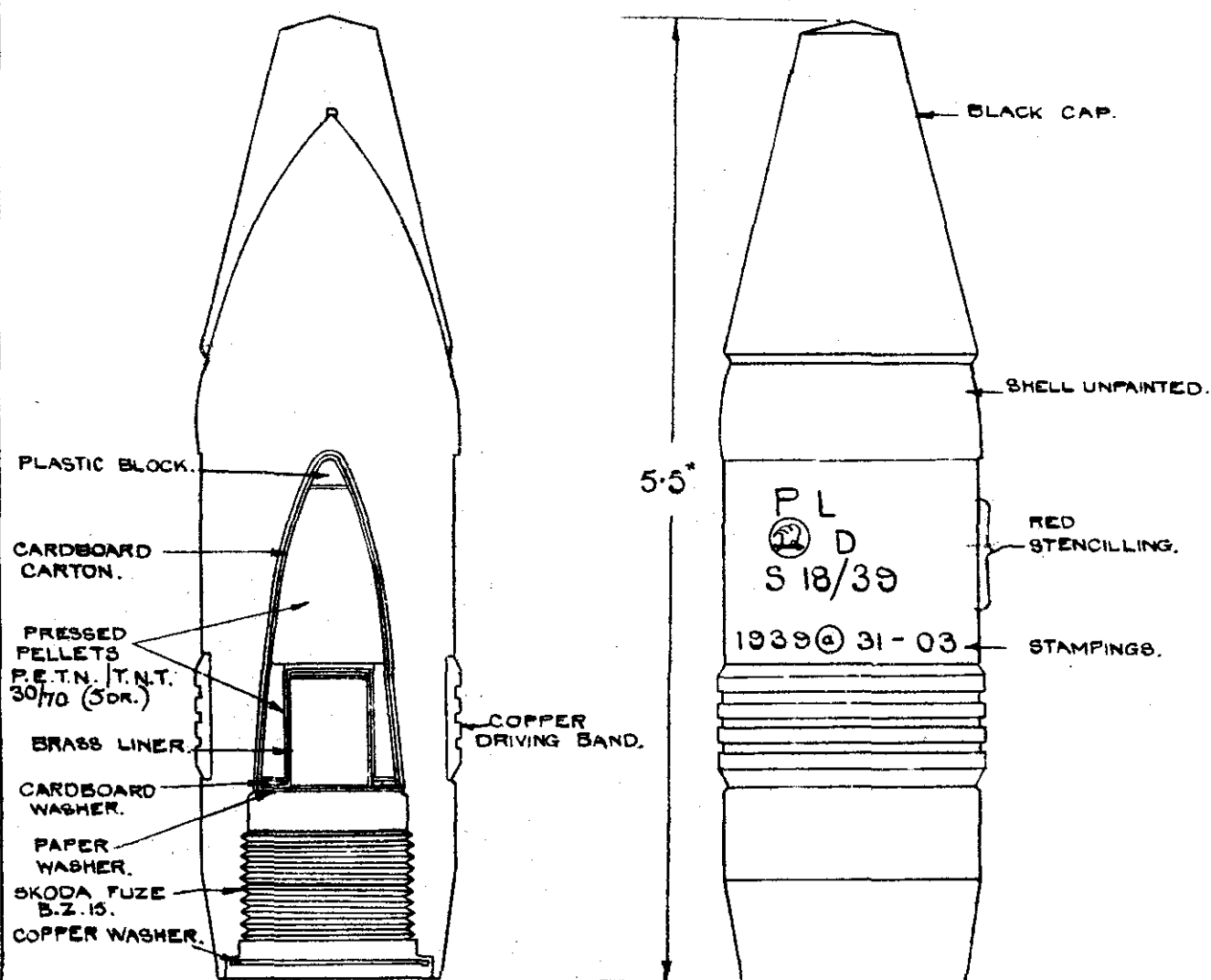
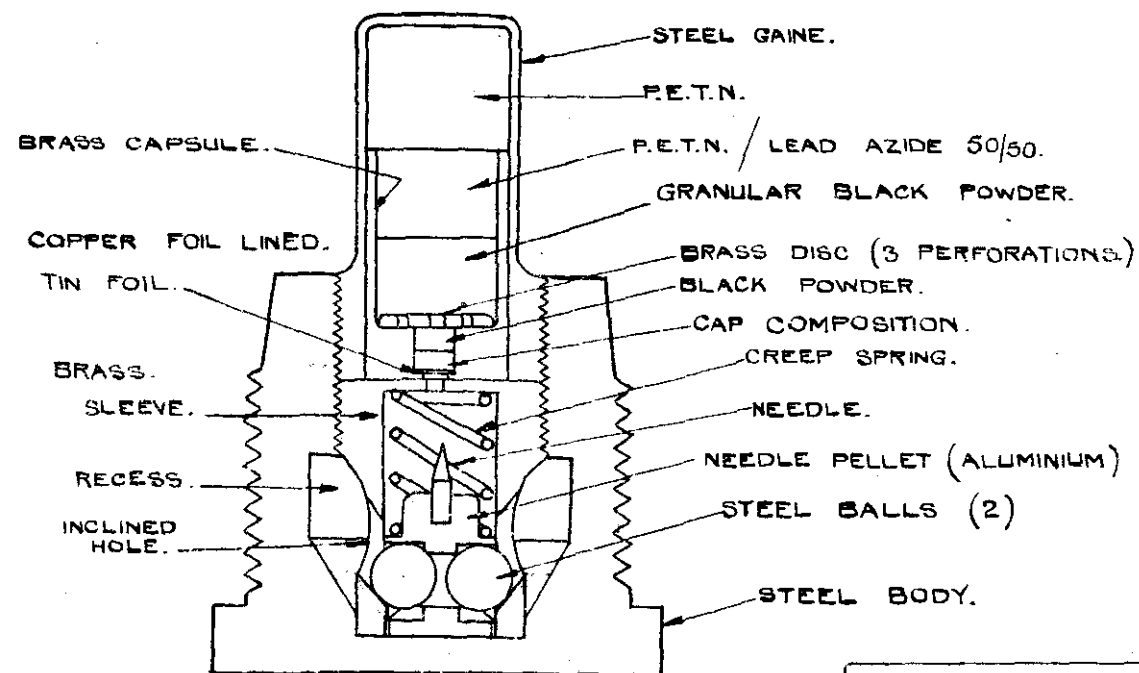
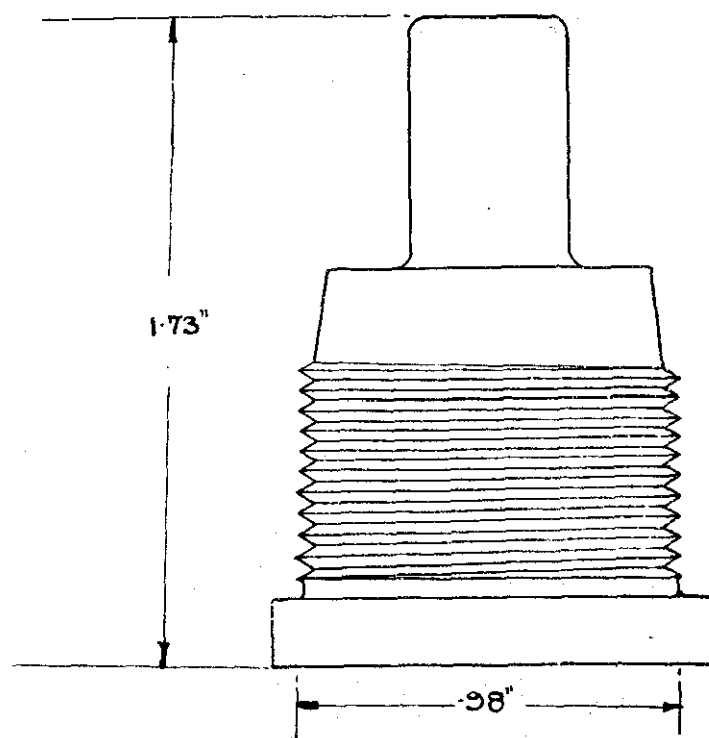
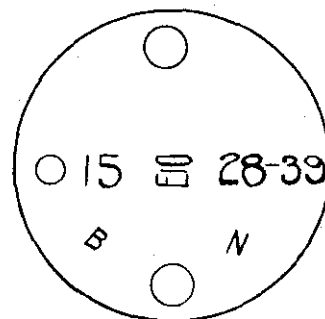


FIG. 348 (ITEM 886)
GERMAN 3.7 cm. A.P.C. SHELL OF CZECH ORIGIN.



FILLED WEIGHT 1LB. 13 OZ. 13 DR.

GERMAN BASE FUZE, SKODA B.Z.15.
FIG. 349. (ITEM 886)



E.A.
FUZES.
SK. N° 12.
C.I.A./A. 7-7-43.

GERMAN PRIMER PERCUSSION Q.F. CARTRIDGE VZ.33dv OF CZECH ORIGIN.

FIG. 350 (ITEM 387.)

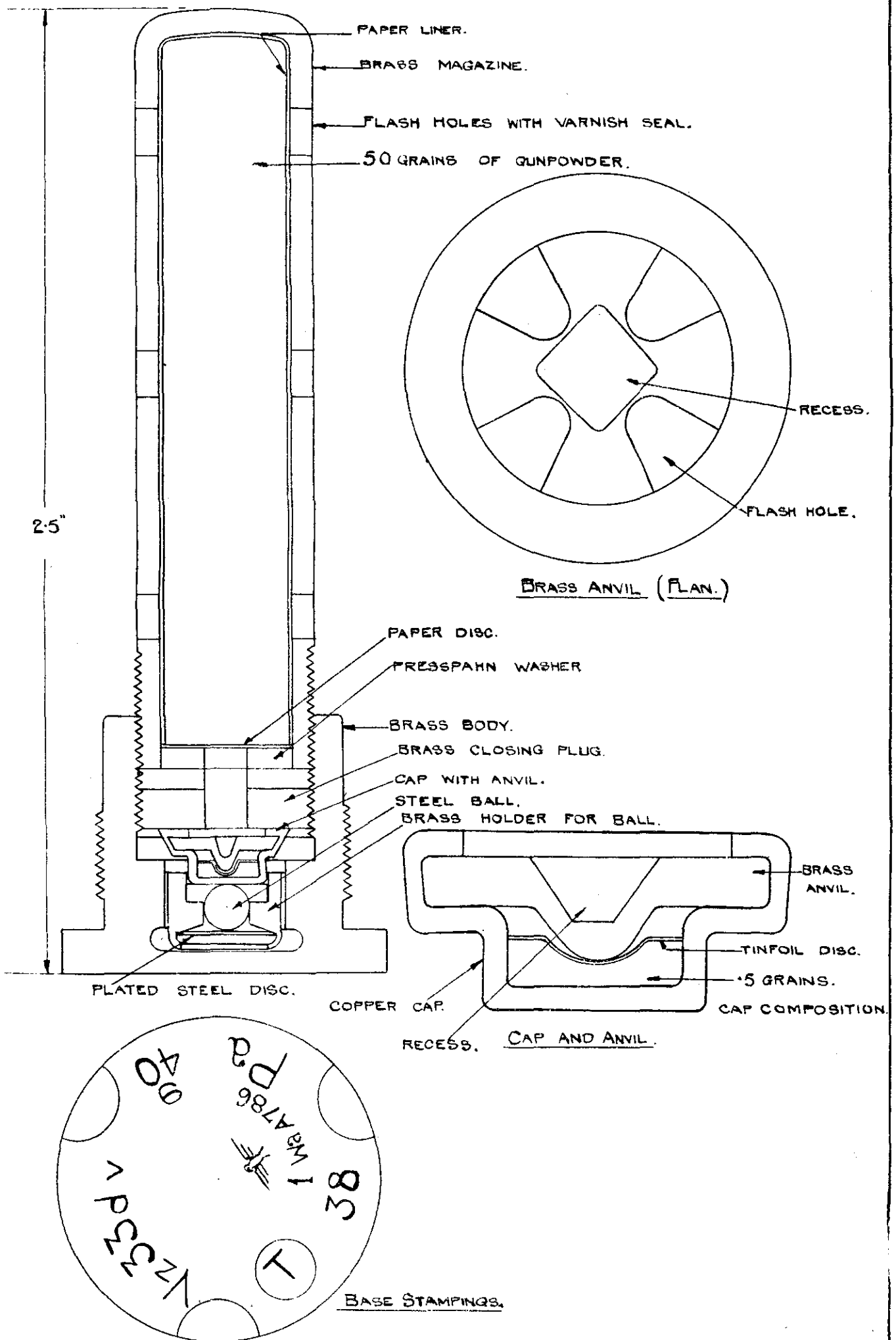


FIG. 351. (ITEM 888.)
 ITALIAN 75/27 CK AND 75/27 AV, H.E. FRAGMENTATION SHELL.

