A MINISTRY OF SUPPLY PUBLICATION

AMMUNITION BULLETIN No. 50

ITEMS 1447-1496

RESTRICTED

The information given in this document is not to be communicated, either directly or indirectly, to the Press or to any person not authorized to receive it.

JULY 1946

PRINTED & ISSUED BY
THE CHIEF INSPECTOR OF ARMAMENTS.

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ITEM NO.

1470. Ammunition S.A. 15 mm. - Obsolescent.

1470. " S.A. .455-in. - Obsolete.

1460. " Q.F. 3-in. Howitzer - Obsolescent.

1448. " Q.F. 3-in. 20-cwt. Gun - Obsolete.

1456. Bomb Spigot 29 mm. - Obsolete.

1476. " M.L. Coloured smoke skytrail B.E. 3-inch Mortar 10-lb. Mk.1 - M. of F. (FIG.600).

1477. " M.L. Coloured smoke B.E. 3-inch Mortar 10-lb. M. of F. - Obsolescent.

1475. " M.L. Smoke B.E., D.S. 4.2-inch Mortar Mk.1/1 - Introduction (FIG.599).

1467. Cartridge Q.F. 6-pr. 7-cwt. S.V. -
N.H., A.P.D.S., Shot/T. Mk.1
Cordite W.M.T. A.P.D.S. Shot/T Mk.2 } Obsolete

1471. Cartridge Q.F. 95 mm. Tk. How., Cordite W.T., or W.M.T. Reduced Charge H.E. Shell Mk.1.A. - Obsolete.

1464. Cartridge Q.F. :-
5.25-in. Mk.2 Gun } Foil
3.7-in. Mk.6 Gun }

1450. Cartridges B.L. 7.2-in. How., 19-lbs. 12-oz. Cordite W.M.T. 316-100 Mk.1 - Obsolete.

Cartridge M.L. 3-in. Mortar - Augmenting:-

1458. Obsolete and obsolescent.

1472. 180 gr. Mk.8.Z. NCRP. Mk.2. Design approved.

1449. Detonators No.36.M. Grenade
Mk.2.
4 secs. delay Mk.5 } - Obsolete

1447. Demolitions - Safety in.

1454. Flares, Lights Signal & Rockets - Obsolete

1465. Fuze, Percussion, D.A. No.117 Mk.3.A. - Obsolescent

1463. " " D.A. No.725 Mk.1 - Obsolete

1461. " Time No.183 - Obsolete.

1459. " " No.199 - Proof

1468. " " No.208 Mk.5 - Introduction

1453. Generator Smoke No.18 Mk.1 & No.28 Mk.1 - Obsolete

1455. Grenade Hand No.74 Mk.2 - Obsolete

1466. " " No.75 A/T Mk.3 - Obsolete

1478. " " No.91 Mk.1 - Introduction (FIG.601)

1474. " Hand/Rifle No.92 Mk.1 - Design approved (FIGS.597 & 598)

1473. " Smoke W.P. Rifle No.87 Mk.1 (FIG.596)

1462. Match Quick and Match Slow - Obsolete.

1457. Rockets 3-inch, Ammunition - Obsolete for Land Service.

ITEM NO.

1469. Shell Q.F. Smoke Emission 95 mm. Tk. How. Mk.1 - Obsolescent.

1452. Tail, Fuzed, Rifle, Grenade, Empty, No.2 Mk.1, No.3 Mk.1, No.4 Mk.1, and No.5 Mk.1 - Design approved.

1451. Thunderflash Mk.8 (FIG.595).

ENEMY AMMUNITION

GERMAN

1479. Anti-tank mine (Riegelmine 43) (FIG.602)

1480. Pull Igniter 42 (Z.Z.42) (FIG.603)

1481. 3.7-cm. Flak 18, Cartridge Q.F. H.E./T. (FIG.604)

1482. 3.7 cm. Flak 18, Cartridge Q.F. H.E./I/T. (FIG.605)

1483. Tracer from 3.7 cm. Flak 18, H.E./I/T. Shell (FIG.606)

1484. 3.7 cm. (Naval) Cartridge Q.F. H.E./T. (FIG.607)

1485. Tracer from 3.7 cm. (Naval) H.E./T. Shell (FIG.608)

1486. 7.5 cm. KwK.40 and Stu.K.40, Cartridge Q.F. Hollow Charge (Gr 38 Hl/C.) (FIG.609)

1487. 7.5 cm. Pak 40, Cartridge Q.F. A.P.B.C./T. Shot (T.C. Core) (FIG.610)

1488. Tracer from 7.5 cm. Pak 40, A.P.B.C./T. Shot (FIG.611)

1489. 10.5 cm. le FH. 18 M. Shell H.E., S/L. (Gr F) (FIG.612)

1490. 10.5 cm. le FH. 18 M. Cartridge Q.F. for "Gr F" Shell (FIG.613)

1491. 10.5 cm. Geb H.40 Coloured Smoke H.E. Shell (F.H. Gr Buntr) (FIG.614)

1492. Fuze 3.7 cm. Kpf Z. Zerl. P.v. (FIGS. 615 and 616)

1493. Fuze AZ.38 St. (FIG.617)

1494. Fuze Wgr Z (r) from 12 cm. Mortar Bomb (FIG.618)

1495. 2.7 cm. Pistol Smoke Cartridge (Nebelpatrone für Kampfpistole) (FIG.619)

1496. 2.7 cm. Pistol Coloured Smoke Cartridge (Deutpatrone für Kampfpistole) (FIG.620)

AMENDMENTS

Bulletin No.7, Item 62, Lines 6 and 8.

	C.M.T. Limits	M.D.
For:	21.0" - 22.3"	0.20" max.
Read:	C.M.T. Limits	M.D.
In Cylinders	20.4" to 21.4"	0.20"
Exposed	20.1" to 22.3"	0.20"

Bulletin No.49, Item 1407, Line 28.

For: "Clearing and Lacquering Cartridge Cases"

Read: "Cleaning and Lacquering Cartridge Cases"

1447. SAFETY IN DEMOLITION

When carrying out demolitions or blowing up surplus or defective ammunition it is the rule that the person who places the demolition charge and detonator in position carries with him the key or other locking device of the Field Service Exploder or other power producer used to provide the firing current. This procedure is designed to protect the person fixing the charge and detonator as the exploder or other firing device should not be operable whilst locked.

As a further precaution it is usual to prescribe that the firing leads are not connected to the exploder until the return of the person fixing the charge and detonator, and the further custom has grown up in some places for a second person to hold the loose ends of the two wires above his head, one in each hand, so that they can be seen by the person fixing the charge and detonator, thereby reassuring him on safety.

With the extensive developments in radio and radar transmission in recent years and the increase in the number of transmitters operating, this practice introduces a definite risk of accident.

The Explosives Storage and Transport Committee is now engaged in investigating the risks which radio or radar transmitters may convey to electrically operated types of Ammunition and it has been established that a risk does exist, though the extent of the risk remains to be determined.

It is clearly established that this risk is considerably increased when a dipole exists in any electrical circuit comprising an electrically operated type of ammunition, e.g. an electric detonator, the risk depending upon the power of the transmitter to which the dipole responds and the resistance of the bridge in the explosive unit (detonator).

A man holding the ends of two wires in an otherwise closed circuit above his head forms, in effect, an aerial and if a radio or radar transmitter having a wave length of approximately twice the distance at which the two ends are apart, is working in the area with sufficient power the detonator may be fired. It is largely a question of power on the one hand and resistance on the other.

In view of the risk, this practice should be discontinued.

To meet the same requirement of visual assurance to the person with the detonator, the two ends of the wires should be connected to an insulated plug having two recessed terminals to fit over two pins on the exploder. Two or three turns of bared wire should be taken round this plug and the end allowed to drop on the ground to screen the plug electrically. The plug can then be held above the head to show it is disconnected from the exploder.

1448. ORDNANCE Q.F. 3-INCH 20-CWT. GUN - AMMUNITION

Approval has been given for the ammunition and associated stores for the above equipment to be declared "obsolete" or "restricted in use".

1449. DETONATOR NO.36M. GRENADE:-
Mk.2.
4 SECS. DELAY Mk.5.
CYLINDER NO.124 MK.4 and NO.124 MK.5.

Approval has been given for the above mentioned stores to be declared "obsolete".

1450. CARTRIDGES B.L. 7.2 INCH HOWITZER, 19-lb. 12-oz. CORDITE W.M.T.316-100 MK.1.

Approval has been given for Design DD(L)13374A. of the above mentioned B.L. 7.2-inch How. cartridge, Charge 4, to be endorsed "obsolescent" and for existing stocks to be disposed of as unserviceable.

1451. THUNDERFLASH MK.8 (FIG.595)

Design D4/1/159/G.F./76 has been approved for the above mentioned store which is illustrated in Fig.595.

1452. TAIL, FUZED, RIFLE, GRENADE, EMPTY
NO.2, MK.1
NO.3, MK.1
NO.4, Mk.1
NO.5, Mk.1.

Designs for the above mentioned tail units have been approved.

1453. GENERATORS, SMOKE NO.18, MK.1.
GENERATORS, SMOKE NO.28, MK.1.

Approval has been given for the above mentioned stores to be declared "obsolete".

1454. FLARES, LIGHTS, SIGNALS AND ROCKETS

Approval has been given for the undermentioned stores to be declared "obsolete".

Flare, beach, Mk.1
Flares, ground:-
½-hour, Red Mk.1
1½-in. long x 1½-in. dia :-
Red, Mk.1
Green, Mk.1
Yellow, Mk.1
White, Mk.1
1¾-inch long x 2-in. dia :-
Red, Mk.1
Green, Mk.1
Yellow, Mk.1
White, Mk.1
3-inch long x 2-in. dia :-
Red, Mk.1
Green, Mk.1
Yellow, Mk.1
White, Mk.1

Lights:-
Long Red, Mk.3
Short G.S. Mk.2

Signals:-
One Star Red, Green or Yellow Mk.1
Vertical, light ray:-
Yellow to Red, Mk.1
Yellow to Green, Mk.1

Rocket, Light, ½-lb., Mk.2.

Box, Flares, ground :-
M.3. Mk.1
M.3A. Mk.1

Box signal vertical, light ray M.36 :-
Mk.1
Mk.2

Box, flare, beach, M.66 Mk.1

Cylinders:-
No.38 Mk.1
No.39 Mk.1
No.76 Mk.1
No.210 Mk.1
No.210 Mk.2
No.218 Mk.1
No.256 Mk.1
No.297 Mk.1

1455. GRENADE HAND NO.74 MK.2.

Approval has been given for the following stores to be declared "obsolete".

Grenades Hand No.74 A.T. :-
Mk.2.
Drill Special Mk.2.
Instructional Mk.2.

Detonator No.74 A.T. Grenade :-
Mk.2.
Mk.3.
Dummy Mk.2.

Box No.74 Grenade G.110 :-
Mk.1.
Mk.2.

1456. BOMB SPIGOT 29 MM.

Approval has been given for the undermentioned stores to be declared "obsolete".

Bomb Spigot:-
H.E. 29 mm. Mortar 14-lb. Mk.1.
H.E. Anti Tank 29 mm. Mortar 20-lb., Mk.1.
Practice Anti Tank 29 mm. Mortar, 20/15-lb. inert
Mark 1
Mark 2
Drill A/T 29 mm. Mortar, 20-lb., Mk.1.
A/T 29 mm. Mortar 20-lb., Ring Stabilizing.

Cartridge Spigot 29 mm. Mortar:-

12 grams	Cordite	W.M.061	Mk.1	
17½	"	"	"	Mk.1
17½	"	"	W.M.118 and W.M.061	Mk.2
19.23	"	"	" " "	Mk.1
20	"	"	"	Mk.1
20	"	"	W.M.118 and W.M.061	Mk.2
21	"	"	" " "	Mk.1

Cartridge Dummy Spigot 29 mm. Mortar Mk.1

Box Ammunition:-
Spigot 29 mm. Mortar B.174 Mk.1
Tails Spigot 29 mm. Mortar B.175 Mk.1

Carrier Ammunition Spigot 29 mm. Mortar:-
No.4 Mk.1
No.5 Mk.1

Box Fuze F.283 Mk.1

Cylinder No.283 F. Mk.1

1457. ROCKET 3-INCH - AMMUNITION AND ANCILLARY STORES.

Approval has been given for the ammunition and ancillary stores for the above mentioned Rocket 3-inch to be declared "obsolete" for Land Service.

1471. CARTRIDGE Q.F. 95-MM. TK. HOW., CORDITE W.T. or W.M.T. REDUCED CHARGE HIGH EXPLOSIVE SHELL MK.1A.

Approval has been given for the above mentioned reduced charge cartridges to be declared "obsolete".

1472. CARTRIDGE, AUGMENTING 3-IN. MORTAR, 180 GR. MK.8Z. N.C.R.P. MK.2.

Design D2(L)2160/GF/97 for the above mentioned cartridge in moulded celluloid container has been approved.

1473. GRENADE SMOKE W.P. RIFLE NO.87 MK.1. (FIG.596)

A design of the above mentioned smoke grenade (see Fig.596) with Fuze No.431 Mk.1 and Tail Unit No.3 Mk.1 has been approved.

Fuze No.431 Mk.1 employs a mechanism similar to that of Fuze No.430 Mk.2. (see Fig.598). It differs mainly in the design of the magazine which has an increased capacity. The magazine is filled with two C.E. pellets above a C.E. stemmed disc and 6 gr. A.Z.Y. detonator.

1474. GRENADE, HAND/RIFLE, NO.92 MK.1. (FIGS. 597 & 598)

A design of the above mentioned hand or rifle grenade has been approved. When used as a hand grenade, a Detonator No.99 Mk.1 and Striker Mechanism No.6 Mk.1 is fitted; for use as a rifle grenade, an adapter, Fuze No.430 Mk.2 and Tail Unit No.2 Mk.1 is fitted.

The grenade consists mainly of a cylindrical body filled C.A.P. and two C.E. pellets.

The body of the grenade is of tin plate, cylindrical in shape except near the base where it is coned. The coned portion has a flat base in which a charging hole is formed; the hole is closed by a soldered-on cup shaped plug. The closing arrangement at the top is formed to make a pressed screwthreaded socket, to which is soldered a cylindrical burster container which intrudes into the grenade body. A tin plate fuze holder, which has a detonator holder soldered to its base, screws into the socket, and is secured by coating the underside of its flange and external thread with R.D. cement.

The main filling consists of a chemical composition and is charged through the hole in the base of the body.

The bursting charge consists of an annular and a solid cylindrical pellet of C.E. which, with a plastic collar, are enclosed in a thin paper wrapping.

The Striker Mechanism No.6 Mk.1 has a plastic body and is generally similar in design to the No.4 Mk.1 mechanism. It differs only in the design of the fly-off lever. The mechanism is only lightly screwed home to ensure easy removal when converting the grenade for use with a rifle.

The No.99 Mk.1 detonator is housed partly in the body of the striker mechanism and partly in the tin plate holder. It comprises a cap, cap holder, length of safety fuze, detonator, plastic collar and a split ring. The cap is secured in the top of the holder and is in contact with one end of the safety fuze; the detonator is crimped to the other end. The plastic collar is secured to the skirt of the holder by a split ring in a cannelure.

Fuze No.430 Mk.2, Tail Unit No.2 Mk.1 and the Adapter are illustrated in Fig.598.

ACTION

Striker Mechanism No.6 Mk.1.

The action of the striker mechanism is similar to earlier marks, and after a short delay the bursting charge is detonated with complete fragmentation.

Fuze No.430 Mk.2.

During acceleration gas pressure passes through the perforations in the retaining cup and forces the base of the inner and outer diaphragms into the recessed base of the guide bush and in so doing carries the arming pin forward until the neck of the pin is in a position to free the ball.

On impact, the striker forces the ball towards the centre into the neck of the arming pin, overcomes the creep spring, and impinges the needle on to the detonator.

MARKING

The body of the grenade is painted grey and has a $\frac{1}{4}$-inch red band at the top and, immediately below, a $\frac{3}{8}$-inch black band. The filling composition code marking "B.2" is painted in white on the black band. Further marking in black are shown in Fig.597.

PACKING

Four grenades, and four detonators in tin plate cylinder No.533 Mk.1, are packed in rolled paper container No.269 Mk.1. Eight containers are then packed in Box B.173A Mk.1.

Two tail units and adapters are packed in rolled paper container No.291 Mk.1. Each tail unit has secured to it a cartridge in tin plate cylinder No.544 Mk.1. Four containers No.291 and three spare cartridges in cylinder No.543 Mk.1 are packed in Box M.104.

Stowage dimensions

Box B.173A Mk.1 - 21.9-ins. x 9-ins. x 13.2-ins.
Weight 56-lbs.

Box M.104 Mk.1 - 19.3-ins. x 8.2-ins. x 7.6-ins.
Weight 21-lbs.

1475. BOMB, S.B., M.L., SMOKE, B.E., D.S., 4.2-in. MORTAR MK.1/1. (FIG.599)

Approval has been given for the introduction of the above mentioned smoke bomb which embodies a discarding sabot in the form of a "Ring (in halves)".

The bomb consists mainly of a ~~cast iron~~ body with steel sabot, two containers smoke No.7 Mk.1, ejection charge, Tail Unit No.8 and Fuze No.390 Mk.2 or 2.A.

The wall of the bomb body is increased in thickness near the centre and grooved to receive the discarding sabot.

The sabot consists of two semi-circular skirted sections secured by two shear screws each with a locking nut as illustrated in the inset in Fig.599. A washer is interposed between the ends of each section.

Each smoke container consists mainly of a steel cylindrical body, a filling comprising a pellet of S.R.264.A. smoke composition weighing approximately 1-lb. 9-oz. and a pellet of S.R.252 priming composition weighing approximately 1-oz. 2-dr., a central perforated steel tube, a tin plate sleeve and a sleeve of worsted cloth.

The body of the container is cup shaped with a central perforation in the base. The filling is in the form of two annular pressed pellets, one within the other and separated by a tin plate sleeve. A sleeve of worsted cloth lines the surface of the cavity formed in the filling. The filling is retained by the central tube and a perforated metal closing disc. The ends of the tube are deeply serrated. The base end passes through the hole in the base of the body and is turned over and secured by spot welding or soldering. The other end of the tube passes through a central hole in the closing disc which is secured by turning over the end of the tube and lip of the container body.

The containers are housed in the bomb body between a baffle plate at the top and a millboard washer and baffle plate in the base; a millboard washer is inserted between the containers. Further millboard or glazeboard disc may be inserted in the base, as necessary, to ensure a good fit.

The ejection charge consists of approximately 12-dr. of gunpowder.

PACKING

Two bombs are packed in Package Ammunition No.3 Mk.1, which consists of two rolled paper containers No.295 Mk.1 each in Carriers No.15 Mk.1, and packed in Box B.185 Mk.1.

Stowage Dimensions

Box B.185 Mk.1 - 28½-ins. x 12½-ins. x 7⅛-ins.

Filled Weight - 80.6 lbs. Approx.

1476. BOMB S.B., M.L., COLOURED SMOKE SKYTRAIL B.E. 3-INCH MORTAR 10-LBS. MK.1. (FIG.600)

Method of filling Design D2(L)1896/G.F./509 governing the filling and assembly of the above mentioned bomb has been approved, and is illustrated in Fig.600.

The bomb consists mainly of a cast iron body, smoke container No.19 Mk.1, ejection charge, Tail Unit No.9 and Time Fuze No.390 Mk.2 or 2.A.

The smoke container consists mainly of a steel cylindrical body, a filling of either, Red, Green, Yellow or Blue smoke composition, a central perforated steel tube and a perforated closing disc.

The body of the container is cup shaped and perforated in the side and base. The filling is in the form of two annular pressed pellets of one of the following compositions :

P.N.507	Red	weight 7 oz.
P.N.508	Yellow	" 7 oz.
P.N.509	Green	" 7 oz.
P.N.493	Blue	" 7½ oz.

The pellets are enclosed by an inner and an outer sleeve of primed worsted cloth and a washer of primed worsted at each end. A primed worsted washer is also interposed between the pellets.

The filling is retained by a central tube and the closing disc. The ends of the tube are deeply serrated. The base end passes through the central hole in the base of the body and is turned over and secured by welding or soldering. The other end of the tube passes through a central hole in the closing disc which is secured by turning over the end of the tube and lip of the container body.

The container is housed in the bomb body between a baffle plate at the top and a millboard washer and baffle plate at the base. Further millboard or glazeboard discs, as necessary, may be inserted in the base to ensure a good fit.

The ejection charge consists of approximately 7-dr. of gunpowder.

PACKING

Four bombs, each in a rolled paper container No.242, are packed in two Carriers No.10, which in turn are packed in Box B.167A.

Stowage dimensions

Box B.167A. - 21.8-ins. x 9.5-ins. x 9.35-ins.
Filled weight - 65-lbs.

1477. BOMB M.L. COLOURED SMOKE B.E. 3-INCH MORTAR 10-LBS.

Coloured smoke Method of Filling design D.D.(L)17216 has been declared "obsolescent".

1478. GRENADE HAND NO.91 MK.1. (FIG.601)

A design of the above mentioned hand grenade with striker mechanism No.3 Mk.1, or alternatively, striker mechanism No.4 Mk.1 has been approved.

The grenade consists mainly of a cylindrical body containing a perforated canister charged with approximately 185 grams of P.N.501 composition in four increments and a priming composition consisting of approximately 5 grams of S.R.252, an adapter, and a striker mechanism.

The body, the top and the bottom are made from tin plate and are secured by folded seams. The body is provided with eight emission holes. The top is formed with a recess which is pressed to form a screwthread to receive the adapter. The bottom of the recess is perforated to form a flash hole.

The canister is made from perforated steel sheet. The perforations are sealed, after filling, by wrapping paper, coated with shellac or other approved adhesive, around the exterior of the canister. The top of the canister is suitably shaped and formed to receive the recessed top of the body. A central flash hole in the bottom of the recess is closed by a cambric disc or square which is secured to the underside with shellac adhesive. An alternative method of securing the cambric disc with a millboard washer is illustrated separately in Fig.601. The bottom of the canister is closed by a loose fitting cap.

The adapter is made from mazak and is screwthreaded externally below a flange for insertion in the body, and is recessed and screwthreaded at the top to receive the striker mechanism. The bottom of the flash hole in the adapter is covered by a cambric or muslin disc primed with S.M.P.

ACTION

The grenade is held with the fingers firmly holding the lever of the striker mechanism against the side of the grenade, whilst the safety pin is withdrawn. On throwing, the striker rotates on its axis pin under the action of its spring and, in doing so, throws the fly-off lever clear. The projection on the striker strikes the detonator thus igniting the primed cambric disc, the priming composition and the main filling.

MARKING AND PACKING

The body of the grenade is painted grey and has a ¾-inch black band at the top. The number and mark of the grenade, the empty maker's and filler's initials or recognised trade mark, date of filling and Lot number are stencilled in black. The filling composition code marking "B.2." is painted in white on the black band.

Twenty-four grenades complete with striker mechanisms are packed in eight rolled paper Containers No.244 Mk.1 in Box B.166A. Mk.1.

Stowage dimensions

Box No. B.166A. Mk.1 - 19.7-ins. x 9-ins. x 13.2-ins.
Weight 57-lbs.

1479. GERMAN ANTI-TANK MINE

(RIEGELMINE 43) (FIG.602)

This anti-tank mine is rectangular in shape, 31½ inches overall in length and 3¾ inches and 3 inches in width and depth respectively. The complete mine weighs 21 lb. 4½ oz. Exterior markings are shown in Fig.602.

The mine is designed to function by pressure applied to a cover plate which, when the mine is armed, operates a percussion igniter "Z.Z.42" at each end of an inner container which is supported on two soft iron shear wires in an outer casing. These igniters are not visible from the exterior when the container is in the outer casing.

There are also three igniter sockets, one on top and two in one side of the mine, to receive anti lifting or trip wire igniters or to take standard igniters to enable the mine to be detonated by remote control.

The mine comprises mainly an inner container filled H.E., two percussion igniters "Z.Z.42", an outer casing, and an arming device. All metal components are made from mild steel.

Inner container

The inner container is rectangular in section and formed from 1 mm. steel sheet which is stitch welded along one side. It is pierced with two holes in one side opposite the welded join and one in the centre of the top to receive three igniter sockets. Each socket consists of a short flanged tubular steel piece which is screwthreaded internally to receive the igniter, and a deep cup which is crimped to its inner end. The sockets are secured to the container by collars which are "S" shape in section and crimped over the flange of the socket and the edge of the hole in the container.

The ends of the container are closed by rectangular cupped plates which are inserted base first and secured at the rim by a deposit of weld metal. The plates are pierced with a central hole approximately 1.3 inches in diameter to receive an igniter socket. Each socket consists of a solid drawn tube, approximately 0.75 inch external diameter, and a steel washer which is crimped to one end of the tube to form a flange. The other end of the tube is reduced in diameter to form a bottle neck which is screwthreaded internally to receive a percussion igniter. The sockets are secured by a collar, "S" shape in section, which is crimped over the flange of the socket and the edge of the hole in the end plate.

Welded to the underside of the container near the ends, are two flanged channel pieces, formed by folded metal strips which serve as seatings for two safety bars. The outer flange of each channel piece is secured by the same deposit weld which secures the rim of the end closing plates. The inner flanges are secured by spot welding. Two metal battens, approximately 0.1 inch thick, are spot welded to the underside of the container at approximately 3 inches from the ends to act as a guillotine surface to cut a shear wire under the container.

Main filling and exploders

The main filling, as indicated by the code number "13A" stencilled on the container, is Amatol and weighs 8 lb. 15 oz. Its composition as found by analysis is T.N.T. 54.6 per cent and Ammonium nitrate 45.4 per cent.

The exploder pellets are cylindrical and recessed in two diameters. Each consist of approximately 42 grams of PETN/Wax (91/9); the wax contains a pink dye. The pellets in the top and sides are retained by the igniter sockets which intrude into the recesses, while those in recesses in the ends of the filling are retained by the end of a cardboard tube which surrounds the igniter socket.

Igniter "Z.Z.42"

The igniter Z.Z.42 is described in Item 1480 of this Bulletin.

Outer casing

The outer casing consists of a tray and a lid cover which acts as a pressure plate.

The tray is a rectangular channel section pressed from sheet metal 1 mm. thick. Holes are pierced in the sides of the tray, at approximately 1½ inches and 4 inches from each end, to permit two safety bars and two shear wires to be passed under the container. The shear wires pass through holes in metal strips, approximately 0.6 inch wide, which re-inforce the sides of the tray and form a bearing surface to guillotine the wire on functioning. There are two slots, approximately 1 inch wide, cut in the sides of the tray in a position corresponding with the igniter sockets in the side of the inner container.

The ends of the tray are closed by two similar flanged plates. The lower flange is spot welded to the tray. A suitably shaped re-inforcing plate is spot welded to the sides of the tray and to the underside of the upper flange. This plate strengthens the upper flange of the end closing plates and the sides of the tray where it carries the safety bars and pivoted shutters. The upper flange is slotted, to accommodate the rear end of the igniters which project into it, and engages loops on the safety pin of the igniter causing withdrawal of the pins and firing of the igniters when pressure is applied to the cover of the mine. Withdrawal of the safety pins by being pulled upwards before the mine is armed is prevented by a strip of metal suitably shaped to form a swivel safety cover which is hinged at one end by a rivet.

The lid cover is rectangular channel section pressed from sheet metal 1 mm. thick. The ends are closed by flanged plates which are spot welded to it. A carrying handle formed from steel rod is loosely riveted to one end of the cover. The cover is pierced, at the top and sides, with holes 1 inch in diameter at positions corresponding with the igniter sockets in the inner container. When the mine is packed for transport these holes are covered with adhesive tape. There are two pairs of slotted holes cut in the sides at positions approximately 4 inches from each end to allow the cover to be pressed down without interfering with the shear wires, and two segments are cut in each side at approximately 1½ inches from the ends which enable the safety bars to be passed through holes in the tray.

Arming Arrangement

The arming device consists of two safety bars, which support the inner container just clear of the shear wires; they are withdrawn after the mine is laid. The safety bars are secured by a split pin to which is attached one end of a lanyard about 6 feet long. The lanyard is wrapped around the mine and then tied to the other end of the bar. Spring loaded shutters close the holes in the tray when the safety bars are withdrawn. Each pair of shutters are pivoted on a rod between the sides of the tray and are linked by an angle bar to the centre of which is attached one end of a helical spring. The other end of the spring is secured to the bottom flange of the end plate. The shutters can be opened to enable the safety bars to be re-inserted by inserting a suitable tool or large nail through holes in the base of the tray, about $\frac{3}{8}$ inch from each end, and pressing upwards on the angle bar.

The mine is armed by withdrawing the two safety bars thus leaving the inner container supported in the outer case.

Safety precautions

The mine may be detonated by anti-lifting or trip wire igniters, or by standard igniters by remote control, which may be fitted to the side and top igniter sockets. These should be looked for and neutralized before moving the mine.

An anti handling device may be provided by inserting one Z.Z.42 igniter with the stirrup pin in the reverse position so that the pin is withdrawn when the inner container is lifted out of the tray.

ACTION

A load applied to the cover forces the inner container down thereby causing the shear wires to be severed and the stirrup pin of the igniter to be withdrawn thus functioning the igniter.

1480. GERMAN PULL IGNITER 42 (Z.Z.42)

(From German Riegelmine) (FIG.603)

This igniter is made from steel and is approximately 3.07 inches overall in length and 0.5 inch in diameter. The screwthreaded end for insertion in the mine is of the standard size for German igniters, i.e. 1 cm. in diameter and 1 mm. pitch. No safety device is fitted.

The igniter consists mainly of a tubular body, striker, striker spring, stirrup pin, adapter and a percussion cap.

The body is screwthreaded internally at the bottom to receive one end of the adapter, and is turned in at the top to form a guide for the stem of the striker and a bearing for one end of the striker spring.

The striker is in the form of a stem with, at one end, a flange at the base of the needle. The stem protrudes from the top of the body, and in this position compresses the helical striker spring which is seated between the flange on the striker and the top of the body. The striker is retained in this position by a "cross" shape stirrup pin which is passed through a hole near the end of the stem. An impregnated felt washer and a brass washer between the end of the striker spring and the top of the body serve to waterproof the hole through which the stem of the striker protrudes.

The adapter is tubular, and is screwthreaded externally at each end for insertion in the body and the igniter socket of the mine respectively. A leather washer is fitted over the threads to seal the join with the igniter socket. The adapter carries the percussion cap at its upper end above a No.8 detonator.

The percussion cap is of the same design as that in the German shrapnel mine igniter S.Mi.Z.35 described in Bulletin No.38, Item 951. An analysis of the cap composition shows it consists of Lead styphnate 38.6 per cent, Barium nitrate 41.4 per cent, Calcium silicide and glass 14 per cent, Antimony trisulphide 4 per cent and Varnish 2 per cent.

The detonator is a German commercial No.8 type similar to those illustrated in Bulletin No.48, Fig.580. It contains approximately 0.3 grams of lead azide/lead styphnate mixture and 0.8 grams of P.E.T.N.

ACTION

Pressure applied to the cover of the mine causes the stirrup pin to be withdrawn and the striker is then impelled forward on to the percussion cap by the action of its spring.

The load necessary to withdraw the pin of samples examined is between 8 and 15 lbs., but it depends to some extent on the dimensions and finish of the pin and hole, and variations are to be expected.

1481. GERMAN 3.7 CM. FLAK 18 CARTRIDGE Q.F. H.E./T. (FIG.604)

This Q.F. H.E./T. round is used in the 3.7 cm. Flak 18 (AA) gun. The complete round weighs 3-lb. 4-oz. 12-dr. and has an overall length of 14.4 inches. The shell body is painted yellow.

The round consists of the following components:-

Fuze 3.7 cm. Kpf. Z.Zerl. Pv.
Shell H.E. with tracer
Case Model 6348
Propellant charge of double base composition with igniter
Primer Percussion C/33.

SHELL (FIG.604)

The shell body is similar to that of the 3.7 cm. Pak HE/T. round described and illustrated in Bulletin No.40, Item 1028, but has two driving bands instead of one and two cannelures around the base. The empty body weighs 14-oz. 15-dr. The H.E. filling consists of a pressed pellet of P.E.T.N./Wax (90/10), weighing approximately 14.4 drams, in an aluminium container. The composition is coloured with a pink dye. The weight of the filled shell with fuze and tracer is 1-lb. 5-oz. 12-dr.

FUZE AND TRACER

The fuze is described as a separate item in this Bulletin, and the tracer is similar to the No.3 tracer described in Bulletin No.40, Item 1027, and illustrated in Fig.405.

CASE

The case is of brass, 10.4-inches long, and is of the Bofors type with a groove immediately in front of the flange at the base; it slightly increases in taper at approximately 1.8-inches from the mouth. The base is stamped "6348 3.7 cm. Flak 18".

PROPELLANT CHARGE

The propellant charge is indicated by the stencilling in black on the case as follows, "0.193 Kg. Digl. RP-8-(201 x 2,2/0,85)". It is tubular NC/DEGDN composition and is contained in a viscose rayon "sock" with the usual igniter compartment at one end. A length of lead decoppering wire weighing four grams is situated between the igniter and the propellant.

The igniter consists of greyish-black chopped porous cord and weighs 2.16 grams.

An analysis of the propellant and igniter composition is as follows:-

	Propellant	Igniter
Nitrocellulose	66.99 per cent	84.90 per cent
Diethylene-glycol-dinitrate	27.50 " "	11.40 " "
Diphenylurethane	1.56 " "	-
Phenylethylurethane	2.23 " "	-
Akardite	0.10 " "	-
Graphite	0.24 " "	0.20 " "
Volatile matter	1.04 " "	1.50 " "
Magnesium nitrate	0.25 " "	-
Magnesium oxide	0.09 " "	-
Diphenylamine	-	0.88 " "
Water soluble salts	-	0.50 " "
Nitrated products of diphenylurethane (by diff)	-	0.62 " "

PRIMER

The primer is described and illustrated in Bulletin No.32, Item 672.

1482. GERMAN 3.7 CM. FLAK 18, CARTRIDGE Q.F. H.E./I/T. (FIG.605)

This Q.F. HE/I/T round is used in the 3.7 cm. Flak 18 (AA) gun. The complete round weighs 3-lb. 2-oz. 10-dr. and has an overall length of 14.4-inches. The shell body is painted yellow and is stencilled in black "Br" (Brand - incendiary) and the shell filling code number "35".

The round consists of the following components :-

Fuze 3.7 cm. Kpf. Z. Zerl. Pv.
Shell H.E./Aluminium with tracer
Case Model 6348 St
Propellant charge of double base composition with igniter
Primer Percussion C/33 St

SHELL (FIG.605)

The shell body differs from that of the H.E./T. round mainly in having a single ferrous driving band instead of two non-ferrous bands. The empty body weighs 14-oz. 11-dr. The main filling consists of a top annular pressed pellet of PETN/Wax (88/12) weighing 10.84-dr. and a bottom solid pellet of PETN/Aluminium/Wax (70/21/9) weighing 3.65-dr., in an aluminium container in which it is retained by turning the lip of the container over a leather washer. The weight of the filled shell with fuze and tracer is 1-lb. 5-oz. 7-dr.

FUZE AND TRACER

The fuze and tracer are described and illustrated in Items 1492 and 1483 of this Bulletin respectively.

CASE, PROPELLANT CHARGE AND IGNITER

The case of the round examined was made of steel and unplated, the letters "St" is stamped in the base and follows the model number.

The propellant charge is contained in a viscose continuous filament rayon bag and is marked "0.192 Kg. Digl. RP - 8 - (201 . 2,2/0,85)".

An analysis of the propellant and igniter compositions is as follows:-

Composition	Propellant	Igniter
Nitrocellulose	68.90 per cent	89.03 per cent
Diethylene-glycol-dinitrate	28.22 " "	8.00 " "
Diphenyl-urethane	0.52 " "	-
Phenylethylurethane (by diff)	0.90 " "	-
Akardite	0.18 " "	-
Graphite	0.17 " "	1.00 " "
Volatile matter	0.69 " "	0.93 " "
Sodium sulphate	0.25 " "	-
Ash sulphated	0.17 " "	-
Diphenylamine	-	1.04 " "

PRIMER

The primer is as described and illustrated in Bulletin No.32, Item 672, but the body and closing washer are of steel.

1483. GERMAN TRACER FOR 3.7 CM. FLAK 18 HE/I/T SHELL (FIG.606)

The tracer weighs 3-oz. 9-dr. and has an overall length of 1.815-inches; the diameter over the threads is 1.015-inches. It is of the usual German type in which the tracer and priming compositions are pressed in a steel liner. The weight of the filling is 13.96 grams.

The composition as found by analysis is as follows:-

Composition	Priming	Tracer
Barium peroxide	67.2 per cent	-
Magnesium	18.4 " "	-
Sodium oxalate	9.3 " "	-
Resinous matter	3.8 " "	-
Corrosion products	0.9 " "	3.1 per cent
Volatile matter	0.4 " "	0.4 " "
Strontium	-	53.5 " "
Magnesium metal	-	33.1 " "
Phenolic resin	-	9.9 " "

1484. GERMAN 3.7 CM. (NAVAL) CARTRIDGE Q.F. H.E./T. (FIG.607)

This fixed Q.F. H.E. round is used in the German Naval 3.7 cm. A.A. Gun. The complete round weighs 3-lb. 14-oz. 14-dr. and its overall length is 20.3-inches. The shell body is painted yellow, stencilled in black and has a black band immediately below the fuze hole.

The round consists of the following components:-

Fuze 3.7 cm. KZ.40
Shell H.E. with tracer
Case Model C/30 St
Propellant charge of NC/DEGDN
Primer percussion C/13 nA. St

SHELL

The filled shell with fuze and tracer weighs 1-lb. 9-oz. 2-dr. The empty body weighs 1-lb. 2-oz. 12-dr., is 4.45-inches in length, and has two ferrous driving bands. Internally it is divided into two compartments separated by a diaphragm. The top compartment is filled H.E. and is screwthreaded to receive the fuze whilst the bottom compartment receives the tracer.

The bursting charge weighs approximately 1-oz. 0¾-dr., and consists of a pressed cylindrical pellet of trinitrotoluene having, at the top, a cavity to accommodate the fuze gaine. The pellet is waxed in position and covered by a thin paper washer.

FUZE AND TRACER

The fuze is described in Bulletin No.48, Item 1387, and the tracer is described in Item 1485 of this Bulletin.

CASE

This is a flanged brass plated steel case, 15.0-inches long with a slight increase in taper near the month. The model number "C/30 St" is stamped in the base.

PROPELLANT CHARGE

The propellant charge consists of a bundle of tubular sticks, approximately 12.5-inches in length, with four grey perforated discs of flash reducing composition approximately 0.078-inch thick and 1.36-inches in diameter and weighing 12.58 grams at the base. It is contained in a viscose sock of plain weave with the usual igniter compartment at the base. The igniter consists of 5.07 grams of graphited pebble powder which is very variable in size and shape. Between the flash reducing discs and the igniter is a decoppering coil of zinc approximately 22-inches long and weighing 3.0 grams. The propellant bag is stencilled "3.7 cm. Sk C/30. 0,359 Kg. - RP.38 - (320 x 2,6/0,6)".

The composition of the propellant, flash reducing charge and igniter as found by analysis are as follows :-

Composition	Propellant	Flash Reducer	Igniter
Nitrocellulose	67.4 per cent	24.50 per cent	-
Diethylene glycol dinitrate	28.0 " "	9.55 " "	-
Ethyl centralite	3.57 " "	-	-
Volatile matter	0.64 " "	0.58 " "	0.80 per cent
Graphite	0.17 " "	0.10 " "	-
Magnesium nitrate	0.28 " "	-	-
Potassium sulphate	-	58.30 " "	-
Potassium nitrate	-	-	74.4 " "
Akardite	-	0.44 " "	-
Diphenyl urethane	-	2.00 " "	-
Remainder of stabilizer (by diff)	-	4.53 " "	-
Sulphur	-	-	10.1 " "
Charcoal	-	-	15.5 " "

PRIMER

The primer is similar to the C/13 nA described in Bulletin No.32, Item 671, but has a body and closing washer of steel, and a cap composition consisting of lead styphnate, antimony sulphide, barium nitrate, calcium silicide together with a peroxide, and probably a small amount of tetrazene.

1485. GERMAN TRACER FOR 3.7 CM. (NAVAL) HE/T SHELL. (FIG.608)

The tracer weighs 4 oz. and has an overall length of 2.08 inches; the diameter over the threads is 1.015 inches. It is generally similar in design to other tracers from German 3.7 cm. shell.

The tracer composition weighs 16.3 grams and is pressed in a steel capsule in four increments with a flat drift. The priming composition weighs 0.7 grams and is pressed with a serrated drift.

The compositions as found by analysis are as follows:-

Composition	Tracer	Priming
Barium nitrate	41.4 per cent	-
Barium peroxide	-	24.9 per cent
Magnesium metal	35.7 " "	30.8 " "
Sodium oxalate	12.2 " "	-
Potassium Salt of a nitrophenolic substance	-	31.6 " "
Resinous matter	-	11.0 " "
Water soluble organic matter	8.7 " "	-
Wax	1.1 " "	0.4 " "
Volatile matter	0.9 " "	1.3 " "

1486. GERMAN 7.5 CM. KwK 40 and Stu K 40, CARTRIDGE Q.F. HOLLOW CHARGE Gr 38 H1/C (FIG.609)

This fixed Q.F. round is fired from the 7.5 cm. tank gun (7.5 cm. KwK 40) and assault gun (7.5 cm. Stu K 40). The weight of the complete round is approximately 17 lb. 9¼ oz. and its overall length 30 inches. The shell is painted the usual olive green and exterior markings are illustrated in Fig.609.

The complete round consists of the following components :-

Hollow charge shell filled TNT/RDX (40/60)
Tracer
Fuze AZ. 38 St
Gaine Zdlg 40 B.
Propellant charge of double base with the addition of nitroguanidine
Steel case coated with brass - Model 6339 St
Primer Electric C/22 St.

SHELL (FIG.609)

The shell filled and fuzed weighs 11 lb. 2½ oz., and has a single ferrous driving band. The cavity for the bursting charge tapers towards the base, and an internal screwthread is formed at the top to receive the cap. The bursting charge weighs 1 lb. 2½ oz. and is a cast filling of TNT/RDX (40/60) in a thin steel container which is cemented to the walls of the body. This filling has the code No.97. The cavity liner is of a die-cast zinc alloy made in one piece, which forms a simple cone and a central flash tube; it is secured to the bursting charge container by a cannelure near the top. Above the filling is a flanged steel frustum. There is a steel washer, the central hole of which is slightly less than the diameter of the top of the frustum, on the underside of the flange, and a cardboard washer on the other side.

FUZE, GAINE AND TRACER

The fuze is described in Item 1493 of this Bulletin. The gaine is similar in design to the gaine Model 40 B. described in Bulletin No.43, Item 1160, except that between the bakelite washer and the transparent paper disc covering the detonator there is a disc of steel wire gauze. The object of the gauze is possibly to prevent

prematures due to set back of particles of swarf etc. into the detonator. The tracer is similar to that described in Bulletin No.47, Item 1331.

PROPELLANT

The propellant charge consists of 14-oz. 7.5-dr. of flake Gudol contained in a viscose rayon bag from which protrudes a central distance piece of tubular propellant weighing 1-oz. 5-dr. The flake propellant is in graphited squares measuring 0.024-in. x 0.154-ins. x 0.154-ins. The tubular stick is cruciform in cross section, 1.6 inches long, and reaches the base of the shell.

An igniter consisting of 1-oz. 6-dr. of chopped cord is contained in a compartment formed by sewing a disc of nitrated cotton to the base of the bag.

The composition of the propellant and igniter as found by analysis is as follows :-

Composition	Propellant		Igniter
	Flake	Tubular	
Nitrocellulose	37.70 per cent	64.33 per cent	91.38 per cent
Diethyleneglycol-dinitrate	30.9 " "	32.5 " "	3.75 " "
Diphenylamine	-	-	0.68 " "
Nitroguanidine	30.22 " "	-	-
Ethyl Centralite	-	-	1.09 " "
Volatile matter	0.32 " "	0.45 " "	1.39 " "
Akardite	0.48 " "	0.45 " "	-
Graphite	0.34 " "	0.17 " "	0.67 " "
Sodium nitrate	0.05 " "	-	-
Potassium sulphate	-	1.90 " "	-
Potassium nitrate	-	-	0.60 " "
Magnesium nitrate	-	0.16 " "	0.04 " "
Nitrated products of Stabilizer	-	-	0.40 " "

CASE AND PRIMER

The case is of the necked type, approximately 19.4 inches long, and is stamped in the base with the model number "6339 St".

The electric primer which is stamped with the Model No. "C/22 St" differs from the "C/22" model described in Bulletin No.26, Item 464 mainly in that the body is of steel.

1487. GERMAN 7.5 CM. PAK 40 CARTRIDGE Q.F. APBC/T. SHOT (T.C. CORE) (7.5 cm. Pak 40 Pzgr 40) (FIG.610)

This fixed Q.F. Cartridge is used with the 7.5 cm. Pak 40 anti-tank gun. The overall length of the complete round is 36.7-inches and it weighs 21-lb. 1½-oz. The shot is painted black and stencilled in red except the letters "FEW" which is in white.

The complete round consists of the following components:-

A.P.B.C. Shot with T.C. Core
Tracer
Brass Case or steel case coated with brass Model 6340
Propellant charge
Percussion primer C/12 nA St.

SHOT (Panzergranate 40) (Fig.610)

The shot with its ballistic cap is 9.46-inches long and without tracer weighs 8-lb. 11-oz. 6-dr. The steel body is screw-threaded in the base to receive the core holder and externally at the shoulder to receive the ballistic cap. The single driving band is of sintered iron and is secured in an undercut milled groove and further fixed by a tack weld across its whole width. A cannelure is formed in rear of the driving band.

The core holder is of steel and screws into the base of the body where it is locked by three tack welds. The holder is bored centrally in two diameters to form two recesses separated by a diaphragm. The forward recess receives the tungsten carbide core which is a force fit, whilst the recess in the base is screwthreaded to receive the tracer.

The core weighs 2-lb. The head of the core is sheathed in moulded plastic which also fills the annular cavity between the core holder and the body. A perforated mild steel washer, embedded in the plastic, is seated on the forward end of the holder and holds the core centrally in the body.

The ballistic cap is made from steel; its base is turned into a groove in a joint ring and spot welded at eight equally spaced points. The ring screws on the forward end of the body and is locked by nicking the edge with a centre punch.

TRACER

The tracer is described in Item No.1488 of this Bulletin.

CARTRIDGE

The case is of steel coated with brass and of conventional design. It is 28.1-inches in length and the model number "6340 St" is stamped in the base.

The propellant charge is of N.C./D.E.G.D.N. composition and weighs 5-lb. 15-oz. 4-dr. The bag is stencilled in black "7.5 cm. Pak 40, 2700 Kg. Digl. RP - G.I. - (625 - 4,1/1,8)".

The percussion primer is described in Bulletin No.26, Item 460. The letters "St" added to the designation indicates that the primer is of steel.

1488. GERMAN TRACER FOR 7.5 CM. PAK 40 APBC/T SHOT. (FIG.611)

The tracer weighs 3-oz. 5-dr. and has an overall length of 1.4-inches; the diameter over the threads is 1.038 inches.

It follows the normal German capsule-filled design. The tracer composition weighs 11.1 grams and is red brown in colour. It is pressed in a steel cup shape capsule in three increments with a serrated drift. The priming composition weighs approximately 1 gram, is light grey in colour and is also pressed in the steel capsule with a serrated drift. The rear end of the body is closed by a thin celluloid disc and sealed with a ring of brown varnish, whilst the forward end is closed by turning the end over a steel closing disc and thickly coating the surface with black paint.

An analysis of the compositions is as follows:-

Priming Composition		Tracer Composition	
Barium peroxide	62.4 per cent	Barium nitrate	62.5 per cent
Magnesium metal	16.2 " "	Magnesium metal	32.3 " "
Red Lead	9.1 " "	Phenolic resin	4.5 " "
Resinous matter	6.1 " "	Volatile matter	0.5 " "
Volatile matter	0.6 " "	Corrosion products	0.2 " "
Corrosion products (by difference)	5.6 " "		
	100.0 " "		100.0 " "

1489. GERMAN 10.5 CM. le. F.H. 18 M. SHELL H.E. S/L (Gr.F.) (FIG.612)

This long range streamlined shell is fired from the German le.F.H. 18 M. Howitzer which is fitted with a muzzle brake, and is used with the special cartridge described in Item No.1490 of this Bulletin. External markings on the shell are illustrated in Fig.612. A large "F" (Fern) is stencilled in black on the shell body and on the propellant bag of the cartridge to denote they are used together as a long range round.

The filled shell with the optional delay fuze AZ.23 v (0,15) with which it is fuzed, weighs approximately 32 lb. 6 oz. The shell is of conventional German type and the single driving band is of the ferrous type. The bursting charge weighs 4 lb. 14¾ oz. and is a poured filling of amatol of the following composition, Ammonium nitrate 33 per cent and Trinitrotoluene 67 per cent. A cavity for a smoke box is formed in the base and a topping of T.N.T. surrounds the exploder container which accommodates the standard C/98. Np.10. gaine. The steel container is secured by means of a steel securing ring, the inner threads of which are screwed to the container and the outer threads to the fuze hole of the threads.

1490. GERMAN 10.5 CM. le. F.H. 18 M. CARTRIDGE Q.F. FOR "Gr.F" SHELL. (FIG.613)

This is a special separate Q.F. cartridge for use with the long range streamlined shell "Gr F" described in Item No.1489 of this Bulletin and is used in the le FH 18 M. Howitzer which is fitted with a muzzle brake. The cartridge weighs approximately 7 lb. 10¼ oz.

PROPELLANT CHARGE

The propellant charge weighs approximately 4 lb. 3¼ oz. and is of the double base type consisting basically of nitrocellulose and diethylene-glycol-dinitrate in tubular form. The sticks are 7.81-ins. in length with a mean external and internal diameter of 0.109-inches and 0.036-inch respectively. The charge is contained in a viscose rayon bag with an igniter cover of nitrated cotton at the base. The igniter is the usual small green chopped porous cord Nz Man NP (1,5 1,5) and weighs approx. 2.2 grams.

The compositions of the propellant and igniter, as found by analysis, are as follows:-

Composition	Propellant	Igniter
Nitrocellulose	61.30 per cent	87.64 per cent
Diethylene-glycol-dinitrate	27.47 " "	9.16 " "
Ethyl centralite	8.29 " "	-
Graphite	1.09 " "	1.01 " "
Mineral Jelly	1.11 " "	-
Potassium sulphate	.74 " "	-
Potassium nitrate	-	0.82 " "
Diphenylamine	-	0.50 " "
Nitrated product of Stabiliser	-	0.87 " "
Volatile matter	1.75 " "	1.19 " "

The charge bag is marked in black as under,

F DR
le. F.H. 18.M.
1.905 Kg.
Digl. R.P. G.0.5. 200 - 2,6/1
dbg. 1941/3.
Ha 30.5.42. Qb.

CASE

The case is of the built-up steel type, and is 6.15 inches in length; the stamping in the base includes the model number "6342/65" and the designation of the equipment "1.F.H.". It consists of a coiled body which is attached to a base by a retaining cup, washer, and a screwed collar which is assembled on the primer boss.

The body is formed by coiling a rectangular sheet of rolled low carbon steel and spot welding the vertical 1 cm. overlap join at about 1 cm. from the mouth. The base end of the body is turned inwards to form a curved internal flange which butts against, and is supported by, the upper side of the base. The base has the usual external flange or rim, and primer hole. The primer boss is screw-threaded externally to receive the screw collar which screws down on to the washer and retaining cup. The retaining cup is pressed from low carbon steel sheet; it has a hole in the base to enable it to be passed over the primer boss and there are three slots, 120 degrees apart, cut in its front edge to allow it to fit inside the body more closely.

PRIMER

The primer is the normal C/12 nA. St. type; it differs from that illustrated in Bulletin No.26, Fig.159 mainly in being made of steel instead of brass. The cap shell is made of brass and the cap filling is varnished on the surface. The primer is closed by a translucent paper disc sealed with an orange thermo-plastic resin and held in place by a thin steel washer.

The composition of the filling as found by analysis is as follows:-

Cap Composition			Gunpowder	
			Pellet	Granular
	per cent		per cent	per cent
Mercury fulminate	23.4	Potassium nitrate	76.3	76.2
Potassium chlorate	39.8	Sulphur	9.3	9.2
Antimony sulphide) Powdered glass)	36.8	Charcoal	14.4	14.6
Weight	0.37 grains	Weight	22.2 grains	16.2 grains

1491. GERMAN 10.5 CM. Geb.H.40 COLOURED SMOKE H.E. SHELL. (F.H. Gr Buntr) (FIG.614)

This coloured smoke H.E. shell which is fuzed with the mechanical Time and Percussion fuze "Dopp. Z. S/60. Fl.", is fired from the 10.5 cm. Geb H.40 (Mountain Howitzer), and on bursting in the air or on the ground gives a red cloud smoke. The shell is painted a grey green and stencilled "Buntr" in black. Exterior markings on the shell are shown in Fig.614. The fuze is described and illustrated in Bulletin No.38, Item 953. The "K" marking on the fuze indicates that it is lubricated with a lubricant suitable for very low temperatures. The shell filled and fuzed weighs 31 lb. 10½ oz. and is 19.33 inches overall in length.

SHELL

The shell is in two parts, the head being screwed to the body about half way up the ogive. The body has a streamline base and is fitted with a single sintered iron driving band. The wall of the cavity is parallel in the upper part of the body and tapers towards the base. The base of the cavity is coated with a thick layer of bitumen. The steel exploder container is secured to the bottom of the fuze hole by a screwed steel adapter.

The bursting charge consists of a cardboard carton containing six powdery pellets the top two of which are annular and surround the exploder container. The composition of the pellets is as follows:-

P.E.T.N./Montan Wax (80/20)	28.3	per cent
Sodium chloride	6.5	" "
Crude red dyestuff	65.2	" "

The weight of each pellet, from the top, are :-

No.1	-	45	grams
No.2	-	80	"
No.3	-	263	"
No.4	-	257	"
No.5	-	297	"
No.6	-	297	"
Total		1239	" = 2 lb. 11 oz. 11 dr.

The two piece carton is suitably shaped to fit the shell cavity and the ends are turned over a cardboard washer at the top and a cardboard disc at the base. A green label on the carton is printed in black "Sprengldg. Buntr. d. F.H. Gr. m. Farbe. Np 20. rdf 1942", and under the label the carton is marked in White "Buntr".

1492. GERMAN FUZE 3.7 CM. Kpf Z. Zerl Pv. (FIGS. 615 and 616)

This is a sensitive direct action fuze with a pyrotechnic self-destroying device and is used in the 3.7 cm. Flak, 18, HE/T shell and HE/I/T shell described in Items 1481 and 1482 respectively of this Bulletin. The fuze weighs 2-oz. 0¾-dr. and has a diameter over the threads of 1.10-inches. It is made of light metal except where stated otherwise in the description below. The designation of the fuze "3.7 cm. Kpf. Z. Zerl. Pv" is stamped in the flange.

The fuze comprises mainly a fuze body, direct action mechanism, safety and arming device, self-destroying arrangement and a gaine.

Fuze body (Fig.615)

The fuze body is in two parts. The bottom part is screw-threaded below the flange for insertion in the shell and above the flange to receive the top part. Internally there are four longitudinal borings suitably arranged around a central boring, to accommodate the direct action mechanism, the safety and arming device, and the self-destroying arrangement. The base is recessed and screwthreaded to receive the gaine. The top part of the fuze body is conical in contour with a flat top, and is bored centrally to accommodate a hammer and the head of the striker. The top is closed by a thin metal foil disc which is secured by turning the metal over its edge and sealing the join with varnish.

Direct action mechanism (Fig. 615. Section AA)

The direct action mechanism consists of a striker and a hammer. The striker is in the form of a needle with a cylindrical head and is housed in the central boring of the fuze body. It is held in the safe position by the prongs of a brass centrifugal slider which forms part of the safety arrangement. The hammer is in the form of a stem with a concave disc head, later patterns are made from moulded plastic instead of light metal. The end of the stem is in contact with the head of the striker.

Safety and arming devices. (Fig.616. Section BB)

To maintain the fuze in a safe condition before firing, the D.A. Striker is held off the main detonator by the prongs of the brass centrifugal slider in a recess in the top face of the lower part of the fuze body. The slider is prevented from moving outwards by a detent which protrudes into the recess and bears against the outer edge of the slider which is chamfered to facilitate its release.

The detent is supported on a gunpowder stemming, weighing 0.056 grams, in an aluminium holder which screws into boring (z). (See plan D-D). Boring (z) is in communication with borings (w) and (x) through a horizontal channel which is drilled from the outside of the body. The outer end of the channel is closed by a plug which is secured by expanding it with a deep axial stab, and waterproofed by filling the external hole with luting.

The arming device is accommodated in boring (w), and comprises a steel striker, steel spring and an igniferous detonator. The striker is secured in the bottom of the boring whilst the detonator is held at the top by the spring. The detonator weighs 0.095 gram and contains one increment of gunpowder and one of a fulminate, chlorate, antimony sulphide mixture. The top of the boring is closed by a light alloy disc.

Self-destroying arrangement. (Fig.616)

The self-destroying arrangement is contained in borings (x) and (y) which are connected at the top by a curved channel, rectangular in section, machined from the top surface of the fuze body. This channel is closed by the bottom face of the top part of the fuze body which is screwed up tight, and no special provision is made to prevent the composition flashing over. The bottom of boring (x), in addition to being connected to the bottom of the arming device, is connected with a horizontal channel bored from the outside. This channel serves as a vent and is closed by a disc and waterproofed by luting.

The lower end of boring (x) is filled with priming composition weighing 0.15 grams; the rest of the boring, the curved channel and the upper end of boring (y) are filled with 0.21 grams, 0.34 grams and 0.24 grams of delay composition respectively.

The lower end of boring (y) (see Section AA) contains 0.23 grams of relay composition in which is embedded an igniferous detonator identical with that in the arming device. At the bottom of boring (y) is an oblique fire channel which emerges near the centre of the fuze body immediately above the gaine.

Filling compositions

The filling compositions as found by analysis are as follows:-

Filling	Weight gram.	Colour	Composition		
Delay composition	0.79	Yellow	Lead chromate	95.0	per cent
			Nitrocellulose	5.0	" "
Priming composition	0.15	Brown	Nitrocellulose	3.0	" "
			Red Lead	70.0	" "
			Calcium silicide	27.0	" "
Relay composition	0.23	White	Potassium perchlorate	50.0	" "
			Lead ferrocyanide	47.7	" "
			Resinous matter	2.3	" "

ACTION

In the unarmed condition, the striker is held clear of the main detonator by the prongs of the centrifugal slider which is retained in position by the detent resting on top of the gunpowder pellet.

Direction action

On acceleration the detonator sets back on the striker of the arming device and the flash ignites simultaneously the priming composition and the gunpowder pellet, and the gas pressure expels the sealing disc from the vent. After a short delay the gunpowder pellet is consumed and no longer supports the detent. The detent is then forced to the rear by the chamfer on the slider which moves outwards under centrifugal action and ceases to support the striker thus arming the fuze. On impact the hammer forces the striker on to the main detonator.

Self-destroying action

If direct action has not occurred during flight, the delay composition burns and after a short delay ignites the relay composition the flash from which reinforced by the detonator, penetrates the cover of the duplex kapsel and so brings about detonation.

The observed delay at rest is 12 seconds.

1493. GERMAN FUZE AZ. 38 St (FIG.617)

This fuze is used in 7.5 cm. Hollow Charge shell (7.5 cm. Gr 38 Hl/C) described in Item 1486 of this Bulletin. It is a modified version of the AZ 38, described in Bulletin No.33, Item 741, but is made mainly of steel instead of aluminium and has a redesigned D.A. Striker unit which is probably intended to give more rapid and reliable functioning at low angles of impact. The fuze is longer than the AZ.38 and, therefore, gives an increased "stand off". The fuze weighs 2 oz. 7 dr.

The body and mechanism of the fuze is similar to the AZ.38, but the head consists of a flanged nose piece and a thin steel nose cap. The nose piece is bored centrally to accommodate the hammer and is secured by turning the top of the fuze body over its flange. The nose cap is in the form of a truncated cone with a cylindrical base and is secured by indenting it in three places to the nose piece. The joint is waterproofed with bituminous material.

The striker is of steel and has a flat head. It is supported by six centrifugal segments of light alloy which are surrounded by an expanding ring. The hammer is of wood, approximately 1-inch long, and the forward end is finished to a 90 degree cone.

The fuze is fitted with the normal Duplex-Kapsel gaine.

ACTION

The action of the fuze is the same as the AZ.38 described in Bulletin No.33, Item 741.

1494. GERMAN 12 CM. MORTAR BOMB FUZE (Wgr Z (r)) (FIG.618)

This is a German mortar bomb fuze of Russian origin, designated "Wgr Z(r)", and is used in the 12 cm. Mortar bomb. It is an impact fuze with an optional delay and is specially designed for use against soft targets and to function on snow. The fuze is initiated on impact by compressing air in a cylinder located in the nose of the fuze thereby producing heat which fires a small detonator. No striker mechanism is provided to ensure functioning on hard targets. A drawing showing the external contour of the fuze and its markings is included in Fig.618. The fuze body and magazine are made from steel and are plated externally. The complete fuze weighs 15-oz. 6½-dr.

The fuze consists mainly of a steel body, a piston type of initiating mechanism with a small igniferous detonator, a delay mechanism, a magazine filled with gunpowder and a gaine detonator.

The body is screwthreaded externally below a flange for insertion in the bomb, and the base is reduced in diameter and screwthreaded to receive the magazine. Internally it is bored centrally to form, at the top, a recess in two diameters which accommodates the initiating mechanism above the detonator. Below this recess is a flash channel which communicates between the detonator and a cavity in the base of the body. The bottom of the flash channel is covered by a disc of gauze. A second boring in the base, displaced from the centre, accommodates a delay unit. This boring is in two diameters, the larger at the bottom is screw-threaded to receive the delay unit, whilst the smaller above it forms a flash channel which communicates with the central flash channel by an oblique boring and fire channel in the delay setting mechanism.

Initiating Mechanism

The initiating mechanism comprises a plated brass cylinder, a steel collar, a light metal piston, a detonator and a hollow nose plug.

The cylinder is approximately 0.52 inch in diameter and its base end is reduced in diameter to form a pocket which accommodates the detonator. It is retained by the collar which is slightly larger in diameter and thickness and is supported on an internal shoulder formed in the cavity of the fuze body.

The detonator consists of a perforated shell which is filled from the base and closed by a plated copper disc. The perforation at the top is closed by a disc of gauze. The filling weighs 0.125 gram and is in four pressings, an analysis of each layer, which is consumed in the order A, B, C & D, gave the following results :-

Composition	A	B	C	D
	per cent	per cent	per cent	per cent
Lead styphnate	94.5	33.0		-
Lead azide	4.0	67.0	50.0	8.5
Trinitrotoluene	-	-	50.0	91.5
Organic matter	1.5	-	-	-
Weight	0.035 gram	0.035 gram	0.055 gram	

The piston consists of a cup with a flanged lip and a thickened base. A leather sealing washer is secured to the base by a suitably shaped spreader which is riveted to the piston. The lip of the cup rests on the upper edge of the steel collar. A load of about 48 lbs. is required to distort the lip sufficiently to permit the passage of the piston through the collar. The maximum travel of the piston is about 0.52 inch.

The mechanism is retained by the hollow nose plug which screws into and closes the top of the fuze body. The plug has a coned opening at the top which is closed by a transparent cellophane disc secured by a brass ring the edges of which are spun over the edge of the disc and into the circumferential groove in the plug.

Delay mechanism

The delay mechanism comprises a delay setting plug, a ball and a screwed retaining collar, all of steel, and a brass washer.

The setting plug consists of a cylindrical body the top end of which is reduced in diameter and suitably shaped to enable the plug to be turned by means of a fuze key. Near the top of the plug is a short cylindrical recess, cut in the side at right angles to the axis of the plug, which is engaged by the steel ball. The ball is accommodated partly in this recess and partly in a recess cut in the wall of the boring accommodating the plug. The ball serves as a stop and limits the rotational movement of the setting plug. A second and larger cylindrical recess is cut obliquely in the side of the plug near its centre, and a small flash channel is cut parallel to the axis of the plug to connect the recess with the delay unit. When the fuze is set for non-delay, the oblique recess is aligned with the axis of the fuze thereby permitting the flash from the igniferous detonator to pass direct to the magazine. For delay action, the plug is turned through 90 degrees and the flash passes through the small flash channel in the plug to the delay unit.

The delay unit comprises a cylindrical brass holder filled with a pressing of black powder, weighing 0.2 grams, which has a cavity formed in its underside. The composition of the powder as found by analysis is as follows, Sulphur 9.1 per cent, Potassium nitrate 73.8 per cent, Charcoal 17.1 per cent. The base of the delay is in contact with 0.75 grams of gunpowder composition which is stuck by a little N/C varnish to the upper surface of the recess in the base of the fuze body. An analysis of this composition shows it consists of Sulphur 9.4 per cent, Potassium nitrate 71.5 per cent, Charcoal 16.1 per cent and Nitrocellulose 3.0 per cent.

The magazine is made from steel, rust proofed and cup shape. The mouth is screwthreaded internally to receive the base of the fuze body. It contains a C.E. pellet, weighing 15.5 grams, which is recessed in its upper surface to accommodate a detonator. The detonator weighs 1.08 grams and consists of a flanged brass plated cup filled with three layers of composition two of which are contained in an inverted perforated cup shaped capsule which closes the cup. The perforation in the capsule is closed by a gauze disc. The layers of composition, in the order they are consumed, consist of 0.04 grams of lead azide/lead styphnate (70/30), 0.20 grams of lead azide, 0.10 grams of C.E.

The base of the detonator rests on a felt disc in the bottom of the cavity and the flange of the detonator lies between two wide paper washers which are covered by a steel plated washer. The hole in the washer is closed by a piece of gauze which is stuck to its underside.

ACTION

Before firing

The fuze is set for delay or non-delay action by turning the setting plug so that the arrow on it is aligned with the appropriate setting mark "0" (non-delay) or "3" (delay) on the fuze body thereby opening or closing the central fire channel in the fuze body.

After firing

On impact snow or other soft material destroys the thin disc in the nose, and intrusion of the material presses the cylinder piston in thereby compressing the air in it. Heat of the compression initiates the small detonator in the base of the cylinder and, when set for non-delay, the flash passes direct to the detonator in the magazine. When set for delay action the flash passes through the small fire channel in the setting plug and ignites the composition in the delay unit. After a short delay the powder in the cavity at the base of the fuze body is ignited and the magazine detonator initiated.

1495. GERMAN 2.7 CM. PISTOL SMOKE CARTRIDGE. (FIG.619)
(Nebelpatrone für Kampfpistole)

This cartridge is used with the 2.7 cm. rifled Walthers pistol (Kampfpistole) which also fires signal and H.E. Cartridges. The complete round is 5.08 inches in length and weighs 5 oz. 8 dr. The shell body and case are unpainted except that the nose has a white tip and the base is stencilled in black "Nebel Z".

The round consists mainly of a pre-rifled aluminium shell filled with a solid smoke composition and two priming compositions, a bakelite base plug carrying a delay, a short aluminium rimmed case with a brass bush in the base carrying a percussion cap, and a propellant charge of granular gunpowder.

SHELL

The shell body has an integral conical nose and is pre-engraved along its parallel portion with five rifling grooves corresponding to the rifling of the pistol. The base is screw-threaded internally with a left hand thread to receive the base plug, and a thin ribbed tubular aluminium liner fits the inside parallel portion of the walls.

The smoke composition is grey in colour and weighs 2 oz. 9.4 drams; it consists of Hexachlorethane 52.5 per cent, Zinc metal 16.0 per cent, Zinc oxide 26.6 per cent, Zinc chloride trace, and Magnesium 4.9 per cent. It is pressed into the nose and body, and possibly part of the filling is pre-pressed in the liner. The base of the composition extends to within 0.79 inch of the open end of the body and is covered by a disc of light alloy.

The two priming compositions are pressed in layers on the underside of the disc. The intermediate layer weighs 1.01 drams and consists of Tetranitrocarbazole 32 per cent, Potassium nitrate 39 per cent, Aluminium 25 per cent and Magnesium 4 per cent. The bottom layer is gunpowder weighing 0.12 drams and provides initial ignition from the delay; it consists of Potassium nitrate 75 per cent, Sulphur and charcoal 25 per cent. The compositions are supported by a cardboard washer and an aluminium distance piece in the form of a flanged collar which are inserted loose between the composition and the base plug. The flange supports the washer and the collar is bored with nine radial holes.

The base plug is bored centrally in two diameters, the larger at the top is screwthreaded to receive the delay holder whilst the smaller at the bottom forms a flash hole. There are eight longitudinal borings, arranged in a circle, in the plug which with the nine radial holes in the collar provide for the emission of smoke. The bottom of the borings in the plug are closed by a thick cardboard washer which is pressed into an annular recess in the base of the plug. The washer prevents premature ignition of the smoke filling by the propellant gases which would otherwise by-pass the delay.

The delay holder consists of a brass tube one end of which screws into the plug whilst the other projects from the plug to within approximately 0.12 inch of the surface of the priming composition. The delay composition weighs approximately 0.116 dram and is heavily consolidated in the tube to a length of approximately 0.35 inch. It consists of Potassium nitrate 65.0 per cent, Antimony sulphide 22.5 per cent, Sulphur 5.0 per cent and Charcoal 7.5 per cent.

CARTRIDGE

The case is 1.342 inches in length and is rimmed. A recess in the base contains the propellant charge and percussion cap assembly, and is connected by 10 fire holes (one central and 9 arranged in a circle) to a cavity at the top in which the base of the shell is secured. The propellant consists of 0.491 drams granulated gunpowder graphited, and is retained in the cavity by a disc of thin paper placed over the bottom ends of the fire holes, and the cap assembly.

The cap assembly consists of a percussion cap in a bush which is pressed into the base of the case. The bush is recessed in the base to form a cap chamber with anvil and flash holes. The cap composition is contained in a zinc plated steel cup and is covered with a disc of thin paper. It is pressed in with a central dimple which fits over the anvil. The composition weighs 0.39 grains and consists of Lead styphnate 40 per cent, Barium nitrate 39 per cent, Calcium silicide 15 per cent, Antimony sulphide 4 per cent and Tetrazene 2 per cent.

ACTION

When the percussion cap is struck the flash passes through the holes to the propellant charge which ignites the delay through the central flash hole and at the same time projects the projectile by gas pressure through the other eight holes. After a short delay, the delay composition ignites the priming compositions and in turn the smoke composition. Pressure set up by the smoke composition blows the cardboard washer from the bottom of the base plug and smoke is emitted through the holes in the distance piece and thence through the holes in the base plug.

1496. GERMAN 2.7 CM. RIFLED PISTOL, COLOURED SMOKE CARTRIDGE. (FIG.620)
(Deutpatrone für Kampfpistole)

This coloured smoke signal cartridge follows closely the design of the 2.7 cm. Pistol signal cartridge described in Bulletin No.39, Item 985 and illustrated in Fig.388.

PROJECTILE

The smoke filling consists of a red composition pressed in the nose and eight pre-pressed annular pellets weighing 11.3 grams and 28.3 grams respectively. The fillings are separated by a paper disc. The smoke composition consists of Dyestuff 39.5 per cent, Potassium chlorate 25.9 per cent, Sodium sulphate 12.1 per cent and Lactose 22.5 per cent.

The three lengths of quick match in the centre of the annular pellets and the two lengths across the flange of the distance piece weigh 0.91 grams and 0.156 grams respectively and consist of Potassium nitrate 48 per cent, Barium nitrate 8 per cent, Carbon 9.5 per cent, Sulphur plus dye 7.5 per cent, Twisted cotton fibre 20 per cent and Binder (water soluble) (by diff) 7 per cent.

The delay composition weighs 2.4 grains and is pressed in a column approximately 0.29 inch long and 0.15 inch in diameter. The composition consists of Potassium nitrate 61.5 per cent, Sulphur 5.2 per cent, Charcoal 10 per cent.

CARTRIDGE

The propellant charge consists of 12.9 grains of graphited granular gunpowder, the composition of which is Potassium nitrate 73.9 per cent, Sulphur 9.8 per cent and Charcoal 16.3 per cent.

The cap composition weighs 0.48 grains and consists of Lead styphnate 40 per cent, Barium nitrate 43 per cent, Calcium silicide 11 per cent and Antimony sulphide/Tetrazene.

ACTION

The action is the same as the 2.7 cm. Pistol signal cartridge described in Bulletin No.39, Item 985.

FIG. 595 (ITEM 1451.)
THUNDERFLASH, MARK 8 /LNA/

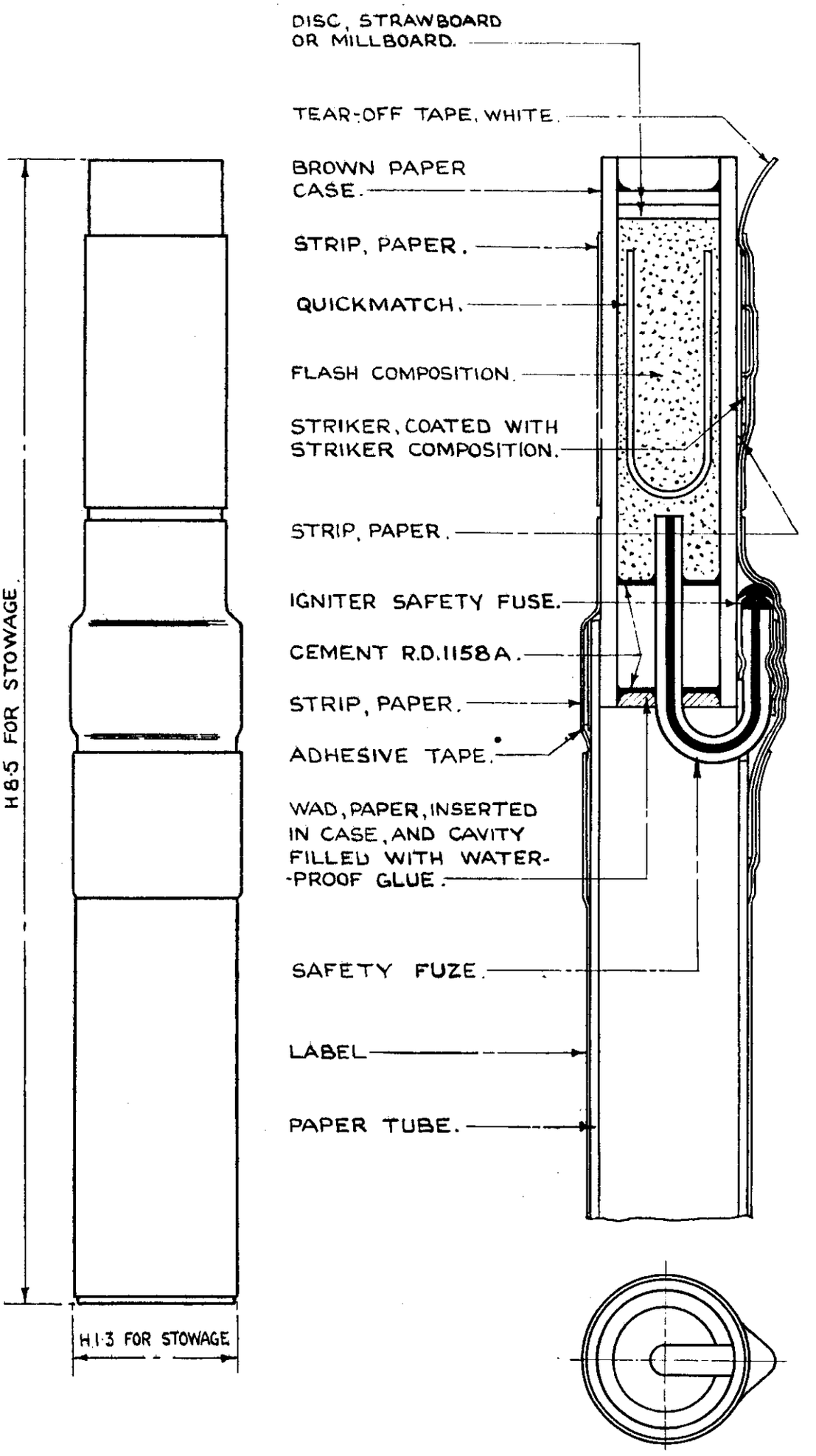


FIG. 596. (ITEM 1473)

GRENADE, SMOKE, W.P. RIFLE, No 87, MK.1 /L/

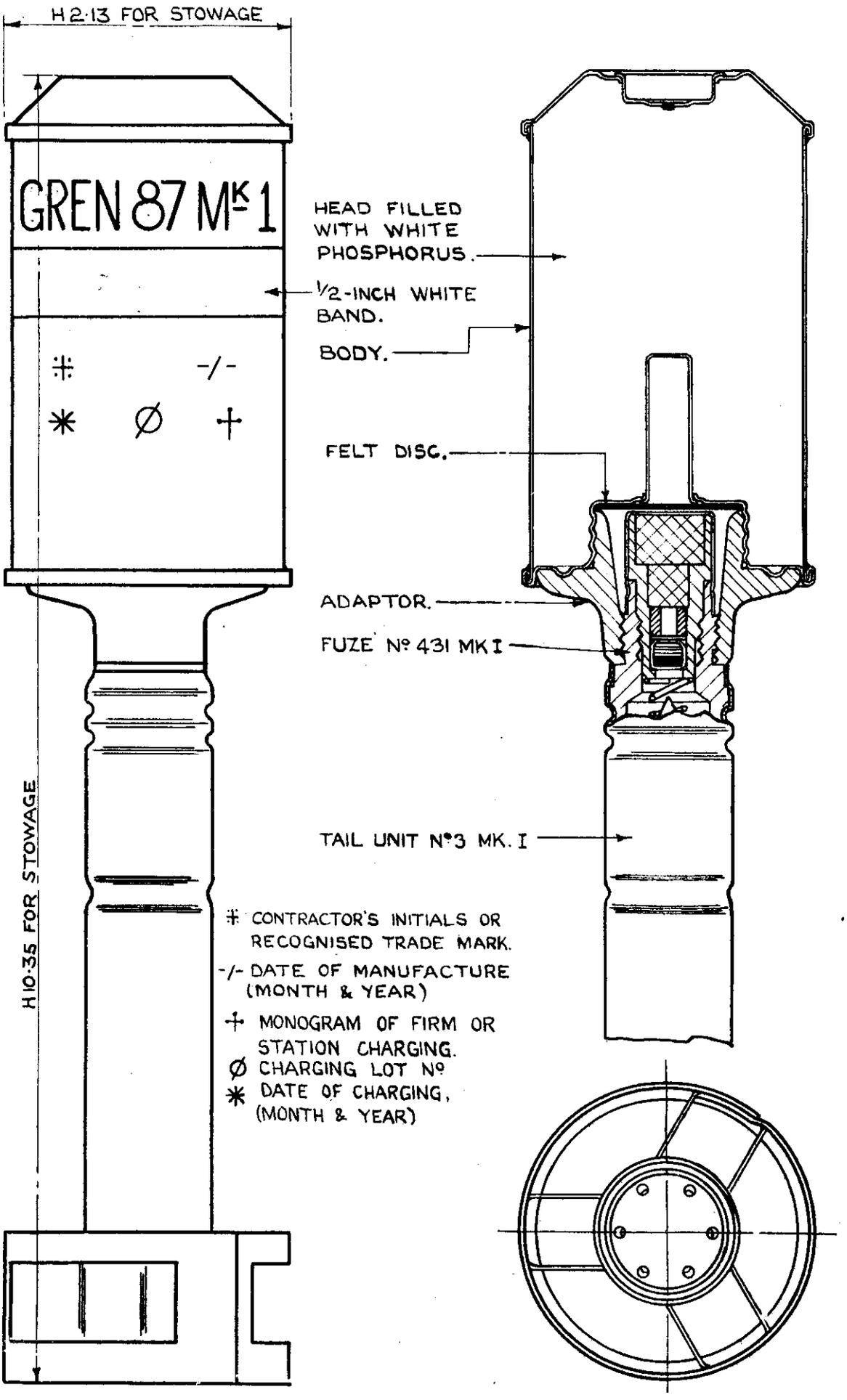
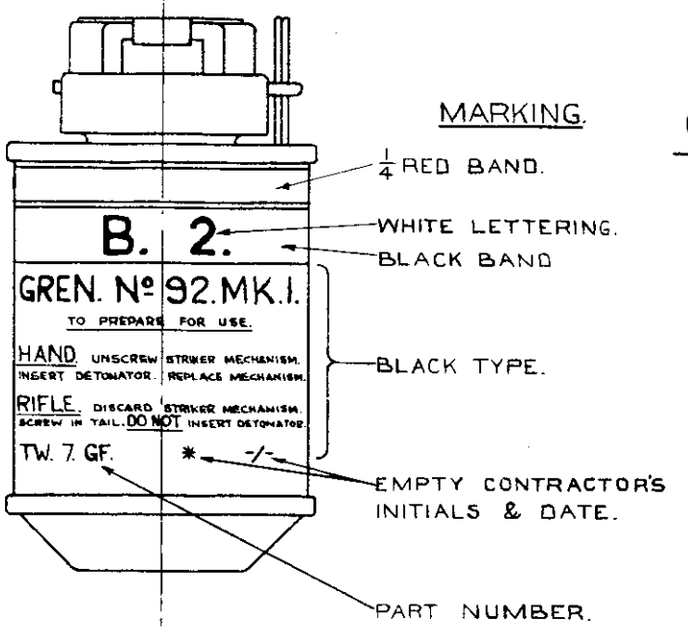
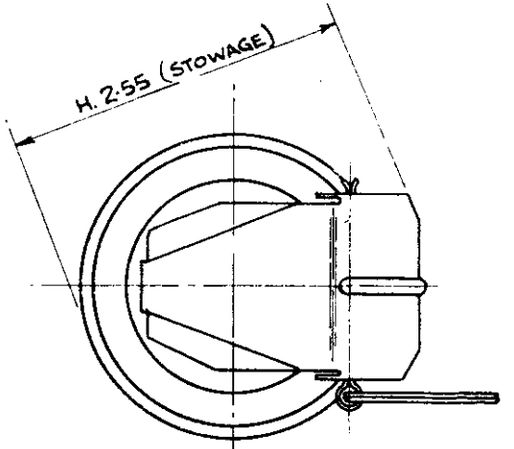
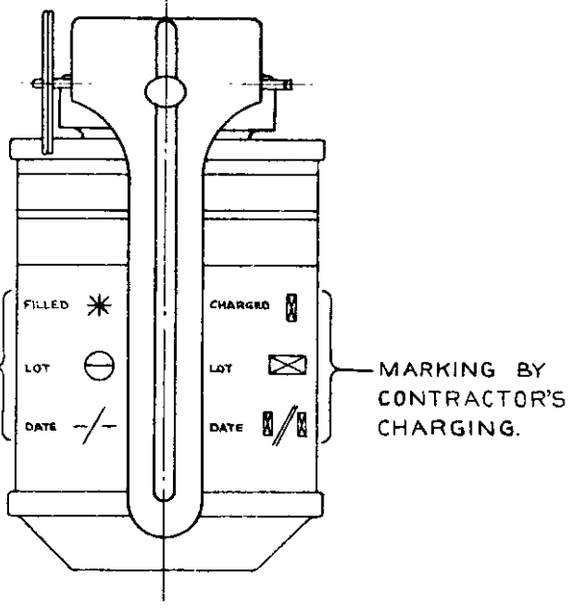


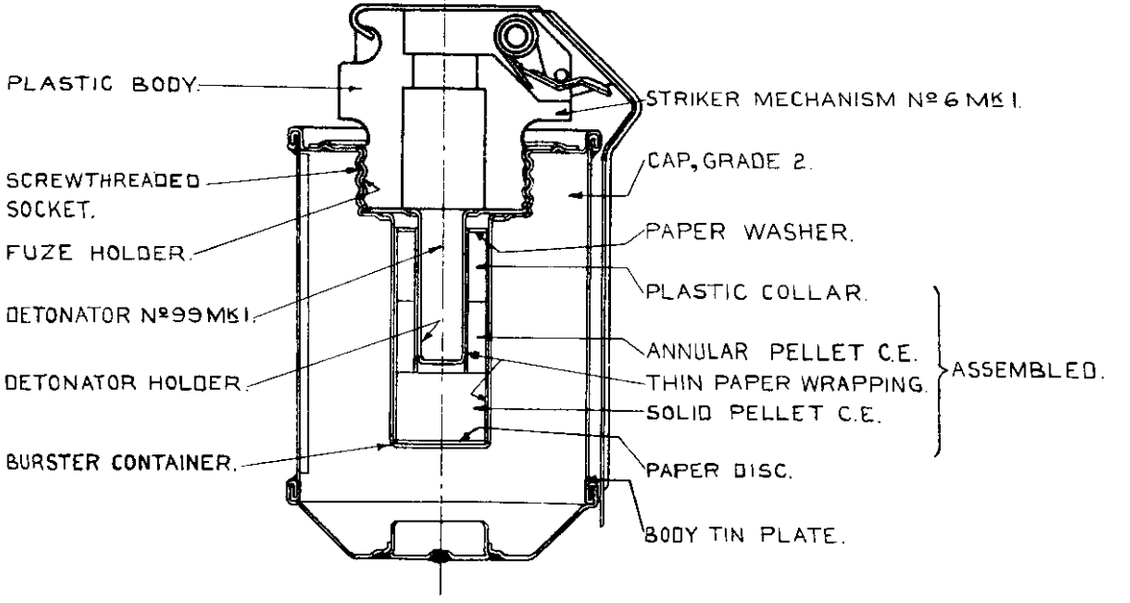
FIG. 597 (ITEM 1474)

GRENADE, HAND/RIFLE, Nº 92., MARK 1.



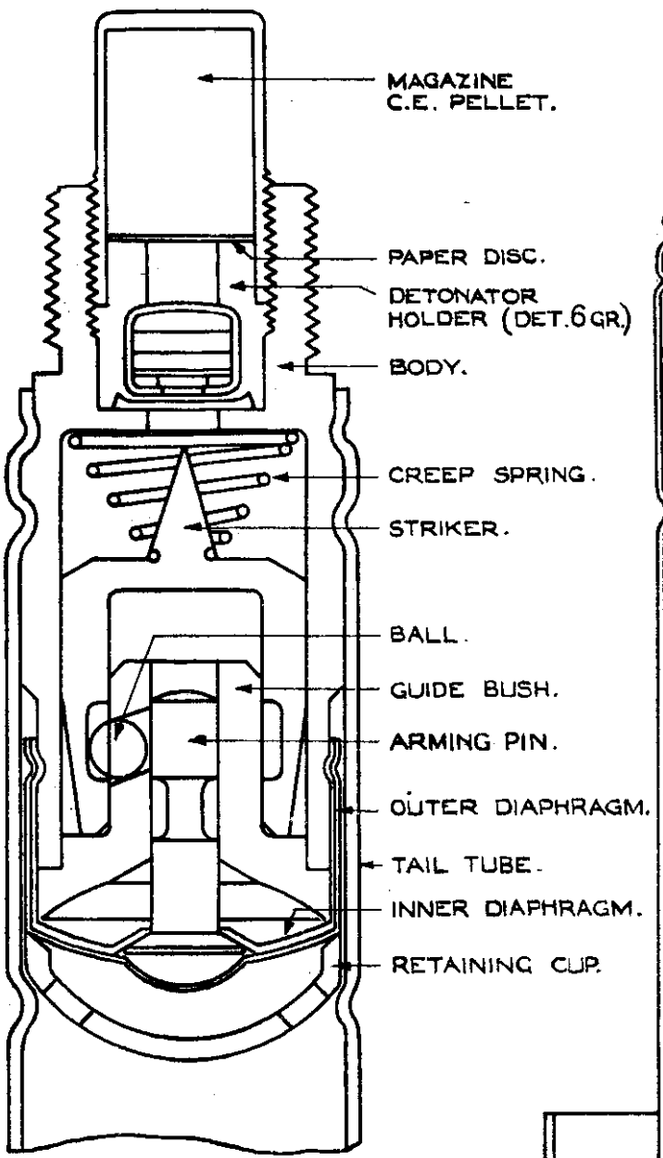




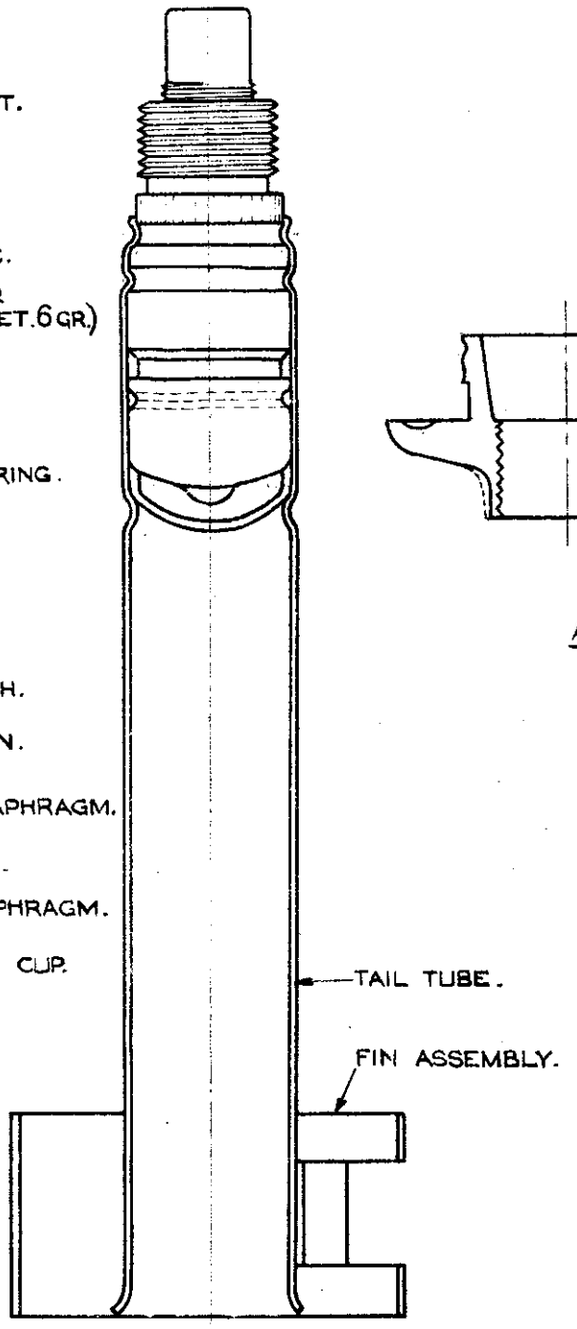


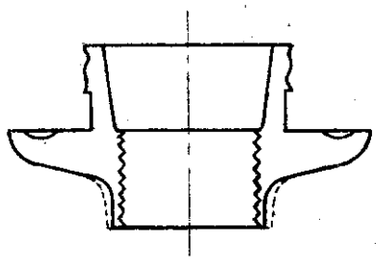
FUZE 430 MK. 2. & TAIL UNIT Nº 2. MK. I.

FIG. 598. (ITEM 1474)

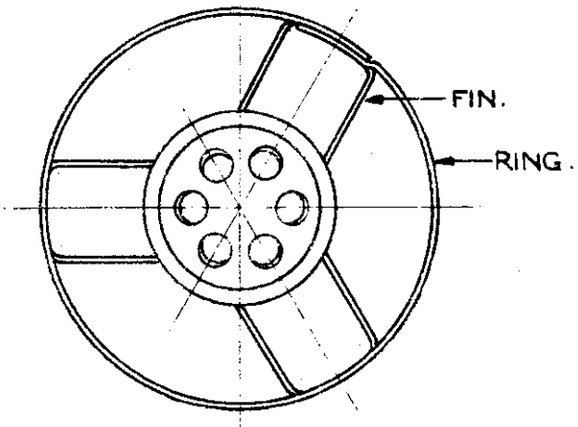


FUZE ENLARGED





ADAPTER



FIN ASSEMBLY.

FIG. 599. (ITEM 1475.)

BOMB, S.B., M.L., SMOKE, B.E.D.S. 4·2INCH MORTAR. MARK 1/1.

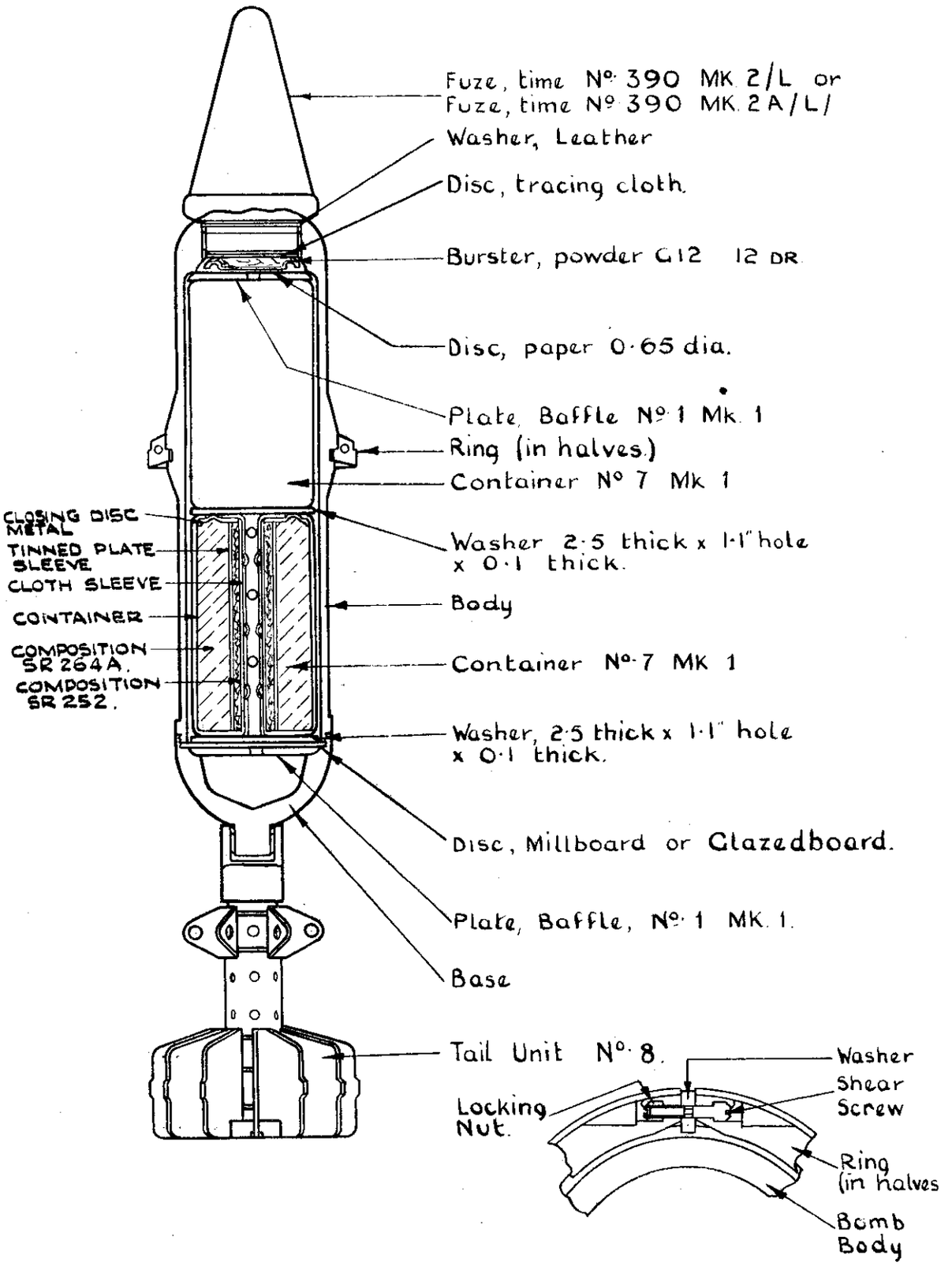


FIG. 600. (ITEM 1476.)

BOMB, S.B., M.L., COLOURED SMOKE, SKYTRAIL, B.E., 3INCH MORTAR, 10LB, MK.1.

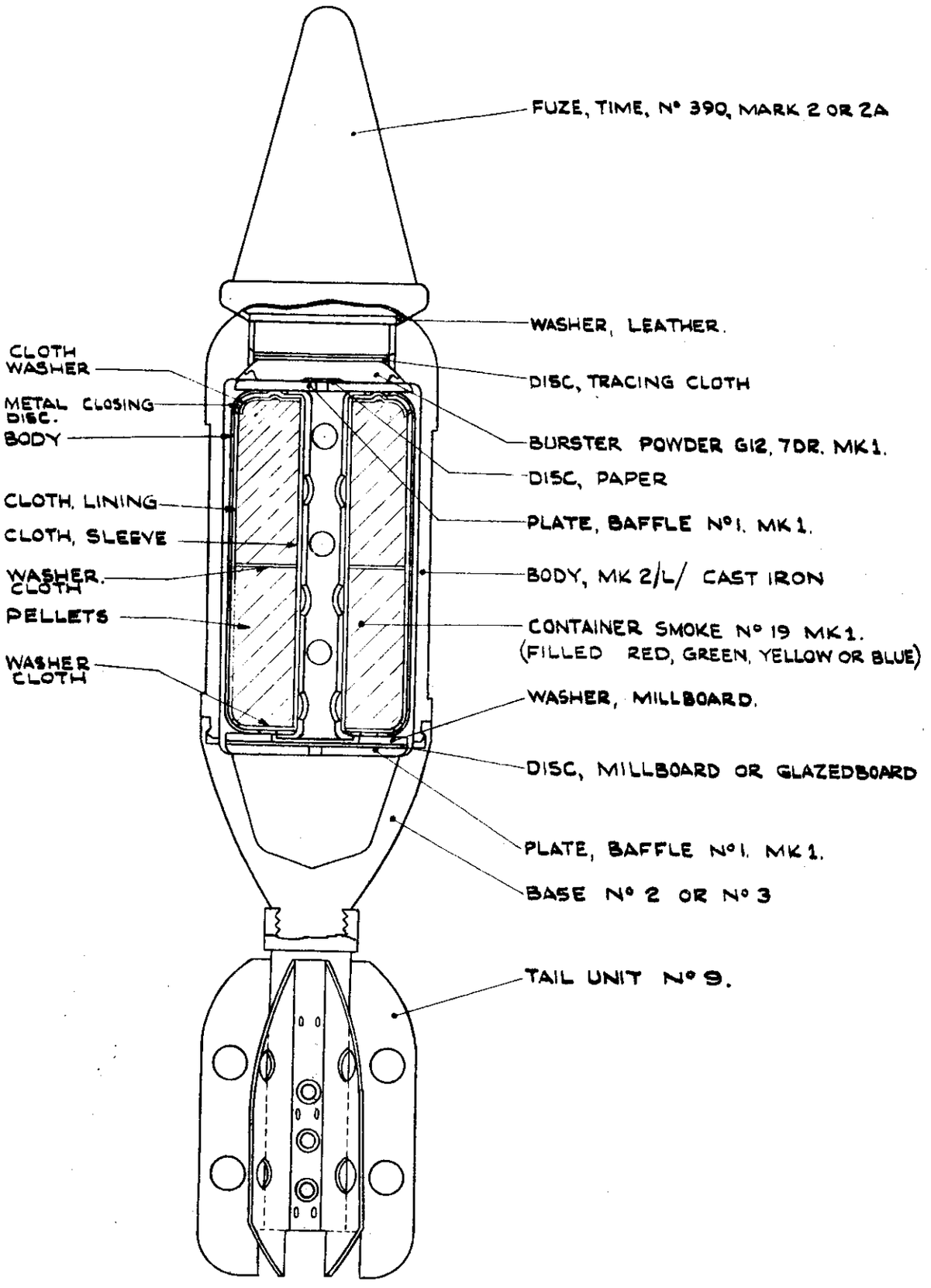
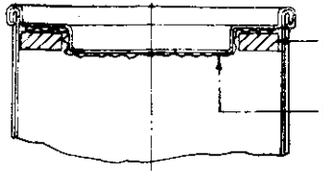


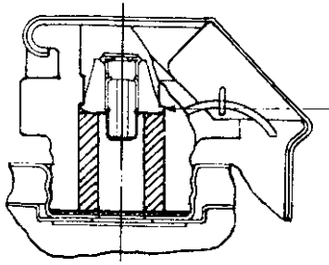
FIG. 601 (ITEM 1478)

GRENADE HAND Nº 91 MK. I.

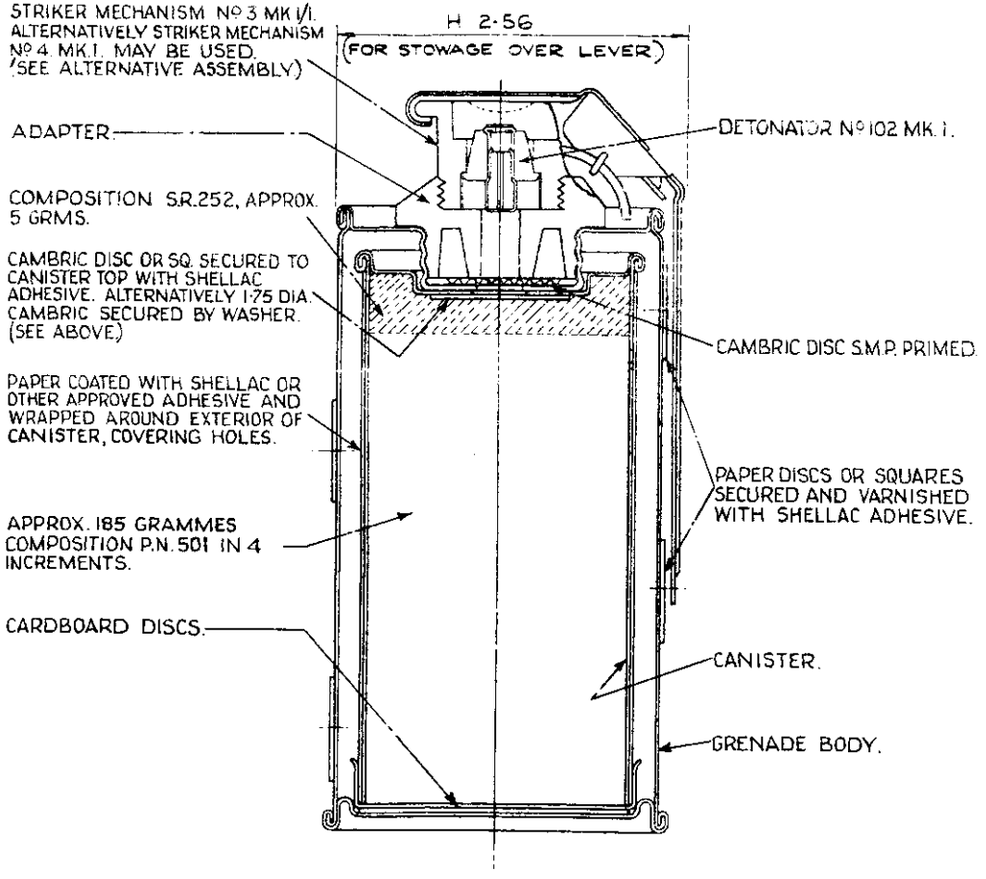
WEIGHT COMPLETE APPROX. 16 OZ.

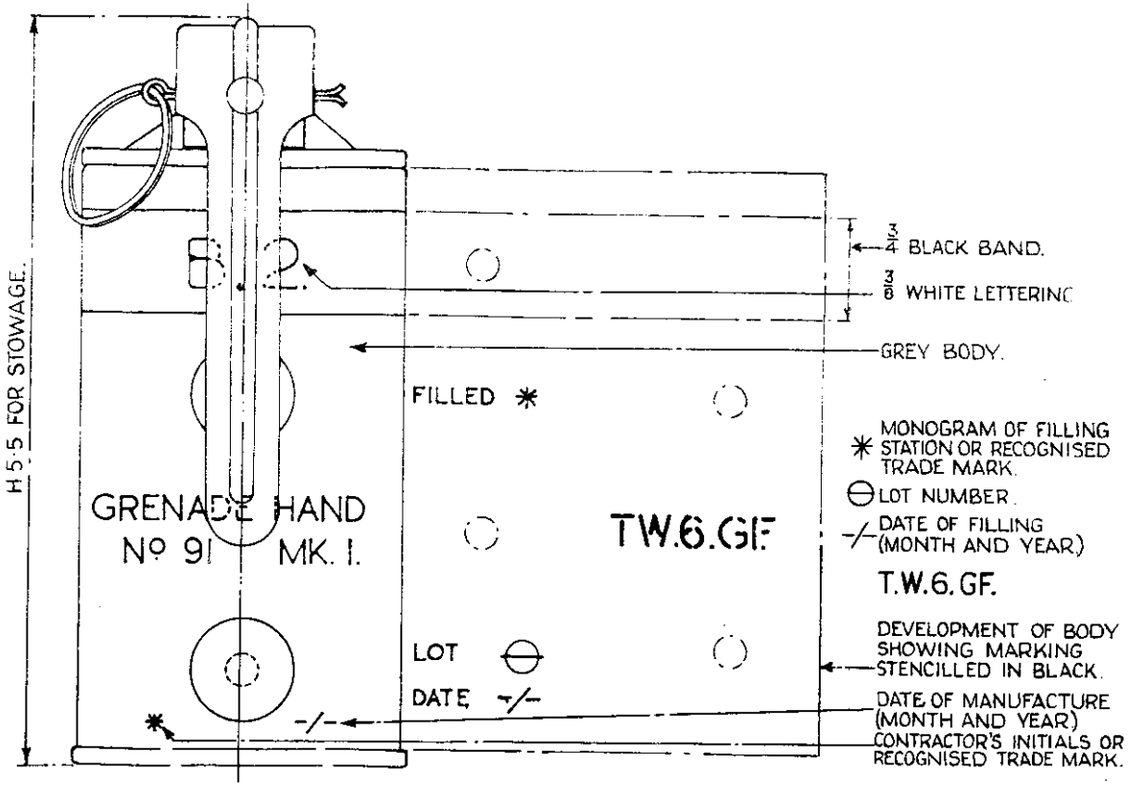


ALTERNATIVE METHOD OF SECURING PRIMED CAMBRIC.



ASSEMBLY OF ALTERNATIVE STRIKER MECHANISM Nº 4.

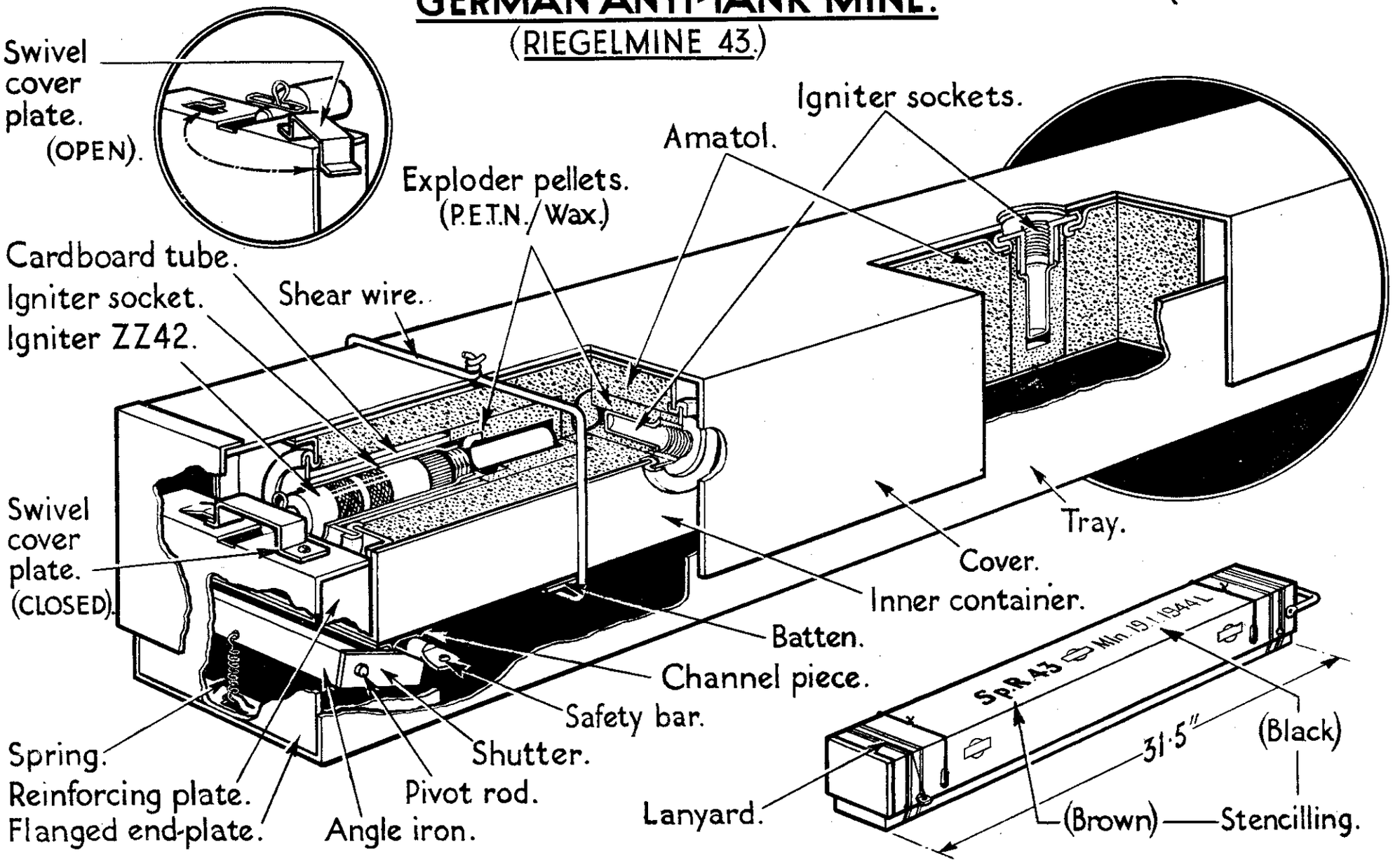




GERMAN ANTI-TANK MINE.

(RIEGELMINE 43.)

FIG. 602 (ITEM 1479.)



GERMAN PULL IGNITER (ZZ. 42)
FROM GERMAN RIELGELMINE.

FIG. 603. (ITEM 1480.)

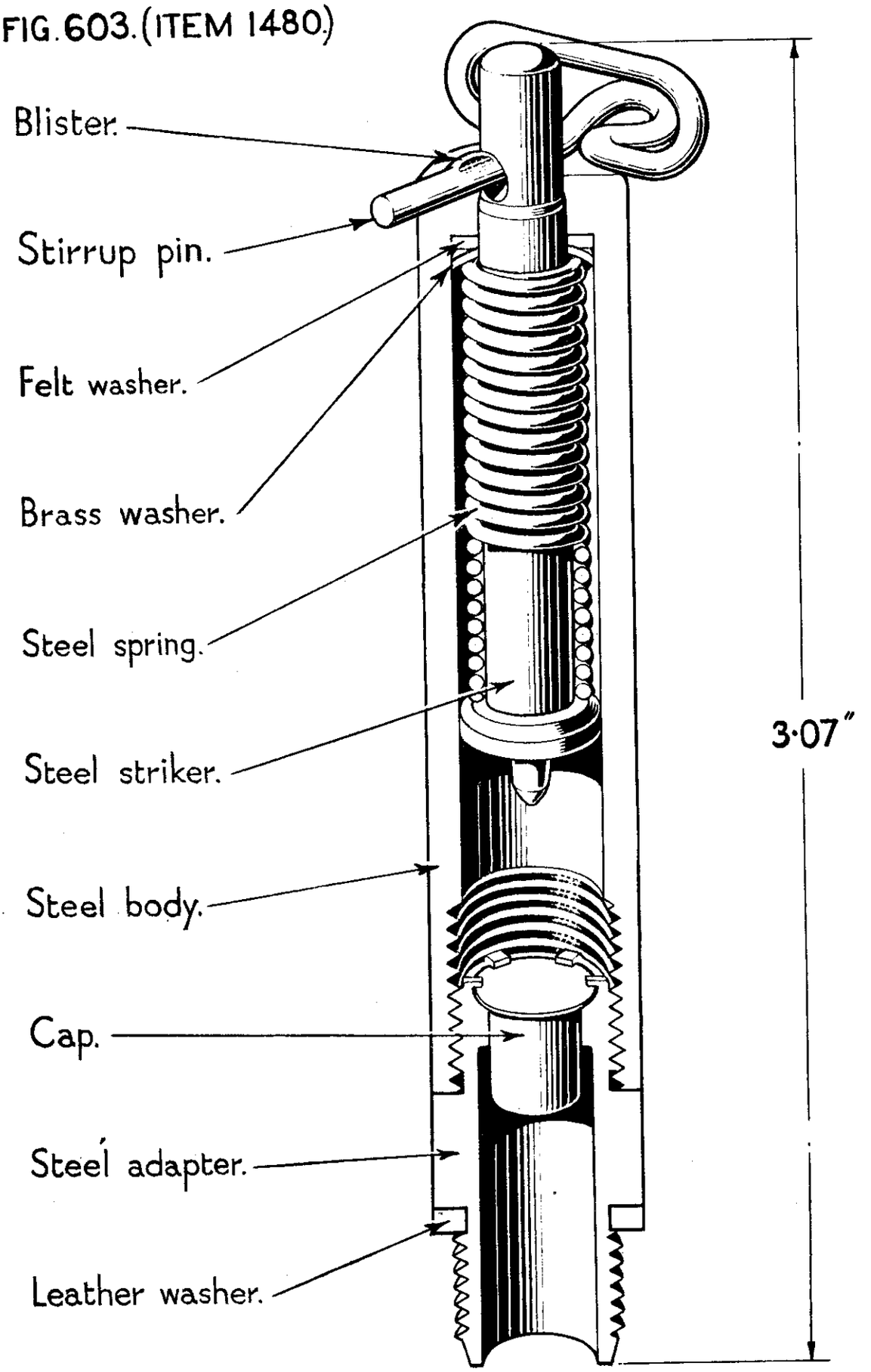
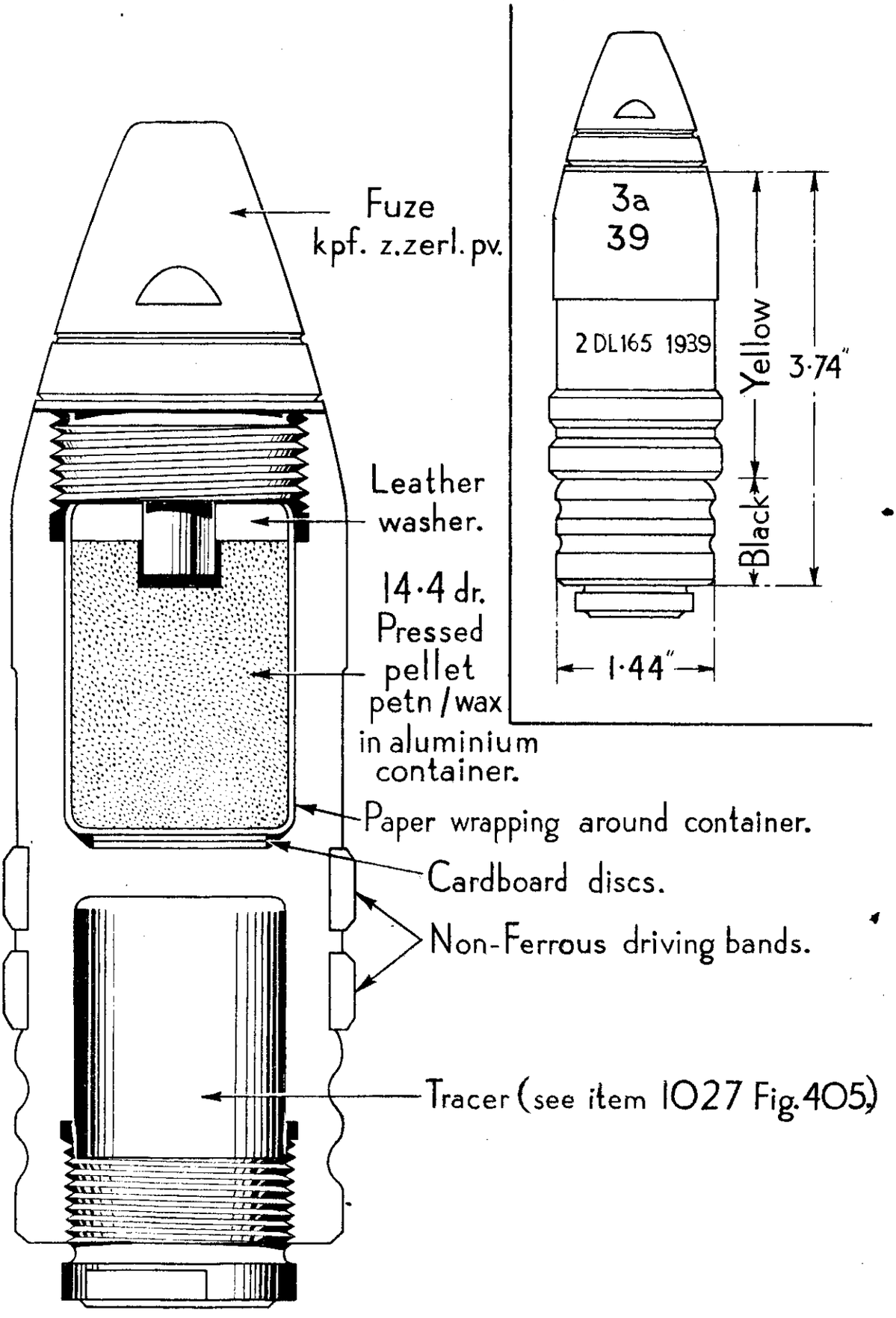


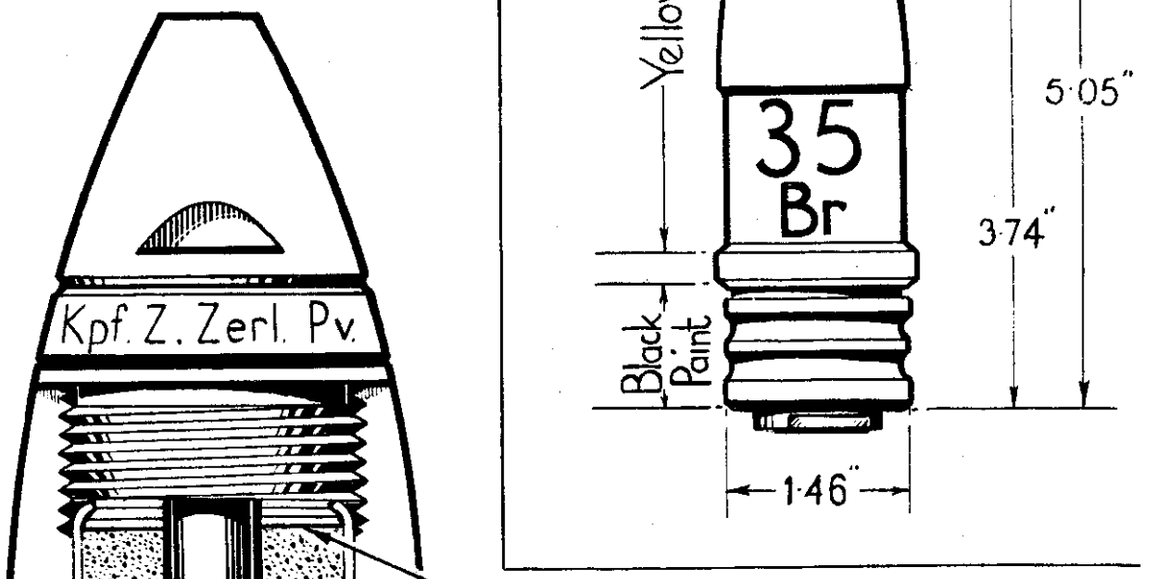
FIG. 604. (ITEM 1481).

GERMAN 3·7 CM. FLAK 18 HE/T SHELL



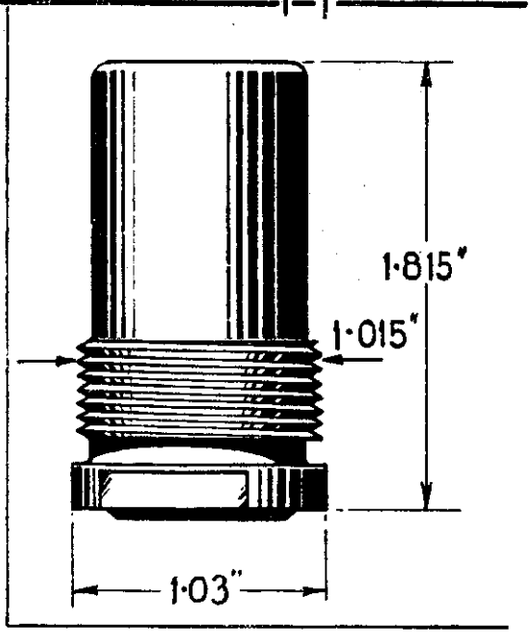
GERMAN 3·7cm FLAK 18 HE/I/T SHELL

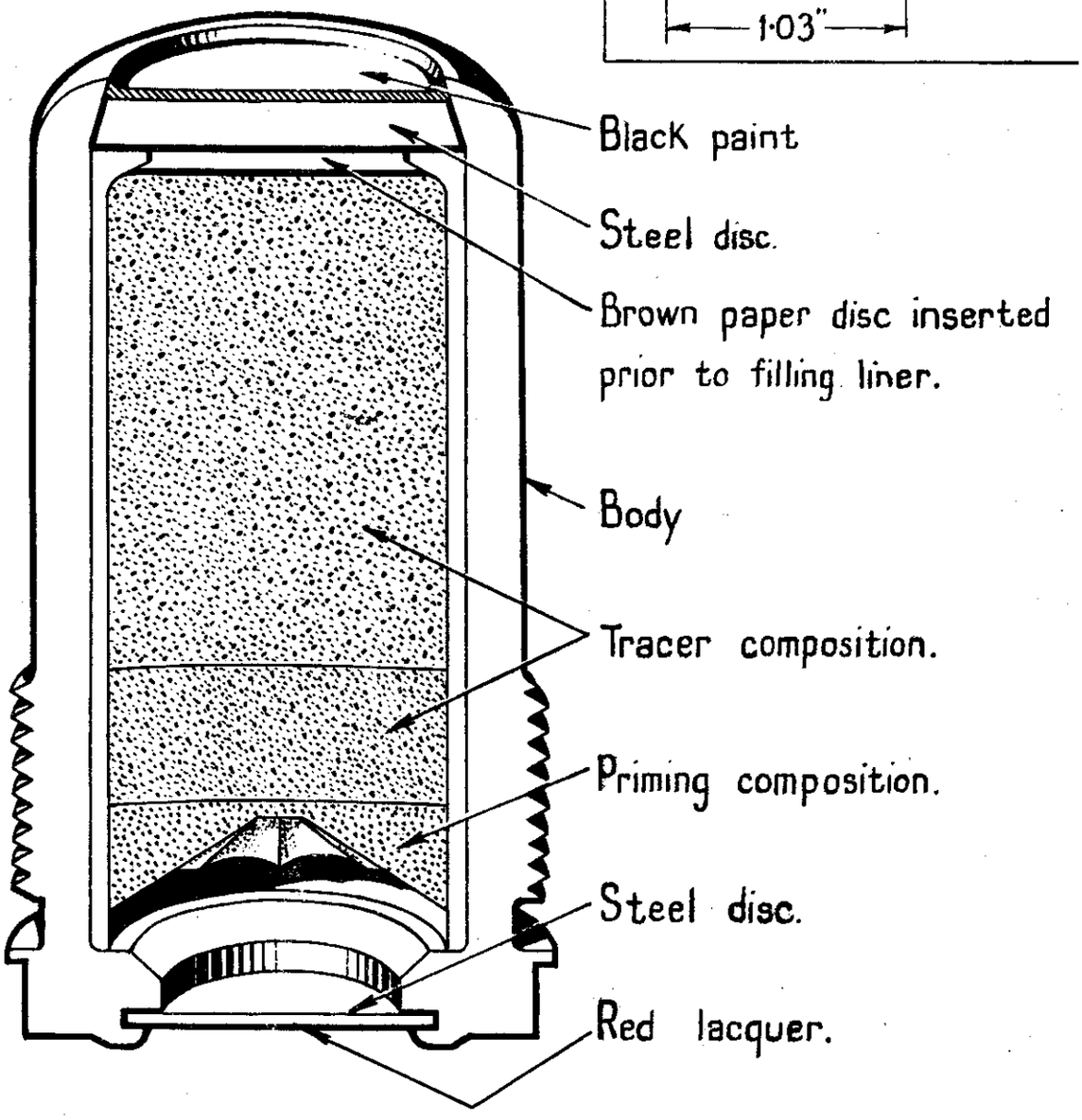
FIG. 605 (ITEM 1482.)



GERMAN TRACER FROM 3·7cm. FLAK 18 H.E. I T SHELL

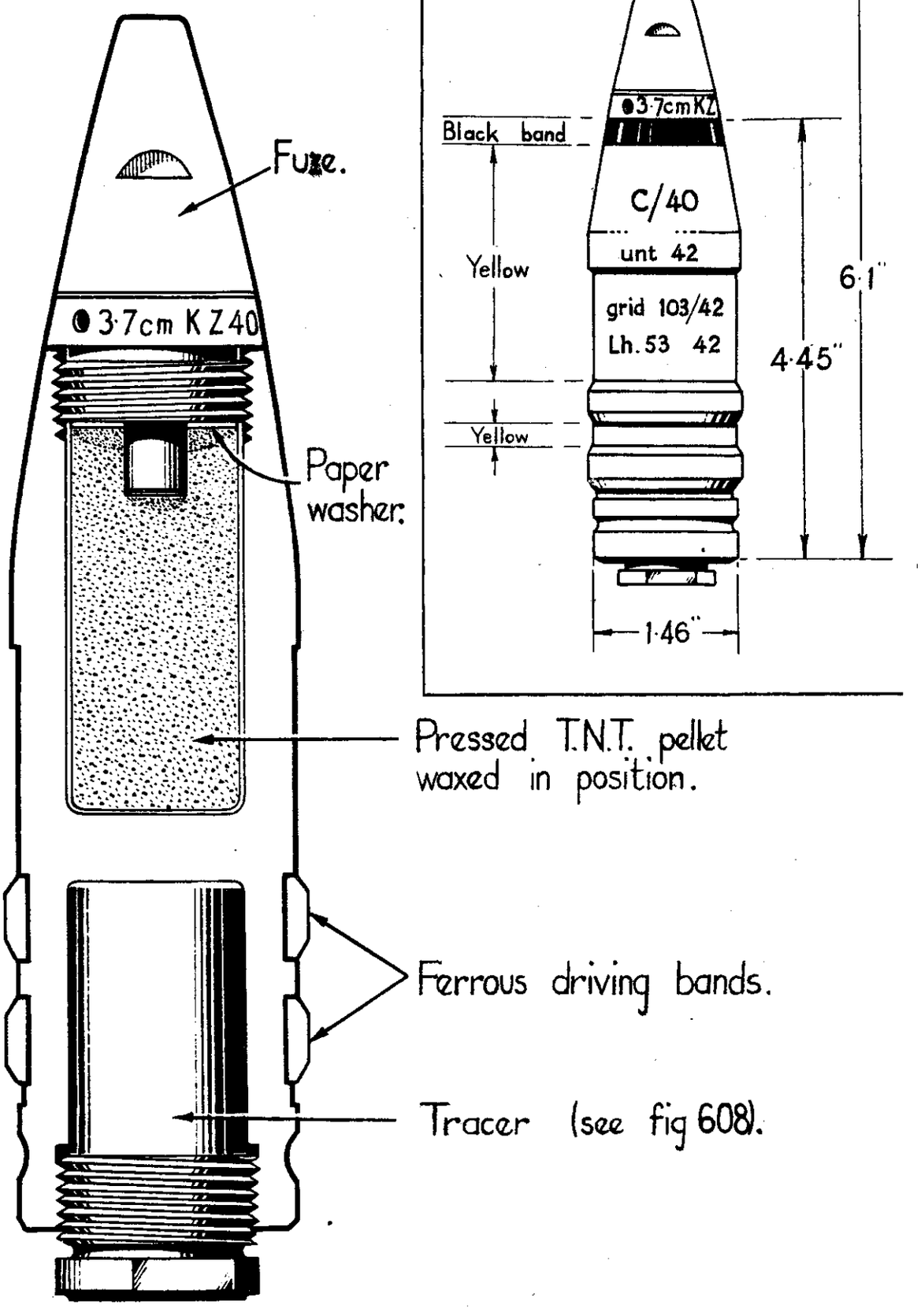
FIG. 606. (ITEM 1483)





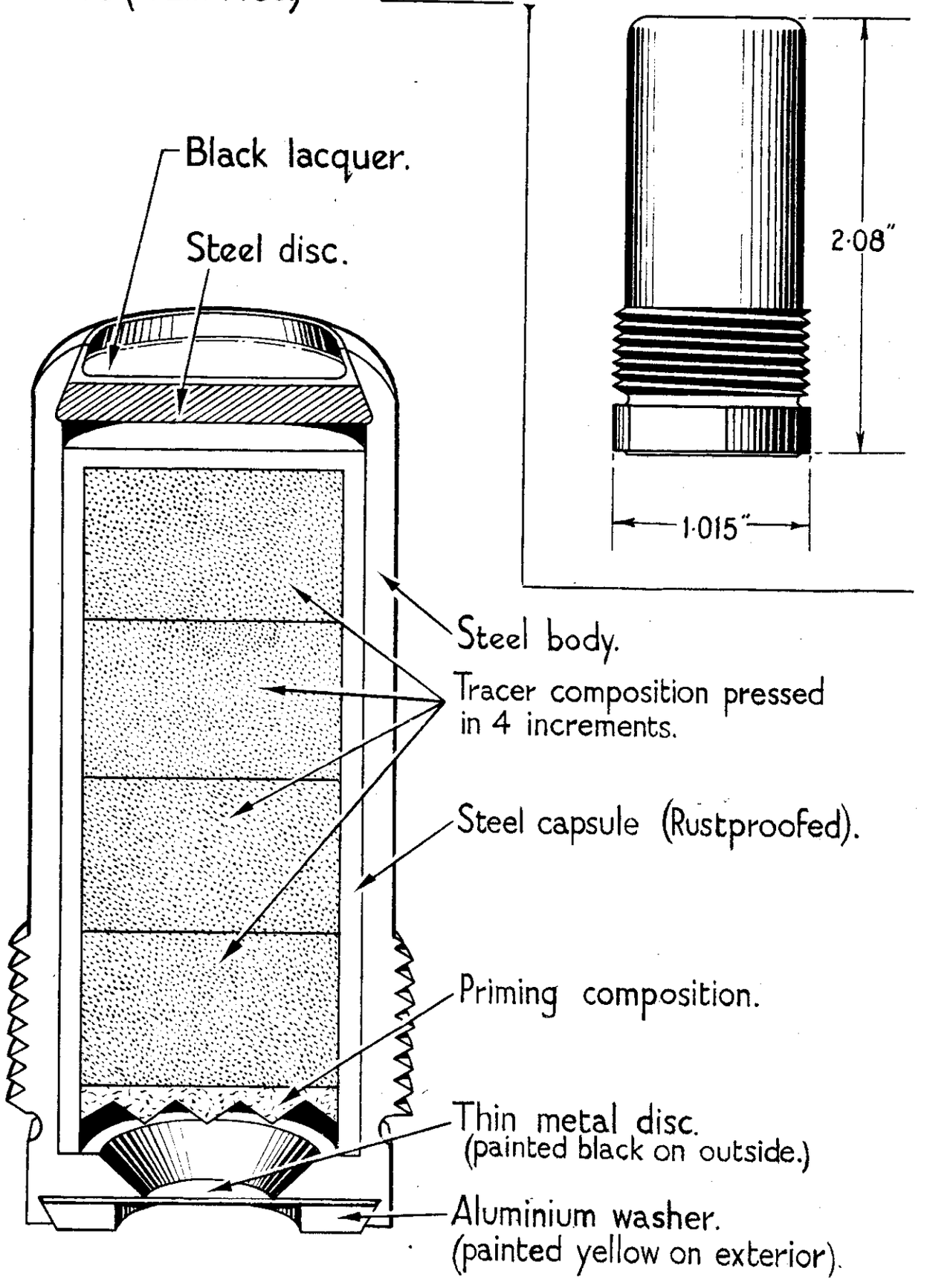
GERMAN 3·7cm (NAVAL) FLAK HE/T SHELL

FIG. 607 (ITEM 1484)



GERMAN TRACER FROM 3·7cm. (NAVAL) H.E./T SHELL.

FIG. 608 (ITEM 1485.)



GERMAN 7·5 c.m. Q.F. HOLLOW CHARGE SHELL

FIG. 609. (ITEM 1486) (Gr. 38 H.L./C).

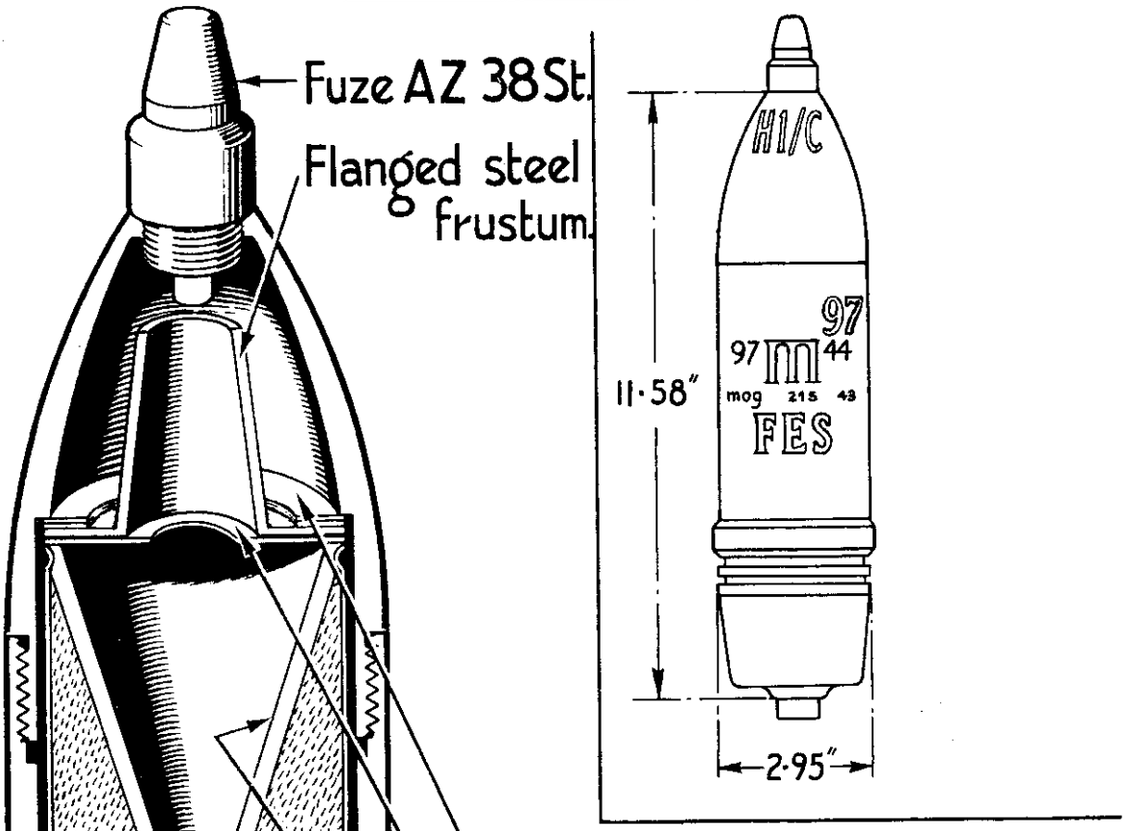
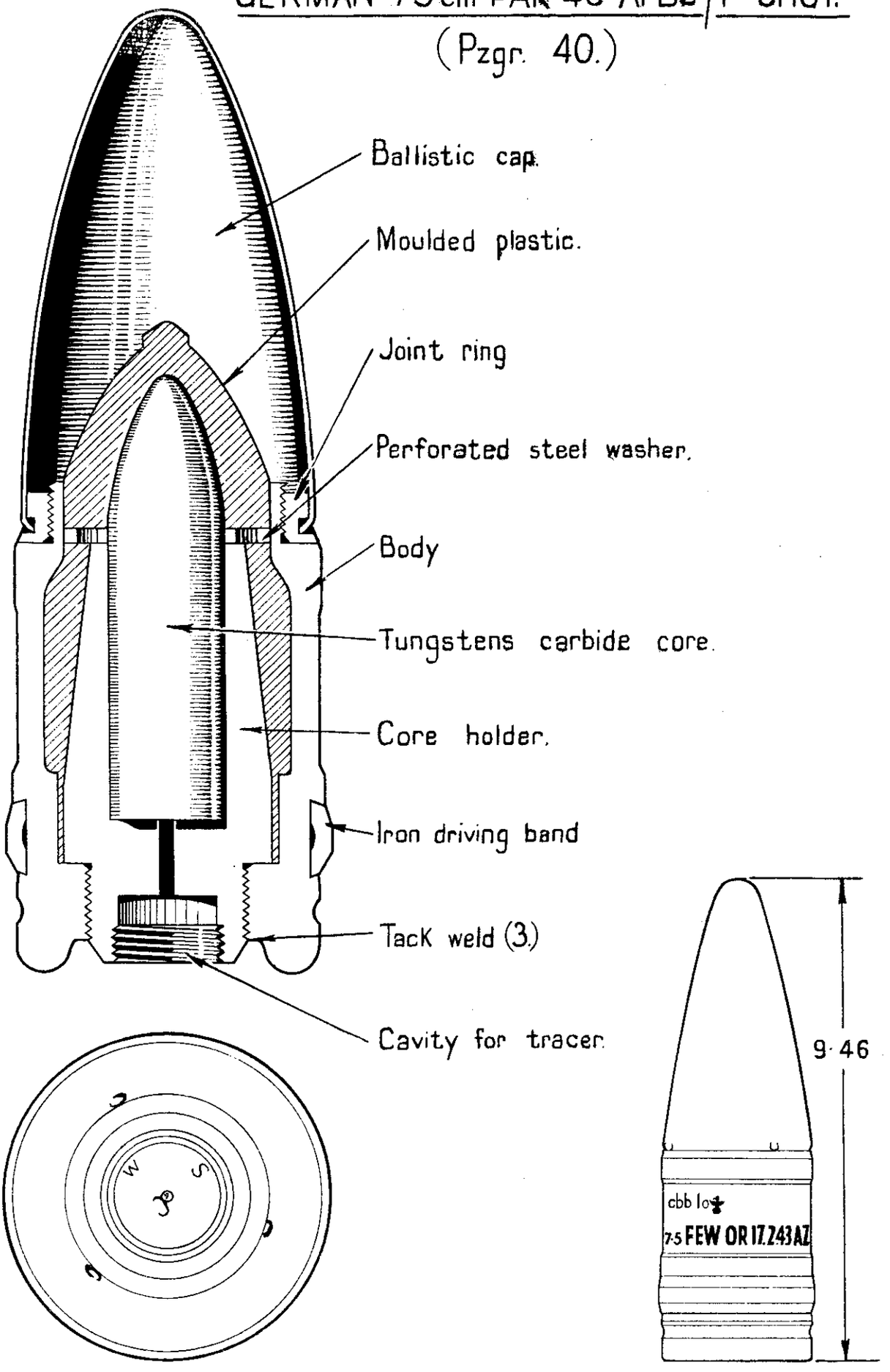


FIG. 610. (ITEM 1487.)

GERMAN 7·5 cm PAK 40 APBC/T SHOT.

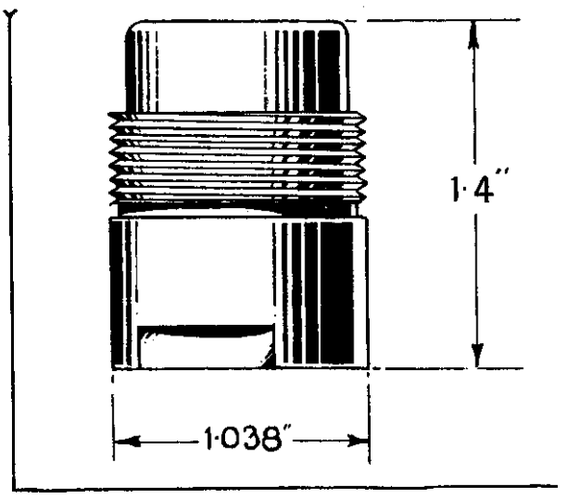
(Pzgr. 40.)

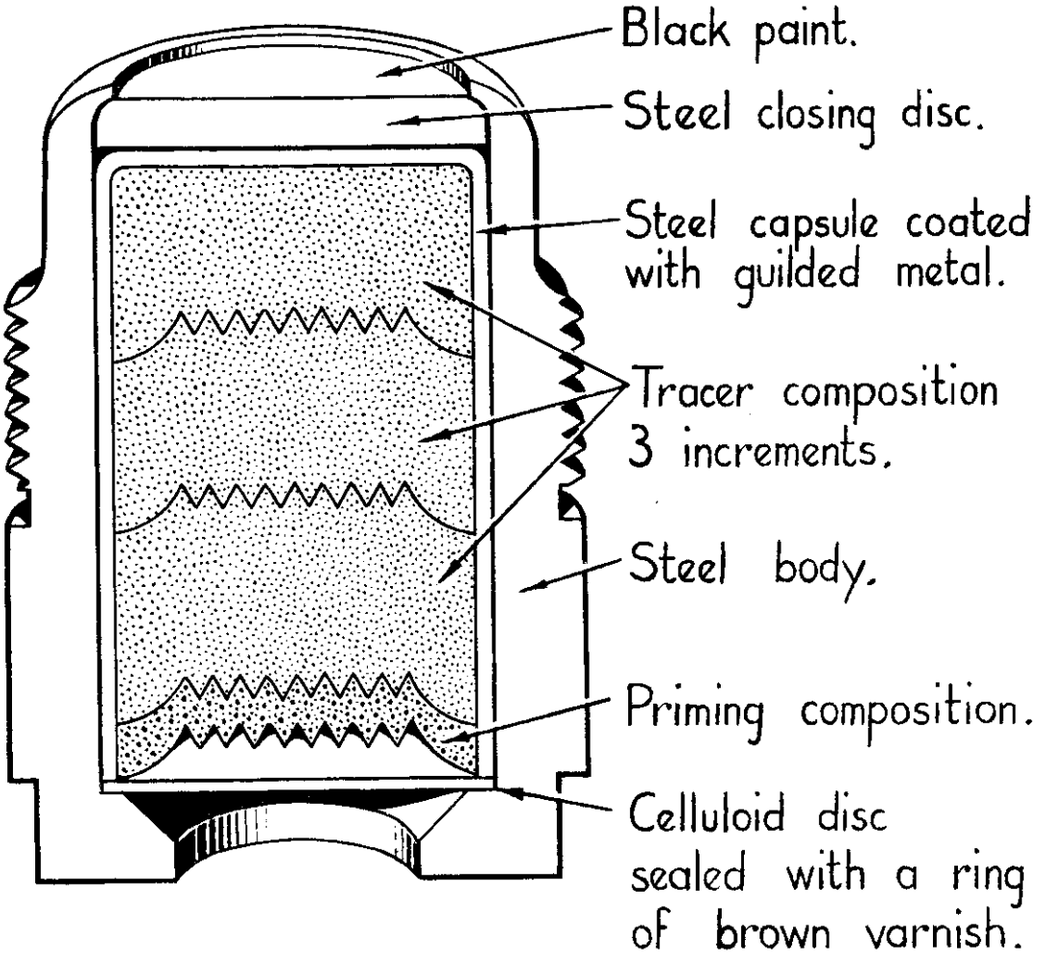


BASE.

GERMAN TRACER FOR 7·5cm. PAK 40 APBC/T SHOT.

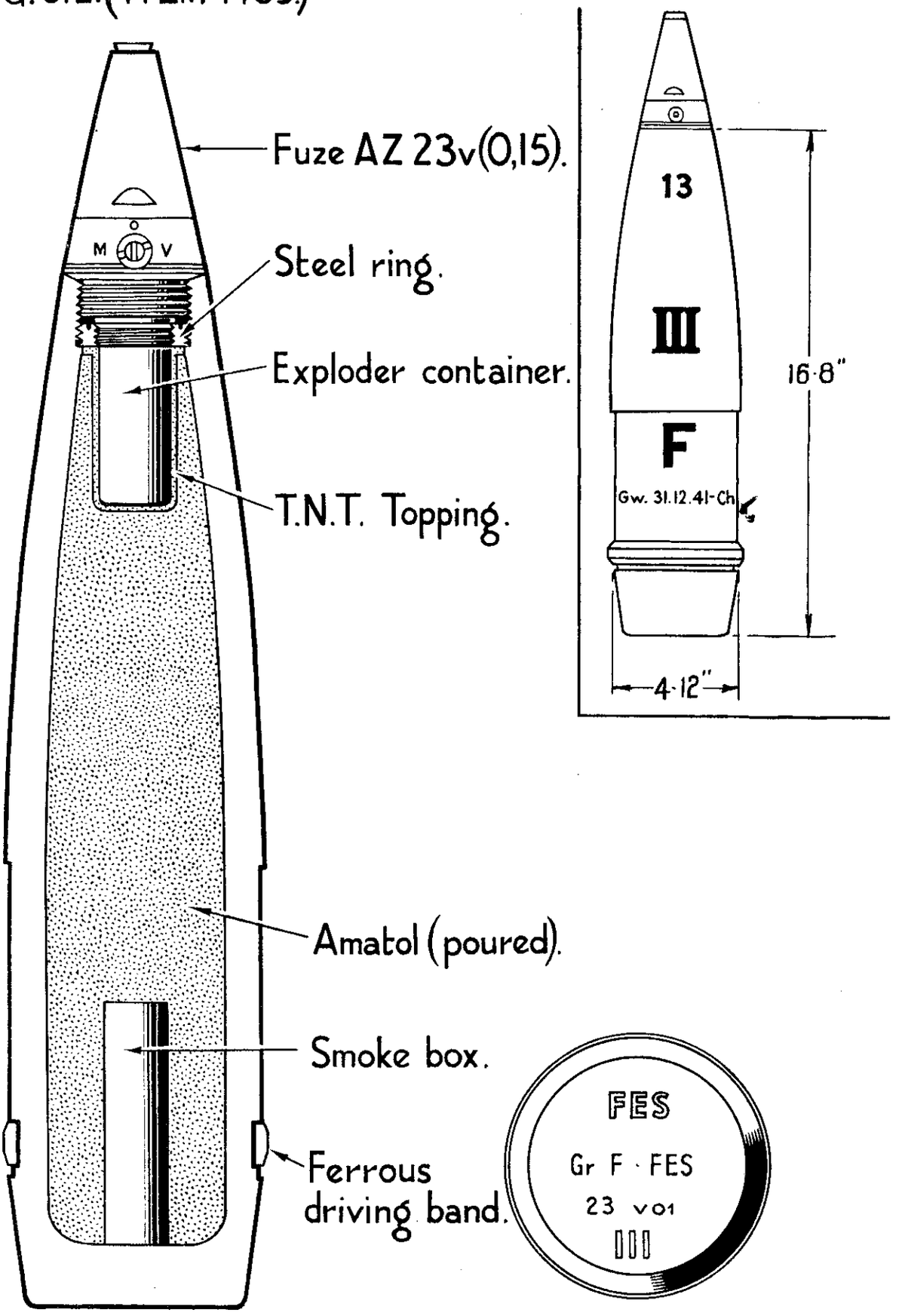
FIG. 611. (ITEM 1488)





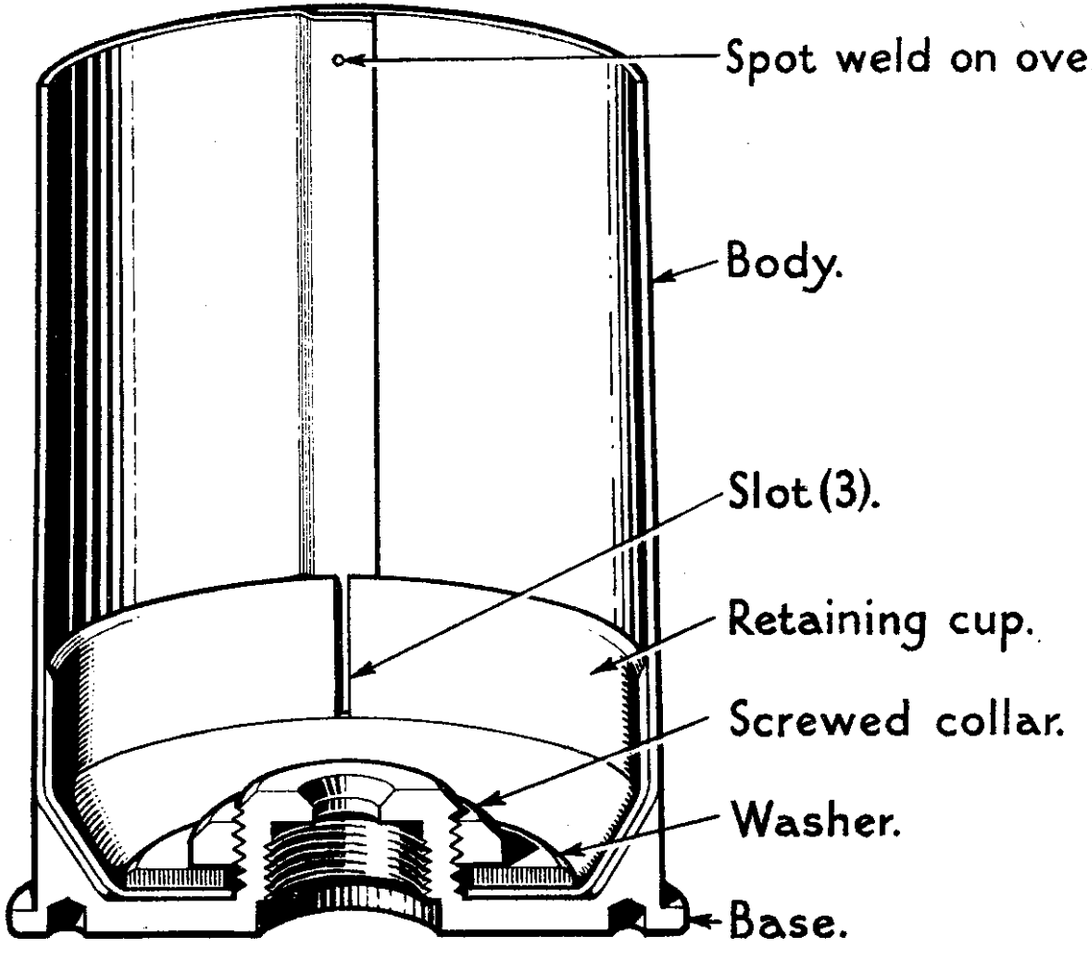
GERMAN 10·5cm. le FH. 18 M, SHELL HE, S/L (Gr. F.)

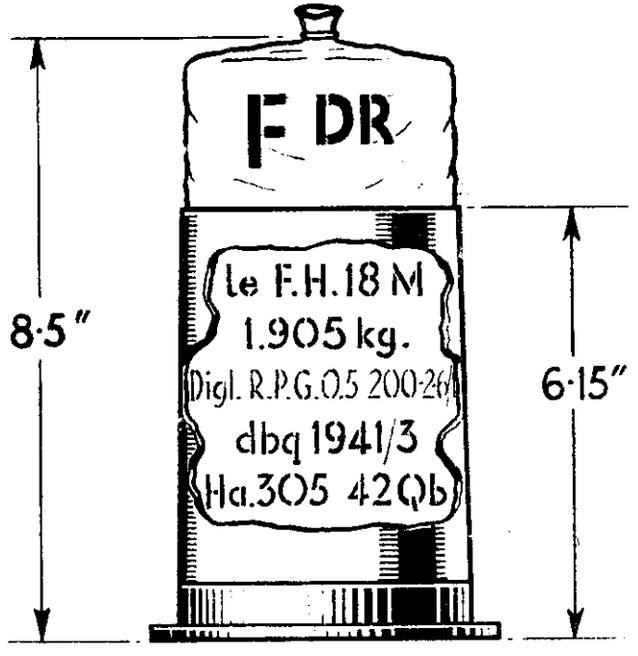
FIG. 612. (ITEM 1489.)

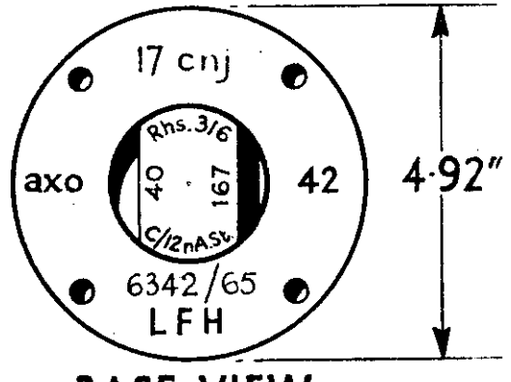


MARKING ON BASE.

GERMAN 10·5cm. le.F.H.18M. CARTRIDGE Q.F. for "Gr F" SHELL. (FIG 613 ITEM 1490.)



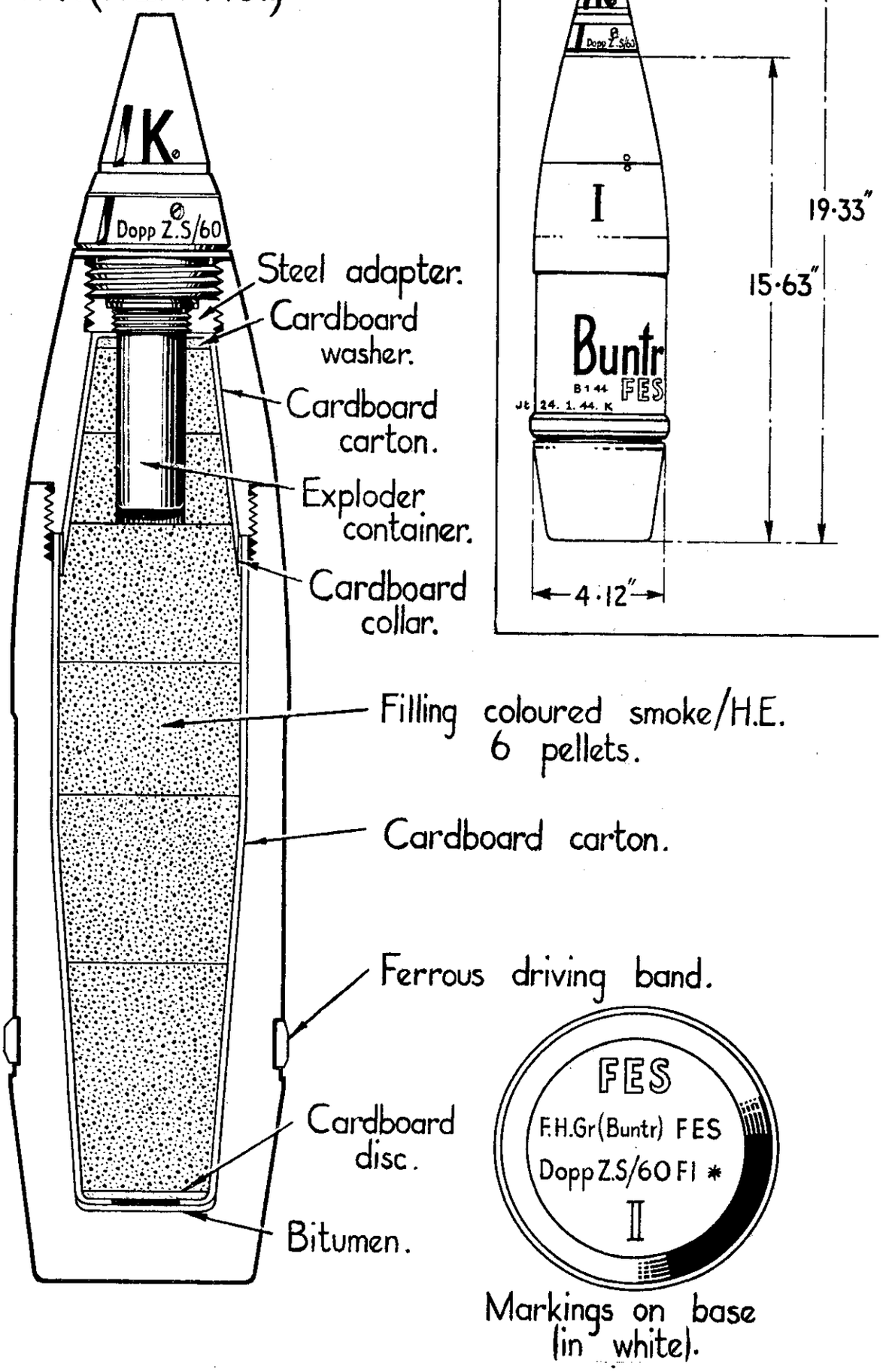




BASE VIEW.

GERMAN 10·5cm GEB H40 COLOURED SMOKE H.E SHELL (F.H. Gr Buntr)

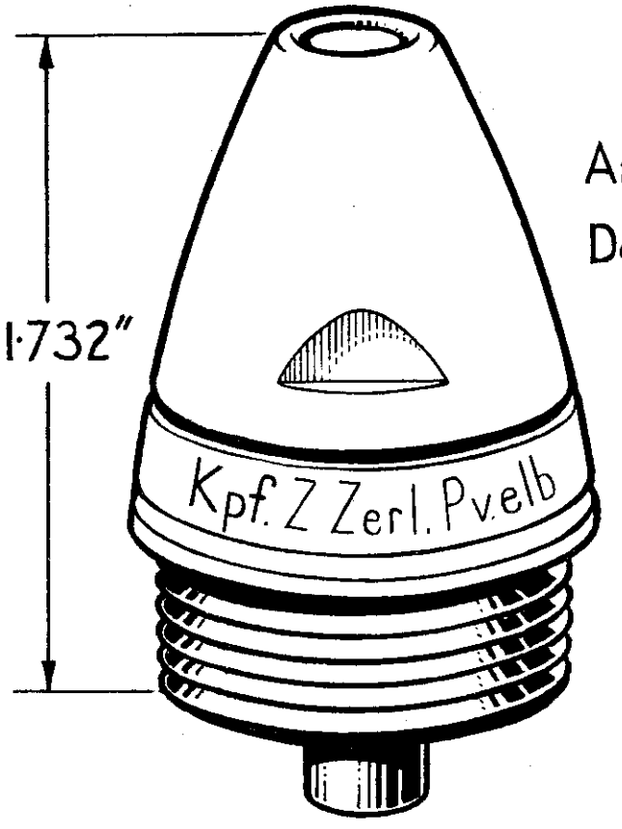
FIG. 614. (ITEM 1491.)



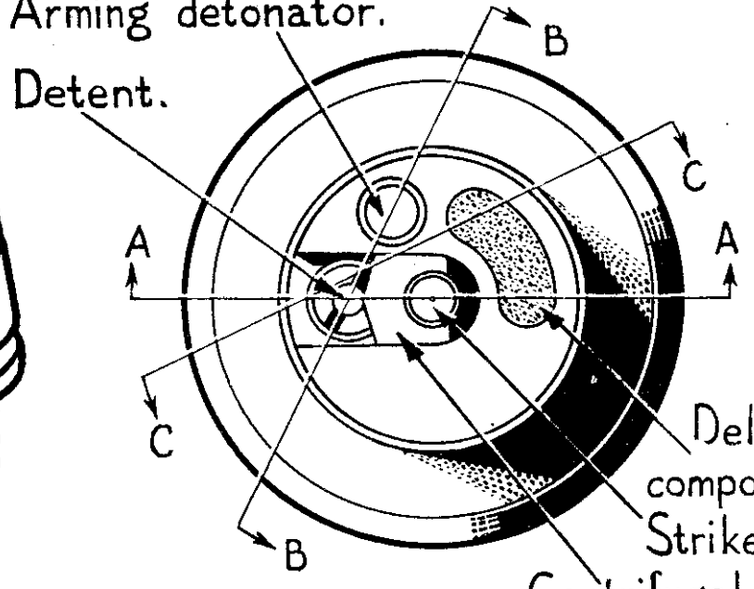
Markings on base (in white).

GERMAN FUZE 3·7 cm. KPF. Z. ZERL. PV.

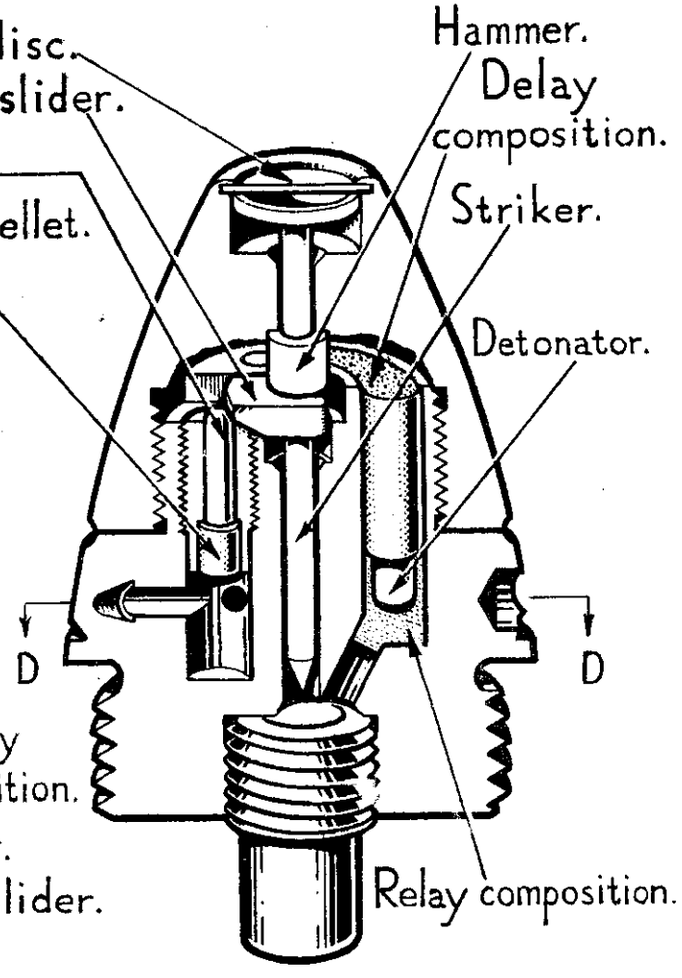
FIG. 615. (ITEM 1492.)



Exterior.

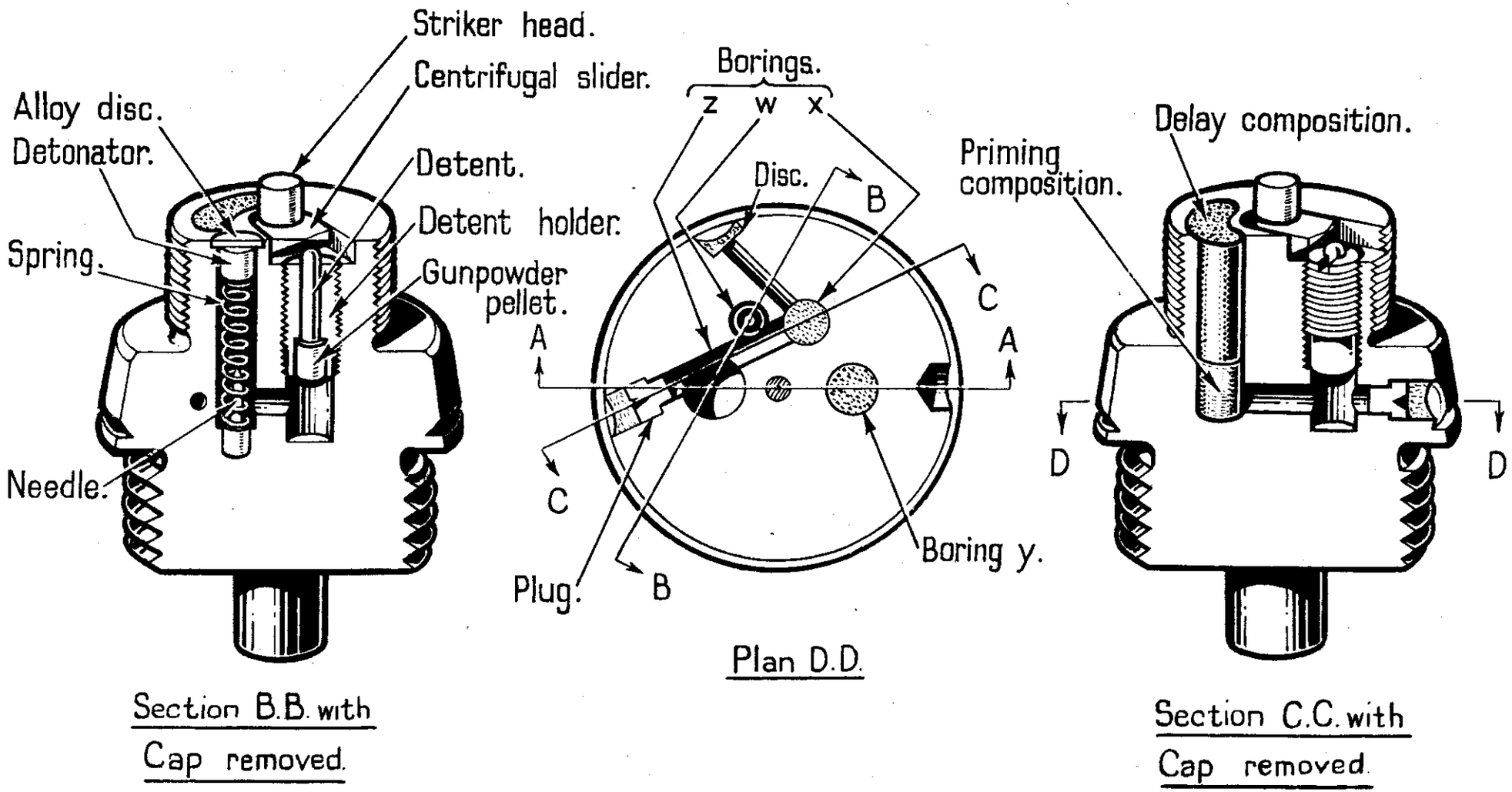


Plan view with Cap removed.



Section A.A.

FIG. 616 (ITEM 1492)
GERMAN FUZE 3·7 CM. KPF Z ZERL PV.



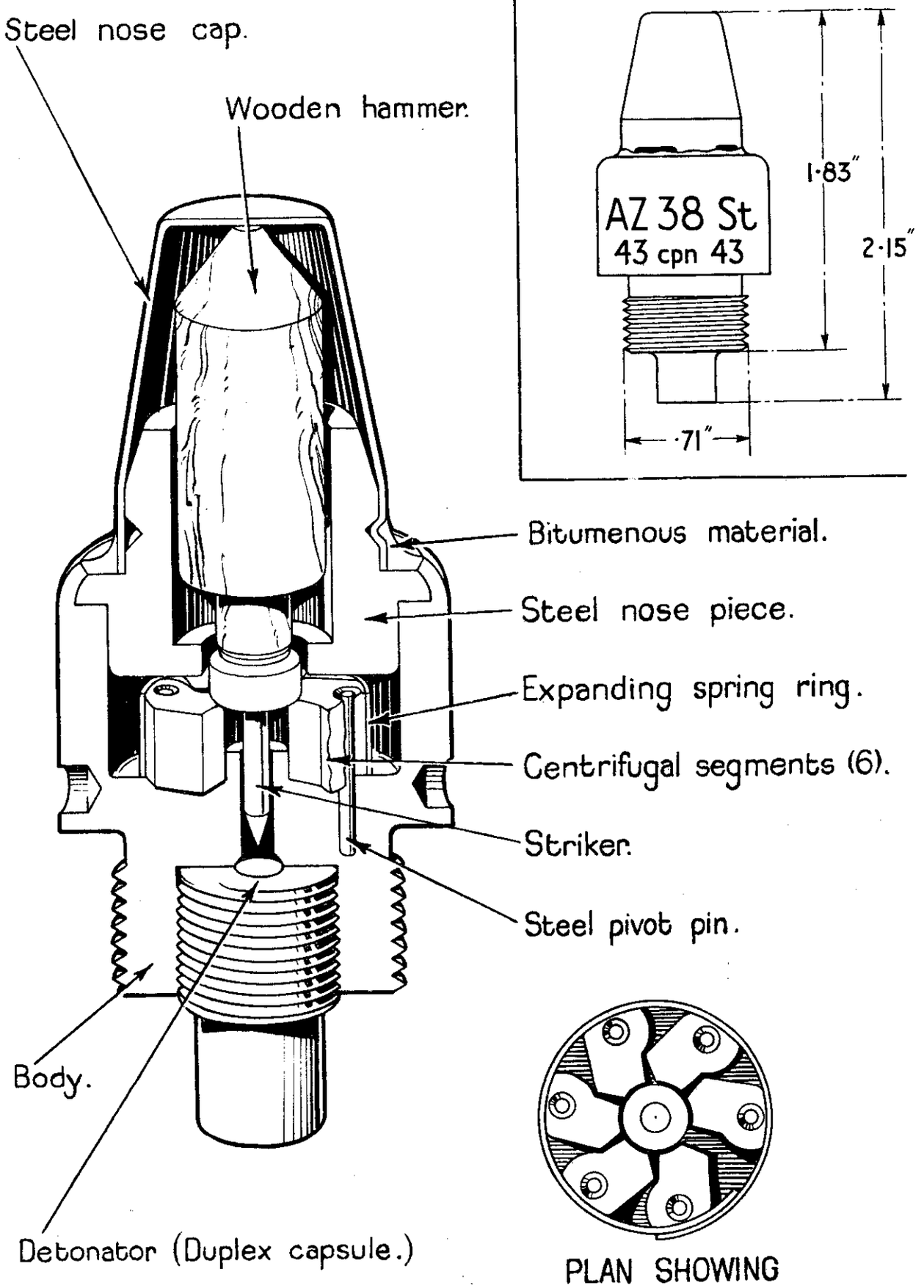
Section B.B. with Cap removed.

Plan D.D.

Section C.C. with Cap removed.

GERMAN FUZE AZ 38 St.

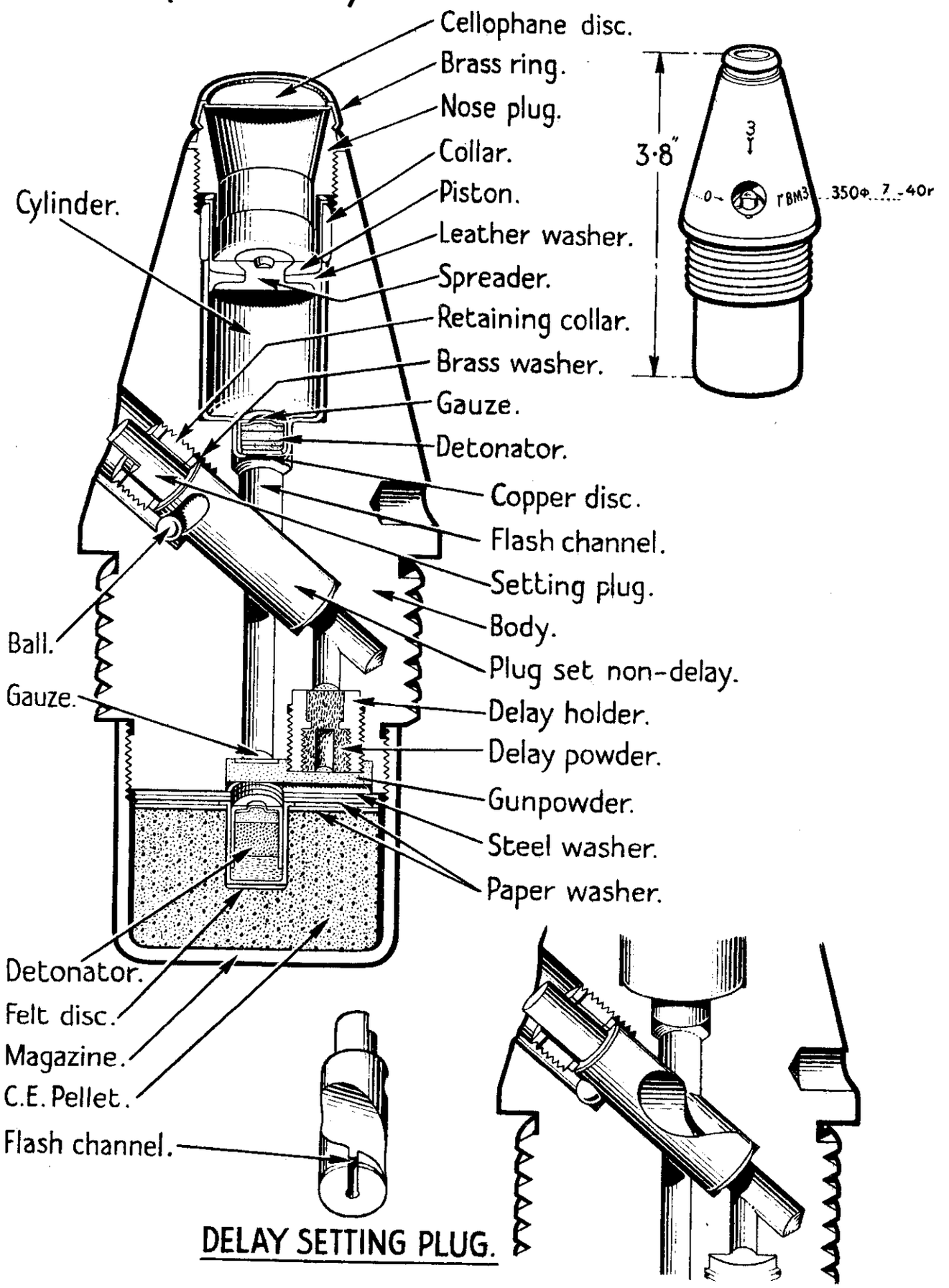
FIG. 617. (ITEM 1493.)



PLAN SHOWING
CENTRIFUGAL SEGMENTS.

GERMAN 12 c.m. MORTAR BOMB FUZE.

FIG. 618. (ITEM 1494.) Wgr Z (r)



DELAY SETTING PLUG.

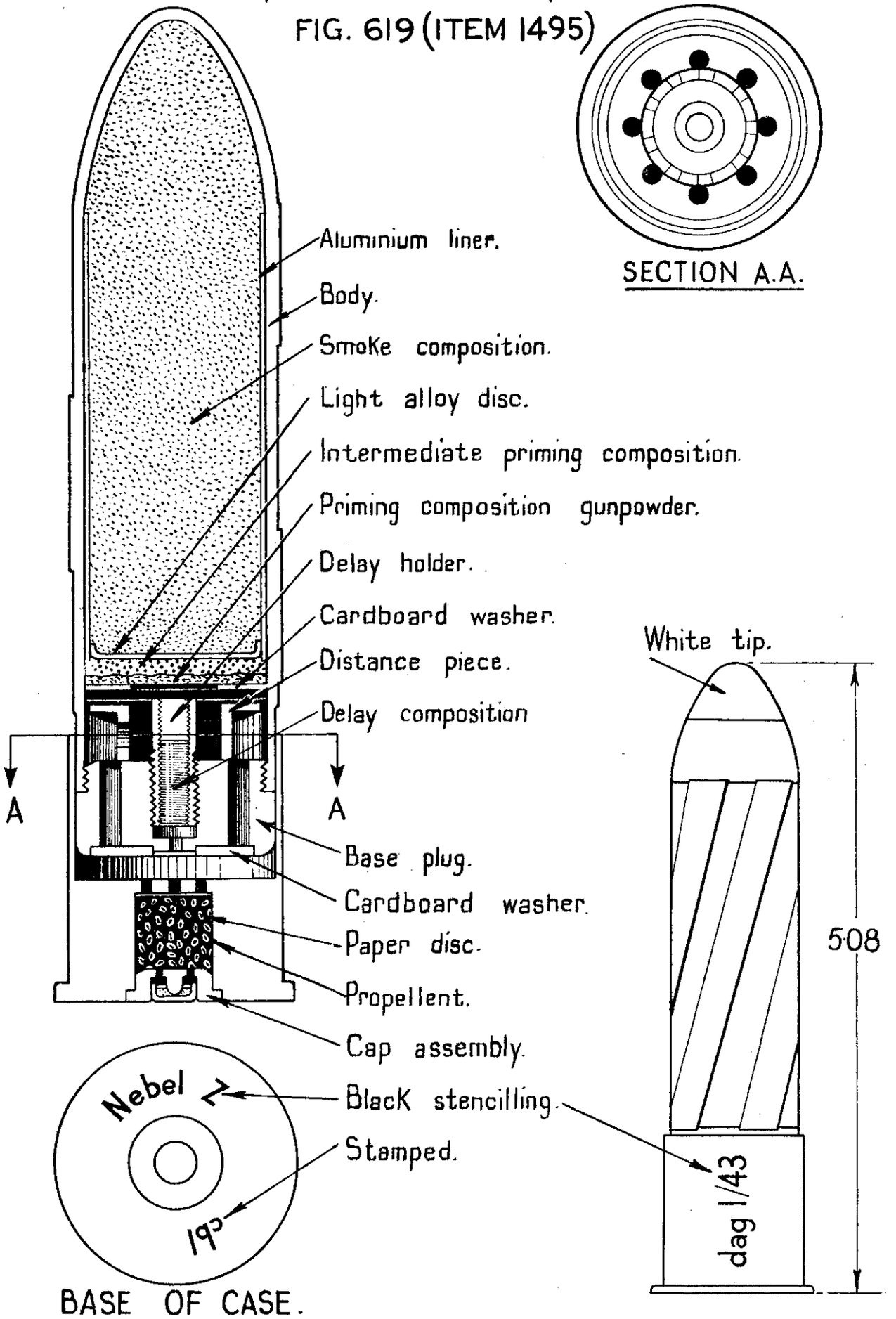
FUZE SET FOR DELAY ACTION.

GERMAN 2·7cm. RIFLED PISTOL, SMOKE CARTRIDGE.

(Nebelpatrone für Kampfpistole.)

FIG. 619 (ITEM 1495)

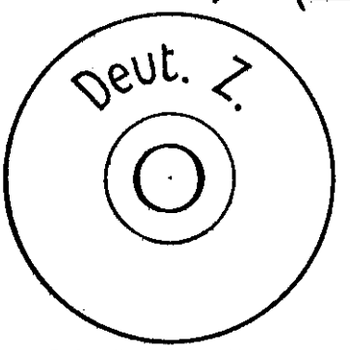
SECTION A.A.



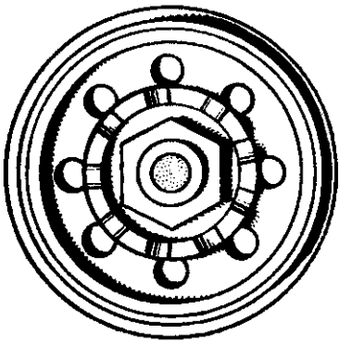
BASE OF CASE.

GERMAN 2·7cm. RIFLED PISTOL COLOURED SMOKE CARTRIDGE.

FIG.620.(ITEM 1496.) (DEUTPATRONE.)



BASE OF CASE.



SECTION AT A.A.