



Handbook

HANDBOOK
OF THE
18-PR. Q.F. GUN.
LAND SERVICE.

AMMUNITION.

Description.	Mark.	Weight of Cartridge Case with Primer.		Charge.			Shell.				Total Weight of complete Round.	Means of Firing.	
							Bursting Charge.		Weight filled and fuze.	Nature of Fuze.			
							Nature.	Weight.					Nature.
Cartridges, Q.F. 18-pr.		lb.	oz.	lb.	oz.	Mark.	R.F.G. 2, or blank F.G.	oz. drs.	lb.	oz.	T. & P. No. 80.	lb.	oz.
Shrapnel	I	2	15	1	6 $\frac{1}{2}$	I-V, VII	R.F.G. 2, or blank F.G.	2 8	18	8	T. & P. No. 80.	22	13 $\frac{1}{2}$
	III	2	15	8 $\frac{1}{2}$	VI or VIII	R.F.G. 2, or blank F.G. new.	2 8	18	8	T. & P. No. 85.	22	15 $\frac{1}{2}$	
	I	2	15	6 $\frac{1}{2}$	I	I	—	—	18	8	T. & P. No. 86/44, with percussion No. 44/80.	22	13 $\frac{1}{2}$
High plosive shell	II	2	15	6 $\frac{1}{2}$	II or III	II or III	—	—	18	8	Graze No. 100, with Gaine No. 1.	22	13 $\frac{1}{2}$
	III	—	—	—	—	II or III	—	—	—	—	T. & P. No. 80/44 with Gaine No. 1.	22	13 $\frac{1}{2}$

Percussion
(Primer, percussion Q.F. cartridges).

Perussion
No. 41/80,
Graze
No. 100,
10th Grain
No. 1,
T. & P.
No. 80/
10th Gal

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GENERAL INSTRUCTIONS FOR CARE AND PRESERVATION OF AMMUNITION.

The following points should receive special attention:—

Care must be taken not to injure the cartridge cases or fuze covers when withdrawing the rounds from the four round boxes or the vehicles.

The rounds should not be carried by the clip tapes rested on the fuze covers.

The rounds should on no account be stacked on their ends, but on their sides, and then not more than two tiers high.

In cases where fuze covers have become detached, the rounds will be returned to the Army Ordnance Department.

When necessary, the shell should be wiped over with boiled linseed oil, care being taken to avoid the fuze.

Primers, if found to be unscrewed, should be tightened up, the time pellet with detonator of the No. 80 fuze lies near the point of the fuze and is protected only by the aluminium cap, rounds should be so handled to avoid risk of the fuze being knocked.

CARTRIDGE, No. 18-PR., SHRAPNEL, MARK I

(Plate XXIV.)

The ammunition is fixed and a complete round consists of Mark I or II cartridge case with percussion primer, charge, shell, and fuze.

The case is of solid drawn brass, slightly tapered towards the mouth, and has a hole in the base screwed and recessed to take percussion primer; formerly the cases were black lacquered (previously "dulled") so as to render them as inconspicuous as possible, but this practice has now been discontinued.

The charge consists of a 1 lb. 6 $\frac{1}{4}$ oz. bundle of cordite M.D. size 8, recessed at one end to fit over the primer and the boss of the case, the other end being in contact with the base of the shell.

The No. 1 Mark II percussion primer (Plate XXV) consists of a metal body, screwed externally for a portion of its length to fit the primer hole in the cartridge case. The interior is bored and recessed to take a cap which is secured by a screwed plug; this plug has an anvil at one end, the other end being bored out to form a sealing chamber, and contains a soft copper ball to seal the escape of gas after firing and relieve the pressure on the cap.

The sealing chamber is closed by a perforated screwed plug. The body is filled with R.F.G.² powder, the mouth being closed with a brass closing disc having six radial slits.

Two small recesses are formed in the flange of the head for the primer key.

The Mark I* primer (Plate XXVI) differs from Mark II in that the head being recessed to receive a brass chamber containing a copper ball, this cap chamber forms the anvil and has three fire holes; it is connected with the gunpowder charge in the body by a channel which contains a soft copper ball in a coned seating, and which forms the sealing chamber.

The Mark III shrapnel shell has a steel body with a recess in the base to contain the tin cup for bursting charge. The head of the shell is struck with a radius of two diameters and is fitted with

2-in. brass fuze socket. A brass tube containing perforated powder pellets conveys the flash of the fuze to the bursting charge, one end of the tube being fitted into the fuze socket, the other being screwed into a steel disc placed over the tin cup.

The shell contains 375 mixed metal bullets (41 per lb.) and is fitted with a copper driving band in a groove having two waved ribs.

The shell is secured in the case by the edge of the latter being pressed into the groove of the driving band. The shells are painted lead colour to distinguish them from the Mark I.

The *Mark II shell* differs from the Mark III in having a slightly narrower driving band. The shell is secured in the case by the latter being indented in four places into a cannellure turned on the shell, the cannellure being filled with Pettman's cement.

The *Mark I shell* differs from the Mark II in the radius of the head being $1\frac{1}{2}$ diameters. The walls of the shell are thinner in the lower part, and the lid of the tin cup containing the bursting charge is also of a different shape. It contains 364 bullets.

Shell of early manufacture will take Mark I fuze covers only, but in later manufacture the fuze socket has been slightly modified, and such shell will take covers of later Marks.

Mark I shell are painted black.

Mark II shell differs from Mark III in containing about 358 mixed metal bullets.

Mark V shell differs from Mark IV in having thicker walls and in containing about 349 bullets.

The *Mark VII* shell only differs from the Mark V in the parallel portion of the driving band being $\frac{1}{16}$ -inch wider.

CARTRIDGE, Q.F., 18-PR., SHRAPNEL,† MARK III.

(Plate XVI.)

The *Mark III* cartridge consists of a Mark II case with a Mark II primer, charge of 1-lb. 8½-oz. nitro-cellulose with a 4-drs. F.G. powder igniter, cardboard distance piece, and Mark VI shrapnel shell.

The charge is contained in a calico bag having the igniter sewn to the bottom, the mouth of the bag being choked with thread.

The distance piece, which retains the charge in position over the primer, consists of 4 pieces of cardboard 3-inches by 3.0625 cut to fit in each other, thus—#

The *Mark VI* shell differs mainly from the Mark V in having a slightly different form of head to receive the "Cover, fuze, T. and P. No. 85," and in containing 327 bullets (41 per lb.) The *Mark VIII* differs from the Mark VI in the parallel portion of the band being $\frac{1}{16}$ -inch wider.

CARTRIDGES, Q.F., 18-PR., HIGH EXPLOSIVE SHELL.

The *Mark I* cartridge consists of the Marks I or II cases, charge of 1-lb. 6½-oz. cordite M.D. size S, and Marks I* or II primer (as described for the shrapnel cartridge) and Mark I High Explosive shell.

† The Mark II is an Indian pattern cartridge.

The *Mark I* High Explosive shell consists of a forged steel body with a metal fuze socket screwed internally at the bottom to receive the "Fuze, percussion, No. 44/80," while the top is screwed to the 2-inch fuze-hole gauge to take the "Fuze, T. and P. No. 80/44." The fuze socket is secured in the head of the shell by a fixing screw, and is provided with a fixing screw for the T. and P. fuze; it has a slot in the side to receive the key for inserting or removing.

The shell has a similar driving band to that described for the Mark III shrapnel shell, and is secured in the case in the same way.

The shell has parallel walls slightly tapering off towards the bottom, and a large steel plate disc is screwed into the base.

The *Marks II, III and IV* cartridges are made up similarly to the Mark I as regards case, charge and primer, but are fitted with Mark II shell with the following combinations of fuzes and gaine:—

Mark II cartridge—

"Fuze, graze, No. 100," with "Gaine, No. 1" (*see* Plate XXXIII).

Mark III cartridge—

"Fuze, T. and P. No. 80/44," and "Gaine, No. 1," and "Adapter, No. 4," having previously been screwed into the bottom of the socket in head of the shell (*see* Plate XXX).

Mark IV cartridge—

"Fuze, T. and P. No. 80/44," with "Fuze, percussion, No. 44/80," an "Adapter, No. 3," having previously been screwed into the bottom of the fuze socket (*see* Plate XXXI).

The Mark II High Explosive shell differs from the Mark I in the interior not being tapered towards the bottom; also in not having a metal fuze socket, the head of the shell body itself being screwed to the 2-inch fuze-hole for a depth of 1.2-inches. The shell is thus suitable for the two alternative methods of solid block High Explosive filling used. The shell are specially marked to denote the method of filling.

The Mark V cartridge (Plate XXVII) is made up with the case, primer, charge and distance piece as described for the Mark III shrapnel cartridge, together with the Mark II High Explosive shell.

The shell is fuzed with the "Fuze, graze, No. 100, Mark I," with "Gaine, No. 1" (Plate XXXIII).

The *Mark VI* cartridge is made up similarly to the Mark I as regards charge and primer, but is fitted with Mark I shell having a "Fuze, time and percussion, No. 80/44" and "Gaine, No. 1" (Plate XXXII), an "Adapter, gaine, Mark I" being screwed into the bottom of the fuze socket to receive the latter. (*See* Plate XXXII.)

Packages containing H.E. ammunition will be specially marked as described in § 17197, List of Changes.

ADAPTERS, 2-INCH FUZE-HOLE.

Adapter, No. 3, Mark I (Plate XXXI) is made of gunmetal screwed on the exterior to the 2-inch fuze-hole gauge. It is bored through the centre and fitted at the top with a screwed plug having a central hole, while the bottom is screwed to the G.S. fuze-hole gauge to receive the No. 44/80 fuze.

Adapter, No. 4, Mark I (Plate XXX) is made of gunmetal screwed on the exterior to the 2-inch fuze-hole gauge. It is bored through the centre and screwed to receive the "Gaine, No. 1."

ADAPTER, GAINE, MARK I.

(Plate XXXII.)

This adapter is made of gunmetal screwed on the exterior to the G.S. fuze-hole gauge and bored and screwed through the centre to receive the "Gaine,"

CARTRIDGE, Q.F., 18-PR., STAR SHELL, MARK I.

(Supplied when specially ordered only.)

The complete round consists of a cartridge case with percussion primer, charge, paper cylinder, star shell and fuze.

The No. 1 *Mark I* or II percussion primer* described on page 44 will be used with this ammunition.

The *charge* consists of 8 oz. of cordite M.D. size $4\frac{1}{4}$ in a circular bundle, recessed at one end to fit over the boss inside the case and to permit of the insertion on the percussion primer. It is held in position in the case by the perforated paper cylinder with two perforated discs at each end, an unperforated disc being also secured to the end that comes in contact with the cordite charge.

The *Mark I star shell* has a steel body recessed in the base to receive a bursting charge of $3\frac{1}{4}$ drams R.F.G.² powder contained in a shalloon bag and threaded with quick match.

The head of the shell, which is fitted with a metal G.S. fuze-hole socket, and a wood block, is attached to the body with 6 brass screws and 6 steel twisting pins.

A metal central tube, perforated with 12 fireholes, is screwed into a wrought iron diaphragm over the bursting charge and is fitted at the top into the fuze socket.

The interior of the shell, which is painted and lined with brown paper, contains 10 stars in tiers of 5. A perforated iron disc separates the tiers, and is supported by wood supports which are placed between the stars in each tier.

The faces of the disc are covered with felt washers, and a felt washer is placed between the top of the stars and the wood block in the head.

The ribs of the groove for driving band are waved.

The "Fuze, time, 15 seconds, No. 25," will be used with this shell.

The *Mark II* shell differs from the Mark I in not having an indenting groove, the mouth of the cartridge being coned into the lower part of the driving band.

The *Mark III* shell only differs from the Mark II in the parallel portion of the driving band being $\frac{1}{16}$ -inch wider.

CARTRIDGE, Q.F., BLANK, 18-PR.

The Mark II blank cartridge consists of a service case and percussion primer with a charge of 1 lb. blank L.G. powder contained in a No. 1 class silk cloth bag, having three silk braid hoops and, together with a felt disc with lifting loop, enclosed in a felt jacket.

The mouth of the cartridge is closed with a split paper ring and leather-board cup by means of the wood drift supplied for the purpose.

The Mark I blank cartridge differs from the Mark II in the bag having two hoops instead of three, and in having a shorter and narrower lifting loop.

CARTRIDGE, Q.F., BLANK, 18-PR., FILLED, 7-OZ., SMOKELESS, BLANK, MARK I.

This blank cartridge consists of a service case and percussion primer, with a charge of 7 oz. smokeless blank and about 4 oz. 5 drs. of matchwood shot. It is closed with a split paper ring and leather-board cup by means of the wood drift supplied for the purpose.

CARTRIDGE, Q.F., BLANK, 18-PR., FILLED, 8-OZ. 12-DRS. CORDITE M.D.T., SIZE 15/13, MARK I.

This blank cartridge consists of a service case and percussion primer, with a charge of 8-oz. 12-drs. cordite M.D.T, size 15/13.

The charges consist of a circular bundle of cordite, tied in three places with "silk, sewing, No. 1," and having a recess at one end to take the end of the percussion primer in the base of the cartridge.

The igniter consists of two circular shalloon discs stitched together to form a circular pocket in the centre and an outer ring, the latter being stitched across to form four pockets. The pockets are filled with 6-drs. of R.F.G.² powder, 2-drs. in the centre one and 1-dr. in each of the pockets of the ring.

The igniter is placed over the end of the charges and tied to the first tie of the bundle in four places, the centre pocket being placed at the bottom of the recess in the cordite and the outer ring over the ends of the outside sticks of cordite.

The charges are held in position in the cartridges with a millboard disc split paper ring and leatherboard cup.

The empty cases for making up blank locally are issued 20 in a "Box, cartridge cases, Q.F. 18-pr."

Instructions for making up blank and smokeless blank cartridges with charges issued for the purpose, as may be necessary from time to time, will be found on the lid of the box in which the empty cases are received.

CARTRIDGE, DUMMY, Q.F., 18-PR.

The Mark II dummy cartridge is for use in practising fuze setting. It consists of an empty service shell body secured in a service case in the usual manner and further secured by a bolt, one end of which is fitted into the primer hole of the cartridge and the other end screwed into the base of the shell.

The shell is fitted with a 2-inch fuze hole socket closed at the bottom, and is filled with a mixture of dust and lead ash.

The cartridge case contains a wood block which is recessed at one end to fit over the boss in the base. Four holes are bored in the side and three in the base of the case, for ready identification of the dummy cartridge.

CARTRIDGE, DRILL, Q.F. 18-PR., MARK III—WOOD, GUNMETAL ENDS, WITH FIXING SCREW; ALSO PRACTISING FUZE SETTING.

This cartridge is made of wood with gunmetal ends to represent the shell and cartridge. The metal ends are connected by a screwed mild steel bolt, the end screwed in the metal base of the cartridge having a recess fitted with a rubber plug for the gun striker to impinge against.

CARTRIDGE, DRILL, Q.F., 18-PR., MARK IV.—BRASS CASE WITH WOOD SHELL, GUNMETAL SOCKET, FIXING SCREW, AND DUMMY PRIMER; ALSO PRACTISING FUZE SETTING.

This cartridge consists of a wood shell with a gun metal fuze socket secured in an empty service case by two brass rivets. Four holes are bored in the side and three in the base for ready identification. A drill percussion primer, as described below for the drill cartridge case, is screwed into the hole in the base of the cartridge, and the socket in the head of the wood shell is fitted with a "Plug, fuze-hole, 2-inch, No. 1."

CARTRIDGE, Q.F., 18-PR.—CASE DRILL.

The drill case consists of an empty service case with the mouth plugged with a hard wood disc about 1-in. thick, and of a diameter to ensure a good fit in the case. Six of these cases with a drill primer are allowed to Batteries for drill purposes generally.

The drill primer consists of a body of the same external shape as a service primer, but bored out to take a hard rubber plug which is held in position by a screwed plug. It is stamped "DRILL" on the head.

FUZE, TIME AND PERCUSSION, No. 80.

(Plate XXVIII.)

The Mark IV fuze is made of aluminium, except where otherwise stated, and consists of the following principal parts:—Body with brass ring, top and bottom composition rings, two waterproofed cloth washers, cap with set screw, base plug, time and percussion arrangements, and brass cover.

The lower portion of the body is screwed to receive a holder for the percussion arrangement, and the upper portion forms a stem containing the time detonator pellet and its stirrup spring. The shoulder or flange of the body is fitted with a brass ring, to the lower part of which the fuze cover is secured. The upper part of the brass ring is graduated from 0 to 22, each graduation being divided into 10 parts; a square notch is cut for the No. 17 Mark II fixing key, and a small cross to denote safety point. A recess is turned on the underside of the brass ring to fit over the nose of the shell, and is provided with a leather washer soaked in mineral jelly.

A pin is screwed into the lower time ring to form a projection by means of which the ring is set with the No. 18 setting key. A setting mark is cut on the ring.

The upper time ring is prevented from turning by two pins.

The cap is screwed on to the body over the upper time ring and closes the fuze. It is secured in position by a set screw.

The base plug is screwed externally to fit the bottom of the body.

The holder percussion arrangement carries the needles of both the time and percussion detonator. It is bored to receive the percussion detonator pellet, ferrule, stirrup spring, and spiral spring.

All the external joints, escape holes, &c., are waterproofed.

The cover is of brass, and consists of a cap, ring, tearing off strip, and strip securing ring.

The tearing off strip, having the brass ring attached at one end, is soldered round the cap, the brass ring being placed over the nose of the cap and held in position by the securing strip. The cap is soldered to the lower edge of the brass ring on the body of the fuze.

To remove the cover from the fuze, tear off the strip securing ring, then the tearing off strip, when the cap will fall off, leaving the fuze exposed.

The fuze when set full should burn, at rest, for about 22 seconds.

To set the fuze, turn the setting mark on the lower ring opposite the graduation required by means of the key No. 18.

Action.—Time arrangement. On shock of discharge, the detonator pellet sets back on the needle, straightening the clips of the time stirrup spring, firing the detonating composition and so igniting the composition of the top ring, which in succession lights that in the lower ring, and so fires the fuze.

Percussion arrangement. On shock of discharge, the ferrule sets back over the detonator pellet, straightening the clips of the percussion stirrup spring; the whole is then set free to move forward on impact or graze, and after compressing the spiral spring, the detonator upon striking the needle ignites the composition, and so fires the magazine.

Weight of fuze 10¼ oz.

A tin cylinder to hold one fuze, if required, will be known as "Cylinder, No. 80 F"; it is painted green and has yellow labels.

Some fuzes have been issued which bear no numeral, lot number, or date of manufacture, but are only marked on the cover with the design number (16603 A). They differ from the Mark IV in the shape of the brass ring and other minor details.

The Mark III fuze differs principally from the Mark IV in not having the brass ring round the flange of the body for the purpose of fitting the cap.

The Mark II fuze differs from the Mark III in not being waterproofed in its external joints. When existing Mark II fuzes have been waterproofed, they will be known as Mark II.*

Fuzes that have been refilled will have the letter "R" placed after existing numeral.

Marks II and III fuzes are fitted with "Cover, fuze, time and percussion, No. 80, Mark II," which is of brass, and consists of the following parts:—Cap, a screwed ring with brass ring and tin band, and a washer.

The cap is shaped to fit over the fuze, and has a screw thread to engage with the thread on the screwed ring.

The brass ring is shaped to fit the nose of the shell, and is attached to the screwed ring by means of the tin band.

To remove the cover from the fuze, tear off the tin band, when the cap, together with the screwed ring, will fall off, leaving the fuze exposed.

Weight of cover 2½ oz.

The *Mark V* fuze differs from the *Mark IV* in the time rings being made of metal instead of aluminium, and in the powder channel of the body being brass lined. The same cover is used.

A number of fuzes bearing the numeral "IV A" have been issued which only differ from the *Mark IV* in having metal time rings.

FUZE, TIME AND PERCUSSION, NO. 65A, MARK I.

The fuze consists of the following parts (made of gunmetal, except when otherwise stated), viz. :—Body, time needle pellet, detonator, percussion pellet, brass spiral spring, base plug, brass safety pellet, brass ball, two composition rings, dome, brass washer, cap, two safety pins, and a leather washer.

The body is screwed at the lower end to the G.S. fuze-hole gauge, and is bored from the bottom to receive the percussion pellet and base plug. Two holes are bored beyond the recess for percussion pellet, one for the detonator plug, the other for the safety pellet.

The detonator is covered with a brass disc, and is secured by the detonator plug.

The hole bored for the detonator plug is continued above to form a small magazine filled with fine grain powder. A recess is bored in the top of the body to contain a perforated powder pellet, which communicates with the magazine by a hole bored at right angles to the axis of the fuze. The stem of the body is screwed on top to take the cap, two grooves being cut in the top end of stem to receive the feathers on the brass washer. Two brass pins are secured into the stem, which engage with slots in the upper composition ring and prevent the latter turning. A groove is cut in the top face of body, close to the stem and half-way round it, and a gas escape hole bored obliquely through the body into the groove. A small tablet of fine white paper is secured with shellac to the body of the fuze over the perforated powder pellet, and over it two washers of fine white paper and calfskin are secured with shellac, a hole being cut through the washers and tablets immediately over the powder pellet.

The percussion pellet has a needle plug screwed in the top and has a slot in the side for the safety pellet and ball to fall into when set in action. A hole is made transversely through the pellet and fitted with a brass centrifugal bolt, held in position by a brass spiral spring. The pellet contains a perforated powder pellet. A small set screw in the wall of the body fits into a slot in the percussion pellet to prevent it from turning in flight. A spiral spring of brass wire is placed between the percussion pellet and detonator plug.

The base plug contains a perforated powder pellet, secured by a brass washer spun over on top, and is closed at the bottom by a shallow disc and brass washer spun in. The plug is fixed by stabbing in three places.

The safety pellet has a slot cut in the side to clear the brass ball, and is suspended in the body by a thin copper wire passing through

it. A hole is also bored in the upper part of the pellet and body of fuze for the safety pin to pass through.

The lower composition ring is movable for setting purposes, and is milled on the exterior to give a better grip to the fingers; it is fitted with a setting pointer.

A gas escape hole is provided at the commencement of the composition; this hole is covered by a thin brass patch covered with Pettman's cement, which is blown out when the ring lights.

A perforated powder pellet is placed in a vertical hole in the top face of the ring to communicate with the upper ring.

The upper ring rests upon a calfskin washer upon the top of the lower ring, and is pinned to the stem so that it cannot turn. It is cylindrical, and is graduated from 0 to 44. It is also marked with an arrow; when this is opposite the setting pointer on the lower ring the fuze is set at safety, as the fire hole in the body is covered by solid metal and not by fuze composition. A gas escape hole is provided similarly to that in the lower ring.

On the upper side of the ring there is a small chamber containing the lighting arrangement, which consists of a gunmetal hammer having a steel needle, and suspended by a thin copper shearing wire over .35 grain of cap composition surrounded by mealed powder and covered by a thin brass disc, kept in position by a small screw collar.

The dome is made of sheet brass.

The washer is made of sheet brass with two feathers which fit into featherways cut in the top of the stem. When screwing up the cap, the washer remains stationary, thus preventing the dome from turning and altering the setting of the fuze.

The cap is made of gunmetal, hexagonal in form, and screws on the stem of the body.

The fuze is stamped "T." on the upper ring close to the time safety pin and "P." on the body close to the percussion pin. The time pin loop is scarlet.

The fuze will be set *before* the safety pins are withdrawn.

To set the time arrangement the cap is loosened with the "Key, No. 5—G.S. fuze-hole fuzes," and the ring moved round to the graduation ordered; the fuze is then clamped by screwing down the cap as tightly as possible, care being taken that the ring and dome have even bearings.

If the fuze is required to act as percussion fuze only, the "P." pin should be withdrawn and the "T." pin left in position; otherwise both pins should be withdrawn; but this should not be done till the moment of loading.

Action.—On discharge, if the "time" safety pin has been withdrawn, the hammer sets back, shearing the suspending wire and igniting the detonator and the composition in the upper time ring, which burns until it reaches the setting pointer on the lower ring; the flash then passes through a hole in the lower ring to the composition in its under service, and burns back in the opposite direction until it reaches a hole in the body in line with the triangular setting mark, where it flashes down through the radial magazine, percussion detonator to pellet and base plug into the shell.

If the "percussion" pin has been withdrawn, the safety pellet sets back, shearing the suspending wire, and the brass ball falls down

into the space over the safety pellet. The centrifugal bolt, owing to the rotation of the shell, is withdrawn, the percussion pellet is free to move forward on impact and ignite the detonator, which flashes through the percussion pellet and base plug into the shell.

At rest it burns about 20.1 seconds.

Weight 15 oz. 12 drs.

FUZE, T

MARK

(Plate XXX.)

The fuze is a double banked tension fuze of brass of similar contour to the No. 80. The time rings are secured on the stem by means of a cap and set screw. The lower time ring is graduated from 0-21.2 seconds and is read by an indicating mark on the body. The gas escape is through a hole in the upper face of the top ring into a groove on the underside of the cap, and thence through holes cut through a circumferential groove near the top of the cap.

The time lighting arrangement is generally similar to that of the No. 80 fuze, but has a split ring of round wire supporting the detonator pellet instead of a stirrup spring.

The percussion arrangement consists of a needle pellet contained in the lower portion of the body and held back from the detonator in the body by means of two small spring plungers. The needle is pivoted in the pellet in such a manner that it only projects when under the influence of centrifugal force.

For setting the fuze a projection is provided on the lower time ring which is engaged by the Key, No. 42.

For fixing the fuze a projection and two slots are formed on the body which are engaged by the Key, No. 43.

Cover, fuze, T. and P. No. 85 is made of thin brass and consists of a cap and tear-off band. The cap is cylindrical for a portion of its depth, then tapers off to a rounded point to suit the nose of the No. 85 T. and P. fuze. One edge of the tear-off band is soldered round the edge of the cap and the other is crimped into a groove round the head of the Marks VI or VIII shrapnel shell.

FUZE, TIME AND PERCUSSION, No. 80/44, MARK I.

(Plates XXX to XXXII.)

This fuze differs from the No. 80, Mark IV, in the rings being made of metal instead of aluminium, and in the powder channels of the body being brass lined. It also has a weaker creep spring for the percussion arrangement, and is provided with a stop pin in the flange of the body, gearing into a groove running almost completely round the inner edge of the lower time ring, to prevent the fuze being set at less than "2". The graduations from "0" to "2" are also omitted.

This fuze is for use in High Explosive shell, but can on an emergency be used in shrapnel shell.

FUZE, PERCUSSION, No. 44/80.

(Plate XXXI.)

The *Mark II* fuze is made of gunmetal, screwed below the head to suit the G.S. fuze-hole.

The head has a pin on each side for the purpose of receiving a key for screwing it into the shell.

The fuze has neither cap, securing pins nor safety pin.

The Mark I fuze differs from the Mark II in having a slightly different form of shutter in the interior.

FUZE, GRAZE, NO. 100, MARK I.

(Plate XXXIII.)

This fuze is made of metal and is screwed to suit the 2-inch fuze-hole.

The upper part of the body is similar in contour to the No. 80 time and percussion fuze. An adapter, which is turned and screwed on the interior to take a No. 1 gaine, is screwed into the base of the fuze.

A slot is provided in the fuze to receive a "Key, No. 16," for fixing purposes.

GAINES, NO. 1, MARK I.

(Plates XXX, XXXII and XXXIII.)

The gaine, which acts as exploder to the shell, is made of steel and consists of a hollow cylinder containing explosive. It is screwed externally at one end to suit the screwed recess of the fuze or adapter with which it is used. The screwed end of the cylinder is closed with a shellaced disc, and the opposite end with a screwed plug.

FUZE, TIME, 15 SECONDS, NO. 25.

The Mark III fuze is made of aluminium, and consists of the following principal parts, viz.:—Body, time ring, cap, safety pin, detonator pellet with detonator, stirrup spring, needle plug, magazine, bottom plug, and leather washer.

The lower portion of the body contains the magazine channel and magazine, and the upper portion forms a stem and contains the detonator pellet with detonator, and the needle plug. The shoulder of the body has a black mark to coincide with an arrow on the time ring, when set at safety.

The time ring, which is graduated from 0 to 44, is fitted round the exterior of the stem.

The cap fits over the time ring, on top of a steel spring washer and closes the head of the fuze. It is secured, when in position, by a steel keep screw.

A copper safety pin, provided with a loop of red cord, passes through the top cap and the detonator pellet.

The detonator pellet is suspended by the safety pin and a stirrup spring, which is kept in position by its two clips.

The magazine contains about 45 grains of R.F.G.² powder, and is closed by means of the bottom plug.

The openings of the fuze are waterproofed to exclude damp.

Action.—On shock of discharge, the detonator pellet sets back, thereby straightening the clips of the stirrup spring, and being driven on to the needle of the needle plug ignites the detonator, which

fires the composition of the time ring, this burning till it reaches the magazine channel, thereby igniting the powder in the magazine.

Weight 5 $\frac{3}{4}$ oz.

Mark II differs from Mark III in not being waterproofed.

The *Mark II* differs from the Mark III in the corners of the channel in the time ring being rounded off, and in the channel not being asbestos lined.

The *Mark I* differs from the Mark IV in being made entirely of brass. The graduations are on the flange of the fuze body and the setting mark on the composition ring instead of vice versa; the graduations read to the right instead of to the left.

It also has a 1:3 grain detonator instead of 1 grain.

FUZE, DRILL, TIME AND PERCUSSION, No. 80.

The drill fuzes are made of gunmetal, and resemble generally the service fuzes which they represent. They are blacked all over with the exception of the flange of the body and a space on each of the composition rings, which are left bright. The lower time ring is fitted with a steel setting pin.

To facilitate identification the drill fuzes are stamped "DRILL" on the cap.

Some burnt-out service fuzes have been converted for the purpose of drill fuzes; no more, however, will be issued.

CLIP, CARTRIDGE, Q.F. 18-PR., MARK I.

The clip is made of brass, cross-shaped so as to form four arms, the ends of which are turned in to form clips to engage with the rim of the cartridge case. One arm is painted red, and is slightly longer than the others, the clip portion being differently shaped, so as to spring over the rim of the cartridge. The other three arms are sand blasted and black lacquered. It has a canvas loop for withdrawing the cartridges from the baskets or tubes in the ammunition boxes of the limbers and wagons.

The clip protects the cap of the percussion primer, and, in the case of vehicles fitted with the brass tubes, also serves to hold the cartridge in the tube as follows:—

The cartridge (with its clip fixed) is inserted so that the red arm engages with the extended portion of the rim of the tube.

When fully inserted, the clip is given part of a turn, thus bringing the end of the red arm inside the rim of the tube, and locking the cartridge in position.

CLIP, SAFETY, FUZE, TIME AND PERCUSSION, No. 80, MARK I.

The clip is of steel, horseshoe shaped, and fits round the No. 80 time and percussion fuze, retaining it at "safety." The clip has a slot in it to fit over the setting pin, and a tongue-piece fitting into the fixing slot; the ends also have projections which fit under the edge of the body of the fuze.

‡ ADAPTER, 2-INCH FUZE-HOLE, No. 1.

The adapter is made of aluminium, and is screwed externally below the shoulder to suit the 2-inch fuze-hole gauge. It is used to adapt shrapnel shell to take the No. 65A fuze. A slot is cut in the shoulder to take the "Key, No. 16" for fixing and removing, and a steel set screw for fixing the fuze is inserted in the hole bored and screwed in the shoulder.

IMPLEMENTS, AMMUNITION.

‡ KEY, No. 5—G.S. FUZE-HOLE FUZES.

The key is made of steel and is used for inserting T. and P. fuzes in the shell, and for inserting and removing plugs. The key has an hexagonal hole in it to suit the nut in the No. 65A fuzes for adjustment purposes. A white cotton lanyard is attached to the key.

† KEY, No. 13—No. 25 FUZE.

This key is made of steel, one end being annular in shape with a rib piece to fit in the slot provided in the body of the fuze, for fixing purposes. The other end is shaped and fitted with a projection to suit the slot in the time ring for setting purposes.

‡ KEY, No. 16.

The *Mark I* key is made of steel and is shaped at one end and provided with a projection to suit the slot in the "Adapter, 2-inch fuze hole, No. 1" for inserting and removing the latter. It is provided with a white cotton lanyard.

The *Mark II* key differs from the *Mark I* in not having the two horns on each side of the projection.

KEY, No. 17, FIXING NOS. 80 AND 83 FUZES.

The *Mark II* key is made of steel, one end being shaped to fit over the fuze; the lower edge of the ring portion is bevelled to suit all Marks of No. 80 fuzes without covers, and is provided with a projection to fit the square notch in the flange of the fuze body. The upper edge of the ring is provided with a slot to fit over the projection on the cover when screwing in No. 80 fuzes with cover.

The *Mark I* key differs from the *Mark II* in the upper edge not being prepared for use with fuzes with cover.

KEY, No. 18, SETTING NOS. 80 AND 83 FUZES.

The *Mark I* key is for use when the lower time ring is too stiff to set by hand. It is made of steel, and formed to engage with the pin projection of the lower time ring. It is provided with a loop of white line, 30 inches in length.

The *Mark II* key differs from the *Mark I* in the ring portion being of greater depth, thereby taking a better seating on the fuze.

Total length of key 6·17 inches.

‡ Issued when using No 65A fuzes.

† " " " " 25 "

KEY, NO. 27, PRIMER 13 AND 18 PR.

This key is for use in inserting or removing the percussion primer in the cartridge. It is made of steel, and formed to engage with the two recesses in the head of the primer. It is also fitted with a white line lanyard.

Total length of key	13.1 inches.
" lanyard	43 "

KEY, NO. 42, MARK I—SETTING NO. 85 FUZE.

This key, which is made of steel, is conical in shape with a T-shaped handle at the top and has the interior bored out to suit the contour of the No. 85 fuze. A projection with slot is provided on the rim at the bottom to engage with a projection on the lower time ring of the fuze for setting purposes. The key is provided with a white cotton lanyard, 43 inches long.

KEY, NO. 43, MARK I—FIXING NO. 85 FUZE.

This is made of steel. It has an annular shaped end with a slot and two horns, the inner edges of the latter being parallel with the length of the key.

For fixing purposes the inner edges of the horns are inserted into the grooves cut in the flange of the No. 85 fuze and the slot engages with a projection.

KEY, REMOVING JAMMED CARTRIDGE CASES.

This key is for use in removing cartridge cases which have jammed after firing. It consists of a steel rod, one end of which is formed into a key to fit the key-holes in the primer, and the other end has screwed and riveted to it a metal plug of the same dimensions as the percussion primer, the bush being screw threaded to fit the primer hole in the cartridge case. A cross handle is formed about the centre of the rod for hauling purposes.

SPECIAL MARKING ON AMMUNITION AND PACKAGES.

High Explosive—

- (1) Shell specially marked to denote the filling.
- (2) Base of cartridge painted yellow.
- (3) Words "High Explosive" on top of the boxes.
- (4) Words "High Explosive" stencilled in black under the cleats on each end of the boxes.
- (5) "T. and P." in large black letters on right of cleat on boxes containing ammunition with T. and P. No. 80/44 fuzes in conjunction either with a percussion No. 44/80 or a No. 1 gainc.
- (6) "P." in similar type to the "T. and P." in (5) on right of cleat on boxes containing ammunition with fuzes acting on percussion or graze only.

Star—

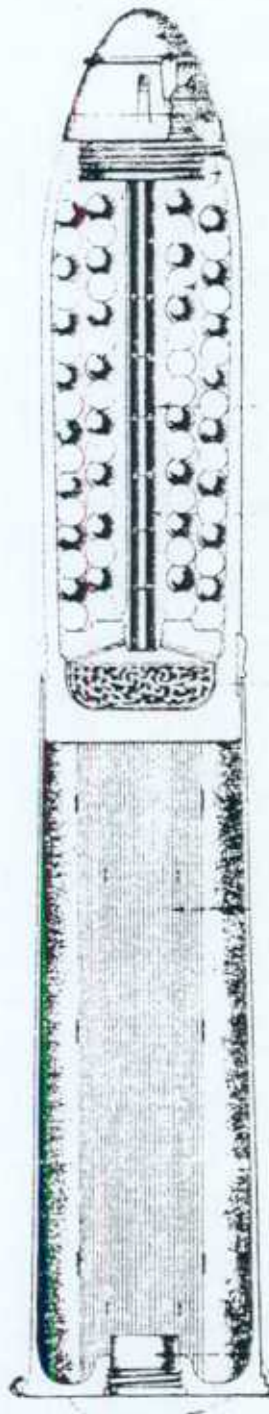
A black star on each end of the boxes.

CARTRIDGE, Q.F. 18 PR SHRAPNEL, MARK I.

SCALE - '3



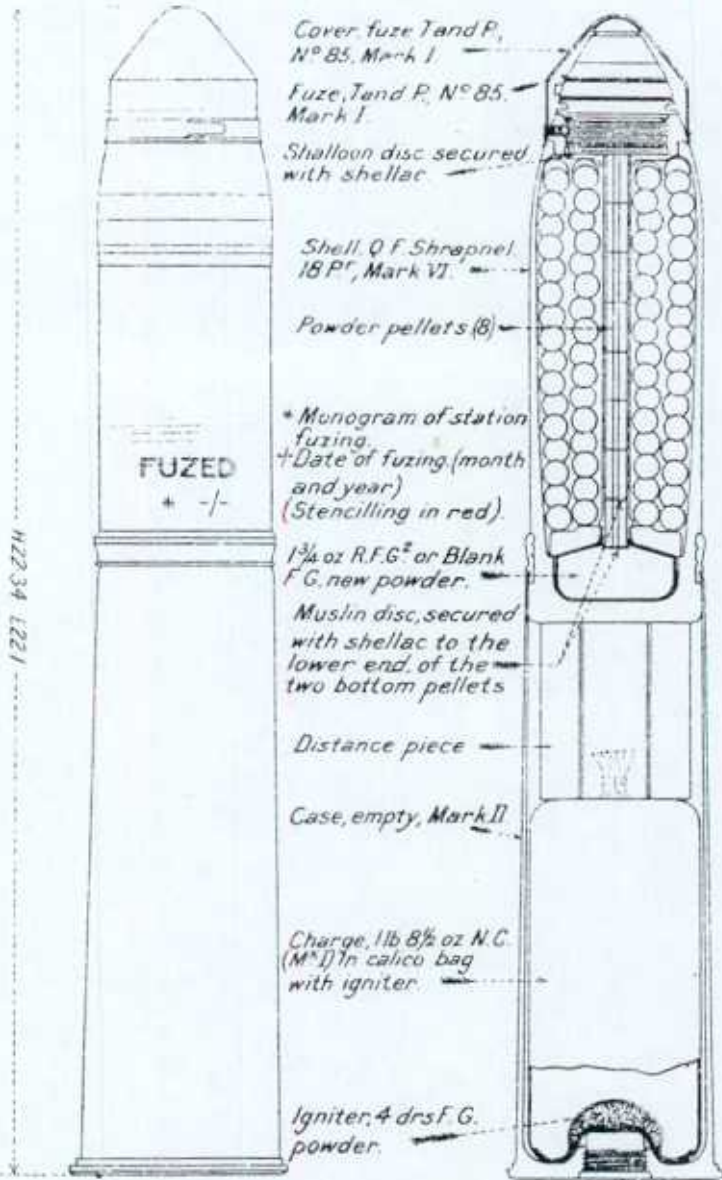
REAR VIEW OF COVER



- COVER.
- FUZE, TAP. N° 80. M° IV.
- SOCKET.
- BALLS.
- TUBE.
- POWDER PELLETS.
- POWDER.
- CORDITE.
- PRIMER.

22-465

CARTRIDGE, Q. F. 18 P^r, SHRAPNEL, MARK III.



Cover fuze Tand P, N^o 85, Mark I.

Fuze, Tand P, N^o 85, Mark I.

Shallow disc secured with shellac

Shell, Q.F. Shrapnel, 18 P^r, Mark VI.

Powder pellets (8)

* Monogram of station fuzing
+ Date of fuzing (month and year)
(Stencilling in red)

1 3/4 oz R.F.G.² or Blank F.G. new powder.

Muslin disc, secured with shellac to the lower end of the two bottom pellets

Distance piece

Case, empty, Mark II

Charge, 1 lb 8 1/2 oz N.C. (M^o I) in calico bag with igniter.

Igniter, 4 drs F.G. powder.

Primer, percussion, Q.F. Cartridges, N^o 1, Mark II.

To be stencilled in red

- * Distinguishing letter of explosive manufacturer
- + Lot number of explosive
- A.C. When explosive of an adjusted lot is used.
- * Date of filling cartridge (day, month & year)
- @ Monogram of station filling.

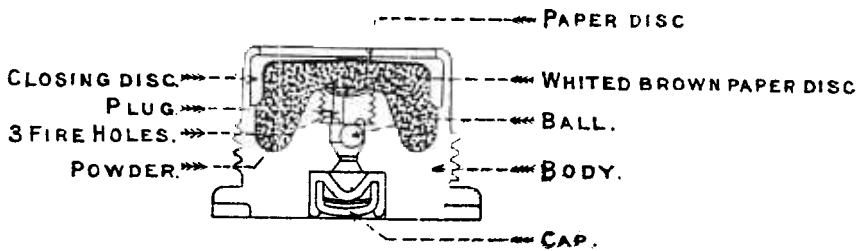


N2234 1221

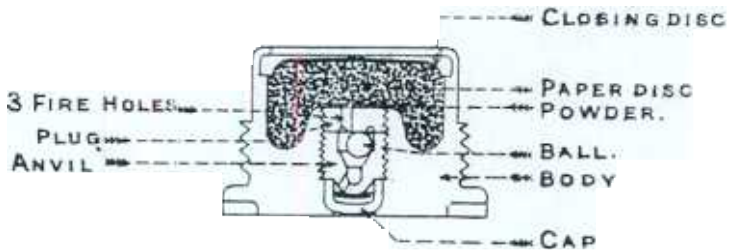
PRIMER, PERCUSSION, Q.F. CARTRIDGES, N^o 1.

SCALE = $\frac{1}{1}$.

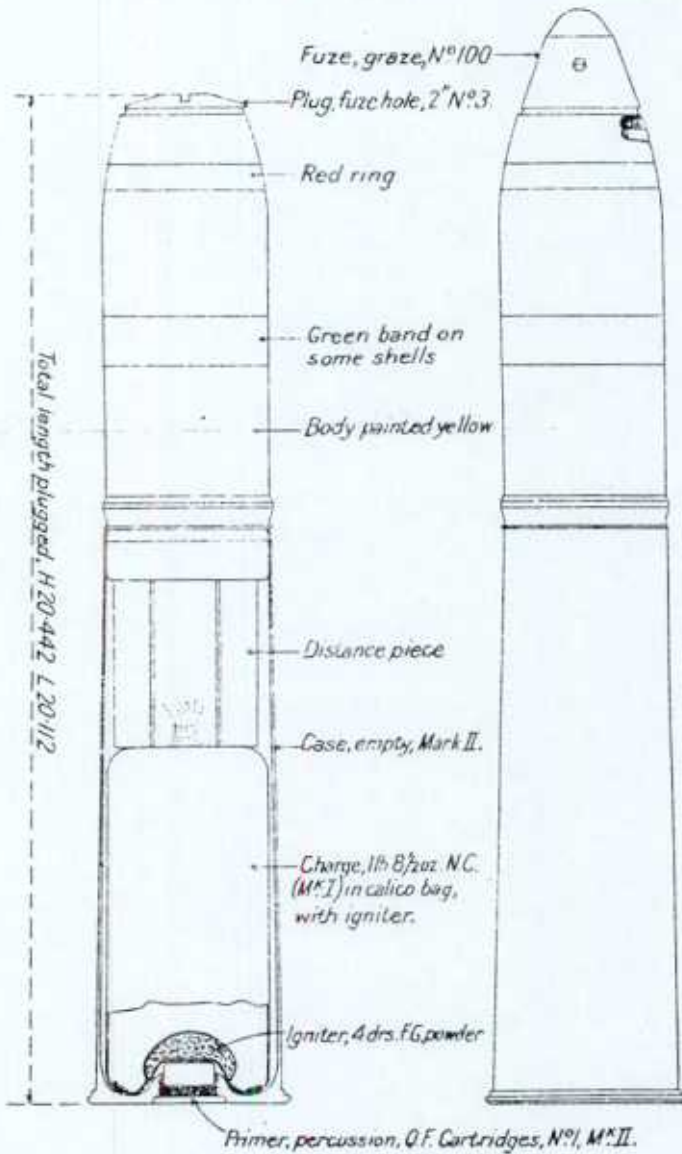
MARK I.*



MARK II.



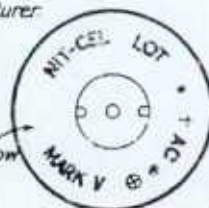
CARTRIDGE, Q.F. 18 Pⁿ. N.C. HIGH EXPLOSIVE SHELL, MARK V.



To be stencilled in Red:-

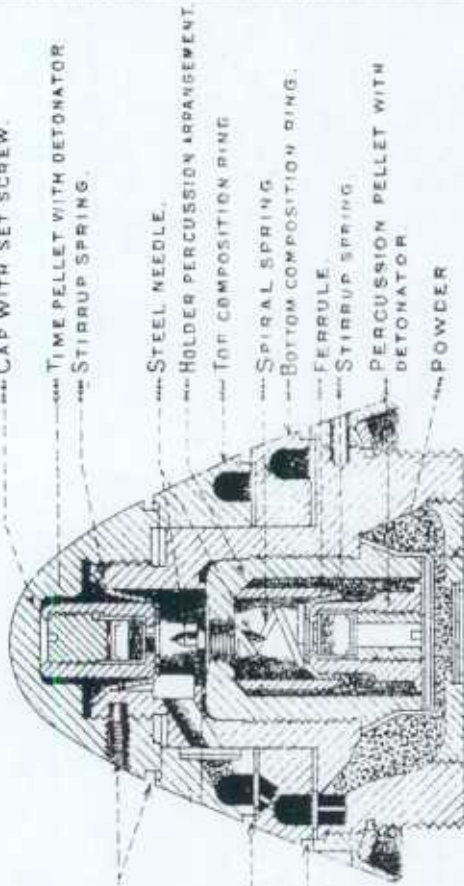
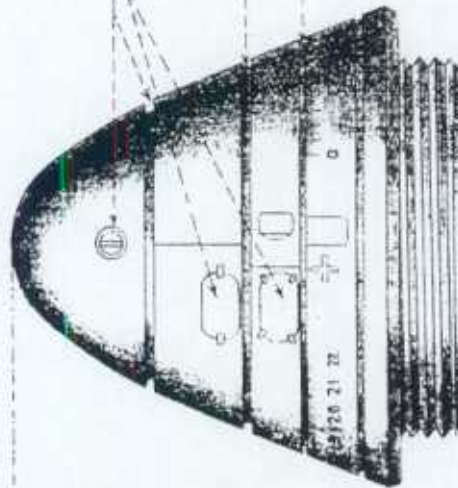
- * Distinguishing letter of explosive manufacturer
- + Lot number of explosive.
- A.C. When explosive of an adjusted lot is used
- † Date of filling cartridge (day, month & year)
- ⊕ Monogram of station filling

Base of case to be painted yellow



FUZE, TIME AND PERCUSSION, N°80, MARK IV.

SCALE $\frac{1}{4}$.



--- CAP WITH SET SCREW.

--- TIME PELLET WITH DETONATOR
--- STIRRUP SPRING.

--- STEEL NEEDLE.

--- HOLDER PERCUSSION ARRANGEMENT.

--- TOP COMPOSITION RING

--- SPIRAL SPRING

--- BOTTOM COMPOSITION RING.

--- FERRULE.

--- STIRRUP SPRING

--- PERCUSSION PELLET WITH
--- DETONATOR.

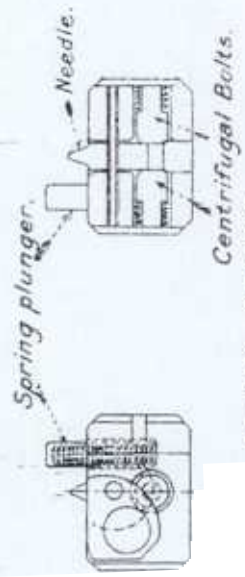
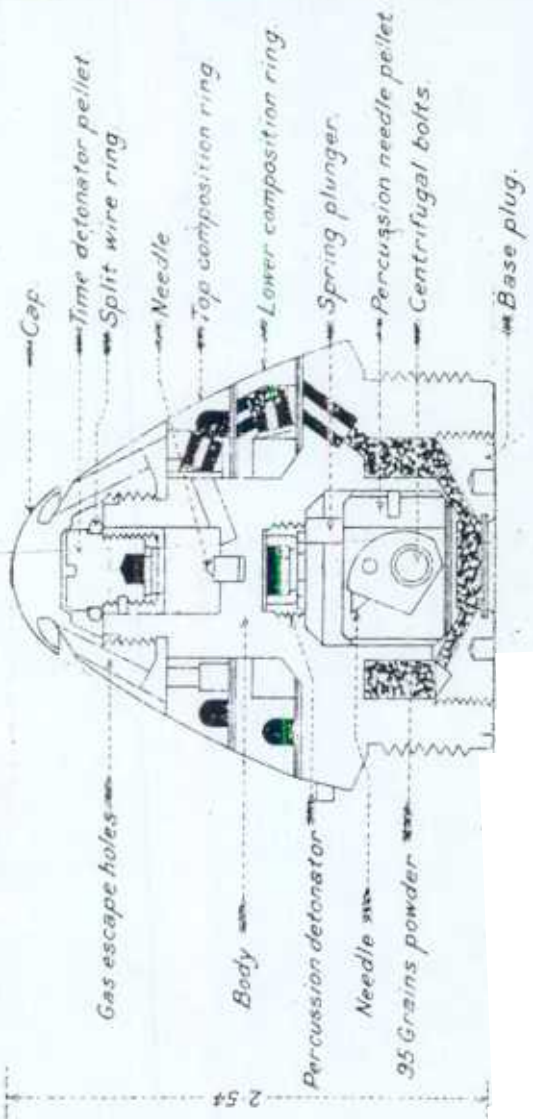
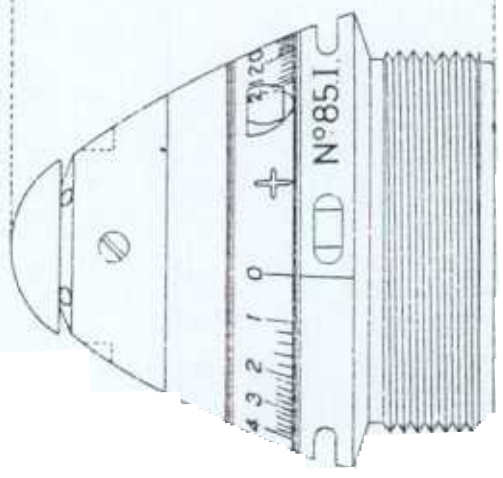
--- POWDER

--- BASE PLUG

FILLED WITH WATERPROOF
COMPOSITION.

FUZE, TIME AND PERCUSSION, N° 85, MARK I

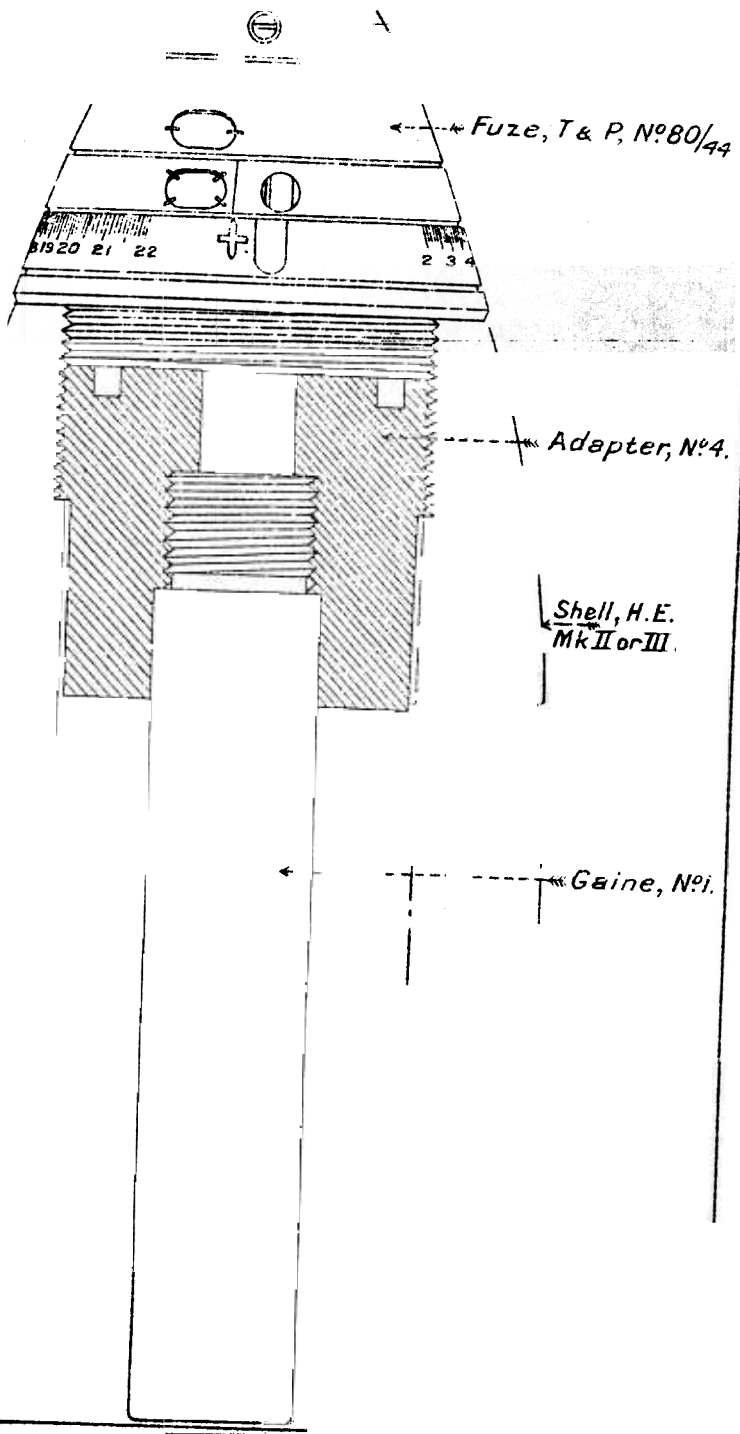
SCALE 1/1



AFTER ARMING

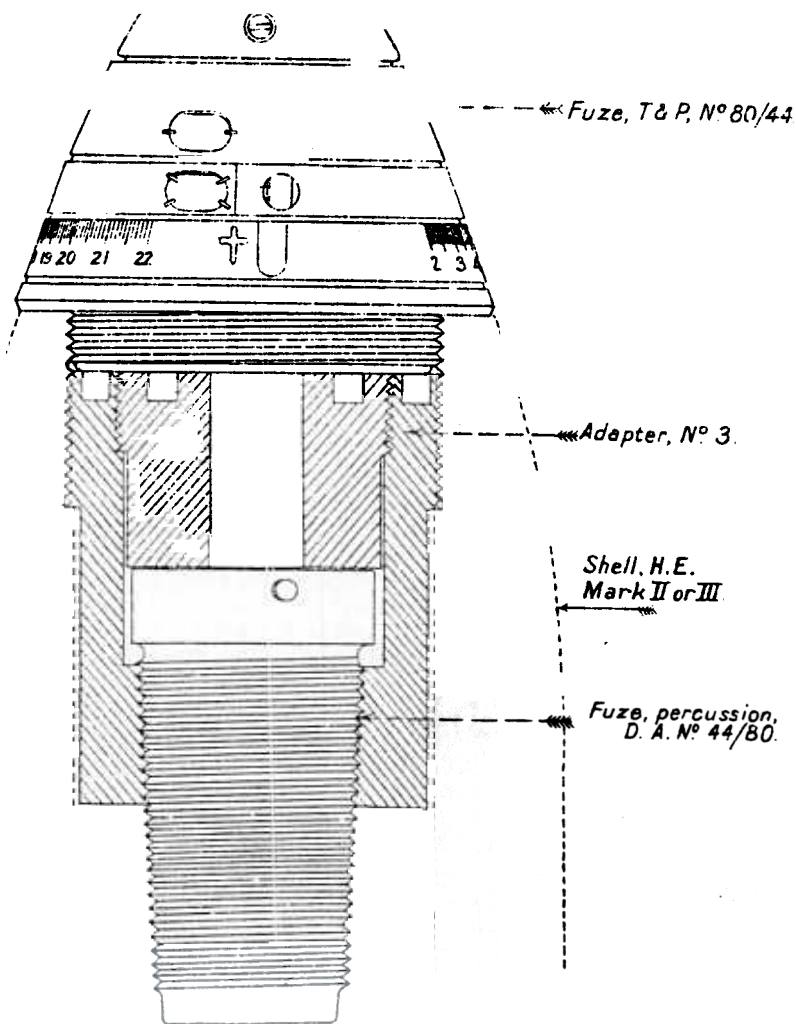
FUZE, T & P, N° 80/44 WITH GAINE N° I.

SCALE: 1/1.



FUZE, T & P, N° 80/44 WITH
FUZE, PERCUSSION, N° 44/80.

SCALE = 1/1.



FUZE, T & P, N° 80/44 WITH GAINÉ, N° I.

SCALE = 1/1

