

[Issued with Army Orders for July, 1920.]

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HANDBOOK
OF THE
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Marks I, II and III.

(LAND SERVICE.)

1920.



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HANDBOOK
OF THE
M.L. 6-IN. TRENCH MORTARS,
Marks I, II and III.
(LAND SERVICE.)

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This book has been corrected up to June, 1920. Any alterations which may be suggested should be forwarded direct to the Chief Inspector of Armaments, Inspection Department, Royal Arsenal, Woolwich.

HANDBOOK

OF THE

M.L. 6-INCH TRENCH MORTARS.

MARKS I, II and III.

1920.

PARTICULARS.

| | | | | |
|---------------------|--------|-----------------------|----------------------|---|
| Material ... | ... .. | ... .. | ... .. | Steel. |
| Length over all ... | ... .. | ... .. | ... .. | 57-inches. |
| Bore | { | Length from muzzle to | front end of striker | |
| | | stud | ... .. | 53.935-inches. |
| | | Diameter | ... .. | 6-inches. |
| Weight ... | ... .. | ... .. | ... .. | 1-cwt. 1-qr. 24-lbs. |
| Means of firing ... | ... .. | ... .. | ... .. | Primer, Percussion, or (for miss- fires) Igniter, Emergency. |

M.L. 6-INCH TRENCH MORTAR, MARK I.

(Plate I.)

The *Mark I* mortar consists of a steel barrel with striker stud, guide stud, adapter and stop and missfire plug with cap.

The barrel is of steel, made in one piece, formed solid at the breech end and slightly tapered on the exterior towards the muzzle, terminating with a muzzle swell. The interior of the barrel is prepared for the reception of a striker stud which is screwed in a central position through the breech end from the interior, the striker stud being prepared with a shoulder and hexagonal flats and furnished with a copper washer to ensure a gas-tight joint. The breech end of the barrel is rounded on the exterior to suit the base block socket of the mortar bed and is furnished on the underside with a steel guide stud which is screwed into the barrel from the exterior, the outer end of the stud engaging a guide cam groove in the base block of the bed when the mortar is mounted. A tommy hole is prepared through the outer end of the guide stud to facilitate assembly and removal of the stud.

A steel adapter, prepared for the reception of the stop and missfire plug and plated or coppered to prevent rusting, is screwed into the breech end on the upper side, the axis of the adapter being arranged at an angle of 34 degrees with the axis of the bore. The adapter is furnished with a fire channel and provided with a steel spring washer to prevent turning when in position. The stop and missfire plug is of steel and consists of a loop furnished at opposite sides with two threaded portions, one of which is solid and forms the stop plug

and the other prepared with a fire channel for the reception of the safety fuze of the emergency igniter. A steel cap with chain and "S" hooks is provided on the plug for the protection of the outer threaded portion.

Loops are formed on the exterior of the barrel on the upper and lower right and left sides, respectively, for the attachment of the hooks of the elevating and traversing guys.

A collar is formed round the exterior of the barrel for the reception of the clinometer and a deflection scale admitting traverse of 50 degrees right and left, graduated in degrees and marked with figures indicating intervals of 10 degrees, is engraved on the upper side. The letters "R" and "L" are engraved at the right and left extremities, respectively, of the scale, to indicate the direction of traverse for deflection.

Longitudinal axis lines (filled in black) are cut on the upper and lower sides of the barrel extending over the muzzle swell, for use in laying.

M.L. 6-INCH TRENCH MORTAR, MARK II.

The *Mark II* mortar differs from the *Mark I* in the following particulars:—

No adapter for stop and missfire plug is provided, and the axis of the screwed socket for the plug is arranged at an angle of 32 degrees with the axis of the bore.

The exterior of the barrel is prepared with a stop collar and seating for a steel supporting collar furnished with three shackles each with hinge bolt with nut and keep pin in place of the loops for the attachment of the elevating and traversing guys of the bed. The supporting collar is retained in position on the barrel seating by three set screws.

A certain number of *Mark I* mortars have been converted to *Mark II* pattern which differ from the above, principally, in the supporting collar being retained in position by three projections formed on the exterior of the barrel and secured by a set screw and a securing bolt.

M.L. 6-INCH TRENCH MORTAR, MARK III.

A certain number of M.L. 6-inch Trench Mortars of alternative manufacture have been made which differ from *Mark II* only in having the breech end screwed on instead of being made in one piece with the barrel. Such mortars are described as *Mark III* and so stamped.

BED, M.L. 6-INCH TRENCH MORTAR.

(*Plates II and III.*)

The *Mark II* bed consists of a cast steel base block and a wood platform built up of two layers of hard wood to which the base block is secured by bolts and a boss on the underside of the base block. The base block is prepared on the upper side with a socket for the reception of the rounded end of the barrel and with a guide

cam groove which engages the guide stud on the breech end of the barrel when in position. One elevating and two traversing guys fitted with Warwicks are arranged on the rear end, left and right upper sides respectively of the bed and are secured at the lower end to eyebolts provided for the purpose. The free ends of the guys are attached to the loops on the barrel when the latter is mounted in position on the bed.

A brass strip is countersunk and screwed in position in the centre of the top of the bed. This forms a zero line for use with the lines scribed on the muzzle face of the mortar.

For purposes of transport hooks are provided on the bed, to which the free ends of the guys are engaged when the barrel has been dismantled. Four wire handles fitted with steel hand grips are provided on the upper side of the bed to facilitate transport.

GUYS, ELEVATING AND TRAVERSING.

The *Mark IV* elevating and traversing guys which are of steel consist principally of a hook, Warwick, upper screw and a shackle with pin. The elevating guy is, in addition, provided with a link as a lengthening piece.

The upper end of the guy is formed with a hook to engage with a loop on the barrel when the mortar is in position, spring washers being fitted under the securing nut of the hook to absorb the shock of recoil.

The lower end is provided with a shackle and pin for attachment to the eyebolts on the bed.

The body of the Warwick is tubular, one end being prepared for the reception of the hook and the other end being threaded for the upper screw which latter is threaded at one end for the screwed stem of the shackle, the other end being provided with a stop cap.

For purposes of manipulation, capstan handles are provided on the traversing guys and a handwheel on the elevating guys.

The *Mark III* guys differ from the *Mark IV* in the shackle being made solid instead of being in two parts and the upper screws are fitted with stop plugs in lieu of stop caps.

The *Mark II* guys differ from the *Mark III* in the upper screws being provided with an external thread only, the hooks are not keyed with the upper end of the Warwicks, thus the Warwicks rotate instead of the upper screws and the spring washers for absorbing the shock of recoil are fitted under the nuts of the shackles instead of under the securing nut of the hooks.

PLATFORM, GROUND,

M.L. 6-INCH TRENCH MORTAR, MARK I.

(Plates II, III and IV.)

The ground platform is for use with the *Mark II* bed and consists of four upper and four lower planks and a rectangular frame of angle iron. The planks are of hardwood, the upper planks cross the lower planks, with which they interlock by means of wood pads attached by screws to the underside of the former and to the top side of the latter. The frame is of $2\frac{1}{2}$ -inch \times $3\frac{1}{2}$ -inch angle iron, braced

at each corner by a tie bolt which also retains the bed in position on the ground platform when assembled for use. The base flange of the frame is provided with 12 holes for securing bolts, which engage socketed nuts fitted in the lower planks.

To enable the planks to be quickly assembled in their correct position, the bottom planks are marked "A," and numbered consecutively from 1 to 4 from right to left and the top planks are marked "B," and numbered 5 to 8, from front to rear. To look from the muzzle towards the breech determines the left and right hand; the front is the muzzle and the rear is the breech end.

CLINOMETER, M.L. 6-INCH TRENCH MORTAR.

(Plate VI.)

The *Mark I* clinometer consists of a bronze body furnished with a hinged carrier which carries longitudinal and transverse spirit levels, a clamping bolt with wing nut and a steel band with nut and clamping screw for attachment to the mortar.

The upper surface of the body forms a segment of a circle and is engraved with a degree scale for elevation, graduated from 40 to 80 degrees and stamped in intervals of 5 degrees. The carrier is hinged to the body by a bolt at the lower end and is furnished with a clamping bolt and wing nut for adjustment. The clamping bolt works in a corresponding groove in the body so as to limit the travel of the carrier. A brass reader shaped to suit the segmental form of the body is provided in the upper end of the carrier for use with the degree scale on the body. An index pointer is formed on the upper side of the body for use with the direction scale on the barrel of the mortar. The spirit levels are protected by means of a cap which is hinged to the spirit level cover.

In future the bubble spirit glasses will be painted on the underside with radium compound to make them self-luminous for use at night. The upper surface will also be marked with two thick black lines, outside the ordinary graduations. When used by day the bubbles are levelled in the ordinary way. At night the air bubbles are brought midway between the two black lines.

Clinometers fitted with radium-treated bubbles will be marked with a red "R," in order to distinguish them from those that are not.

The *Mark II* clinometer is generally similar to the *Mark I*, from which it differs principally in the method adopted for reading the degree scale, in that the reader forms part of the bubble carrier and the scale is read by an arrow head instead of a metal reader.

NOTE.—When not in use the clinometer is carried in a "Bag, clinometer, M.L. 6-inch Trench Mortar, Mark I."

METHOD OF USING THE CLINOMETER.

The clinometer is placed around the mortar and secured upon the seating on the barrel by means of the clamping screw, so that the index pointer on the clinometer bracket coincides with the zero mark of the direction scale on the barrel.

To lay for elevation.—Release the wing nut of the clinometer frame and set the reader on the frame to the elevation required, as shown on the elevation scale. Then manipulate the elevating guy of the bed until the bubble of the longitudinal level is in the centre of its run.

To lay for direction.—Release the clamping screw in the band and turn the clinometer on the barrel until the index point on the upper end of the clinometer bracket coincides with the direction required, as shown below and tighten the clamping screw. Then manipulate the traversing guys until the bubble of the transverse spirit level is in the centre of its run.

EXAMPLE:—

Order.—“Two degrees right.”

Execution.—Unclamp clinometer, rotate it two degrees towards the word *right* on the barrel and reclamp.

The mortar, when relaid, will now shoot two degrees more right.

NOTE.—All guys must be tightened up before firing,

METHOD OF LAYING THE MORTAR BED.

To lay the bed.—The bed is laid down upon a levelled surface of earth, which may be arranged as shown on the accompanying diagrams.

Fig. 1.—When this method of laying the bed is employed, six pickets must be used, two being driven into the earth at the rear of the bed and two on either side. The rear pickets must be supported by a solid backing as shown in the diagram, so as to prevent any movement of the bed to the rear when the mortar is fired.

FIG. 1.

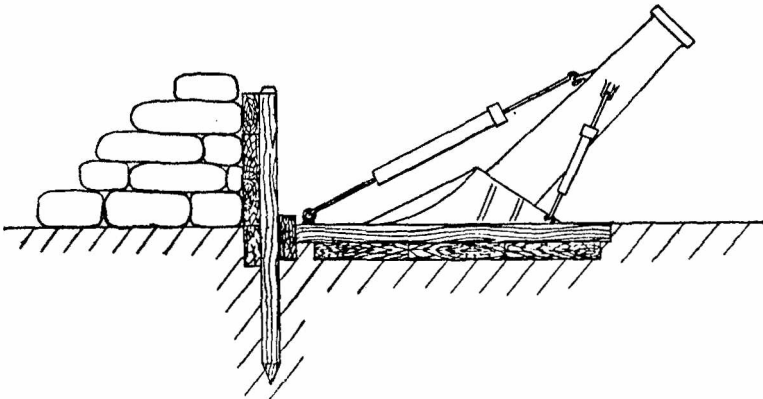
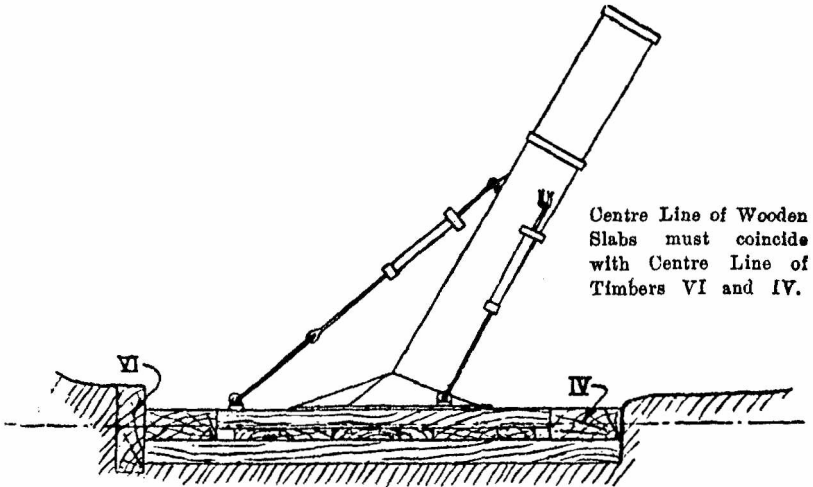


Fig. 2.—In this method of laying, a sub-platform of deals bolted together is shown forming a recess in which the mortar bed is laid. Behind the sub-platform is inserted a piece of wood (9-inch or

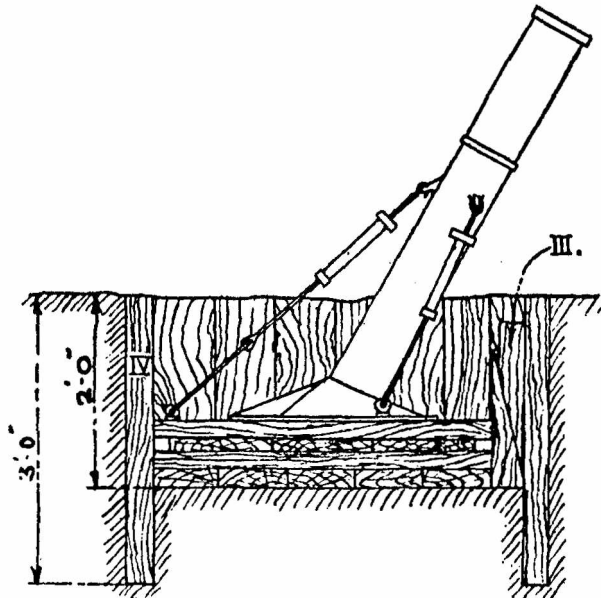
FIG. 2.



11-inch by 3-inch deal) (marked VI) at least 5 feet long, so as to increase the area for the backward thrust of the platform.

Fig. 3.—In this method of laying, the mortar platform is well supported all round, the recess being lined with 3-foot lengths of 3-inch deals (marked IV). A double sub-platform of 3-inch deals is

FIG. 3.

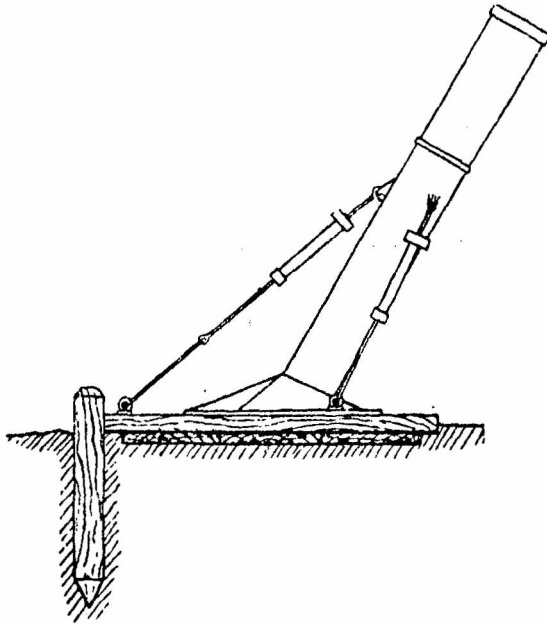


laid in the bottom of the recess, the lower lengths of deals being placed transversely and the upper layer in alignment with the direction of recoil. The mortar bed is laid on the sub-platform and secured by two sets of wedges (marked III) at the front end of the platform. When this method is employed, arrangements must be made for draining the pit.

In each of the above methods of laying the bed, the mortar bed will be further secured by sandbag weighting, as many filled sandbags as it is practical to place on the bed being used, but care must be taken that the sandbag weighting is kept clear of the elevating and traversing guys, so as not to impede the working of the mortar.

In either of the above methods of laying the mortar bed, extreme

FIG. 4.



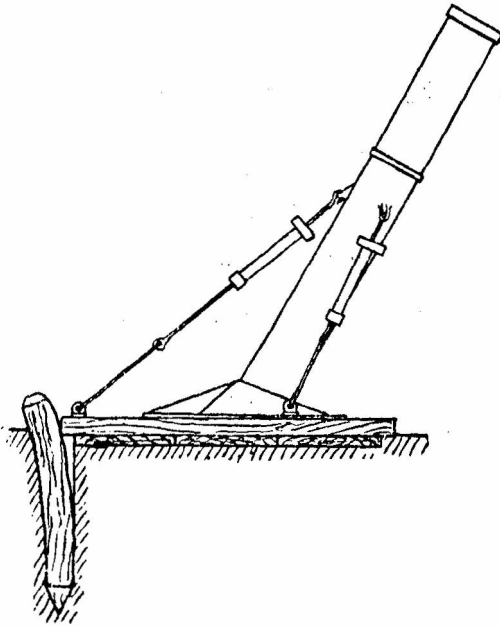
care must be taken that a solid backing is provided for the mortar platform, but more particularly so when Fig. 1 is employed, as, especially on sandy soil and when long pickets are used, considerable effects due to springiness of the pickets are likely to occur with consequent irregular shooting of the mortar.

For ranges over 500 yards, there must be a sub-base arrangement of timber, consisting of at least two thicknesses of 3-inch timber (6 inches in all), otherwise unsteady flight of the bomb is certain.

Figures 4, 5 and 6 show the action of the mortar and bed when not solidly supported.

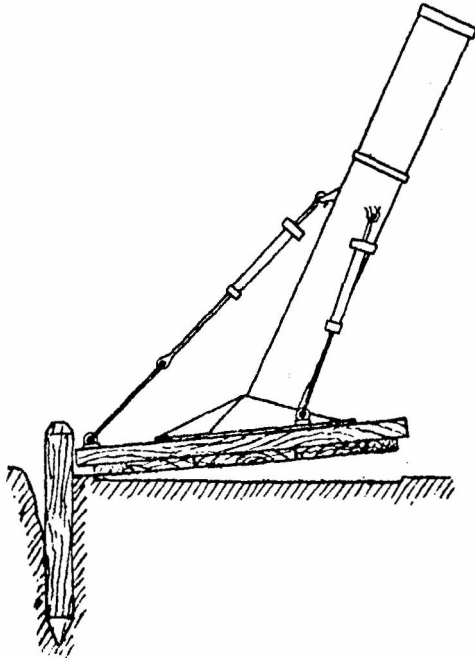
The above figure (4) shows the mortar ready for firing. Figure 5 shows the effects of recoil of the mortar and bed against

FIG. 5.



springy pickets during firing. Figure 6 shows the disarrangement of the mortar and bed as the springy picket returns to its original position after firing.

FIG. 6.



TO ASSEMBLE THE MORTAR ON THE BED.

Place the rounded end of the barrel in the socket of the base block with the muzzle end inclined slightly out of the vertical plane towards the rear and partially revolve the barrel in the socket until the guide stud in the barrel is opposite the guide cam groove in the base block. Then depress the muzzle and engage the elevating and one of the traversing guys, the other traversing guy will then be engaged and the guys screwed up.

TO DISMANTLE THE EQUIPMENT.

Lengthen the right-hand guy by revolving the Warwick until the hook can be disengaged from the loop on the barrel, disengage the guy from the barrel and ease the muzzle of the latter over sufficiently to admit of the other two guys being disengaged. Remove the barrel and engage the free ends of the guys with the hooks for their reception on the bed and screw up so as to retain them in position on the bed for transporting purposes. The free ends of the guys should also be lashed to the hooks, as they are liable to unscrew and unhook during transit. The gas ejector, with brush attached, is placed in the barrel and retained by the muzzle cap at the handle end. The mortar and bed are now ready for transport.

CARE AND PRESERVATION.

The barrel must always be kept clean and free from rust and debris and the bore slightly greased. If the mortar is not to be used for some time, the interior of the barrel should be cleaned and oiled with paraffin or mineral oil. Thick lubricating oil should not be used for this purpose, as it chars and tends to clog the barrel.

The gas ejector should be kept in place in the barrel when the mortar is not being used.

The striker stud should be examined from time to time and if found to be worn so as to be likely to cause missfires it should be replaced, care being taken that the new striker stud is tightly screwed home on replacement.

The guide stud should occasionally be examined to see that it has not shaken loose by vibration due to firing.

The guide cam groove in the base block of the bed should be kept free from earth or the guide stud will break off.

The use of the gas ejector is essential after each round, especially when charges for long ranges are used when hot gases are left in the barrel. When the ejector is inserted into and pushed smartly down the bore to the lower end of the barrel, the hot gases pass up through the tube handle and escape through the valve inside the handle. In withdrawing the ejector the cold air which has followed the head down the bore passes through the slight clearance between the head and bore and replaces the hot gases which have been passed out through the tube handle.

Should it be considered necessary to cool the barrel during long periods of rapid fire, sandbags may be wrapped round the barrel and kept constantly wet. By this means it is possible to maintain continuous fire with the mortar.

MISSFIRES.

In the event of a missfire, pause for half-a-minute, then the stop and missfire plug will be unscrewed and removed from the exterior of the breech end of the barrel; the cap is then removed from the plug, the plug reversed and screwed into the adapter. In the case of mortars fitted with separate missfire and stop plugs, the stop plug will be unscrewed and removed and the missfire plug screwed into the adapter in its place. An "Igniter, Emergency," as supplied, will be inserted through the hole in the plug and arranged so that at least 1-inch of the safety fuze is left projecting from the exterior of the plug. This will allow of sufficient time in lighting and burning for the firer to take cover. A cigarette lighter or matches are suitable for lighting the fuze end.

TABLE OF WEIGHTS.

| | Cwt. | qrs. | lbs. |
|---|------|------|------------------|
| Mortar | 1 | 1 | 24 |
| Bed, M.L. 6-inch, Mark II | 3 | 3 | 19 |
| Box, packing guys, { empty | — | 1 | 0 |
| { filled | — | 3 | 4 |
| Box, spare parts (1 per battery) { empty | — | 1 | 13 |
| { filled | — | 2 | 22 |
| Box, tools (1 per mortar) { empty | — | — | 19 |
| { filled | — | 1 | 4 |
| Clinometer, M.L. 6-inch T.M., Mark I | — | — | 2 |
| Ejector, gas, Mark IV (with brush) | — | — | 14 $\frac{3}{4}$ |
| Ejector, gas, Mark IV (without brush) | — | — | 8 $\frac{1}{4}$ |
| Platform, ground | 6 | 2 | 0 |

SPECIAL POINTS OF IMPORTANCE.

Keep the mortar and bombs clean and free from oil; oil means smoke, dirt means missfires.

See that the elevating and traversing screws of the guys are always tight. A slack guy leads to inaccurate shooting and the stresses on firing are not equally distributed; this is usually the cause of the guys breaking.

Caution.—Under no circumstances should anyone be allowed to pass in front of or near the muzzle of the mortar, as there is an appreciable amount of gas blast at the muzzle, especially when the longer range charges are being employed. When heated after continuous firing there is a possibility, should a missfire occur and the bomb with its charge remain for some time in the bore, of the propelling charge igniting, but if the above precautions are taken there will be no liability of accident. Should the interior of the barrel become "sticky" and missfires occur repeatedly, the surfaces should be cleaned with paraffin or petrol.

AMMUNITION.

| Projectiles. | | | Nature of Fuze. | Propelling charge. | | | Means of Firing. |
|---|--------------------------------------|---|--|--|----------------------------|------------------|---|
| Description. | Mark. | Mean weight filled and plugged. | | Nature. | Weight. | Size. | |
| Bomb, M.L. H.E. 6-inch Trench Mortar | I† II† III† III† V VR | lbs. 46½ ± 1 lb. " " 50½ ± 1 lb. " | Fuze, per- cussion, No. 110, or Fuze, percus- sion, No. 134. | Cordite flake Gun- cotton yarn | oz. dr. 5 0† 4 0 | 4 m/m ... | Primer, percussion or (for miss- fires) Igniter, Emergency |

† Obsolete for future manufacture.

‡ A number of complete charges were made up as follows:—4 G.C. bags (each containing 1-oz. G.C. yarn), plus 3 cordite bags (each containing 1½-oz. 4 m/m flake cordite).

CHARGE, PROPELLING, M.L. 6-INCH TRENCH MORTAR, 1-OZ. GUN-COTTON YARN, MARK II (4 PER SET).

(Plate VIII.)

The guncotton charge consists of four 1-oz. white cambric bags containing guncotton yarn; the mouth of each bag is closed by being stitched with silk or cotton sewing.

Not more than one bag to be placed in each vane angle of the bomb.

CHARGE, PROPELLING, M.L. 6-INCH TRENCH MORTAR, 1-OZ. 4-DRS. CORDITE, 4 M/M FLAKE, MARK III (4 PER SET).

(Plate IX.)

The cordite charge is contained in four white cambric bags; each bag is filled with 1-oz. 4-drs. of cordite, 4 m/m flake and the mouth closed by being stitched with silk or cotton sewing. This charge is used to augment the guncotton charge described above for ranges of, approximately, 1,000 yards and above.

IGNITER, EMERGENCY, PROPELLING CHARGE, M.L. 6-INCH TRENCH MORTAR, MARK II.

(Plate X.)

This igniter is used for firing the mortar in the event of a miss-fire. It consists of a length of "Fuze, Safety, No. 15 or 15A, Mark I," to the front end of which is attached a cambric or woven cotton yarn bag containing about 35 grains of S.M.¹ powder. The safety fuze is inserted in one end of the bag and secured to it with silk cord; the other end of the bag is closed by being stitched with

silk sewing. A copper tube containing a powder pellet is cannellured or crimped to the rear end of the safety fuze. A length of "6 Strand Quickmatch" is inserted through a hole in the top of the tube.

BOMB, M.L. H.E. 6-INCH TRENCH MORTAR.

(Plate XI.)

The *Mark V* bomb is of cast iron with parallel walls tapering slightly at the shoulder. The lower end is fitted with four steel vanes which serve to keep the bomb steady in flight. A steel angle plate is riveted longitudinally about the centre of the junction of each vane to strengthen it. A recess is formed at the intersection of the vanes to take a "Primer, Percussion, Propelling Charge," and the outer end of each vane is formed with an undercut to take the "Cup, Retaining, Primer Propelling Charge." The vanes are provided with a spring attachment which serves to retain in position the propelling charges. The spring attachment consists of a 66-inch (approximate) length of electro-coppered wire bent to form four loops and secured into slots formed in the vanes of the bomb. The head of the bomb is screwed to receive an exploder container and the fuze, or, during transit, a "Plug, fuze-hole, 2-inch, No. 6A or B."

The exterior of the bomb is rust-proofed by the coslettising process instead of being painted dirty white as in previous Marks.

The *Mark Vr* bomb differs from *Mark V* in being fitted with a repair bush owing to a defective fuze-hole.

The *Mark III* bomb differs from the *Mark V* in having the outer edges of the vanes connected by wire in place of a spring attachment for retaining in position the propelling charges and in the angle plates being omitted.

PRIMER, PERCUSSION, PROPELLING CHARGE, MARK II.

CLIP, PRIMER, PROPELLING CHARGE, MARK I.

(Plates XII and XIII.)

The primer, which is used to ignite the propelling charge, consists of a shortened brass .303-inch Mark VII cartridge case, in the base of which is fitted a percussion cap. The case is perforated with 20 holes and lined with a paper cylinder which contains 12½ grains of guncotton yarn, dusted with as much mealed black powder as will adhere. The mouth of the case is closed by being crimped in and sealed by dipping in beeswax.

The primer is held in the recess in the bomb vanes by a retaining cup. The cup is of spring brass and carries a clip which is secured to it by a steel striker. The clip (see Plate XIII) has four arms, which engage under the rim of the cartridge case of the primer.

FUZE, PERCUSSION, No. 110.

(Plate XIV.)

The *Mark III* fuze consists of the following principal parts:—

Body, liner, shearing wire piston with striker, safety pin with becket, guide washer, dust cap and rubber disc.

The *body*, which is made of cast iron, is screw-threaded externally at its lower end for screwing into the bomb, a flange being formed above the thread, while its upper end is notched for the reception of the safety pin. Internally, the upper end of the body is bored out to receive the liner and striker piston with striker, while the lower end is bored to receive an igniter or detonator and the guide washer. A shoulder with groove is formed at the lower end of the top opening to support the liner. Three flats are cut externally on the body to receive the No. 60A key, which is used for fixing or removing the fuze.

The *liner* is of steel and is split to enable it to be sprung into position in the upper end of the body, where it is supported by resting in the above-mentioned groove. A copper shearing wire is fixed across it near its lower end, while its upper end has two holes for the reception of the safety pin.

The *striker piston* consists of two cup-shaped pieces of mild sheet steel, placed base to base and held together by the steel striker, which is riveted in position. The upper piece is prepared to receive the safety pin. The piston complete with striker is sprung into position inside the liner, its lower end resting upon the shearing wire, which keeps the striker clear of the cap of igniter or detonator until the bomb strikes.

The *dust cap* is of mild steel; it is placed on top of the body and held in position by a steel wire safety pin, passed through the dust cap, liner and striker piston and resting in the notch in the body.

The *safety pin* is furnished with a tarred whipcord safety becket, the loose ends of which are passed around the cap and tied tightly below the open end of the safety pin with a reef knot.

The *rubber disc* is secured to the inside of the cap by cement.

The *guide washer* is of sheet steel and is sprung into position in the lower portion of the body. It has a central opening to support the lower end of the igniter or detonator.

The parts of the fuze made of iron or steel are tin-plated or rust-proofed by the Fermannan process.

Preparation of fuze.—Withdraw the cap with liner attached and insert the igniter or detonator as ordered. Insert the liner in the body and press home until the bottom of the liner rests upon the base of the recess in the fuze body; in this position the top of the liner will be flush with the top of the fuze body. The safety pin will be withdrawn and cap removed immediately before loading.

Action.—On discharge, the shearing wire prevents the striker setting back on to the cap of igniter or detonator, but on impact the striker piston is crushed in, breaking the shearing wire and forcing the striker on to the cap; this fires the igniter or detonator, the flash from which passes into the exploder and thus detonates the bursting charge in the bomb.

FUZE, PERCUSSION, No. 134, MARK I.

(Plate XV.)

The following are the principal parts:—

Body, detonator pellet, delay holder, magazine, guard, needle, guard spring and creep spring.

The *body* is of metal, screw-threaded externally for screwing into the adapter and for holding in position the magazine. The interior is bored out and screw-threaded at the bottom to take the delay holder. The head is screw-threaded internally to take the needle. Two key slots are cut in the head to take the key No. 64 or 64A which is used for fixing or removing the fuze.

The *detonator pellet* is of metal and is provided externally with three inclined projections in one piece with the pellet. At the bottom end it is screwed externally to take the "nut, detonator pellet," which forms a seating for the lower end of the guard spring. The pellet is bored out internally and screw-threaded at the bottom to retain in position a powder pellet, while near the top a diaphragm is formed provided with a flash hole. A seating is formed at the top to take the detonator. The cavity below the detonator is filled with mealed powder.

The *delay holder* screws into the bottom of the fuze body and is filled with mealed powder to give a delay of .20 second.

The *magazine* is screw-threaded internally at the top to screw on to the bottom of the body and is closed at the bottom with a copper disc sweated into an internal recess. It is filled with fine grain powder and the threads are coated with Pettman's cement before assembly.

The *guard* is in two pieces, upper and lower, which are identical. Each is provided with three ramps which are designed to suit the inclined projections on the detonator pellet.

The *needle* is of brass, four-pointed; it is screwed into the head of the fuze and secured by punch stabbing.

The *guard spring* is of steel. Its lower end bears against the "nut, detonator pellet," the upper end against a seating on the underside of the lower guard.

The *creep spring* is of bronze. Its lower end bears against the upper guard, the upper end against a seating formed in the body near the head.

Action.—When the fuze is assembled and at rest the ramps formed on the upper guard bear against the top of the inclined projections on the detonator pellet by the action of the creep spring. The base of the lower guard is pressed against the bottom of the inclined projections on the detonator pellet by the action of the guard spring. The two guards and the projections on the pellet are thus interlocked and the friction set up effectively locks the guards, the upper guard completely masking the detonator.

On the shock of discharge the lower guard sets back overcoming and further compressing the guard spring. The ramps on it ride down the inclined projections on the pellet causing the guard to slightly revolve. The upper guard is then free to follow the lower under the action of the creep spring and the set-back thus un.masks the detonator. The guard spring then re-asserts itself and its upward pressure jams the guards in the set-back position.

The creep spring prevents a rebound action.

On impact the detonator pellet moves forward overcoming the creep spring and carrying the detonator on to the needle. The flash from the detonator ignites the mealed powder in the pellet,

which communicates with the delay composition in the holder thence to the fine grain powder in the magazine; the copper disc is destroyed and the exploder ignited, this in turn exploding the bursting charge in the shell.

The fuze is designed not to arm at ranges of 600 yards and under at 45° and is therefore not suitable for use with the 1st and 2nd charges.

IGNITER WITH DELAY, No. 110 FUZE, MARK II.

(Plate XIV.)

The igniter is contained in a blackened .303-inch cartridge case with cap. Inside the case below the cap is placed a paper cylinder $\frac{1}{2}$ -inch long; under this is a glazed board washer with a central hole and below this is the "Delay," consisting of a piece of "Fuze, Safety, No 15A," 6-inch long, which is contained in a paper cylinder and rests on a glazed board washer, also with a central hole.

The remainder of the case is filled with not less than 17 grains of R.F.G.² powder contained in a paper cylinder. The parts are held in position by the mouth of the case being crimped in and sealed by dipping in beeswax or Pettman's cement.

For identification purposes, the head of the case is painted blue and a blue band, $\frac{1}{2}$ -inch wide, is painted round the body of the case.

Two holes are bored through the case above the safety fuze to allow for the escape of gas; the holes are covered by a strip of paper shellaced around the exterior of the case.

DETONATOR, No. 110 FUZE, MARK II.

(Plate XIV.)

The detonator consists of a blackened .303-inch service cartridge case with cap, the case being lined with a paper cylinder. Inside the case below the cap is shellaced a short paper cylinder, below which is a "Detonator, No. 6, Large, Mark I," containing fulminate of mercury composition. The detonator is held in position by the mouth of the case being turned over and closed with beeswax.

The head of the case is painted red.

As these detonators contain fulminate of mercury they should be handled with great care and never subjected to violence when inserting them into, or removing them from, the body of the fuze.

ADAPTER, 2-INCH FUZE-HOLE, No. 14, MARK I.

The No. 14 adapter is of cast iron. It is screw-threaded externally to the 2-inch fuze-hole gauge, and two flats are formed to take the jaws of No. 64 key. It is bored out through the centre and screw-threaded to take the "Fuze, Percussion, No. 134."

ADAPTER, 2-INCH FUZE-HOLE, No. 14A, MARK I.

This adapter differs principally from the No. 14 in not being formed with a flange and in having an increased length of thread externally. The flats formed at the head of the adapter are to a decreased dimension, necessitating the use of No. 64A key.

PACKING OF AMMUNITION.

There are two methods of packing the ammunition, viz. :—

- (1) Bombs. One in a "Case, packing, skeleton, bomb, M.L. 6-inch Trench Mortar, Mark I or II."

| | | | |
|----------------------------|--------|----|---|
| Fuzes, No. 110 | .. | 20 | } In "Box, ammunition components, M.L. 6-inch Trench Mortar, B.119, Mark II." |
| Primers, propelling charge | 20 | 20 | |
| Igniters | ... .. | 20 | |
| Detonators | ... .. | 20 | |
| Exploders | ... .. | 20 | |
| Firing clips | ... .. | 20 | |
| Key, No. 60A | | 1 | |

The fuzes are packed loose. The igniters, detonators and primers are issued in 12 cardboard boxes; each box contains 5. The cardboard boxes are packed in a tinned plate box. The exploders are packed in four tinned plate boxes and the firing clips are issued on a card.

| | | | | | |
|---------------|---|--------|-----|-----|----------------|
| Weight of box | { | filled | ... | ... | 42-lbs. 0-ozs. |
| | | empty | ... | ... | 14-lbs. 8-ozs. |

| | | | | |
|---------------------|-----|----|---|---|
| Charges, propelling | ... | 40 | } | In "Box, propelling charges and igniters, M.L. 6-inch Trench Mortar, A.2, Mark II." |
| | | | | |

The "Charges, propelling," are packed in 20 tinned plate cylinders; each cylinder contains two complete charges, *i.e.*, eight 1-oz. guncotton and eight 1½-oz. cordite charges. The emergency igniters are packed two in a No. 187 cylinder.

| | | | | | |
|---------------|---|--------|-----|-----|----------------|
| Weight of box | { | filled | ... | ... | 55-lbs. 8-ozs. |
| | | empty | ... | ... | 23-lbs. 0-ozs. |

- (2) Bombs. One in a "Case, packing, skeleton, bomb, M.L. 6-inch Trench Mortar, Marks I or II."

| | | | |
|----------------------------|--------|---|--|
| Fuzes, No. 110 | | 5 | } In "Box, ammunition components, M.L. 6-inch Trench Mortar, B.152." |
| Primers, propelling charge | 5 | 5 | |
| Igniters | ... .. | 5 | |
| Detonators | ... .. | 5 | |
| Charges, propelling | ... .. | 5 | |
| Exploders | ... .. | 5 | |
| Igniter, emergency | ... .. | 1 | |
| Firing clips | ... .. | 5 | |
| Key, No. 60A | | 1 | |

The fuzes are packed loose. The igniters, detonators and primers are each packed 5 in a tinned plate box. The complete charges are each packed in a No. 201 cylinder, the emergency igniter in a No. 202 cylinder and the exploders in a tinned plate box. The firing clips are issued on a card.

| | | | | | |
|---------------|---|--------|-----|-----|----------------|
| Weight of box | { | filled | ... | ... | 20-lbs. 0-ozs. |
| | | empty | ... | ... | 10-lbs. 8-ozs. |

The fuzes No. 134 and adapters No. 14 are packed as follows:—

| | |
|-----------------------------|--------------------------------|
| One fuze and adapter No. 14 | in Cylinder, No. 134F, Mark I. |
| " | " No. 14A " No. 134F, Mark II. |

MISCELLANEOUS STORES.

BAND, PROTECTING, CLINOMETER COLLAR, M.L. 6-INCH TRENCH
MORTAR.

(Plate VII.)

The band is of steel and is prepared internally to fit over the collar on the barrel for the protection of the collar while the mortar is in transit. A clamping bolt with flynut is provided on the band for retaining the latter in position on the barrel.

EJECTOR, GAS, M.L. 6-INCH TRENCH MORTAR.

(Plate VII.)

The *Mark IV* gas ejector consists of a tubular steel rod, a metal head and a "T" shaped handle. The rod is screw-threaded at each end for connection to the handle and head portions which are secured by split pins. A small hole is bored through the wood plugs of the "T" handle to allow for the escape of gas. The head is of convex form on the face and threaded internally in the centre for reception of the wire brush, its diameter being slightly less than the bore. On inserting the ejector in the bore the gas is forced up through the interior of the rod and emitted through the ends of the handle.

The *Mark III* gas ejector differs principally from the *Mark IV* in the head and handle being brazed to the rod instead of being removable.

BRUSH, WIRE, M.L. 6-INCH TRENCH MORTAR.

(Plate VII.)

The *Mark I* wire brush is used for cleaning out the bore and consists of four wood segments faced with card wire and curved at the front end to suit the interior of the breech piece and striker stud; a front flange and rear flange of cast iron and a steel spindle. The flanges are formed with perforations to engage the ends of the retaining plates on the brush segments. The spindle is of square steel having a flat steel spring attached by screws to each of its four sides; the springs act as supports behind the brush segments when in use in the bore. The projecting end of the spindle is threaded to suit the head of the gas ejector, in conjunction with which it is used, the rod of the ejector serving as a stave for the wire brush.

The *Mark II* brush differs principally from the *Mark I* in being formed with four expanding wood segments and a steel spindle having flat steel springs attached thereto. The wood segments each have a steel plate which engages with the front and rear flanges and so retains the segments in position. The front flange is secured on the spindle by a grub screw and the rear flange by a nut with spring washer.

The brush is also provided with an adapter riveted to the spindle to enable the brush to be attached to the gas ejector.

SPONGE, M.L. 6-INCH TRENCH MORTAR, MARK I.

The sponge is used for cleaning the bore of the mortar and consists of a wood head built up of four segments riveted to a wood core and provided with a cast-iron flange which is threaded on the socket portion for attachment to the gas ejector. The head is furnished with a covering formed of canvas with sheepskin attached and is protected by an outer bag of waterproof canvas; both the sheepskin covering and the outer bag are held on the head by draw cords.

BAG, CLINOMETER, M.L. 6-INCH TRENCH MORTAR, MARK I.

The bag is provided for carrying the clinometer when it is not in use. It is of canvas and is furnished with a draw string inserted through eyelets at the mouth for use as a sling.

CAP, MUZZLE, M.L. 6-INCH TRENCH MORTAR, MARK II.

(*Plate VII.*)

The cap consists of a wood block with canvas bag and leather strap. The block is of hard wood shaped to fit in the muzzle of the mortar and is covered by a canvas bag, which is secured to it by means of a leather band and copper nails. The cap is secured in position by a leather strap, which is passed around the mortar below the flange formed at the muzzle.

IMPLEMENTS, AMMUNITION—KEY, No. 40.

The *Mark II* key, which is made of steel, is used for removing the fuze-hole plugs. One side is chamfered to form a screwdriver; the other side has a projection to fit the fuze-hole plug.

It is fitted with a loop of white cotton line.

IMPLEMENTS, AMMUNITION—KEY, No. 60.

This key, which is used for fixing or removing the No. 110 Marks I and II fuzes, is made in the form of a spanner, the jaw of which is shaped to fit around the body of the fuze.

It is fitted with a loop of white cotton line.

IMPLEMENTS, AMMUNITION—KEY, No. 60A.

This key is generally similar to the No. 60 key, described above, differing only in the dimensions of the jaw. It is used for fixing or removing the No. 110 Mark III fuze.

IMPLEMENTS, AMMUNITION—KEY, No. 64.

This key is used for fixing or removing the "adapter, No. 14," required for use with fuze No. 134 and for fixing or removing No. 134 fuze. One end of the key is shaped to grip the flats on the No. 14 adapter; the other end of the key is made with jaws to fit the slots in the head of No. 134 fuze.

IMPLEMENTS, AMMUNITION—KEY, No. 64A.

This key is used for fixing or removing the "adapters, Nos. 14 or 14A," required for use with No. 134 fuze and for fixing or removing No. 134 fuze. The jaw of the key is sufficiently wide for the outer half of its depth to grip the flats on the No. 14 adapter, the inner half being made to fit the narrower flats of the No. 14A adapter. The other end of the key is made with jaws to fit the slots in the head of No. 134 fuze.

WRENCH, STRIKER STUD, M.L. 6-INCH TRENCH MORTAR.

(*Plate VII.*)

The wrench is used for inserting and removing the striker stud into or from the mortar and consists of a steel spindle with supporting disc and head. The spindle is shaped at the outer end with a loop for a tommy and is provided at the inner end with a supporting disc for retaining the wrench in a central position in the bore and a head recessed to suit the hexagonal flats on the striker stud. The supporting disc and head are screwed on the spindle and secured in position by a rivet.

MILITARY BOOKS, published by Authority—continued.

(As to prices in brackets, see top of page 2.)

Guns. Handbooks for—continued.

- Stokes 3-inch Trench Mortar. M.L. Land Service. 1919. 1s. 6d. (1s. 2d.)
M.L. Stokes 3-inch Trench Mortar Equipments. Land Service, 1919. (1920).
1s. 6d. (1s. 2d.)

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The Duke of Wellington's West The Princess Charlotte of Wales's
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The Durham Light Infantry. The Princess Louise's Argyll and
The East Lancashire Regiment. Sutherland Highlanders.
The East Surrey Regiment. The Queen's (Royal West Surrey
The Hampshire Regiment. Regiment).
The Highland Light Infantry. The Royal Inniskilling Fusiliers.
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Regiment). The Royal Welsh Fusiliers.
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The Lancashire Fusiliers. The Suffolk Regiment.
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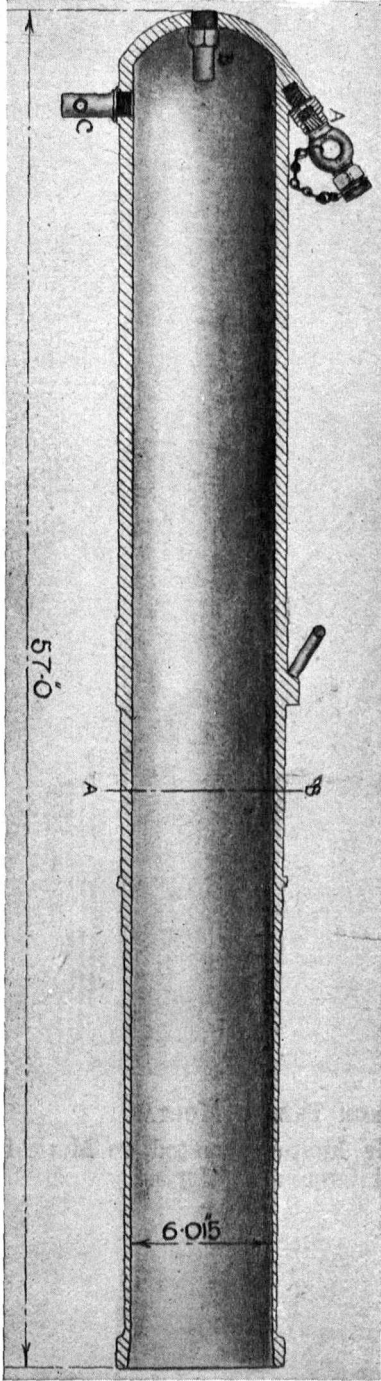
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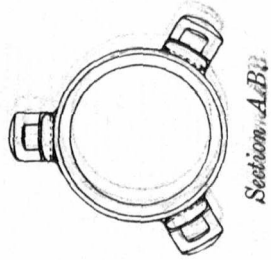
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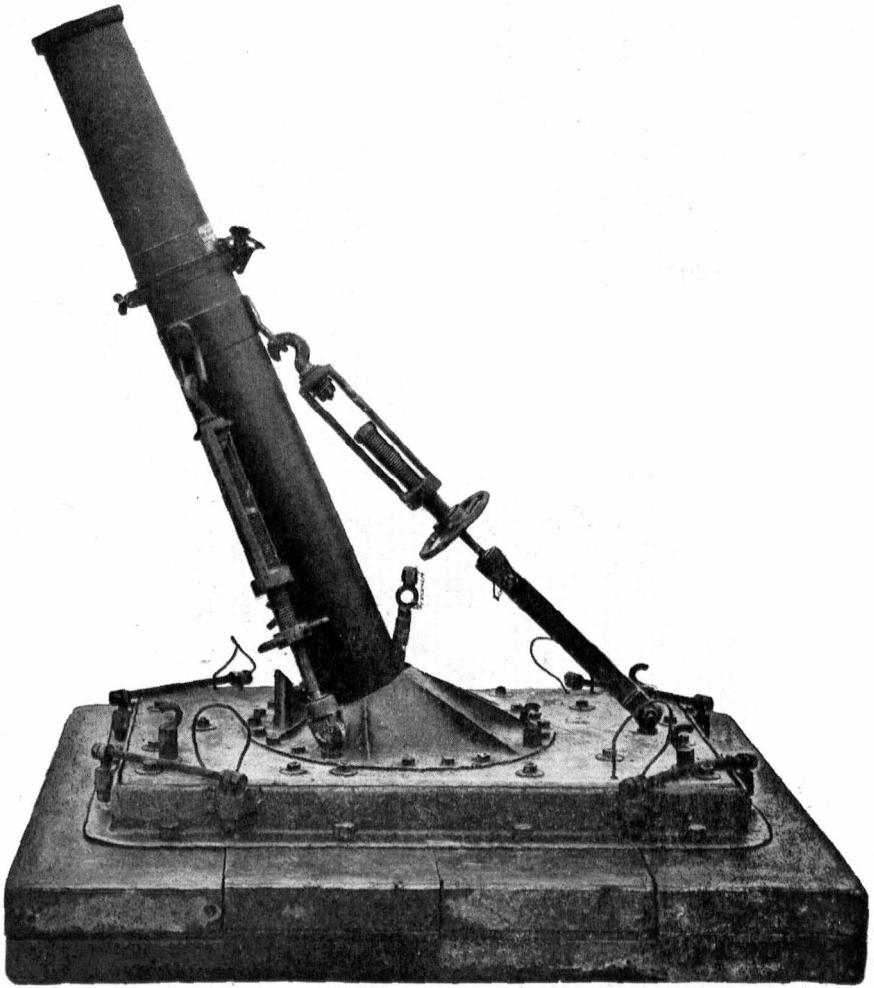
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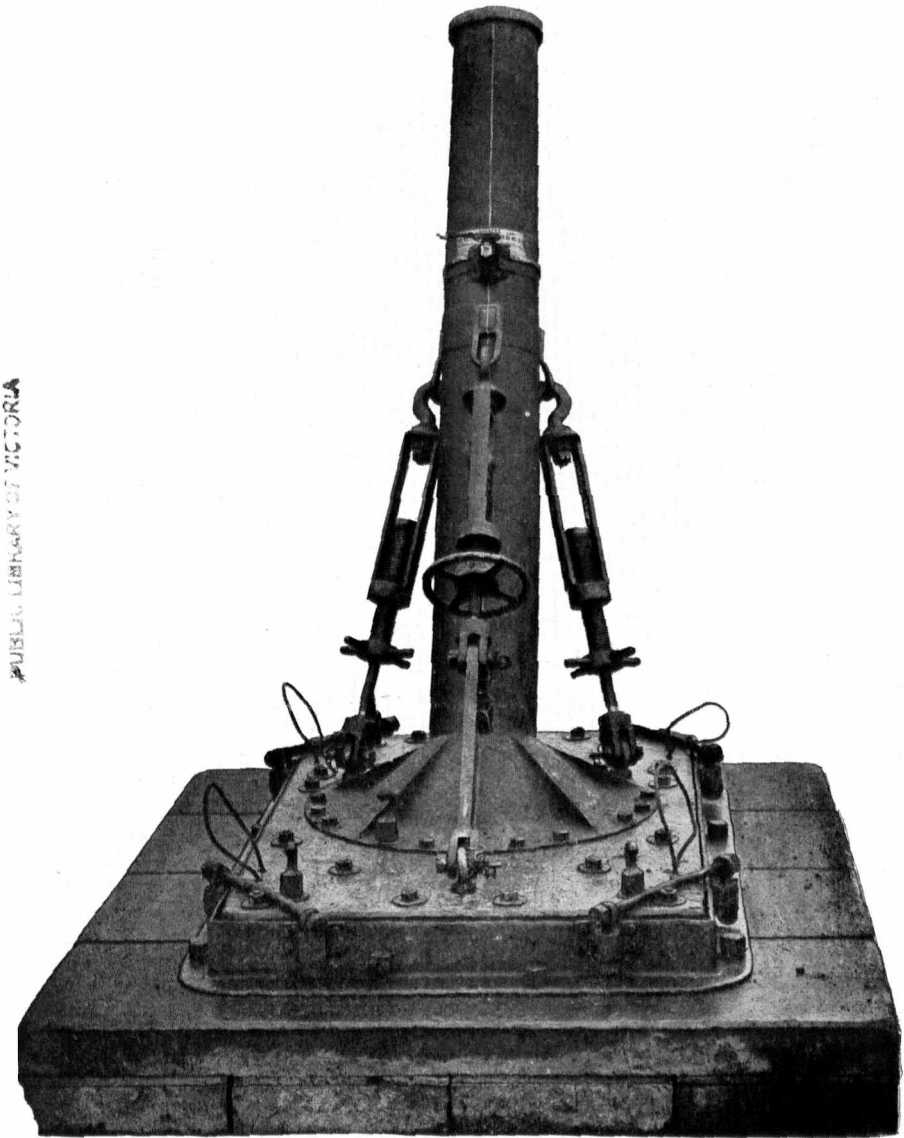
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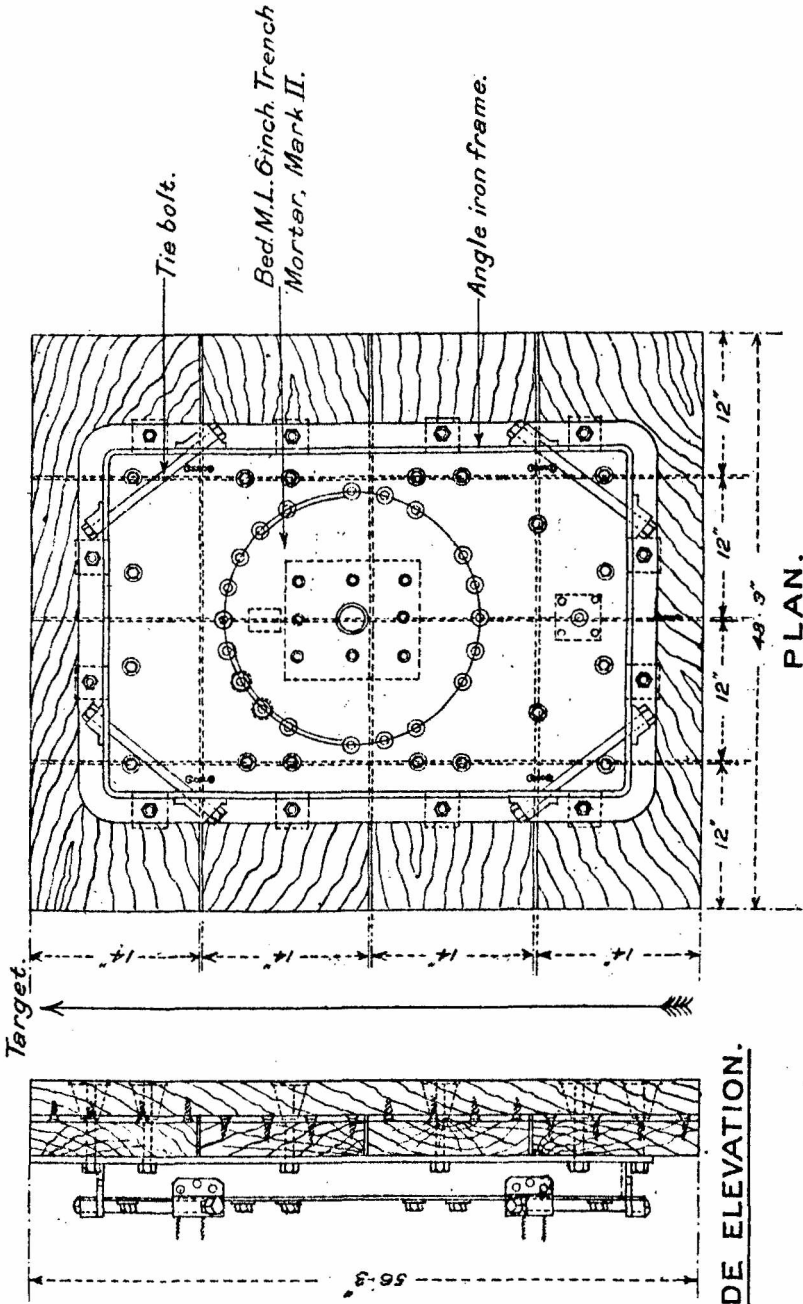


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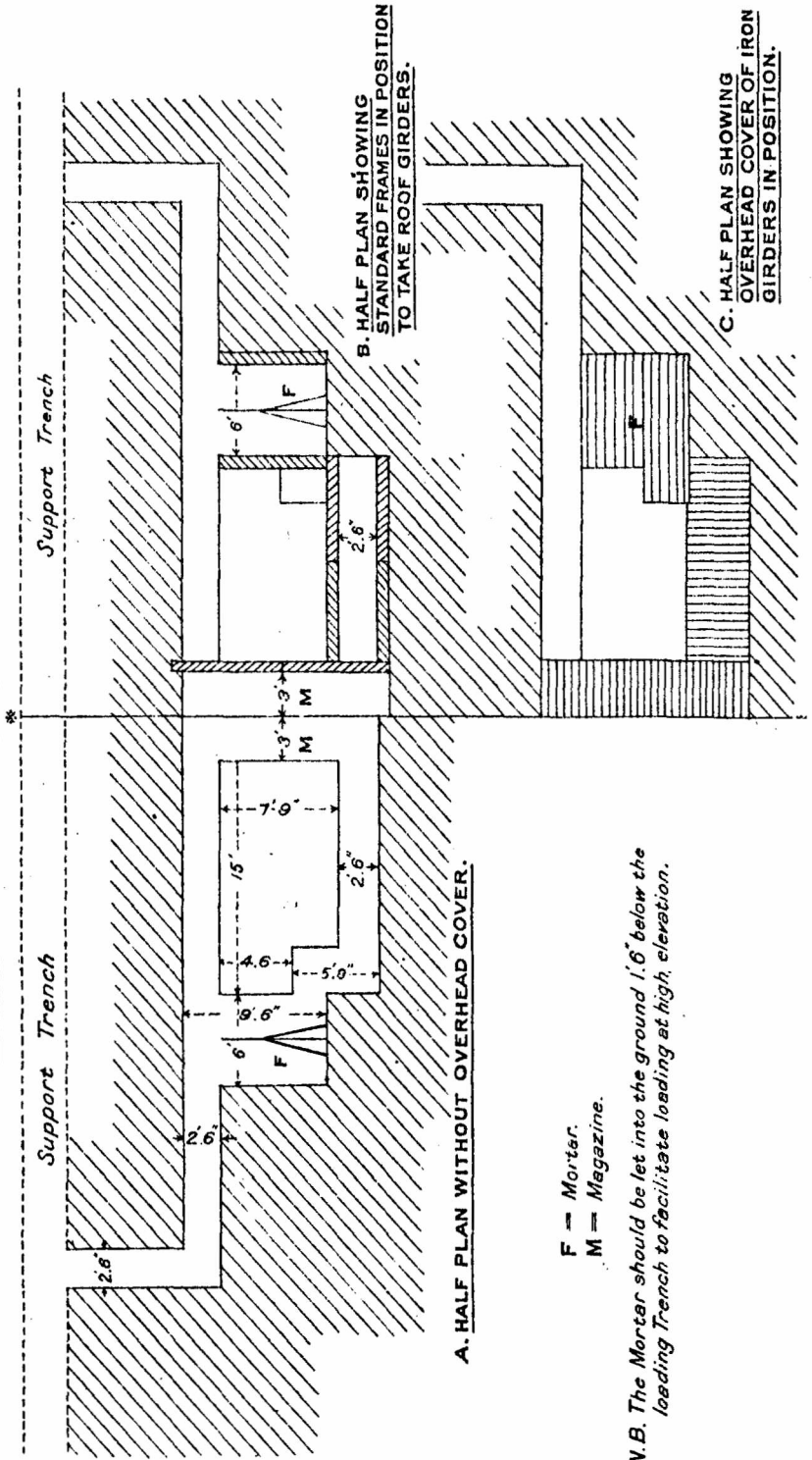


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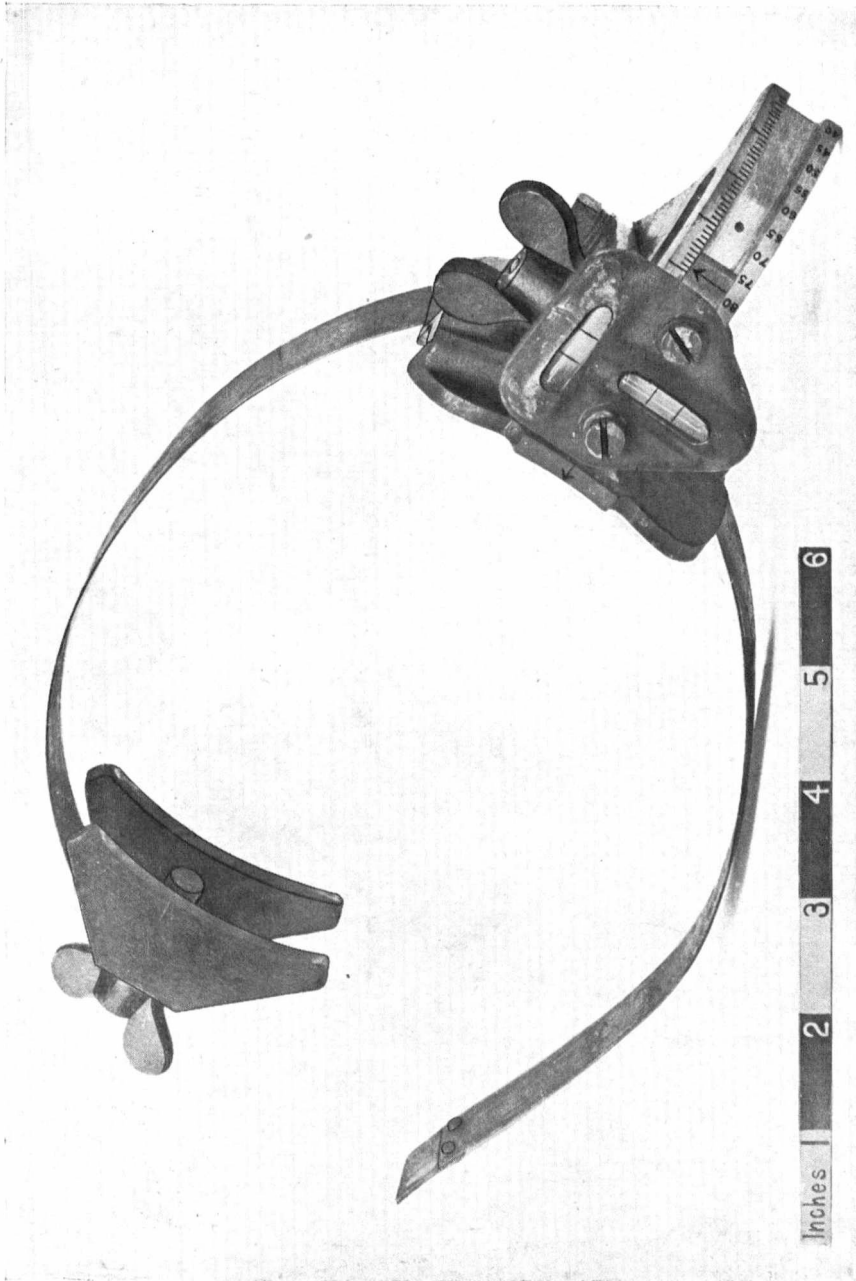
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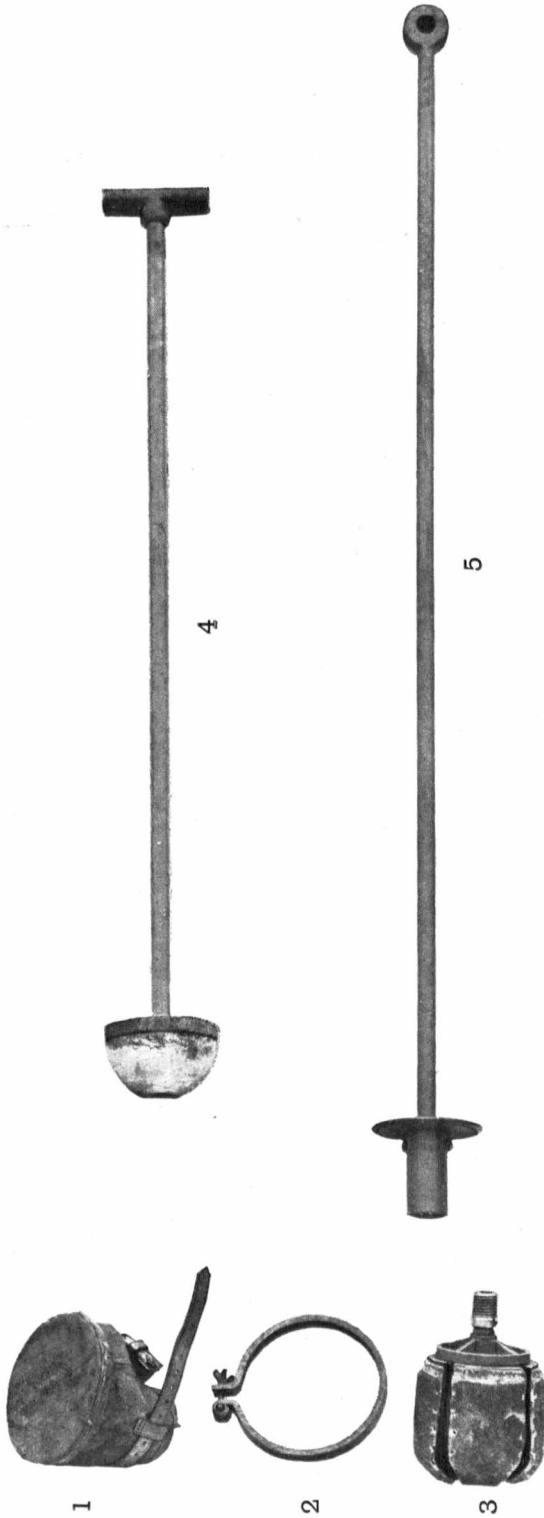
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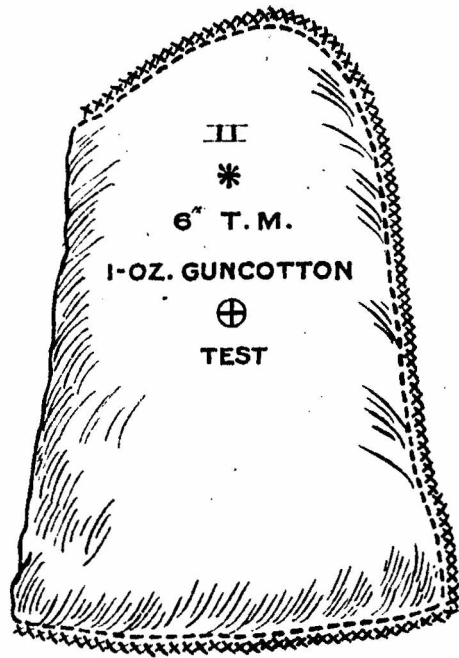
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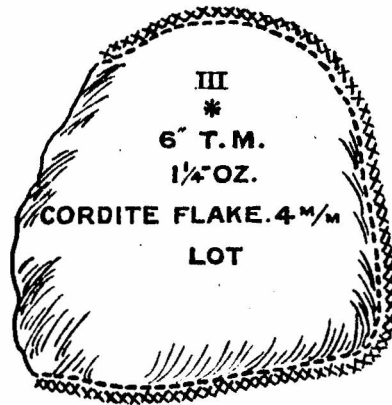
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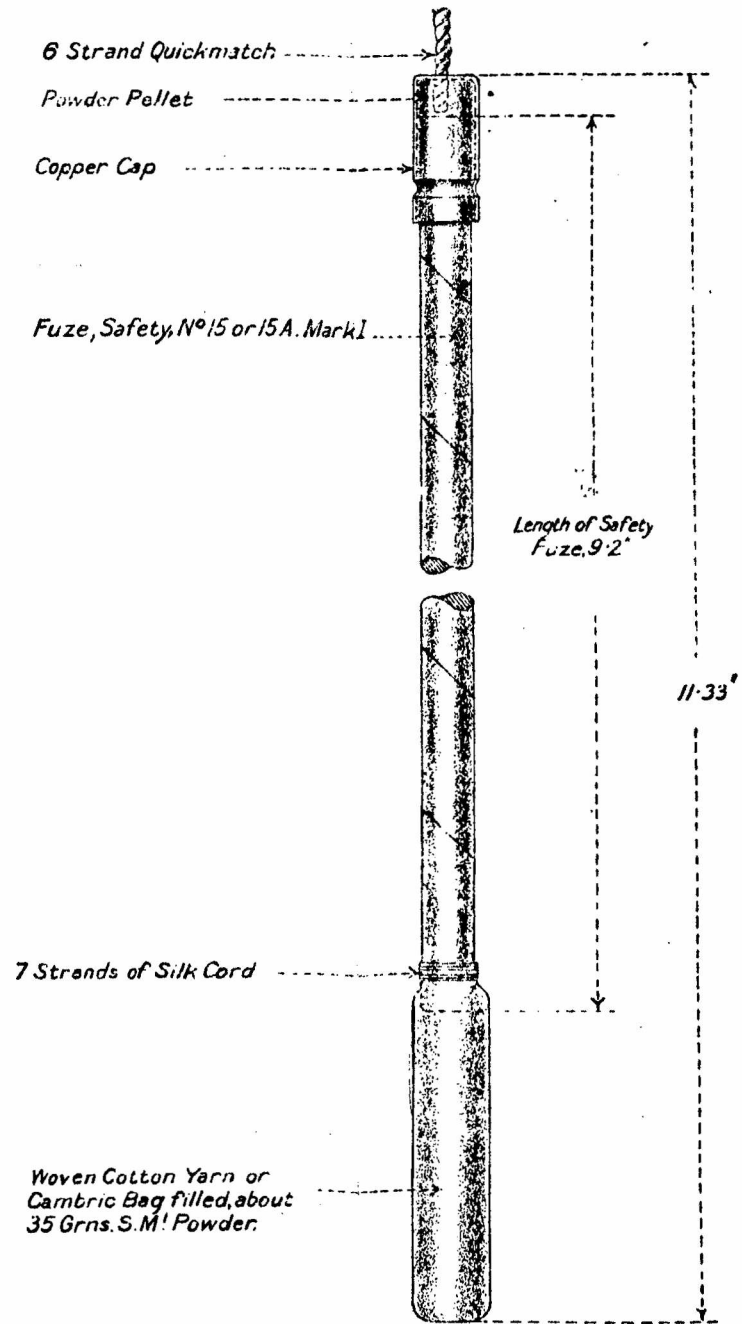
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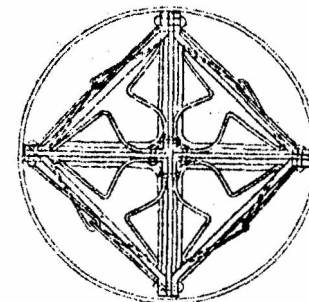
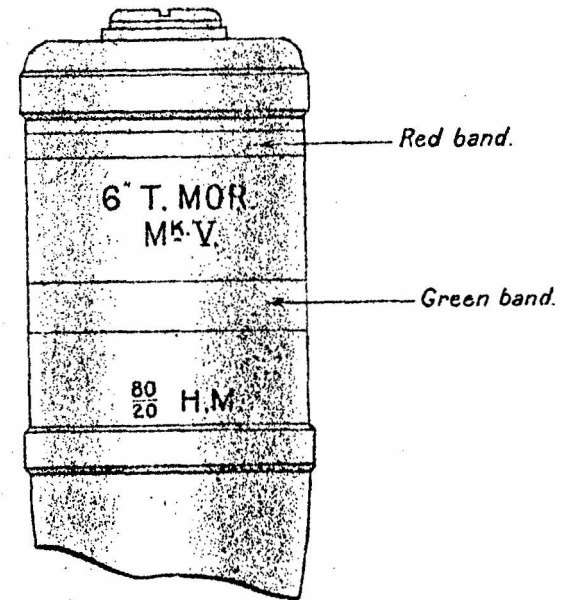
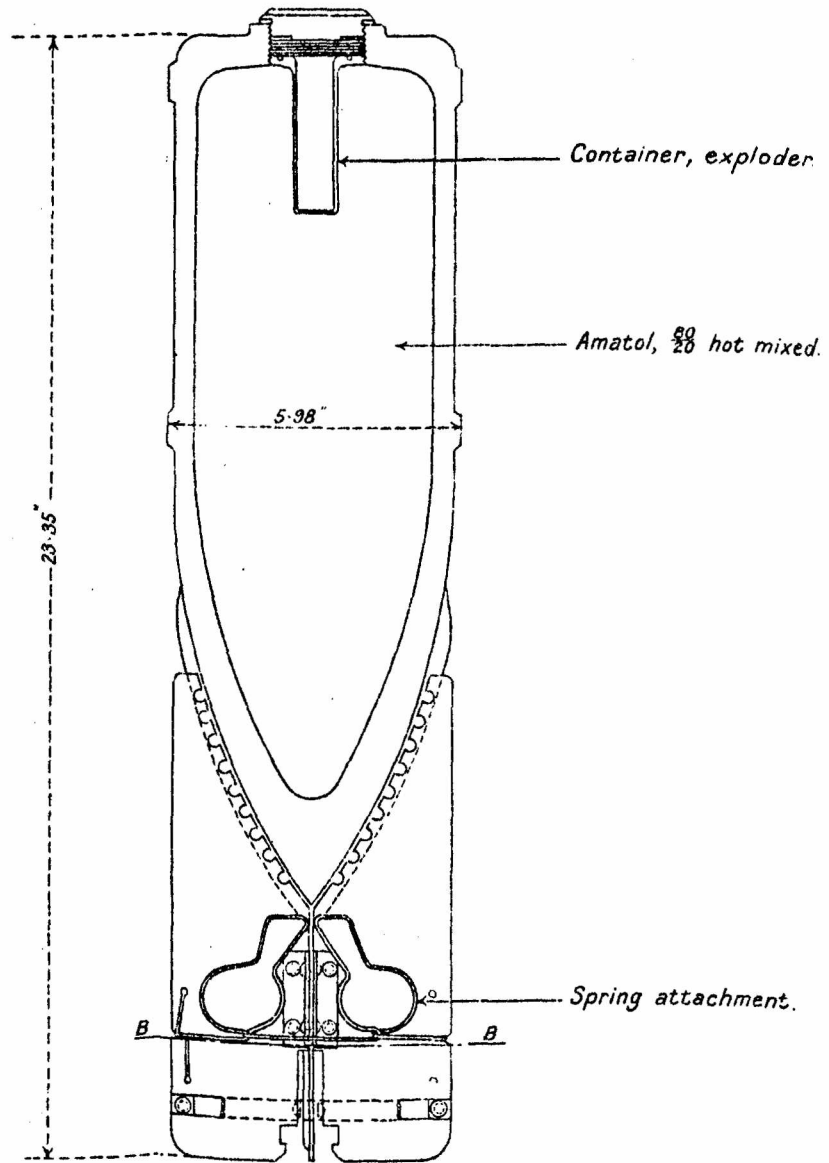
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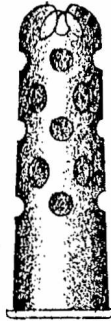
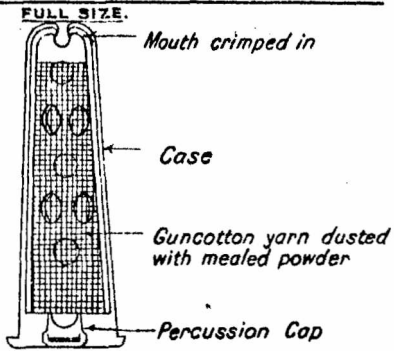
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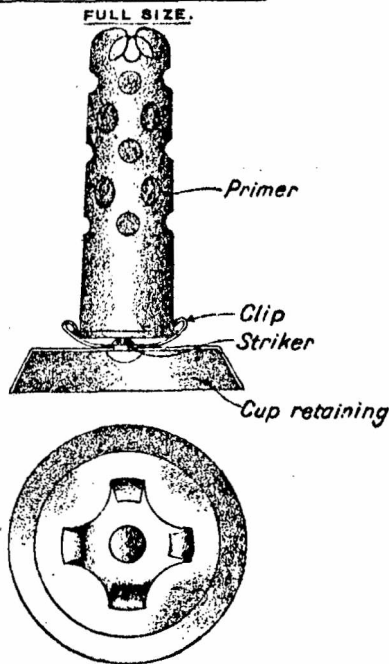
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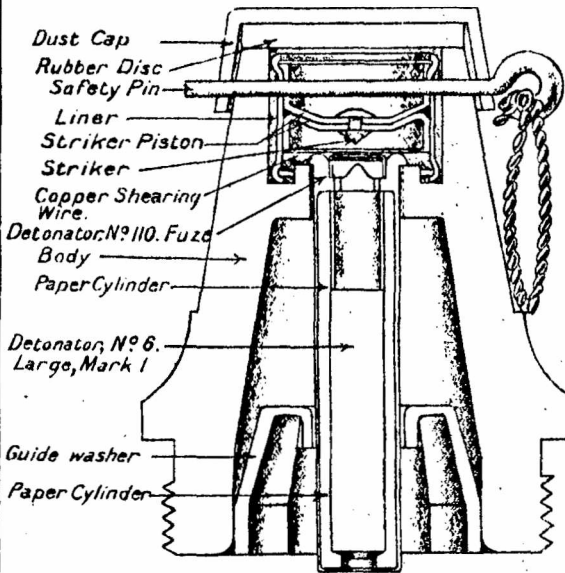
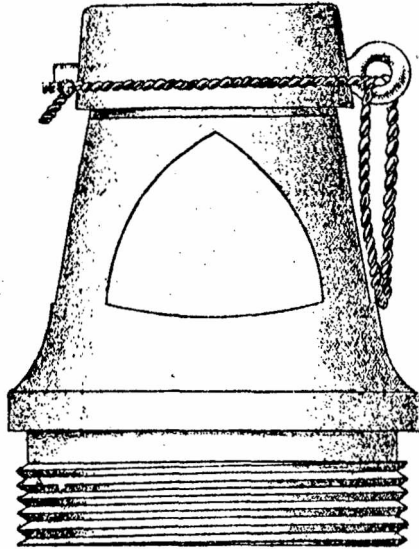
CLIP, PRIMER, PROPELLING CHARGE, M. L. 6-INCH
TRENCH MORTAR, MARK I.

Showing Primer in Position.

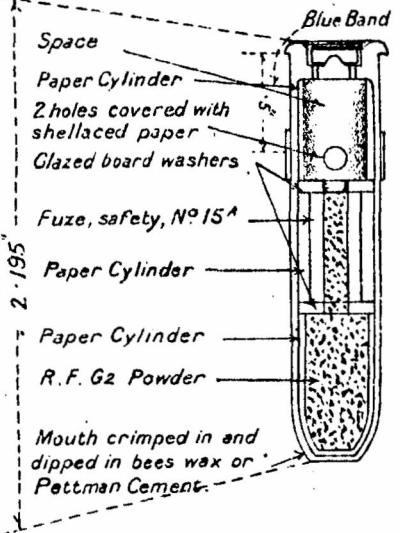


FUZE, PERCUSSION, N°110, MARK III.
SHOWING DETONATOR IN POSITION.

SCALE 1/1



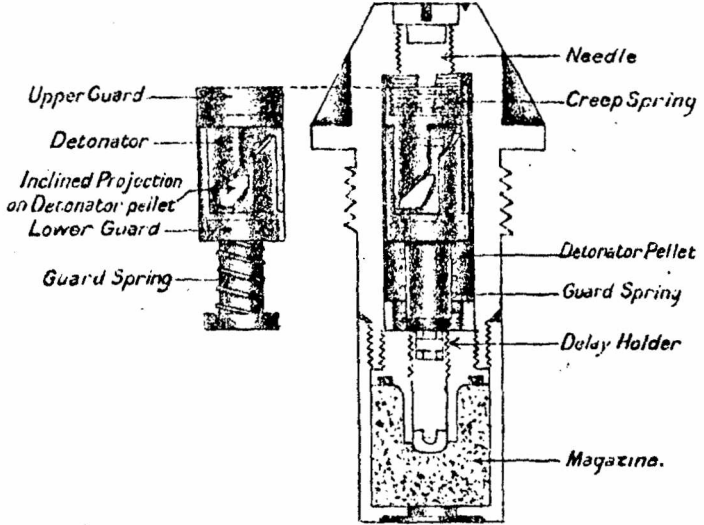
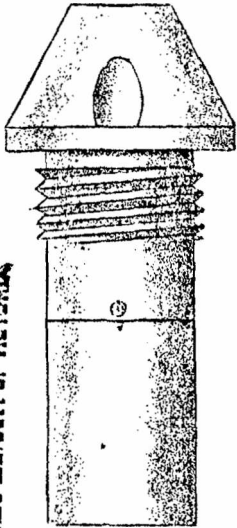
IGNITER, WITH DELAY,
N° 110 FUZE, MARK II.



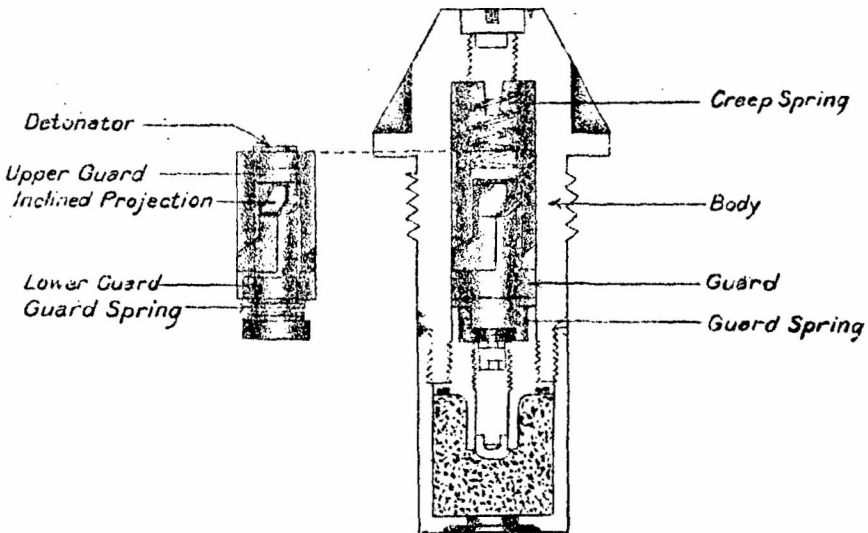
FUZE, PERCUSSION, N° 134.

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

BEFORE FIRING.



AFTER FIRING.



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