HANDBOOK

OF THE

NORDENFELT 6-PR. QUICK-FIRING GUNS.

Marks I. & II.

1897.

(Reprinted 1899.)

By command of the Lords Commissioners of the Admiralty.

LONDON:
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
BY EYRE AND SPOTTISWOODE,
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HANDBOOK OF THE NORDENFELT 6-PR. QUICK-FIRING GUNS.

MARKS I. AND II.

MARK I.—6-PR.

The accompanying Plate I. illustrates sufficiently the manner in which the gun is constructed; it is only necessary to add that the material used for all portions of the gun is oil-tempered steel, carefully selected.

The mechanism is made of steel, and consists of the following principal parts :— Mechanism.

a.—Action lever.
b.—Action cam.
c.—Breech block.
d.—Wedge.
e.—Extractor.
f.—Trigger lever.

Plate I.
- Fig. I.—Represents a vertical section of the gun.
- „ II.—A plan of the gun and development of rifling.

Plate II.
- Fig. I.—An elevation of the breech when closed, showing the outside parts.
- „ II.—An elevation of the breech when open.
- „ III.—A plan of the breech when closed.

Plate III.
- Fig. I.—A vertical section of the breech (closed).
- „ II.—A vertical section of the breech (open).
- „ III.—A horizontal section of the breech (closed).

Action lever has a vertical one-third circle motion from front to rear. It is one piece with the main axis (2) and extractor cam lever which projects to the front and rear. The heel of the extractor cam lever takes against a lever stop when the breech is properly closed. Description of mechanism.

Action cam (3) is connected to the main axis by 2 feathers and feather ways and has a slot, a part of which is concentric with the arc described by the action lever. On the rear upper part of the cam is a bearing (4) corresponding to one on the under part of the trigger lever (5).

Breech block (6) carries the firing pin (7), main spring (8), and trigger lever. The firing pin has cocking lugs (9) on its base for the wedge to act on, and on its under part is a lug (10) by which the trigger lever retains it. The main spring is flat,

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of great power and strength. The trigger lever (11) pivots on its pins, and its motion is regulated by a safety lug (12), moving round a corresponding lug (13) on the wedge. On the arm of the trigger lever are two lugs, one above (14) and one below (5), the former of which is acted on by the wedge. To the end of the trigger lever is attached a steel trigger handle for firing the gun.

The wedge has a vertical motion in the breech. On its lower end is a pin (15) which fits in the slot of the action cam.

The extractor lever (16) is connected to the double extractor (17), working on both sides of the cartridge case. The tongue of the extractor lever abuts on the extractor cam lever (18), which is on the main axis.

Action of the Mechanism.

The action of the mechanism is as follows, supposing the gun to have just been fired, and therefore the action lever in its most forward position :—

Lever moved back.

1st. The action lever carries the action cam slot over the action pin in the part which is concentric to its own motion, and, therefore, no movement of the mechanism takes place.

2nd. The part of the action cam slot which is not concentric to its own motion now engages the action pin, forcing the wedge down, which, acting on the cocking lugs of firing pin, forces it back and extends the main or firing spring. When the firing pin lug is clear of the trigger lever the wedge bearing acts on the upper trigger lever lug, forces up the trigger lever, which catches and retains the firing pin.

3rd. When the action pin has reached the end of the cam slot the extractor lever begins to be forced back by its tongue, being met by the raised portion of the extractor cam lever, and the empty cartridge case is thus slowly started. The action pin having reached the end of the action cam slot, the action lever still moving back causes the breech block to rotate and fall back to the rear, and at the latter part of this movement brings the tongue of the extractor cam lever in contact with the extractor lever, and thus throws the empty cartridge case rapidly to the rear. The action lever is now at its furthest position to the rear.

Lever moved forward.

1st. The breech block is brought up and carried forward, pushing a fresh cartridge into the chamber.

2nd. The cartridge being quite home, the action cam slot engages the action pin in the part of the slot which is not concentric, and forces the wedge up into position.

3rd. The forward motion of the action lever continuing, the action pin passes into the concentric portion of the action cam slot until the heel of the action cam lever takes under the lever stop; the action lever is now in its most forward position and the gun ready for firing.

4th. The gun is fired by pulling the steel trigger handle attached to the eye in the end of the trigger lever.

The gun cannot be fired before the breech is secured by the wedge:—

1st. As the inclined surface inside the wedge is formed in such a manner that the firing pin cannot be made to strike the cap of the cartridge until the wedge is quite home and supported by the entire bearing surface. If the trigger handle is pulled before the breech is secured, the cocking lugs on the firing pin strike on the inclined surface of the wedge, and the point cannot strike the cap of the cartridge.

2nd. The safety lug on the trigger lever is behind the corresponding lug on the wedge until the wedge is fully home, and the sear-nose of the trigger lever can consequently not be forced to release the firing pin before the breech is secured.

Mounting and Dismounting the Mechanism.

Dismounting.

1st. Open the breech.

2nd. Take out keep screw of lever stop, and remove lever stop.

3rd. Close the breech and partially withdraw the main axis so as to free the feathers on the axis.

4th. Open the breech, take the weight of the block, and completely withdraw the main axis.

5th. Place the mechanism on a support, with its left side downwards, unscrew the action pin, and remove the action cam.

6th. Turn the mechanism with the wedge downwards, and draw the breech block out backwards.

7th. Ease the main spring by pulling the trigger handle, take out the spring by gently tapping its lower part, towards the left, with the hammer-like handle of the action pin.

8th. Remove the firing pin and trigger lever.

Mounting.

The mounting or putting together the mechanism is performed in the reverse order to that of dismounting.

1st. Insert the firing pin and trigger lever.

2nd. Insert the main spring from behind with half its breadth underneath its holder on the breech block, and drive it forward by the action pin as far as it has to go, and then to the right till it is home.

3rd. Place the wedge on end, with the slot up, slide the block into the wedge, forcing it hard down with both hands, thus extending the main spring, till the firing pin is caught and retained by the trigger lever.

4th. Turn the mechanism with its left side downwards, insert the action cam, and screw in the pin, and let the end of its handle stop underneath the lug on the right-hand side of the breech block, which will thereby prevent it from sliding down.

5th. Lift the mechanism and place it in the breech in the position that it is when the breech of the gun is fully open.

6th. Insert main axis as far as it will go, then close the breech.

7th. Force the main axis right in so that the feathers on the axis engage in the grooves in the action cam slot.

8th. Draw the action lever back a short distance, and place on the lever stop, securing it with keep screw.

NOTE.—A drill stop was originally fitted to this gun; it has been removed, and the lever stop substituted.

TO DISMOUNT.—THE EXTRACTOR.

Open the breech; force out spring; partly close the breech; withdraw extractor axis; remove extractor.

CARE REQUIRED IN ORDER TO PRESERVE THE GUNS IN EFFICIENT WORKING ORDER.

The guns must be kept clean, free from rust, and undefaced.

Brick-dust or substances of like nature must never be used on any part of the gun.

The parts of the mechanism must not be scraped or roughened in any way, but must be kept lightly oiled as a protection from rust.

After firing, every part of the gun must be thoroughly cleaned, the mechanism dismounted, washed with fresh water and soap, well dried, and then lightly oiled.

When all parts of the gun are cleaned, dried, and oiled, the mechanism may be mounted, and the gun should be protected from the weather.

ACCIDENTS.

The following accidents may possibly occur during practice with these guns, and in case of such occurrence, the action detailed will prove efficacious:—

1. If in loading, the cartridge appears too large and will not permit the breech to close readily, do not endeavour to force it home, but take it out and use another.

2. If a cartridge or case jams, and will not extract, force it out from the muzzle; in the case of a cartridge, taking great care that the cap does not strike against anything whilst coming to the rear.
3. If the extractor breaks, open the breech, drive out keep pin, partially close the breech and shift the extractor.
4. If the firing pin or main spring break, dismount the mechanism, and replace the broken part.
5. If the gun constantly misses fire, after the usual pause, open the breech, examine the firing pin and cap of cartridge; if everything appears correct dismount the mechanism and change the main spring.
6. If cartridges insert with difficulty, examine the edge of the chamber for burrs in the metal; if they are found to exist, remove them with a file.

   Note.—Care must be taken in loading that the point of the shell does not strike the entrance to the chamber.
7. Should a cartridge miss fire when the cap is fairly struck, it is on no account to be returned to the box. After waiting a pause of one minute, the breech should be carefully opened, the cartridge removed and thrown overboard.

   Note.—On no account is the gun to be re-cocked after a miss-fire.

SIGHTS.—(*See* Plate XII.)

The same forms of sights are used with the Mark I. and II. guns, the hind sight is of the H form, and the fore sight a bead sight. The hind sight is fitted with a deflection scale graduated in degrees in front and knots of speed in rear, the distance is marked in hundreds of yards on the rear face of the sight.

MARK II.—6-PR.

The accompanying Plate VI. illustrates sufficiently the manner in which the gun is constructed, and it will be observed that in this respect it differs but slightly from Mark I. gun.

Mechanism.

The mechanism is made of steel, and consists of the following principal parts:—

a.—Action lever.
b.—Action cam.
c.—Breech block.
d.—Wedge.
e.—Extractor.
f.—Tappet lever trigger.
g.—Trigger lever.

Plate VI.
- Fig. I.—Represents a vertical section of the gun.
- „ II.—A plan of the gun and development of the rifling.

Plate VII.
- Fig. I.—An outside elevation of the breech when closed.
- „ II.—An elevation of the breech when open.
- „ III.—A plan of the breech when closed.

Plate VIII.
- Fig. I.—A vertical section of the breech when closed.
- „ II.—A vertical section of the breech (open).
- „ III.—A horizontal section of the breech (closed).

It will be observed that the arrangement of the mechanism in Mark II. gun differs somewhat from that in Mark I. This has been necessary, as Mark II. gun is intended to be used with a shoulder piece, whereas Mark I. is intended for wheel gear.

Description of mechanism.

a. Action lever has a vertical one-third circle motion from front to rear. It is one piece with the main axis.

b. Action cam is connected to the main axis by two feathers and feather ways and has a slot, a part of which is concentric with the arc described by the action lever.

c. Breech block carries the firing pin, main spring, tappet lever trigger and trigger lever. The firing pin has bevelled projections or cocking lugs on its base for the wedge to act on, and in the under part there is a groove in which the trigger lever catches and retains it. The main spring is flat, of great power and strength. The trigger lever pivots on its pins, and its motion is regulated by a safety lug moving round a corresponding lug on the wedge. The tappet lever trigger actuated by the wedge strikes the trigger lever, so catches and retains the firing pin.

d. The wedge has a vertical motion in the breech. On its lower end is a pin which fits in the slot of the action cam.

e. The extractor axis is one with the "drill stop." The extractor works on both sides of the cartridge case, and has two projections which abut on the lower part of the breech block.

Action of the Mechanism.

The action of the mechanism is as follows, supposing the gun to have just been fired, and therefore the action lever in its most forward position:—

Lever moved back.

1st. The action lever carries the action cam slot over the action pin in the part which is concentric to its own motion, and therefore no movement of the mechanism takes place.

2nd. The part of the action cam slot which is not concentric to its own motion now engages the action pin, forcing the wedge down, which, acting on the cocking lugs of firing pin forces it back and extends the main or firing spring. When the firing pin lug is clear of the trigger lever, the wedge bearings act on the tappet lever trigger and forces up the trigger lever, which catches and retains the firing pin.

3rd. The action pin having reached the end of the action cam slot, the action lever still moving back causes the breech block to rotate and fall back to the rear. In the beginning of this movement, the projections on the extractor have been slowly forced forward by the turning of the breech block, and the empty cartridge case is thus slowly started, and at the latter part of this movement the projections on the extractor get a much quicker motion forward, and the extractor thus throws the empty cartridge case rapidly to the rear. The action lever is now at its furthest position to the rear.

Lever moved forward.

1st. The breech block is brought up and carried forward, pushing a fresh cartridge into the barrel.

2nd. The cartridge being quite home, the action cam slot engages the action pin in the part of the slot which is not concentric, and forces the wedge up into position, the action pin then passes into the concentric portion of the action cam slot.

3rd. The forward motion of the lever continuing, the end of the trigger lever comes in contact with the trigger.

The "drill stop" is placed on the right side of the breech, and keeps the action lever in its place. Firing the gun is effected by pulling the trigger, which is protected by a guard.

The gun cannot be fired before the breech is secured by the wedge:—

1st. As the inclined surface inside the wedge is formed in such a manner that the firing pin cannot be made to strike the cap of the cartridge until the wedge is quite home and supported by the entire bearing surface. If the trigger is pulled before the breech is secured, the cocking lugs on the firing pin strike on the inclined surface of the wedge, and the point cannot strike the cap of the cartridge.

2nd. The safety lug on the trigger lever is behind the corresponding lug on the wedge until the wedge is fairly home, and the end of the trigger lever consequently cannot be forced to release the firing pin before the breech is secured.

Mounting and Dismounting the Mechanism.

Dismounting.

1st. Place the drill stop in the position marked for taking out the mechanism.

2nd. Move the lever to the rear as far as possible.

3rd. Withdraw the lever completely, a man holding his hands beneath the mechanism in order to receive it.

4th. Place the mechanism on a support, with its left side downwards, unscrew the action pin, and remove the action cam.

5th. Turn the mechanism with the wedge downwards, and draw the breech block out backwards.

6th. Ease the main spring by pulling the trigger lever, which then becomes free; turn the tappet lever trigger, so that it is out of the way of the main spring, which remove by gently tapping its lower part, towards the left, with the hammer-like handle of the action pin.

7th. Remove the firing pin and tappet lever trigger.

Mounting.

The mounting or putting together the mechanism is performed in the reverse order to that of dismounting.

1st. Insert the firing pin and trigger lever.

2nd. Place the tappet lever trigger in the same position as when the main spring was taken out.

3rd. Insert the main spring from behind with half its breadth underneath its holder on the breech block, and drive it forward by the action pin as far as it has to go, and then to the right till it is home.

4th. Place the wedge on end, with the slot up; slide the block into the wedge, forcing it hard down with both hands, thus extending the main spring till the firing pin is caught and retained by the trigger lever.

5th. Turn the mechanism with its left side downwards, insert the action cam, and screw in the action pin, and let the end of its handle stop underneath the lug on the right-hand side of the breech block, which will thereby prevent it from sliding down.

6th. Lift the mechanism and place it in the breech in the position that it is in when the breech of the gun is fully open.

7th. Insert completely the action lever in a position corresponding to that of the mechanism, viz., in its extreme rear position.

8th. Turn the handle of the action pin so as to allow the wedge to slide.

9th. Lock the mechanism by moving the lever into its extreme forward position.

10th. Lock the lever by placing the "drill stop" in the horizontal position.

NOTE.—The "drill stop" placed in the position marked enables it to be taken out; the extractor is then free to be removed.

CARE REQUIRED IN ORDER TO PRESERVE THE GUNS IN EFFICIENT WORKING ORDER.

The same care is required with the Mark II. guns as has been already detailed for Mark I. guns, *see* page 6.

ACCIDENTS.

The same accidents may possibly occur during practice with the Mark II. guns as with the Mark I. These, and the action necessary in order to remedy them, are detailed at page 6.

SIGHTS.

The Mark II. guns are fitted with the same sights as the Mark I. guns. For details, *see* page 7.

MOUNTINGS.

Non-Recoil Mounting.—This mounting consists of a crosshead in which the trunnions of the gun rest, and are there secured by cap squares. This crosshead is in one piece, with a strong steel pivot, which works in a gun-metal socket in the head of an elastic cone, and is secured in place by a bolt from the outside of the cone.

The cone is of sheet iron and is firmly bolted to the deck. For Mark I. guns (Plate V.), the training is given by a hand-wheel, which works a worm, gearing into a horizontal worm-wheel on the head of the socket. The elevation is given by a vertical hand-wheel and bevelled cog-wheel gearing, by means of which the inside cylinder of the elevating nut, fixed to the arm of the crosshead is turned. For Mark II. guns, Plate IX., the elevation and training are given by means of a shoulder piece attached to the loading shield fixed in the rear of the gun.

Recoil Mountings.—There are two descriptions of recoil mountings, viz., the Nordenfelt recoil mounting, and the 6-pr. recoil mounting.

Of the Nordenfelt recoil mountings, Plate IV., there are very few which are at present in store. This mounting consists of a forked-shaped lever which forms the bearings for the trunnions, it is pivoted about the centre on a bolt passing through the brackets of the carriage, and the lower end of the lever is connected to the piston rod of a combined hydraulic and spring

buffer. The cylinder of the hydraulic buffer is grooved, and a constant pressure maintained during the recoil. After recoil the gun returns instantly to the firing position.

The training is given by a pinion gearing into a horizontal racer attached to the deck.

6-pr. Recoil Mounting, Plate X.—This mounting is suitable for either the 6-pr. Hotchkiss or the 6-pr. Nordenfelts, Marks I. or II., but special trunnion blocks, Plate XI., and securing bands are required for each type. The shoulder piece when fitted for use with the Nordenfelt gun is reversed, as shown on Plate X.

The Base Plate.—The base plate is a hollow wrought-iron forging closed on top, which supports the moving parts of the mounting. A circular recess in the upper surface receives the pivot bolt. The lower part is shaped to fit the holding-down ring.

The Clip Ring.—The clip ring is a bronze flanged ring which holds the base plate and revolving bracket together whilst permitting the latter to rotate in training.

The Revolving Bracket.—The revolving bracket is a fork-shaped steel casting, with bearings for the trunnions of the carriage. It is tapped in the centre to receive the pivot bolt which supports the whole system. The latest pattern of revolving bracket is built up of cast steel plates. It consists of the bottom plate, tapped in the centre to receive the pivot bolt, and of two brackets each carrying a bronze casting with a bearing for the trunnion of the carriage. The brackets are secured to the bottom plate by angle irons.

The Carriage.—The carriage is a single bronze casting, which supports the gun in trunnion boxes.

The Trunnion Boxes.—The trunnion boxes are steel castings, which rest on the carriage to which they are secured by stout clips.

The piston rods are screwed into the front end of the trunnion boxes and the spring acts on their rear side. The bracket forming part of the trunnion box extends downwards and is attached to the rod of the spring cylinder. A band is placed round the gun behind the trunnions, and is bolted to the rear sides of the trunnion boxes.

The cylinders.

The hydraulic and spring cylinders are part of the casting which forms the carriage. The former are of the coned type, and are provided with stuffing boxes for the passage of the piston rods. The pressure in the two is equalized by a connecting channel passing through the front part of the carriage. The spring cylinders contain heavy coiled springs under an initial compression of 300 lbs.; a steel rod runs through it having a cap attached at its front end, and the rear end being attached to the bracket of the trunnion box, the spring is thus

compressed between the cap and the rear end of the cylinder. The energy of recoil is absorbed by the hydraulic cylinders, and the gun is immediately returned to the firing position by the springs.

AMMUNITION.

6-Pounder.

NOMENCLATURE.

Plates XIII., XIV., and XV.

Shell.

(61) Point; (62) shoulder; (63) wall; (64) base; (65) fuze seat; (66) chamber; (67) driving band; (68) cannelure.

Fuze.

(73) Body; (74) pellet; (75) needle; (76) detonator; (77) screw cap; (72) plug.

Cartridge case.

(79) Neck; (80) body; (81) base.

Primer.

(82) Case; (83) cap; (84) anvil.

The 6-pr. ammunition is interchangeable with Hotchkiss or Nordenfelt guns.

The cartridge case, cap chamber and cap.

The cartridge case is of solid drawn brass; the interior is varnished. The cap chamber is of brass, is pierced with three fire holes, and contains the percussion cap, which is of copper.

All cartridge cases which are found to be split, either through developing cracks spontaneously, or after being fired, are to be returned on the first opportunity to the nearest Naval Ordnance Store Depôt, for transmission to Woolwich for examination and report. (*Vide* Admiralty Letter G. $\frac{6}{95}\frac{6}{63}$.)

The service or steel shell.

The service shell is made of steel, it is furnished with a copper driving band of the usual type and has a shallow groove or cannelure near the base into which the cartridge case is indented at three points. The base piece is of mild steel, and is screwed into the shell; it is optional to manufacturers whether a base piece is employed or the base formed in one with the body. The base is bored and screwed to receive the fuze. The head is pointed and is struck with a radius of 6·555 inches. The interior of the shell is varnished; the exterior is painted black with a white band round the head, and a red band below the white band. The present stock of common shell (of which a drawing is shown in Plate XIII.), is now being used up for target practice.

The Hotchkiss fuze, Mk. II.

The body of the Hotchkiss fuze is of gun metal threaded to screw into the base of the shell, and is fitted with a percussion pellet, gun metal screwed cap, screw plug, and a copper detonating cap. The percussion pellet consists of a brass casing filled with lead, in which a hard drawn brass wire needle (roughened) is embedded. The cap is filled with detonating

composition and covered with a thin brass disc. A Mark III. fuze percussion Hotchkiss has been sealed to govern future manufacture. It differs from the Mark II. in having the base of the needle made of larger diameter, and the point is surrounded by a spiral brass spring so as to prevent the rebound of the pellet, also the lead part of the pellet projects beyond the gun metal at the bottom to act as a cushion (*see* Plate XIII. A).

Action of fuze. The shock of discharge sets the pellet back along the needle, leaving the whole free to fly forward against the cap on graze or impact.

The powder. The 6-pounder cartridge case contains 1 lb. 15 oz. of Q.F. powder, and the shell is filled with 4 oz. of fine grain powder.

DIMENSIONS OF AMMUNITION.

		For 6-pounder.
The case.	Diameter over base	3 inches.
	„ at neck	2·3 „
	Total length	12·07 „

		For 6-pounder.
The shell.	Diameter over body	2·22 inches.
	„ at swell	2·24 „
	„ at driving band	2·29 „
	Length	8·583 „
	Weight empty	5 lbs. 9 ozs.

The complete cartridge. The shell is inserted in the neck of the cartridge case, and is secured by 3 indents. A felt wad is placed in the case between the head of the fuze and the powder.

Safety clip. To protect the cap against being accidentally struck a brass safety clip is placed on the base of the cartridge, a dome is formed in the centre of it to cover the cap.

Results of firing. The fuze will act when the shell is fired at a steel plate $\frac{3}{16}$ inch in thickness, or on 2 inches of wood. The shell, if fired without a burster at a 4-inch W.I. armour plate, placed at right angles to the line of fire at 100 yards range, will not break up.

CORDITE CARTRIDGE.

Cordite cartridge. Plate XV. shows a section through the cartridge containing a cordite charge. The charge consists of $7\frac{3}{4}$ ozs. of cordite 5/11, which is doubled and tied with silk twist, and placed in with

the ends up; to the lower end is secured an igniter of 4 drs. R.F.G.^{2} powder contained in a shalloon bag. A perforated millboard disc covers the cordite, and the space between this and the base of the projectile is occupied by a perforated brown paper cylinder which keeps the cordite in its place, and so reduces the chances of miss-fires.

Dummy Ammunition.

Dummy ammunition. Dummy ammunition consists of an ordinary cartridge case weighted with wood and having a wooden projectile which is held to it by screws; in the base a metal primer is screwed containing an india rubber disc instead of a cap, and a spiral spring bearing against the india-rubber; the front end of the primer is closed by a screw plug. One of these dummy cartridges should always be used at drill to avoid injury to the striker, but should not be kept in the gun. Four rounds of dummy cartridges are allowed per gun (which are issued in Mark I. ammunition boxes, if available, otherwise in Marks II. or III.), but the boxes containing 11 rounds are always issued full, with the word *Dummy* painted in large letters on the *front* and *top* of the box.

Blank and Saluting Ammunition, Mark III.

The Mark III. blank and saluting ammunition for these guns is identical, the terms "blank" and "saluting" having reference only to the proportions in which it is issued.

The cartridge case. The ammunition consists of a short, solid drawn cartridge case, fitted with a hole in the base, into which is inserted a removable primer which is held in place by a small stud or pin engaging in an inclined circular groove formed round the hole in the base.

The primer. The primer consists of a small brass tube, capped and primed with fine-grain powder; two slots are formed in it with the aid of which and a special screwdriver the primer is forced into place or removed. The cartridge cases (ready primed) are supplied in wooden boxes, 20 in each box, and additional primers are supplied in tin cylinders, 20 in each cylinder.

The charge. The charge (which is the same for all 6-pr. and 3-pr. quick-firing guns) is made up of 15 ozs. of F.G. powder in a shalloon bag, and is issued in half metal-lined cases, 50 in each case.

The wads. To hold the charge back against the primer paper split wads and felt wads are supplied; these are glued in above the charge as described in the following instructions for refilling. The wads, together with the primers and tools for re-priming, are issued in a special box (Mark III.) for saluting tools.

Re-priming tools. In addition to the special screw-driver for inserting or removing the primers, a 12·7-inch rod is supplied for driving out the primer if set fast or if the pin of it has been broken; there is 1 screw-driver and 1 rod in each box of saluting tools.

Sponging wads.

The Sponging wad consists of three thicknesses of felt sewn together, of the same diameter and material as the felt wad used in making up a cartridge.

How used.

It is used as follows:—On the breach of the gun being opened after firing, and the empty cylinder extracted, *before* the gun is reloaded, a "Sponging wad" taken direct from a bucket of water is to be inserted by hand just inside the chamber; a fresh cartridge is then to be entered and pushed home in the usual manner, thus forcing the "Sponging wad" up the bore in front of it.

Miss-fires with blank ammunition.

Note.—In case of a miss-fire with blank ammunition the breech is not to be opened for 10 *minutes*, and then gently; the cartridge complete is to be thrown overboard at once.

Blank and Saluting Ammunition, Mark IV. (Plate XIII. A.)

The Mark IV. blank and saluting ammunition differs from the Mark III., as follows:—

The cylinder has two slots near the mouth. The charge is made up in red shalloon, and is then nearly half enveloped in a felt cap, attached to the top of which is a silk braid loop, which passes through a felt wad and a millboard disc. Silk braid, 0·35 inch wide, is supplied (packed in the half metal-lined case with the charges) for securing the charges in the cylinders, in the proportion of 1 yard to every 3 charges.

Instructions for Re-priming and Re-filling Blank and Mark III. Saluting Ammunition.

The operation of filling should be carried out on the upper deck and some ordinary glue, prepared beforehand, should be in readiness for the purpose of fixing the paper and felt wads in position in the manner described below:—

1. The case being perfectly clean and dry, insert a new primer and place a clip over the base of the case to protect the cap.
2. Stand the case vertically on a small board suitably recessed for the clip, so that the case will stand steadily on its base. Insert the charge choke end uppermost.
3. With a brush coat with glue the exterior of the paper wad all round. Press it into the case firmly, by hand, round the charge, thin end downwards, so that the bottom of the charge is held securely in position against the bottom of the case.
4. With a brush coat with glue the top edge of the paper wad and the inside of the case above it.
5. Press the felt wad (or wads) down into the case until it rests firmly on the top edge of the paper wad. Great

care should be taken that the felt wad maintains its shape, and that its edge adheres closely to the sides of the case all round.

6. Clean the exterior of the case carefully, removing any surplus glue at once with a cloth dipped in hot water, and, if time permits, lay the cartridge down in a horizontal position for 2 hours, to allow the glue to set.

Mark IV.

1. The case being perfectly clean and dry, insert a new primer, and place a clip over the base of the case to protect the cap.

2. Stand the case vertically on a small board, suitably recessed for the clip, so that the case will stand steadily on its base.

3. Insert the charge with felt and millboard wads attached in the case, the felt wad being placed next to the charge, then pass a piece of ·35-inch silk braid through the loop on the charge and the slots in the case, and securely tie it across the mouth of the case. If there is any difficulty in inserting the charge, it should be slightly rolled on a bench or board, by hand, to reduce the diameter, but it is necessary that the charge should fit tightly into the case.

Note.—Care is to be taken that the silk braid after being passed through the slots in the cylinder is made to lay flat, as otherwise a difficulty in entering the cartridge might be experienced.

Procedure to be followed with Blank and Saluting Cartridges which are filled on Board.

1. The cartridge cases are only to be filled as required, but should a greater number have been filled than are found necessary for immediate use, those not fired are to be returned to their boxes for re-stowage in the magazines, safety clips having first been placed on the caps. The safety clips removed from the service cartridges expended for practice can be used for this purpose, or if none are available, they can be obtained from the local Ordnance Depôt.

2. Cartridge cases which have been filled on board are to be emptied before being returned to store, the charges being thrown overboard.

SUPPLY OF AMMUNITION.

Service Ammunition Allowed—

Steel shell 400
Common 100
} rounds per gun

(until the stock of common shell is exhausted, when all steel will be supplied).

SALUTING AMMUNITION, MARK III., ALLOWED—

To each ship or vessel in which the 6-pr. Nordenfelt guns are used for saluting.

Articles.		6-pr.	Remarks.
Primers (in tin cylinders, each containing 20).		400*	
Cartridges, shalloon, 15 oz. (in half metal lined cases, 50 in each).		500*	
Cases, cartridge, empty, primed (in wood boxes, 20 in a box).		200	* In Flagships each of these quantities is 1,000.
Wads.	felt — cartridge	500*	
	felt — sponging	500*	
	paper	500*	
Tools, cartridge, Q.F., saluting.	Boxes for	4†	
	Drivers, screw, primer, 6-pr. or 3-pr.	4†	† In Flagships each of these quantities is 8.
	Rods, steel, 12·7-inch, removing primer.	4†	

BLANK AMMUNITION, MARK III., ALLOWED—

To all ships and vessels for 6-pr. Nordenfelt guns, except when these guns are provided with the saluting proportion shown in the preceding table.

Articles.		6-pr.	Remarks.
Primers (in tin cylinder, each containing 20).		*a* 100	*a* To every 2 or less number of guns, not to exceed 400 per ship.
Cartridges, shalloon, 15 oz. (in half metal lined cases, 50 in each case).		*b* 50	*b* To each gun but not to exceed 500 per ship.
Cases, cartridge, empty, primed (in wood boxes, 20 in a box).		*c* 20	
Wads.	felt — cartridge	*d* 125	*c* To every 2 or less number of guns but not to exceed 100 per ship.
	felt — sponging	*d* 125	
	paper	*d* 125	
Tools, cartridge, Q.F., saluting.	Boxes for	*e* 1	*d* To every 2 or less number of guns but not to exceed 500 of each per ship.
	Drivers, screw, primer, 6-pr. or 3-pr.	*e* 1	
	Rods, steel, 12·7-inch, removing primer.	*e* 1	*e* To every 2 or less number of guns but not to exceed 4 of each per ship.

SALUTING AMMUNITION, MARK IV., ALLOWED—

To each ship or vessel in which the 6-pr. Nordenfelt guns are used for saluting.

	Articles.	Flag-ships.	Other ships.	Remarks.
		6-pr.	6-pr.	
Cartridges, Q.F., saluting (Mark IV.)	Boxes, cartridge	10	10	Packed as at present, 20 in each box, cartridge.
	Cases, with primers	200	200	
	Shalloon, 15 oz. (with felt and paper wads).	1,000	500	Packed 37 in a half metal lined case.
	Primers	1,000	400	Packed in ordinary wood packing cases.
	Tools, 6-pr. Drivers, screw, primer	4	4	
	Tools, 6-pr. Rods, 12·7 inch	4	4	

BLANK AMMUNITION, MARK IV., ALLOWED—

To all ships and vessels for 6-pr. Nordenfelt guns, except when these guns are provided with the saluting proportion shown in the preceding table.

	Articles.	Proportion, 6-pr.		Remarks.
Cartridges, Q.F., saluting (Mark IV.)	Boxes, cartridge	—	As required.	Packed as for saluting proportion.
	Cases, with primers	20	To every 4 or less number of guns.	
	Shalloon, 15 oz. (with felt and paper wads).	10	Per gun.	
	Primers	20	To every 2 or less number of guns.	
	Tools, 6-pr. Drivers, screw, primer	1	Of each per ship.	
	Tools, 6-pr. Rods, 12·7 inch.	1		

PARTICULARS OF GUNS AND MOUNTINGS.

Guns.	Marks I. and II.
Calibre	2·24 inches.
Length of bore, including chamber	95 „
„ „ from base of projectile to muzzle	84 „
„ „ gun over all	110·45 „
Rifling—number of grooves	24 „
„ width of lands	·074 „
„ depth of grooves	·012 „
Twist	From 1 in 180 to 1 in 29·89 up to 14·98 inches from muzzle, and then uniform 1 in 29·89.

Particulars of Guns and Mountings—*cont.*

BALLISTICS.	MARKS I. AND II.
Velocity—muzzle	1,818 f.s.
„ at 1,000 yards	1,319 „
Total energy—muzzle	137·4 foot tons.
„ at 1,000 yards	72·4 „

MOUNTINGS &c.	MARK I.
	Cwt. qrs. lbs.
Weight of guns	5 3 15
Non-Recoil Carriage:—	
Weight of pivot and socket	6 2 22
„ elastic cone	7 0 0
„ shield	3 1 0
Nordenfelt Recoil Carriage:—	
Weight of carriage complete, with racer	8 1 0
„ shield	4 0 0

MOUNTINGS, &c.	MARK II.
	Cwt. qrs. lbs.
Weight of gun	6 3 0
Non-Recoil Carriage:—	
Weight of pivot and socket	4 0 0
„ elastic cone	7 0 0
„ shield	1 0 6
Nordenfelt Recoil Carriage:—	
Weight of carriage, with crosshead and pivot	5 1 0
6-pr. Recoil Carriage:—	
Weight of recoil carriage (without shield or base plate)	5 0 0

Table showing contents of Box, Spare Parts, and Implements, 6-pr. Nordenfelt.

Article.	Quantity. Mark I. Gun.	Mark II. Gun.
Brush, sponge, without rod	1	1
Can, oil	1	1
Drifts — Brass	1	1
Drifts — Steel	2	2
Drivers, screw	1	1
Hammer	1	1
Pins, firing	6	6
Sights — Tangent, with automatic clamp	1	1
Sights — Fore	1	1
Springs — Indicator, drill stop	—	2
Springs — Main	4	4
Springs — Trigger	—	2
Screws, fixing, bracket, trigger piece or shield, loading	3	1
Trigger	—	1
Wrench	1	1

ORDNANCE Q. F. 6 PR. (MARK I) NORDENFELT STEEL

TUBE AND JACKET.

SCALE 1/16.

Fig I.

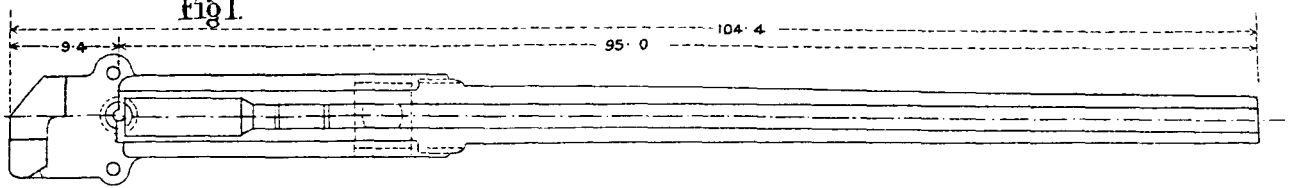
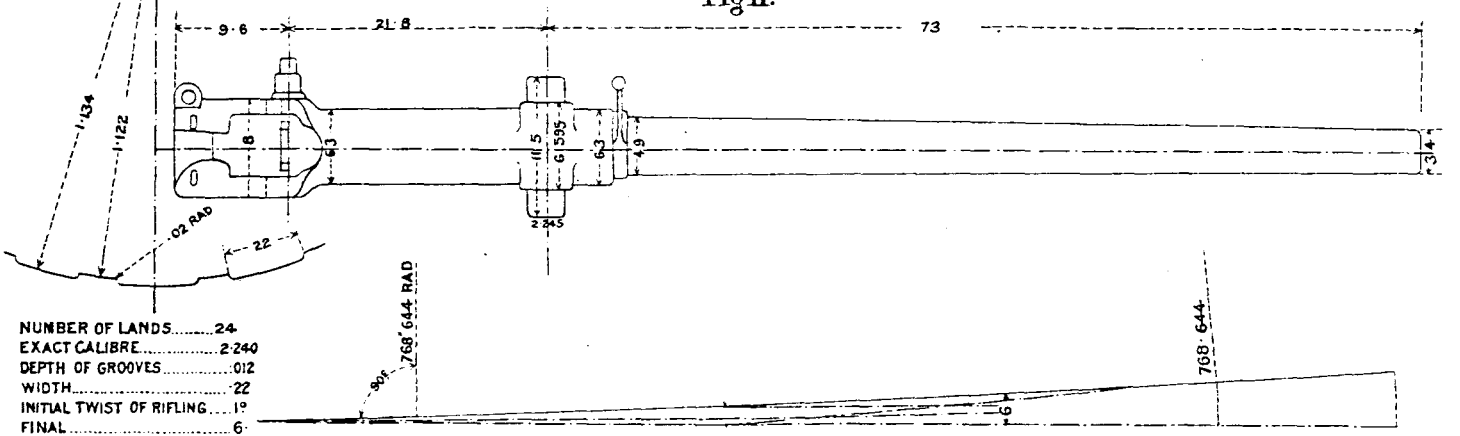


Fig II.



NUMBER OF LANDS.....24
EXACT CALIBRE.....2·240
DEPTH OF GROOVES.....·012
WIDTH.....·22
INITIAL TWIST OF RIFLING....1°
FINAL.....6°
1 TURN IN 30 CALIBRES.

14.11.99

E. Weller & Grahams Ltd Litho London.

Plate I.

ORDNANCE Q. F. 6 PR. (MARK I) NORDENFELT.
EXTRACTOR MECHANISM ACTION LEVER & DRILL SLOP.

SCALE 1/6

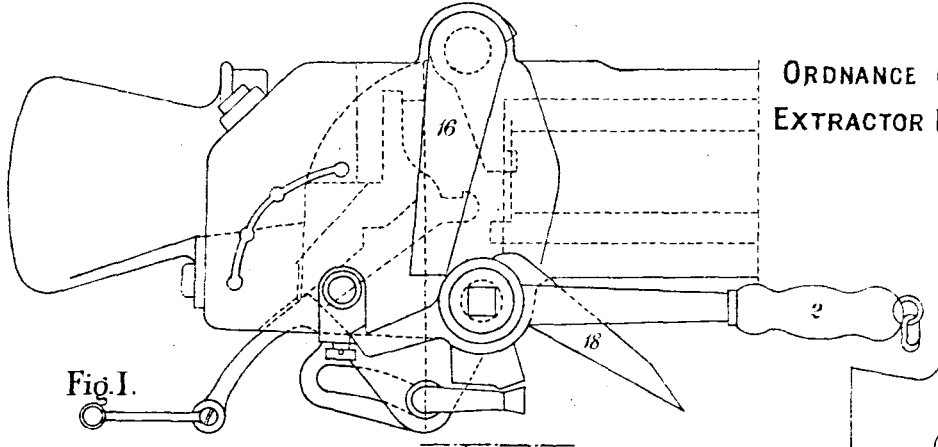


Fig. I.

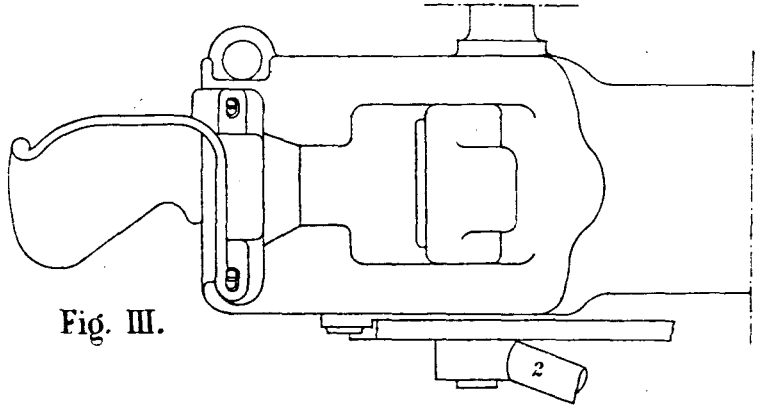


Fig. III.

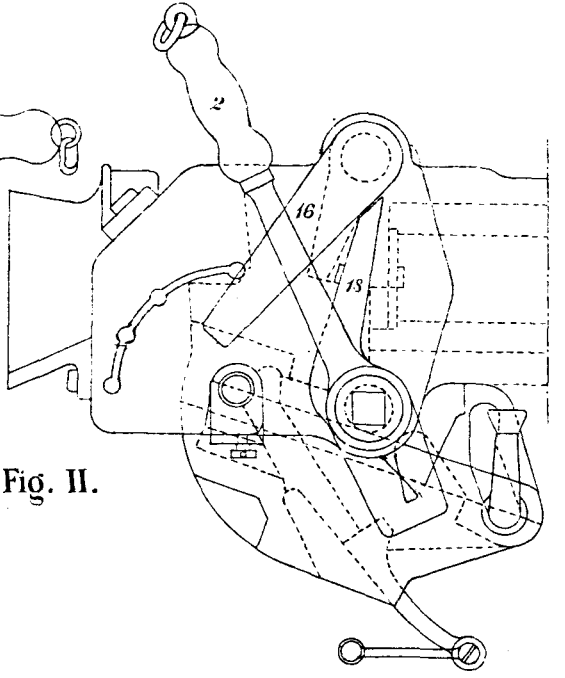


Fig. II.

Plate II.

E. Weller & Grahams Ltd Litho London.

14: 12: 99

SHUT

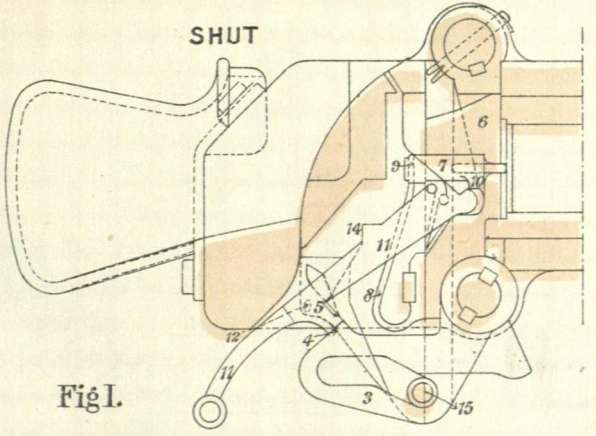


Fig I.

PLAN.

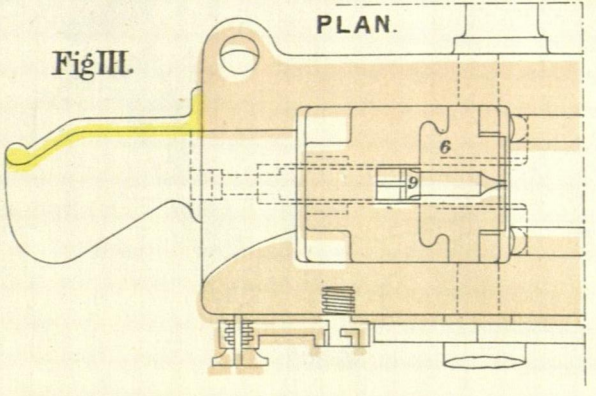


Fig III.

OPEN.

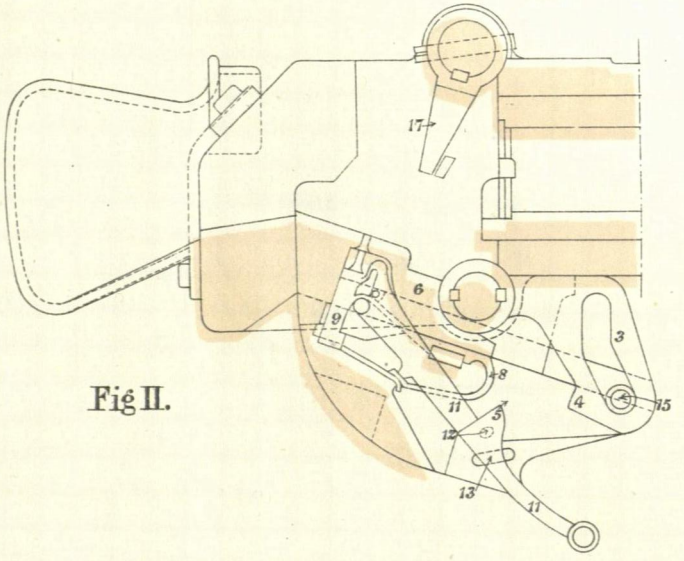


Fig II.

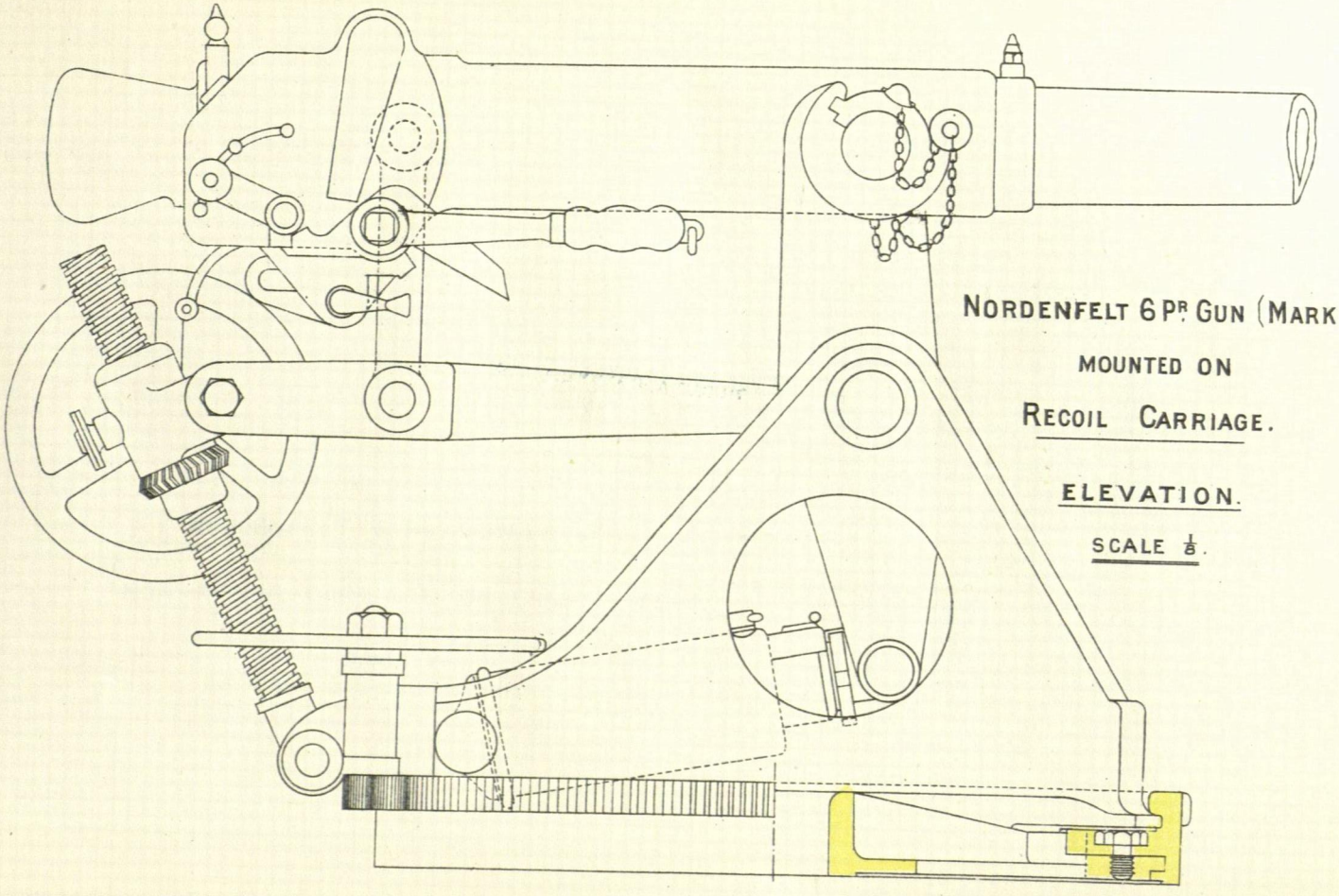
ORDNANCE Q.F. 6 PR. (MARK I) NORDENFELT

MECHANISM

SCALE 1/8

Plate III.

E. Weller & Grahams Ltd. Litho London.



NORDENFELT 6 Pr. GUN (MARK I)

MOUNTED ON

RECOIL CARRIAGE.

ELEVATION.

SCALE 1/8.

Plate IV.

E. Weller & Grahams Ltd. Litho. London.

NORDENFELT 6 PR GUN (MARK I)

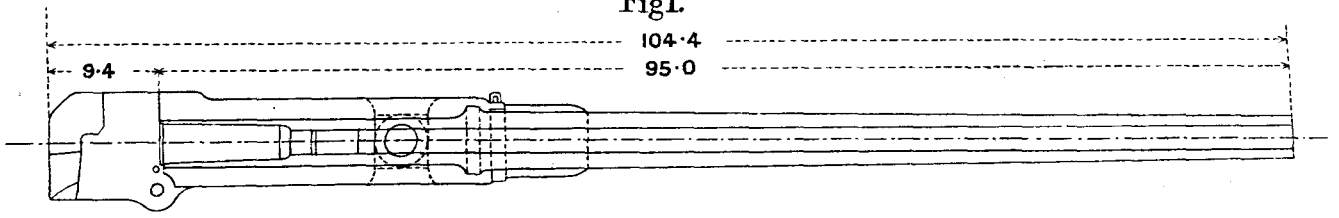
NON-RECOIL CARRIAGE ON ELASTIC CONE

SCALE 1/10.

141 12.99

E. Weller & Grahams Ltd Litho London.

Fig I.

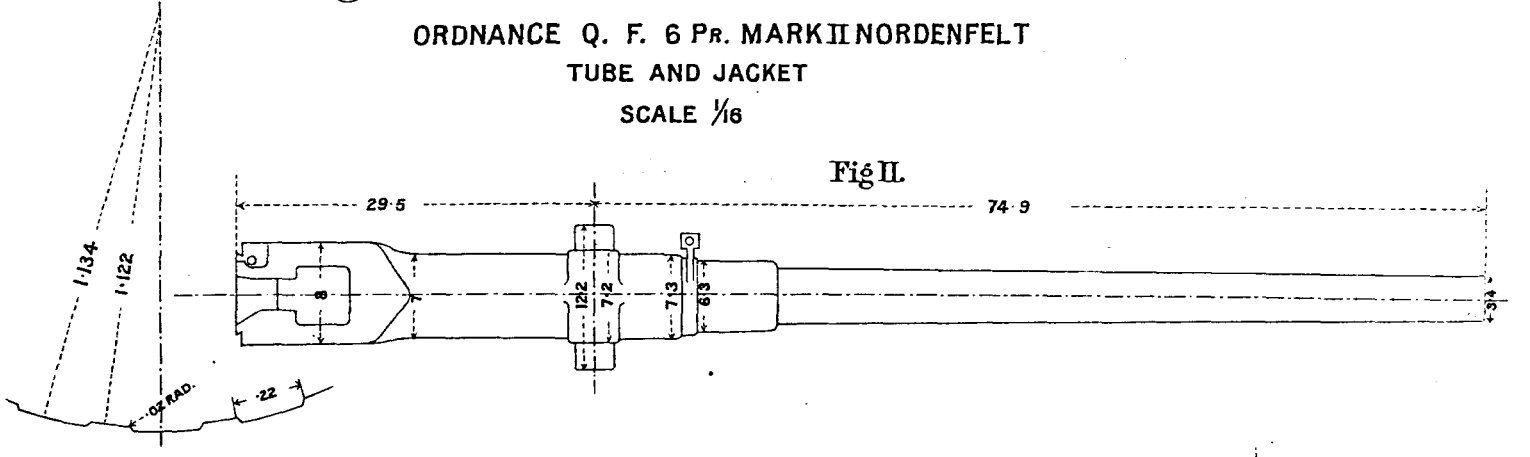


ORDNANCE Q. F. 6 PR. MARK II NORDENFELT

TUBE AND JACKET

SCALE 1/16

Fig II.



NUMBER OF LANDS	24
EXACT CALIBRE	2·244
DEPTH OF GROOVES	·012
WIDTH	·22
INITIAL TWIST OF RIFLING	1°
FINAL	6°

1 TURN IN 30 CALIBRES

E. Weller & Grahams Ltd. Litho. London.

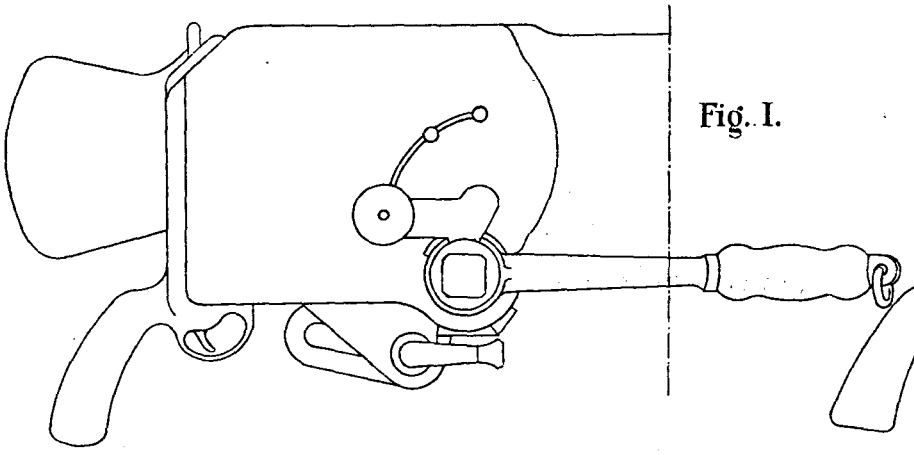


Fig. I.

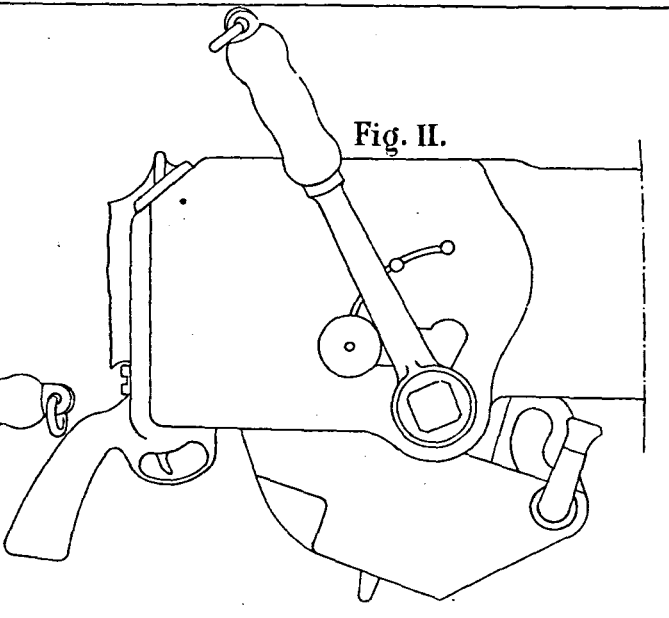


Fig. II.

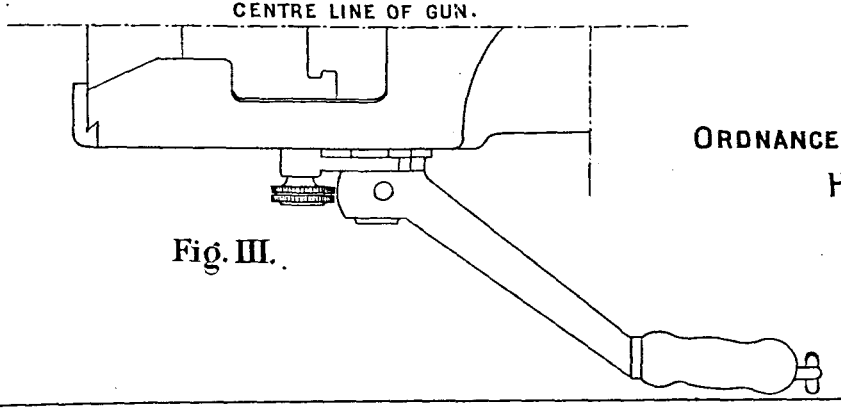


Fig. III.

ORDNANCE Q. F. 6 PR. (MARK II) NORDENFELT HANDLEVEL & DRILL STOP.

SCALE 1/6.

Plate VII.

141 12 99.

E. Weller & Grahams Lth. Litho. London.

Fig. I.

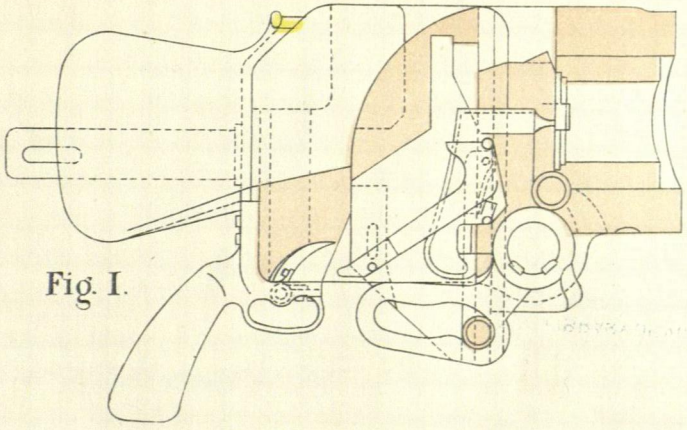
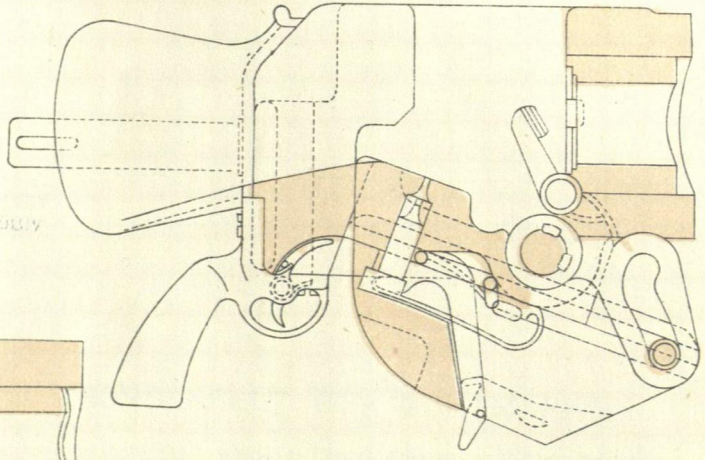


Fig. II.



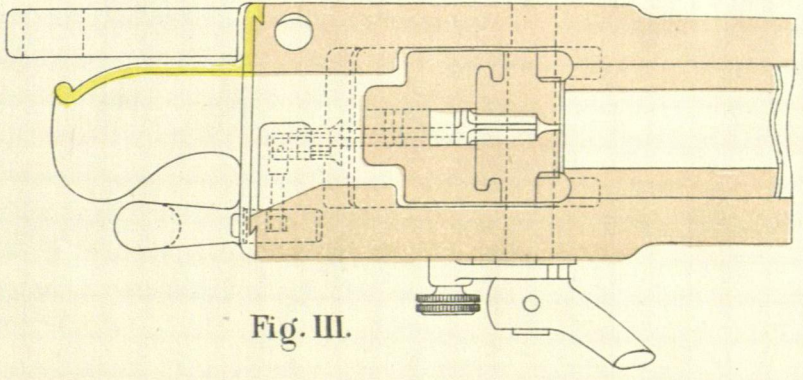


Fig. III.

ORDNANCE Q. F. 6 PR. (MARK II)

NORDENFELT

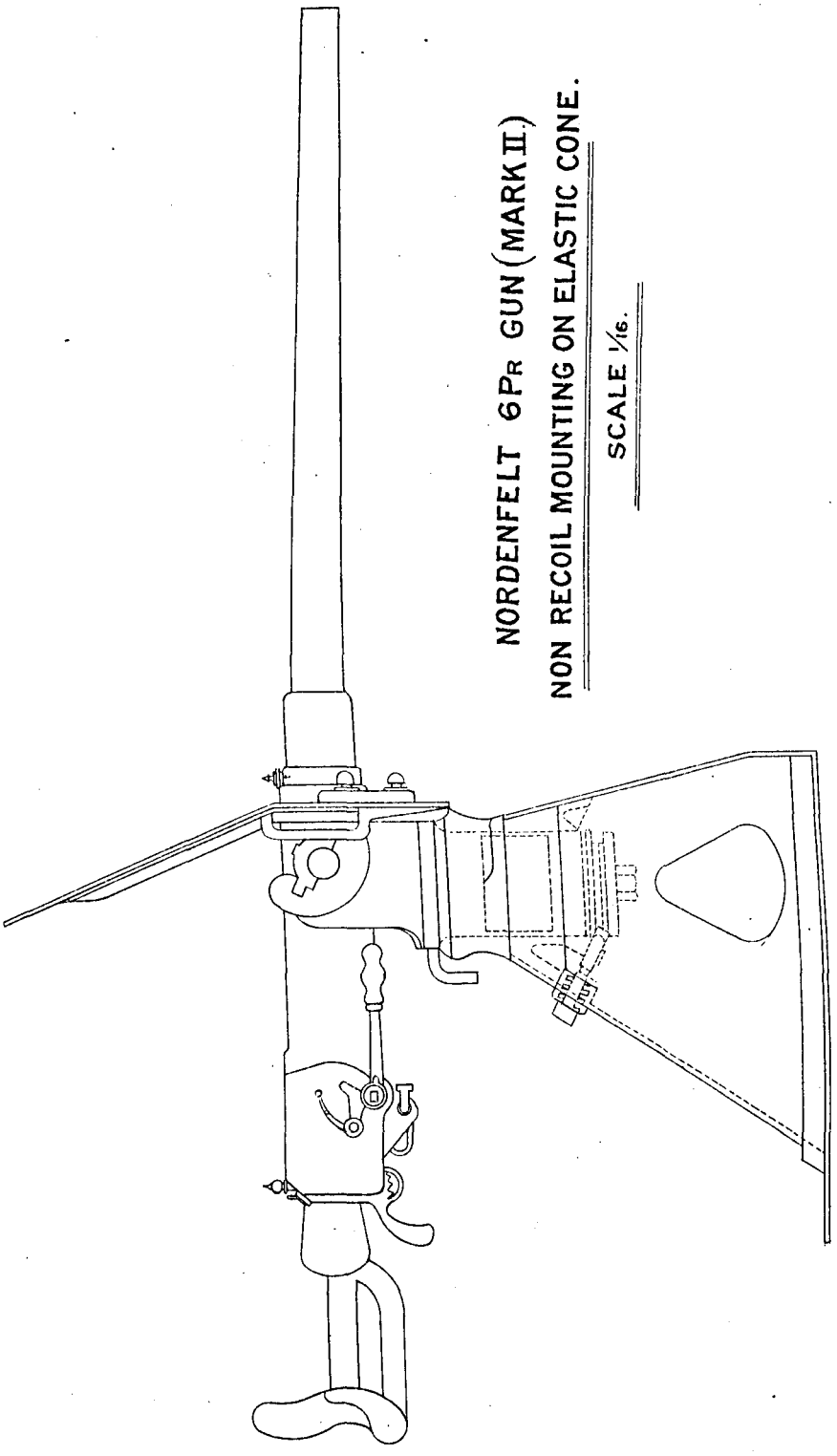
MECHANISM.

SCALE 1/6

E. Weller & Grahams Ltd. Litho London.

NORDENFELT 6PR GUN (MARK II.)
NON RECOIL MOUNTING ON ELASTIC CONE.

SCALE 1/16.



144.11 99

E. Weller & Grahams Ltd Litho London.

Fig. 1.

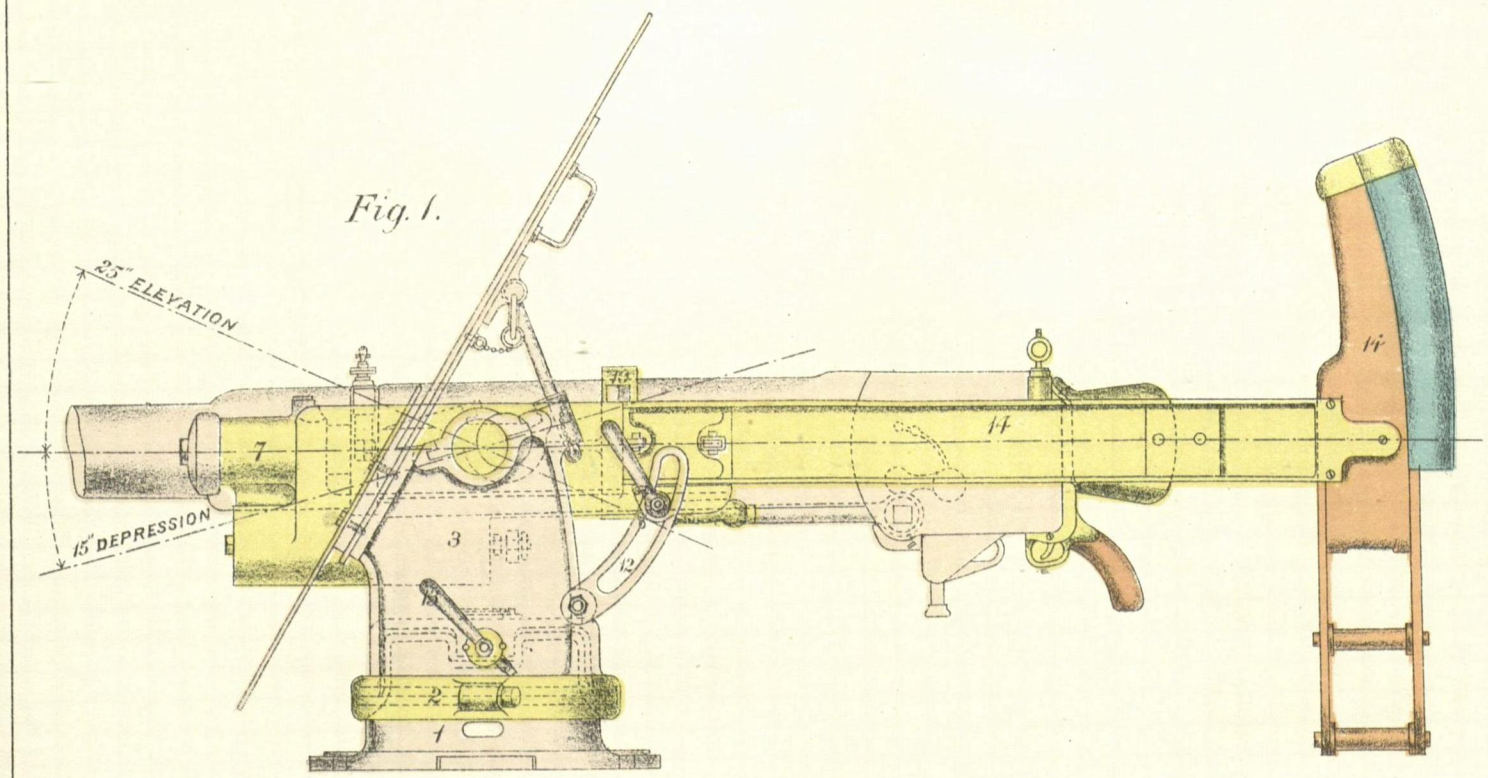
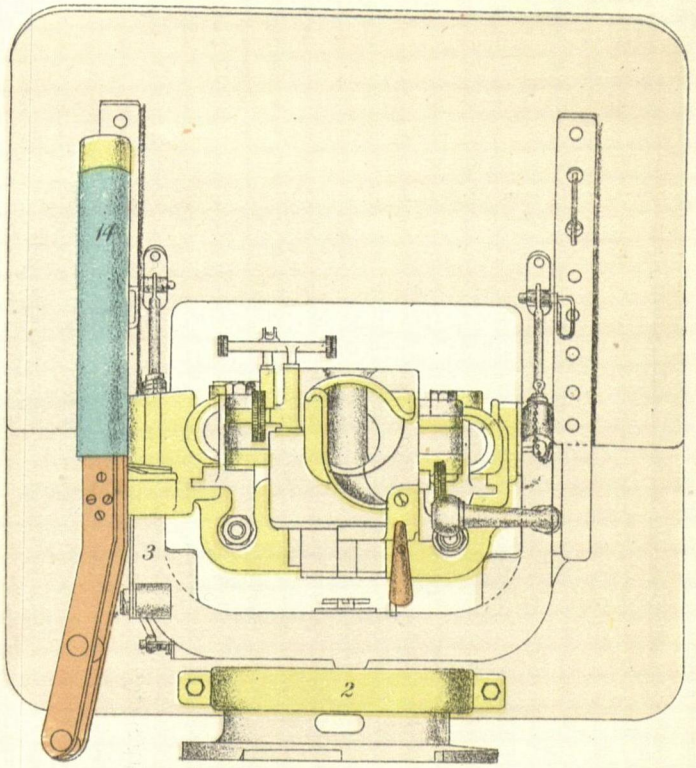


Fig. 2.

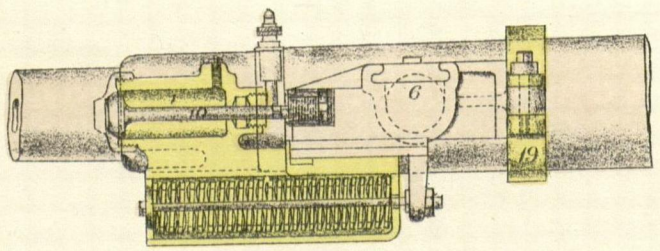


RECOIL MOUNTING FOR 6 Pr Q. F. GUNS.

Scale $\frac{1}{10}^{th}$

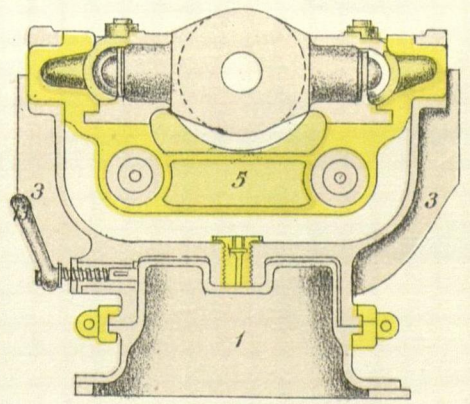
NORDENFELT GUN MARK II.

Fig. 3.



SECTION THROUGH CYLINDERS.

Fig 4.



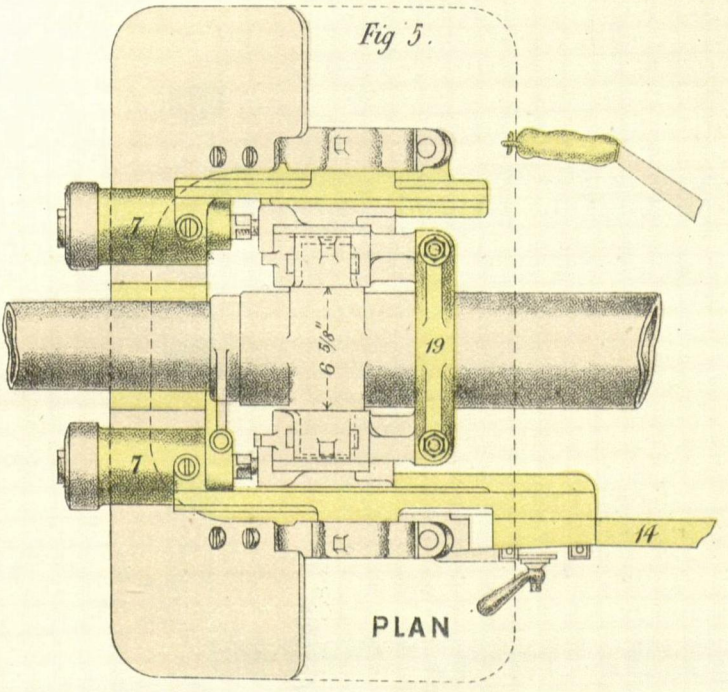
SECTION THROUGH TRUNNION.

E. Weller & Grahams Ltd Litho London.

RECOIL MOUNTING FOR 6 PR Q. F. GUNS.

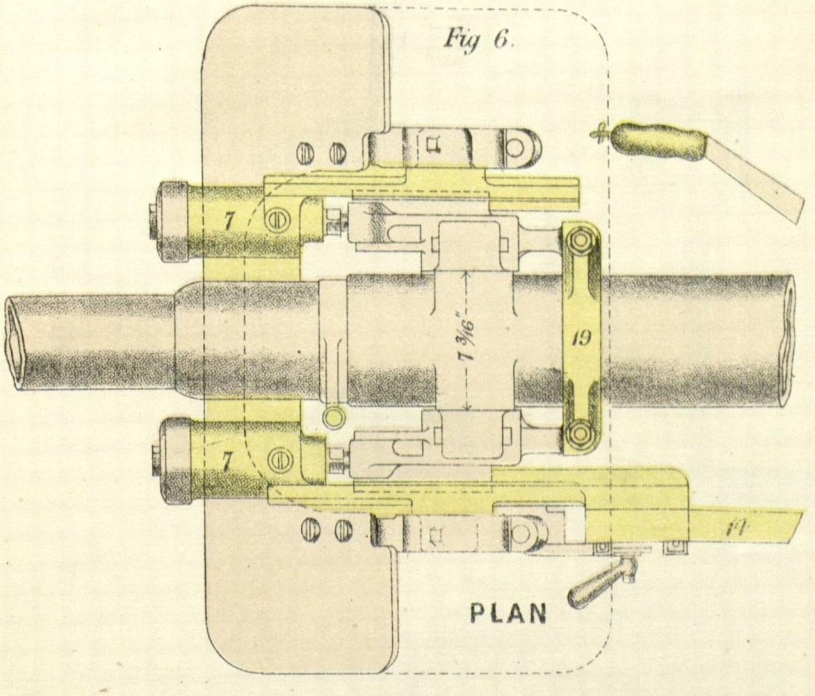
Scale 1/10th

Fig 5.



NORDENFELT GUN MARK I

Fig 6.



NORDENFELT GUN MARK II.

141 12·39.

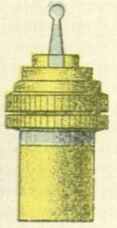
E. Weller & Cranams Ltd Litho London.

14.12.59

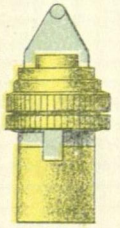
FORE SIGHT.

Scale ½.

FRONT VIEW.

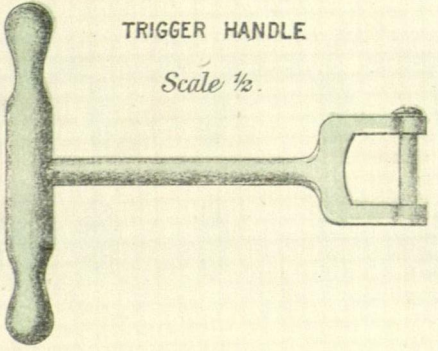


SIDE VIEW.



TRIGGER HANDLE

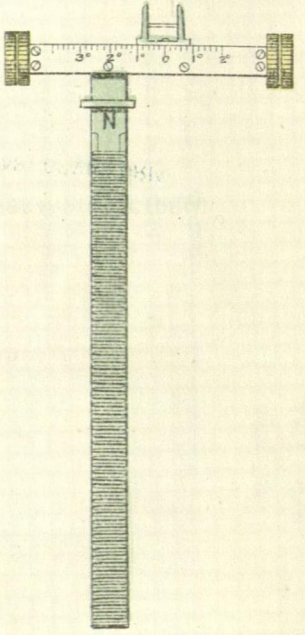
Scale ½.



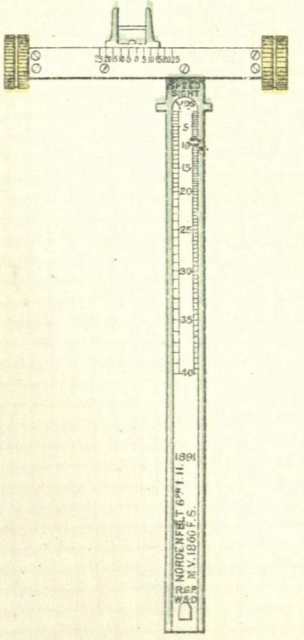
HIND SIGHT

Scale ¼.

FRONT VIEW.

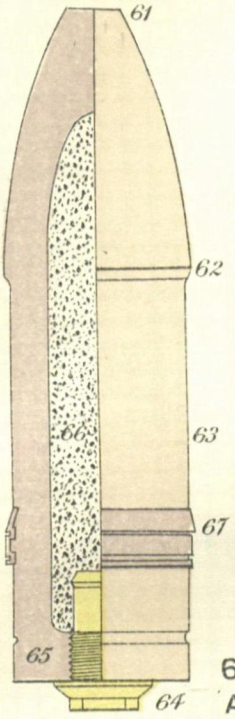


REAR VIEW.

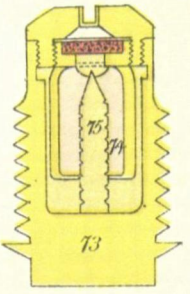


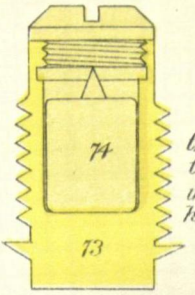
E. Weller & Grahams Ltd. Litho. London.

Plate XII.



COMMON SHELL
NOW BEING USED UP





12 threads to the inch left handed

THE BASE FUZE. MARK II
Full Size

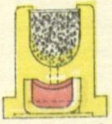
THE CAP
Full Size

6 PR AND 3 PR. AMMUNITION DETAILS ETC.

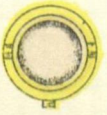
Suitable for either Nordenfelt or Hotchkiss Guns.

Felt wad secured with glue.

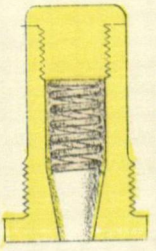
Paper wad secured with glue.



PRIMER FOR BLANK CARTRIDGE
Full Size

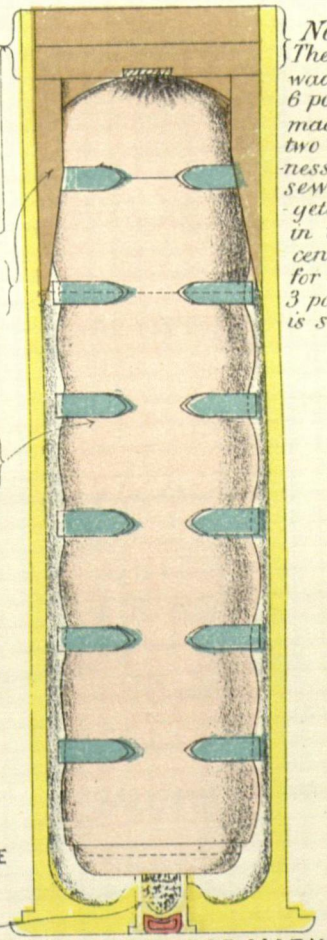


Shalloon cartridge



THE PRIMER OF DUMMY CARTRIDGE
Full Size

Removable primer.



Note The felt wad for 6 pdr is made in two thicknesses sewn together in the centre for the 3 pdr it is single

THE BLANK CARTRIDGE MARK III.
Half Full Size

141 12 99.

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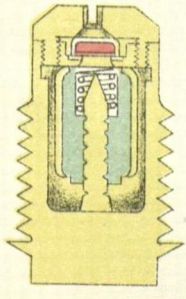
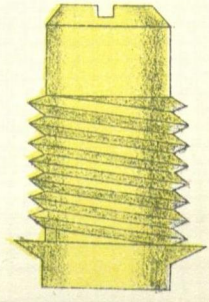
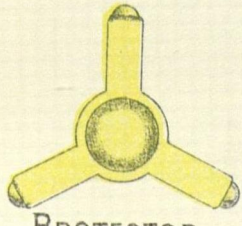
6 Pr Ammunition



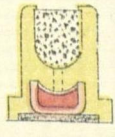


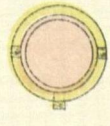
Base Fuze Mark III.

Cap
Full Size

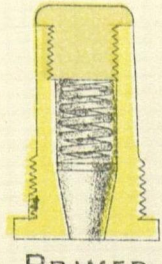


Protector
Half Size.

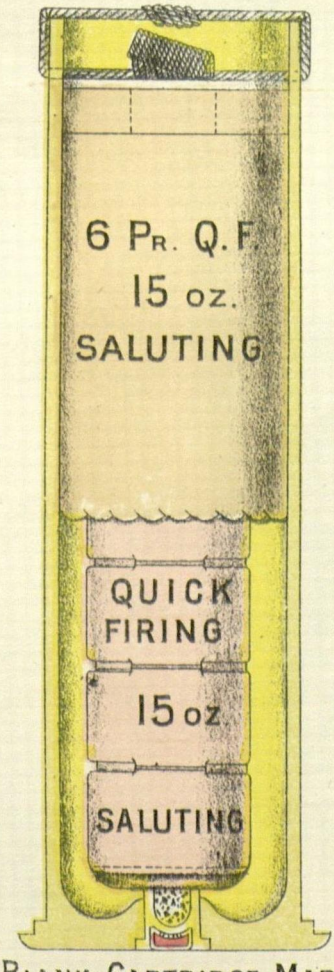




Primer
for
Blank
Cartridge
Full Size



Primer
of Dummy Cartridge
Full Size



Blank Cartridge Mark IV.

141, 12 59

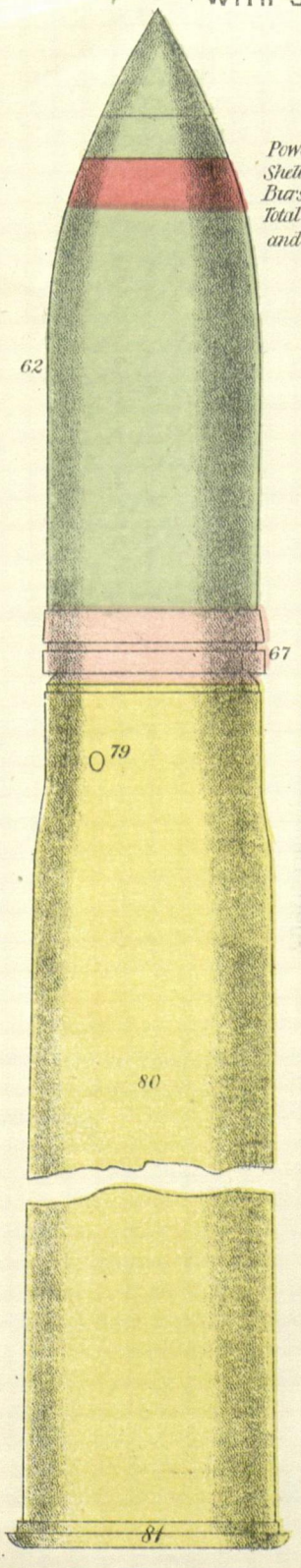
E. Weller & Grahams Ltd Litho London

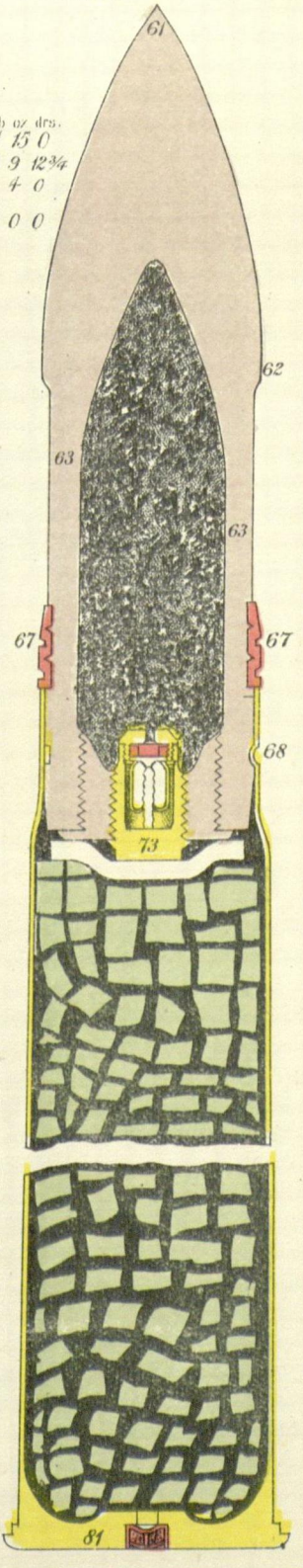
CARTRIDGE QUICK FIRING 6 PR SHELL. MARK III.

WITH STEEL SHELL FUSED.

Scale ½

WEIGHT	lb oz drs.
Powder Charge Q F I	1 15 0
Shell Empty	5 9 12¾
Bursting Charge	0 4 0
Total Weight of Fuzed and Filled Shell	6 0 0





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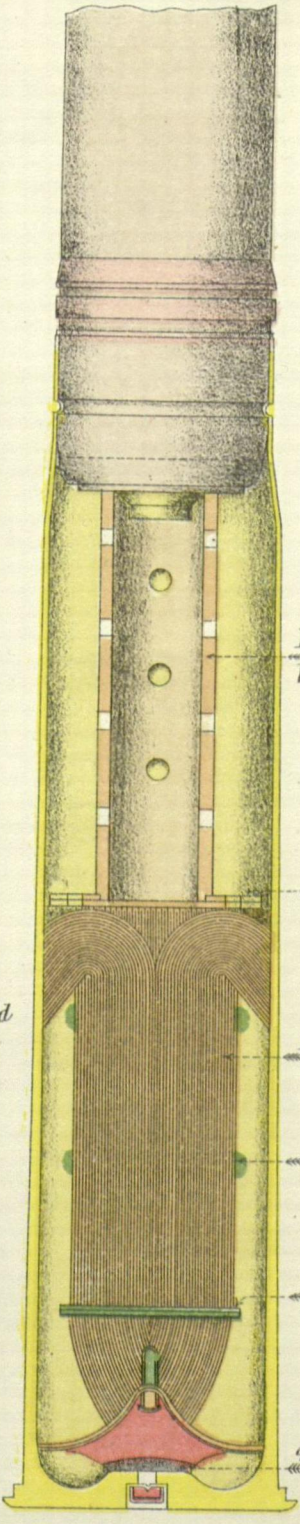
CARTRIDGE Q. F. 6 Pr FILLED WITH CORDITE.

Scale ½



Note: The ends of the Cordite should not be turned down as shown in the Plate.

141.12.99

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HANDBOOK

FOR THE

NORDENFELT 6-PR. QUICK FIRING GUNS.

Marks I. & II.

By command of the Lords Commissioners of the Admiralty.

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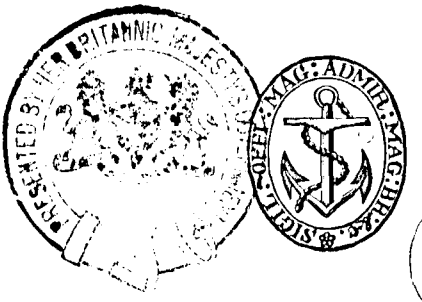
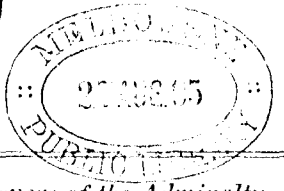
FOR THE

1884

NORDENFELT 6-PR. QUICK FIRING GUNS.

Marks I. & II.





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Price 9d

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G. 3669-93.

ORDNANCE B-L. GUN 6 PR. (MARK I) NORDENFELT.

EXTRACTOR MECHANISM ACTION LEVER & DRILL SLOP.

SCALE 1/6.

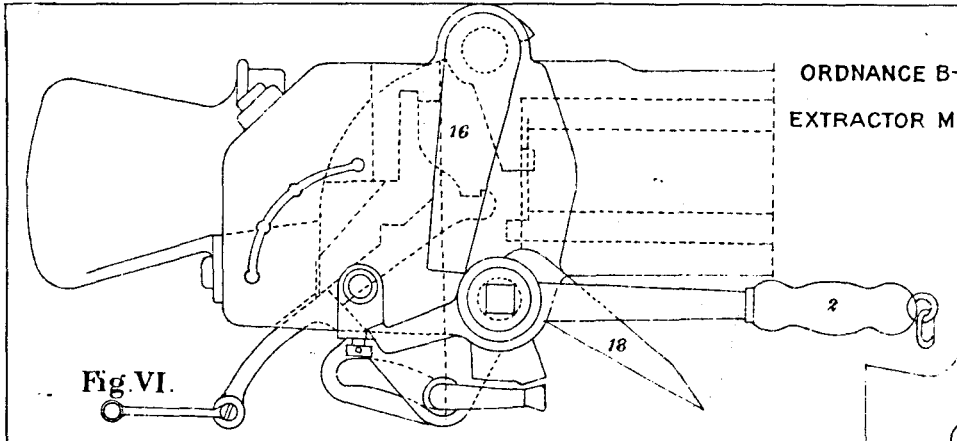

Fig. VI.

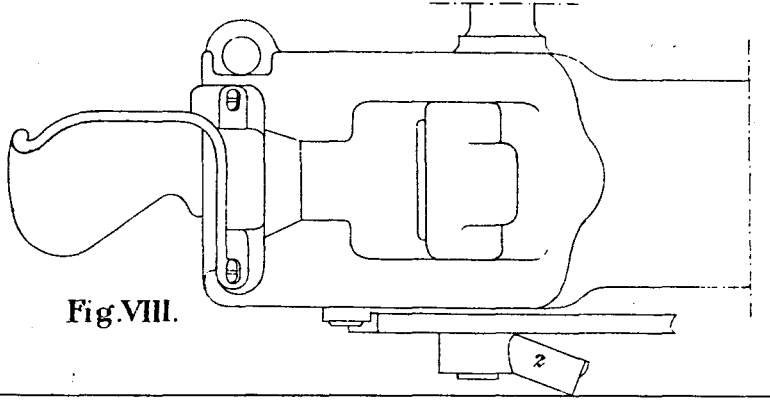

Fig. VIII.

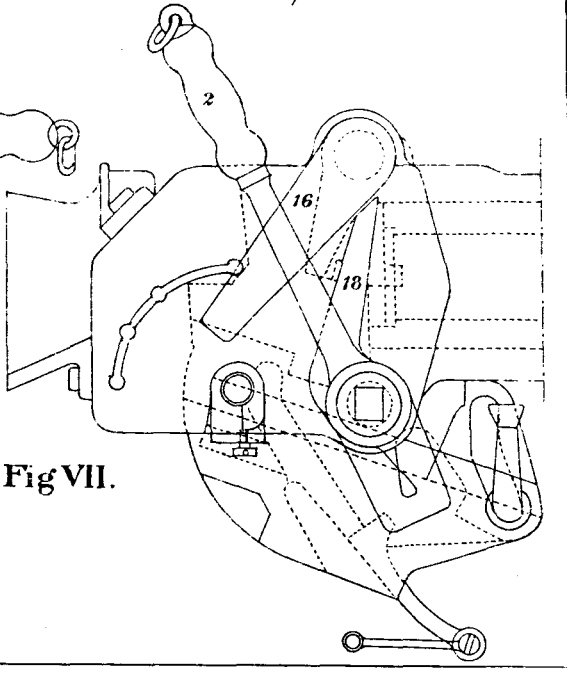

Fig VII.

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Plate 3.

To face page 2.

SHUT.

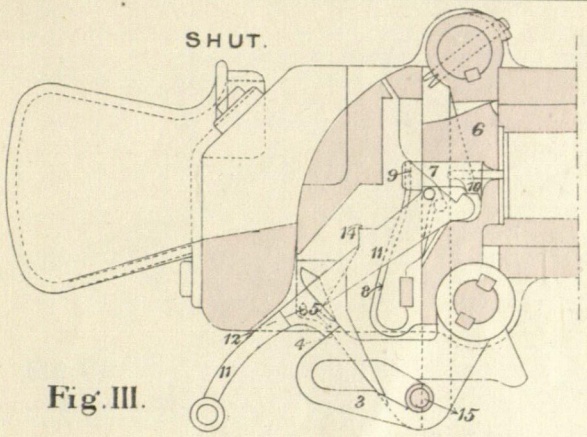

Fig. III.

PLAN.

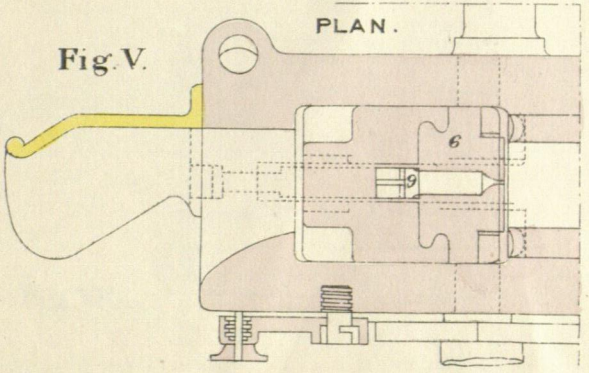

Fig. V.

OPEN.

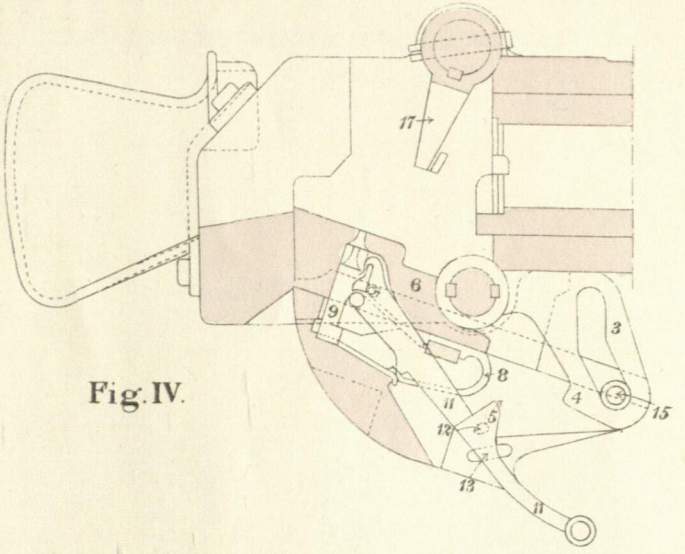

Fig. IV.

ORDNANCE B-L GUN 6 PR. (MARK I) NORDENFELT MECHANISM.

SCALE 1/8.

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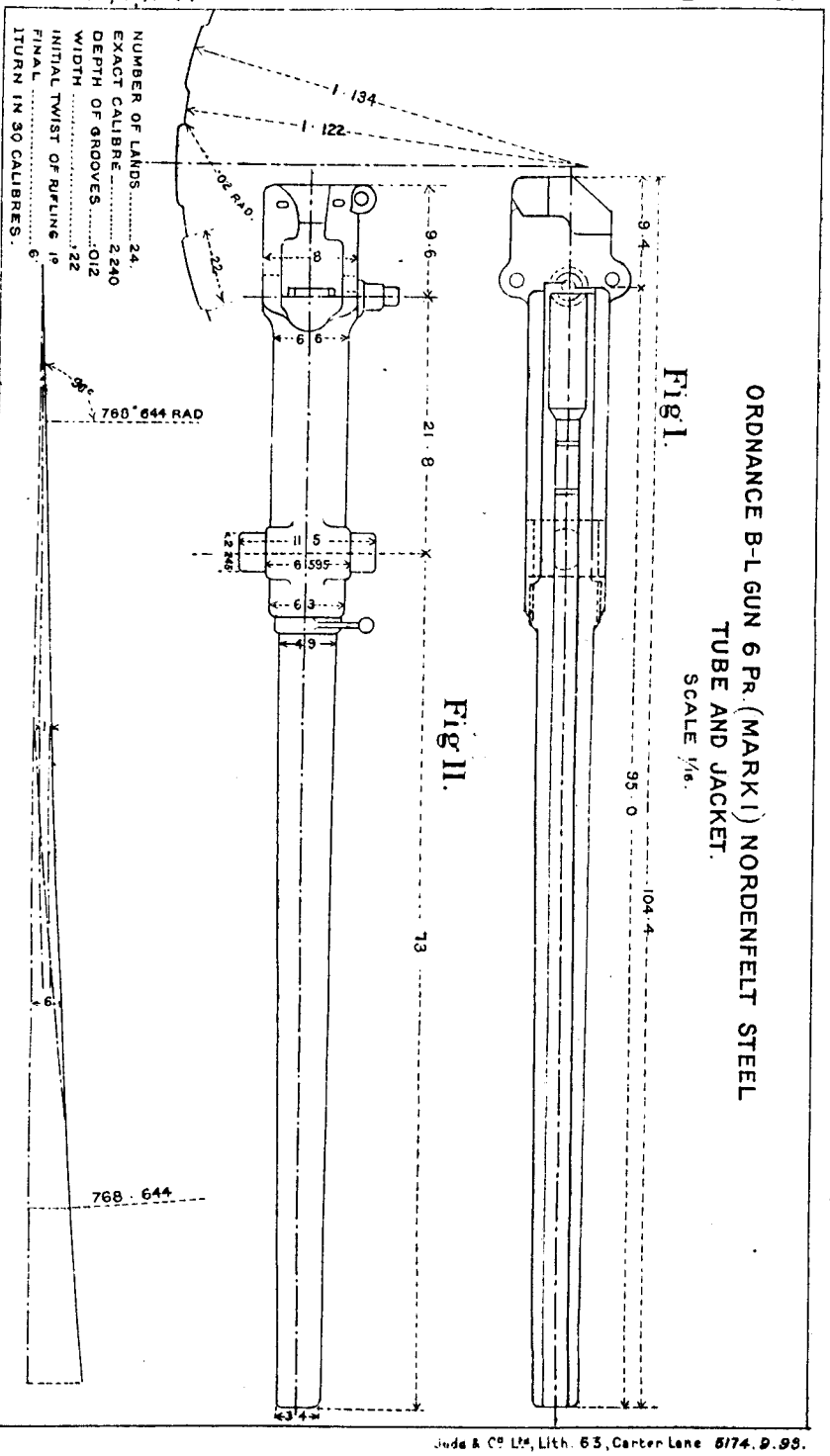

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HANDBOOK FOR THE NORDENFELT 6-PR. QUICK FIRING GUNS.

MARKS I. AND II.

MARK I.—6-PR.

The accompanying plate 1 illustrates sufficiently the manner in which the gun is constructed; it is only necessary to add that the material used for all portions of the gun is oil-tempered steel, carefully selected.

Mechanism.

The mechanism is made of steel, and consists of the following principal parts:—

a.—Action lever.
b.—Action cam.
c.—Breech block.
d.—Wedge.
e.—Extractor.
f.—Trigger lever.

Fig. 1. represents a vertical section of the gun. } Plate 1.
„ II.—A plan of the gun and development of the rifling. }
„ III.—A vertical section of the breech when closed. }
„ IV.—A vertical section of the breech when open. } Plate 2.
„ V.—A horizontal section of the breech when closed. }
„ VI.—An elevation of the breech when closed, showing the outside parts. }
„ VII.—An elevation of the breech when open. } Plate 3.
„ VIII.—A plan of the breech when closed. }

NOTE.—Parts marked (2), (16), and (18) are shown on Figs. VI., VII., and VIII.

Description of mechanism

Action lever has a vertical one-third circle motion from front to rear. It is one piece with the main axis (2) and extractor cam lever which projects to the front and rear. The heel of the extractor cam lever takes against a lever stop when the breech is properly closed.

Action cam (3) is connected to the main axis by 2 feathers and feather ways and has a slot, a part of which is concentric with the arc described by the action lever. On the rear upper

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part of the cam is a bearing (4) corresponding to one on the under part of the trigger lever (5).

Breech block (6) carries the firing pin (7), main spring (8), and trigger lever. The firing pin has cocking lugs (9) on its base for the wedge to act on, and on its under part is a lug (10) by which the trigger lever retains it. The main spring is flat, of great power and strength. The trigger lever (11) pivots on its pins, and its motion is regulated by a safety lug (12), moving round a corresponding lug (13) on the wedge. On the arm of the trigger lever are two lugs, one above (14) and one below (5), the former of which is acted on by the wedge. To the end of the trigger lever is attached a steel trigger handle for firing the gun.

The wedge has a vertical motion in the breech. On its lower end is a pin (15) which fits in the slot of the action cam.

The extractor lever (16) is connected to the double extractor (17), working on both sides of the cartridge case. The tongue of the extractor lever abuts on the extractor cam lever (18), which is on the main axis.

Action of the Mechanism.

The action of the mechanism is as follows, supposing the gun to have just been fired, and therefore the action lever in its most forward position:—

Lever moved back.

1st. The action lever carries the action cam slot over the action pin in the part which is concentric to its own motion, and, therefore, no movement of the mechanism takes place.

2nd. The part of the action cam slot which is not concentric to its own motion now engages the action pin, forcing the wedge down, which, acting on the cocking lugs of firing pin, forces it back and extends the main or firing spring. When the firing pin lug is clear of the trigger lever the wedge bearing acts on the upper trigger lever lug, forces up the trigger lever, which catches and retains the firing pin.

3rd. When the action pin has reached the end of the cam slot, the extractor lever begins to be forced back by its tongue, being met by the raised portion of the extractor cam lever, and the empty cartridge case is thus slowly started. The action pin having reached the end of the action cam slot, the action lever still moving back causes the breech block to rotate and fall back to the rear, and at the latter part of this movement brings the tongue of the extractor cam lever in contact with the extractor lever, and thus throws the empty cartridge case rapidly to the rear. The action lever is now at its furthest position to the rear.

1st. The breech block is brought up and carried forward, pushing a fresh cartridge into the chamber. Lever moved forward.

2nd. The cartridge being quite home, the action cam slot engages the action pin in the part of the slot which is not concentric, and forces the wedge up into position.

3rd. The forward motion of the action lever continuing, the action pin passes into the concentric portion of the action cam slot until the heel of the action cam lever takes under the lever stop; the action lever is now in its most forward position and the gun ready for firing.

4th. The gun is fired by pulling the steel trigger handle attached to the eye in the end of the trigger lever.

The gun cannot be fired before the breech is secured by the wedge :—

1st. As the inclined surface inside the wedge is formed in such a manner that the firing pin cannot be made to strike the cap of the cartridge until the wedge is quite home and supported by the entire bearing surface. If the trigger handle is pulled before the breech is secured, the cocking lugs on the firing pin strike on the inclined surface of the wedge, and the point cannot strike the cap of the cartridge.

2nd. The safety lug on the trigger lever is behind the corresponding lug on the wedge until the wedge is fully home, and the sear-nose of the trigger lever can consequently not be forced to release the firing pin before the breech is secured.

Mounting and Dismounting the Mechanism.

Dismounting.

1st. Open the breech.

2nd. Take out keep screw of lever stop, and remove lever stop.

3rd. Close the breech and partially withdraw the main axis so as to free the feathers on the axis.

4th Open the breech, take the weight of the block, and completely withdraw the main axis.

5th. Place the mechanism on a support, with its left side downwards, unscrew the action pin, and remove the action cam.

6th. Turn the mechanism with the wedge downwards, and draw the breech block out backwards.

7th. Ease the main spring by pulling the trigger handle, take out the spring by gently tapping its lower part, towards the left, with the hammer-like handle of the action pin.

8th. Remove the firing pin and trigger lever.

Mounting. The mounting or putting together the mechanism is performed in the reverse order to that of dismounting.

1st. Insert the firing pin and trigger lever.
2nd. Insert the main spring from behind with half its breadth underneath its holder on the breech block, and drive it forward by the action pin as far as it has to go, and then to the right till it is home.
3rd. Place the wedge on end, with the slot up, slide the block into the wedge, forcing it hard down with both hands, thus extending the main spring, till the firing pin is caught and retained by the trigger lever.
4th. Turn the mechanism with its left side downwards, insert the action cam, and screw in the pin, and let the end of its handle stop underneath the lug on the right-hand side of the breech block, which will thereby prevent it from sliding down.
5th. Lift the mechanism and place it in the breech in the position that it is when the breech of the gun is fully open.
6th. Insert main axis as far as it will go, then close the breech.
7th. Force the main axis right in so that the feathers on the axis engage in the grooves in the action cam slot.
8th. Draw the action lever back a short distance, and place on the lever stop, securing it with keep screw.

NOTE.—A drill stop was originally fitted to this gun; it has been removed, and the lever stop substituted.

TO DISMOUNT.—THE EXTRACTOR.

Open the breech; force out spring; partly close the breech; withdraw extractor axis; remove extractor.

CARE REQUIRED IN ORDER TO PRESERVE THE GUNS IN EFFICIENT WORKING ORDER.

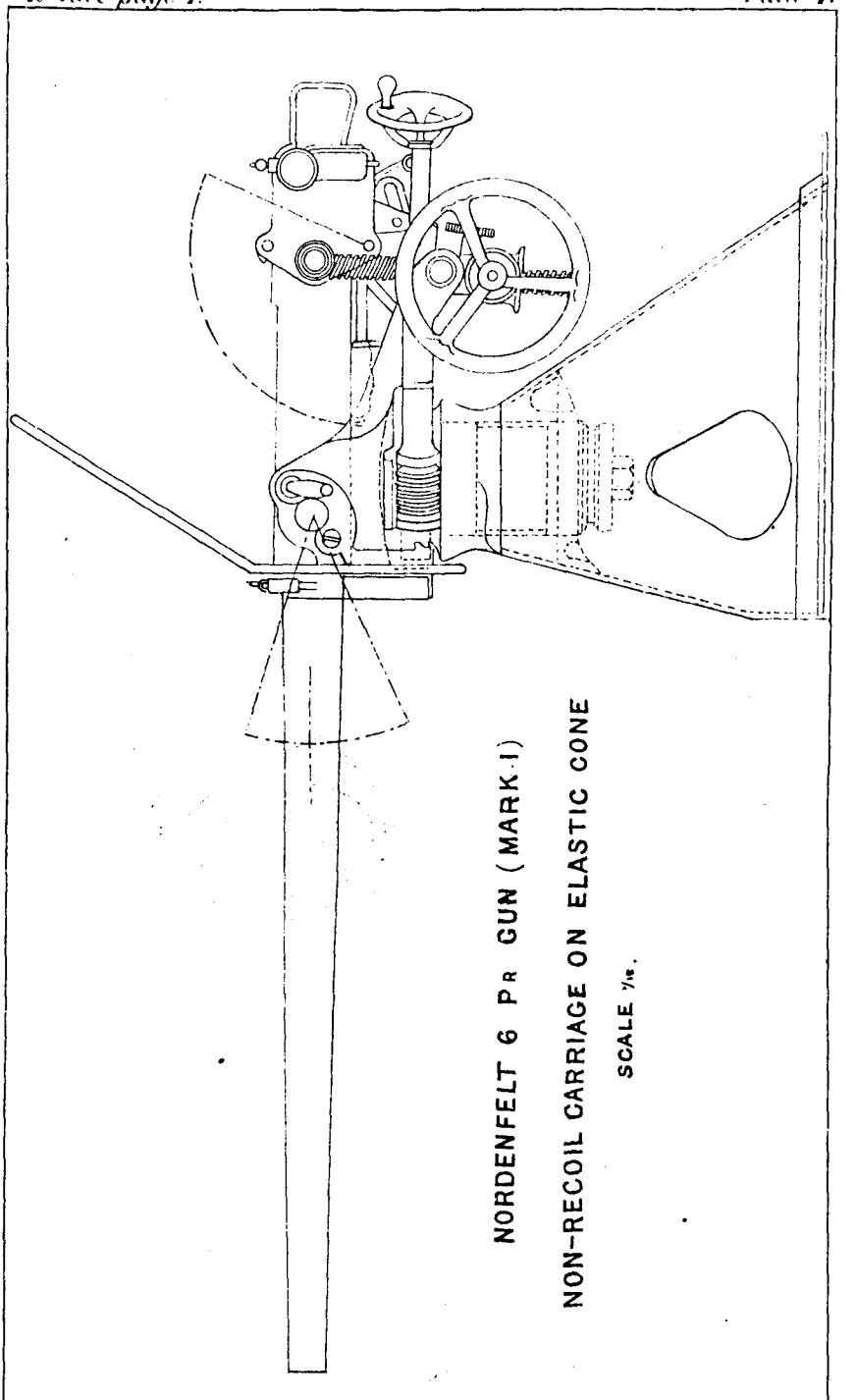
The guns must be kept clean, free from rust, and undefaced.

Brick-dust or substances of like nature must never be used on any part of the gun.

The parts of the mechanism must not be scraped or roughened in any way, but must be kept lightly oiled as a protection from rust.

After firing, every part of the gun must be thoroughly cleaned, the mechanism dismounted, washed with fresh water and soap, well dried, and then lightly oiled.

When all parts of the gun are cleaned, dried, and oiled, the mechanism may be mounted, and the gun should be protected from the weather.



NORDENFELT 6 PR GUN (MARK I)

NON-RECOIL CARRIAGE ON ELASTIC CONE

SCALE ½.

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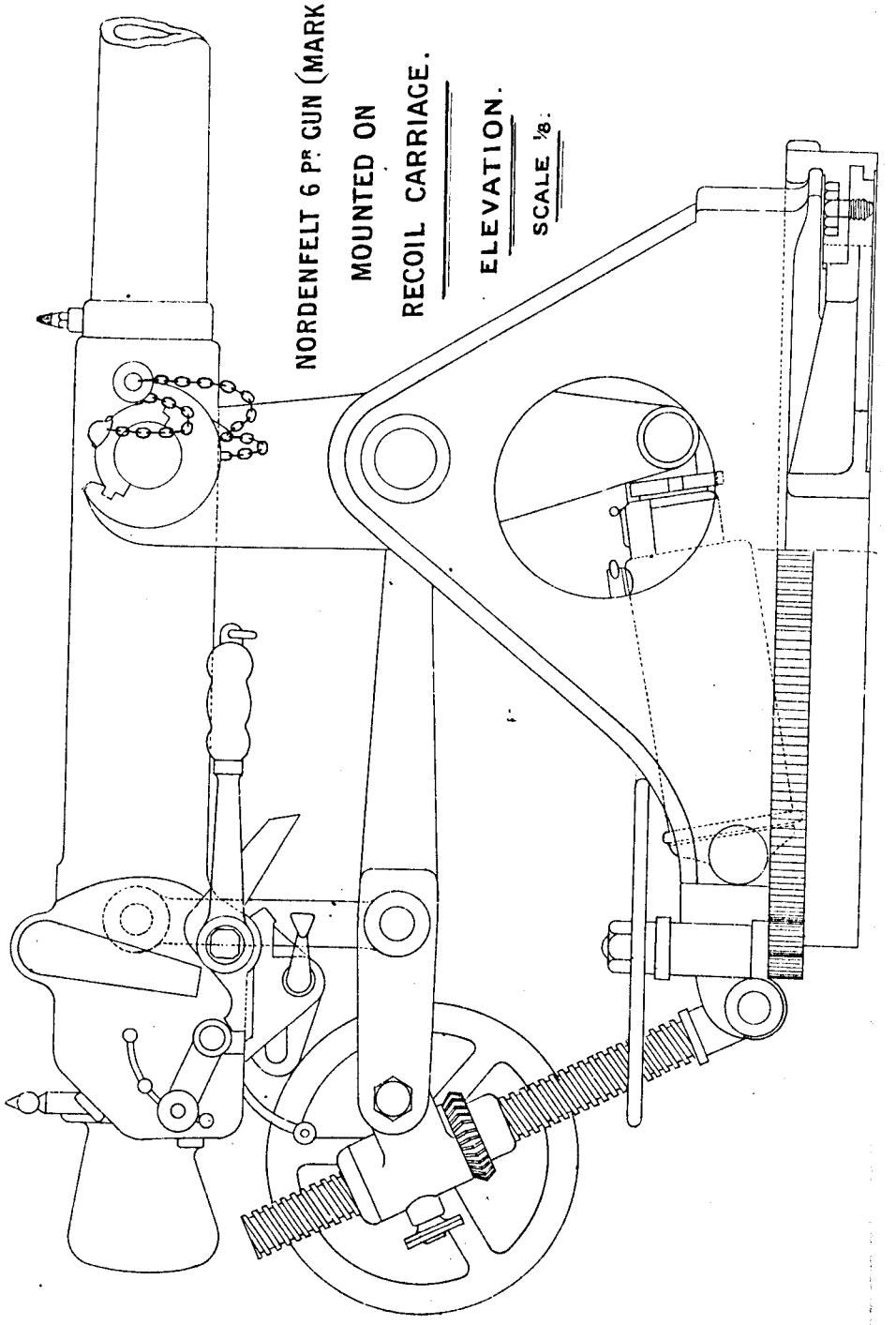

Judd & Co Ltd Lith 5174. 10. 93

MOUNTINGS.

There are at present two descriptions of mountings for these guns, viz.: Plate 6. Plate 7.

1. The recoil mounting. Recoil. mounting.
2. The non-recoil mounting.

The gun is mounted on a lever which is fork-shaped, and constitutes the bearings for the trunnions. This lever is pivoted, about the centre, on a bolt passing through the brackets of the carriage, and the lower end of the lever is connected to the piston rod of a combined hydraulic and spring buffer.

The elevation is effected by means of a hand-wheel and cog-wheel transmission, working a single elevating screw. The training is given by a pinion gearing into a horizontal racer attached to the deck.

The cylinder of the hydraulic buffer is grooved, and a constant pressure maintained during the recoil. It is desirable to see the cylinder filled with oil before the firing commences.

After recoil, the gun returns instantly to the firing position without any blow or rebound, and without causing any alteration in the training or elevation.

This mounting consists of a cross-head, in which the trunnions of the gun rest, and is there secured by cap-squares. This cross-head is one piece, with a strong steel pivot, which works in a gunmetal socket in the head of an elastic cone, secured in its place by a bolt from the outside of the cone. Non-recoil. mounting.

The cone is of sheet iron, and is firmly bolted to the deck. The training is given by a hand-wheel, which works a worm gearing into a horizontal worm-wheel on the head of the socket. The elevation is given by a vertical hand-wheel and bevelled cog-wheel gearing, by means of which the inside cylinder of the elevating nut, fixed to the arm of the cross-head, is turned.

Note.—There are a very few of the recoil mountings, which are in store at the present time.

ACCIDENTS.

The following accidents may possibly occur during practice with these guns, and in case of such occurence, the action detailed will prove efficacious:—

1. If in loading the cartridge appears too large and will not permit the breech to close readily, do not endeavour to force it home, but take it out and use another.
2. If a cartridge or case jams, and will not extract, force it out from the muzzle; in the case of a cartridge, taking

great care that the cap does not strike against anything whilst coming to the rear.

3. If the extractor breaks, open the breech, drive out keep pin, partially close the breech and shift the extractor.
4. If the firing pin or main spring break, dismount the mechanism, and replace the broken part.
5. If the gun constantly misses fire, after the usual pause, open the breech, examine the firing pin and cap of cartridge; if everything appears correct dismount the mechanism and change the mainspring.
6. If cartridges insert with difficulty, examine the edge of the chamber for burrs in the metal; if they are found to exist, remove them with a file.

   Note.—Care must be taken in loading that the point of the shell does not strike the entrance to the chamber.
7. Should a cartridge miss fire when the cap is fairly struck, it is on no account to be returned to the box. After waiting a pause of 30 seconds, the breech should be carefully opened, the cartridge removed and thrown overboard.

   Note.—On no account is the gun to be recocked after a miss fire.

SIGHTS.—(See Figs.)

The same forms of sights are used with the Mark I. and II. guns, the hind sight is of the H form, and the fore sight a bead sight. The hind sight is fitted with a deflection scale graduated in degrees in front and knots of speed in rear, the distance is marked in hundreds of yards on the rear face of the sight.

MARK II.—6-PR.

The accompanying Plate 8 illustrates sufficiently the manner in which the gun is constructed, and it will be observed, that in this respect it differs but slightly from Mark I. gun.

Mechanism. The mechanism is made of steel, and consists of the following principal parts :—

a.—Action lever.
b.—Action cam.
c.—Breech block.
d.—Wedge.
e.—Extractor.
f.—Tappet lever.
g.—Trigger lever.

Plate 8. { Fig. I. represents a vertical section of the gun.
„ II.—A plan of the gun and development of the rifling.

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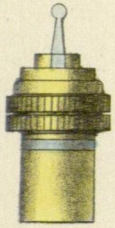
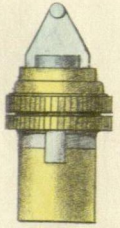
FORE SIGHT.

Scale ½.

FRONT VIEW.



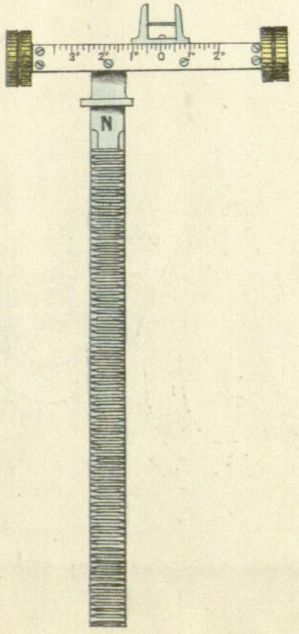
SIDE VIEW.



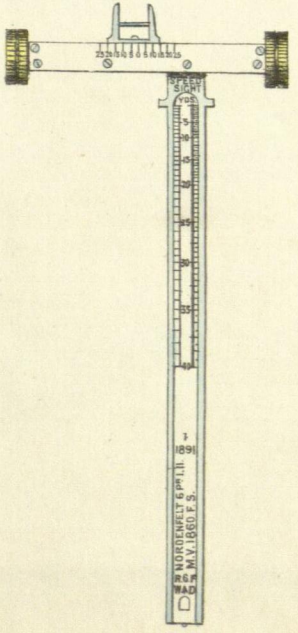
HIND SIGHT.

Scale ¼.

FRONT VIEW.

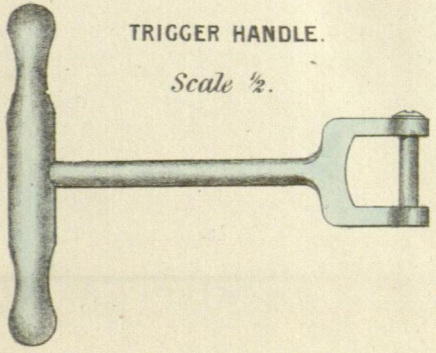


REAR VIEW.



TRIGGER HANDLE.

Scale ½.



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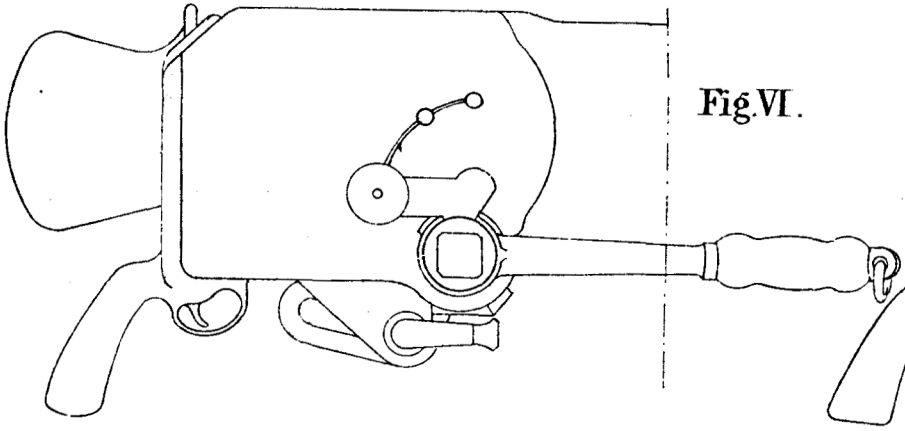


Fig. VI.

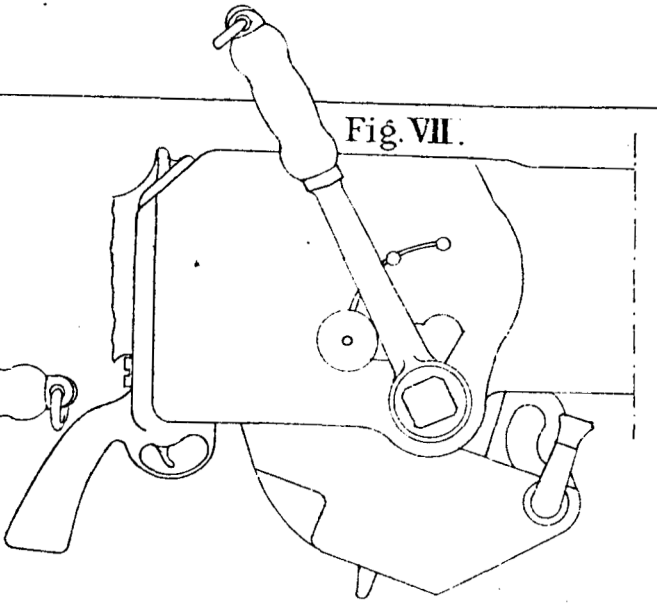


Fig. VII.

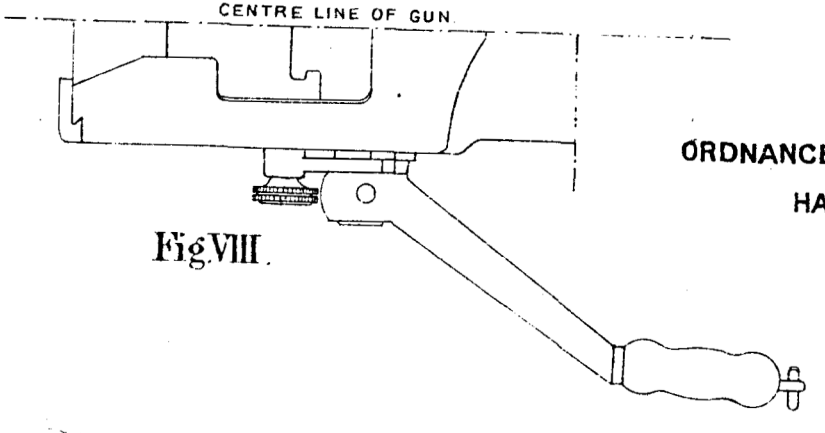


Fig. VIII.

ORDNANCE B-L. GUN 6 PR. (MARK II) NORDENFELT

HANDLEVER & DRILL STOP

SCALE 1/6

5174. 9.5

Plate 9.

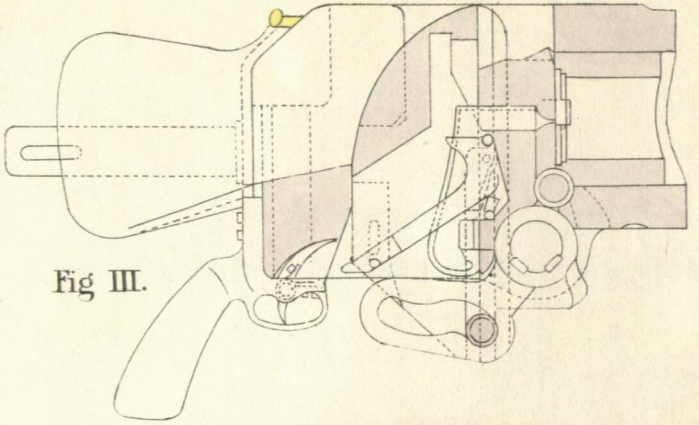
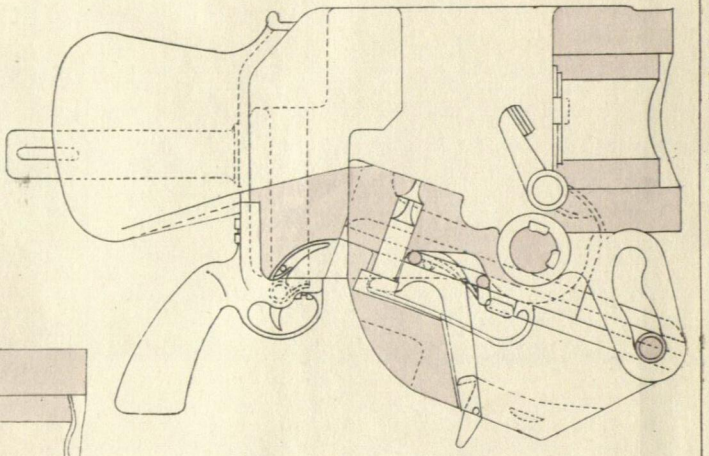


Fig III.

Fig IV.



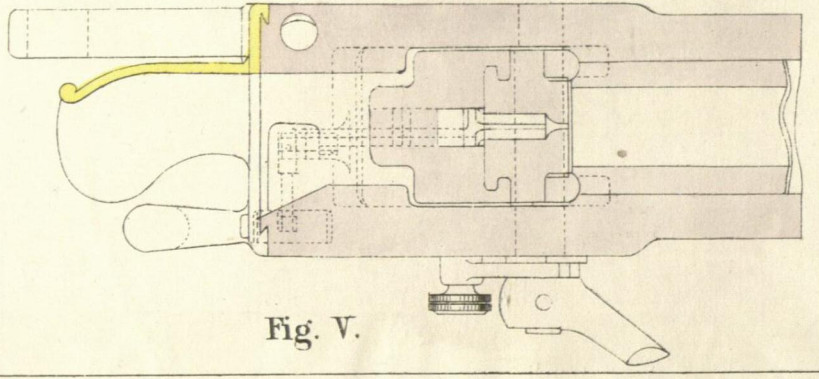


Fig. V.

ORDNANCE B.- L. GUN. (MARK II.)

NORDENFELT

MECHANISM.

SCALE 1/6.

To face page 9.

Judd & Co. Lt.d, Lith. 63, Carter Lane, E.C. 74, 10, 88

Fig. III.—A vertical section of the breech when closed.
" IV.—A vertical section of the breech when open. } Plate 9.
" V.—A horizontal section of the breech when closed.
" VI.—An elevation of the breech when closed, showing the outside.
" VII.—An elevation of the breech when open. } Plate 10.
" VIII.—A plan of the breech when closed.

It will be observed that the arrangement of the mechanism in Mark II. gun differs somewhat from that in Mark I. This has been necessary, as Mark II. gun is intended to be used with a shoulder piece, whereas Mark I. is intended for wheel gear.

Description of mechanism

a. Action lever has a vertical one-third circle motion from front to rear. It is one piece with the main axis.

b. Action cam is connected to the main axis by two feathers and feather ways and has a slot, a part of which is concentric with the arc described by the action lever.

c. Breech block carries the firing pin, main spring, tappet lever and trigger lever. The firing pin has bevelled projections or cocking lugs on its base for the wedge to act on, and in the under part there is a groove in which the trigger lever catches and retains it. The main spring is flat, of great power and strength. The trigger lever pivots on its pins, and its motion is regulated by a safety lug moving round a corresponding lug on the wedge. The tappet lever actuated by the wedge strikes the trigger lever, so catches and retains the firing pin.

d. The wedge has a vertical motion in the breech. On its lower end is a pin which fits in the slot of the action cam.

e. The extractor axis is one with the "drill stop." The extractor works on both sides of the cartridge case, and has two projections which abut on the lower part of the breech block.

Action of the Mechanism.

The action of the mechanism is as follows, supposing the gun to have just been fired, and therefore the action lever in its most forward position.—

Lever moved back.

1st. The action lever carries the action cam slot over the action pin in the part which is concentric to its own motion, and therefore no movement of the mechanism takes place.

2nd. The part of the action cam slot which is not concentric to its own motion now engages the action pin, forcing the wedge down, which, acting on the cocking lugs of firing pin forces it back and extends the main or firing spring. When the firing pin lug is clear of the trigger lever, the wedge bearings act on the tappet lever and forces up the trigger lever, which catches and retains the firing pin.

3rd. The action pin having reached the end of the action cam slot, the action lever still moving back causes the breech block to rotate and fall back to the rear. In the beginning of this movement, the projections on the extractor have been slowly forced forward by the turning of the breech block, and the empty cartridge case is thus slowly started, and at the latter part of this movement the projections on the extractor get a much quicker motion forward, and the extractor thus throws the empty cartridge case rapidly to the rear. The action lever is now at its furthest position to the rear.

Lever moved forward.

1st. The breech block is brought up and carried forward, pushing a fresh cartridge into the barrel.

2nd. The cartridge being quite home, the action cam slot engages the action pin in the part of the slot which is not concentric, and forces the wedge up into position, the action pin then passes into the concentric portion of the action cam slot.

3rd. The forward motion of the lever continuing, the end of the trigger lever comes in contact with the trigger.

The "drill stop" is placed on the right side of the breech, and keeps the action lever in its place. Firing the gun is effected by pulling the trigger, which is protected by a guard.

The gun cannot be fired before the breech is secured by the wedge :—

1st. As the inclined surface inside the wedge is formed in such a manner that the firing pin cannot be made to strike the cap of the cartridge until the wedge is quite home and supported by the entire bearing surface. If the trigger is pulled before the breech is secured, the cocking lugs on the firing pin strike on the inclined surface of the wedge, and the point cannot strike the cap of the cartridge.

2nd. The safety lug on the trigger lever is behind the corresponding lug on the wedge until the wedge is fully home, and the end of the trigger lever consequently cannot be forced to release the firing pin before the breech is secured.

Mounting and Dismounting the Mechanism.

Dismounting.

1st. Place the drill stop in the position marked for taking out the mechanism.

2nd. Move the lever to the rear as far as possible.

3rd. Withdraw the lever completely, a man holding his hands beneath the mechanism in order to receive it.

4th. Place the mechanism on a support, with its left side

downwards, unscrew the action pin, and remove the action cam.

5th. Turn the mechanism with the wedge downwards, and draw the breech block out backwards.

6th. Ease the main spring by pulling the trigger lever, which then becomes free; turn the tappet trigger, so that it is out of the way of the main spring, which remove by gently tapping its lower part, towards the left, with the hammer-like handle of the action pin.

7th. Remove the firing pin and tappet lever.

Mounting. The mounting or putting together the mechanism is performed in the reverse order to that of dismounting.

1st. Insert the firing pin and trigger lever.

2nd. Place the tappet lever in the same position as when the main spring was taken out.

3rd. Insert the main spring from behind with half its breadth underneath its holder on the breech block, and drive it forward by the action pin as far as it has to go, and then to the right till it is home.

4th. Place the wedge on end, with the slot up; slide the block into the wedge, forcing it hard down with both hands, thus extending the main spring till the firing pin is caught and retained by the trigger lever.

5th. Turn the mechanism with its left side downwards, insert the action cam, and screw in the action pin, and let the end of its handle stop underneath the lug on the right hand side of the breech block, which will thereby prevent it from sliding down.

6th. Lift the mechanism and place it in the breech in the position that it is in when the breech of the gun is fully open.

7th. Insert completely the action lever in a position corresponding to that of the mechanism, viz., in its extreme rear position.

8th. Turn the handle of the action pin so as to allow the wedge to slide.

9th. Lock the mechanism by moving the lever into its extreme forward position.

10th. Lock the lever by placing the "drill stop" in the horizontal position.

NOTE.—The "drill stop" placed in the position marked enables it to be taken out; the extractor is then free to be removed.

CARE REQUIRED IN ORDER TO PRESERVE THE GUNS IN EFFICIENT WORKING ORDER.

The same care is required with the Mark II. guns as has been already detailed for Mark I. guns, *see* page 6.

Plate 11.

NON-RECOIL MOUNTING.

This mounting consists of a cross-head, in which the trunnions of the gun rest, and is there secured by cap-squares. This cross-head is one piece, with a strong steel pivot, which works in a gun-metal socket in the head of an elastic cone, secured in its place by a bolt from the outside of the cone.

The cone is of sheet iron, and is firmly bolted to the deck. The elevation and training are given by means of a shoulder piece attached to the loading shield fixed in the rear of the gun.

ACCIDENTS.

The same accidents may possibly occur during practice with the Mark II. guns as with the Mark I. These, and the action necessary in order to remedy them, are detailed at pages 8, 9.

SIGHTS.

The Mark II. guns are fitted with the same sights as the Mark I. guns. For details, *see* page 9.

AMMUNITION.

6-Pounder.

NOMENCLATURE.

Plates VII. and VIII.

Shell. (61) Point; (62) shoulder; (63), wall; (64) base; (65) fuze seat; (66) chamber; 67 driving band: (68) cannelure.

Fuze. (73) Body; (74) pellet; (75) needle; (76) detonator; (77) screw cap; (78) plug.

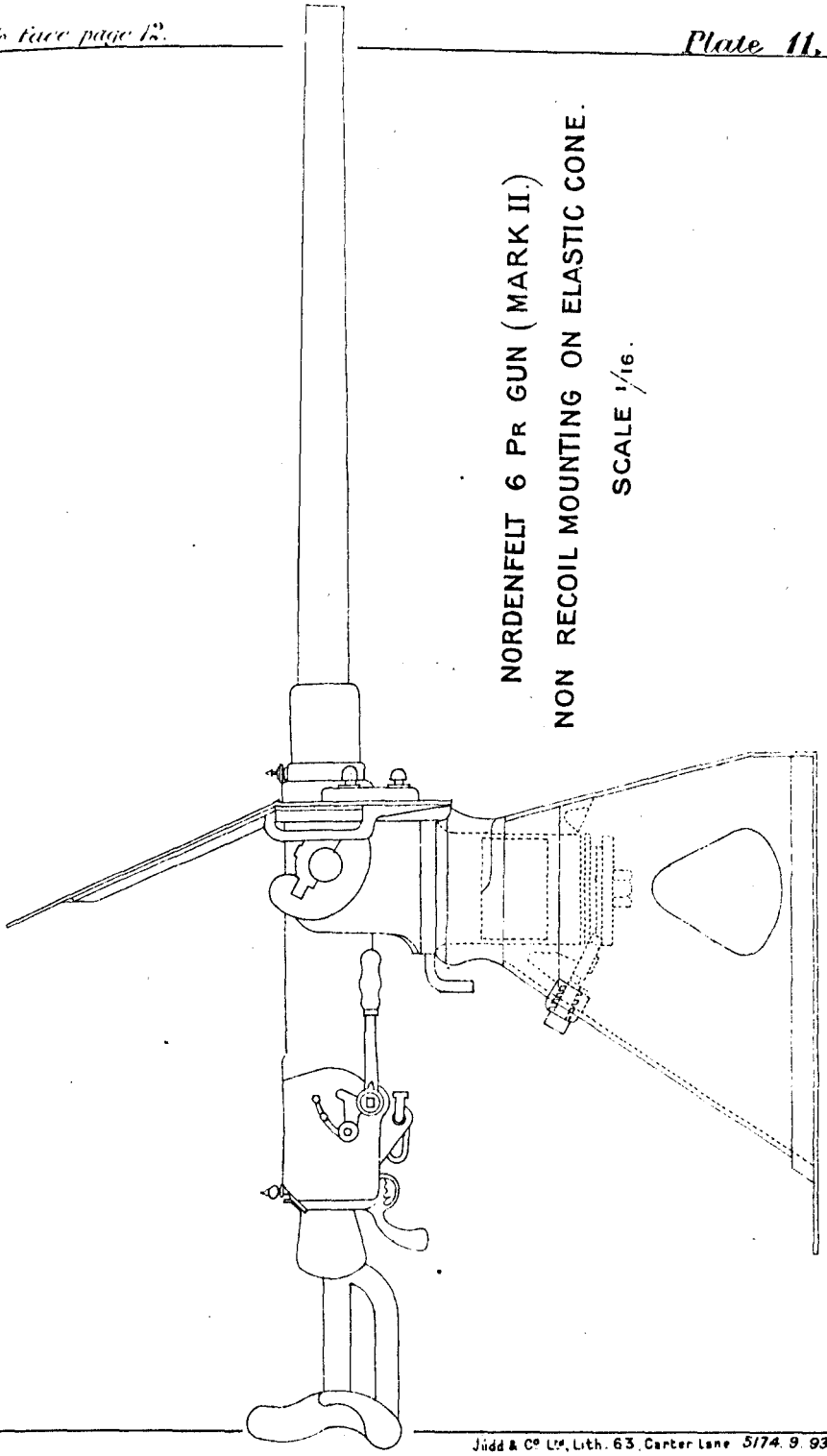
Cartridgecase (79) Neck; (80) body; (81) base.

Primer. (82) Case; (83) cap; (84) anvil.

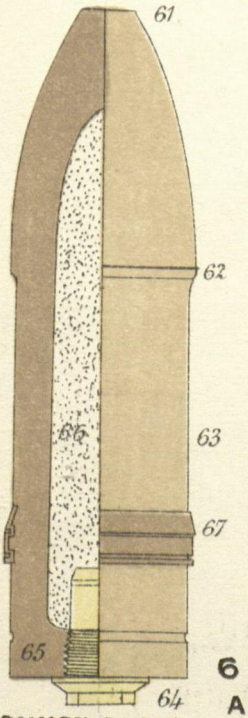
The 6 pr. ammunition is interchangeable with Hotchkiss or Nordenfelt guns.

The cartridge case, cap chamber, and cap. The cartridge case is of solid drawn brass; the interior is varnished. The cap chamber is of brass, is pierced with three fire holes, and contains the percussion cap, which is of copper.

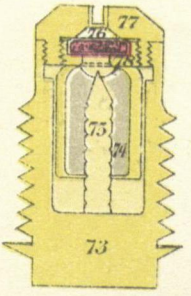
NORDENFELT 6 PR GUN (MARK II.)
NON RECOIL MOUNTING ON ELASTIC CONE.
SCALE 1/16.

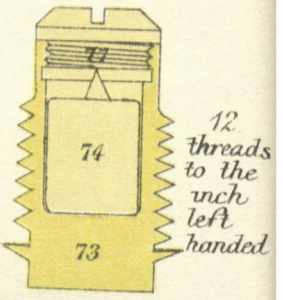


Judd & Co Ltd, Lith. 63, Carter Lane 5174. 9. 93.



COMMON SHELL
NOW BEING USED UP



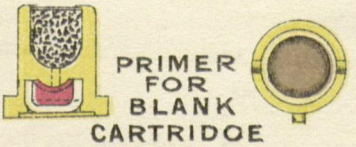


THE BASE FUZE
Full Size

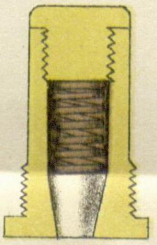
THE CAP
Full Size

6 PR AND 3 PR AMMUNITION DETAILS ETC.

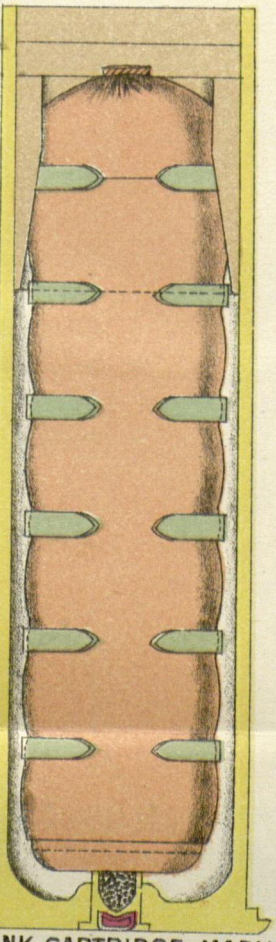
Suitable for either Nordenfelt or Hotchkiss guns.



PRIMER FOR BLANK CARTRIDGE
Full Size



THE PRIMER OF DUMMY CARTRIDGE
Full Size.



THE BLANK CARTRIDGE MARK III.
Half Full Size

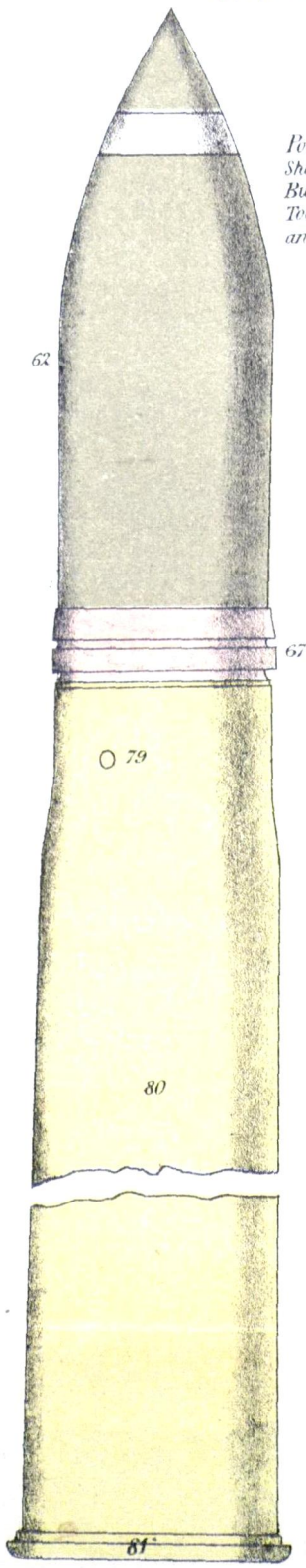
Judd & Co Ltd, Lith. 4098.

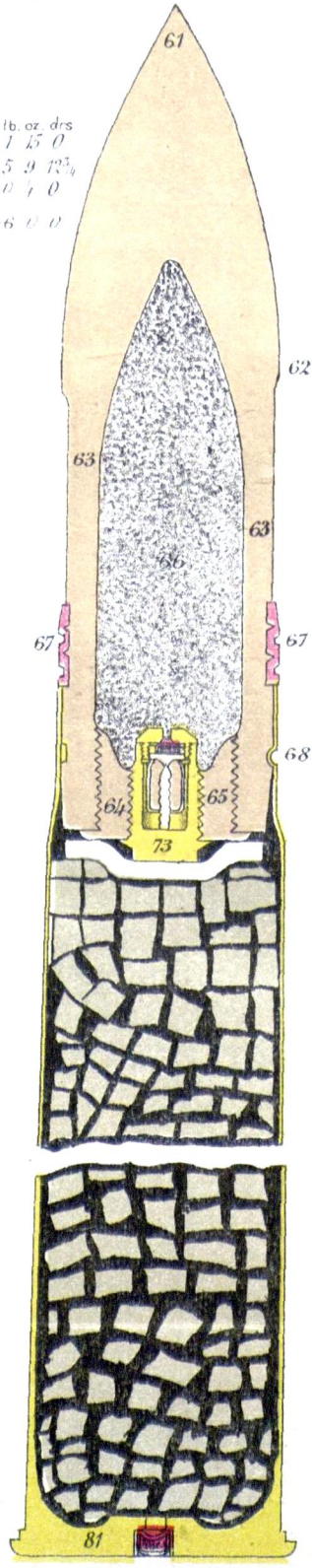
CARTRIDGE QUICK FIRING 6 PR SHELL. MARK III.

WITH STEEL SHELL FUZED.

Scale $\frac{1}{2}$

WEIGHT	lb.	oz.	drs
Powder Charge Q.F.	1	15	0
Shell Empty	5	9	$13\frac{3}{4}$
Bursting Charge	0	7	0
Total Weight of Fuzed and Filled Shell	6	0	0





Judd & Co Ltd, Lith. 4098./0.9.

The service shell is made of steel, it is furnished with a copper driving band of the usual type and has a shallow groove or cannelure near the base into which the cartridge case is indented at three points. The base piece is of mild steel, and is screwed into the shell; it is optional to manufacturers whether a base piece is employed or the base formed in one with the body. The base is bored and screwed to receive the fuze. The head is pointed and is struck with a radius of 6·555 inches. The interior of the shell is varnished; the exterior is painted black with a white band round the head. The present stock of common shell (of which a drawing is shown in *Plate VIII.*), is now being used up for target practice. The service or steel shell.

The body of the Hotchkiss fuze is of gun metal threaded to screw into the base of the shell, and is fitted with a percussion pellet, gun metal screwed cap, screw plug, and a copper detonating cap. The percussion pellet consists of a brass casing filled with lead, in which a hard drawn brass wire needle (roughened) is embedded. The cap is filled with detonating composition and covered with a thin brass disc. The Hotchkiss fuze.

The shock of discharge sets the pellet back along the needle, leaving the whole free to fly forward against the cap on graze or impact. Action of fuze.

The 6-pounder cartridge case contains 1 lb. 15 oz. of Q.F. powder, and the shell is filled with 4 oz. of quick fine grain powder. The powder.

Dimensions of Ammunition.

	For 6-pounder.	
Diameter over base	3 inches.	The case.
„ at neck	2·3 „	
Total length	12·07 „	

	For 6-pounder.	
Diameter over body	2·22 inches.	The shell.
„ at swell	2·24 „	
„ at driving band	2.29 „	
Length	8·583 „	
Weight empty	5 lbs. 9 ozs.	

The complete cartridge. The shell is inserted in the neck of the cartridge case, and is secured by 3 indents. A felt wad is placed in the case between the head of the fuze and the powder.

Safety clip. To protect the cap against being accidentally struck a brass safety clip is placed on the base of the cartridge, a dome is formed in the centre of it to cover the cap.

Results of firing. The fuze will act when the shell is fired at a steel plate $\frac{3}{16}$in. in thickness, or on 2-inches of wood. The shell, if fired without a burster at a 4-in. W.I. armour plate, placed at right angles to the line of fire at 100 yards range, will not break up.

Dummy Ammunition.

Dummy ammunition. Dummy ammunition consists of an ordinary cartridge case weighted with wood and having a wooden projectile which is held to it by screws; in the base a metal primer is screwed in containing an india rubber disc, instead of a cap and a spiral spring bearing against the india rubber; the front end of the primer is closed by a screw plug. One of these dummy cartridges should always be used at drill to avoid injury to the striker, but should not be kept in the gun. Four rounds of dummy cartridges are allowed per gun (which are issued in Mark I. ammunition boxes, if available, otherwise in Marks II. or III.), but the boxes containing 11 rounds are always issued full, with the word *Dummy* painted in large letters on the *front* and *top* of the box.

Blank and Saluting Ammunition, Mark III.

The Mark III. blank and saluting ammunition for these guns is identical, the terms "blank" and "saluting" having reference only to the proportions in which it is issued.

The cartridge case. The ammunition consists of a short, solid drawn cartridge case, fitted with a hole in the base, into which is inserted a

The primer. removable primer which is held in place by a small stud or pin engaging in an inclined circular groove formed round the hole in the base. The primer consists of a small brass tube, capped and primed with fine-grain powder; two slots are formed in it with the aid of which and a special screw-driver the primer is forced into place or removed. The cartridge cases (ready primed) are supplied in wooden boxes, 20 in each box and additional primers are supplied in tin cylinders, 20 in each cylinder.

The charge. The charge (which is the same for all 6-pr. aud 3-pr. quick-firing guns) is made up of 15 ozs. of F.G. powder in a shalloon bag, and is issued in half metal-lined cases, 50 in each case.

To hold the charge back against the primer paper split wads are supplied which are placed in, tightly, round the latter after it has been inserted; the mouth of the case is closed by a felt wad which is shellaced in. The wads, together with the primers and tools for repriming, are issued in a special box (Mark III.) for saluting tools. The wads.

In addition to the special screw-driver for inserting or removing the primers, a 12·7 inch rod is supplied for driving out the primer if set fast or if the pin of it has been broken; there is 1 screw-driver and 1 rod in each box of saluting tools. Re-priming tools.

Mark II. blank or saluting ammunition resembles Mark III., except that the base of the cartridge is provided with a percussion cap instead of a removable primer, and no paper split wad is employed to hold the charge back; the cap chamber and cap are the same as in the service cartridge.

Spare caps in their cap chambers are supplied in tin cylinders, 150 in a cylinder, and together with the felt wads and tools for recapping are issued in a special box (Mark II.) for saluting tools.

For driving out the fired caps a 12·7 inch steel rod is supplied, and for inserting the caps a 4 inch rod; three of each are supplied in each box of saluting tools. Re-capping tools.

Mark II. ammunition will be withdrawn from all ships for conversion to Mark III. as soon as supplies of the latter mark are available.

Note.—In case of a missfire with blank ammunition the breech is not to be opened for 10 *minutes*, and then gently; the cartridge complete is to be thrown overboard at once. Missfires with blank ammunition.

Instructions for Re-capping and Re-filling Mark II. or III. Blank and Saluting Ammunition.

1. Remove the fired primer or cap by means of the screw-driver or the 12·7 inch rod and a hammer.
2. Clean the interior of the case when necessary, by washing it in hot soda water, and afterwards thoroughly dry it. After once firing it may only be necessary to wipe out before re-capping.
3. Insert a new primer or cap in the base with the screw driver (Mark III.) or with the 4-inch rod and a wooden mallet (Mark II.); the primer or cap must be forced close home.
4. Place a clip on the base of the cartridge to protect the cap.
5. Insert the charge in the case, and place over it a paper split wad, which should be firmly pressed in; over the charge and paper wad place the felt wad, which should also be firmly pressed in and secured with shellac. For Mark II. charges no

split wad is supplied; after pressing in the felt wad cut a tongue in the rim of the cartridge case and turn it in over the wad.

SALUTING.

Salutes are to be fired by :—

(*a*) All ships commanded by a Captain or Commander carrying 4 or more quick-firing guns of the same nature (6-pr. or 3-pr.). The 6-pr. is to be used for saluting when 4 or more of that nature are carried, otherwise the 3-pr., provided there are 4 or more of that nature on board.

(*b*) Ships not included in (*a*), but which are specially provided with 6 light guns for saluting.

(*c*) Ships not included in (*a*) or (*b*), but which carry 10 or more broadside guns, not heavier than the R.M.L. 7-inch 6½ tons.

(*d*) Special cases not included above are also sanctioned by Art. 45. Queen's Regulations.

There are a few exceptions to rule (*a*), where the 4 quick-firing guns are not suitably placed for saluting, and the ships have been supplied with saluting ammunition for the guns mentioned in (*b*) or (*c*), or have been classed as non-saluting ships. Such exceptions are noted in the Confidential Armament List.

SUPPLY OF AMMUNITION.

SERVICE AMMUNITION ALLOWED—

Steel shell 400
Common 100 } rounds per gun

(until the stock of common shell is exhausted, when all steel will be supplied).

SALUTING AMMUNITION ALLOWED—

To each ship or vessel in which the 6-pr. Nordenfelt guns are used for saluting.

Articles.	6-pounder.		Remarks.
	If Mark II. Ammunition.	If Mark III. Ammunition.	
Caps (in tin cylinders, each containing 150).	900	—	* In Flagships each of these quantities is 1,000.
Primers (in tin cylinders, each containing 20).	—	400*	
Cartridges, shalloon, 15 oz. (in half metal lined cases, 50 in each).	500*	500*	
Cases, cartridge, empty (in wooden boxes, 20 in a box), (capped).	200	200	
Wads, felt	1,000	500*	
Wads, paper	—	500*	
Tools, cartridge, Q.F., saluting. Boxes for	3	4*	* In Flagships each of these quantities is 8.
Tools, cartridge, Q.F., saluting. Drivers, screw, primer 6-pr. or 3-pr.	—	4*	
Tools, cartridge, Q.F., saluting. Rods, steel. 12·7-inch (removing primer or cap).	9	4*	
Tools, cartridge, Q.F., saluting. Rods, steel. 4-inch (inserting cap) ...	3	—	

BLANK AMMUNITION ALLOWED—

To all ships and vessels for 6-pr. Nordenfeldt quick-firing guns, except when these guns are provided with the saluting proportion shown in the preceding table.

Articles.	6-pounder.		Remarks.
	Mk. II.	Mk. III.	
Caps (in tin cylinder, each containing 150).	*a*600	—	*a* To each ship carrying 6-pr. Q.F. blank ammunition.
Primers (in tin cylinder, each containing 20).	—	*b*100	*b* To every 2 or less number of guns, not to exceed 400 per ship.

Blank ammunition allowed—*cont.*

Articles.	6-pounder. Mk. II.	6-pounder. Mk. III.	Remarks.
Cartridges, shalloon, 15 oz. (in half metal lined cases, 50 in each case).	*d*50	*e*50	*a* To each ship carrying 6-pr. Q.F. blank ammunition.
Cases, cartridge, empty, capped or primed.	*d*10	*f*20	*d* To each 6-pr. Q.F. gun when not supplied with saluting ammunition.
Wads, felt	*d*680	*g*125	*e* To each gun but not to exceed 500 per ship.
Wads, paper	—	*g*125	
Tools, recapping. Boxes for	*a*2	*i*1	*f* To every 2 or less number of guns but not to exceed 100 per ship.
Tools, recapping. Drivers, screw, primer	—	*i*1	*g* To every 2 or less number of guns but not to exceed 500 of each per ship.
Tools, recapping. Rods, steel. 12·7-inch	*a*6	*i*1	
Tools, recapping. Rods, steel. 4-inch	*a*6	—	*i* To every 2 or less number of guns but not to exceed 4 of each per ship.

Particulars of Guns and Mountings.

GUNS.	Marks I. and II.
Calibre	2·24 inches.
Length of bore, including chamber	1·95 "
" " from base of projectile to muzzle	84 "
" " gun over all	110·45 "
Rifling—number of grooves	24 "
" width of lands	·074 "
" depth of grooves	·012 "
Twist	From 1 in 180 to 1 in 30 calibres.

Particulars of Guns and Mountings—*cont.*

BALLASTICS.	MARKS I. AND II.
Velocity—muzzle	1,860 f.s.
„ at 1,000 yards	1,296 „
Total energy—muzzle	145·4 foot tons.
„ at 1,000 yards	69·8 „

PENETRATION INTO WROUGHT IRON.	MARKS I. AND II.
At the muzzle	4·75 inches.
„ 500 yards	3·94 „
„ 1,000 yards	3·26 „
„ 1,500 yards	2·75 „

MOUNTINGS, &c.	MARK I.
	Cwt. qrs. lbs.
Weight of guns	5 3 15
Non-Recoil Carriage:—	
Weight of pivot and socket	6 2 22
„ elastic cone	7 0 0
„ shield	3 1 0
Recoil Carriage:—	
Weight of carriage complete, with racer	8 1 0
„ shield	4 0 0

Particulars of guns and mountings—*cont.*

Mountings, etc.	Mark II.	
	Cwt. qrs. lbs.	
Weight of gun	6 3 0	
Non-Recoil Carriage :—		
Weight of pivot and socket	4 0 0	
„ elastic cone	7 0 0	
„ shield	1 0 6	
Recoil Carriage :—		
Weight of carriage, with crosshead and pivot	5 1 0	
„ brass socket	1 0 8	For mounting in forts.
„ half cone	2 0 0	For mounting in forts.

Range Table.—Nordenfelt 6-pr. Quick Firing Guns, Marks I. and II.

Charge, 1 *lb.* 15 *oz.*; *Weight of Projectile*, 6 *lb.*; *M.V.* 1860 *f.s.*

Yards.	Elevation.	Angle of Descent.	Increase or Decrease of Range due to 5′.	Time of Flight.	Dangerous Zone for a 6′ Object.	Remaining Velocity.
	° ′	° ′	yards.	seconds.	yards.	f. s.
100	0 5	0 6	100	·18	—	1804
200	0 10	0 12	100	·35	—	1741
300	0 15	0 18	100	·52	—	1680
400	0 20	0 24	100	·7	—	1620
500	0 26	0 31	83	·88	222	1561
600	0 32	0 38	83	1·07	182	1504
700	0 39	0 48	71	1·26	143	1448
800	0 46	0 58	71	1·46	118	1395
900	0 53	1 9	71	1·66	100	1345
1000	1 0	1 21	71	1·88	87	1296

Range Table—*cont.*

YARDS.	Elevation	Angle of Descent.	Increase or Decrease of Range due to 5′.	Time of Flight.	Dangerous Zone for a 6′ Object.	Remaining Velocity.
	° ′	° ′	yards.	seconds.	yards.	f. s.
1100	1 7	1 33	71	2·1	74	1251
1200	1 15	1 48	62	2·33	64	1208
1300	1 23	2 6	62	2·57	54	1169
1400	1 31	2 24	62	2·83	47	1132
1500	1 39	2 42	62	3·1	42	1097
1600	1 48	3 0	55	3·38	38	1066
1700	1 57	3 18	55	3·67	35	1038
1800	2 8	3 37	46	3·97	31	1014
1900	2 19	3 56	46	4·27	29	995
2000	2 31	4 17	42	4·57	27	979
2100	2 43	4 38	42	4·88	24	966
2200	2 55	5 0	42	5·19	23	954
2300	3 8	5 23	38	5·5	21	942
2400	3 21	5 46	38	5·82	19	930
2500	3 34	6 10	38	6·14	18	918
2600	3 47	6 37	38	6·46	17	904
2700	4 0	7 4	38	6·78	16	890
2800	4 14	7 32	36	7·02	15	876
2900	4 28	8 0	36	7·46	14	862
3000	4 43	8 30	33	7·8	13	848
3100	4 58	9 2	33	8·15	13	834
3200	5 13	9 36	33	8·5	11	821
3300	5 28	10 11	33	8·85	11	808
3400	5 44	10 47	31	9·2	10	796
3500	6 0	11 23	31	9·53	10	784
3600	6 16	12 0	31	9·98	9	773
3700	6 33	12 37	29	10·38	8	762
3800	6 50	13 15	29	10·8	8	752
3900	7 8	13 54	27	11·22	8	743
4000	7 27	14 36	26	11·64	7	735

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