HANDBOOK

FOR THE

7-inch Rifled Breech-Loading Guns of 72-cwt. and 82-cwt., on Moncrieff and Sliding Carriages.

LAND SERVICE.

1885.

By Authority.

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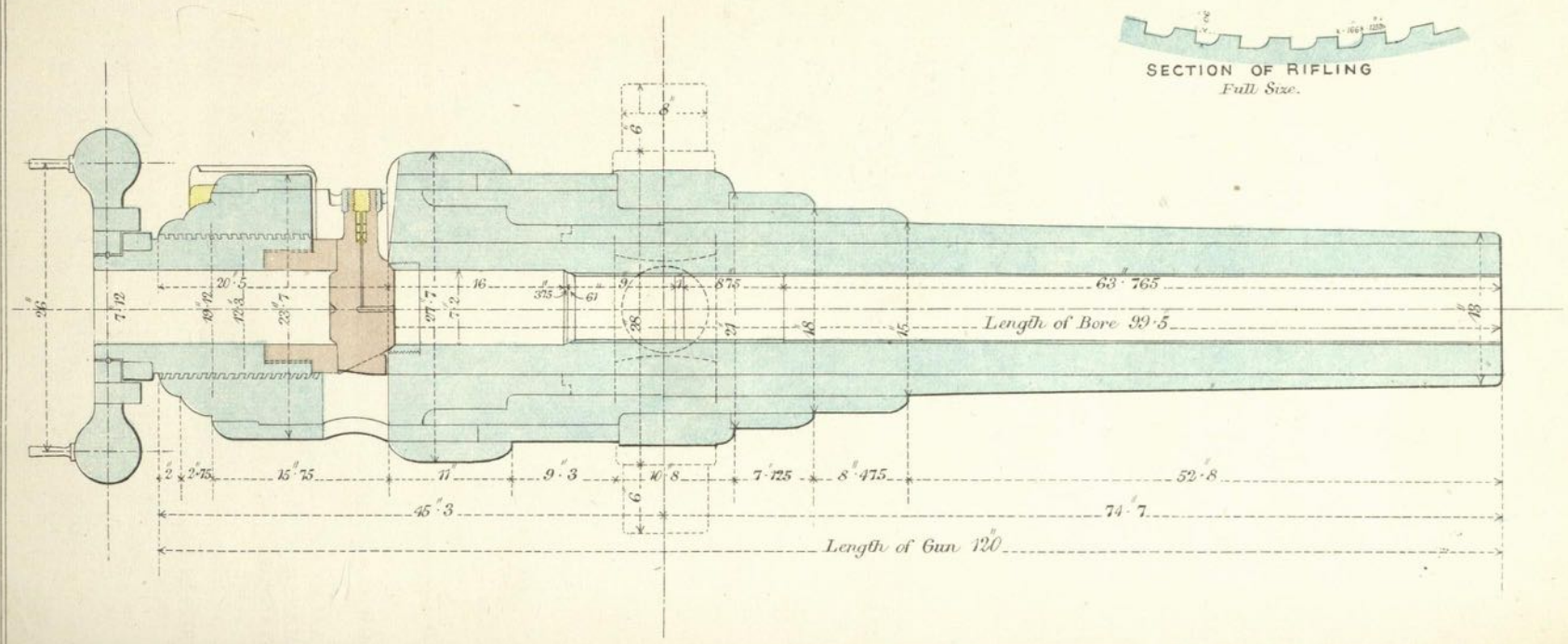
Frontispiece.

ORDNANCE, WROUGHT IRON, R.B.L. 7 INCH, 82 CWT.

SCALE $\frac{1}{16}$.



DANCKERFIELD, LITH. 22 BEDFORD ST COVENT GARDEN.

CONTENTS.

PLATES.

7-inch R.B.L. Guns of 82 cwt. and 72 cwt.

(See Frontispiece.)

(List of Changes, §§ 593, 269, 935.)

Guns and Fittings.

	Gun of 82 cwt.	Gun of 72 cwt.*
Material	An inner tube of wrought iron, a breech piece and trunnion ring of forged iron, and coils of wrought iron.	Same as 82 cwt. gun
Weight, nominal	82 cwt.	72 cwt.
Length, total	120 inches	118 inches.
Preponderance, average	cwt. qrs. lbs. 6 3 11	cwt. qr. lbs. 7 1 27.
Bore — calibre	7 inches	7 inches.
Bore — length	99·5 inches	99·5 and 97·5 inches.
Rifling — system	Polygroove, saw-shaped	Polygroove.
Rifling — twist	1 in 37 calibres	1 in 37 calibres.
Rifling — length	83·1 inches	82·9.
Rifling — grooves — number	76	76.
Rifling — grooves — depth	0·06 inch.	0·06 inch.
Rifling — grooves — width	0·166 „	0·166 „
Chamber — length	16 inches.	14·25 inches.
Chamber — diameter	7·2 „	7·2 „
Chamber — capacity	620 cubic inches	552·9 cubic inches,
Vent	Through vent piece, the upper part of vertical portion being bushed with copper.	Same as 82 cwt. gun.

A *slot*, or vent opening, is made in the top of the breech piece for the introduction or removal of the vent piece. It is continued through the bottom of the breech in the form of a circular hole, to allow water to escape after cleaning.

The *vent piece* is a block of wrought iron or steel, which closes the end of the breech before firing. It is dropped down the vent slot, and is then tightened up by means of the breech screw.†

The *breech screw*, having a V-bevelled double thread on its surface, fits into the thread cut into the breech piece. Its use is to send home and retain the vent piece in its proper position.

The *tappet ring* is fitted on the octagonal part of the breech screw, on which it acts as a wrench.

* There are two classes of the 72-cwt. guns, marked respectively A and B. They only differ in the length of barrel, A being 2 inches longer in the barrel than B, and 2 inches shorter behind the breech slot.

† Primers for the vent are used (see Drill); they are inserted twisted end down. Tin cups are always used to assist in closing the breech, and as a protection to the breech and vent piece bush ("List of Changes," §1794).

The *lever* fits on the breech screw behind the tappet ring. It is free to revolve round the breech screw, but is prevented from falling off by two keep pins working in grooves. The object of the lever and tappet arrangement is to gain a powerful momentum in tightening up and relaxing the vent piece from its seat in the gun.

The *indicator ring* is a thin narrow ring fitted on the breech screw in front of the tappet ring; on its internal circumference are a series of grooves, or feather ways, any one of which fits the feather on the breech screw. It is so adjusted that when the vent piece is properly screwed up, the raised line of brass or arrow on the ring must coincide with that on the top end of breech piece. Thus this ring serves as a safety indicator to show that the vent piece has been properly screwed home.

Obturation, or the means of forming a gas-tight joint between the vent piece and A-tube, is ensured by means of a *tin cup*, in conjunction with a ring of wrought iron called a *breech bush*, screwed into the rear end of the tube.

The number* of the gun will be found on its left trunnion; the numbers of the vent piece and breech screw on the back of the articles.

Sighting.

The gun is sighted on both sides, having two tangent scale sights and two trunnion sights. The tangent scale sights are graduated on the face towards the muzzle to 15° on the right hand, with a fuze scale; on the rear face, with a scale of yards up to 3,600. Each degree of elevation on the scale is divided into six divisions of 10 minutes each, while the elevating nut under the cross head is marked from 1 to 10 minutes.

The permanent angle of deflection is 2° 16′.

The tangent sights of early pattern are barrel headed; those of the present pattern having a sliding leaf head, and are marked for ½° deflection, right or left.

The trunnion sights are of the drop pattern, locked into the sight sockets by a bayonet joint. They are removed by raising the collar, and turning the pillar round a quarter of an inch.

When this nature of gun is mounted on Moncrieff carriages (*vide* Plate I) they are provided with reflecting sights in addition to those named above. Upon the elevator, or rocker, is screwed a bar graduated in degrees; upon this bar slides a mirror with cross-lines upon it, and which is adjusted to the required elevation. Upon the trunnion is screwed a bracket, carrying a second mirror with cross-lines also marked upon it. When the object and the intersections of the cross-lines of the trunnion mirror are reflected together on the intersection of the lines on the lower mirror, the gun is laid.

Carriages, Platforms, &c.

Carriage, Garrison, Moncrieff, with Platform, R.B.L. 7-inch.

(*Plates II and III.*)

The main principles adopted in the Moncrieff garrison carriages are:—

1st. To obtain cover for the gun detachment by enabling the gun to recoil under a solid parapet for loading.

2nd. To store up the force of recoil, and utilise it for raising the gun from loading to firing position.

These objects are obtained in 7-inch R.B.L. carriages by mounting the gun into an elevator direct. The gun in recoiling raises a counterweight.

The form of the elevator is such that, as it rolls back along the top of the platform, the counterweight acts against the gun with increasing leverage.

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* The numbers should always be quoted in reports, to admit of identification.

The gun is held down by the racks and brake gear, and is raised from the loading to the firing position by the force of gravity in the counterweight when the brake is released.

The elevator, or carriage, is constructed of two double-plate sides, each formed of plates of wrought iron, rivetted on each side of a cast-iron frame; they are connected at the lower part to the counterweight by horizontal bolts. The rear edges of the carriage are curved, and have teeth cut in them to fit corresponding spaces in the racks on the platform.

The counterweight consists of four blocks of cast iron.

In the upper part of the carriage are cylindrical metal bearings for the trunnions of the gun, which is secured in position by capsquares.

Platform.

The platform is 15 feet 3 inches long, is made horizontal, and supported on four cast-iron flat-soled trucks, running in cast-iron flanges, and traversed by gear, driving either the front or rear left-hand truck.

A guide rack is fixed on the top of each side, with recesses to correspond with the teeth on the elevator or carriage. The platform is arranged for "D" pivot.

Elevating Gear.

The elevating gear is principally attached to the platform. It consists of a guide along the centre of the platform, pivoted at the rear, and an arc under the front; the arc is geared with a pinion moved by a worm wheel with friction cones, driven by a worm and hand wheel on the right side of the platform. The worm wheel is fitted with two friction cones, which can be adjusted by keep and lock nuts on the end of the shaft. A slight slip (about 2) should be allowed when the gun is fired, to lessen the strain on the gear.

Pivoted to the elevator are two radius bars, supporting, near their centre, a rod, jointed to a bracket under the gun; and at the rear end carrying a roller which moves along a slot in the guide.

Elevation or depression is given to the gun by raising or lowering the guide. During recoil the roller in the elevating guide is carried by the radius bars to the rear of the slot, and as the elevating guide is pivoted at the rear, the gun always comes down to point blank when in the loading position.

A graduated brass plate is fixed on the outside friction cone of the worm wheel, and a pointer on the platform, to register the elevation or depression.

Retaining Gear.

The retaining gear consists of a straight rack, sliding along on each side of the platform, connected by a rod to the outside of the carriage. The racks have ratchet teeth cut on the top, and spur teeth on the under side; the latter gear into pinions on a cross shaft having a brake wheel on the left side, and on each end a capstan head, for iron-pointed levers for hauling down at drill.

The brake wheel is fitted with an internal ratchet wheel and pawl, arranged to allow the shaft with the ratchet wheel to revolve in one direction (during recoil) without resistance, but prevented from turning in the opposite direction by the pawls acting on the rim of the brake wheel, which is held by the band and counterweighted lever. To run up, the lever must be raised to allow the whole of the brake wheel to revolve.

A pawl is fitted on each side to engage in the ratchet teeth on the top of the racks, when required.

Hauling down or running back gear consists of a capstan head on each end of the cross shaft; and two iron-pointed levers. No other gear is required, as there is sufficient power to bring the gun down from the firing to the loading position.

Traversing Gear.

The traversing gear consists of a bevel wheel, cast on one side of both trucks on the left side of the platform; into each is geared a bevel pinion, having a bevel wheel keyed on the same shaft. The bevel wheel is driven by a bevel pinion on the winch handle shaft.

Racers, &c.

Racers or Sweep Plates.

Cast-iron sweep plates have been supplied for bedding in concrete 1 foot wide, $1\frac{1}{4}$ inch thick, and strengthened by ribs $2\frac{3}{4}$ inches deep. The same sweep plates are also used for the $\frac{64}{32}$-pr. gun, mounted on Moncrieff counter-weight carriage.

Radii of Racers.

	"C"	"D"
	ft. ins.	ft. ins.
Front	6 10	8 11
Rear	6 10	4 $8\frac{1}{2}$

Graduated Arc and Pointer.

A graduated arc of zinc, 1·5 inch wide and ·1 inch thick, is recessed into both front and rear sweep plates, and a pointer is attached to the front and rear flange feet on the left side, to indicate the angle of traverse.

Pivot.

The pivot block is of cast iron, in two parts, bolted together; the lower part is bedded in the concrete foundation. The pivot bolt passes through a socket in the platform, and fits loosely in the pivot block, so that it can be withdrawn when required.

		ft. ins.	tons cwt.
Height to centre of gun in firing position		10 5·75	
Height of parapet		9 4	
Elevation, maximum		15°	
Depression		5°	
Weight { Elevator, or carriage with counterweight			8 $19\frac{1}{2}$
Weight { Platform, with elevating gear			4 $9\frac{1}{4}$
Total			13 $8\frac{3}{4}$

CARRIAGE, GARRISON, SLIDING, MEDIUM, No. 16.

(*Dwarf, for Platform No.* 16.)

(*Plate IV.*)

The carriage consists of two brackets of oak or teak, a transom of the same material, and two Sabicu or African oak blocks to take the bearing on the platform. It has two side loops on each bracket for tackles, one loop in the rear block for the preventor rope, or for the pintail of the transporting limber; a metal pan for the elevating nut, and a leather loop for the tin cup extractor. It has two loops in the rear block, with pawl stops in the rear of the brackets for roller handspikes, to be used in running up. The carriage is fitted with two metal rollers, secured in wrought-iron flanges bolted at the front of the carriage.

The elevating arrangement consists of a wrought-iron stool bed, a ratchet head elevating screw with handle, a large and a small coin.

A wooden compressor, consisting of two blocks of elm, supported by iron plates, is placed between the sides of the platform betwixt the two blocks of the carriage. By means of an eccentric fitted in the centre, and worked by a lever, the blocks are forced against the sides of the platform, and so check the carriage, which on recoil must carry the compressor with it. This carriage is used with a wooden dwarf platform, 16 feet long.

CARRIAGE, GARRISON, SLIDING, MEDIUM, No. 15.

(*Wood Casemate for Platform No.* 14.)

(*Plate V.*)

The construction of this carriage is similar to the 7-inch Dwarf, No. 16, but it is 7 inches less in height.

The carriage fittings, elevating and compressor arrangements, are identical with the 7-inch Dwarf. The carriage is intended for a wood casemate platform, 16 feet long.

CARRIAGE, GARRISON, SLIDING, MEDIUM, No. 3.

(*Iron* 3 *feet* 6 *inch Parapet for* 11 *feet Platform No.* 13.)

(*Plate VI.*)

The carriage consists of two single plate brackets, a front and rear transom standing on a bottom plate, which takes the bearing on the platform, and is attached to the brackets by angle irons on the outside. Angle iron is rivetted round the trunnion holes to give sufficient bearing for the trunnions, and steps on each bracket for raising the breech of the gun with handspikes.

The carriage has metal trunnion bearings, metal flanges for rear rollers, side loops for tackles, and a metal pan for the elevating nut.

The carriage is fitted with—capsquares, interchangeable and reversible; two metal rollers, for running up (in wrought-iron flanges with metal bearings, bolted at the front of the carriage); two rear rollers, also of metal, on an eccentric shaft, which is fitted with sockets outside the brackets, for light iron-pointed levers; clip plates attached to the bottom plate to hold the carriage to the platform; and two side steps placed on the brackets.

The elevating gear is similar in every respect to that for the 7-inch Dwarf.

The E.O.C. compressor gear is described on page 8.

This carriage is intended for a wood traversing platform, 11 feet long, fitted with E.O.C. compressor.

CARRIAGE, GARRISON, SLIDING, MEDIUM, No. 2.

(*Iron* 4 *feet* 3 *inch or* 3 *feet* 6 *inch Parapet for Platforms Nos.* 11 *and* 12.)

(*Plates VII and VIII.*)

The carriage, in construction and fittings, is similar to that for the 11-feet platform, but it is arranged for the hydraulic buffer instead of the E.O.C. compressor gear. A bracket is fitted under the bottom plate at the front for attaching the piston rod of the hydraulic buffer.

This carriage is mounted either on a wood 13 feet 2 inch traversing platform, for 4 feet 3 inch parapet, or on one for a 3 feet 6 inch parapet, both fitted with hydraulic buffers.

CARRIAGE, GARRISON, SLIDING, MEDIUM, No. 1.

Iron 4 feet 3 inch, 3 feet 6 inch, or 2 feet 7 inch Parapet for Platforms Nos. 1, 2, and 3 (converted Naval R.M.L. 7 inch, 6½ tons).

(*Plate IX.*)

This carriage, a conversion from the naval R.M.L. 7-inch, 6½ tons, is of double-plate construction. It consists of two brackets formed of iron plates, rivetted to a wrought-iron frame, a front transom, and a bottom plate strengthened with angle iron.

The carriage has metal trunnion bearings, wrought-iron loops for tackles, metal bearings for axles of front roller, an adjusting and compressing arc, and a metal bracket and drop plates for securing the rear roller eccentric shaft.

The fittings are :—

Two front and two rear metal rollers.

An eccentric shaft, fitted with sockets outside the brackets for light iron-pointed levers.

Clip plates attached to the bottom plate.

Capsquares, interchangeable and reversible.

Two side steps.

The elevating gear on each bracket of the carriage consists of an arc, a pinion with spindle, a capstan head, with a clamp and a friction roller.

The E.O.C. compressor gear consists of seven iron plates, suspended from the carriage through an opening in the bottom plate, and hanging between iron bars fitted to the platform. The plates and bars are compressed together by rocking levers moved by a compressing and an adjusting nut, fitted on a screw shaft, which has a compressing lever handle on it on the outside of the right bracket of the carriage. By pushing down the compressing lever, both nuts travel outwards along the screw shaft, and force the lower arms of the rocking levers inwards, thus jamming the plates and bars together. The compression is regulated by raising or lowering the adjusting lever placed outside the left bracket, and keying it on its arc, at the desired position thus altering the original position of the adjusting nut on the shaft. Moving the adjusting lever up its arc increases the compression ; moving it down diminishes it.

The compressing lever should be worked by hand, but to secure its working automatically there is a tripper attached to the right side of the platform, which engages with a projection on the compressing lever when the gun recoils. The proper amount of compression is attained when one man can just force the compressing lever beneath its catch.

This carriage is intended for iron traversing platforms, for 4 feet 3 inch, 3 feet 6 inch, or 2 feet 7 inch parapets.

PLATFORM, TRAVERSING, MEDIUM, No. 16.

(*Wood, Dwarf, for Wood Carriages, Nos. 16, 17, 22, and 23, 16 feet long.*)

(*Plate IV.*)

The platform, which has a slope of 5°, is made of teak, and consists of two sides with cheeks, three transoms, one head block, one rear block, four cast-iron flanges, and four wrought-iron trucks. The platform has four battens between the rear and centre transoms, a bollard for the preventor rope, four side loops for tackles, a rear plate for the pintail of the transporting limber, and two iron bands for a round transporting axle. It is fitted with two side steps, one long and one short.

The sides are 16 feet × 1 foot × 1 foot, placed 21 inches apart, and the front and rear trucks are 12 inches diameter. Several of these platforms are fitted with a pivot plate as shown on Plate VII, for C, D, E, or F pivots.

PLATFORM, TRAVERSING, MEDIUM, No. 14.

(*Wood Casemate for Wood Carriages, Nos.* 15, 19, *and* 21, 16 *feet long.*)

(*Plate* V.)

This platform is similar in all respects to the Dwarf (Plate IV), but is reduced in height to suit casemates. The rear block is dispensed with, and the front flanges for trucks are of gun metal, and are recessed into the bottom of the platform.

The trucks are of wrought iron; the front are 5 inches diameter, and the rear 12 inches.

PLATFORM, TRAVERSING, MEDIUM, No. 13.

(*Wood,* 3 *feet* 6 *inch Parapet, for Iron Carriages, Nos.* 3 *and* 11, 11 *feet long.*

(*Plate VI.*)

This platform is similar in construction to that shown on Plate V, but is shortened in length to 11 feet, and has a slope of 5°. The sides of the platform are strengthened inside by an iron plate, to which is rivetted a plate for the clips of the carriage. The front trucks and flanges are special.

This platform is fitted with the E.O.C. compressor gear. The trucks are of wrought iron, the front are 6½ inches diameter, and the rear 12 inches.

PLATFORM, TRAVERSING, MEDIUM, No. 11.

(*Wood, B.L.,* 4 *feet* 3 *inch Parapet, for Iron Carriages, Nos.* 2, 10, *and* 13, 13 *feet* 2 *inches long.*)

This platform is the same in construction as that shown on Plate IV, except that the truck flanges and rear block are similar to those of the Dwarf. The rear block is strengthened by stays of plate and angle iron, secured under each side and to the block.

The platform is fitted with a plate to suit either C, D, E, or F pivots, and is secured by a plug to a cast-iron pivot block. Plate V shows the arrangement for a C pivot.

PLATFORM, TRAVERSING, MEDIUM, No. 12.

(*Wood,* 3 *feet* 6 *inch Parapet, for Iron Carriages, Nos.* 2, 10, *and* 13, 13 *feet* 2 *inches long.*)

(*Plate VIII.*)

This platform is similar in general construction to that shown on Plate VI, but its length is 13 feet 2 inches, and it has a rear block.

It is fitted with a hydraulic buffer, which is supported by a wrought-iron bracket at the rear, and rests on, and is secured to, the rear and centre transoms by means of bands.

PLATFORM, TRAVERSING, MEDIUM, No. 2.

(*Iron, 3 feet 6 inch Parapet for Carriage, No. 1, converted slide*).

(*Plate IX.*)

The platform (which is a conversion of the R.M.L. 7-inch 6½ ton slide) is of wrought iron, has a slope of 5°.

It is fitted with E.O.C. compressor gear.

The flanges and trucks are of wrought iron ; the front trucks 13 inches in diameter, the rear trucks 18½ inches. Cast-iron packing pieces and a wrought-iron cross plate are placed between the front flanges, and wrought-iron brackets and a cross plate between the rear flanges and the platform. Each girder is strengthened by a wrought-iron stay.

PLATFORM, TRAVERSING, MEDIUM, No. 1.

(*Iron, 4 feet 3 inch Parapet, for Carriage No. 1, converted slide.*)

This platform is a similar conversion to the No. 2 (plate IX.), differing from it principally in having two wrought iron brackets substituted for the cast iron packing pieces on which the front truck flanges rest, and the wrought iron brackets between the rear truck flanges and the platform of increased height. The trucks are the same.

PLATFORM, TRAVERSING, MEDIUM, No. 3.

(*Iron, 2 feet 7 inch Parapet, for Carriage No. 1, converted slide.*)

This platform is also a similar conversion to the No. 2 (plate IX.), differing from it principally in having the truck flanges and the trucks of less height, the front trucks being 6·5 inches, and the rear trucks 13 inches in diameter.

GENERAL INSTRUCTIONS FOR CARE AND PRESERVATION.

Care should be taken that all nuts, screws, and bolts are properly tightened up ; on no account should a hammer be used in doing this.

A nut, screw, or bolt if removed, should be slightly oiled before being replaced ; a few turns should be given by hand before employing the spanner, to prevent damage by the threads crossing.

All bright parts should be kept clean, and slightly coated with Field's grease No. 3.

All bearings should be well lubricated through the holes provided for the purpose ; the small screws should be replaced in the holes, after lubrication.

All working parts should be kept clear of clotted grease, dirt, and corrosion.

When the mountings are not required for immediate use, the piston rods will be unfastened and pushed home in the cylinder, and the removable parts of the various gears will be placed in store.

These articles will be frequently examined to ensure their being kept clean and in good condition, they will also be fitted in their places and worked once in three months.

Compressor Gear.

The compressor plates and bars are on no account to be greased, but excessive rust should be scraped off, to ensure accuracy of working.

Hydraulic Buffer.

To fill the buffer. Run the carriage up, remove the filling hole plug, and by means of the gallon measure, run in the requisite quantity of fluid; replace the filling hole plug.

As the quantity of fluid in the buffer is liable to diminish from various causes, care should be taken before firing that the contents of the cylinder is in accordance with that given on the inscription plate.

If the buffer leaks at the gland, and tightening up the latter does not remedy it, the packing must be renewed.

To renew the packing. Run the carriage up, empty the buffer, unscrew the gland with the spanner hydraulic buffer No. 2, and extract the defective packing, well tallow the fresh packing, insert it in the stuffing box, and replace the gland.

Moncrieff Mountings.

The retaining racks, teeth of bevilled wheels, pivot bolt, and the inside of the trunnion rings must be well lubricated. The friction cones of the elevating gear must be kept clean, and not allowed to set. They are adjusted by tightening up the nuts on the end of the cross shaft; if too much slip occurs in action, the nuts must be again screwed up and locked. The brake drum must be kept free from rust and grease. The drum should be occasionally examined to see that the pawls and springs are in working order; the pawls should be lubricated by oiling the ends of the studs.

The tension of the brake band should be sufficient to retain the gun in the loading position. The tension can be regulated by altering the position of the counterweight on the lever.

NOTE. The registered number of the mountings should always be quoted in reports, to admit of identification.

PROJECTILES.

(*Plate X*).

		Bursting charge. lbs.	ozs.	Weight. lbs.	ozs.
Shells	common	7	10	98	2½
	("List of Changes," § 753.)				
	("List of Changes," § 1609.)				
	segment (containing 112 3¼-oz. segments)	3	2	101	2
	("List of Changes," §§ 211, 405.)				

The shells are lead coated to take the grooves of the rifling, and thus obtain the necessary rotation.

	Weight. lbs.	ozs.
Shot, case containing 71½ lbs. sand shot	69	2½
(*Vide* "List of Changes," § 2924.)		

Fuzes.

(*List of Changes*, § 4434).

(*See Plate XI.*)

Percussion, direct action, for common and segment shells.

(*See Plate XII.*)

Time, Wood, 15 seconds (Mark III), with detonator for segment shell.

Instructions for the Preparation of Shells and Fuzes, and the Examination of Filled Shells.

(See Clause 175, Army Circulars, 1884.)

Filling Shells.

Common and Segment Shells.

Remove the plug from the fuze-hole, insert the leather funnel and pour in the bursting charge; the shell should be tapped with a mallet or a piece of wood to ensure its being completely filled, just leaving room for the fuze if it is to be fuzed with a time fuze: this can be done by inserting a piece of wood the same size as the fuze; after filling the shell carefully wipe every portion of powder from the fuze-hole, then fix the fuze or plug as may be required.

In shells that are liable to be moved, or that are not required for immediate use, insert the wad, papier-mâché, G.S., with the side on which the shalloon is cemented downwards, *i.e.*, next the powder; drive it in with the "Drift, wood, G.S.,"as far as the shoulder on the drift will allow, and then screw in the fuze or plug, as may be required.

Shrapnel Shells.

Remove the plug from the fuze-hole, and after seeing that the fuze-hole is clear of any dirt, &c., insert the leather funnel and pour in the bursting-charge, which has been previously weighed out or measured. This must be done gradually, for if the whole of the powder is put in at once the tube will probably become choked. The shell should be tapped on the side with a wooden mallet until the whole of the bursting-charge has passed down the tube, taking care that none of the powder is left at the bottom of the socket. Drop in the metal primer and, by means of the large diaphragm Shrapnel screwdriver, screw it tightly into the tube, and then screw in the fuze or plug as may be required.

Fixing Plugs and Fuzes and Securing Shells.

When plugs, or metal fuzes, are screwed into shells they will be lubricated with Field's grease No. 3, if for use at Home Stations or in British North America; Price's composition grease will be used at all other stations.

Palliser and other projectiles, fitted with plugs and kept in exposed situations, where the plugs are liable to become set fast by corrosion from the action of salt water, or otherwise, should have their plugs unscrewed once at least every six months, and the screws cleaned and re-lubricated as above.

Instances have occurred in which the fuze-hole plugs of common shells have been so jammed in as to be immovable, in consequence of using the "Wrench, removing base plugs of Palliser shells." The "Key, iron, fuze and plug, G.S.," and the "Key, iron, plug, G.S.," are the only implements which should be used for screwing in the G.S. plug.

Distinguishing Marks.

All filled shells must be marked with the word "Filled" and date, and also "Bag" if a bag is used. The colour of the paint will be red on a black ground, or black on a red ground. At stations where means are available the monogram is to be painted.

Shells which have been emptied will be marked on the head with the letter E in red paint.

Storage of Filled Shells in charge of the Royal Artillery.

Filled shells will be piled. An exception to this rule may, however, be made when the size of the store will admit of it, in the case of Mark I., 7-inch R.B.L. shells of 83 lb., which have flat bases.

Preparing Fuzes.

Wood Time Fuzes, with Detonator.

These fuzes are prepared for any desired time of flight by boring through the side hole corresponding to the required time, into the composition.

When using the hook-borer place the fuze in the hook of the hook-borer in the proper position for boring the required hole; enter the bit into the side-hole, screwing up until the bit has entered as far as the borer will allow, taking care to press the fuze with the fingers so as to ensure its bedding fairly in the hook.

Unscrew, and, when the bit is quite clear, remove the fuze from the hook. The length of the bit is so regulated that, when placed in the handle, it will enter sufficiently far into the composition when screwed down to the shoulder. If the bit should become unserviceable, the handle must be detached from the shank and the tightening-screw unscrewed, the square hole in the hook being made for that purpose. Care must be taken when substituting another bit that it is properly placed in the handle, and that the tightening-screw firmly presses upon it, for if any space be left between the handle and the head of the bit, the end will not enter a sufficient depth into the composition. The borer should be occasionally examined and cleaned. The operation of preparing the fuze and fixing it in the shell takes, on an average, about 15 seconds; with a little practice these operations may be performed in a shorter time.

Fixing Fuzes.

Direct-Action Percussion Fuzes.

These fuzes require no preparation, except the removal of the metal cap; they are screwed firmly into the fuze-hole by means of the "Key, iron, plug, G.S.," which fits into the square hole in the cap. This cap is fastened on to the head of the fuze by two double bayonet joints, which enable the cap to be used either in fixing or unfixing the fuze. The cap can be removed by bringing the centre of the bayonet joints in line with the studs on the side of the head of the fuze.

The cap will not be removed until just before entering the shell into the breech.

Wood Time Fuzes, with Detonator.

These fuzes should be screwed into the fuze-hole by hand; when they cannot be screwed any further they are properly secured. These fuzes must not be fixed by striking them with a mallet or any other instrument, neither must they be struck against anything.

The safety-pin will not be withdrawn until just before entering the shell into the breech.

Extracting Wood Fuzes.

Apply the fuze-extractor to the head of the fuze, and unscrew; if the adapter which is in the fuze-hole of some R.B.L. shells should also be unscrewed, do not remove the fuze from it by striking it on the end, as a blow in that direction may weaken or break the wire that suspends the hammer.

Examination of Filled Shell.

Common, Double, and Segment Shells, filled with Loose Powder, without Bags.

Remove the fuze-hole plug, pass the "metal hook for removing wads" through the hole in the centre of the wad, and draw the wad out of the fuze-hole; if the powder charge is in a serviceable condition, insert a new papier-mâché wad, and replug the shell as directed in instructions for filling. If the powder charge is found to be caked from the effects of damp, empty the shell and clean it out. If the powder is so caked that it will not run out of the shell, or if any powder remains adhering to the interior of the shell, fill the shell with boiling water and allow it to stand for about five minutes, then pour out the water and fill up again with boiling water. After standing for 15 minutes more, the shell may be emptied, using the copper scraper for shells to facilitate the removal of the wetted powder. The scraper must not be applied until after 15 minutes have elapsed after the second quantity of boiling water has been poured in. When the shell is perfectly dry, refill with serviceable powder.

Shrapnel Shells.

Remove the fuze-hole plug, unscrew the primer with the "large screw-driver," and lift out the primer with the "metal pincers for removing primers"; turn the shell nose downwards, and if the powder charge flows out and is serviceable, refill and replace primer and plug; the shell should be well shaken if the powder does not come out quite freely, as a portion of the powder may possibly be jammed in the tube; if the powder cannot be extracted as above, being cracked from the effects of damp, &c., the primer and plug will be replaced, and steps taken for the exchange of the shell.

Note.

If means are available, a wooden horse placed over the open mouth of an empty powder-barrel should be used when emptying shells by up-ending them.

Charges.

(See "Changes in War Stores," §§ 1038, 1039, 1415, 4460.)

Silk Cloth Cartridges with Lubricators.

Full charge for 82-cwt. gun = 11 lb. R.L.G.²*
" " 72-cwt. gun = 10 lb. R.L.G.²*
Saluting charge .... = 7 lb. blank.

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* This charge is likely to be replaced by one of R.L.G.⁴ powder.

Directions for making up Cartridges.

(See Appendix to Clause 155, A.C. 1883.)

Filling.

Care will be taken to see that the cartridge bags are properly dry before being filled, and the proper charge will be carefully weighed out, and inserted in the bag by means of the "Funnel, copper, cartridge."

In filling cartridges half the charge will be inserted, the paper cylinder will then be placed on the powder *in the centre of the cartridge*, the flat side uppermost, and the remainder of the charge then filled in.

When filled, they will be choked *tightly* round the groove of the wood socket, into which the lubricator is screwed, the greatest care being taken to fix the socket in the centre of the cartridge.

The cartridges will be made up to their proper lengths and diameters by means of the hoops, which should be drawn tight, so as to make a firm cartridge.

Hooping.

Draw the braid through the serge or silk cloth until the knot of the loop comes home to the serge or silk cloth, the single end being already passed through the loop from underneath, pass the single end to one side of, and under the loop, then draw the loop tight and keep it so by placing the forefinger of the left hand firmly on the loop; bring the running end between itself and the loop, and draw tight the single bend thus formed, *taking care that the bend bites on the loop and not on the single end*, otherwise the knot will slip. The maintenance of the proper form of the cartridge depends on the hooping being thus secured.

Cartridges which are intended for either P. or R.L.G. powder will, when filled with the R.L.G., be brought to their proper length by having the hoops drawn in very tightly; the ribs formed in those parts where the hoops are in the interior of the cartridge will, however, be found to project to about the regulated diameter. The braid hoops will be thus drawn in with all cartridges whenever the powder is of a denser description than usual.

Marking Filled Cartridges.

All cartridges issued from store filled will have the initial or monogram of the station at which they are filled stamped on the bottom end. Cartridges filled with L.G. powder will be marked with the letters "L.G." in black printer's ink, 1 inch long. About ¼ oz. of ink will be sufficient for 100 cartridges.

The cartridges filled by the Royal Artillery will be distinguished by having no initial letter stamped on them. This order does not apply to cartridges filled by working parties of Royal Artillery for the Ordnance Store Department (see § 3564, "List of Changes in War Material," &c.)

Finished Cartridges.

All cartridges will be very carefully examined and gauged as to length and diameter previous to packing.

Drill Cartridges.

Drill cartridges are a special manufacture and issued complete; are of wood, with a thick coating of felt, covered with leather, and have a metal plate at the bottom, where the flash from the friction tube strikes.

Range Table.

Based on Practice of Minutes. M.V. 1100 f.s.

Charge, 10 lb. R.L.G.[2] for 72-cwt. gun, and 11 lb. R.L.G.[2] for 82 cwt. gun.

Projectile, common shell, weight 106 lbs. Jump, 8 minutes.

Range.	Elevation.	Angle of Descent.	Remaining velocity.	5 minutes elevation increases or decreases the range by	5 minutes will alter point of impact vertically or laterally at each range.	Time of Flight.	Fuze Scale.
yards	° ′	° ′	f s.	yards.	yards.	seconds.	
100	0 6	0 26	1081	...	0·14	0·25	
200	0 20	0 40	1064	40	0·29	0·60	1
300	0 35	0 55	1048	39·2	0·43	0·90	1·9
400	0 50	1 11	1033	38·4	0·58	1·20	2·8
500	1 5	1 27	1019	37·6	0·72	1·50	3·7
600	1 20	1 44	1006	36·8	0·87	1·85	4·6
700	1 35	2 1	993	36·1	1·01	2·23	5·5
800	1 51	2 19	980	35·4	1·16	2·56	6·4
900	2 7	2 37	978	34·7	1·31	2·90	7·3
1000	2 23	2 56	966	34	1·45	3·25	8·2
1100	2 40	3 15	955	33·3	1·60	3·62	9·1
1200	2 57	3 35	944	32·6	1·74	3·95	10
1300	3 14	3 56	934	31·9	1·89	4·30	10·9
1400	3 32	4 18	924	31·2	2·03	4·65	11·8
1500	3 50	4 41	914	30·5	2·18	5·00	12·7
1600	4 8	5 4	905	29·9	2·32	5·36	13·6
1700	4 26	5 28	896	29·3	2·47	5·72	14·5
1800	4 45	5 52	887	28·7	2·61	6·08	15·4
1900	5 4	6 17	878	28·1	2·76	6·42	16·3
2000	5 23	6 42	869	27·6	2·91	6·76	17·2
2100	5 43	7 7	860	26·9	3·05	7·14	18·1
2200	6 3	7 32	852	26·3	3·20	7·53	19
2300	6 23	7 58	844	25·7	3·34	7·92	19·9
2400	6 44	8 24	836	25·2	3·49	8·32	20·8
2500	7 5	8 51	828	24·7	3·63	8·72	21·8
2600	7 26	9 19	820	24·2	3·78	9·13	22·8
2700	7 48	9 49	813	23·7	3·92	9·54	23·8
2800	8 10	10 21	806	23·2	4·07	9·96	24·9
2900	8 33	10 55	799	22·7	4·21	10·38	25
3000	8 56	11 30	791	22·3	4·36	10·80	26·1
3100	9 20	12 2	783	21·9	4·51	11·24	27·2
3200	9 44	12 38	776	21·5	4·65	11·68	28·3
3300	10 9	13 15	769	21·2	4·80	12·12	29·4
3400	10 34	13 52	762	20·9	4·94	12·56	
3500	10 59	14 30	755	20·6	5·09	13	

* It is contemplated to issue charges of R.L.G.[4], which it is hoped will not interfere with the M.V. given above.

Drill with Gun on Traversing Platform.

The detachment consists of 9 Nos., and falls in two deep.

To Tell Off.

Officer.	*No.* 1.
Tell off.	

At "*Tell off*," No. 1 (who is on the left of the detachment) takes a pace to his front, turns to his right, and numbers himself 1; the right-hand man of the rear rank numbers 2; the right-hand man of the front rank 3, and so on to the left.

After the detachment is told off, No. 1 falls in again on the left of the front rank.

The detachment is marched into the battery and halted in line, facing the parapet and to the left rear of the platform.

The detachment is now in the position of "*Detachment rear.*"

To Take Post under Cover.

Officer.	*No.* 1.
Take post under cover.	*Right turn.* *Double march.*

The detachment, stepping, off, wheels to its left at the left corner of the platform; the front rank filing to the left of the gun, the rear rank to the right; 2 and 3 halting close to the parapet, and near the mouth of the embrasure; 4 and 5 forming upon their right and left, and the whole turning to the right-about together. No. 1 follows in rear of the detachment, keeping under cover as much as possible; 6 and 8 go to the cartridge store (6 outside), and 7 and 9 to the shell store (7 outside).

General Duties.

No. 1 commands, directs, or superintends boring and fixing fuzes, holds on to the preventor rope, and lays.

No. 2 runs up, sponges (if necessary), rams home, elevates, and traverses.

No. 3 runs up, removes safety-pin, loads, rams home, elevates, and traverses.

No. 4 runs up, attends to breech screw, vent piece, and tin cups, attends to side arms, and supplies them to 2, and to elevating screw and coin in laying.

No. 5 runs up, attends to breech screw and vent piece, attends to the preventor rope, primes, makes ready, and fires.

No. 6 supplies 3 with cartridge, and brings up projectile.

No. 7 attends to fuzes, and brings up projectile.

No. 8 attends to cartridge store, serves out cartridges to 6, with lubricators attached.

No. 9 attends to shell store, issues shells, tubes, and fuzes.

To Prepare for Action.

Officer.	*No.* 1.
Prepare for action.	*Prepare for action.* *Examine gun.*

"*Prepare for action.*"

The stores are brought up as follows:—

No. 1 sights, file for vent piece, and preventor rope.

No. 2, 7-foot handspike, truck lever, iron-shod lever, and assists 4 with side arms.

No. 3, 7-foot handspike, truck lever, iron-shod lever, and elevating screw, removes apron and tampeons.

No. 4, side arms and support; tin cups in pocket and extractor.

No. 5, primers in pocket, tubes in box, lanyard, oil can and hemp, and iron lever.

No. 6, two cartridge cases, which he takes to the cartridge store, bucket filled, and brush (two dummy cartridges for drill).

No. 7, fuzes, fuze and shell implements, one set of luff tackle, and one shell bearer. He obtains the fuze boxes from 9, having ascertained from No. 1 the nature of fuzes required, satisfying himself as to the correctness of fuzes and fuze implements.

No. 8 prepares to issue cartridges.

No. 9, one set of luff tackle and a brush; prepares to issue shells, tubes, and fuzes; he examines the shells carefully, cleaning them if necessary, and removing burrs; he loosens the fuze-hole plugs of shells that will be first issued.

The stores having been brought up, No 1 will satisfy himself that the foresights fit properly on the gun, that the deflection leaves of the hind sights work easily, and that the platform is properly swept; he attaches the preventor rope to the carriage, and, assisted by 3, takes two turns with it round the bollard, the running end coming off to the left at the top. He receives reports from the Nos. responsible of any irregularity or deficiency in connection with the gun, ammunition, and stores. He ascertains that the breech fittings are properly put on and well oiled.

Should the indicator ring require adjusting, he adjusts it in the following manner:—The vent piece is screwed home as it would be for firing. The lever and tappet ring are then removed. The indicator ring is passed over the octagonal part of the breech screw, so that the arrow marked on it, or raised line, will correspond with a similar mark on the gun. If the arrows cannot be made to coincide, the indicator ring is to be so placed that the arrow on it will be to the left of the mark on the gun, as close as the cogs of the indicator ring will permit. The tappet ring and lever are then replaced. They ought to be put on so that the lever ball will be resting on a cam of the tappet ring on the right side of the gun in a convenient position for No. 4 to give two taps after the breech is screwed up;. 4 depresses the gun about 3°.

The side arms are laid down to the right of the gun, and parallel to it, heads to the front, resting on the support provided.

The sponge next the gun, and in line with the breech when the gun is run up, the sponge bucket near the sponge head.

The handspikes and iron-shod levers are laid down bevelled side uppermost, the handspikes next the gun; the truck levers between them, the whole with their points to the front.

The tin cup extractor and lever are placed in loops on the carriage.

If the indicator and tappet rings, with their keep pins, have been detached, 4 and 5 bring them up.

4 sees that the elevating screw is properly oiled.

5 straps the tube box round his waist on the right side, coils up the lanyard, and places the bight of it under the tube box strap. He fills the tube box with friction tubes, which he procures from 9.

The standing blocks are hooked by 7 and 9 to the rear eye-bolts of the platform, the tackles rounded in, and the falls coiled down.

"*Examine gun.*"

Nos. 4 and 5 take a purchase with their handspikes over the cheeks and under the breech, and bear down; 2 double mans 4's handspike. The coin is withdrawn, and the elevating screw put in by 3, No. 1 holding up the stool bed with an iron-shod lever applied over the bottom step of the carriage. No. 1 gives "*Lower,*" when 4 and 5 withdraw their handspikes and lay them down. 4 and 5 then mount up on the platform, and open the breech; 4 by taking the lever handle in his right hand, back up, and swinging it round a half circle towards him from cam to cam, 5 in his left hand, back up. This will strike a blow hard enough to move the screw, which is then unscrewed two turns, and the vent piece is released; 4 and 5 lift the vent piece out of slot, and lay it on the saddle on the top of the breech coil. At "*Clear,*" from

No. 1, they drop in the vent piece; 5 takes the lever handle in his left hand, back up, and turning the handle towards him, with 4 screws up the breech screw until it is home. 4 and 5 then go under cover.

If No. 1 gives "*Sponge out*," 2 mounts up, taking the sponge with him and sponges the gun out; at "*Clear*," 4 and 5 act as before detailed, 2 passes the sponge over his head as he turns left about, replaces it and goes under cover.

No. 1 then directs 5 to fire a tube.

To Load.

Officer.	*No. 1.*
Range——yards.	*Run up. Halt.*
With——load.	*With——load.*

"*Run up.*" No. 1 takes in the slack and holds on the preventor rope; 2, 3, 4 and 5 take up the truck levers; 2 and 3 raising the small ends to enable 4 and 5 to hook the points to the eyebolts. When this is done 2 and 3 haul down the small ends by means of the ropes; 4 and 5 place the pawls; 4 goes under cover; 5 holds on to the preventor rope behind 1; 2 and 3 guide the levers whilst the carriage is in motion; 1 and 5 ease off hand over hand, and hold on when the mark on the preventor rope comes over the bollard.

"*Halt.*" When the gun is in its proper position No. 1 gives "*Halt;*" 2 and 3, bear down the small ends of the levers; 4 and 5 throw back the pawls; 2 and 3 allow the small ends of the levers to rise gently, manning the ropes when the levers are out of reach. When the rear of the carriage rests on the platform, the levers are unhooked, withdrawn, and laid down outside the handspikes by 2, 3, 4, and 5, who go under cover.

"*Load.*" 2 and 3, as soon as 4 and 5 have lifted out the vent piece, mount on the side pieces by the steps, and place themselves in a position for sponging or loading.

They lift the shell in the bearer to the bore, into which 3 forces it with his right hand, having first withdrawn the safety-pin from the fuze; 2 then receives the rammer from 4, and, assisted by 3, rams home the projectile, their outward hands back under, inner hands back up; 3 then turns to his right, takes the cartridge out of the case, places it in the bore, and goes under cover; 2 presses the cartridge gently home, withdraws the rammer, turns to his left about, gets down, replaces the rammer, and goes under cover.

Should "*Sponge out*" be given by No. 1, 2 receives the sponge from 4 introduces it into the bore and sponges out in two motions; he then withdraws the sponge, cleaning the chamber well, and hands it back to 4.

4 and 5 mount up, unscrew the breech screw and lift the vent piece on to the saddle, using the iron lever if necessary; 4 removes the old tin cup with the extractor, and goes to the side arms, lifts the sponge (if required) with his left hand back under, turning to the right about as he does so, and hands it to 2, waits for it, replaces it, and then takes up the rammer in the same way he did the sponge, hands it to 2 and goes under cover; 5 unhooks and takes in the slack of the preventor rope.

As soon as the gun is loaded 4 and 5 mount up, 4 passes a tin cup down the slot, edge to the front, and presses it into the bore; 5 primes the vent piece. They then drop in the vent piece, and screw up the breech screw as before explained, 4 (for additional security) placing both hands on the top of the lever ball, and giving two smart taps; 4 and 5 then go under cover.

6 and 7 bring up the projectile in bearer, 6 carrying the cartridge case in his right hand; the bearer is placed on the platform on the right of 3; 7 removes it when the shell has been placed in the bore by 2 and 3; 6 uncovers and raises the cartridge case to enable 3 to withdraw the cartridge.

To Lay the Gun.

Officer.	*No. 1.*
	Elevate.
	Lower. Coin.
	With screw elevate. Halt.
	Depress. Halt.
	Trail right. Halt.
	Trail (left). Halt.

No. 1 looking over his sights gives "*Elevate*," then "*Lower*," and when the gun is at the required elevation, "*Coin.*" If a slight amount of elevation or depression is required, he gives "*With screw*," "*Elevate*," or "*Depress.*"

"*Elevate*," 2 and 3 take up their handspikes and step forward in line with the breech, place their handspikes, bevels down, over the steps of the carriage and under the breech, and bear down; 5 double mans 3's handspike; at "*Lower*," they allow the small ends to rise gently; at "*Coin*," they withdraw their handspikes and step outwards; 4 withdraws the coin as soon as 2 and 3 elevate, and at "*Coin*" forces it sharply home. If the order is "*With screw*," "*Elevate*," or "*Depress*," 4 works the screw until "*Halt*" is given, and 2 and 3, laying down their handspikes, take up the iron-shod levers, placing themselves ready to traverse. All the platforms on which the gun is mounted are pivoted in front, centre, or in rear, the position taken up by 2 and 3 differs according to the manner in which the platform is pivoted.

Nature of Pivot.	*Position of Nos. 2 and 3.*
"A" (under the muzzle of the gun when run up).	"*Trail right.*" 2 stands facing to the rear with the point of his lever resting on the rear racer; at "*Halt*" he scotches the rear truck on his own side with the lever. 3 stands facing to the rear and applies the point of his lever under the left rear truck of the platform, both hands back up, and heaves the platform over to the right, taking short, quick purchases. "*Trail left.*" The numbers work in the opposite directions.
Pivot "B" (under the front part of the platform.)	As with A pivot.
Pivot "C" (in the centre of the platform.	"*Trail right.*" 3 works as with pivot "A"; 2 takes up his position at the front truck on his own side, and works over the front of the platform to the left. At "*Halt*," 2 withdraws his lever and with it scotches the rear truck. "*Trail left.*" 3 works the front truck, and 2 the rear; 3 scotches the rear truck at "*Halt.*"
Pivot "D" (at an intermediate point between the centre of the platform and the rear truck).	"*Trail right or left.*" 2 and 3 work the front truck, 2 heaving the front of the platform over to the left in the first case, 3 the front to the right in the second.
Pivot "E" (in front of the rear block).	As with "D" pivot.
Pivot "F" (in the rear of the rear block).	As with "D" pivot.

With platforms pivoted at "A" or "B"; at "*extreme right*" (or *left*), 2, 3, 4, and 5 push over the rear of the platform in the direction ordered.

When traversing tackle is used, at "*hook traversing tackle*," 4 and 5 hook

the double blocks to the rings or holdfasts prepared for them; 2, 4, and 3, 5 haul on the tackle, or ease off at "*Trail right* (or *left*), so as to move the platform in the direction required.

If the tackle when hooked hinders the service of the gun, the double blocks are removed by 4 and 5, or the single ones by 2 and 3, as may be directed by No. 1.

Should no order to fire be given when the gun is laid, No. 1 gives the word "*Under cover.*"

To Make Ready and Fire.

At "*Ready,*" 2 and 3 withdraw their levers, and place them, bevels up, as scotches under the trucks; 2, 3, and 4 then go under cover. 5 presses a tube into the vent, descends from the platform, and stands ready to fire, facing the gun. At "*Fire*" he draws the lanyard strongly towards him without a jerk, replaces it under his belt, hooks the preventor rope (except at drill), and goes under cover.

To Run Back and Unload.

Officer.	*No.* 1.
	Run back.
	Halt.
	Examine gun.

"*Run back.*" 4 slackens the compressor if the carriage is fitted with one.

The truck levers are applied as in running up; No 1, standing between the cheeks, holds the small ends of the truck levers and guides them; 4 and 5 overhaul the tackle and hook the front blocks to the front eye-bolts on the carriage. All the numbers, except No. 1, man the falls on their respective sides, and at "*Heave*" haul the gun back.

"*Halt.*" When the gun is run far enough back, No. 1 hauls down the levers by the ropes till the pawls fall; the levers are then allowed to come up, No. 1 rising with them. The front blocks are unhooked by 4 and 5, who carry them to the rear, lay them down clear of the racers, and coil down the end of the fall; 2, 3, 4, and 5 unhook the truck levers and lay them down; 5 hooks the preventor rope.

"*Examine gun.*" 4 and 5 mount up on the platform and take out the vent piece, as before detailed in "*Prepare for action;*" 2 forces the drill projectile and cartridge through the bore with the sponge; 6 and 7 receive them at the muzzle and carry them to the rear; 4 and 5 replace the vent piece, and screw up the breech screw.

To Cease Firing and Replace Stores.

Officer.	*No.* 1.
	Elevate.
Cease firing.	*Lower. Coin.*
Replace stores.	*Replace stores.*

"*Elevate.*" "*Lower.*" "*Coin.*" 4 and 5 take a purchase with handspikes, as detailed in "*Prepare for action,*" 3 taking out the elevating screw and replacing the pedestal or coin, No. 1 assisting as before.

The gun is laid "Under metal."

"*Replace stores.*" The stores are replaced by the numbers who brought them up.

To Form Detachment Rear.

Officer.	*No. 1.*
Detachment rear.	*Outwards turn.*
	Double march.
	Halt.
	Front.

"*Detachment rear.*" No. 1 doubles to the left rear of the platform, faces to the left, and gives the order "*Outwards turn*"; 2 and 4 turn to their left, 3 and 5 to their right.

"*Double march.*" 4 and 5, followed by 2 and 3, wheel to the right and left, and when clear of the platform to the right, and round No. 1's left shoulder, 6, 7, 8, and 9 coming up into their places; when 2 and 3 have passed him No. 1 gives "*Halt,*" "*Front,*" and changes his flank by the rear.

To Change Rounds.

Officer.	*No. 1.*
Change rounds.	*Change rounds.*

In changing rounds No. 2 becomes 4; 4, 1; 1, 9; 9, 8; 8, 7; 7, 6; 6, 5; 5, 3; 3, 2.

Drill with Guns on Naval Slides.

The same stores are brought up as for traversing platforms, except that no truck or iron-shod levers are required. 2, 3, 4, and 5 each provide a 7-foot handspike.

The gun is served as if on a traversing platform; the slide is traversed and the gun run up as with R.M.L. guns similarly mounted.

Drill with Gun on Moncrieff Carriage.

The detachment, consisting of nine Nos., is told off, and takes post under cover, as with the same gun mounted on a traversing platform.

General Duties.

No. 1 commands, directs, or superintends boring and fixing fuzes, attends to the brake in running up, and lays.

No. 2 sponges, places projectile in bore, rams home, attends to lever if required, and elevates.

No. 3 removes safety-pin, loads, rams home, attends to lever if required.

No. 4 attends to breech screw, vent piece, and tin cups, attends to side-arms, supplies them to 2, traverses, attends to lever if required.

No. 5 attends to breech screw and vent piece, primes, depresses the gun for loading, elevates previous to running up (about 1°), traverses, attends to lever if required, makes ready, and fires.

No. 6 supplies 3 with cartridges, and brings up projectile.

No. 7 attends to fuzes, and brings up the projectile.

No. 8 attends to carriage store, serves out cartridges to 6, with lubricators attached.

No. 9 attends to shell store, issues shells, tubes, and fuzes.

To Prepare for Action.

As with the gun on a traversing platform, except that no preventor rope, handspikes, truck levers, or iron-shod levers are required. No. 5 provides a long lanyard.

Nos. 2 and 3 bring up an iron-pointed lever each, which they lay down on side of the gun.

Tackle will be necessary to run the gun back.* Two sets of heavy gun tackles are brought up by 6 and 7.

The sponge and rammer are laid down on the right of the gun, close to the parapet, heads towards the muzzle, the shell extractor and wad hook outside the pit.

At "*Examine Gun*," the same as at 7-inch R.B.L., on a traversing platform, and 5 attends to the elevating wheel, and depresses till the gun is in a convenient position for loading.

To Load.

No. 1 at "*Load*" gets the gun into a convenient position; 5 depresses if necessary.

After the loading is completed, 5 gives 1° or more of elevation, as shown on the arc.

To Run Up.

Before running up No. 1 will give the caution "*Stand clear*," then holding the brake he allows the gun to run up.

He must be very careful not to let it escape from his control, and, on the other hand, he must not check it too soon. Should the latter be the case, No. 1 gives "*Work levers*," 2 and 3 fix the latches, and work their levers, small ends to the rear; 2 and 4 man the right, 3 and 5 the left lever; No. 1 will give "*Down*," "*Fresh purchase*," "*Halt*," as required.

When the gun is up, No. 1 will mount up the ladder to lay it, 2 and 3 slackening the latches and unshipping the levers; 4 and 5 man the traversing handle.

To Lay the Gun.

Nos. 4 and 5 traverse.

No. 2 elevates or depresses.

The gun may be laid without exposing any number, No. 1 using a reflecting sight, or elevating in accordance with the graduations on the elevating arc or trunnion pointer, and traversing to marks previously made on the racers.

To Make Ready and Fire.

When No. 1 has laid the gun at "*Ready*," 5 mounts up and drops the tube into the vent, throwing the lanyard clear of the carriage, and comes down.

When the gun is laid from below, No. 5 makes ready before the gun is run up. As soon as he has fired he coils up the lanyard, and replaces it under his belt.

To Unload and Run Back.

(*For drill purposes extra men will be required.*)

To run back, 2 and 3 fix the latches and work their levers, small ends to the front, and bear down, double-manned by 4 and 5. No. 1 gives "*Down*," "*Fresh purchase*," "*Halt*," as required. Tackles to be hooked by 4 and 5, assisted by 6 and 7, and manned by all available numbers.

Unloading should be effected when the gun is run back.

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* Two heavy gun tackles allowed for each gun mounted singly, or for every two guns when together.

To Cease Firing and Replace Stores.

To Form Detachment Rear.

To Change Rounds.

As with 7-inch R.B.L. on traversing platform.

Drill with Guns on Rear Chock Carriages.

In preparing for action, No. 1 brings up a roller handspike, which he lays down in rear.

The stores detailed for a gun mounted on a traversing platform are brought up by the several numbers, but the truck and iron-shod levers and preventor ropes are not required.

A tackle is brought and arranged by Nos. 8 and 9 for running back

The gun is served as when mounted on a traversing platform.

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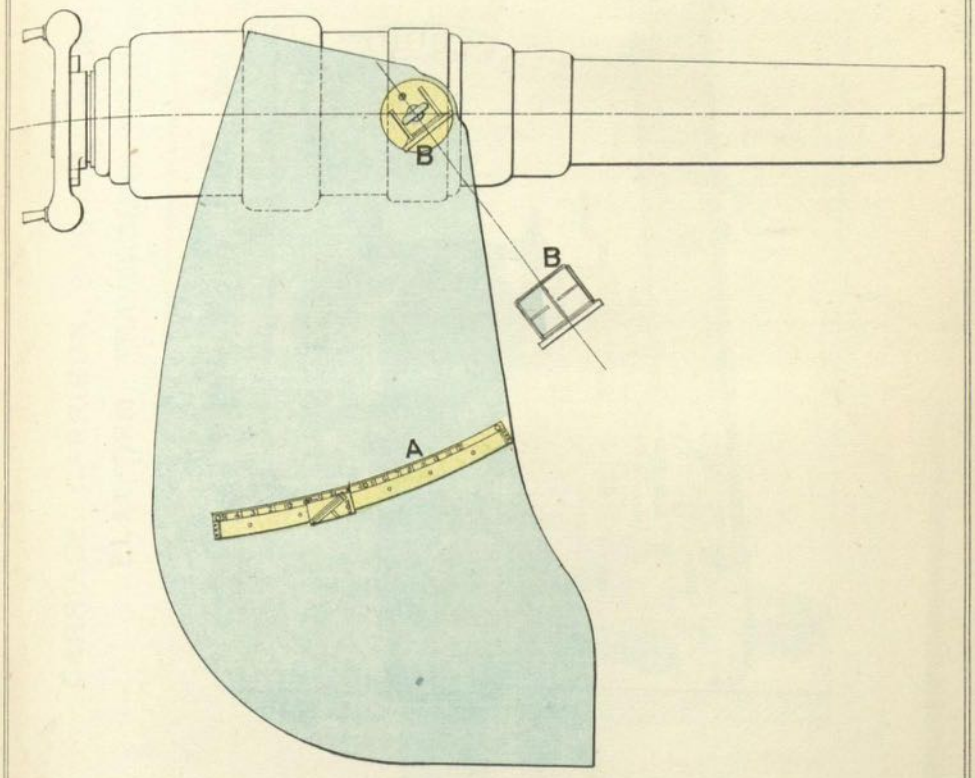
(Wt. 4180 1000 6 | 85—H & S 3042)

MONCRIEFF CARRIAGE MARK II.

SKETCH SHEWING POSITION OF REFLECTING SIGHTS.



Sights reflecting Mark II Carriage

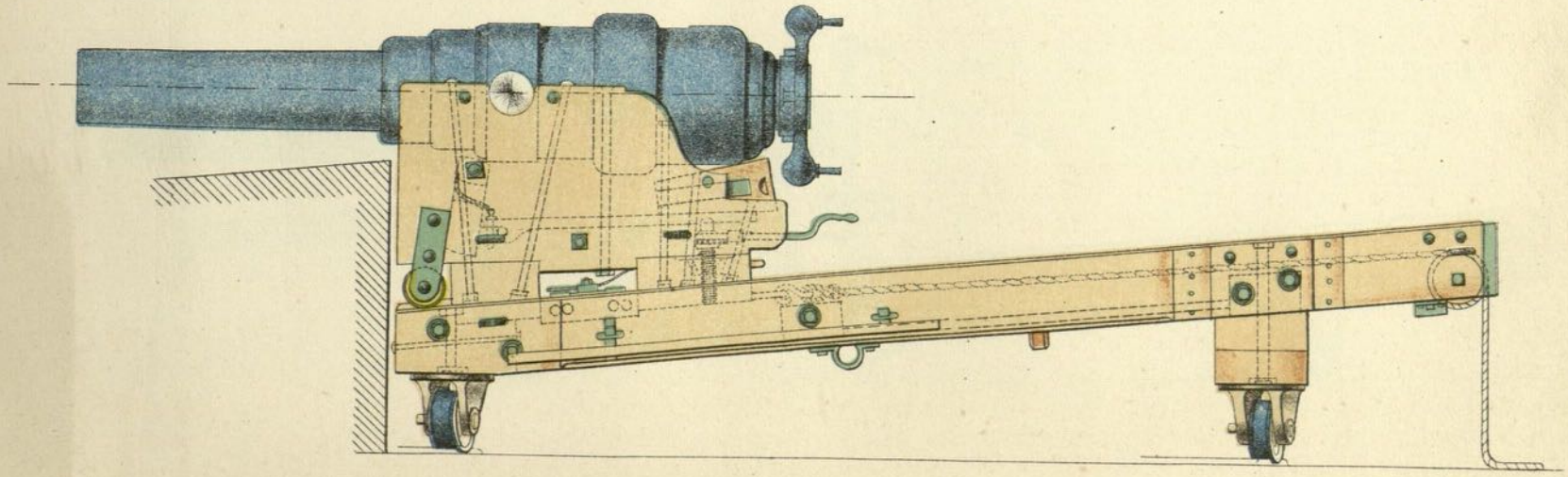
A With graduated bar for Rocker and fixing screws.
B Trunnion with Bracket and fixing screws.

6338.

DANGERFIELD LITH. 22 BEDFORD ST. COVENT GARDEN.

CARRIAGE, GARRISON, SLIDING, DWARF, MEDIUM Nº 16.
PLATFORM, TRAVERSING, MEDIUM Nº 16.

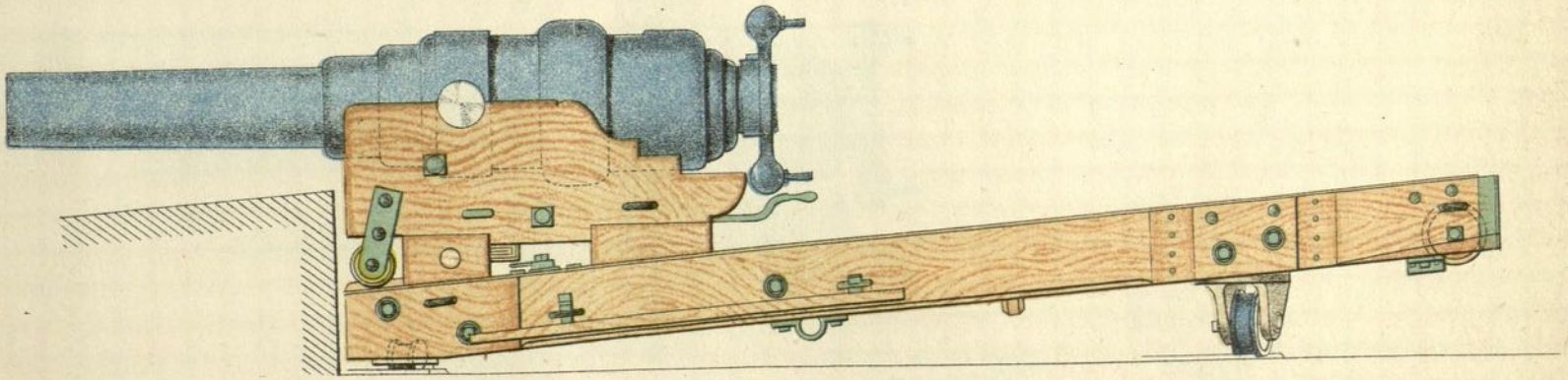
Scale, $\frac{1}{32}$ Full Size.



DANGERFIELD LITH 22 BEDFORD ST COVENT GARDEN 6339.

CARRIAGE, GARRISON, SLIDING, CASEMATE MEDIUM Nº 15.
PLATFORM, TRAVERSING MEDIUM Nº 14.

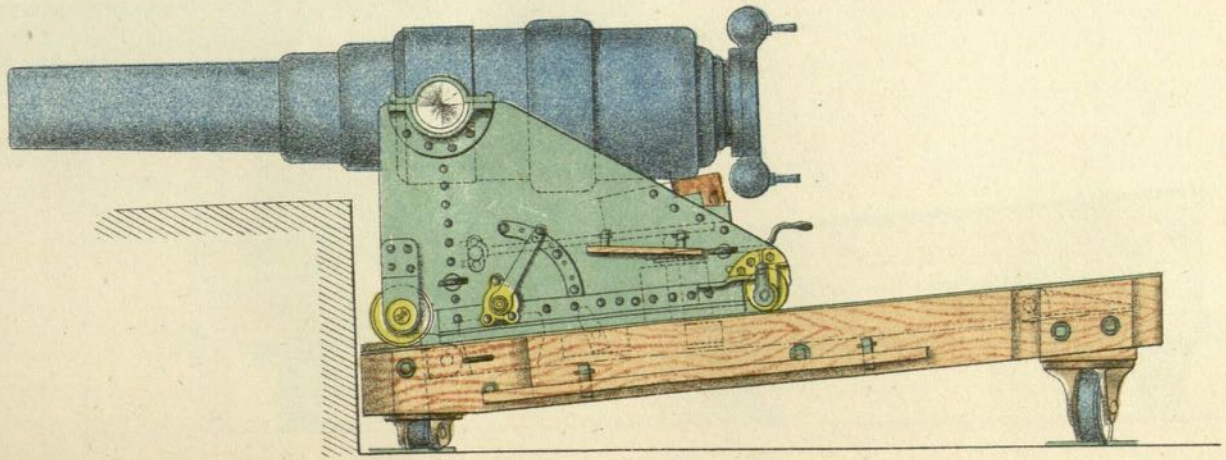
Scale, $\frac{1}{32}$ Full Size.



DANGERFIELD. LITH. 22 BEDFORD ST COVENT GARDEN. 6339.

CARRIAGE, GARRISON, SLIDING, MEDIUM, Nº 3. IRON, 3 Ft 6 IN PARAPET.
PLATFORM, TRAVERSING, MEDIUM, Nº 13 WOOD. 3 Ft 6 IN PARAPET, 11 Ft LONG.

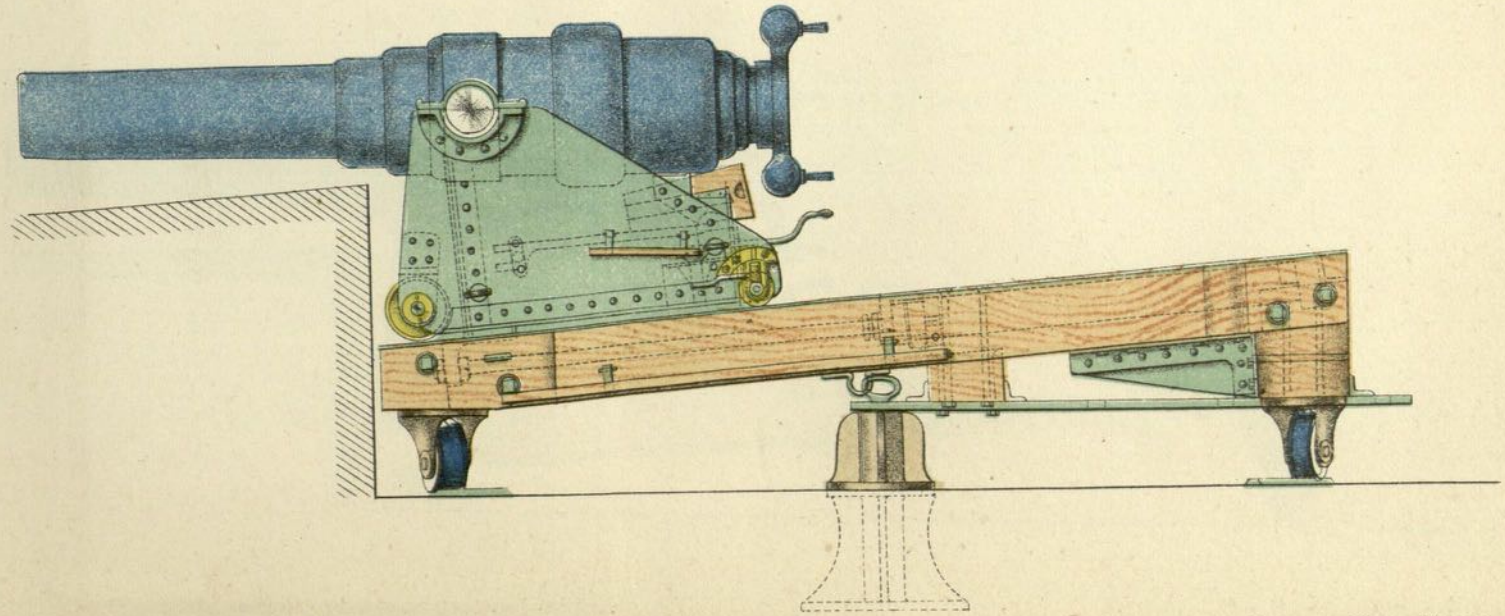
Scale, $\frac{1}{32}$ Full Size.



DANGERFIELD. LITH. 22 BEDFORD St COVENT GARDEN 6339.

CARRIAGE, GARRISON. SLIDING, MEDIUM Nº 2, IRON 4 FT 3 IN. OR 3 FT 6 IN. PARAPET.
PLATFORM TRAVERSING MEDIUM Nº II WOOD 4 FT. 3 IN PARAPET, 13 FT 2 IN. LONG.

Scale; $\frac{1}{32}$ Full Size.



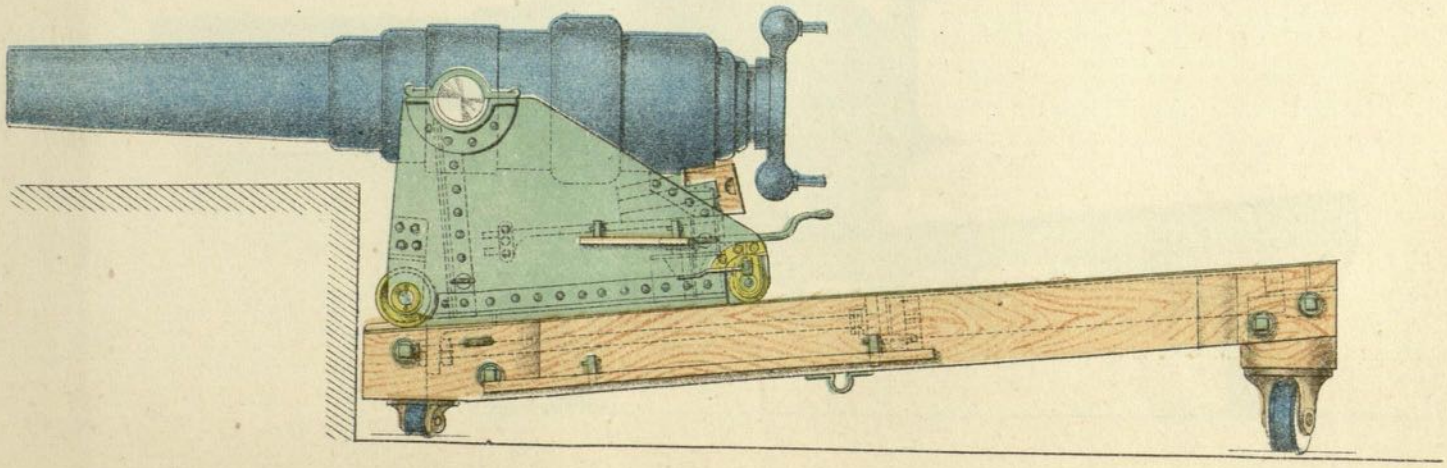
DANGERFIELD, LITH. 22, BEDFORD ST. COVENT GARDEN. 6339.

Plate VIII.

CARRIAGE, CARRISON, SLIDING MEDIUM Nº 2 IRON, 4 FT 3 IN OR 3 FT 6 IN PARAPET.

PLATFORM, TRAVERSING, MEDIUM Nº 12 WOOD 3 FT 6 IN PARAPET 13 FT 2 IN. LONG.

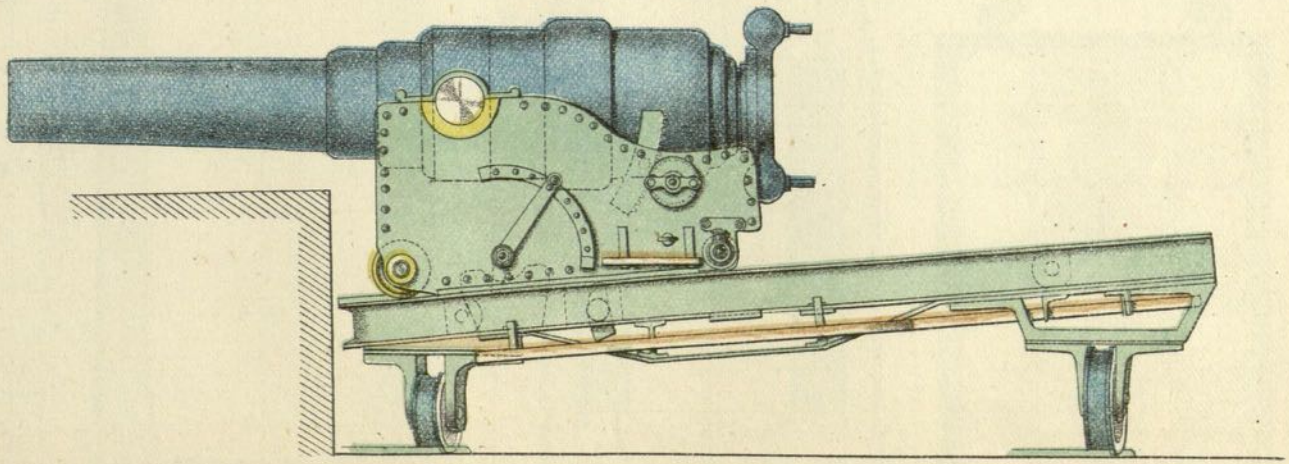
Scale, $\frac{1}{32}$ Full Size.



DANGERFIELD, LITH 22 BEDFORD S^T COVENT GARDEN 6339.

CARRIAGE, GARRISON, SLIDING, MEDIUM, N° 1 IRON 4 FT. 3 IN. 3 FT. 6 IN & 2 FT. 7 IN. PARAPET
PLATFORM, TRAVERSING, MEDIUM, N° 2, IRON, 3 FT. 6 IN PARAPET.

Scale, $\frac{1}{32}$ Full Size.

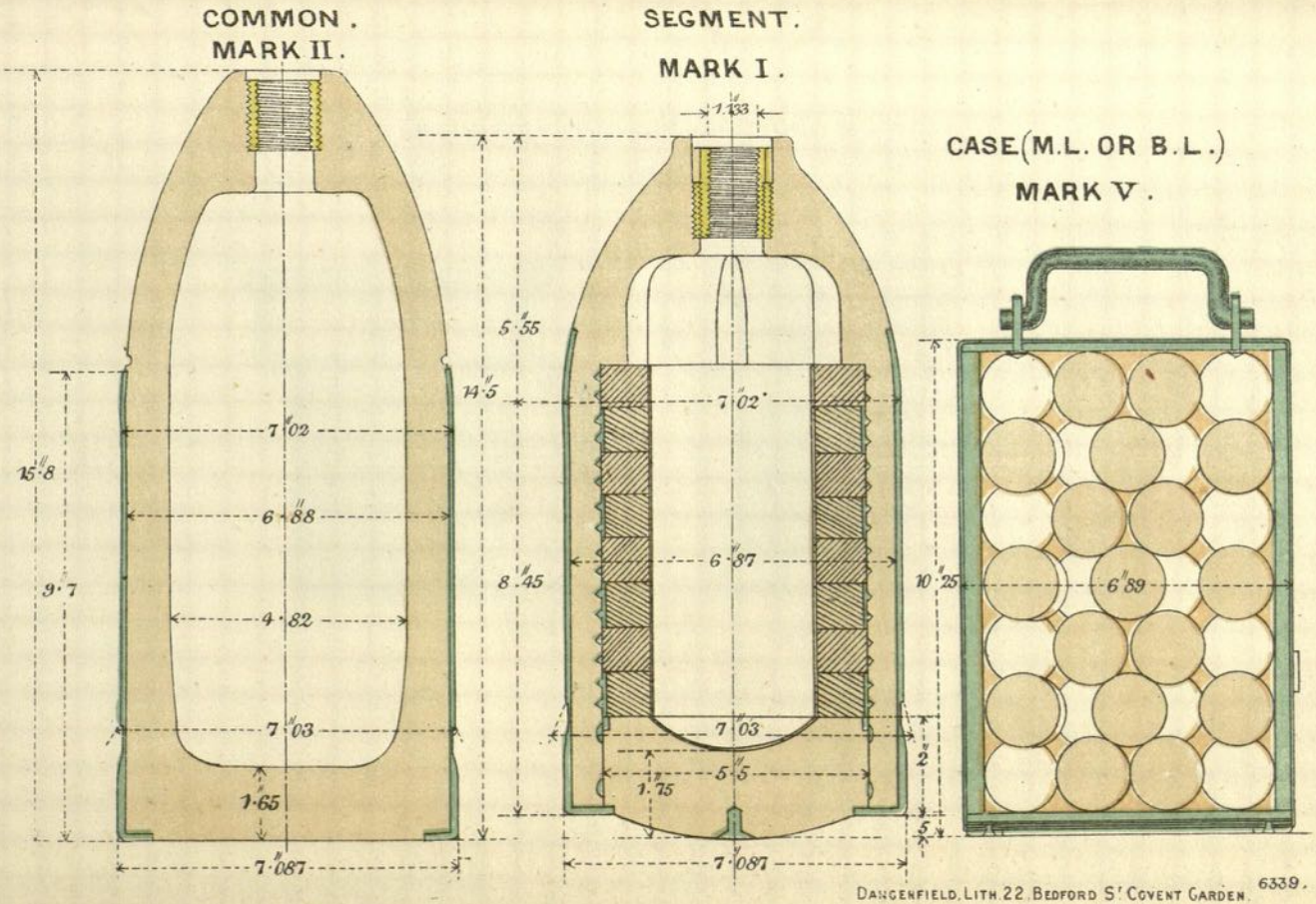


DANGERFIELD. LITH 22. BEDFORD ST. COVENT GARDEN. 6359.

PROJECTILES.

Scale, 3 Inches = 1 Foot.

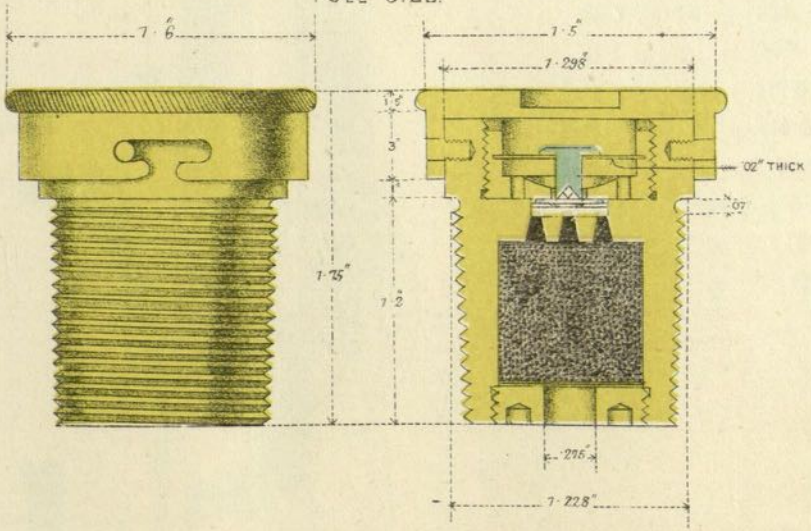
Plate X.



DANGENFIELD, LITH. 22, BEDFORD ST. COVENT GARDEN. 6339.

FUZE PERCUSSION DIRECT ACTION MARK I.

FULL SIZE.



DANCKERFIELD LITH 23 LEICESTER ST. COVENT GARDEN. 6339.

Nº 4123 $\frac{E}{458}$ (A)

FUZE, TIME, WOOD, WITH DETONATOR, 15 SECONDS. (MARK III)

FULL SIZE.

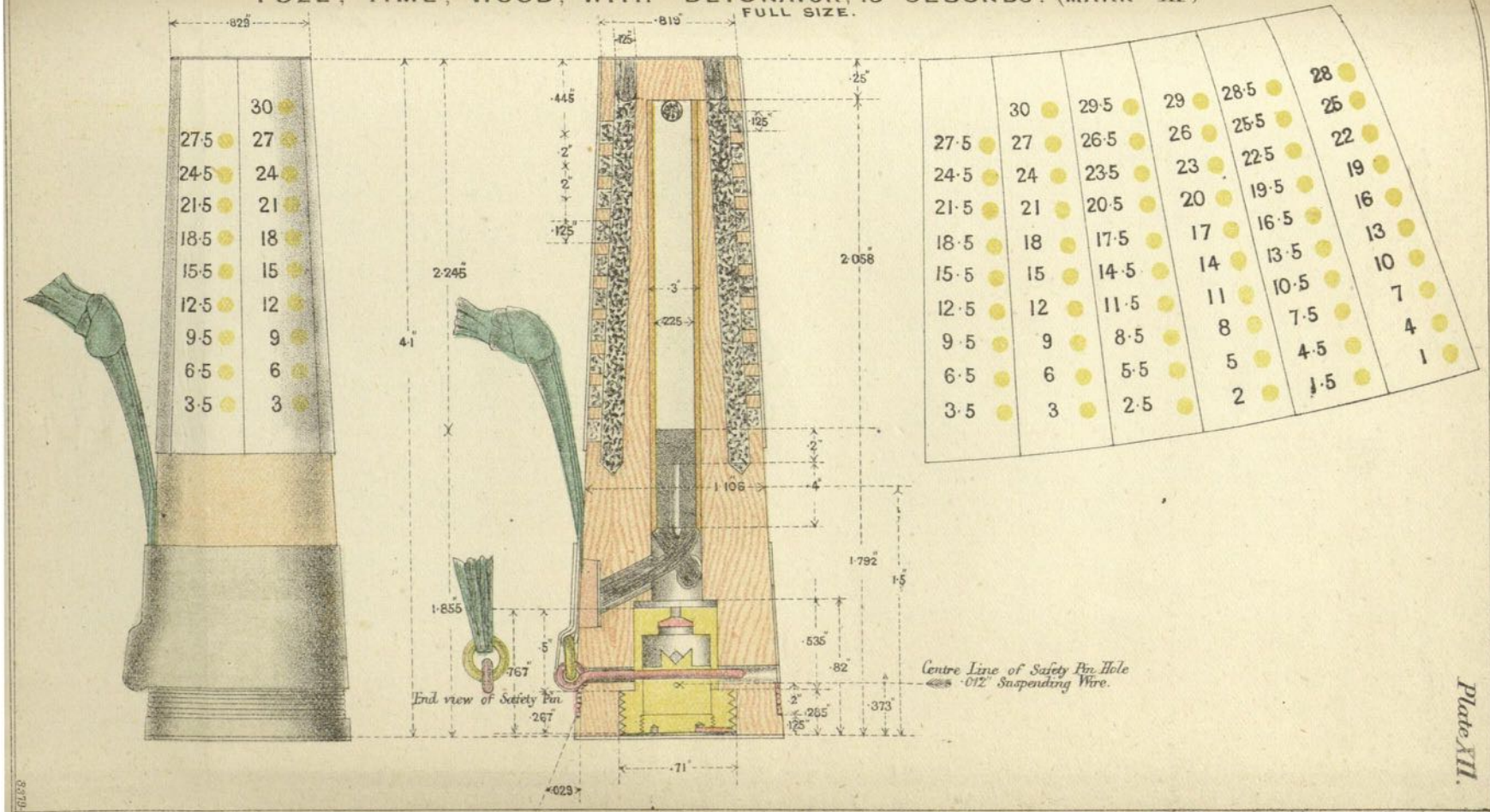
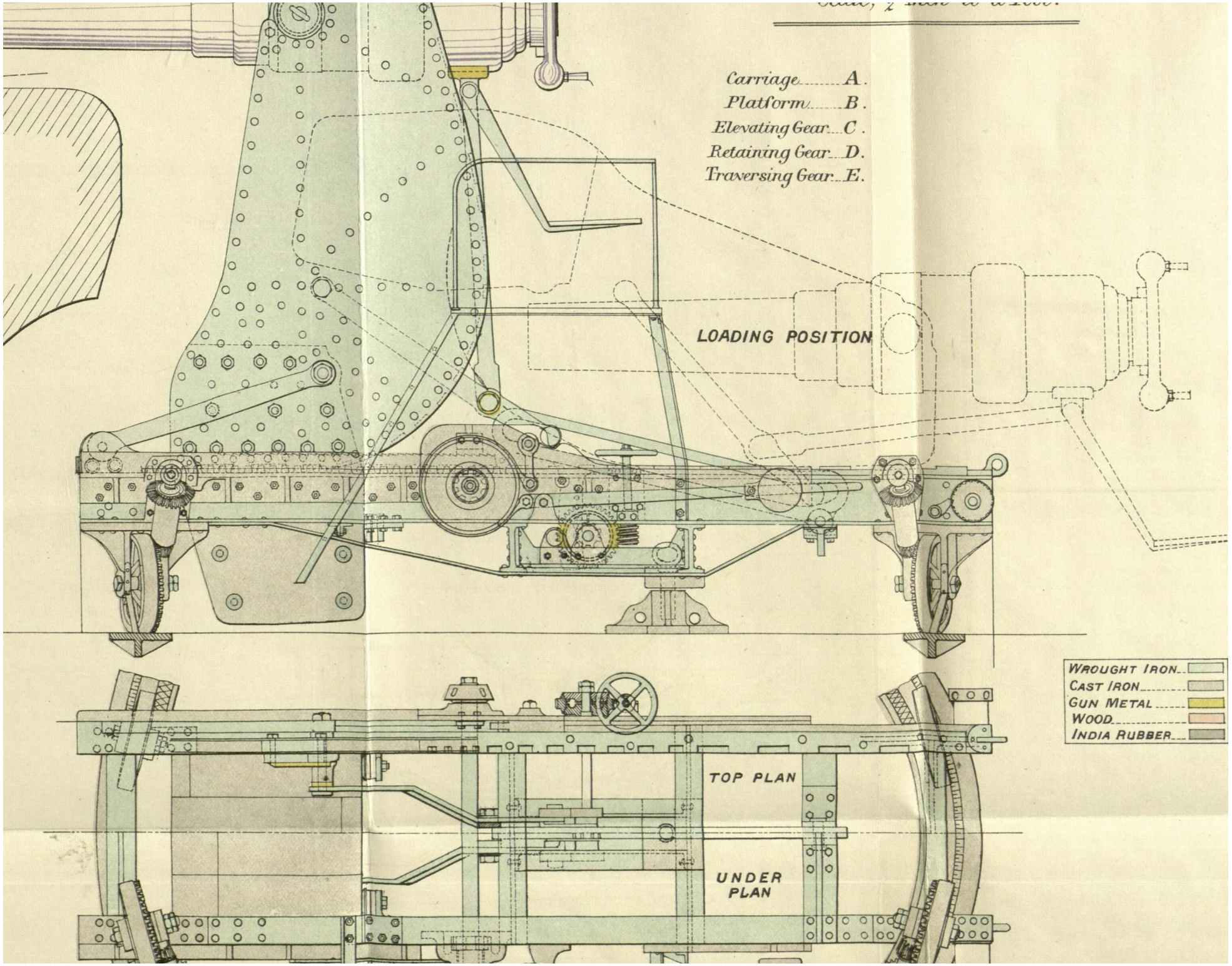
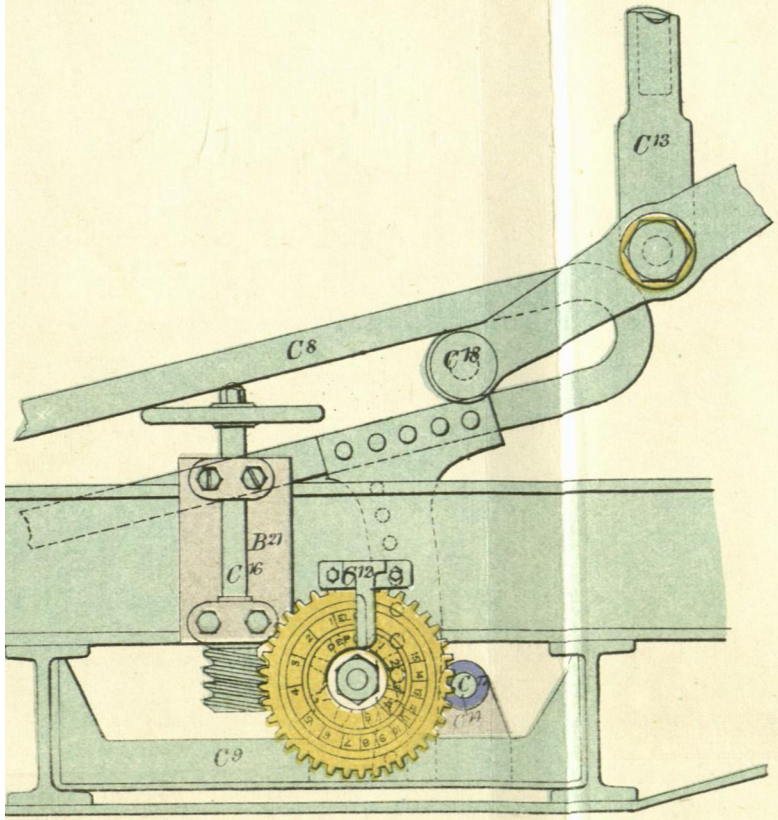
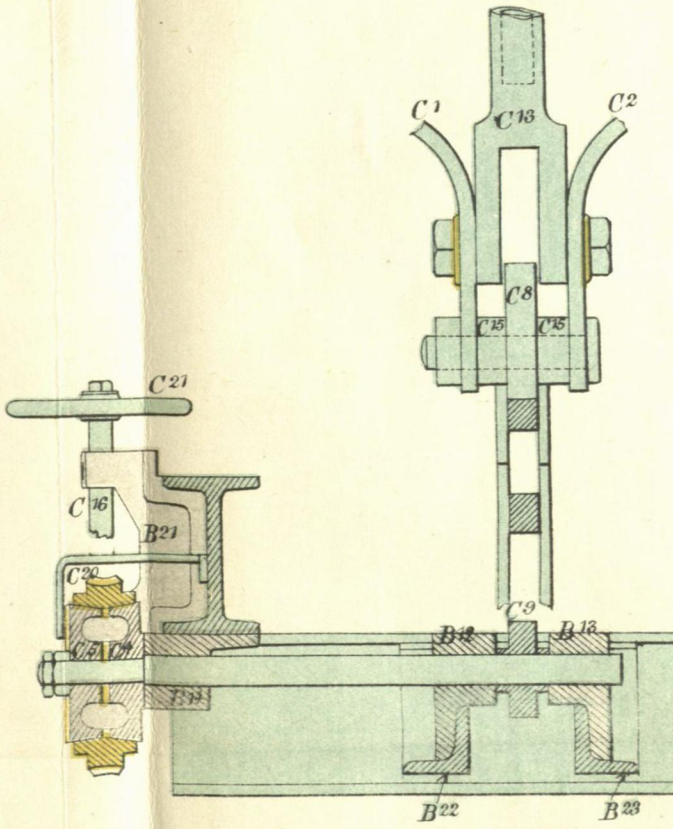


Plate XII.

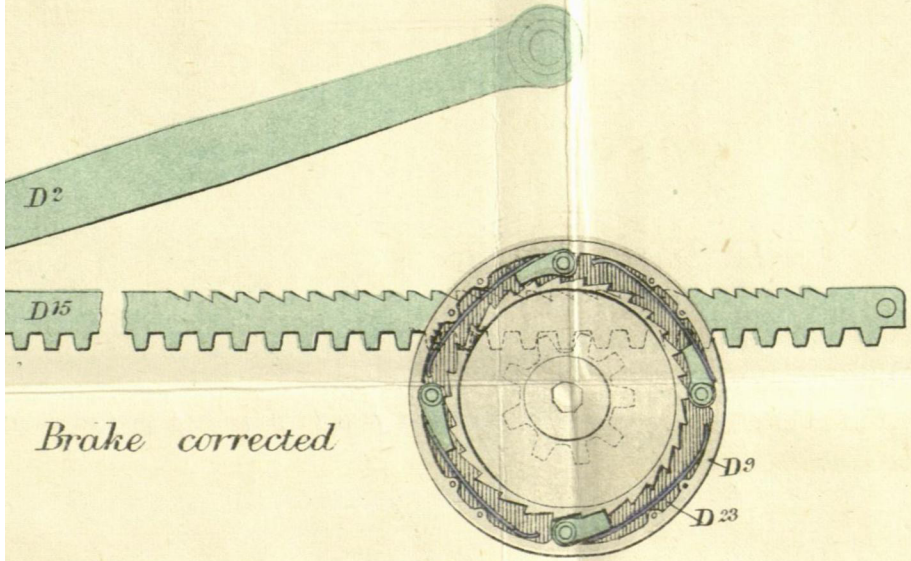
8376


Carriage.....A.
Platform.....B.
Elevating Gear...C.
Retaining Gear...D.
Traversing Gear...E.
LOADING POSITION
TOP PLAN
UNDER PLAN
WROUGHT IRON
CAST IRON
GUN METAL
WOOD
INDIA RUBBER





GEAR ELEVATING



Brake corrected