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# HANDBOOK

FOR

## 9-PR. R.M.L. GUNS OF 6-CWT. & 8-CWT.

(MOVABLE ARMAMENT.)



1898.



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LONDON:

PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,  
BY HARRISON AND SONS, ST. MARTIN'S LANE,  
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### MEMO.

This handbook has been corrected up to August, 1898. Any alterations which may be suggested should be forwarded to Chief Inspector, Woolwich Arsenal.

*C.H.*

# 9-pr. R.M.L. Guns of 6 cwt., Mark II, and 8 cwt., Mark I.

(MOVABLE ARMAMENT.)

## DESCRIPTION.

### GUN.

(Plates I and II.)

		6-cwt. Gun.		8-cwt. Gun.	
Length,	{ nominal .. ..	71 inches	.. ..	68.5 inches.	
	{ total .. ..	74.5 inches	.. ..	72 inches.	
Weight, nominal..	.. ..	6 cwt. ..	.. ..	8 cwt.	
Preponderance ..	.. ..	10 lb. ..	.. ..	7 lb.	
Bore ..	{ calibre .. ..	3 inches	.. ..	3 inches.	
	{ length .. ..	66 inches	.. ..	63.5 inches.	
	{ capacity of unrifled portion of bore.	24.86 cubic inches	.. ..	24.86 cubic inches.	
Rifling..	{ system .. ..	French, modified	.. ..	French, modified.	
	{ twist .. ..	uniform, 1 in 30 cal.	.. ..	uniform, 1 in 30 cal.	
	{ length .. ..	62.3 inches	.. ..	59.8 inches.	
grooves	{ number..	3	.. ..	3	
	{ depth ..	0.11 inch	.. ..	0.11 inch.	
	{ width ..	0.8 inch	.. ..	0.8 inch.	
Vent, hardened copper	.. ..	.. ..	.. ..	0.6 in. from end of bore.	

The two natures of this gun differ from one another chiefly in weight and dimensions; they both fit the same carriage, are vented alike, have the same rifling, and take the same ammunition.

As regards their construction they each consist of an "A" tube of steel, over which is shrunk a wrought-iron jacket.

The cascable is in one piece with the "A" tube in the 8-cwt. gun, and was originally so in the case of the 6-cwt. gun also, but in the latter was too weak to stand the jar of the elevating gear on firing, and so has been removed, a cascable of wrought iron, of strengthened pattern, being screwed in to replace it.

### SIGHTS.

Both guns are centre-sighted, and each is provided with 2 tangent sights of different lengths, only the shorter of which can be carried in the gun. The longer one is only for use when firing at higher angles of elevation than those given on the short sight.

In each gun the tangent sight is set at an angle of 1° 30' to correct for drift.

The sights are graduated in degrees, yards, and length of fuze, and are each provided with a deflection leaf, capable of giving 30 minutes right or left.

The graduations are:—

			degrees.	yards.
6-cwt. gun	{	short sight	.. 0 to 5 ..	2,100
		long ..	.. 0 to 12..	2,500
8-cwt. gun	{	short ..	.. 0 to 6 ..	2,400
		long ..	.. 0 to 12..	3,500

The tangent sights are not interchangeable between the two guns, as they are graduated to a different radius.

The fore-sight is a small hog-backed sight, screwed into a recess in the dispart patch at the muzzle. A wrench is provided for removing the sight when necessary.

A clinometer is supplied for use when firing at elevations above 12°, a plane being cut for it on the gun immediately in front of the vent.

#### CARE AND PRESERVATION OF GUN AND FITTINGS, BASED ON INSTRUCTIONS CONTAINED IN "REGULATIONS FOR MAGAZINES AND THE PRESERVATION OF ARTILLERY MATÉRIEL."

A "Memorandum of Examination" is issued with each gun. It contains a drawing showing the principal dimensions, with a short description of the construction and rifling, as well as the particulars of any slight original defects or tool marks which may have existed at the date of issue. In it are recorded in detail the number of rounds fired, and the date and result of any examination.

This memorandum will remain in charge of the officer who has possession of the ordnance, and a certificate to the effect that it is in possession and complete up to date will be included in the Annual Return of Rifled Ordnance, Army Form G 872.

At the conclusion of each day's firing an entry will be made in the memorandum by the officer in charge, giving a detail of the rounds fired, so that an accurate record of the firing may always be kept up.

A statement of the results of the examination will be added to the memorandum by the inspecting officer or other examiner who performs the duty, and when the gun is returned into, or issued from, store, the memorandum will accompany the vouchers.

If at any time the memorandum be lost or damaged, a duplicate can be obtained from the Chief Inspector, Woolwich, by whom also inside sheets for continuation of the record of the number of rounds fired will be supplied on demand.

The gun will, as far as possible, be examined after firing 150 rounds, and practice from such ordnance should cease until such examination has been carried out. In cases, however, where such examination would happen within a series of rounds allowed for practice, and thus cause inconvenience, the gun will be examined before practice commences, irrespective of the number being completed.

In computing the number of rounds for examination purposes, four rounds of blank charges may be regarded as equal to one round with projectile, but in recording the number on the memorandum of examination, "blank rounds" should be shown as such. Ordnance used for saluting purposes or for time-guns should, however, be examined at least once a year, or oftener if necessary.

The exterior of the gun will be painted biennially, and the bore will be lacquered at the conclusion of each year's practice, when, in addition, the vent will be plugged, and all fittings liable to damage by exposure will be removed.

During practice the bore will be kept slightly oiled to prevent rusting; at the close of each day's practice the gun will accordingly be washed out and placed under metal, and as soon as dry, the bore will be oiled with a greasy sponge and the muzzle closed with a tampeon.

The clinometer plane is not to be painted, and it is on no account to be cleaned by filing, or by the use of brick dust. It must be cleaned by a soft rag, and afterwards slightly oiled.

The sights must be kept clean, free from grit, and oiled, and the sliding leaves of the tangent sights must have free play; on no account are the sights to be burnished or cleaned in such a manner as to remove the bronzing or blueing.

Preserving and fixing screws should be occasionally removed and slightly oiled, to prevent them from setting fast.

#### RIFLES, AIMING, M.-H. CHAMBER, EWART.

This apparatus is for use with the gun in imparting instruction in laying, and consists of the following parts:—

Rifles, aiming, M.-H. chamber,

Ewart—

Bands	..	..	..	Bronze.
Front	..	..	..	With securing bolt, nut, and washer.
Rear	..	..	..	With securing bolt, nut, and washer, buffer, and key.
Barrel, rifle	..	..	..	M.-H. rifle barrel, with breech action and metal boss.
Cord, firing	..	..	..	White line, tarred, 2 yards long (with two hooks).
Lever, vent	..	..	..	Steel.
Link, trigger	..	..	..	Bronze, with fixing screw.
Tube, 0.23-inch "J"	..	..	..	Including breech-piece, bushes (movable and fixed), set nut, and leather washer.
Lanyard, friction tube, siege, No. 1				With toggle, 5 feet 5 inches.
Tube, friction, drill	..	..	..	Dummy, iron, with spring clip.
Tube, 0.23-inch—				
Brush, cleaning.				
Key, M.-H.				
Rod, cleaning.				

#### *Method of Fitting, Adjusting, and Using the Apparatus.*

The aiming rifle is fitted to the left side of the gun in the following manner:—

The two bands are placed over the chase of the gun, the distance between the inner faces of the bands being 27 inches.

The bands are secured round the gun by fixing bolts. The muzzle of the rifle is passed through the hole in the arm projecting from the front band, and the breech is placed in the socket on the rear band and fastened with a key. A buffer spring, to lessen the strain on

recoil, fits into the socket in rear of the rifle. A hole is made at the rear end of the socket to facilitate the extraction of the buffer spring.

To adjust the rifle on the gun, the latter is laid horizontally; the 0.23-inch tube "J" is then inserted in the bore of the rifle, sufficient length being allowed to project from the bore to admit of the application of a spirit level to the 0.23-inch tube, by which means the rifle is levelled, so that the axis of rifle and gun are in parallel horizontal planes. The bands are then firmly screwed up, care being taken to see that they do not shift during the operation, in the event of which they must be slackened and re-adjusted.

Elevation is obtained by means of the gun sights, and any error in line is corrected by use of the deflection scale.

The rifle is fired by means of the firing cord. One end is hooked to the loop of the "Link, trigger," and the other end to an arm of the "Lever, vent," the service "Lanyard, friction tube, siege, No. 1" is then hooked to the other arm of the "Lever, vent," the latter being kept in position by the service dummy tube.

### CARRIAGE AND LIMBER, MARK I.

The carriage is formed of two bracket sides, connected by transoms, bolts, and a trail plate; an axletree bed with axletree and two field wheels.

Each bracket side is constructed of plate iron, rivetted to the outer side of an angle iron frame.

The trail plate is of the same form as in the wood field gun carriages; its eye is steeled to prevent wear.

The axletree bed is of wrought iron, constituting with the axle a beam of box girder section, which is connected to the brackets by stays. A deflector, which is fitted with a pendulum to indicate on a degree scale the differences in the height of the wheels, is suspended by loops from the axletree bed.

The wheels are of the 2nd class, with metal nave.

The elevating screw is attached to the cascable by a bolt, and worked by a metal nut, bevel wheel, spindle, and handwheel on the right.

The axletree boxes are fitted with guard-irons and sliding-foot rests, in order that they may serve as seats. Each carries two rounds of case shot, or two shells, and small stores. A leather guard is fitted to the lid of the near box to protect the gunners' overalls from contact with the sponge head.

The limber is formed on the same plan as the wood limber, but has the futchells and splinter bar of iron.

To support the ammunition boxes, four knees of T-iron are secured to the back of the bed.

The limber hook is steeled to prevent wear, and has a steel key.

The axletree is the "light field" axle (2nd class), and the wheels are the same as those for the gun carriage.

The shafts are No. 1 "near" and Nos. 3 and 19 "off," the latter known as the "Brandling" pattern; they are fitted for farmers' draught, and the limber is fitted for single, double, treble, and bullock draught.

The limber boxes are "near," "off," and "centre"; the "near" and "off" carry each 18 projectiles in trays, and as many cartridges in a canvas cartouche.

Four extra projectiles can be carried under the trays, and as many more cartridges in the cartouche when necessary. In this case,

however, the cylinder for bits and hookhorer will have to be removed from the lids of the "off" limber boxes, and carried where convenient.

## CARRIAGE AND LIMBER, MARK II.

(Plates III and IV.)

The carriage differs from the Mark I carriage, in having the plate of each bracket placed on the inner instead of the outer side of the frame; and in the trail piece, which lies between the brackets, instead of overlapping them.

The wheels and elevating screw are the same as in the Mark I carriage; the axletree boxes are similar, but not interchangeable with those of Mark I.

The limbers differ from Mark I in having an iron (box girder) axletree bed instead of wood, and in the form of the limber hook, which is made to stand out from the bed, and so obviates the necessity of a block between them.

The wheels and boxes are the same as in Mark I limber.

	Mark I.	Mark II.		
Height, centre of gun .. .. .	3' 6½"	3' 6½"		
Length of {	{	carriage .. { with wheels .. .. .	10' 3"	10' 4"
		axletree .. { without wheels .. .. .	9' 0"	8' 10½"
		carriage and limber { without gun .. .. .	6' 4¼"	6' 4¼"
		{ with gun .. .. .	21' 0½"	21' 3½"
Minimum space through which carriage can turn .. .. .	22' 4½"	22' 6"		
Angle of trail .. .. .	32' 3"	32' 0"		
Angle of lock .. .. .	22°	23°		
Elevation, maximum { with screw .. .. .	52°	56½°		
{ without screw .. .. .	21°	22°		
Depression, maximum .. .. .	24°	22°		
Wheels { diameter .. .. .	4°	0°		
{ track .. .. .	5' 2"	5' 2"		
{ diameter .. .. .	5' 0"	5' 0"		
Weight of {	{	carriage, empty, with wheels, drag ..	12 3 8	11 3 8
		shoe, and elevating screw .. .. .		
		limber, empty, with boxes, shafts, and		
		wheels .. .. .	11 1 19	11 1 10
		wheels .. .. .	4 2 0	4 2 0
{ elevating screw .. .. .	0 0 11	0 0 11		
{ carriage and limber, packed .. .. .	34 3 20	33 3 17		
Tonnage of carriage and limber .. .. .	tons. 4.079	tons. 3.818		

## AMMUNITION WAGON, MARK I.

The frame of the wagon consists of a perch of girder iron, with steeled eye, and two sides of angle iron, connected together by iron plates, over which the boards are secured, namely, two footboards and three platforms. The axletree, which is the "light field" axle, is secured in a bed of wood bolted beneath the perch and sides.

The wheels of the wagon are the same as for the gun carriage.

The wagon is fitted with a sabicu block, with arm, for carrying a spare wheel, and has also fittings for carrying a drag shoe and stores.

The ammunition boxes (four) stand between the platform boards, secured by nib-irons and straps; two are the same as the "near" gun limber box, and two the same as the "off," except lid fittings. Beneath the wagon are two under boxes.

The wagon limber is identical with the gun limber.



## AMMUNITION WAGON, MARK II.

(Plate V.)

This wagon differs from Mark I in having an iron axletree bed, similar to that of the gun carriage, instead of a wooden one; in the perch being formed of channel iron in two parts, with strengthening plates, instead of solid girder iron, and in the block for the spare wheel being of iron instead of wood. The perch resembles the trail of gun carriage in its general form, and is rivetted to the axletree bed. The wheels, ammunition boxes, &c., are the same as in Mark I wagon.

The wagon limber is identical with the gun limber.

	Mark I.			Mark II.		
Length of wagon and limber .. .. .	20'	5 $\frac{1}{2}$ "		20'	7 $\frac{1}{2}$ "	
Minimum space through which wagon can turn	29'	8 $\frac{1}{2}$ "		29'	6"	
	cwt. qrs. lbs.			cwt. qrs. lbs.		
Weight of wagon and limber, empty.. ..	25	3	13	25	0	22
"    "    "    packed .. .. .	41	1	25	40	0	2
Tonnage of .. .. .	tons.			tons.		
	4.493			4.373		

## INSTRUCTIONS FOR CARE AND PRESERVATION.

All bearings should be kept clean and slightly oiled, and all nuts tightly screwed up. Linch pins, washers, the end of the wheel iron of the off shaft, and axletree arms should be kept perfectly clean, care being taken in cleaning them not to rub them away too much, and so reduce them in size; they can be kept slightly oiled, but if so the old oil must be frequently rubbed off and fresh put on. Carriages kept in store should have the bright parts of the ironwork coated with grease. Water should not be allowed to lodge in any of their recesses.

Defects or damages should be made good without delay, and if the paint becomes rubbed off at any part, it should be patched over as soon as possible. Opportunity should be taken of the annual painting to give the carriages a thorough overhauling and repair.

*Elevating Screws.*

Elevating screws should be kept clean and oiled; if they do not run up and down freely, they should be removed and examined; if the threads are indented on the edges, they must be neatly filed down. If the bevel pinions in the box have become indented or choked up with clotted oil and dirt, the box should be opened, the necessary adjustments made, and the inside of the box painted with red lead.

*Cap-squares.*

The inside of the cap-squares and the trunnion bearings must be kept clean and oiled.

The lugs and the crown of the cap-square are liable to be "drawn," giving too much play to the trunnions of the gun. The cap-square should be repaired as soon as possible, as the deformation otherwise will rapidly increase in firing, and the lugs will be broken.

*Bolts.*

All bolts should be kept tightly nutted up. Sometimes a particular nut will work loose continually; in such cases, after tightening it up, cut the thread of the bolt across close up to the nut, and caulk it under a little.

Care must be taken in painting that no working parts are painted, and intelligence must be exercised in keeping the working surfaces free from paint. Such parts must, on the other hand, *on no account be polished*, but kept clean by greasing or oiling. If they are not in constant action, a coating of oil will preserve them from rust and not collect dust.

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## AMMUNITION.

### CHARGES.

Service,  $1\frac{3}{4}$  lbs. R.L.G., silk cloth.  
Saluting, 1 lb. blank, L.G. "

These are of No. 1 class silk cloth, hooped with silk braid, and choked with silk twist.

For filling and examining cartridges, see "Magazine Regulations" and "Regulations for Army Ordnance Services."

### *Drill Cartridge.*

A dummy cartridge of raw hide is issued for drill.

### PROJECTILES.

(Plate VI.)

Nature.	Mark.	Bursting charge.		Weight.
		Weight.	Powder.	
Shell { common ..	V	$8\frac{3}{4}$ oz.	P and F.G.	9 lbs. $2\frac{1}{4}$ oz.
Shrapnel ..	VIII	12 drms.	F.G.	9 " 12 "
Shot, case.. ..	IV and V	..	..	9 " $10\frac{1}{4}$ "

Projectiles will be painted black, except the studs and distinguishing marks.

### *Common Shell.*

The common shell is of iron, cast to finished dimensions, and furnished with two rings of studs. The head is struck with a radius of  $1\frac{1}{2}$  cals. The interior of the shell is lacquered, and the fuze-hole is tapped to G.S. gauge.

The bursting charge is in the proportion of 6 oz. of P and  $2\frac{3}{4}$  oz. of F.G.

#### *Shrapnel Shell.\**

The body of the shell is cast to finished dimensions, and has two rings of copper studs. The walls of the shell are thickened near the base so as to form a shoulder, on which rests a wrought-iron diaphragm, a lining of brown paper, and mixed metal bullets, 28 at 18 per lb. and 35 at 34 per lb., run in with melted resin. The head is of Bessemer metal lined with wood, and contains a composite fuze socket of tin and gun-metal, screwed to G.S. gauge. The bursting charge is contained in a tin cup in the base of the shell, connected with the fuze socket by a gun-metal tube screwed into the diaphragm.

#### *Case Shot.†*

The body of Mark IV is of tin, in three parts, soldered together longitudinally. The base is strengthened by having a disc of sheet iron laid loose in the interior, and a ring of the same rivetted to the tin case outside. The sides are lined with three longitudinal segments of sheet iron laid in loose. The top consists of a disc of sheet iron secured to the case by turning over and soldering the ends of the latter. It is filled with 108 mixed metal balls at  $16\frac{1}{2}$  per lb. packed in clay and sand.

Mark V differs from Mark IV in being fitted with a wrought-iron handle on the top to facilitate the removal of the shot from the limber boxes. Earlier patterns are not issued.

#### DISTINGUISHING MARKS.

Shrapnell shell will be painted with a red tip, 1 inch deep. All filled shell will be marked in red as follows:—

- (a) A band  $\frac{1}{2}$  inch wide round the head,  $1\frac{1}{2}$  inches from the top; this will be  $\frac{1}{2}$  inch below the red tip of Shrapnel shell.
- (b) The monogram of the station.
- (c) The date of filling.
- (d) The letter "P," 1 inch long, if filled with P. and F.G.
- (e) The word "fuzed" if the shell is fuzed.

Projectiles which are to be used for practice only will be marked with a yellow band,  $\frac{1}{2}$  inch wide, round the body.

Shells which have been emptied will be marked on the head with the letter "E," in red paint, and also the monogram of the station.

#### MAKING UP CARTRIDGES, &c.

#### FILLING SHELLS, &c.

See "Magazine Regulations" and "Regulations for Army Ordnance Services."

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\* Shrapnel shell can be utilized as case shot, for distances up to 100 yards, by loading the reverse way, and firing them without fuze or plug.

† The shot, when placed in axletree boxes, should be packed with oakum to prevent their being damaged in travelling.

## FUZES.

Percussion, { R.L., No. 7. Marks II\*, III\*, IV.  
 { small, No. 8. Mark IV.  
 Time, 15-secs., M.L., No. 41. Mark II.  
 Time and percussion, No. 56. Mark IV.  
 Primer, fuze, percussion, R.L., No. 7.

## DESCRIPTION OF FUZES.

*Percussion, R.L., No. 7.*

(*Plate VII.*)

The body is of gun-metal, screwed to fit the G.S. gauge, and with a square hole in the head to fit the key by which the fuze is screwed into the shell.

The safety-pin (of double twisted wire) passes through the head of the fuze, and is kept in its place by the two ends being opened out slightly, in the conical cup, as shown in Plate VII. A thin disc of brass is then fitted over the ends, and soldered to keep the fuze watertight. The head of the safety-pin is fitted with a loop of tarred twine, by which it is withdrawn. The pin is not to be withdrawn until the shell is placed in the gun.

When the safety-pin is withdrawn, the hole through which it passed, if left open, would probably admit of the passage of the flash from the discharge of the gun into the interior of the fuze, and so cause a premature burst. To guard against this, a small lead pellet slides freely in a recess cut in the head above the safety-pin hole. When the shell is rammed home, the pellet sets back, and so closes the safety-pin hole.

The percussion arrangement of Mark IV fuze consists of a steel needle, fixed in the centre of the top on the inside, and a lead pellet containing a detonator covered by a brass disc 0.005 inch thick, and having a tinfoil disc under it to prevent the detonating composition working through the fire holes in its head. The pellet is kept in position by a gun metal guard, which rests on two feathers on the outside of the pellet. The guard is furnished with a feather on the outside which fits a groove in the body of the fuze, so that body and guard must rotate together. On the shock of discharge, the guard sets back on the pellet, shearing off the feathers, and on graze or impact, the guard and pellet fly forward together, bringing the detonator in contact with the needle, and thereby firing the fuze.

A shield of copper is placed over the top of the lead pellet to prevent the brass safety-pin from indenting it, and thereby allowing the detonator to approach too close to the needle. Mark III has the brass disc over the detonator only 0.001 inch thick, and the guard has no feather. This pattern when converted to Mark IV pattern is called Mark III\*. Mark II had not the copper shield.

*Percussion, Small, No. 8.*

(*Plate VIII.*)

The fuze (Mark IV) consists of the following parts:—

Body, detonator pellet, with two retaining bolts, spiral spring, safety-pin, closing pellet, needle plug, and magazine.

The body is of gun-metal, screwed on the outside to the G.S. gauge. It is bored out from the top to receive the detonator pellet, and is closed by means of the needle plug. Two holes, closed on the outside by brass discs, are bored in the body to receive the retaining bolts of the pellet. Two fire-holes are bored in the bottom to communicate the flash from the pellet to the magazine, which consists of a pierced pellet of pressed powder, secured in the lower end of the fuze by a brass disc spun in.

A detonator, covered by a brass washer, 0·03 inch thick, and having a tinfoil disc under it to prevent the detonating composition working through the fire-holes, is secured in a recess in the top of the gun-metal pellet, and two fire-holes filled with F.G. powder, lead from it to the bottom, where they are closed with paper discs. The top of the pellet is reduced to fit inside a spiral spring, which prevents the pellet rebounding or working forward during flight.

The two retaining bolts, with brass spiral springs, pass transversely through the pellet (as shown in the drawing), the springs keeping them locked in the holes in the body until spun out by the rotation of the shell. A screw in the body projects into a groove down the side of the pellet, and prevents it from turning.

The needle plug has a steel needle fixed in the centre, and screws into the top of the body. A hole through the side of the fuze into the needle plug contains a brass pellet, with spiral spring behind it, for closing the safety pin-hole.

The safety-pin, of twisted copper wire, passes through the needle plug, down the body, behind the head of one of the retaining bolts, and is bent over at the top into a groove in the needle plug.

Mark III differed from the above in having the detonator pellet held in position by a small screw plug, and in having no protecting washer over the detonator. In Mark II the spiral spring in front of the detonator pellet was found stronger, and was replaced by the same spring as in Mark III, the fuze being then Mark II\*, which was identical with Mark III. Marks II\* and III will be exchanged for Mark III\* or IV.

Mark III fuzes are converted to practically the same as Mark IV, and are then Mark III\*.

*Action of the Fuze.*—The safety-pin being withdrawn at the moment of loading, the hole is closed by the closing pellet. On discharge the centrifugal motion of the shell causes the retaining bolts to fly outwards, leaving the detonator pellet free to move forward. On impact, the pellet compresses the spring in front of it, and moves forward on to the needle, which ignites the detonator, and so fires the fuze.

#### *Fuze, Time and Percussion, No. 56.*

(Plate IX.)

The fuze consists of the following parts, made of gun-metal, except when otherwise stated, viz.:—Body, detonator plug with detonator, percussion pellet, brass spiral spring, base plug, brass safety pellet, brass ball, composition ring, cap, brass washer, dome, and two safety-pins, and two leather washers.

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

The *detonator plug* is screwed on the outside and fitted with a detonator.

The hole bored for the detonator plug is continued above it to form a small magazine filled with F.G. powder. In the top of the body is bored a recess to contain a perforated pellet of pressed pistol powder, which communicates with the magazine by a hole bored at right angles to the axis of the fuze. The stem on the body is screwed on top to take the cap, two grooves being cut in the top end of stem to receive the feathers on the brass washer. A groove is cut in the top face of body, close to the stem, and half way round it, and a gas escape hole bored obliquely through the body into the groove. A small tablet of fine white paper is secured with shellac to the body of the fuze over the perforated powder pellet, and over it, two washers of fine white paper and calf-skin are secured with shellac, a hole being cut through the washers and tablet immediately over the powder pellet.

The *percussion pellet* has a cut in the side for the safety pellet and ball to fall into when set in action. A hole is made transversely through the pellet and fitted with a brass retaining bolt, held in position by a brass spiral spring. The pellet contains a powder charge of F.G. powder. A small set screw, in the wall of the body, fits into a slot in the percussion pellet to prevent it from turning in flight.

The *base plug* has a conical hole bored in it, and closed at the bottom by a shalloon disc and brass washer spun in; it contains a perforated pellet of pressed powder, secured by a brass washer spun over on top.

The *safety pellet* has a slot cut in the side to clear the brass ball, and is suspended in the body by a thin copper wire passing through it. A hole is also bored in the upper part of the pellet and body of fuze for the safety pin to pass through.

The *composition ring* has a chamber on one side, and three projections on the inside to keep it concentric with the stem of the body. The chamber has a hammer with a steel needle suspended in it by a copper wire over a patch of detonating composition. A safety pin also passes through the hammer and chamber. The ring has a groove on the underside filled with composition, and connected with the chamber by a lighting hole. The outside of the ring is graduated from 0 to 18, each division being subdivided into halves and quarters, with a broad arrow at the point, where the groove is interrupted by a bridge soldered in.

The *dome* is made of sheet brass.

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

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

The fuze is stamped **T** on the composition ring close to the time safety pin, and **P** on the body close to the percussion pin.

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

To set the time arrangement, the cap is loosened with the "key, fuze, universal," and the ring moved round until the graduation ordered is exactly in line with the arrow on the body; the fuze is then clamped by screwing down the cap as tightly as possible, care being taken that the ring and dome have even bearings.

If the fuze is required to act as a percussion fuze only, the **P** pin should be withdrawn and the **T** pin left in position; otherwise both

pins should be withdrawn, but this should not be done till the moment of loading.

*Action.*—On discharge, if the time safety-pin has been withdrawn, the hammer sets back, shearing the suspending wire, and igniting the detonator and the time ring, which burns until it comes over the pellet, and so flashes down through the radial magazine, detonator pellet, and base plug, and into the shell.

If the percussion pin has been withdrawn, the safety pellet sets back, shearing the suspending wire, and the brass ball falls down into the space over the safety pellet. The centrifugal bolt, owing to the rotation of the shell, is withdrawn, the percussion pellet is free to move forward on impact and ignite the detonator, which flashes through the percussion pellet and base plug into the shell.

At rest it burns about 13 seconds.

*Time, 15 seconds, M.L., No. 41.*

*(Plate X.)*

Is of beech wood with a composition channel bored almost the whole length of the centre of the fuze. This channel is lined with paper, and driven with 2 inches of slow-burning composition. Above this is a 0.6-inch pellet of mealed powder having a hole bored down its centre to a depth of 0.4 inch. There are six powder channels bored parallel to the composition channel, connected at the bottom by quick-match placed in an annular groove and pressed into the bottom of each channel. The last hole is bored through and threaded with quick-match. The numbers on the paper scale are reversed, so that they read correctly when the fuze is being bored. Each side hole is marked on the index paper with a dot of yellow paint. The head of the fuze is closed by a gun-metal plug, round the pin of which quick-match is looped and led through two fire-holes to a groove round the head. This groove is covered by a copper and tape band, which must be removed before firing.

The fuze is prepared for any desired time of flight by boring through the "side-hole" corresponding to the required time into the composition.

The fuze is fixed in the fuze-hole by screwing it round by hand until it is held firmly in the fuze-hole; it must not be fixed by tapping with a mallet or striking the fuze, previously inserted loosely in the shell, against any hard object. Such action would tend to crack the fuze and cause a premature explosion.

The fuze must not be uncapped until the shell is placed in the muzzle of the gun. This is done by taking hold of the exposed end of the copper band, and unwinding from *right to left* smartly, so as to thoroughly detach the band from the head of the fuze, and to leave the priming fully exposed.

Time of burning at rest, 14.6 to 16.5 seconds.

*Primer, Fuze, Percussion, R.L., No. 7.*

*(Plate XI.)*

The primer is for use with the "Fuze, percussion, R.L., No. 7." It resembles the G.S. plug without loop, but is smaller so as to fit the bottom of the G.S. fuze-hole. It has four fire-holes on top, one at each corner of keyhole recess.

### FIXING PLUGS, FUZES, AND SECURING SHELLS.

When plugs or metal fuzes are screwed into shells, they will, unless required for immediate use, be lubricated with a mixture composed of whiting, mineral jelly, and castor oil. It is issued, ready mixed, in tin cylinders.

The mixture is to be applied to the threads of the fuze or plug with a brush, in sufficient quantity to cover them, care being taken that it does not extend over the bottom. A coat of paint of the same colour as the tip of the shell will be applied over the junction of the G.S. fuze-hole, plug, and shell when the latter is filled.

The "turnscrew" on the limber is to be used for starting fuze-hole plugs that may have become jammed or set fast.

### TUBES, FRICTION, COPPER, SOLID DRAWN, WITH BALL, MARK II.

(Plate XI.)

The tube is made of solid drawn copper, and has a solid head: it is filled with pistol powder, and the bottom is closed by a brass ball, over which is a cork plug, secured by shellac. The length is 2.1 inches. The nib-piece is solid drawn, and projects right through the tube, and has a small hole bored in it to allow the flash from the friction composition to reach the powder in the tube.

The nib-piece contains a copper friction bar roughened on both sides; the roughened portion of the bar has a detonating composition, composed of chlorate of potash, sulphur, and sulphide of antimony, smeared on both sides of it. The composition is damped with shellac varnish while it is being smeared on. The nib-piece is pinched down so as to press on the sides of the friction bar, the projecting part of which has a vertical eye, into which the hook of the lanyard fits. The exterior of the tube is varnished black, after the tube has been thoroughly dried.

On pulling the lanyard the friction bar is drawn out, igniting the composition and firing the tube. The gas from the exploded cartridge drives the tube out of the vent.



RANGE TABLE.

Charge, { weight, 1½ lb.  
nature, R.L.G.<sup>2</sup>.  
Projectile, Common shell.

Muzzlo velocity, 1330 f.s.

Remain- ing velocity.	5' elevation or deflection alters point of impact.		Slope of descent.	ELEVA- TION.	RANGE.	FUZE scale for time and percussion fuze, Mark IV.	50 per cent. of rounds should fall in			Time of flight.
	Range.	Laterally or vertically.					Length.	Breadth.	Height.	
f.s.	yards.	yards.	1 in	° ' "	yards.		yards.	yards.	yards.	secs.
1275	45	0·14	312	0 1	100	½	7	0·1	0·1	0·27
1224	44	0·29	149	0 12	200	¾	9	0·1	0·1	0·54
1177	43	0·43	98	0 23	300	1¼	10	0·1	0·1	0·81
1133	42	0·58	72	0 34	400	1¾	12	0·1	0·2	1·09
1093	41	0·72	56	0 46	500	2	13	0·1	0·2	1·36
1058	40	0·87	46	0 58	600	2½	15	0·1	0·4	1·64
1031	39	1·01	38	1 10	700	3	16	0·2	0·6	1·92
1007	38	1·16	33	1 23	800	3½	18	0·2	0·7	2·20
985	38	1·31	28	1 36	900	3¾	19	0·2	0·9	2·49
964	37	1·45	25	1 50	1000	4¼	21	0·3	1·1	2·78
944	36	1·60	22	2 4	1100	4½	23	0·4	1·3	3·08
924	35	1·74	20	2 18	1200	5¼	25	0·5	1·5	3·38
905	34	1·89	18	2 32	1300	5½	26	0·7	1·8	3·69
887	33	2·03	16	2 47	1400	6	28	0·9	2·0	4·01
870	33	2·18	15	3 2	1500	6½	30	1·1	2·3	4·34
853	32	2·32	14	3 18	1600	7	32	1·4	2·6	4·67
837	31	2·47	12	3 34	1700	7½	34	1·8	2·9	5·00
821	30	2·61	11	3 50	1800	8	36	2·2	3·2	5·34
806	30	2·76	10	4 7	1900	8½	37	2·5	3·6	5·68
792	29	2·91	9·8	4 24	2000	9	39	2·9	4·1	6·03
778	28	3·05	9·1	4 42	2100	9½	41	3·3	4·6	6·39
764	27	3·20	8·4	5 0	2200	10¼	43	3·6	5·1	6·75
750	27	3·34	7·8	5 19	2300	10½	45	3·9	5·7	7·13
737	26	3·49	7·3	5 38	2400	11¼	47	4·1	6·4	7·51
724	25	3·63	6·8	5 58	2500	11½	49	4·3	7·2	7·90
711	24	3·78	6·3	6 18	2600	12¼	52	4·4	8·1	8·30
698	23	3·92	5·9	6 39	2700	13	54	4·5	9·1	8·71
686	22	4·07	5·5	7 1	2800	13½	56	4·6	10·2	9·12
674	22	4·21	5·1	7 24	2900	14¼	58	4·6	11·5	9·54
662	21	4·36	4·7	7 47	3000	15	61	4·7	13·0	9·98
650	20	4·51	4·4	8 12	3100	15½	63	4·7	14·5	10·43
638	19	4·65	4·1	8 37	3200	16¼	65	4·8	16·1	10·89
627	18	4·80	3·8	9 3	3300	17	67	4·8	17·8	11·36
616	17	4·94	3·5	9 31	3400	17½	70	4·8	19·7	11·85
605	17	5·09	3·3	10 0	3500		72	4·9	21·8	12·25
594	16	5·23	3·0	10 31	3600		75	5·2	23·9	12·85
583	15	5·38	2·8	11 3	3700		78	5·5	26·5	13·36
572	14	5·52	2·6	11 35	3800		81	6·2	29·8	13·89
562	14	5·67	2·4	12 9	3900		83	7·3	33·9	14·43
552	13	5·81	2·2	12 44	4000		86	8·6	39·1	14·98

## SECTION GUN DRILL.

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*Battery gun drill*, which does not vary with the equipment, is given in "Field Artillery Drill."

The following paragraphs give the duties of the detachments at the section commander's orders.

Single detachments should be accustomed to drill as if forming part of a section, and the instructor should therefore always use the orders given for the section commander.

*On dismounted parades* the detachment will form Detachment Rear, where it is laid down for them to mount, and Nos. 6, 7, 8, and 9 will attend to the limbers, No. 6 pushing in rear, Nos. 7, 8, and 9 at the shafts, No. 9 between them, No. 7 at the point of the off, No. 8 of the near shaft.

Batteries practising either with blank cartridges or projectiles should leave their drill shell and cartridges in camp or barracks. The tampecon is not to be placed in the gun except in the gun park.

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## ARRANGEMENT.

### THE DETACHMENT—

To tell off.

Detachment rear.

To form detachment rear in action.

Take post from detachment rear in action.

Mounted.

To mount.

To dismount.

To move the gun with drag ropes.

    "    "    without    "

### PREPARATION FOR ACTION.

#### ACTION.

#### DUTIES—

Wagon supply.

Casualties.

Signals.

To Load.

To Fire—

Miss-fire.

## PREPARATION FOR CAVALRY.

MAGAZINE FIRE.

CASE.

TO STAND FAST.

TO CEASE FIRING.

TO LUMBER UP.

INDIRECT LAYING--

One aiming post.

Two " posts.

MOUNTING AND DISMOUNTING--

To dismount the gun and carriage.

To mount " "

DISABLED ORDNANCE--

To replace a damaged wheel.

To remove a gun and carriage by a limber.

To " " " wagon.

METHOD OF DRILLING RECRUITS--

General remarks.

To fire.

To load.

## THE DETACHMENT.

On mounted parades, as long as limbered up, No. 1 remains mounted on the left of the leaders—he does not dismount when the *detachment* is ordered to do so.

The detachment consists of nine numbers, who fall in two deep, one pace between ranks, No. 1 on the right of the front rank.

TO TELL OFF.

*Section Commander.**No. 1.*.... *Section—Tell Off.*

*At the order from the section commander—No. 1 numbers 1; the right hand man of the rear rank numbers 2; the right hand man of the front rank 3; the second man from the right of the rear rank 4; his front rank man 5; and so on.*

DETACHMENT REAR.

Formed as above, 3 yards in rear of the gun wheels, No. 1 covering the off wheel.

TO FORM DETACHMENT REAR IN ACTION.

*Section Commander.**No. 1.*.... *Section—Detachment Rear.**No. .... Double March.*

*At the order from the section commander*—No. 1 doubles to his place and gives the order "Double March."

*At the order from the No. 1*—The numbers double into their places on the left of No. 1, each halting as he reaches his place.

TO TAKE POST FROM DETACHMENT REAR IN ACTION.

<i>Section Commander.</i>	<i>No. 1.</i>
.... Section—Take Post.	No. .... Double March.

*At the order from the No. 1*—all the numbers double to their places.

MOUNTED.

No. 1 on his horse; 2 and 3 on the gun limber; 4 and 5 on the axletree seats; 6 and 7 on the wagon limber; 8 and 9 on the wagon body; 2, 4, 6, and 8 on the near; 3, 5, 7, and 9 on the off side.

The actual positions of the numbers on the carriages are as follows:—

*At the order "Attention"*—they sit upright, holding the handstraps with both hands.

*At the order "March"*—they take hold of the guard irons with their outward hands, and when going over rough ground slightly raise themselves so as to avoid being jolted.

*At the order "Sit at Ease"*—they drop the handstraps and sit well back, both hands between the thighs.

When a subdivision is without a wagon, No. 6 may on an emergency on service ride between Nos. 2 and 3 when going into action. In this case he will mount and dismount by the front of the limber on the near side.

TO MOUNT.

<i>Section Commander.</i>	<i>No. 1.</i>
.... Section—Detachments, Prepare to Mount—Mount.	

*At the order "Detachments prepare to Mount" from the section commander*—the numbers double to their places at the carriages; 2 and 6 lay hold of the guard irons with their left, 3 and 7 with their right hands, placing the inner foot on the trail or perch handle; 4 and 8 lay hold of the guard irons with their right hands, placing the right foot on the foot rest or spoke; 5 and 9 lay hold of the guard iron with the left hand, placing the left foot on the foot rest or spoke.

*At the order "Mount"*—the whole spring into their places. The numbers on the limbers turn round to the front, lifting their feet close together and throwing them over the guard irons; the numbers on the axletree seats turn outwards.

TO DISMOUNT.

<i>Section Commander.</i>	<i>No. 1.</i>
.... Section—Detachments, Prepare to Dismount—Dis- mount,	

*At the order "Detachments Prepare to Dismount" from the section commander—Nos. 2, 3, 6, and 7 turn to the rear, throwing their legs over the guard irons; Nos. 4 and 5 place their inner hands on the gun and their feet in front of the foot rests; the other numbers stand up, keeping their outer hands on the guard irons.*

*At the order "Dismount"—the whole jump off and form detachment rear.*

#### TO MOVE THE GUN WITH DRAG ROPES.

<u>Section Commander.</u>		<u>No. 1.</u>
.... Section—with drag ropes.		
Prepare to Advance.		

*At the order from the section commander—Nos. 2 and 3 hook the drag ropes to the gun wheel washers, the three highest numbers go to the shafts, and the remainder man the ropes.*

#### TO MOVE THE GUN WITHOUT DRAG ROPES.

<u>Section Commander.</u>		<u>No. 1.</u>
.... Section—without drag ropes,		
Prepare to Advance.		

*At the order from the section commander—Nos. 2 and 3 push between the muzzle and wheels; Nos. 4 and 5 man the gun wheels; the three highest numbers go to the shafts, and the remainder assist.*

### PREPARATION FOR ACTION.

<u>Section Commander.</u>		<u>No. 1.</u>
.... Section—Prepare for		
Action.		

*At the order from the section commander—The detachment dismount, and—*

*No. 1 sees that the bore is clear, and superintends the other numbers.*

*No. 2 examines the axletree box, removing the covers from the cartridges.\**

*No. 3 fills the tube pocket and examines the vent and axletree box, removing the covers from the cartridges.\**

*No. 4 examines the sights and elevating gear.*

*No. 5 sees that the fuze key is in its pocket, and examines the limber boxes.*

*The wagon numbers examine the wagon boxes.*

*On the completion of the above the detachment mount without further order*

*The numbers detailed to "examine" the various ammunition boxes see that they are properly filled, also that the lids open easily, and the locks are in good order. Any deficiencies in the limber boxes are filled up from the wagon body under the direction of the No. 1.*

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\* At drill the covers need not be removed from the cartridges.

## ACTION.

<u>Section Commander.</u>	<u>No. 1.</u>
.... Section—Action Front.	No. ... Action Front.

*At the order from the No. 1—*

The detachment dismount, and No. 3 unkeys, and with No. 2 lifts the trail; when the trail is clear of the hook, No. 3 gives "Limber drive on."

Nos. 2 and 3 carry the trail round half a circle to the left, No. 2 shifting round the trail eye to avoid walking backwards, and lower it to the ground.

Nos. 4 and 5 man the wheels.

The limber moves as detailed in Field Artillery Drill.

*As soon as the trail has been lowered to the ground—*

No. 1 ships the handspike, lays for direction, and points out the target to No. 4.

No. 2 receives the sponge from No. 4, and remains facing the gun with the sponge stave in his right hand, rammer head on the ground to the rear.

No. 3 takes the lanyard out of the tube pocket, and places it round his neck, the hook end hanging down on his right side.

No. 4 unbuckles the sponge and throws it over to No. 2, sets his sight as ordered, and lays for elevation. As soon as the gun is layed he holds up his hand; he should remain in position until the signal "make ready" is given, but should not weary his eye by looking over the sights.

No. 5 prepares to issue ammunition; if wagon supply is ordered he takes post 10 yards in rear of the gun until the arrival of the wagon.

No. 6 assists No. 5.

*The positions of the numbers are as follows:—*

No. 1 one yard in rear of the trail eye.

No. 2 facing the gun, outside of and in line with the front of the right wheel.

No. 3 close to and facing the breech on the left side.

No. 4 on the right of the trail eye.

No. 5 in rear of the limber on the off side.

No. 6 in rear of the limber on the near side.

*Action right, left, or rear is the same except that at—*

*Action Right.*—The trail is carried round a quarter of a circle only.

*Action Left.*—The trail is carried round a quarter of a circle to the right, No. 3, in this case, shifting round the trail eye.

*Action Rear.*—The trail is not carried round.

The limber in all cases moves as detailed in Field Artillery Drill.

## DUTIES.

## No. 1.

Commands, attends to the handspike, sees that the time fuzes have been set correctly, and lays for direction.

He is responsible for the entire service of his gun.

While in action he must see that the gun is kept in the general alignment of the battery.

Should it be necessary for No. 1 to leave the handspike, No. 3 will take his place there as soon as the loading is completed, in addition to his own duties.

Should a case arise in which it is necessary that No. 1 should lay, he will perform the duties of No. 4, with the addition of "commands, and see that the time fuzes have been set correctly," No. 4 performing No. 1's duties with the above exceptions.

He lays for direction by looking along the line given by the cascable and muzzle while standing at the end of the handspike, not by looking over the sights. When, however, great accuracy of line is of importance the laying for direction will be done by No. 4, in which case No. 1 will traverse according to No. 4's signals.

He only gives the words of command shown for him; he does not repeat the section commander's orders. His executive orders should be no louder than is necessary for his subdivision to hear.

### No. 2.

Sponges, rams home, and mans the wheel.

He sponges and rams home as follows:—

He takes an oblique pace first to the right with his right foot, then to the left with his left, then a side pace of 30 inches to his right, at the same time bringing the sponge stave horizontal, sponge head towards the gun; he then enters the sponge head into the bore, shifts his left hand, back under, to the right, straightens his right knee, forces the sponge up the bore until his hands meet the face of the piece, shifts his hands to the rammer head, and forces the sponge hard home, bending over the left knee. He then gives the sponge two half turns by first lowering his wrists and then raising them, at the same time pressing the sponge against the bottom of the bore. He next draws the sponge out about half its length, at the same time straightening the left knee and bending over on his right; then again bending over the left knee, and shifting his hands to the centre of the stave, he bends outwards, withdrawing the sponge, and, with the left hand close to the head, turns the sponge, keeping the right hand fast, but turning the wrist, and throwing the sponge head upwards with the left hand, with which he seizes the stave at the rammer head.

When No. 6 has put in the charge, uncapped the fuze, or removed the safety pin or pins, No. 2 introduces the rammer head, brings his hands to the sponge head, and forces the charge home in one motion, throwing in the weight of his body, both arms extended as far as possible so as to keep his body clear of the muzzle. Directly the charge is home he springs the rammer by jerking it out with his right hand, and allowing the stave to slide through his hand; he then grasps it firmly in the middle with the right hand, and at the rammer head with the left, both knees straight, steps back outside the wheel, first with his right foot, then with his left, and brings the right heel to the left; he brings the sponge stave to the slope, and the left hand to the side in the first motion of stepping back, and remains facing the gun.

### No. 3.

Attends to the vent, fires, and mans the wheel.

He places his right thumb on the vent, keeping his elbow raised, and his fingers on the right side of the gun.

## No. 4.

Supplies No. 2 with the sponge, and replaces it on the trail, lays for elevation, and lifts at the handspike in running up or back. He must keep the gun layed for elevation, whether loaded or not; he must remember to look over the sights after loading is completed, to see that the gun has not been shifted. He must always depress last.

As a general rule, the whole of the laying for direction will be done by No. 1, but when great accuracy of line is of importance, No. 4 will lay for direction only, using the signals given below.

If through casualties there are no non-commissioned officers left in the detachment, No. 4 will "command and see that the time fuzes have been correctly set, in addition to his other duties."

## No. 5.

Fuzes shell, setting time fuzes.

## No. 6.

Brings up ammunition, shows time fuzes to No. 1, loads from left side of muzzle, removes safety pins, and assists No. 5.

He carries the cartridge in his right hand, covered by his left arm, the shell in his left hand, backs of both hands down. In loading he must be careful that the choked end of the cartridge is next the base of the shell, and that the seam does not come under the vent.

The cartridge should be kept covered until the sponge is out of the bore.

Except when it is otherwise ordered, the numbers work on their own sides of the gun, even numbers on the right side, odd numbers on the left.

NOTE.—On no account should a fuze without a safety pin be placed in any ammunition box.

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## WAGON SUPPLY.

One wagon for each section is brought up as detailed in Field Artillery Drill.

As soon as the wagon halts the Nos. 5 of the two guns of the section go to the wagon body and issue ammunition to their respective guns as above detailed.

The numbers brought up on the wagon first unhook the wheel horses, and then perform the duties detailed for No. 6 to the two guns of the section; the numbers on the off side of the wagon to the right gun, those on the near side to the left gun.

*At standing gun drill without wagons, Nos. 7, 8, and 9 stand 5 yards in rear of the limber.*

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## CASUALTIES.

The captain is responsible for the replacement of casualties as directed in "Field Artillery Drill." Section commanders order such changes of duties in their sections and detachments as they consider necessary.

If the full detachments cannot be maintained, the duties are divided as follows:—

With 5 numbers.—No. 2 performs the duties of No. 6 in addition to his other duties, resting the sponge against the gun while doing so.



With 4 numbers.—No. 1 performs the duties of Nos. 1 and 3, No. 2 performs the duties of Nos. 2 and 6, No. 3 performs the duties of No. 5.

## SIGNALS.

Nature.	By whom given.	Meaning.
Either hand raised above head . . . . .	No. 4	My gun is layed.
Motions with either hand in the required direction, arm well back . . . . .	No. 4*	Trail, right or left.
Drops his hand . . . . .	No. 4*	Halt (traversing).
Points to the vent with his right hand	No. 1	Make ready.

## TO LOAD.

*Section Commander.*

. . . . Section—Shrapnel—  
Fuze—Load.†

*No. 1.*

No. . . . Shrapnel —  
Fuze—Load.†

*At the order from the No. 1—*

No. 2 sponges, and as soon as No. 6 has removed the safety pin rams home.

No. 3 serves the vent until No. 2 has sprung the rammer, when he hooks a tube to the lanyard, and holds it with the tube in his right hand, the lanyard in his left.

No. 5 supplies No. 6 with the ammunition ordered, fuzing shell and setting time fuzes.‡

No. 6 receives the ammunition from No. 5, shows time fuze to No. 1, loads, removes safety pin, and then doubles back to the limber.

## TO FIRE.

No gun is ever to be fired without an *order* from the No. 1, and the No. 1 must never give this order until he has received the order from the section commander and seen that the gun is in proper condition.

*Section Commander.*

Fire No. . . . Gun.

*No. 1.*

Points to the vent.  
No. . . . Fire.

*At the order from the section commander—*No. 1 steps clear of the recoil to the left and points to the vent with the right hand.

\* Only when great accuracy of line being required, the laying for direction is done by No. 4.

† "Percussion Shrapnel load" or "common load." A percussion fuze is always used with common, unless otherwise ordered.

‡ With wooden fuzes, No. 5, after boring, only places them loosely in the shell, and No. 6 takes them out of the shell to show to No. 1. After No. 1 has examined the fuzes No. 6 fixes them.

*At the signal from the No. 1—*

No. 3 places the tube in the vent, steps outside the wheel, and stands facing to the front, holding the lanyard tight with his left hand, the forearm across the body, and the elbow so bent that the hand is level with the vent.

No. 2 steps to his left in line with the axle.

No. 4 removes the sight and steps clear of the recoil.

As soon as he sees No. 3 ready and the other numbers clear No. 1 gives the order, "No. . . . Fire."

*At the order from the No. 1—*

No. 3 slews his body to the left, and thus fires the gun; he then places the lanyard round his neck, the hook end hanging down on his right side.

*Directly the gun stops in its recoil it is run up to its previous position without any order.*

No. 1 assists if he considers it necessary.

Nos. 2 and 3 man the wheels.

No. 4 lifts at the handspike.

At battery and section fire No. 6 brings up another round, but does not load until the order is given.

*As soon as the gun is run up—*

No. 1 lays for direction.

No. 3 drifts the vent.

No. 4 lays for elevation.

*In addition when using drill ammunition without further order—*

Nos. 1 and 4 raise the trail until the drill ammunition falls out.

Nos. 2 and 3 man the wheels. No. 3 removes the drill tube.

No. 6 doubles up, picks up the drill ammunition, and returns it to the limber or wagon.

#### MISS-FIRE.

If there is a miss-fire No. 3 goes round to the front of the axle-tree, and from there takes out the old tube and puts in a fresh one, and then resumes his position.

---

### PREPARATION FOR CAVALRY.

*Section Commander.*

*No. 1.*

.... Section—Prepare for  
Cavalry.

*At the order from the section commander—*

Nos. 5 and 6 fuze three shrapnel, setting the fuzes at 2,\* and fix them. They place these shell together on the ground behind the limber.

---

### MAGAZINE FIRE.

*Section Commander.*

*No. 1.*

.... Section—Magazine Fire.

---

\* With wooden fuzes, fuze 1'5.

*At the order from the section commander—*

No. 4 lays for elevation by placing two fingers over the tangent sight, which is run down in its socket.

The guns are reloaded with shrapnel fuze 2\* as soon as fired without any further order.

Nos. 5 and 6 perform the duties of No. 6 alternately, so that directly the gun has been sponged one of them may be ready to reload.

The gun is not run up between rounds unless necessary.

No. 6 should not show the time fuzes to No. 1.

---

### CASE.

*Section Commander.*

*No. 1.*

.... Section—Case.

This is exactly the same as above, substituting case for Shrapnel fuze 2.

---

### TO STAND FAST.

*Section Commander.*

*No. 1.*

.... Section—Stand Fast.

*At the order from the section commander—*

All stand fast, whatever they are doing, except that No. 3 removes the tube if it is in the vent.

At the order "Go on" the work is continued.

---

### TO CEASE FIRING.

*Section Commander.*

*No. 1.*

.... Section—Cease Firing.

*At the order from the section commander—*

No. 1 straps the handspike on the trail.

No. 2 throws the sponge over to No. 4.

No. 3 replaces the lanyard in the tube pocket.

No. 4 straps the sponge on the trail.

Nos. 5 and 6 replace in the limber or wagon the ammunition, removing the fuzes and screwing in the plugs.

*Note.*—If for any reason it is impossible to fire the guns at "Cease Firing," and the guns cannot be left in their position, the

---

\* With wooden fuzes, fuze 1-5.

battery commander may order them to be unloaded. This is done as described for drill ammunition, but great care must be taken. The shell should be received by hand at the muzzle by No. 6, and not allowed to drop on the ground.

In cases when the time pin has been taken out before the order "Cease Firing" is given, the loading will be completed and the gun fired as if it had been loaded when the order was given.

## TO LIMBER UP.

<u>Section Commander.</u>	<u>No. 1.</u>
.... Section—Front Limber Up.	

*At the order from the section commander—*

Nos. 2 and 3 carry the trail round half a circle to the right, No. 2 shifting round the trail eye to avoid walking backwards, and lower it to the ground.

Nos. 4 and 5 man the wheels.

*As soon as the trail is lowered the numbers get under cover—*

No. 1 in front of No. 2;  
 Nos. 2 and 3 between breech and wheels;  
 Nos. 4 and 5       "      muzzle       "      ;  
 No. 6 in front of No. 4;

the whole with their backs to the axletree.

The limber comes up as detailed in Field Artillery Drill, and No. 1 gives "Halt, Limber Up."

*At the order from No. 1—*

Nos. 2 and 3 lift the trail and place it on the hook.

No. 3 keys up.

Nos. 4 and 5 man the wheels.

On the completion of the above, the detachment mount without further order.

*Right, left, or rear limber up is the same except that at:—*

*Right Limber Up*—The trail is carried round a quarter of a circle only.

*Left Limber Up*—The trail is carried round a quarter of a circle to the left, No. 3 in this case shifting round the trail eye.

*Rear Limber Up*—The trail is not carried round.

The limber in all cases moves as detailed in Field Artillery Drill.

## INDIRECT LAYING.

Aiming posts should be issued in pairs of the same colour, the right guns of sections having red; the left, blue. They should be planted with their coloured sides towards the guns, except when, owing to light, &c., the section commanders order the white sides.

### ONE AIMING POST.

<u>Section Commander.</u>	<u>No. 1.</u>
.... Section—One Aiming Post.	

*At the order from the section commander—*

No. 1, standing at the end of the handspike, directs No. 4, by signal, to plant his aiming post in line with the target.

Nos. 2 and 3 mark on the ground the position of the wheels.

No. 4 doubles out about 50 yards to the front with one aiming post, which he plants as directed by No. 1; he then doubles back and gets out his clinometer.

At "Go on" the firing is continued, the gun being layed for direction on the aiming post, and for elevation by clinometer.

When the target cannot be seen by the No. 1 dismounted, the section commander will direct whether he should mount or stand up on the limber.

#### TWO AIMING POSTS.

<i>Section Commander.</i>		<i>No. 1.</i>
.... Section—Two Aiming Posts.		

*At this order from the section commander, which is given when the battery is halted under cover previous to occupying a position by the deliberate method—*

No. 4 gets out his clinometer and aiming posts.

As soon then as the battery commander gives the signal (*see* Field Artillery drill), the section commanders and layers fall out in the usual way, but each layer carries his two aiming posts and clinometer instead of sights.

The battery commander, after pointing out the target, shows the position of the front post of the directing gun, the layers of the remaining guns extend along the alignment and plant their front posts at the interval ordered.

Each layer, as soon as he has planted his front post, doubles a short distance to the rear and plants his second post in line with the target and the front one. He then takes up a position for his gun out of sight of the target and in line with his two posts, looking to the directing gun for his dressing.

The section commanders see that the layers are properly placed before they double back to the battery.

Then when the battery commander gives the signal to advance, the battery is brought into action as detailed in Field Artillery Drill (Chapter III, Section 8 (ii)). As, however, it is very important that the guns should be brought exactly into line with the two posts, it will usually save time if the battery is advanced at a walk and in such a manner that the guns may be brought into action "right" or "left." Nos. 2 and 3 mark on the ground the positions of the wheels.

After the first round the gun is layed for direction on the near aiming post only.

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### MOUNTING AND DISMOUNTING.

This should only be practised at the annual course of military training, and then only sufficiently for instruction: every care must be taken that the equipment is not injured.

## TO DISMOUNT THE GUN AND CARRIAGE.

<u>Section Commander.</u>	<u>No. 1.</u>
Dismount No. . . . . Gun and Carriage.	No. . . . . Prepare to Dismount the Gun. Dismount the Gun. Dismount the Carriage. Lift—Lower.

*At the order "Prepare to Dismount the Gun"—*

No. 1 disconnects the elevating gear, runs it up, throws it back.

Nos. 2 and 3 remove the capsquares and the inner stanchions of the guard irons and man the wheels.

No. 4 removes the sights.

Nos. 4 and 5 double two drag ropes and make fast the bights with a reef knot, half over and half under the cascable, and pass the ends to the front. Nos. 4 and 5 then man the trail handles.

Nos. 6 and 7 bring up the drag ropes to Nos. 4 and 5, and then man the ropes.

Nos. 8 and 9 man the ropes.

*At the order "Dismount the Gun"—*

Nos. 1, 4, and 5 raises the trail until the muzzle touches the ground; Nos. 2 and 3 man the wheels forward; Nos. 6, 7, 8, and 9 haul the gun out of the trunnion holes, steadying it when perpendicular. Care must be taken that no number gets between the gun and carriage.

*As soon as the gun is steady, No. 1 gives "Lower the Trail" and "Run back," and the carriage is run out of the way by Nos. 2, 3, 4, and 5, who then immediately man the ropes. No. 1 then gives "Lower the Gun," and the gun is lowered gently for about one-third of the distance and then allowed to fall to the ground by all the numbers walking forward with the drag ropes.*

*At the order "Dismount the Carriage"—*

Nos. 2, 3, 4, and 5 go to the carriage; Nos. 2 and 3 in rear, 4 and 5 in front.

Nos. 6, 7, 8, and 9 go to the wheels; Nos. 6 and 7 in front, 8 and 9 in rear.

Nos. 8 and 9 take off the linch-pins and washers.

*At the order "Lift"—*The carriage is lifted and the wheels taken off.

*At the order "Lower"—*The wheels are placed on the ground, dish down, and the carriage is lowered to the ground.

## TO MOUNT THE GUN AND CARRIAGE.

<u>Section Commander.</u>	<u>No. 1.</u>
Mount No. . . . . Gun and Carriage.	No. . . . . Mount the Carriage. Lift. Prepare to Mount the Gun. Mount the Gun.

This is exactly opposite to the dismounting just described.

A handspike is placed under the cascable, and the drag ropes are given a turn round it, the running ends coming off below. To raise

the gun, Nos. 1, 2, 3, 4, and 5 lift at this handspike, No. 1 in the centre, while 6, 7, 8, and 9 haul on the ropes.

*Note.*—Limbers and wagons are mounted and dismounted in a similar way, the shafts having been previously removed.

## DISABLED ORDNANCE.

Whenever operations are not described in detail or numbers are not told off to particular duties, the No. 1 will order such duties to the several numbers as may be required.

### TO REPLACE A DAMAGED WHEEL.

Should a gun wheel be disabled in action, it should be immediately turned so as to bring the sound portion on to the dragshoe, and, if necessary, lashed, and notice should be sent to the captain.

The latter will immediately send up another wheel, which will be brought alongside the damaged one, and the wheels changed as follows:—

<i>Section Commander.</i>		<i>No. 1.</i>
No. . . . . <u>Change Wheels.</u>		No. . . . . <u>Change Wheels.</u>
		Lift.
		Lower.

*At the order "No. . . . . Change Wheels," from the No. 1—*

Nos. 1 and 6 go to the damaged wheel, No. 1 in rear, No. 6 removes the linch-pin and washer.

Nos. 2, 3, 4, and 5 man the traversing handspike, which is placed under the axletree by No. 2 or 3 (according to side).

*At the order "Lift"—*

The axletree is lifted and the damaged wheel is taken off; No. 6 rolls it out of the way, and the new wheel is put on by the numbers who brought it up.

*At the order "Lower"—*

The carriage is lowered, the linch pin and washer put on by No. 6, the handspike replaced by No. 2 or 3, and all resume their duties in action.

The damaged wheel is either left on the ground or removed by the numbers who brought up the new one, as the captain may have directed.

In removing wagon wheels the lifting jack should be used.

### TO REMOVE THE GUN AND CARRIAGE BY A LIMBER.

The gun is dismounted, the horses taken out; the limber is run over the gun so that the breech is towards the shafts, and the trunnions under the limber hook; the muzzle and the shafts are raised, and the gun slung with a drag rope round the trunnions to the limber hook; the end is passed to the front, and the muzzle borne down, a half hitch is taken round the cascable and made fast to the centre futchell.

The carriage is dismounted, elevating gear removed and turned

over by all the numbers with the trail towards the shafts. It is then lifted, trail first, up the front of the limber on to the top of the boxes, until the weight is balanced for draught.

The trail is secured by a drag chain to a handspike in the bere, the sidearms are strapped to the trail, the wheels are placed, dish down, on top of the carriage, securely lashed with drag ropes to the box handles in rear, and to the splinter bar in front.

#### TO REMOVE A GUN AND CARRIAGE BY A WAGON.

The gun is slung to a limber as before. The carriage is turned over and the trail rested on the rear footboard of the wagon. It is then lifted by all the numbers on to the wagon body until the trail-eye nearly touches the limber boxes, it is secured to the perch by the drag chain. The wheels are placed, dish down, on the top of the carriage, and lashed to the box handles.

## METHOD OF DRILLING RECRUITS.

### GENERAL REMARKS.

Many good recruits are acquainted only with the commonest English words, and as their duties and the materials they have to use are altogether new and strange, instructors should be careful—

To use the simplest language possible.

To explain as they occur, all technical terms.

To illustrate descriptions by means of a piece of chalk or otherwise, and in all cases to render clear the objects of the various duties.

Not to attempt to teach recruits elaborate descriptions, exact measurements, &c., which they do not understand.

To avoid needless repetitions, or wearying the men by keeping them for a long time at one thing; the drill should be varied by short descriptions (avoiding manufacturing details), setting fuzes, &c.

To bring men forward by successive steps, by explaining a position and then doing it; for instance, when commencing recruits' gun drill, the instructor should himself show how a duty should be performed, and then cause every man in turn to do that duty (make every man do No. 1's duty, then every man No. 2's, then No. 4's, and so on). When each man knows the duties of each post separately, the numbers who work and move together should be instructed after the manner described below, before commencing gun drill in quick time.

Great patience is necessary on the part of the instructor. He must make allowance for the different capacities of the recruits, and squads should periodically be arranged so that the intelligent soldier may reap the advantage of his work, and not be kept back by those of inferior ability. Recruits as they progress should be called out in turn to drill, for this gives a man confidence, helps him to learn, and causes him to take an additional interest in his work.

The instructor should place himself where he can be seen and heard by all in the squad; he should stand in a smart soldier-like attitude, and should avoid pacing up and down, looking down on the ground, turning his back on the squad, and similar habits, which have the effect of fidgeting the men and distracting their attention.



His explanation should be given in a distinct voice; his word of command should be sharp and decisive.

Stress is laid on the above points, because men unconsciously imitate their instructors. A first rate instructor will make a good detachment; his manner and style are therefore of the first importance.

The utmost alertness of attitude and smartness of movement should be enforced throughout gun drill.

The instructor can at any time ascertain that each number is at his post by proving. This he does by calling out "*Prove your numbers—No. 1, No. 2, &c.*" The man called upon raises his right hand, and extends it smartly to the front, hand open, thumb uppermost, hand as high as the shoulder. When the next number is called, he drops his hand. The last number lowers his hand at the word "*Down.*"

If at any time the instructor wishes to change the numbers, he gives the order, "*Change Rounds.*" On this, No. 1 becomes 9; 9, 8; 8, 7; 7, 6; 6, 5; 5, 4; 4, 3; 3, 2; 2, 1.

The following is only an example of how the drill should be taught; the details of the other operation should be divided up in a similar manner.

#### TO FIRE.

At the order "*Fire No. . . . Gun*" from the section commander—

No. 1 steps clear of the recoil to the left, and points to the vent with his right hand.

*At that signal—*

No. 3 places a tube in the vent, steps outside the wheel, &c.

No. 2 steps to his left in line with the axle.

No. 4 removes the sight and steps clear of the recoil.

No. 1—" *Fire No. . . . Gun.*"

As soon as No. 1 sees No. 3 ready, and the other numbers clear, he gives "*No. . . . Fire.*"

*At that order—*

No. 3 slows his body to the left, and thus fires the gun; he then places the lanyard round his neck, &c.

" *Go on.*"

Next explain that directly the gun has ceased recoiling, it is run up to its previous position without any further orders.

No. 1 assists, if he considers it necessary.

Nos. 2 and 3 man the wheels.

No. 4 lifts at the handspike.

At battery and section fire, No. 6, &c.

Nos. 1, 2, 3, 4, and 6—" *Go on.*"

*Next explain—*

As soon as the gun is run up.

No. 1 lays for direction.

No. 4 lays for elevation.

Nos. 1 and 4—" *Go on.*"

*Next give—*

In addition when using drill ammunition, without further order, the gun must be unloaded.

Nos. 1 and 4 raise the trail until the drill ammunition falls out.

Nos. 2 and 3 man the wheels.

No. 6 doubles up, picks up the drill ammunition, and returns it to the limber or wagon.

Nos. 1, 2, 3, 4, and 6—"Go on."

#### TO LOAD.

On the command ". . . . Section—Shrapnel—Fuze—Load" from the section commander—

No. 1 gives the order to his detachment.

"No. . . . Shrapnel—Fuze—Load."

No. 3 serves the vent until No. 2 has sprung the rammer, &c.

"No. 3, Load."

"No. 2 takes an oblique pace to the right with his right foot,\* then to the left with his left,\* then a side pace of 30 inches to his right, at the same time bringing the sponge stave horizontal, sponge head towards the gun;\* he then enters the sponge head into the bore,\* shifts his left hand back under to the right, straightens his right knee,\* forces the sponge up the bore until his hands meet the face of the piece,\* shifts his hands to the rammer head,\* and forces the sponge hard home, bending over the left knee.\* He then gives the sponge two half turns by first lowering his wrists and then raising them, at the same time pressing the sponge against the bottom of the bore.\* He next draws the sponge out about half its length, at the same time straightening the left knee, and bending over on his right;\* then again bending over the left knee, and shifting his hands to the centre of the stave, he bends outwards, withdrawing the sponge,\* and with the left hand close to the head, turns the sponge, keeping the right hand fast, but turning the wrist, and throwing the sponge head upwards, with the left hand, with which he seizes the stave at the rammer head."\*

"No. 2, Load."

No. 5 supplies No. 6 with the ammunition ordered, fuzing shell, and setting time fuzes.

"No. 5, Load."

No. 6 receives the ammunition, &c.

"No. 6, Load."

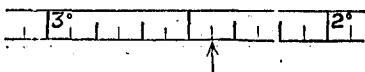
Now go back to No. 2, starting with:—"When No. 6 has put in the charge, uncapped the fuze, or removed the safety pin or pins, No. 2 introduces the rammer head, brings his hand to the sponge head, and forces the charge home in one motion, throwing in the weight of his body, both arms extended as far as possible, so as to keep his body clear of the muzzle"—here give "No. 2, Go on." Then continue No. 2's duties thus:—"Directly the charge is home he springs the rammer by jerking it out with his right hand, and allowing the stave to slide through his hand,\* he then grasps it firmly in the middle with the right hand, and at the rammer head with the left, both knees straight, steps back outside the wheel, first with his right foot,\* then with his left, and brings the right heel to the left;\* he then brings the sponge stave to the slope, and the left hand to the side in the first motion of stepping back, and remains facing the gun.

\* This detail should be given with a distinct pause at each point marked by an asterisk, so as to admit of the recruit carrying out in successive motions the detail given; thus simplifying a lengthy detail.

## INSTRUCTIONS FOR USING THE CLINOMETER.

*To read the angle marked on the drum.*—The brass drum is marked in degrees, commencing at  $0^\circ$  on the top to  $45^\circ$  at the bottom. Each degree is subdivided into 12 parts; each small division, therefore, represents angles of 5 minutes.

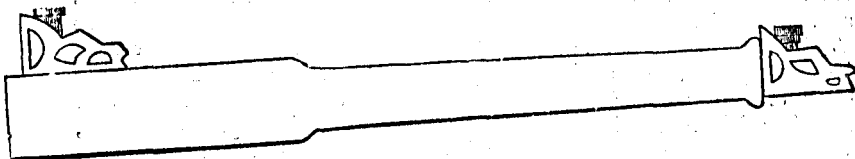
The scale is read from right to left, thus—



the reading opposite the arrow would indicate an angle of  $2^\circ 25'$ .

*To lay a gun for elevation.*—Unscrew the drum until  $\uparrow$  points to the elevation required, place the clinometer on the planed portion of the breech, or against the muzzle, thus—

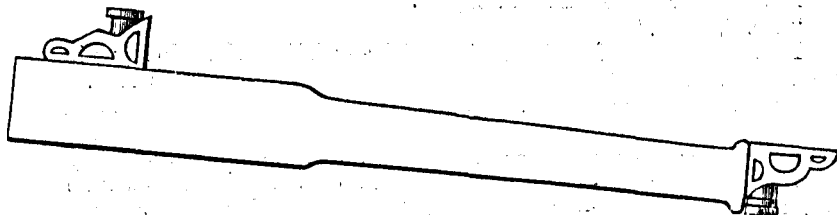
FIG. 1.



and elevate the piece until the bubble of the spirit-level is in the centre of the tube.

*For angles of Depression.*—Proceed as above, but reverse the direction of the instrument, thus—

FIG. 2.



*“To measure the angle of sight.”*—Lay the gun, with tangent or telescopic sight set at zero, on the object, then measure the angle at which the gun stands by clinometer.

When laying by clinometer it is necessary to mark out a line of fire; this is done as follows:—

1. When from the selected position the target is visible to a mounted man.

When the battery comes into action the section officers, who remain mounted, give the word, “Stand fast—one picket.” One picket is taken at least 50 yards to the front by each No. 5 and is aligned on the target by the section officer, who then dismounts. The position of the wheels is marked by 4 and 5,

A similar method will be adopted in any position if the target is likely to be obscured.

2. When the target cannot be seen from the battery.

Six pairs of pickets are brought up by the No. 5. The first will be planted furthest from the position the guns will occupy. These pickets should be planted 19 yards apart, or at whatever interval the guns may have been ordered to come into action.

The second pickets will then be placed in line with the target and the first pickets.

The guns are then brought into action and run up in line with the two pickets; Nos. 4 and 5 mark the position of the wheels.

#### RANGE-FINDER, WATKIN, FIELD.

These range-finders are issued to movable armament as approved from time to time.

It will be issued complete with all its appurtenances, except the picket buckets.

A history sheet in duplicate will be prepared for each range-finder, and every transaction connected with the instrument will be entered on these sheets as shown on the specimen page 36. One copy will accompany the instrument to which it relates on all occasions of inspection, or return to store; the other will be retained by the Chief Inspector of Position Finding.

The instrument and equipment will be in charge of the officer commanding Royal Artillery at the place of issue, who will be responsible that the instruments are not made use of by uninstructed non-commissioned officers, and the general rules for their care and preservation contained in the "Handbook of Field-range Finding" are adhered to.

Demands will be put forward, as a rule, every two years for the exchange of the range-finding equipment for the purpose of being inspected by the Instructor in Range-finding.



9-PR. R.M.L. CARRIAGE AND LIMBER.  
MOVABLE ARMAMENT.

LIMBER.

Pair of drag-ropes.

Swingletree.

"NEAR" Box.  
Grease box, 3 lbs., under.

"CENTRE" Box.  
Felling axe, under.

"OFF" Box.  
Bill hook, under.

Shovel.	6 Shrapnel shells.	
	3 Shrapnel shells 10, 15-sec. No. 41 time fuzes, under.	18 filled cartridges in cartouche 1 fuze pocket.
	3 Shrapnel shells 5, 15-sec. No. 41 time fuzes, under.	
2 Shrapnel shells. 4 common shells.		

9 perc. fuzes, No. 7.
16 perc. fuzes No. 7.
25 primers fuze perc. No. 7.
20 time fuzes 15-sec. No. 41.
100 friction tube v.
clinometer.

Shovel.	6 Shrapnel shells.	
	3 Shrapnel shells 10, 15-sec. No. 41 time fuzes, under.	18 filled cartridges in cartouche.
	3 Shrapnel shells.	
2 Shrapnel shells. 4 common shells.		

Pickaxe, under.

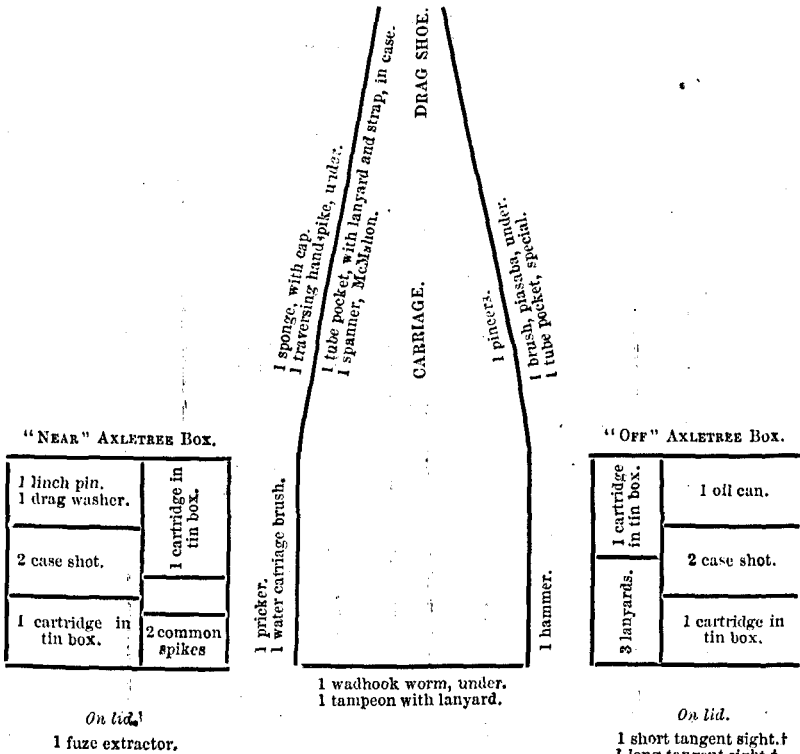
Leather bucket, under.

On lid.

1 key, fuze and plug, G.S.

On lid.

1 hook-borer.  
1 cylinder, with 6 bits.



"NEAR" AXLETREE BOX.

1 lynch pin. 1 drag washer.	1 cartridge in tin box.
2 case shot.	
1 cartridge in tin box.	2 common spikes

On lid.

1 fuze extractor.

"OFF" AXLETREE BOX.

1 cartridge in tin box.	1 oil can.
2 case shot.	
3 lanyards.	1 cartridge in tin box.

On lid.

1 short tangent sight.†  
1 long tangent sight.†  
1 spring spike.  
1 wrench, sight muzzle.  
1 punch, vent 8 in.

† When not in gun.

NOTE.—A little oakum may be used with advantage to prevent the movement of the time fuze cylinders in ammunition and centre boxes, and case shot in axletree boxes.

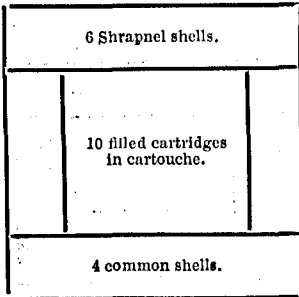
9-PR. R.M.L. WAGON AND LIMBER.  
MOVABLE ARMAMENT.

LIMBER.

1 lifting jack.  
"CENTRE" Box.

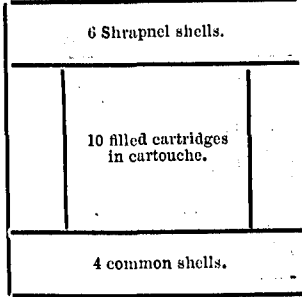
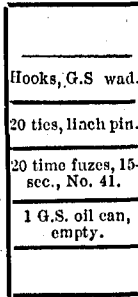
"NEAR" Box.

"OFF" Box.



*On lid.*

1 bolt, cascable, elevating.



*On lid.*

1 key, powder case.  
1 pincers, Shrapnel, primer.

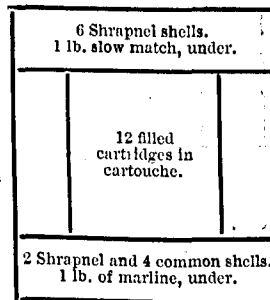
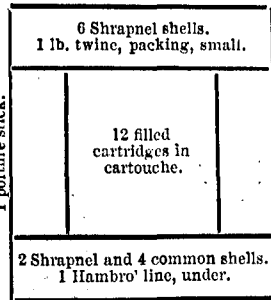
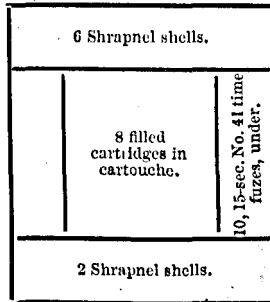
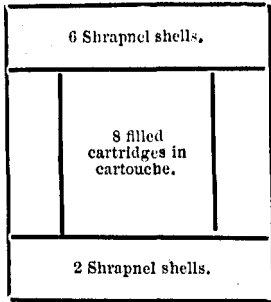
WAGON

DRAG SHOE.

BODY.

Wheel

1 water brush, under.



Shafts, spare, under.

*On lid.*

1 drift, G.S.  
1 portfire.  
1 clasp knife.

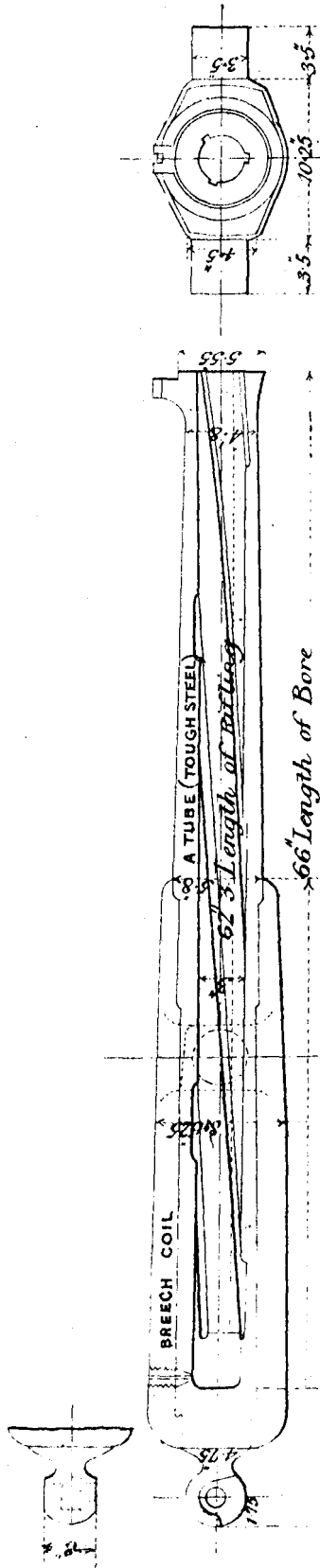
*On lid.*

1 portfire.  
1 portfire clipper.  
1 large screwdriver, Shrapnel.

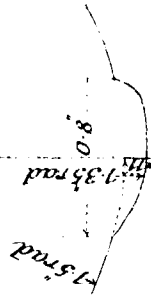
(Wt. 10379 1500 9 | 98--H & S 1765  $\frac{P 97}{1215}$ .)



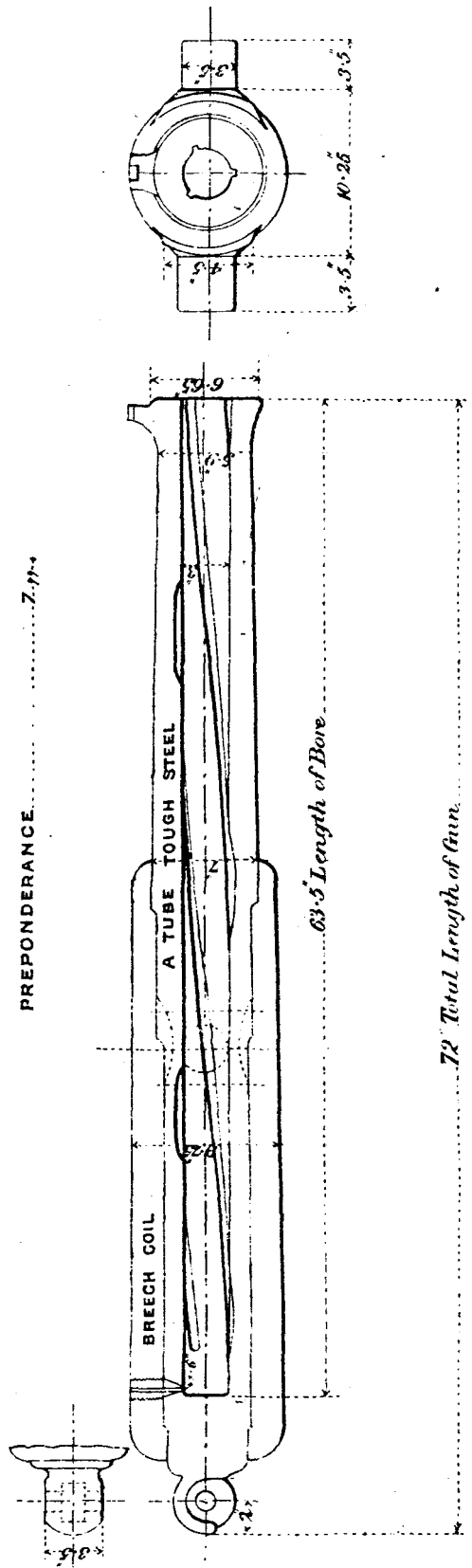
ORDNANCE, R. M. L., 9-PR, 6-CWT, MARK II.



74.5' Total Length of Gun

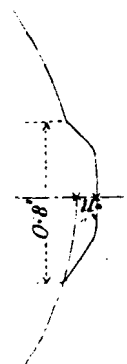


ORDNANCE, R. M. L., 9-PR., 8-CWT., MARK I.



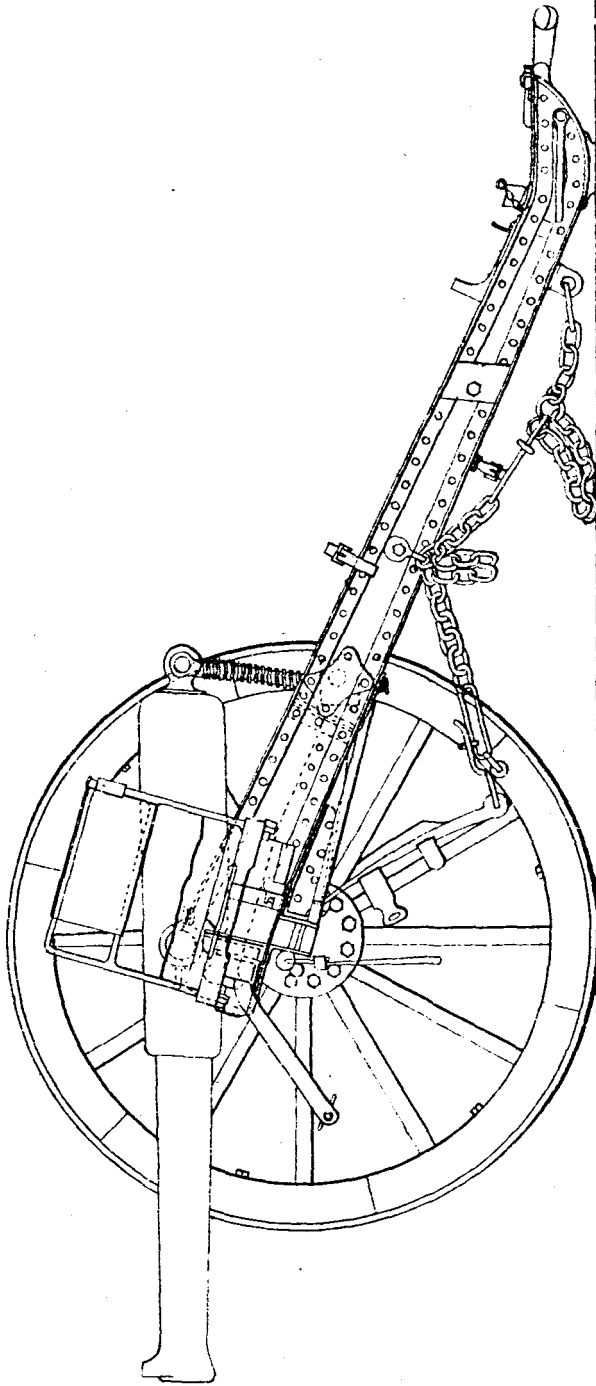
63.5 Length of Bore

72 Total Length of Gun



**CARRIAGE, FIELD, R. M. L., 9-PR., MARK II.**

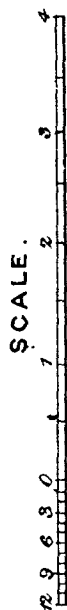
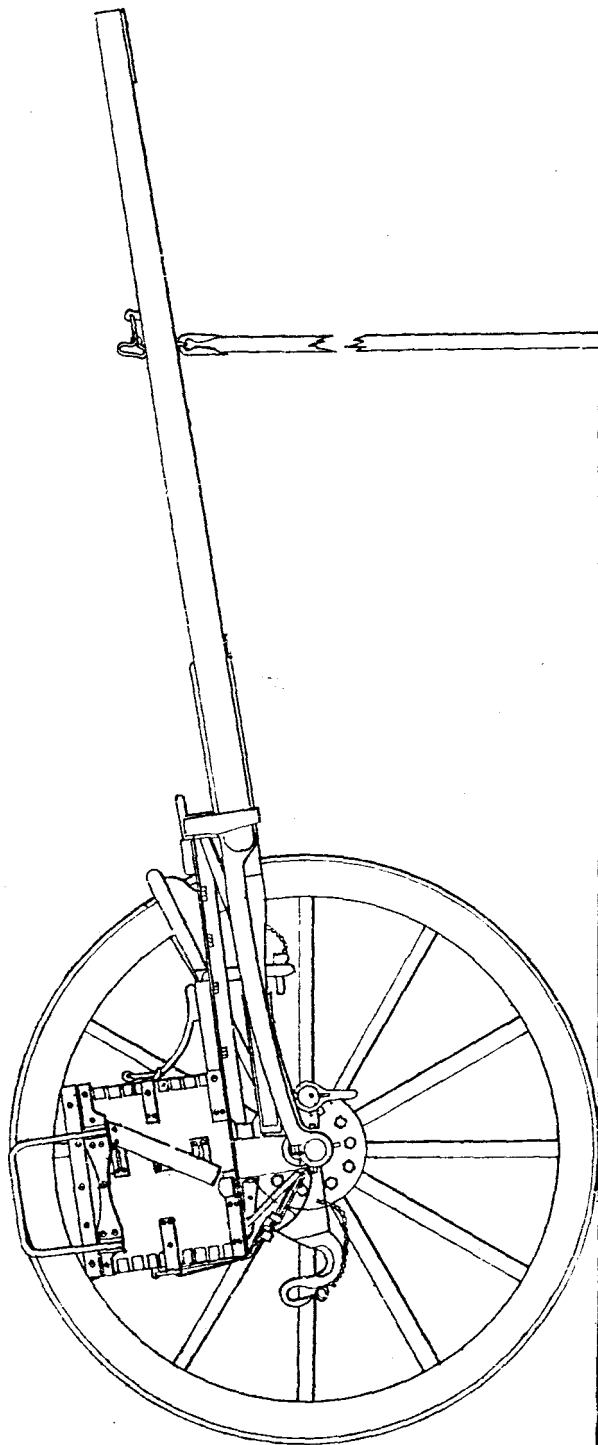
*NOTE; SUITABLE FOR 8 OR 6 CWT GUN.*



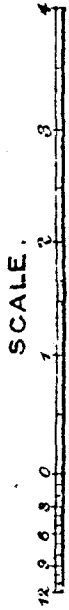
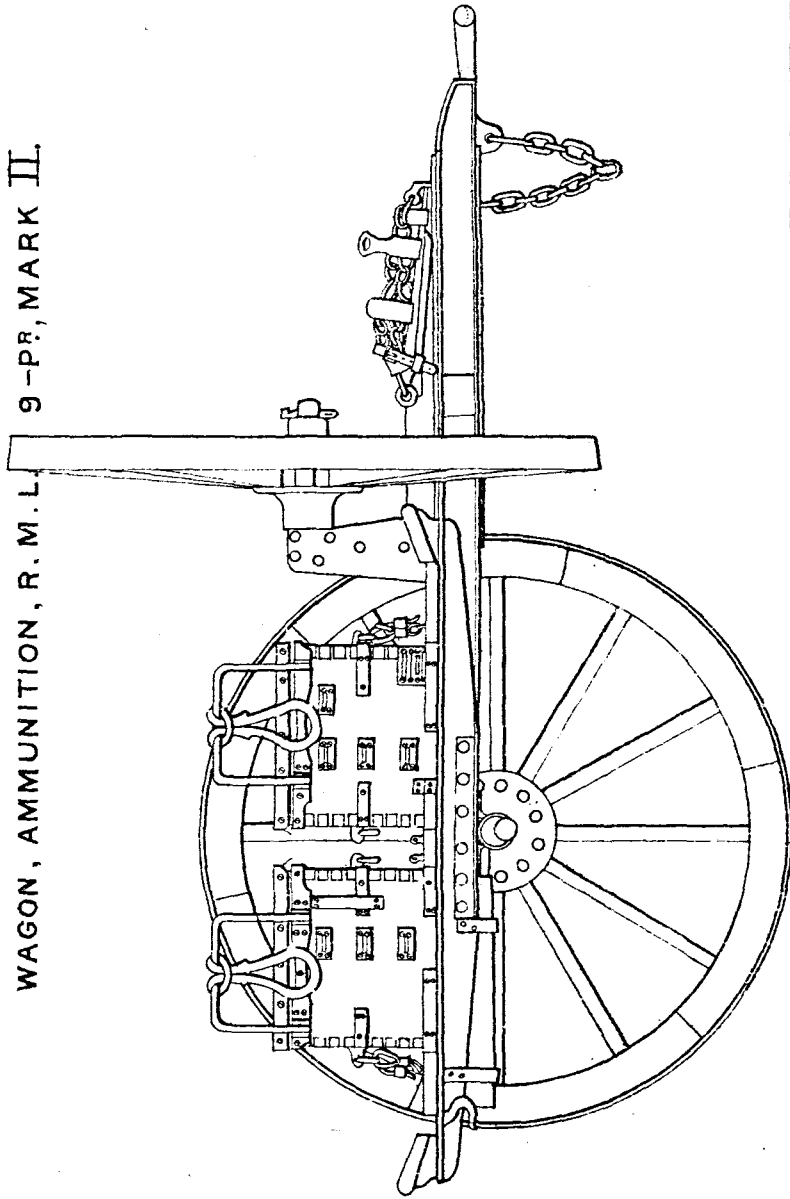
SCALE.



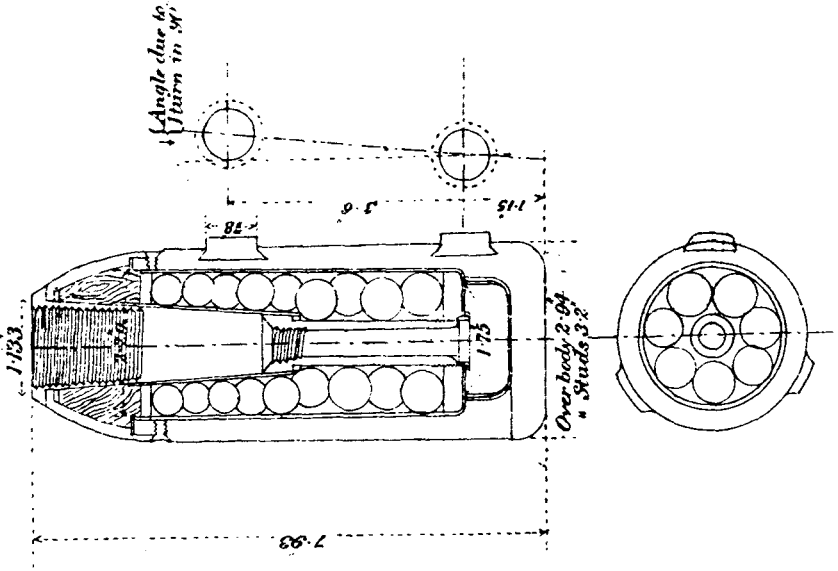
LIMBER, FIELD, R. M. L., 9-PS, MARK II.



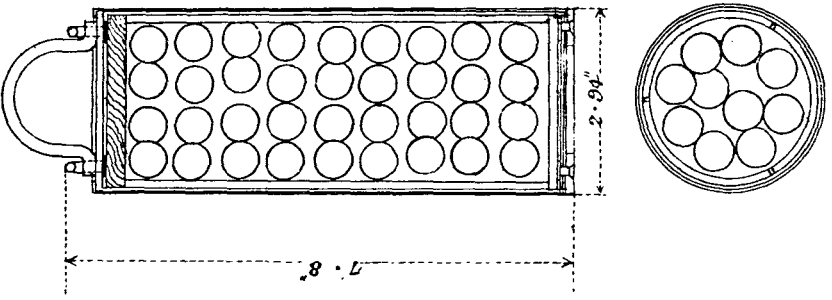
WAGON, AMMUNITION, R. M. L. 9-PR., MARK II.



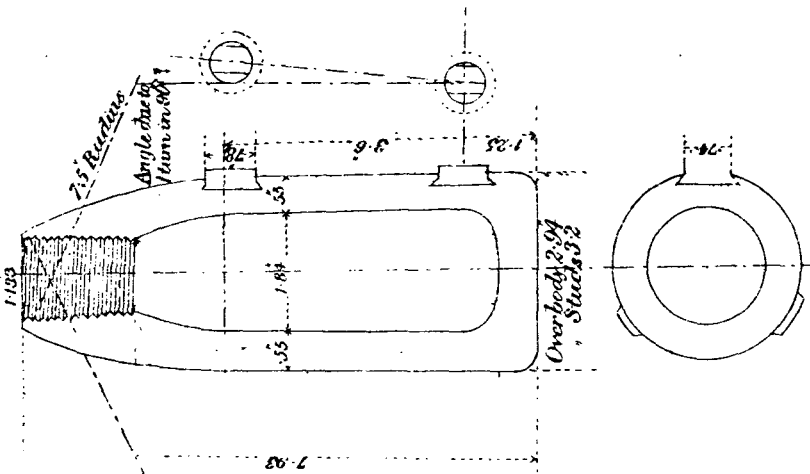
SHELL, R. M. L., SHRAPNEL, 9 PR., VIII.



SHOT, R. M. L., CASE, 9 PR., V.

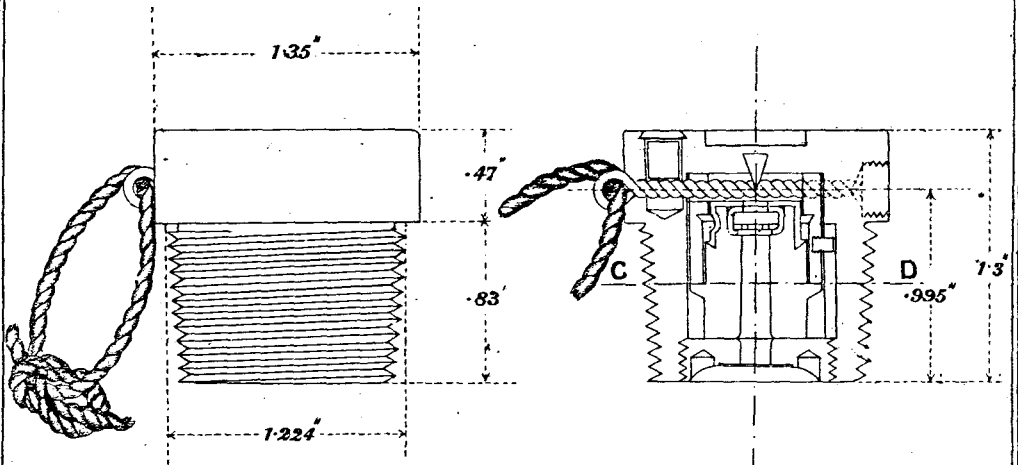


SHELL, R. M. L., COMMON, 9 PR., V.



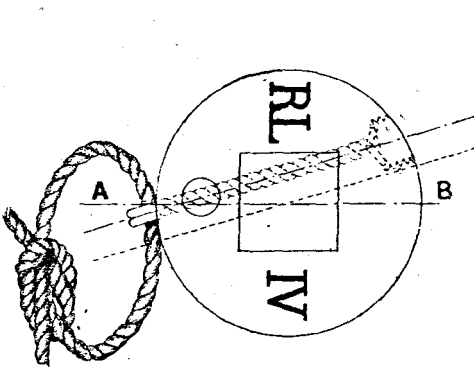
# FUZE, PERCUSSION, R. L, N° 7, MARK IV.

FULL SIZE.

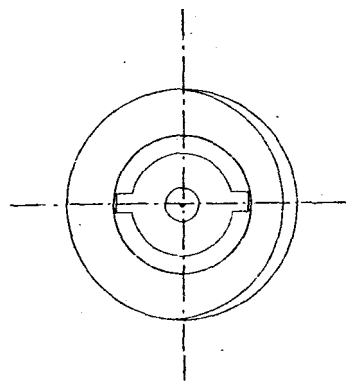


ELEVATION:

SECTION AT A.B.



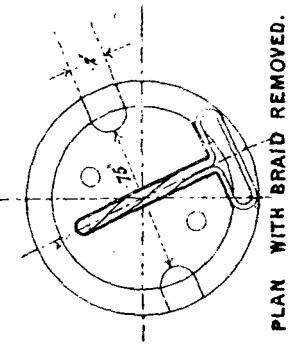
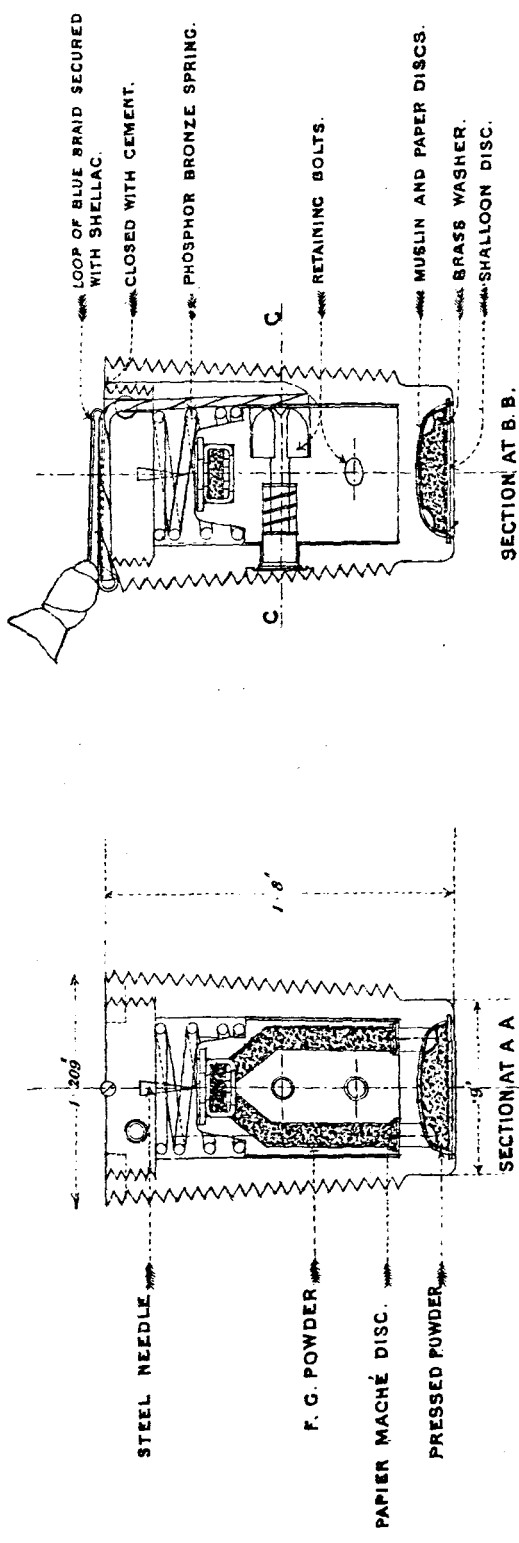
PLAN.



SECTION AT C.D.

# FUZE, PERCUSSION, SMALL, N° 8., MARK IV.

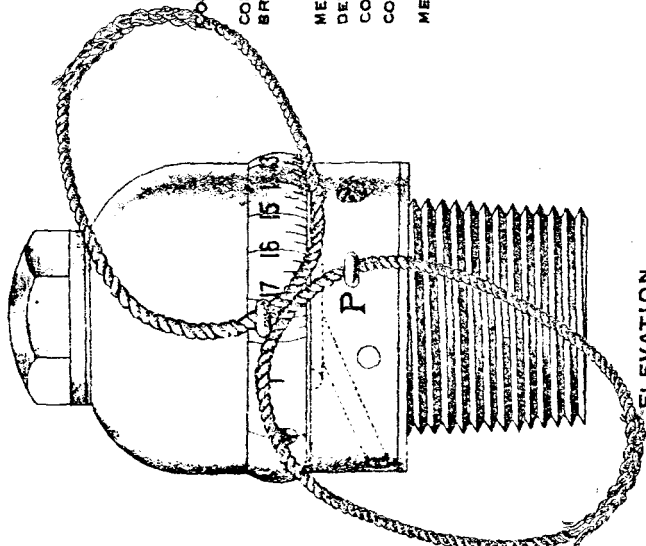
FULL SIZE.



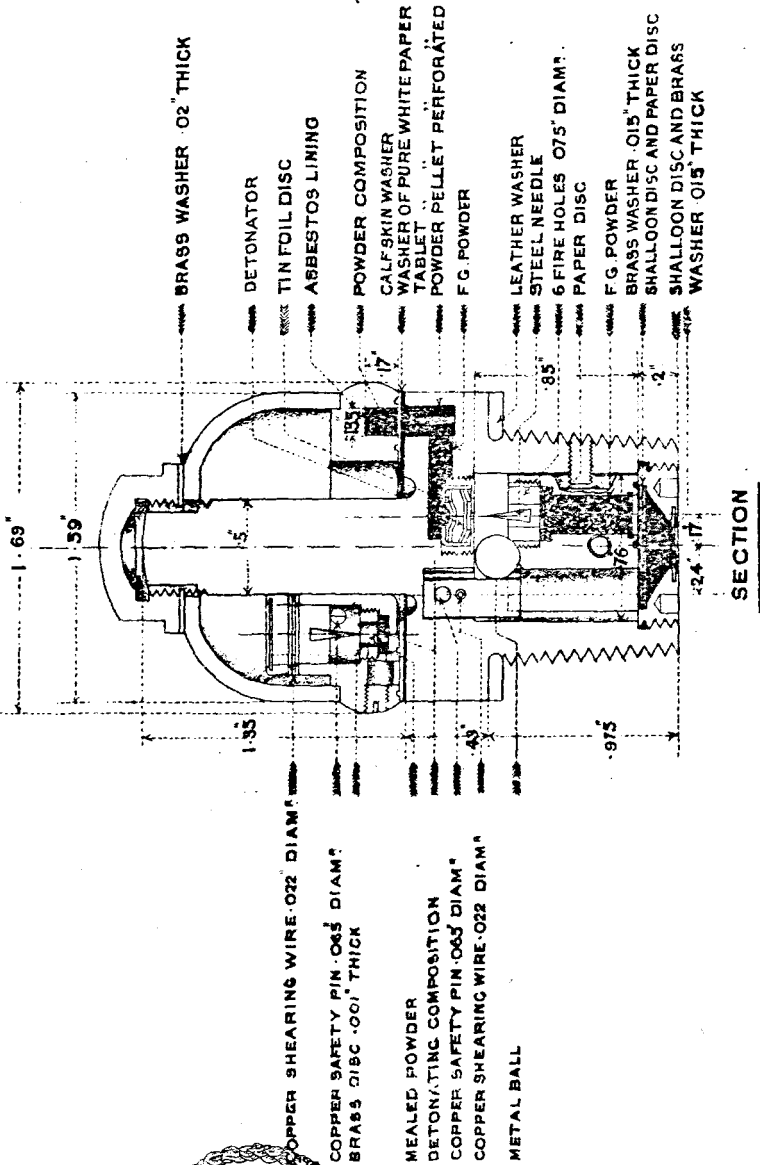


# FUZE, TIME AND PERCUSSION, N° 56. (MARK IV.)

FULL SIZE.



ELEVATION

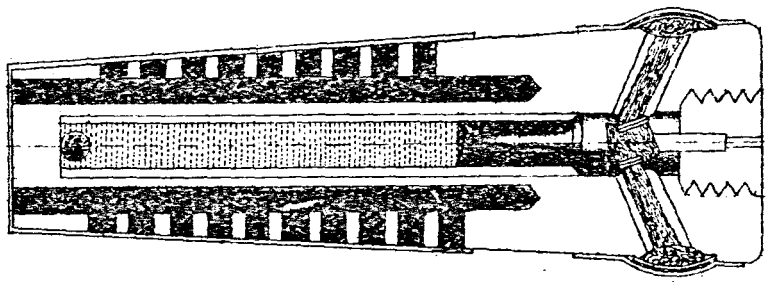


SECTION

- BRASS WASHER .02" THICK
- DETONATOR
- TIN FOIL DISC
- ASBESTOS LINING
- POWDER COMPOSITION
- CALF SKIN WASHER
- WASHER OF PURE WHITE PAPER
- TABLET
- POWDER PELLET PERFORATED
- FG. POWDER
- LEATHER WASHER
- STEEL NEEDLE
- 6 FIRE HOLES .075" DIAM.
- PAPER DISC
- FG. POWDER
- BRASS WASHER .015" THICK
- SHALLOW DISC AND PAPER DISC
- SHALLOW DISC AND BRASS WASHER .015" THICK
- 1.69
- 1.59
- 1.5
- .153
- .975
- .24
- .17
- COPPER SHEARING WIRE .022 DIAM.
- COPPER SAFETY PIN .065 DIAM.
- BRASS DISC .001" THICK
- MEAL POWDER
- DETONATING COMPOSITION
- COPPER SAFETY PIN .065 DIAM.
- COPPER SHEARING WIRE .022 DIAM.
- METAL BALL

**FUZE, TIME, M. L., 15 SECONDS, N° 41, MARK II.**

*Full size.*

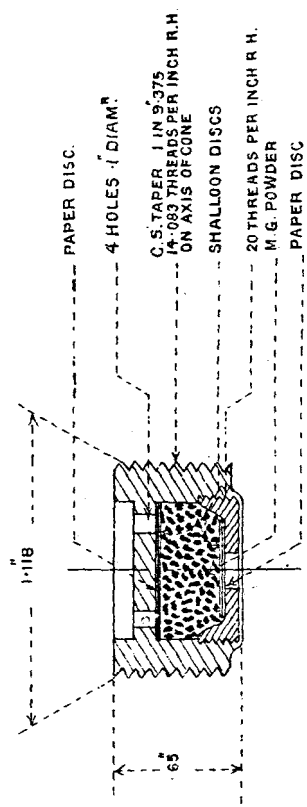


DEVELOPMENT OF PAPER SHOWING  
MARKING OF FUZE.

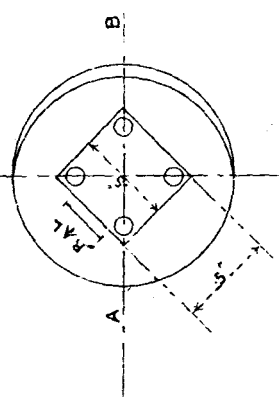
27.5	30	29.5	28	28.5	28
24.5	27	26.5	26	25.5	25
21.5	24	23.5	23	22.5	22
18.5	21	20.5	20	19.5	19
15.5	18	17.5	17	16.5	16
12.5	15	14.5	14	13.5	13
9.5	12	11.5	11	10.5	10
6.5	9	8.5	8	7.5	7
3.5	6	5.5	5	4.5	4
	3	2.5	2	1.5	1

PRIMER, FUZE, PERCUSSION, R. L., No. 7, MK I.

GUNMETAL  
FULL SIZE

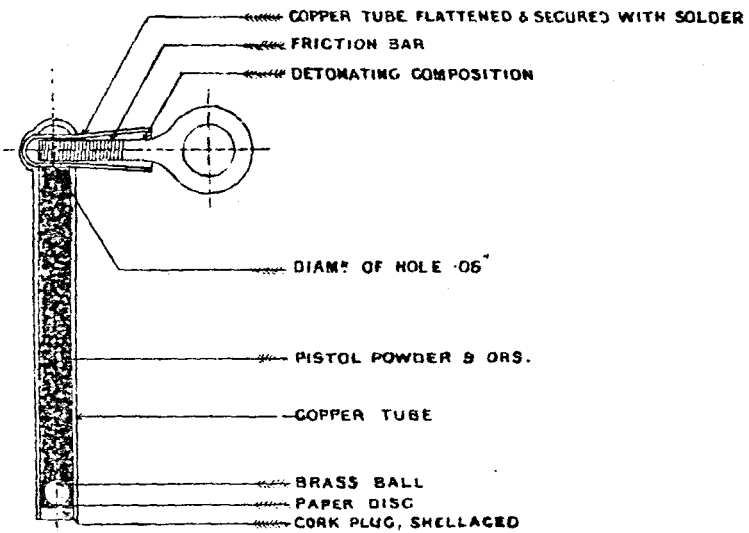


SECTION AT A.B.

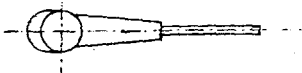


PLAN.

TUBE, FRICTION, COPPER, SOLID DRAWN, WITH BALL,  
( MARK II. )  
Full Size.



SECTION AT A. B.



PLAN.