

THE GARDNER GUN, 0.45 INCH, 2 BARREL, E.I.G.M.H. CHAMBER.

(Letters and figures in brackets refer to drawings at the end of book).

Nomenclature.

- Barrels (L) ... Fixing pin for do.
- Cam slide (N).
- Cartridge carrier (O) ... Guide pins. Ejectors (1) with springs and fixing pins, Ejector cone.
- Cartridge feeder (G) ... Slides, top and bottom. Springs, top and bottom, with fixing screws.
- Cartridge holders (P) ... Covers (2) with brass bands.
- Casing (B) ... Hoods (3) left and right, with fixing screws.
Joint pin. *Joint screw for cross-hatch;*
Joint screw for elevating screw
- Cover (C) ... Joint pin (4) cascade screw with knob. (D)
Extractor guide plate (5), with fixing and pivot screws, cartridge feeder catch (6), with collar, spring, and fixing pin. Stop screw.
- Crank, disc (Q) ... Axis pin (7) left. Cam (8).
- Crank handle (F) ... Axis pin, right, with fixing pin, gunmetal grip. Stem with fixing pin.
- Foresight (I).
- ~~Front disc (K)~~ ... ~~Fixing pin.~~
- Locks, consisting of ... Plungers (9) left and right. Butts (10). Studs with fixing pins. Extractors (11) with fixing pins. Firing pins (12). Hammers (13) with axis and fixing pins. Springs (14). Friction rollers with axis pins. *22 /*
- Safety bar (S) ... Spring, with centre stud, knob, and screw.
- Tangent sight (J), *with firing pin, spring, & pinion.*
consisting of ... ~~Slide, stem, stem spring.~~
- Tangent sight bracket (H) ... ~~Pinion with milled head and fixing pin.~~
~~Spring. Fixing screws.~~

Mounting.

Elevating gear, consisting of ... Brake, complete with collar, hand-nut (15), sleeve (16), joint pin with fixing pin, locking screw with set screw, elevating screw (17) with joint pin and check nut (18), handle (19) with adjusting nut (20), collar and fixing screws.

Stem (T).

Traversing gear, consisting of... Casing (21) with under-plate and fixing screws. Worm and spindle (22) with collar and adjusting nuts. Worm wheel. Hand wheel (23) with fixing pin. Gunmetal grip and stem. Set screws (24).

Tripod, consisting of

... Bearing piece with stop screw; set screw (25); Legs (26), with tie-rod and 2 joint pins each. Lug ring (27), Socket (28) with joint and split pins and stop nut. Deck plate (29). Holding down bolt (30), with adjusting nuts. Holding down screw (31). Lengthening key (32).

Description.

The barrels (the axes of which lie in a horizontal plane and are parallel to each other) are fixed in a gunmetal casing; ~~the fore-end or barrel casing (A) is tubular, and the rear end or breech casing (B) is rectangular.~~ The top of the casing is closed in by the cover (C) which is pivoted to the fore-end of the breech casing, and is locked down by means of the cascable screw (D).

In the breech casing are the locks which carry the mechanism for igniting the cartridges, and extracting the empty cartridge cases. The locks are driven backward and forward by means of a disc crank (Q) worked by the handle (P). At the forward motion the cartridges are pushed into the barrel chambers, and there held during the time of discharge, whilst during the backward motion, the empty cases are withdrawn.

The gun is fed from a vertical cartridge feeder (G), which is attached to the cover, behind an opening, through which the cartridges fall from the feeder to the cartridge carrier.

The cartridge carrier (O), which is to the rear of the breech ends of the barrels, has a transverse motion, for the purpose of bringing the cartridges from the opening in the cover and delivering them opposite the right and left hand barrels alternately, where they are in line with the lock plungers.

The cartridge feeder (G) holds thirty cartridges and is supplied during firing from wooden cartridge holders, each holder containing twenty cartridges.

Part A I **Sighting.**

~~The gun is furnished with two sights,—the foresight (I), which is attached to the barrel casing, and the tangent sight (J), which slides in a bracket (K), attached to the breech casing. The tangent sight consists of a slide upon which teeth are cut to form a rack, a stem, and a spring which snaps into a recess in the slide and acts as a stop when the stem is drawn out to its full extent. The slide is marked on its right edge from 0 to 1,300 yards, and on its left edge from 1,400 to 2,000 yards. The right hand marking is for use when the head of the stem is resting upon the top of the slide; the left hand marking, for use when the stem is fully withdrawn.~~

Safety Bar.

This is a flat bar passing through the casing in front of the hammers; when the edge of the bar is turned towards the hammers, they cannot complete their forward movement; the springs are consequently kept compressed and no cartridges can be fired, although fed through the gun; the spring handle of the bar shows when the bar is in "safe" or "firing" position.

Part B **Mounting.**

The gun is furnished with a tripod mounting. The tripod is held in position by the head of the holding-down bolt (30), being passed through the slot in the deck-plate (29) and turned a quarter turn, after which the holding-down screw (31) is screwed into the socket (28) until a firm hold is obtained. The nuts on the holding-down bolt should be so adjusted that the thread can be screwed about half its length into the socket before the head of the bolt commences to tighten in the deckplate.

The traversing gear is clamped in position in the tripod by the set screw (25) in socket. The two set screws (24) on the top of the

worm wheel casing are to allow of a lateral motion being given to the gun independent of the worm gear.

Elevating Gear.

For rapid elevation or depression, the hand nut (15) of the brake is released, when the handle will be found free to slide in the sleeve. When laying the gun upon an object, the hand nut is tightened, and the adjusting nut (20) turned to give the required elevation or depression. If the hand nut will not tighten up the brake by reason of its coming in contact with the breech-casing, slack out the set screw and turn the locking screw until the hand nut tightens in the desired position, then fix with set screw.

Action.

Supposing the right-hand barrel to be just fired, the continued rotation of the handle (F) and disc crank (Q) causes the right hand hammer to be turned upon its axis, drawing back the firing pin and compressing the lock spring; at the same time the cartridge carrier moves over to the left, and the ejector which has passed under the lock rises to the left of it forming a trough under the opening in the cover, and into this trough a cartridge falls ready for conveyance to the barrel chamber. The crank pin (33) now comes in contact with the butt of the lock and forces it backward, extracting the empty cartridge case. The lock being fully back, the cartridge carrier moves to the right, bringing the cartridge from under the opening in the cover to a position in line with the barrel chamber and with its rim or head between the face of the plunger and the hook of the extractor, at the same time the empty case has been thrown out at an opening in the side of the casing. The lock now moves forward pushing the cartridge into the chamber, and forcing down the ejector that it may duly pass under the lock. The lock now being fully forward supports the cartridge in the barrel chamber, whilst the hammer being released, the firing pin flies forward and ignites the cartridge.

The right and left hand barrels are fired alternately, the right lock advancing as the left is being withdrawn, and *vice versa*.

The cartridge carrier (O), which is actuated by a cam (8) upon the disc crank, obtains its supply of cartridges from the cartridge feeder.

Instructions for armourers in stripping, assembling, and adjusting the gun.

To remove Locks.

See that the safety bar is in firing position; open the cover and turn the crank until the right hand crank pin is at the top; when in

this position the fore-end of the plunger of the right hand lock will be about 2 inches from the barrel; take hold of the plunger and raise it at the same time moving the crank slightly; the lock will now come away; turn the left hand crank pin to the top and take out the left hand lock.

To remove the Cartridge Carrier.

Lift up the right hand hood and push out the guide pins; turn the crank until the cartridge carrier is to the left, then with the fingers inserted through the discharge ports, lift out the carrier. It will be found easier to remove the cartridge carrier if both hoods are first taken from the casing, but with a little practice it may be removed without.

To remove the Safety Bar.

Lift up the right hand hood and draw the safety bar out.

To remove the Crank.

Place the flat part of the spanner in the slot of the left axis pin, letting the cross piece or screwdriver end, rest upon the frame at the rear; take hold of the crank handle and give a smart backward turn; this will loosen the left axis pin; do not take it *quite* out until the right axis pin is loosened, which is accomplished by placing a piece of hard wood between the crank and rear end of breech casing and turning the crank handle backwards; both axis pins being removed, the crank may be lifted out.

To remove the Barrels.

Remove the hoods and drive the barrel fixing pin out of casing; ~~drive the fixing pin upwards from the front sight, take off the fore sight and front disc and draw the barrels forward with a vice and~~
draw and hammer **To strip a Lock.**

Compress the spring by means of the hammer; place the jaws of the spanner over the spring as low as possible; this will keep the spring compressed; when the hammer is released, the spring may be taken from the lock; take out the hammer; drive out the fixing pin from the plunger, and draw off the butt, take out the firing pin, drive out the fixing pin, and remove the extractor. If it is necessary to remove the spring from the spanner, compress the spring in a vice or between the frame and cover of the gun, when it will be left free of the spanner. Care must be taken to hold the *open* end of the spring in the vice, and not the turned end.

N.B.—The locks of all Gardner guns should be taken out and oiled and tested monthly.

To strip the Tangent Sight.

Drive out the taper pin and take off the milled head, take out fixing screws and ~~remove bracket, take out pinion~~, then remove sight and spring; when it is necessary to ~~take out the stem~~, the stem-spring must be forced back by pressing a piece of wire through the hole in the slide, the stem may then be withdrawn.

N.B.—All pins without heads are to be driven out from the left.

To assemble Guns.

Reverse the above operations, taking care in replacing locks to have the crank pins in the same position as directed for stripping, and that the end of the hammer is under the crank and *not* in the opening in the disc, see that the locks are placed right and left as marked.

Miss-fires.

May be caused by a weak lock spring; the weight of the spring may be tested with a wire and spring balance; it should require a pressure of not less than 17lbs. to press the point of the firing pin back slightly. Miss-fires may also occur if oil be allowed to corrode round the firing pin.

Non-extraction.

Must
Should any cases of non-extraction occur owing to the extractor cutting through the head of the cartridge, draw back the lock and drive out the empty case with the cleaning rod, inserted from the muzzle. Sometimes owing to a hang-fire the head of the cartridge case may be blown off, leaving the cylindrical part in the chamber; in this case take out the lock and introduce the clearing plug from the breech, turn the plug with the spanner until the threaded part obtains a fair hold in the case, then with the cleaning rod used from the muzzle push or tap out the plug, when the case will be found to come away with it.

Jams.

A jam may occur after a hang-fire by the next cartridge being driven forward into the chamber which is already occupied by the cylindrical part of the previous cartridge case. When this happens, cut off the supply of cartridge and remove the feeder, open the cover, turn back the crank handle and remove any cartridges from the carrier, take out the lock and drive back the jammed cartridge, with the cleaning rod, then use the clearing plug as before directed.

To replace a Barrel.

The spare barrel is interchangeable as regards diameter; should the fixing pin be found difficult to enter, the groove in the barrel may

be eased away with a round file until the pin goes home ; copy the chamfer on the breech end of the barrel from the old one.

Cleaning Gun.

When cleaning the gun, turps or oil is to be used. On no account may emery cloth or any cutting substance be allowed. In oiling before assembling, use Rangoon oil sparingly ; oil the parts all over, but do not put on enough to allow it to run into drops, or it will clog.

It is *very* important that the barrel chambers should be kept clean ; they should be oiled immediately after firing ceases.

When the gun is not loaded, the crank handle must *not* be turned until the safety bar is placed at safe position ; neglect of this will cause serious damage to the chambers.

Frank P.

Spare Parts and Implements issued with each Gun.

Barrel	1
Cartridge-feeder	1
Crank handle	1
Extractors	4
Hammers	1
Locks, right	1
" left	1
Pins, extractor	4
" firing	4
" joint, for casing	1
Sights, fore	1
" tangent	1
Springs, lock	4
" sight, tangent	1

Implements.

Cleaning rod	1
Clearing plug	1
Punch 5/32"	1
" 3/16"	1
Spanner	1
Tommy	1

Weights and Dimensions.

Weight of gun with stem and cartridge feeder	92 131 lbs.
" tripod, with traversing gear <i>mounting</i>	72 61 "
Total weight <i>of wheeled mounting</i>	105 392 "
Cartridge-holder containing	20 cartridges.
" " weight empty	7 ozs.
" " " full	2 lbs. 14 1/2 oz.
" number issued with each gun	1,000 50

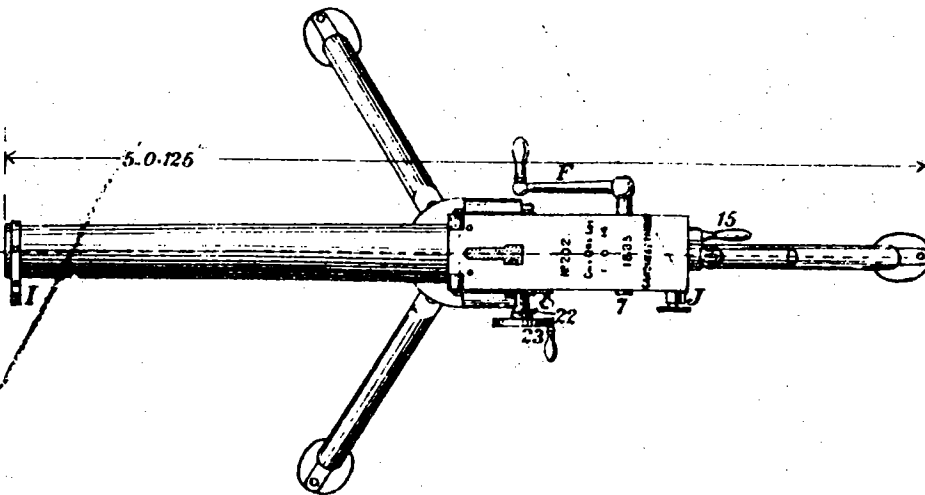
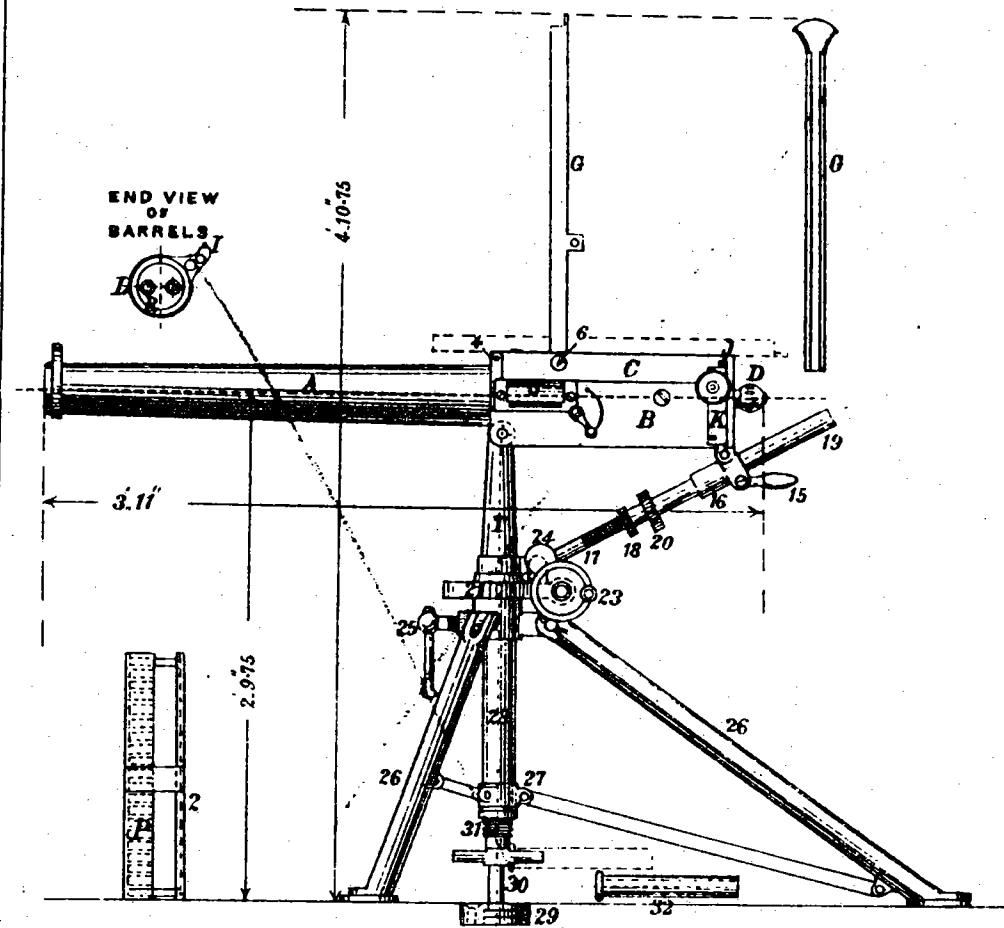
Weights and Dimensions—contd.

Barrels, number	. . . . .	2	
" calibre	. . . . .	0.45 inch.	0.4
" extreme length	. . . . .	30 "	28.5
Rifling description	. . . . .	" Henry."	
" number of grooves	. . . . .	7	
" twist uniform	. . . . .	1 in 15 inches.	
Length of gun, extreme	. . . . .	47 "	45.52
Height from ground to centre of barrels	. . . . .	34 "	32
Elevation, extreme	. . . . .	32°	
Depression "	. . . . .	60°	

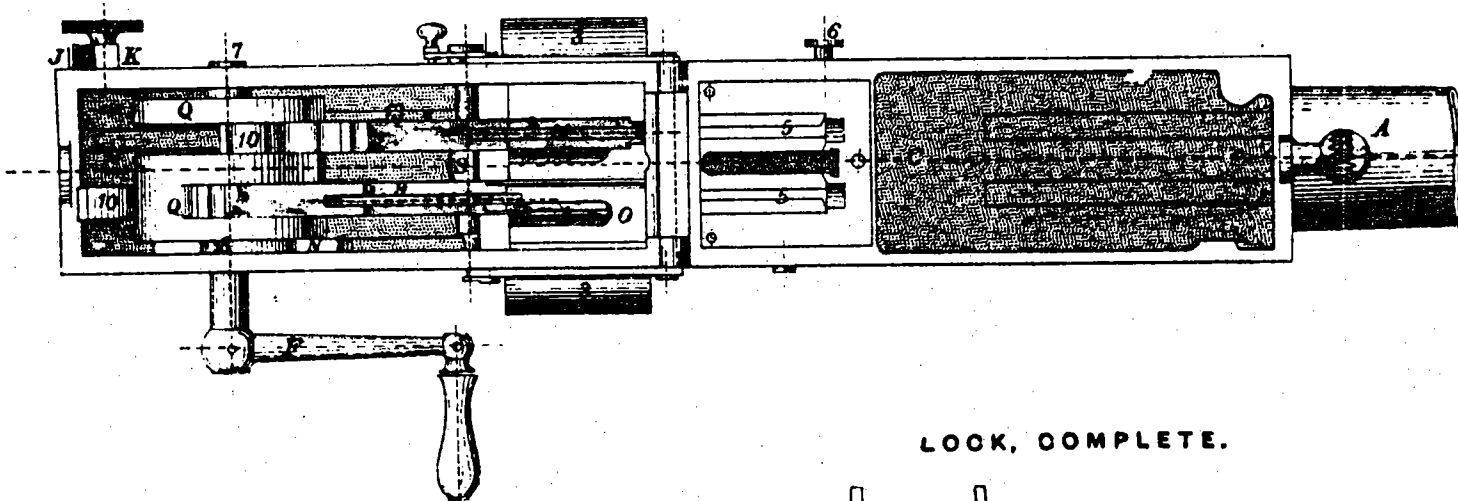
Ammunition M. H. Solid Case.

Projectile, nature	. . . . .	lead.
" weight	. . . . .	385 480 grs.
Charge "	. . . . .	85 " RFG.²
Cartridges, number in box	. . . . .	680 580
Weight of box, filled	. . . . .	87 lbs.
Number of holders carried in cartridge holder box	18
Weight of cartridge holder box, empty	17 lbs. 2 ozs.
" " " filled	69 " 7 "

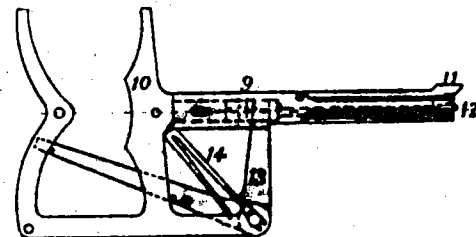
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PLAN OF ACTION
COVER OPEN.



LOCK, COMPLETE.



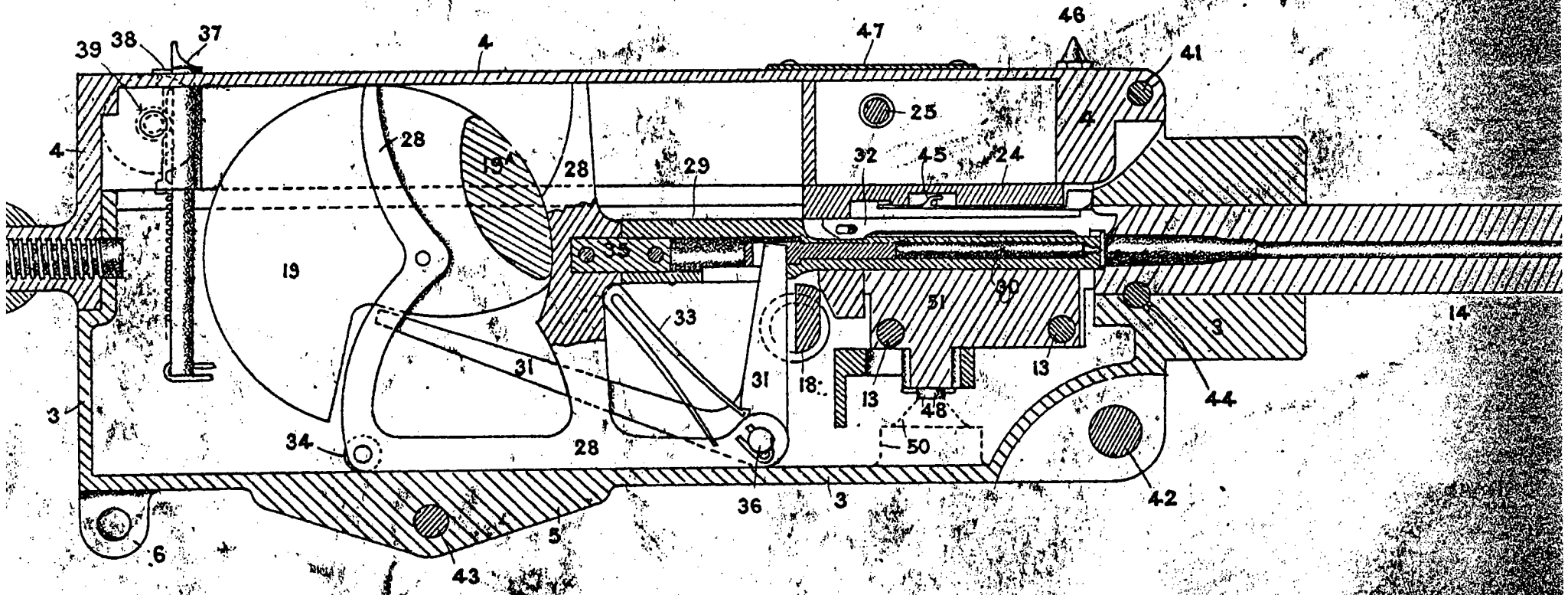
Scale 2 Inches = 1 Foot.

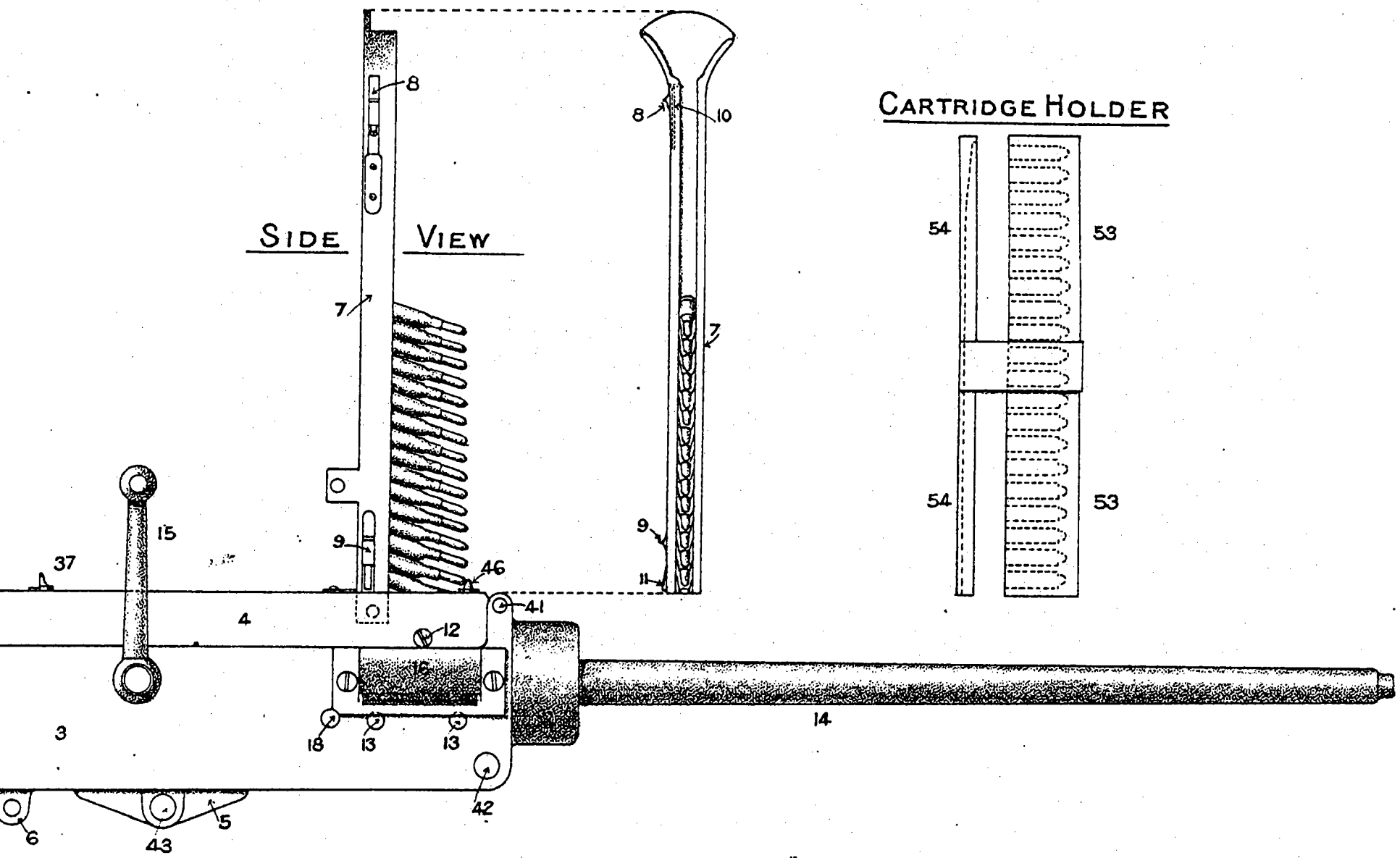
Lithographed at the Survey of India Office, Calcutta, June 1860.

GUN GARDNER. 2 B.

LONGITUDINAL SECTION THROUGH LEFT HAND BARREL.

SCALE 4" = 1 FOOT.



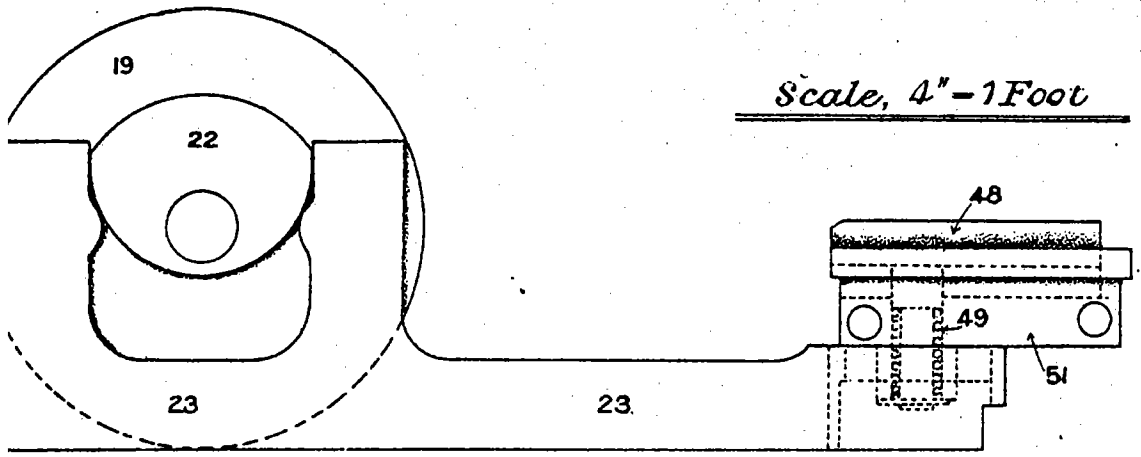


SIDE VIEW

CARTRIDGE HOLDER

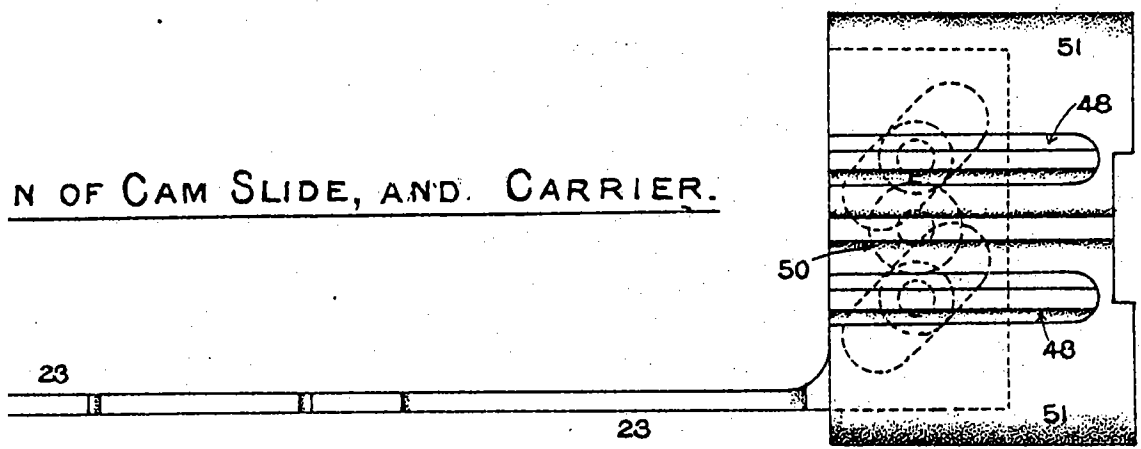
Scale, 2" - 1 Foot

ELEVATION OF CRANK DISC. CAM SLIDE, AND CARRIER.



Scale, 4" = 1 Foot

PLAN OF CAM SLIDE, AND CARRIER.



STOP-OFF BLOCK.

