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HANDBOOK

FOR THE

Q. F. HOTCHKISS 2.244-INCH, 6-PDR., 6-CWT. MARK II GUN WITH TANK MOUNTING

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The following publication, entitled "Handbook for the Q. F. Hotchkiss 2.244-inch, 6-pounder, 6-hundredweight, Mark II Gun with Tank Mounting," is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

PEYTON C. MARCH,
General, Chief of Staff.

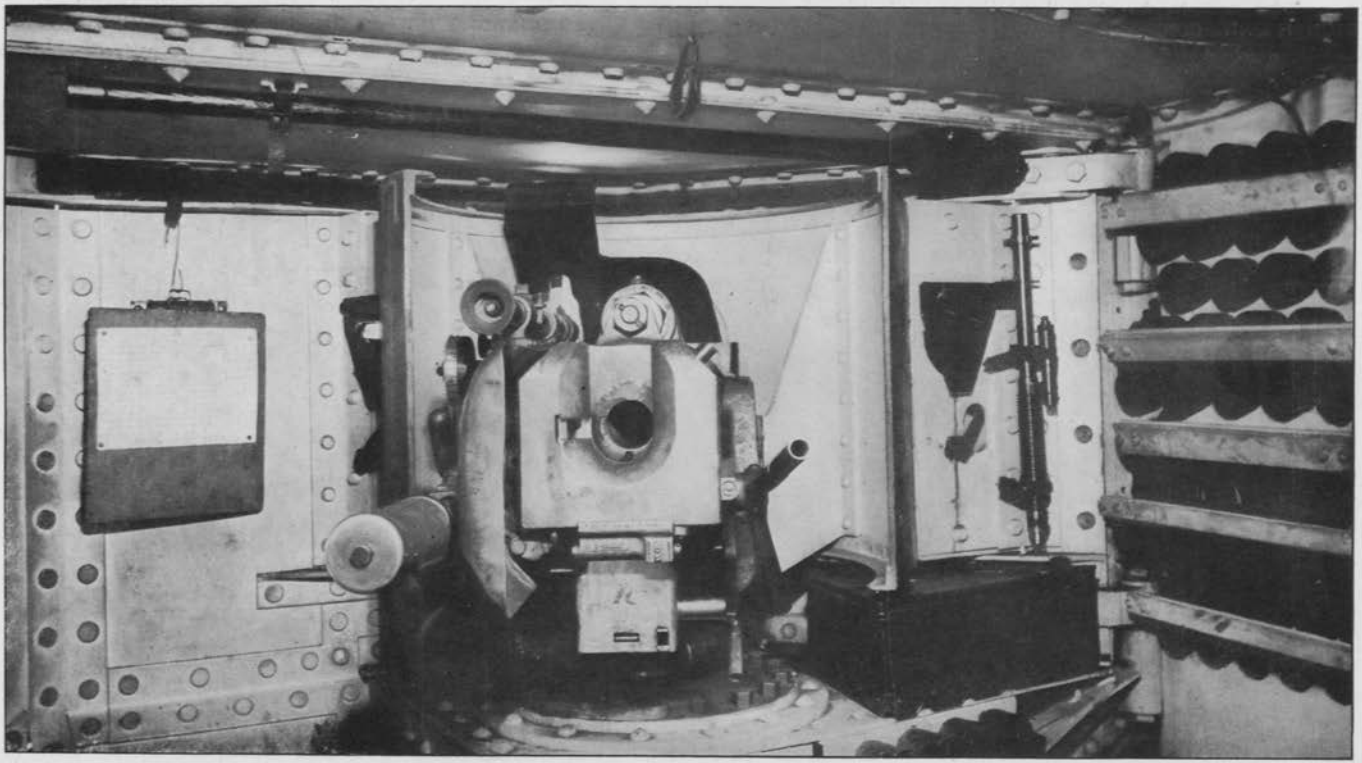
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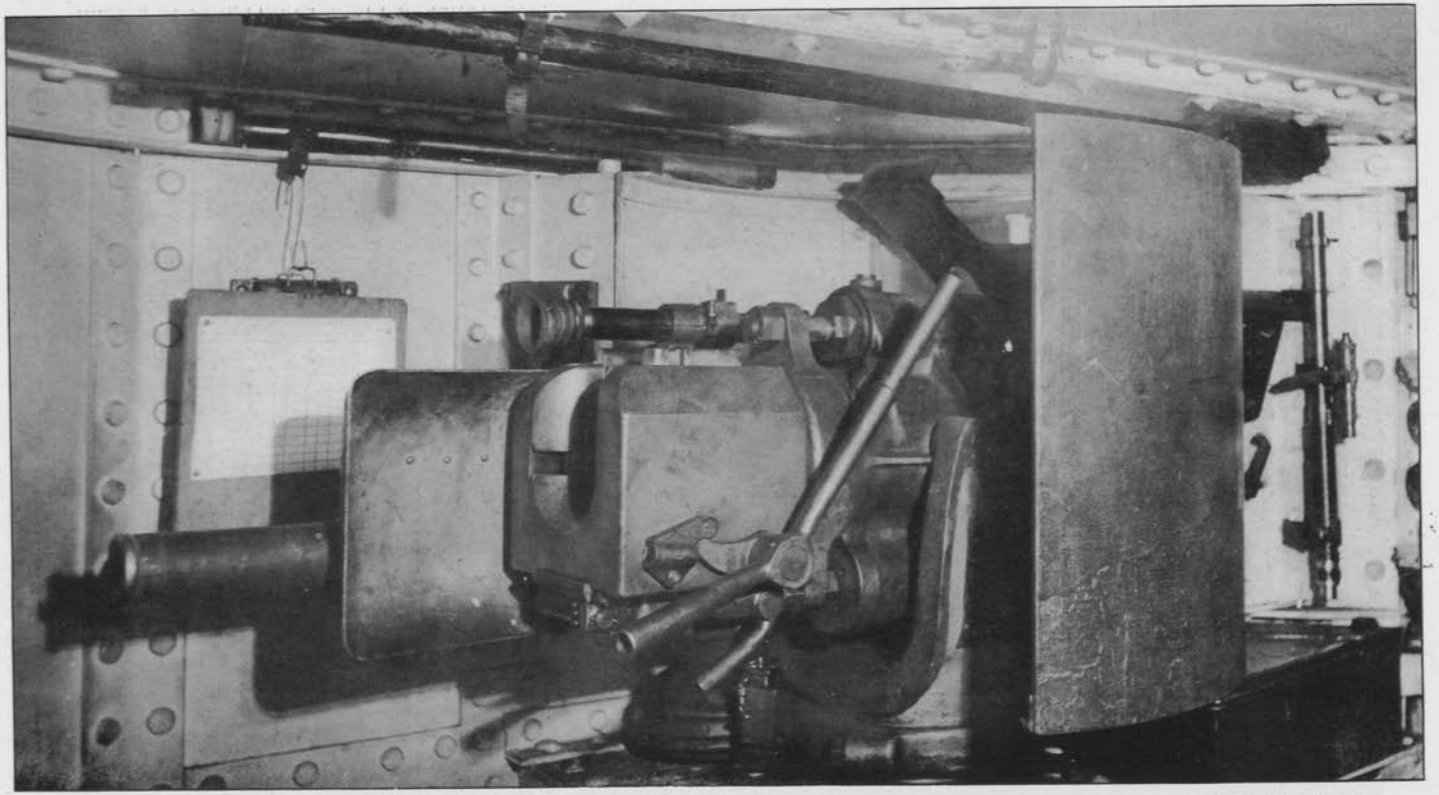
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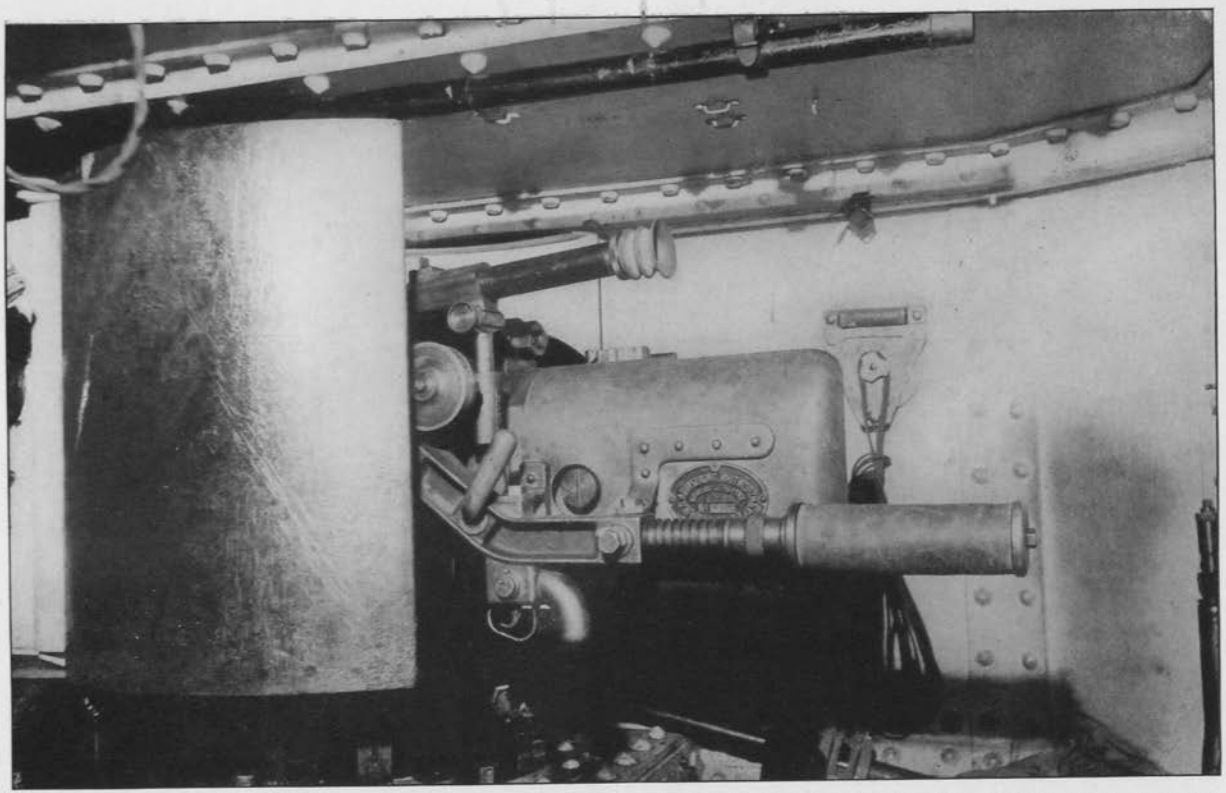
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BREECH END OF GUN, BREECH OPEN, SHOWING EXTRACTOR, EXTRACTOR GROOVE, ROCKING SHAFT WITH RECOCKING HANDLE, SEAR (IN LOWER RIGHT-HAND CORNER OF BREECHBLOCK), SEAT FOR THE BEND OF MAIN SPRING (LOWER CENTER OF BREECHBLOCK), FIRING SHAFT BRACKET, ETC.



RIGHT-HAND SIDE, BREECH END OF GUN, SHOWING CRANK HANDLES, LENGTHENING LEVER, COCKING CAM, RECOCKING HANDLE, CRANK HANDLE LATCH, REVOLVING BRACKET, SHIELD, RECOIL BAND, RECOIL AND COUNTER-RECOIL CYLINDERS, ETC.



LEFT-HAND SIDE, BREECH END OF GUN, SHOWING TRIGGER, PISTOL GRIP, SHOULDER PIECE, GUARD PLATE, SHIELD, SIGHTING GEAR, ETC.

Q. F. HOTCHKISS 2.244-INCH, 6-POUNDER, 6-HUNDREDWEIGHT, MARK II GUN.

1. TABLE OF WEIGHTS, DIMENSIONS, ETC.

Weight of gun, including breech mechanism	pounds	644
Caliber	inches	2.244
Total length	do	60
Length of bore, including chamber	do	52.12
Length of bore, including chamber, in calibers		23
Rifling, uniform, 1 turn in 30 calibers:		
Number of grooves		24
Width of grooves	inch	.22
Depth of grooves	do	.012

2. DESCRIPTION OF THE GUN BODY.

(See Plate I.)

(*a*) The gun is of British design and manufacture. The body is of alloy steel, built up, and consists of a tube, jacket, recoil band, and locking ring. The jacket is shrunk on and envelops the rear end of the tube, being extended rearwards to allow a recess for the breechblock to be formed in it.

(*b*) The recoil band is screwed on the exterior of the jacket just in front of the breech recess. It is provided with top and bottom lugs for attaching to the recoil and counter-recoil mechanisms, respectively. It is secured against turning by two flush set screws, one at each end of the horizontal diameter.

(*c*) The jacket and tube are secured longitudinally by the front end of the jacket seating against a shoulder on the tube and the locking ring being screwed and shrunk on both the tube and jacket over this shoulder seat, thus locking these parts together.

(*d*) Two feathers are formed on the jacket, one on the top, the other on the bottom, which slide in featherways cut into the cradle (Pl. VI) and serve as guides for the gun when in its mounting.

(*e*) Horizontal axis lines are cut on the sides of the gun at the muzzle end. Vertical and horizontal lines are also cut on the breech and muzzle faces.

(*f*) A line locating the center of gravity (without mechanism) is cut transversely on the upper side of the gun.

(*g*) The type, register number, manufacturer's initials, and year of manufacture are marked on the lower portion of the breech face.

3. BREECH AND FIRING MECHANISM.

(See Plate II.)

(*a*) The breech mechanism is of the drop-block type, the block being actuated by means of a crank with handles on the right-hand side of the breech.

(*b*) *Breech recess.*—The recess in the rear end of the jacket, called the "breech recess," in which the breechblock is contained and operated, has four surfaces, which are termed, respectively, the front face, the right cheek, the rear face, and the left cheek. The front face and the right and left cheeks are perpendicular to the axis of the bore, the rear face slants downward and backward 0.357 of an inch. The guides for the breechblock, which project from each cheek face of the breech recess, have their bearing, or guiding, faces parallel to the rear face of the breech recess.

(*c*) *Breechblock.*—The breechblock is a square hollowed steel wedge with guideways cut into each side. The guides, which are formed on the inside of each cheek of the breech, fit into and slide in these ways. The front face of the breechblock is perpendicular to the axis of the bore, while the rear face is slightly inclined. The front upper corner is cut back to allow free movement to the extractor. The firing mechanism is contained in the hollow part of the block. A catch is set into the top of the block for retaining the cartridge when loading at high angles. By the movement of the block, the breech of the gun is opened or closed, the empty cartridge case is extracted and the firing mechanism is cocked.

(*d*) *Breechblock plate.*—That part of the front face of the breechblock which covers the bore of the gun consists of a removable hard steel plate, dovetailed into the face of the block and secured by two screws. The plate has a removable steel bushing with a hole in its center, through which the firing pin acts on the primer cap.

(*e*) *Crank.*—The breechblock is actuated by the crank which has a stud and roller traveling in a groove cut into the side of the block. The crank is journaled in the right cheek of the breech and carries on its stem the two crank handles and cocking cam. The crank handles are formed on one hub, the hub being keyed to the crank shaft and secured with a set screw. A lengthening lever for the crank handles is provided, and is used by simply inserting in the hollowed ends of the handles. It provides greater leverage for operating the breechblock, and is an aid to rapid firing of the gun. This lever should be removed before firing, for its extra weight thrown on the crank handle on recoil of the gun may break the

handle. By reversing the lengthening lever, it can be used on the cocking handle.

(*f*) *Crank-handle latch.*—A latch is fitted to the outside of the right cheek of the breech. This latch, when the breechblock is in the closed position, engages the tip of the cocking cam, which is attached to the crank shaft, and holds the crank, and hence the block, in the closed position. The latch consists of a steel plunger and spiral spring contained in a steel bracket. The bracket is secured to the cheek by a feather and two screws.

(*g*) *Firing hammer.*—The firing hammer is located in the vertical center line of the breechblock and carries a detachable firing-pin housing, the upper end of the housing carrying the firing pin. The hammer is mounted on a rocking shaft which carries a cocking toe and recocking handle on its extreme right end. This cocking toe is in the same vertical plane as the cocking cam on the crank handle hub. When the crank is turned to drop the breechblock, the cocking cam of the crank handle meets the cocking toe of the rocking shaft, forcing back the hammer and cocking it. A stirrup is pivoted to the hammer and carries one end of the main spring. The rocking shaft is also fitted with a handle S for recocking after a misfire.

(*h*) *Sear.*—The hammer is held at full cock by means of a sear actuated by a spring, both being mounted in the bottom of the breechblock. A toe on the sear catches in a cock notch on the hammer when in the cocked position.

(*i*) *Firing arm and shaft.*—The firing arm is keyed to the right end of the firing shaft, at the left end of which is a lever which engages the trigger mechanism of the mounting when the gun is in the firing position. The firing arm and shaft are retained in position by the spring V, so that when the breechblock is raised to the closed position the firing arm comes into contact with the sear. When the firing shaft is actuated through the trigger mechanism of the mount, it rotates through a small arc carrying the firing arm with it, which depresses the sear until the toe of the sear slips clear of the notch on the hammer, allowing the hammer to fly forward and fire the gun. The firing shaft is housed in a bracket which is screwed to the underside of the breech.

(*j*) *Main spring.*—The main spring is a flat double-branched spring fitted so that both branches work on the hammer, one on each side of the axis of rotation. One branch of the spring lies in a rest on one side of the axis and the other end in a stirrup on the other side. This stirrup also locks the rocking shaft in place by engaging in a transverse slot cut into the shaft.

(*k*) *Extractor.*—The extractor is a single piece of steel working in a longitudinal groove BB cut into the inside of the left cheek of the breech. Its forward end is shaped into a hook to engage the

rim of the cartridge. On the same side of the extractor as the hook is a small stud, which travels in groove CC cut into the left face of the breechblock, thus giving motion to the extractor.

(*l*) *Block-stop screw.*—When the breechblock is thrown into the open position, it is prevented from dropping clear out of the recess by the block-stop screw, which is screwed through the left cheek of the breech, its inner end traveling in groove G.

4. ACTION OF THE MECHANISM.

(*a*) The gun having been fired, the action of the mechanism in reloading is as follows:

(*b*) *After firing.*—The breech is opened by pulling the crank handle to the rear. As the crank handle commences to move, the crank stud is carried backward in the part of its groove which is concentric with the axis of the crank; therefore, the breechblock does not move; during this time the cocking cam acts on the cocking toe and cocks the hammer. The crank stud passing on into the inclined part of its groove forces the breechblock to descend. The extractor, actuated by its stud traveling in the vertical portion of extractor groove CC in the block, at first moves slowly backward with a powerful leverage, starting the cartridge case from its seat. The motion of the extractor during this portion of its functioning is caused by the rearward travel of the breechblock due to the inclination of its guides. This first movement, the loosening of the case, is referred to as "primary extraction." When the block has descended so far as to unmask the bore the sharp change in direction of the extractor groove in the block causes the extractor to take a quick violent motion to the rear, throwing the cartridge case entirely out of the gun and clear of the breech. This latter movement is referred to as "final extraction." At the end of this motion the block is stopped in its descent by the block-stop screw meeting the blind end of its groove in the block.

(*c*) *Loading and closing the breech.*—The cartridge having been entered in the chamber is pushed home until the rim of the case engages the hook of the extractor; the breech is then closed by a reverse movement of the crank handle. As the breechblock rises its inclined upper corner pushes the cartridge and extractor close home. When the block reaches its closed position its action as a sliding wedge has forced the cartridge entirely home and its front face bears firmly against the base of the cartridge. When the block is completely closed the crank has passed the vertical position and rests against the body of the gun, so that the block is held secure in three ways; its own weight pressing on the crank past the center,

by the reaction of the crank and crank handle in firing and by the crank-handle latch.

(*d*) *Ready—Firing.*—When the breech is closed the cocking cam is in the up position and allows the cocking toe, and with it the hammer, to act in firing. The firing arm also rests against the sear. On pulling the trigger, the firing arm presses down upon the sear, releases it from the cock notch, and the hammer, carrying the firing pin, flies forward, striking the cap of the cartridge.

(*e*) *Note.*—Care should be taken to see that the crank is properly forward before firing, otherwise the force of the mainspring is partially expended in bringing the crank handle into the correct position, thus tending to cause misfire.

(*f*) *Safety.*—It is impossible to fire the gun before the breech is entirely closed, for three reasons, viz, the firing pin is not in line with the cap; the firing arm will not act on the sear; the cocking toe will catch on the cocking cam before the firing pin can touch the cap. It is impossible to bring a shock on the cap in closing the breech, as the face of the breechblock slides along the base of the cartridge, thus giving perfect security in loading and unloading.

DRILL HOOK.

(*g*) The drill hook, Plate III, is designed to lengthen the stirrup, thereby lessening the effect of the mainspring and relieving the mechanism from strain when snapping the gun at drill. When the gun is made ready for action, remove the drill hook and hook the lower branch of the spring to the stirrup, otherwise a misfire may occur.

5. DISMOUNTING AND ASSEMBLING BREECH MECHANISM.

(See Plate III.)

TO DISMOUNT.

The following instructions will be observed in dismounting and assembling breech fittings:

(*a*) *Breechblock.*—The breech being closed, partially unscrew the block-stop screw by backing it about four turns. Start the crank handle back and ease the block down out of its guides, care being taken to support the block as it comes out of the breech recess. Parts of the mechanism may be dismantled with the block either in or out of the gun. First uncock the hammer; if the breech is closed and the gun not loaded, this will be done by pulling the trigger; if the breech is open or the block is out of the gun, it will be done by pressing down on the sear.

(*b*) *Main spring and hammer.*—Insert the point of the screw driver, B, Plate IV, in the seat of the bend of the main spring, press down, and slip the stirrup off the end of the spring. Take out the main spring. Turn the stirrup to a horizontal position, so as to unlock the rocking shaft. Pull out the rocking shaft and remove the hammer. Insert the point of the screw driver under the firing pin housing and force up the outer end clear of the groove in the hammer. The housing can then be struck out from one side of the hammer, the firing pin driven out and a new one inserted, if necessary.

(*c*) *Sear.*—With the point of the screw driver back out the sear spring, which is dovetailed in its seat. Take off the sear.

(*d*) *Crank.*—Take out the set screw in the hub of the crank handle and pull the latter off the stem of the crank. Take out the crank.

(*e*) *Extractor.*—Withdraw the extractor from its groove.

TO ASSEMBLE.

(*f*) The mechanism is assembled in the reverse order. To facilitate the assembling of the stirrup and firing hammer, indicating arrows are stamped on them and care must be taken in replacing the stirrup that the indicating arrow on it coincides with that on the lug of the firing hammer. Care should be taken not to bruise or indent the fittings when stripping or assembling, a wooden drift or piece of hard wood being used when found necessary to prevent injury to them. The hammer should be at full cock when inserting the rocking shaft.

6. SPARE PARTS AND ACCESSORIES FOR TWO GUNS.

(See Plate IV.)

IN SPARE PARTS BOX.	Reference letter on Plate IV.
2 rocking shafts	
2 extractors	
2 hammers, firing, complete	
4 firing pins	
4 firing pin housings	
2 sear springs	
4 main springs	
2 retaining springs for firing arm	
1 oil can	A
2 screw drivers	B
2 hand extractors	C
2 tommies	D
2 wrenches, screw driver, for sights (D)	E
2 sets of packing glands	
3 cloths for cleaning lens	
2 brushes, sponge	E

CARRIED, BUT NOT IN BOX.

2 sponge rods	G
1 cleaning brush	H

7. CARE OF GUN.

(*a*) After firing, the bore of the gun should be cleaned to remove the residue of powder and then oiled. In cleaning, wash the bore with a solution made by dissolving one-half pound of sal soda in 1 gallon of boiling water. After washing with soda solution, wipe perfectly dry and then oil the bore with a thin coating of light slushing oil, furnished for this purpose. A brush is used to apply the oil.

(*b*) The breech and firing mechanisms should be dismounted from time to time and cleaned and oiled. Kerosene is used for cleaning purposes only, and may be applied with a rag or wad of cotton waste. Engine oil No. 1 is provided for oiling and in general for lubricating all bearings not provided with compression grease cups.

(*c*) The spare parts should be well coated with vaseline or heavy oil and each piece then wrapped in paper to prevent the oil from being rubbed off.

(*d*) *Jammed cartridge.*—If, in loading, a cartridge jams and so prevents the easy closing of the breech, never attempt to drive it home by forcing the breechblock; unload at once, put the cartridge aside, and try another.

(*e*) *Nonextraction.*—If for any reason the cartridge case or cartridge will not extract, catch the base with the hand extractor and pull it out.

(*f*) *Broken extractor.*—If the hook of the extractor breaks, back the block-stop screw clear of the breechblock (four turns), lower the breechblock until the extractor slot is clear, pull out the extractor and insert the spare one. Do not insert the spare extractor with a cartridge already in the gun, as the hook will come on the wrong side of the cartridge base.

(*g*) *Misfires—Hangfires.*—"Misfires" and "hangfires" are of rare occurrence with our ammunition. In case of the failure of a cartridge to fire, the breech should not be opened until after the expiration of at least one minute. The gun may be immediately recocked, however, without opening the breech and the cartridge tried again. Defective cartridges and primers should be reported.

(*h*) *Chamber disfigured.*—If, after firing, the cartridge case sticks after partial extraction, feel for a burr about the edge of the chamber; careless loading may cause the hard point of the shell to knock up a burr just sufficient to clinch the case on firing. If such exists, it must be filed off smooth.

8. MOUNTING FOR THE Q. F. HOTCHKISS 6-POUNDER, 6-HUNDREDWEIGHT, MARK II GUN.

(See Plates V, VI, VII, and VIII.)

(*a*) The mounting is designed for platforms that are of too light a structure to resist the stresses obtained with nohrecoil mounting. The gun is arranged to be traversed and fired directly from the shoulder piece. At all angles of elevation and depression the axis of the bore and the recoil cylinder are in the same plane, so that all destructive shocks on mounting and platform are absorbed by the hydraulic recoil mechanism.

(*b*) The principal parts of the mounting are:

Pivot plate.
Clip ring.
Revolving bracket.
Cradle.
Hydraulic recoil mechanism.
Counter-recoil mechanism.
Shoulder piece.
Firing gear.
Shields.
Sighting gear.

PIVOT PLATE.

(*c*) The pivot plate is a hollow steel stamping closed on top, which supports the moving parts of the mounting. A circular recess in the upper surface receives the pivot. A projecting flange is provided to which the clip ring is attached. The lower flange is provided with the necessary holes for holding down bolts.

CLIP RING.

(*d*) The clip ring is a bronze flange ring which holds the pivot plate and the revolving bracket together, while permitting the latter to rotate in traversing. A bracket is cast on the clip ring, the sides of which form the traversing stops; a square pin is carried by this bracket to secure the mounting in its housing position.

REVOLVING BRACKET.

(*e*) The revolving bracket is a fork-shaped steel casting, with bearings for the cradle trunnions. It is tapped in the center to receive the pivot which supports the whole system. The pivot can be adjusted without dismounting the cradle.

CRADLE.

(*f*) The cradle is a gun-metal casting having four openings, viz:

A large central opening fitted with a featherway, top and bottom, to receive feathers on the gun; a top opening which forms the hydraulic recoil cylinder; and two openings on the underside to receive the recuperator springs.

At its front end is a circular flange to which is bolted a bracket carrying the inner shield.

Trunnions are cast on the cradle to fit the trunnion bearings on the revolving bracket in which they are held by caps secured by spring pins.

The left side of the cradle is prepared for the attachment of the sighting gear and shoulder piece.

HYDRAULIC RECOIL MECHANISM.

(*g*) The hydraulic recoil cylinder is formed in the metal of the cradle itself. Its front end is closed by a gun-metal plug which is screwed into the cylinder against a leather washer to make a tight joint. On the inner face of the plug a chamber is formed to receive a projection on the front face of the piston. Internally the cylinder has five tapered grooves for the flow of oil from one side of the piston to the other on recoil and counter-recoil. Working in the cylinder is a steel piston and rod, the latter being connected to a lug on top of the recoil band of the gun by a nut and pin. A tapered projection is formed on the front face of the piston which fits the recess in the front plug and serves to control the return of the gun to firing position. The rear end of the cylinder is closed by a stuffing box with leather washer, packing, and gland. A filling hole is provided on the top of the rear end of the cylinder and is closed by a steel plug and leather washer.

(*h*) For filling of recoil cylinder, see page 19.

COUNTER-RECOIL MECHANISM.

(*i*) The counter-recoil mechanism consists of two strong spiral springs held in initial compression between front steel heads and rear end plates on counter-recoil rods. The steel heads fit over the rods and bear against hexagons, while the rear end plates are held by nuts screwed and pinned to the rear ends of the rods. The springs thus assembled, each on its rod, are contained in separate cylinders cast in the cradle (Plate VI) and are nutted up to the counter-recoil lug on the underside of the recoil band. The rear end of each cylinder is closed by a steel plug screwed in. Each plug has a central opening for the rod to pass through.

(*j*) *Action of recoil and counter-recoil mechanism.*—On firing, the gun recoils axially through the cradle, taking with it the piston rod and the counter-recoil spring rods. The oil in the recoil cylinder passes from rear to front of the piston through the grooves, thus setting up a hydraulic resistance which absorbs the recoil energy, while the shape of the grooves equalizes the pressure throughout.

(*k*) As the counter-recoil rods are drawn back the springs are compressed against the cylinder-closing plugs, and when recoil has ceased they expand and return the gun into the firing position.

(*l*) During the last movement of counter-recoil, the projection on the recoil piston reenters its recess in the closing plug, and in displacing the oil gathered there acts as a hydraulic cushion to prevent the gun returning to the firing position with violence.

SHOULDER PIECE.

(*m*) The shoulder piece is fitted to the rear end of an arm which is attached to the left-hand side and to the rear of the cradle and also to the left-hand side cradle trunnion.

(*n*) The shoulder piece is a steel bar fitted with a rubber pad and provided with a hinge. When in use it is held in position by a gun-metal sleeve, which is prevented from slipping back by means of a light steel spiral spring. When not in use this sleeve is pushed back and thus allows the end of the shoulder piece to hang down. Attached to the arm is a steel guard plate to protect the gunner from the recoiling gun.

9. FIRING GEAR.

(See Plate VII.)

(*a*) The gun is fired by means of a trigger carried in a pistol grip, which is cast on the underside of the shoulder-piece arm. On the end of a pin which carries the trigger a lever is secured; this lever actuates another lever secured to a pin supported by a bracket which forms part of the shoulder-piece arm casting; on the other end of this pin a lever is fixed, which in turn actuates the firing gear on the gun when the trigger is pulled.

SHIELDS.

(*b*) A bullet-proof outer shield is fitted to the mounting. It is supported by stays fixed to the revolving bracket and traverses with the mounting. An inner shield is fixed to the cradle to prevent bullets entering through the gun port in the outer shield.

TRAVERSING AND HOUSING STOPS.

(*c*) Two stops are provided to limit the arc of traverse. A square hole is cut in one of the stops to suit the square pin carried in the bracket on the clip ring and this forms a housing stop. The stops are secured to the bottom flange of the pivot plate by four of the holding-down bolts, which have countersunk heads.

(*d*) To avoid any possibility of the guns firing into the machine on which they are placed, tests should be made to insure that the traversing stops are correctly adjusted on each side of machine, so that when the guns are at extreme traverse no projection on the machine is within 1½ calibers of the axis of the projectile, i. e., 3¾ inches at any time during its flight. This should be done on the first occasion when the alignment tests are being made.

10. SIGHTING GEAR.

(See Plate VIII.)

(*a*) A telescopic sight is fitted to the left-hand side of the mounting. The telescope is of the power of two, 32 inches long, with 20° field of vision and with sight adjustment. The telescope is carried in two holders. The one at the front is supported by a bracket secured to the flange on the front end of the cradle and provided with the necessary fittings to allow for elevation and deflection of the telescope.

(*b*) The rear holder is supported on a deflection screw which in turn is carried by a rack and pinion. The bracket supporting these is carried on facing provided at the rear of the cradle. Open sights are fitted to the covers of the telescope holders, an acorn for the fore and a V for the rear. As the telescopes are not interchangeable, provision is made for the necessary alignments. Near the center of the telescope a clip with a roller attached is fixed. This engages a forked bracket secured to the left-hand trunnion cap of the revolving bracket and keeps the telescope at approximately the same distance from the sight port at all angles of elevation or depression.

11. TESTING AND ADJUSTING SIGHTS.

(*a*) There are two methods of adjusting the sights of this gun:

1. Chart method: Use of a printed chart that is furnished to the gunners.

2. Service method: Lining up the sights on some well-defined point at least 1,000 yards from the gun.

CHART METHOD.

(*b*) Place the crossed strings on wires on the muzzle of the gun and an empty round with the cap removed in the chamber. Set up the chart about 25 yards from the gun on some convenient pole, wall, side of house, etc. Align the bore of the gun on the bottom right-hand chart (see Plate IX) and firmly secure both clamps of the gun. With the range drum and deflection scale at zero, ascertain the error, if any, of the telescope, sighting on the lower of the two targets in the upper left-hand corner of the chart (usually marked C. L. of T., center line of telescope). If the telescope is out of line, the two bolts holding the rear tangent sight bracket must be slackened slightly and the entire bracket moved to the right or left as required. If there is not room for enough correction, a new zero point must be marked on the deflection scale, or the gunner must remember the zero of his scale. If there is an error in elevation, lay the telescope on the target by moving the range drum. Then to make the range drum read zero the three screws which hold the scale on the drum must be *slackened*, *not removed*, and the scale adjusted until the zero is in the correct position and the three screws then tightened. Never remove these screws. When this is finished check the alignment of the bore again to see that the gun has not been moved.

(*c*) The open sights are now tested on the extreme upper left-hand target. If out of line, the rear V-notch sight may be moved in the desired direction to right or left, and if out of elevation the front acorn sight may be screwed up or down until corrected.

(*d*) *Note.*—The bore should be occasionally checked to see that the gun has maintained its correct alignment.

SERVICE METHOD.

(*e*) Prepare the gun as before, and then align the bore, the telescope, and the open sights on some well-defined object about 1,000 yards from the gun position. Make the adjustments, if necessary, as with the chart method, using a 6 o'clock aim with both sights and bore.

(*f*) *Note.*—With the chart method, the axis of the bore and the line of sights are parallel, but with the service method these lines converge at the object chosen.

12. CARE AND PRESERVATION OF MOUNTING.

(*a*) *Hydraulic recoil cylinder.*—Before firing, it must be seen that the recoil cylinder is full, piston rod correctly nutted up to gun lug, and that there is no leakage at the front plug, stuffing box, or gland.

(*b*) *To fill the recoil cylinder.*—Fully depress the gun, remove the filling plug from the cylinder, and pour in oil until the cylinder is full. Replace filling-hole plug. Quantity of cylinder oil required is 1 pint.

(*c*) *To empty the recoil cylinder.*—Depress the gun. Unscrew and remove front closing plug and run the oil off into a suitable receptacle.

(*d*) *Leakage of gland.*—Should it be found that there is leakage at the recoil cylinder gland the latter should be tightened, but if this does not stop the leak the packing must be renewed. It must, however, be remembered that the gland should not be too tight or the gun may fail to return correctly.

(*e*) If it is found that leakage is taking place over the leather washer of front plug, or stuffing box, the fitting must be removed and a new washer placed in position.

(*f*) *Counter-recoil springs.*—The counter-recoil rods must be firmly nutted up to the gun lug. The springs must be frequently examined and any spring which is found broken or with a permanent set must be exchanged.

(*g*) The whole of the working parts must be kept thoroughly clean and well lubricated.

List of lubricators on mounting.

Fitting.	Number of lubricators.	Position.
Cradle	1	Right rear end.
Do	1	Top front end.
Do	1	Oil screw, left rear end.
Trunnion bearings	1	Oil screw, right hand.
Do	1	Oil screw, left hand.
Firing gear	2	Lever bearings.
Elevating and traversing clamps	2	1 on each clamp.
Pivot	1	Through center of pivot bolt.

13. INSTRUCTIONS FOR ASSEMBLING THE GUN AND MOUNTING.

(*a*) Place clamp screw brushes in revolving bracket and secure with grub screws. Place revolving bracket on base plate.

(*b*) Place clip ring in position, see that keys on bracket take keyways in ring, then secure with two bolts.

(*c*) Screw in adjustable pivot and adjust so that revolving bracket revolves freely, then secure by keeper screw.

(*d*) Assemble cradle. Screw stuffing box into rear end of recoil cylinder, see that leather washer is in place, pass piston rod through cylinder and stuffing box. Pack stuffing box and set up gland. Screw plug into front end of cylinder. See that leather washer is in place.

(*e*) Screw plugs into rear end of spring cylinders, place spring end-plate on end of spring, place heads on counter-recoil spring rods, pass rod through spring and end-plate. Place these in spring cylinder, the screwed end of rod passing through plug. Screw nut on rod and compress spring until the nut comes up against shoulder on rod.

(*f*) Place cradle in revolving bracket bearings, fit trunnion caps and spring pins.

(*g*) Place shoulder piece with guard and firing gear assembled and secure to trunnion by bolt. Place clamping arc and secure with shoulder piece by bolt.

(*h*) Place elevating clamp screw with handle downward.

(*i*) Place traversing clamp screw with handle upward.

(*j*) Place inner shield and secure with bolts; see that bracket for foresight holder is in position.

(*k*) Place circular shield and secure with bolts to revolving bracket.

(*l*) Place gun and secure to piston rod and counter-recoil springs.

(*m*) Place gun at extreme depression, fill recoil cylinder, and insert filling plug with leather washer in position.

(*n*) Adjust firing gear.

(*o*) Place sight brackets and secure with bolts.

14. TO STRIP 6-POUNDER GUN IN MOUNTING.

(*a*) Remove breechblock.

(*b*) Remove clip ring. (This must be done, as otherwise the piece can not be traversed sufficiently to enable its removal through sponson door when mounted in tank.)

(*c*) Remove nut from piston rod and nuts on counter-recoil rods.

(*d*) Elevate gun and run piece out of cradle to the rear. (When gun is mounted in tank, the piece must be removed through sponson door.)

(*e*) Swing revolving bracket till circular shield is entirely inside sponson. Then remove circular shield to inside tank.

(*f*) Remove trunnion caps and elevating clamp, then lift cradle out from outside sponson by means of a piece of wood placed through it. Strip cradle, small arc shield, recoil cylinder, and spring cylinders.

(*g*) Remove revolving bracket and strip traversing clamp and adjustable pivot bolt.

The gun is now stripped to base plate.

15. STOWAGE FOR TRANSPORT.

(See Plate X.)

(*a*) The sponsons in which the guns are fitted have to be stowed inside the tank for transport purposes.

(*b*) To enable this to be done, the gun has to be drawn back from its firing position in the mounting. This is effected as follows:

(*c*) The guard should be detached by removing the securing bolts. The gun should be slightly elevated and the piston-rod nut and counter-recoil-rod nuts removed. The bracket "A" should have its fore-end drawn over the plug for recoil cylinder. The gun should then be withdrawn by hand until the rear end of the piston ring brings up against the back flange of the bracket "A." These should then be secured together by a bolt as shown and the gun elevated to its maximum elevation and secured in this position by the clamp bolt on the clamping arc.

(*d*) By alternately traversing the gun and moving the sponson it will be found that the whole can be satisfactorily stowed into the tank.

(*e*) When the gun is secured by the bracket "A," it *must not* be depressed, as this will cause it to fall back into the cradle.

(*f*) When the sponson is in the stowing position the housing stop is to be placed in position to fix the mounting.

16. TABLE OF WEIGHTS AND MEASUREMENTS.

Weight of pivot plate	pounds	68
Weight of revolving bracket	do	103
Weight of cradle complete, with piston, rod, counter-recoil springs, etc	pounds	203
Weight of shields (circular and inner)	do	406
Weight of shoulder piece, guard, and firing gear	do	60
Weight of sight without telescope	do	20
Weight of gun with mechanism	do	644
Weight of mounting complete, without gun	do	890
Mean height from base to center line of gun	inches	17.5

17. LIST OF TOOLS.

Wrenches, Q. F., 6-pounder, Mark II:

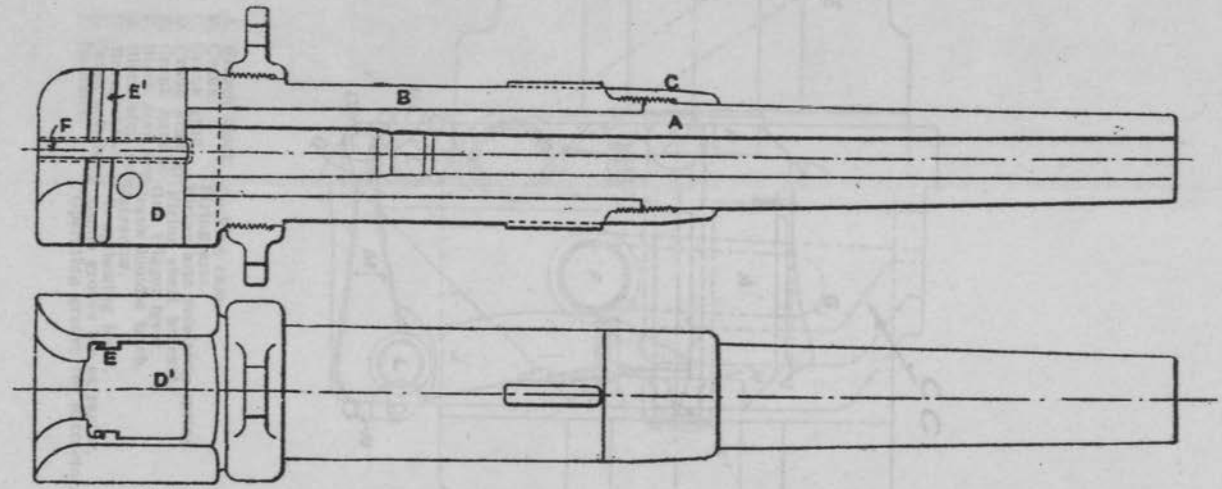
- No. 136—Sighting gear.
- No. 137—Gland piston rod, compression rod, and clip ring.
- No. 138—Cylinder cap and stuffing box.
- No. 139—Compression rod and plate.
- No. 140—Compression rod and shoulder piece.
- No. 141—Guard and firing gear.
- No. 142—Shield stays.
- No. 143—Piston rod and pivot.

Screw drivers, Q. F., 6-pounder, Mark II:

- No. 144—Steel, T-handled.

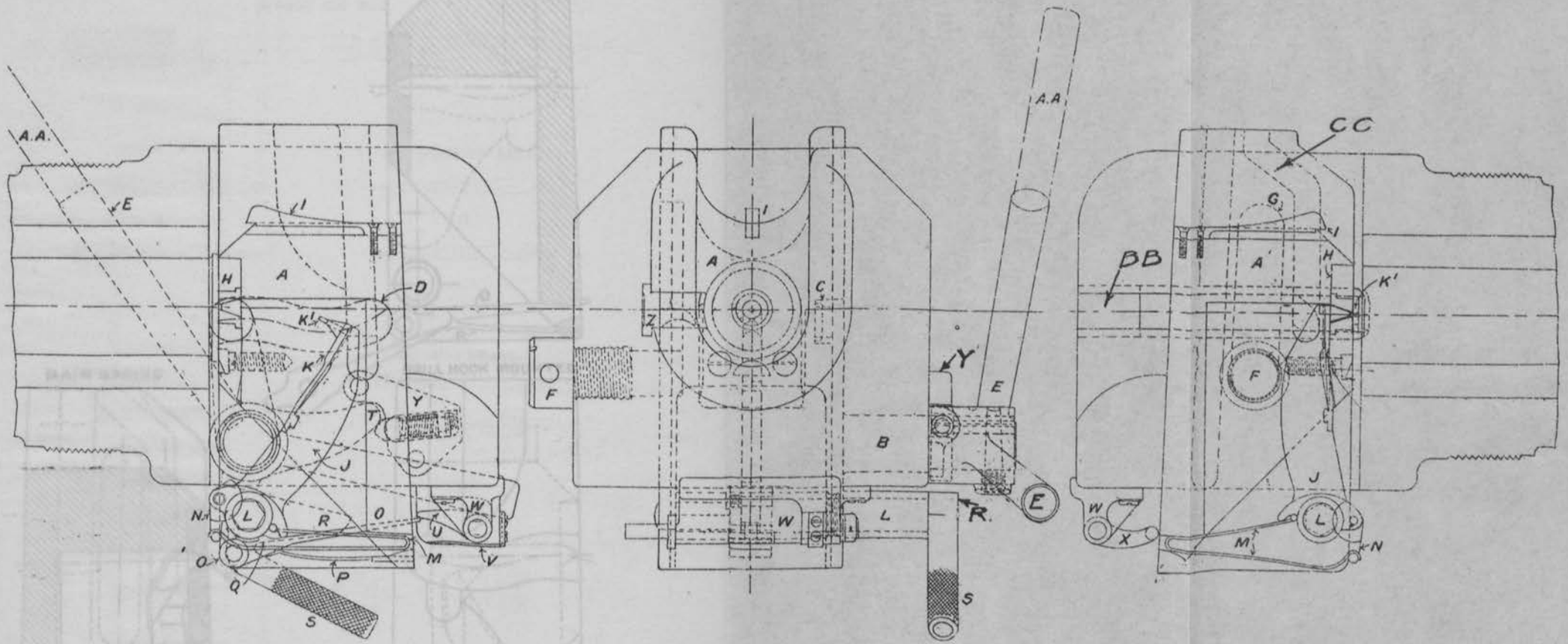
Plate I.

Q. F. Hotchkiss 2.244-Inch, 6-Pounder, 6-Hundredweight, Mark II Gun.



A. Tube.
B. Jacket.
C. Locking ring.
D, D'. Breech recess for block.
E, E'. Guides for breech block.
F. Extractor guides.

Plate II. Q. F. Hotchkiss 2.244-Inch, 6-Pounder, 6-Hundredweight, Mark II Gun (Breech and Mechanism).



A. Breech block.
B. Crank.
C. Crank stud.
D. Crank stud groove.
E. Crank handle.
F. Block stop screw.
G. Block stop screw groove.
H. Breech block plate.
I. Catch retaining cartridge.
J. Hammer.

K. Firing pin housing.
K'. Firing pin.
L. Rocking shaft.
M. Main spring.
N. Hammer stirrup.
O. Sear.
P. Sear spring.
Q. Cock notch.
R. Cocking toe.
S. Recocking handle.

T. Cocking cam.
U. Firing arm.
V. Firing arm retaining spring.
W. Firing shaft bracket.
X. Gun trigger lever.
Y. Crank handle latch.
Z. Extractor.
AA. Lengthening lever.
BB. Guide groove for extractor.
CC. Operating groove for extractor.

Plate III.

Q. F. Hotchkiss 2.244-Inch, 6-Pounder, 6-Hundredweight, Mark II Gun
(To Dismantle Parts of Breech Mechanism).

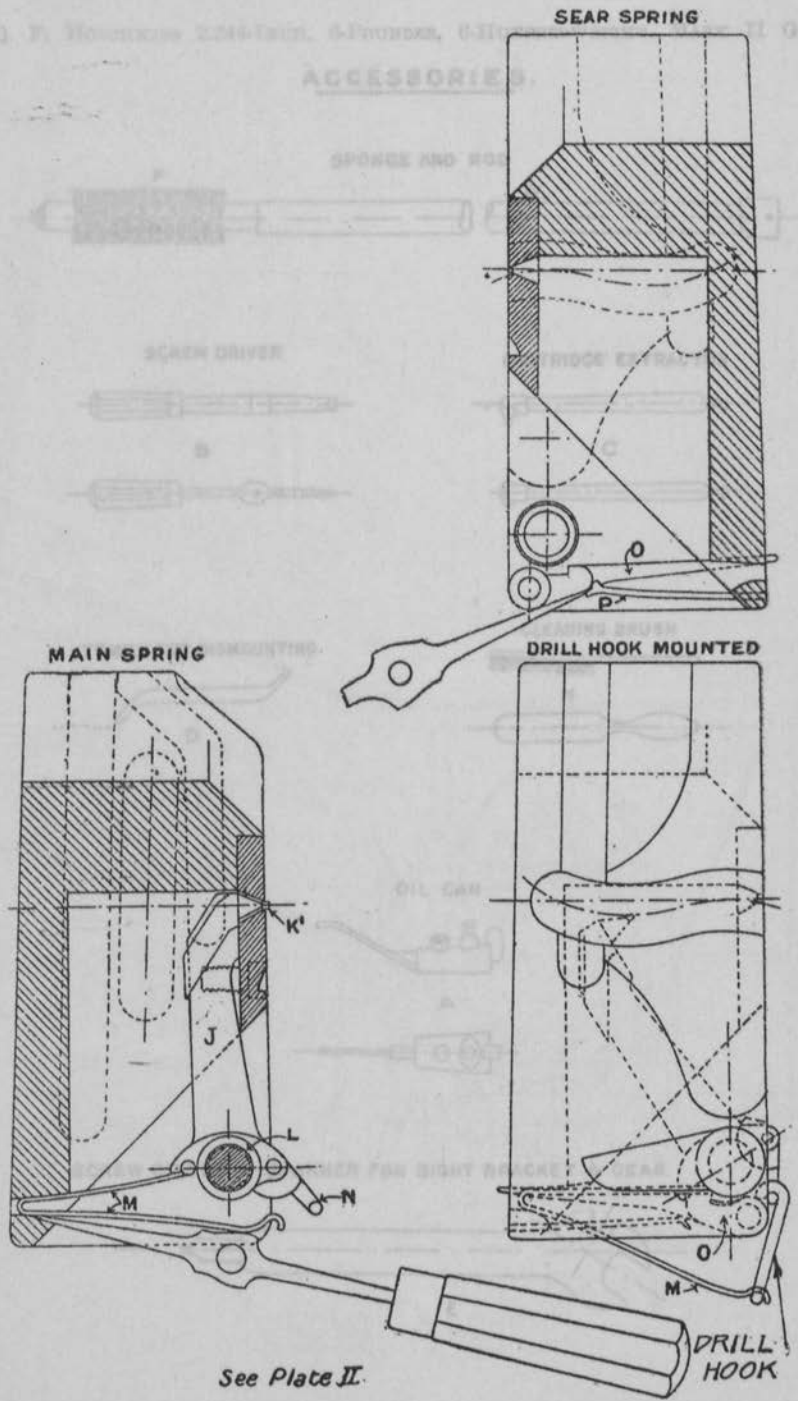
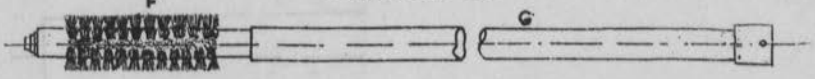


Plate IV.

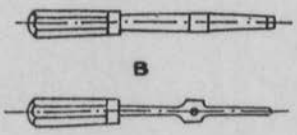
Q. F. Hotchkiss 2.244-Inch, 6-Pounder, 6-Hundredweight, Mark II Gun.

ACCESSORIES.

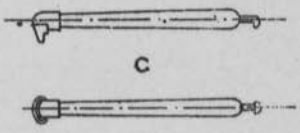
SPONGE AND ROD



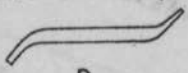
SCREW DRIVER



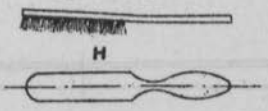
CARTRIDGE EXTRACTOR



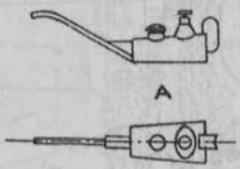
TOMMY FOR DISMOUNTING



CLEANING BRUSH



OIL CAN



SCREW DRIVER & SPANNER FOR SIGHT BRACKET & GEAR.

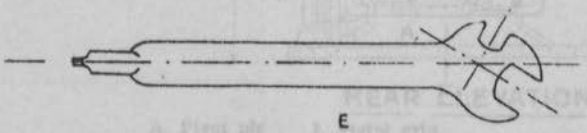
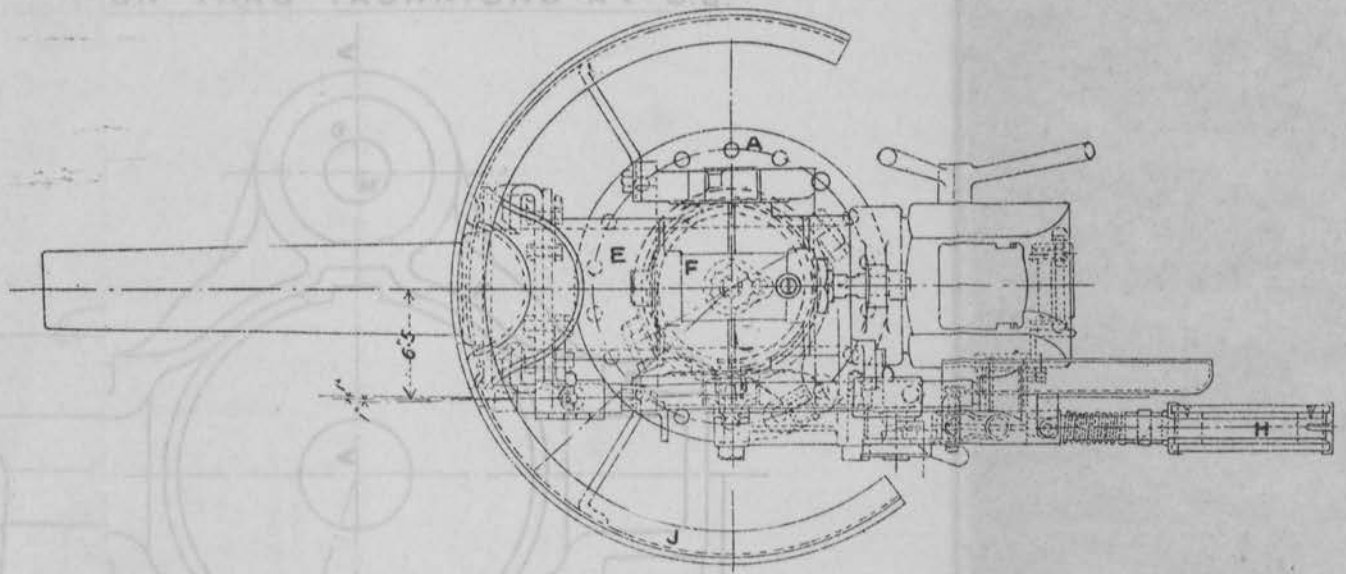
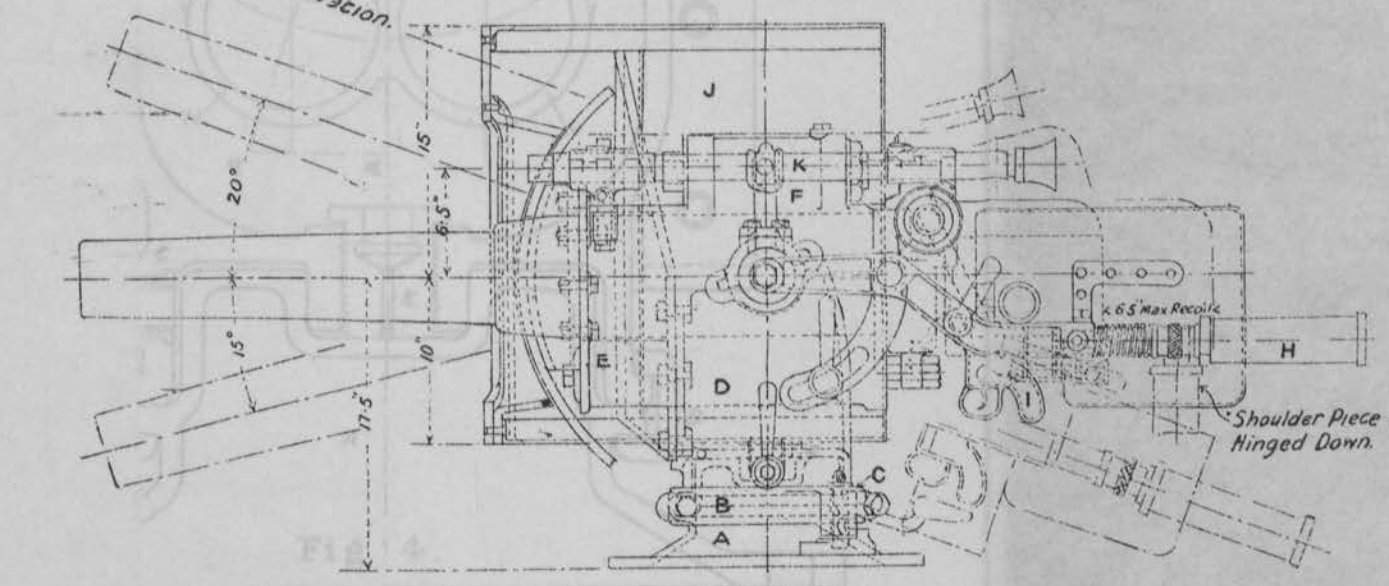


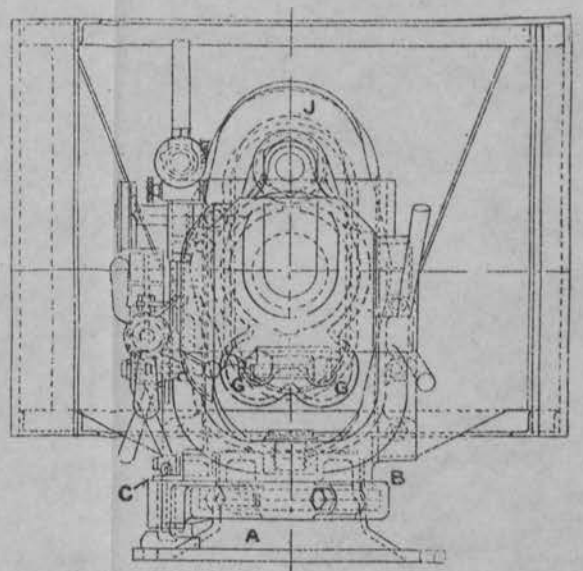
Plate V. TANK MOUNTING FOR Q. F. HOTCHKISS 2.244-INCH, 6-POUNDER, 6-HUNDREDWEIGHT, MARK II GUN (GENERAL ARRANGEMENT).



PLAN



ELEVATION.



REAR ELEVATION.

A. Pivot plate.
B. Clip ring.
C. Housing pin.
D. Revolving bracket.
E. Cradle.
F. Hydraulic recoil cylinder.
G. Counter recoil cylinder.
H. Shoulder piece.
I. Pistol grip.
J. Shield.
K. Sight.

Tank Mounting for Q. F. Hotchkiss 2.244-Inch, 6-Pounder, 6-Hundredweight, Mark II Gun.

SECTION THRO' CYLINDERS

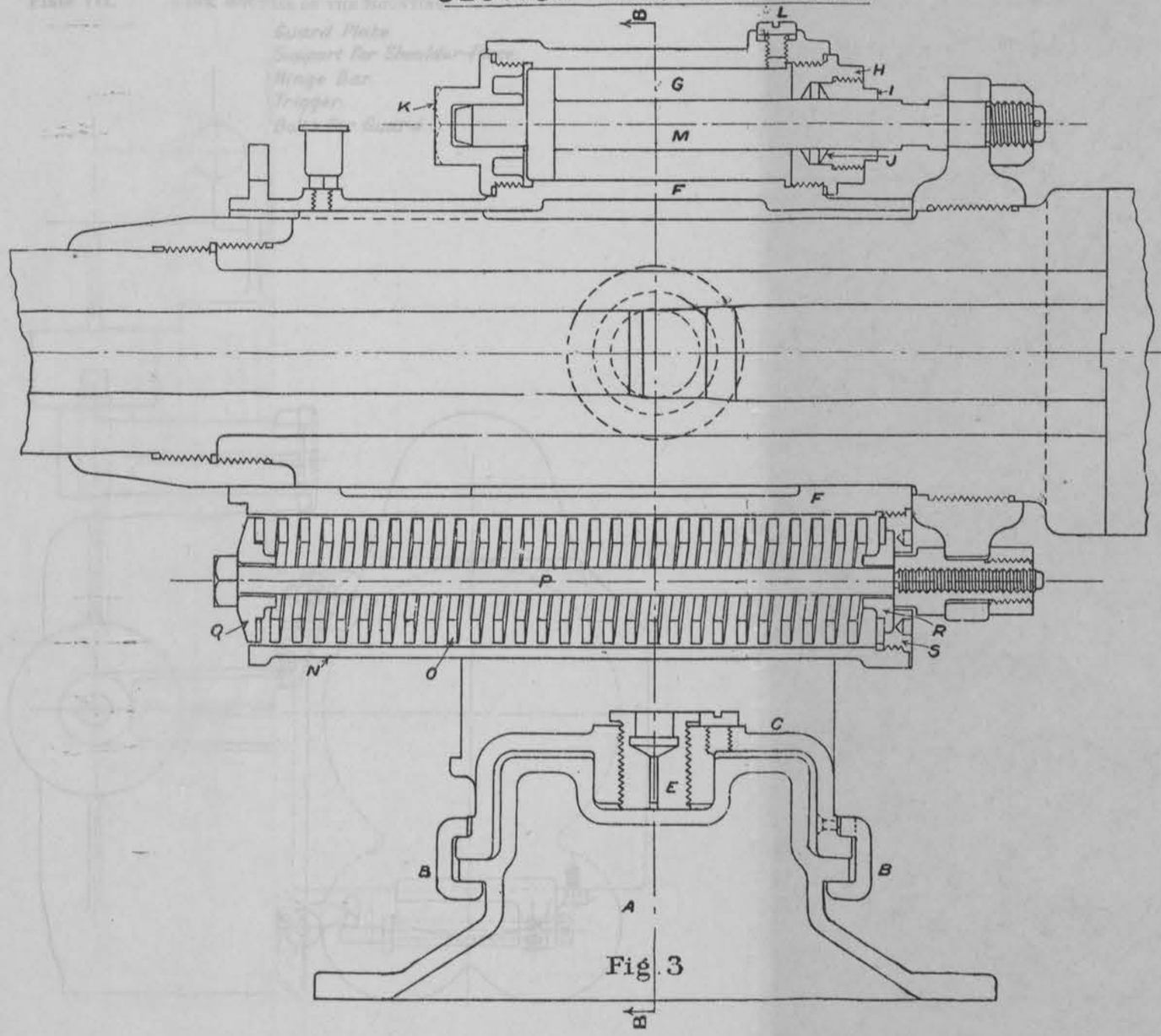


Fig. 3

SECTION THRO TRUNNIONS AT B.B.

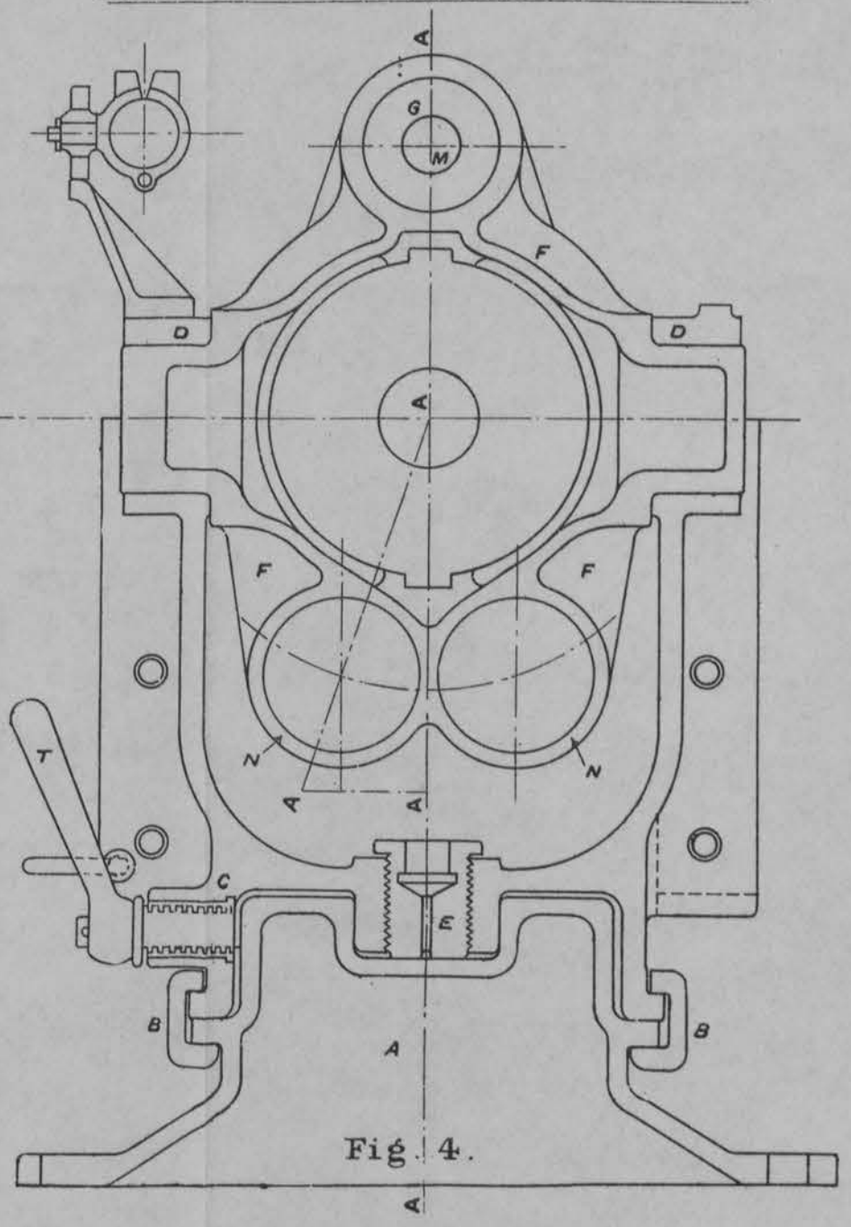


Fig. 4.

SECTION. ON A. A A. A. A.

A. Pivot plate.
B. Clip ring.
C. Revolving bracket.
D. Trunnion bearing caps.
E. Pivot bolt.
F. Cradle.
G. Hydraulic recoil cylinder.
H. Stuffing box.
I. Gland.
J. Packing.
K. Closing plug.
L. Filling plug.
M. Piston rod and piston.
N. Counter recoil cylinders.
O. Counter recoil springs.
P. Counter recoil rod.
Q. Front steel head.
R. Rear-end plate.
S. Steel plug.
T. Clamp.

Plate VII. TANK MOUNTING FOR Q. F. HOTCHKISS 2.244-INCH, 6-POUNDER, 6-HUNDREDWEIGHT, MARK II GUN (ARRANGEMENT OF TRIGGER FIRING GEAR ON THE MOUNTING).

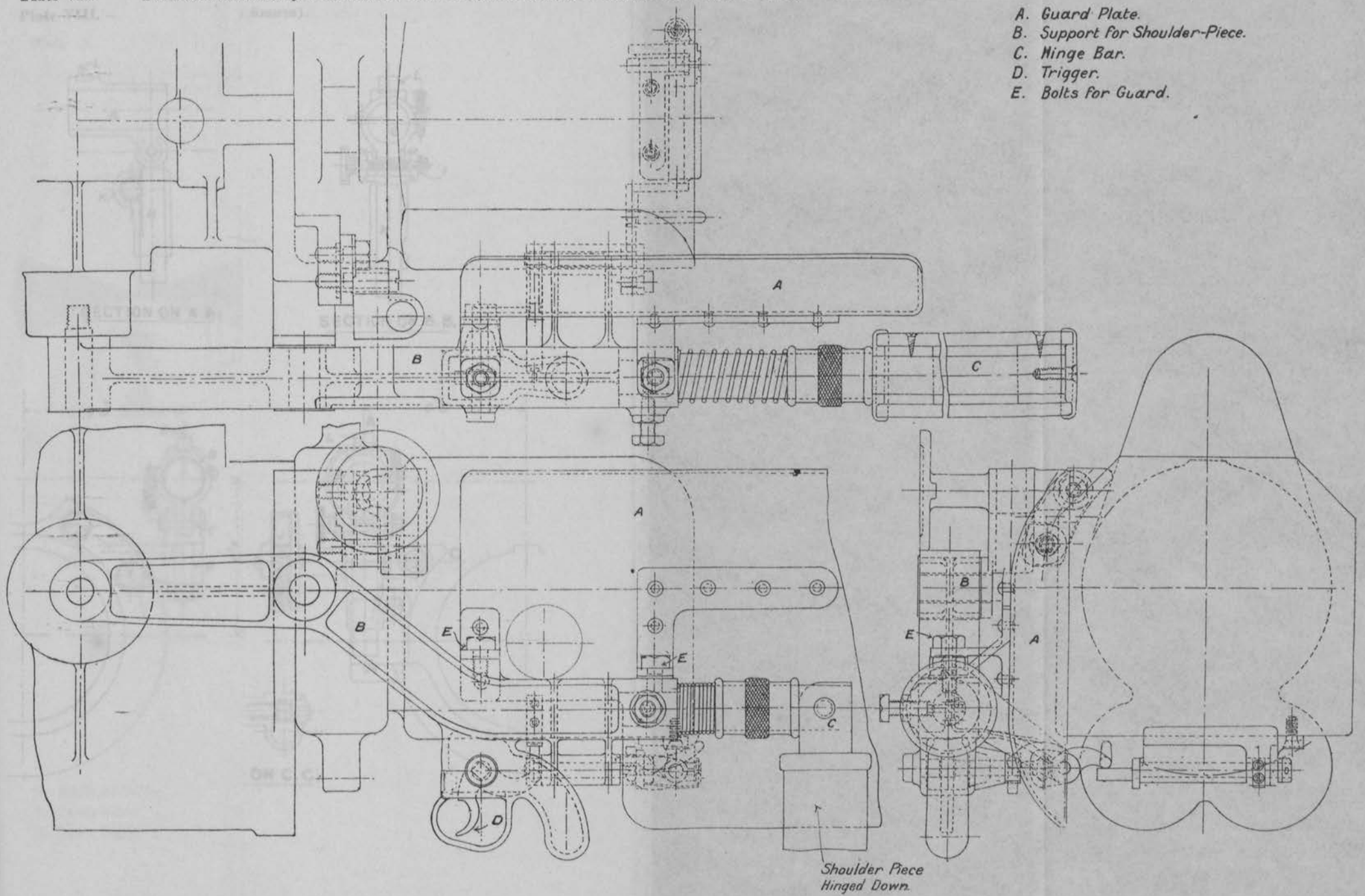
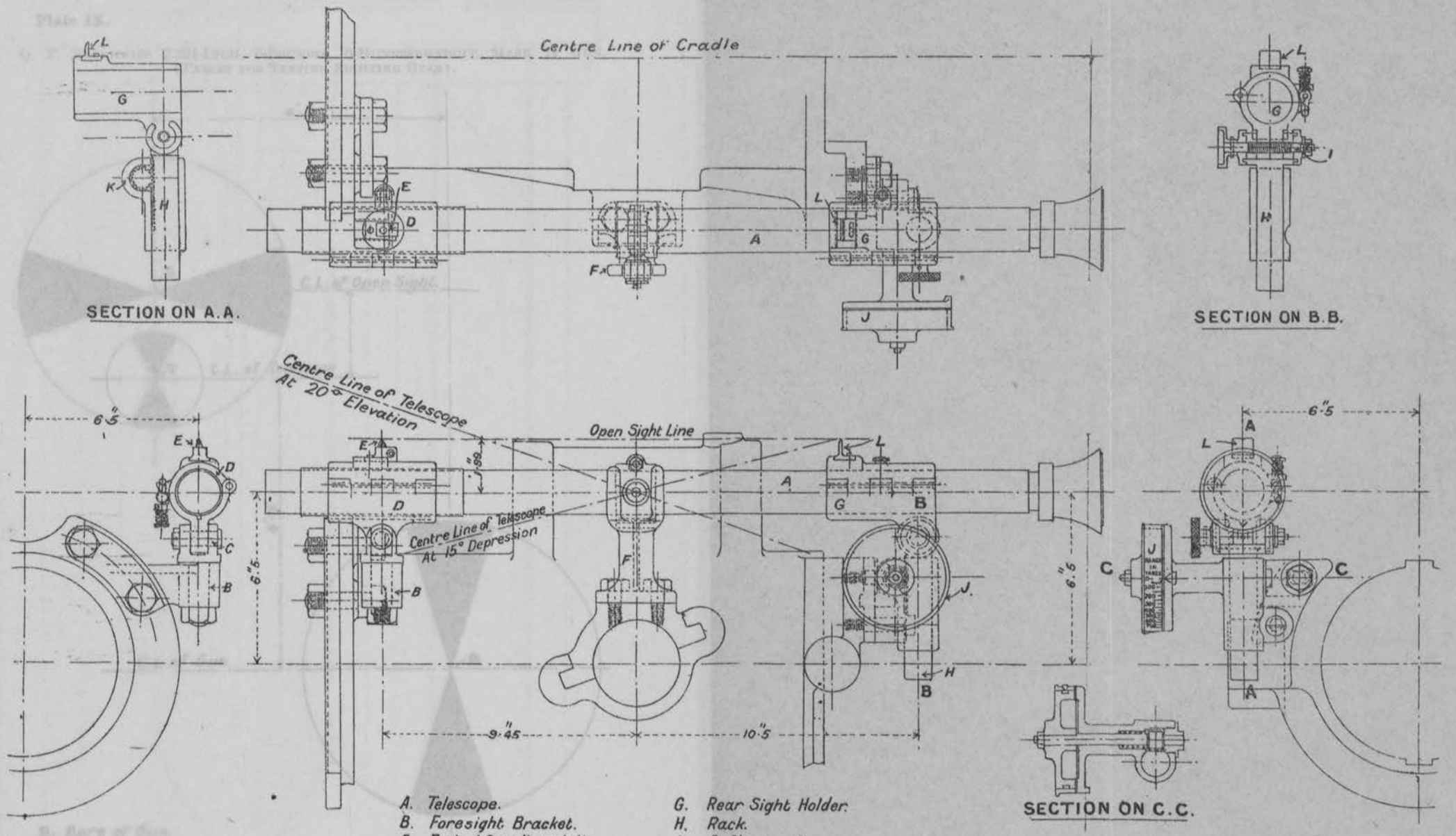


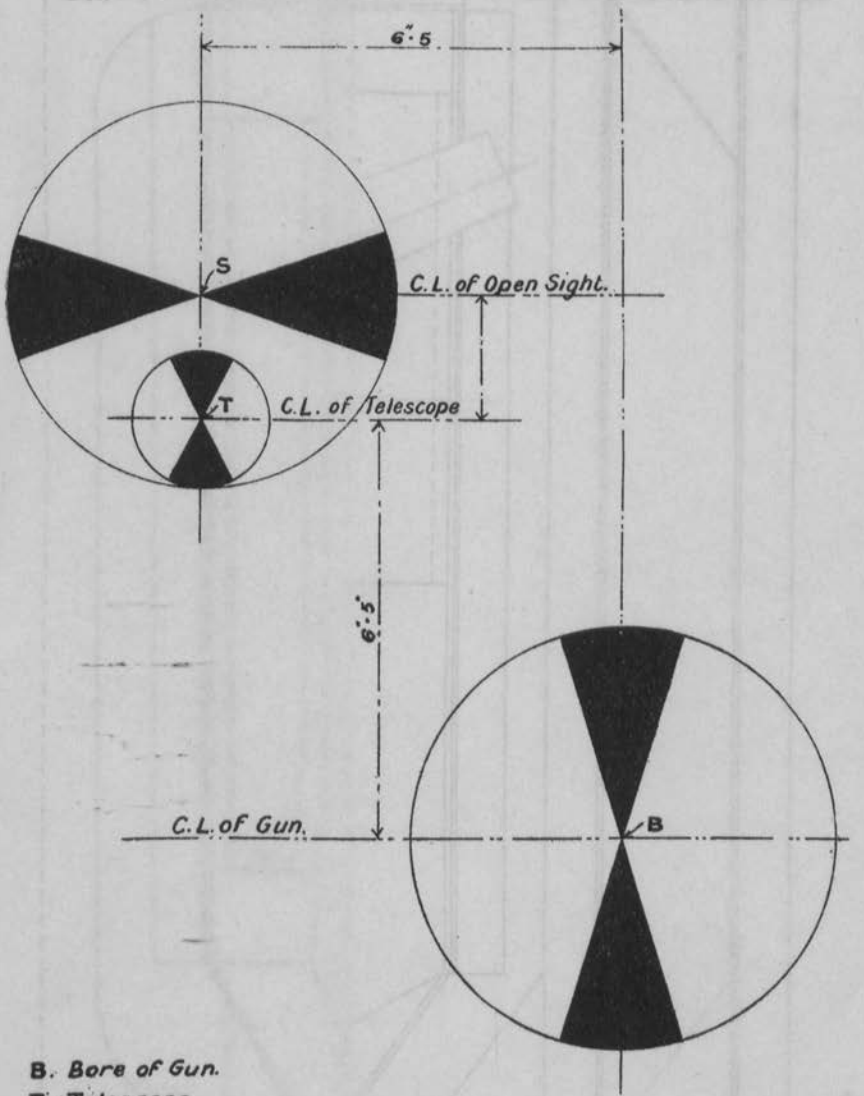
Plate VIII. TANK MOUNTING FOR Q. F. HOTCHKISS 2.244-INCH, 6-POUNDER, 6-HUNDREDWEIGHT, MARK II GUN (ARRANGEMENT OF SIGHTS).



A. Telescope.
B. Foresight Bracket.
C. Forked Spindle with Nut.
D. Front Telescope Holder.
E. Fore open Sight.
F. Centre Bracket.
G. Rear Sight Holder.
H. Rack.
I. Deflection Screw.
J. Range Drum.
K. Rack Pinion.
L. Back Sight.

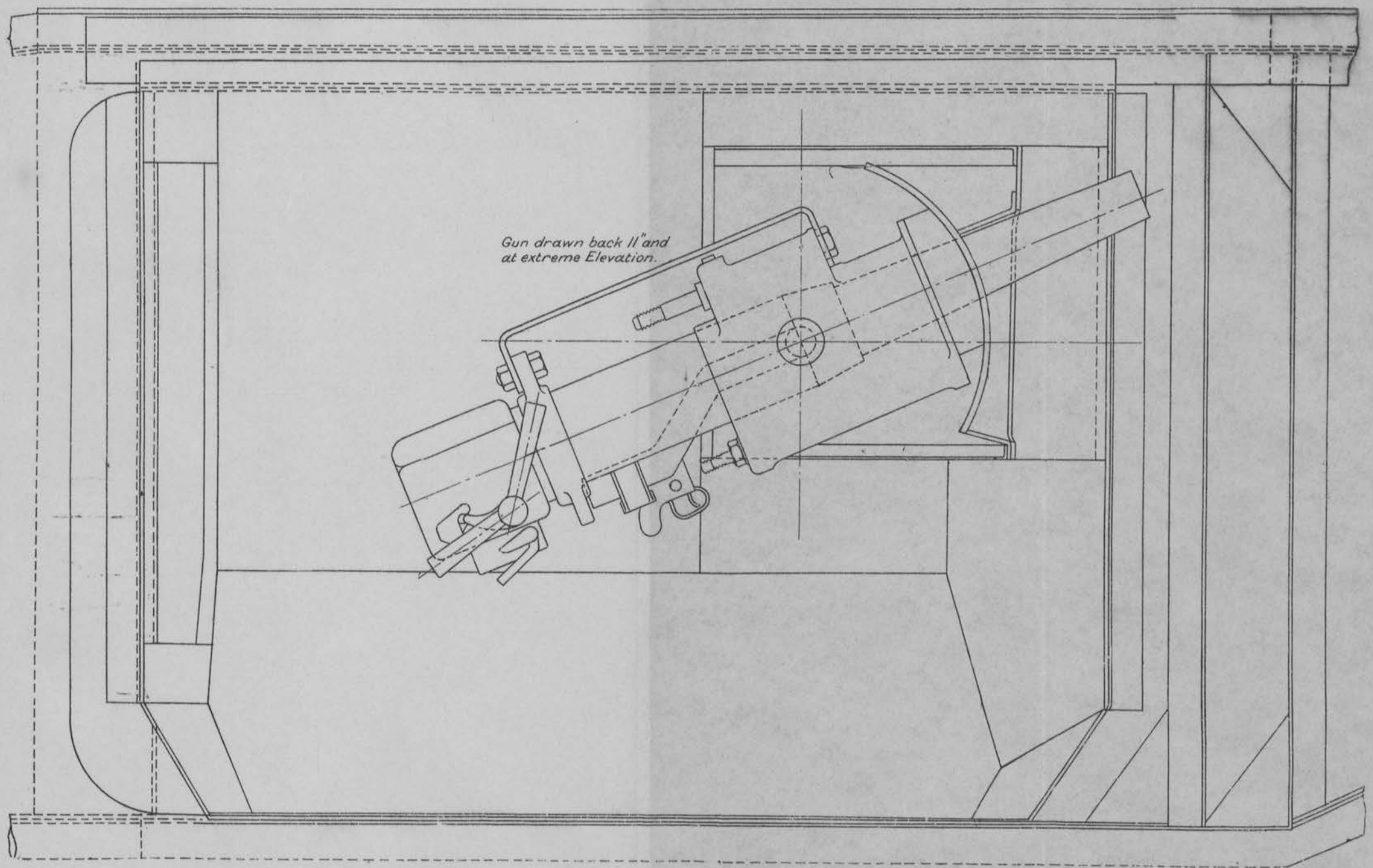
Plate IX.

Q. F. Hotchkiss 2.224-Inch, 6-Pounder, 6-Hundredweight, Mark II Gun.
(Target for Testing Sighting Gear).



B. Bore of Gun.
T. Telescope.
S. Open Sight

Plate X. TANK MOUNTING FOR Q. F. HOTCHKISS 2.244-INCH, 6-POUNDER, 6-HUNDREDWEIGHT, MARK II GUN (ARRANGEMENT OF STOWING FOR TRANSPORT).



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