

(No Model.)

7 Sheets—Sheet 1.

J. VAVASSEUR.
MOUNTING FOR GUNS.

No. 450,829.

Patented Apr. 21, 1891.

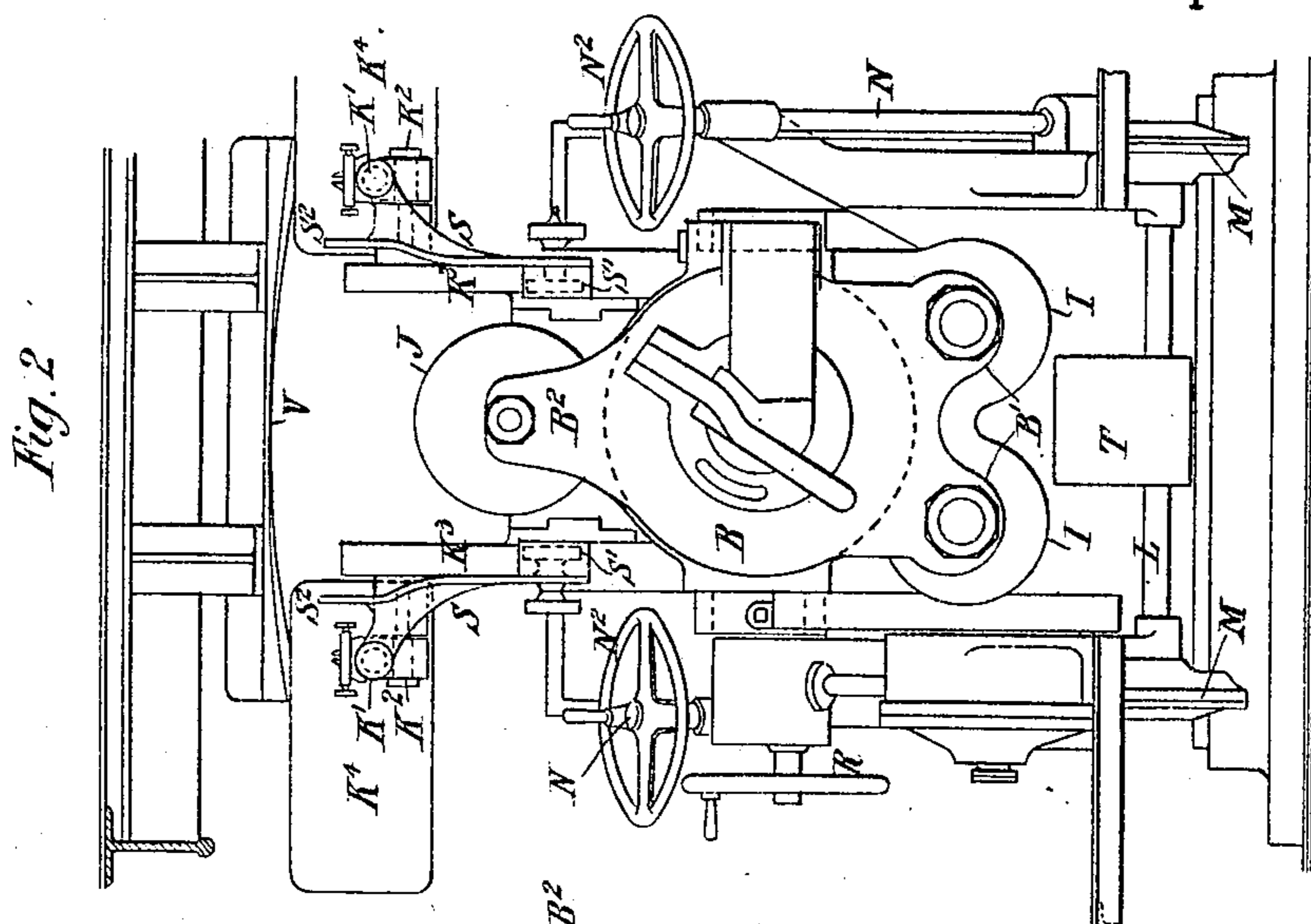


Fig. 2

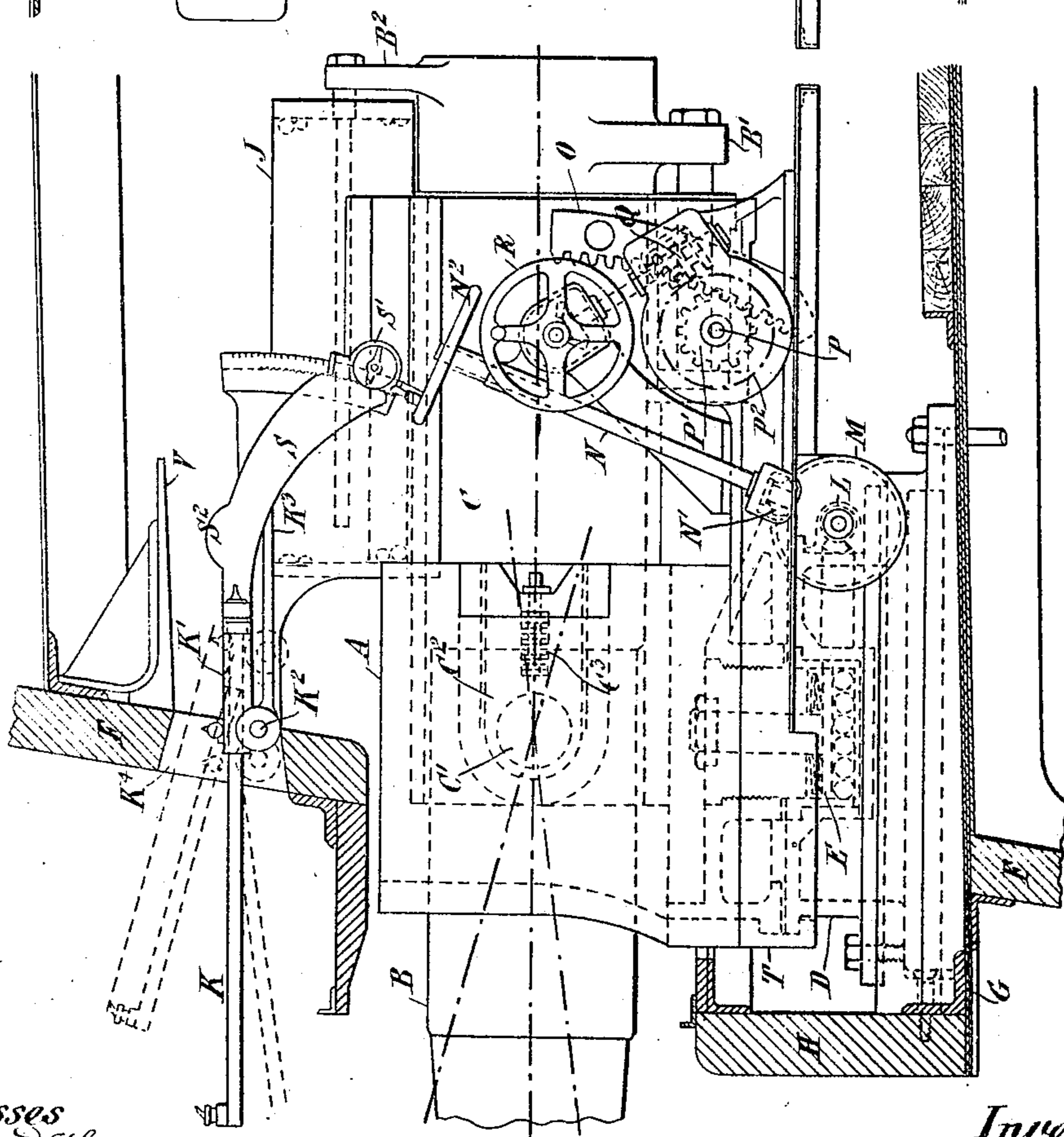


Fig. 1.

Witnesses

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By his Attys.

Baldwin, Davidson & Night

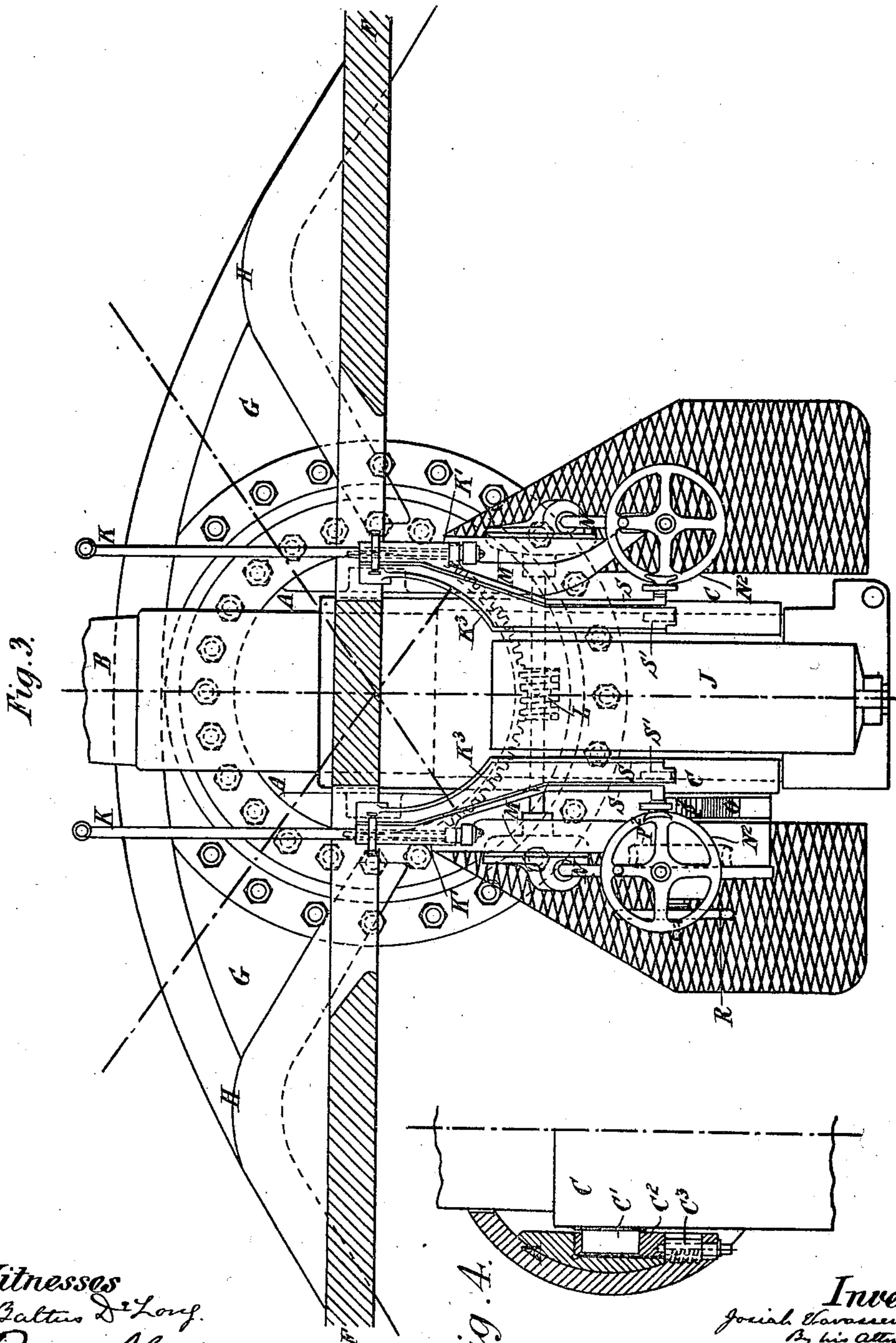
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Fig. 4.

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Fig. 6.

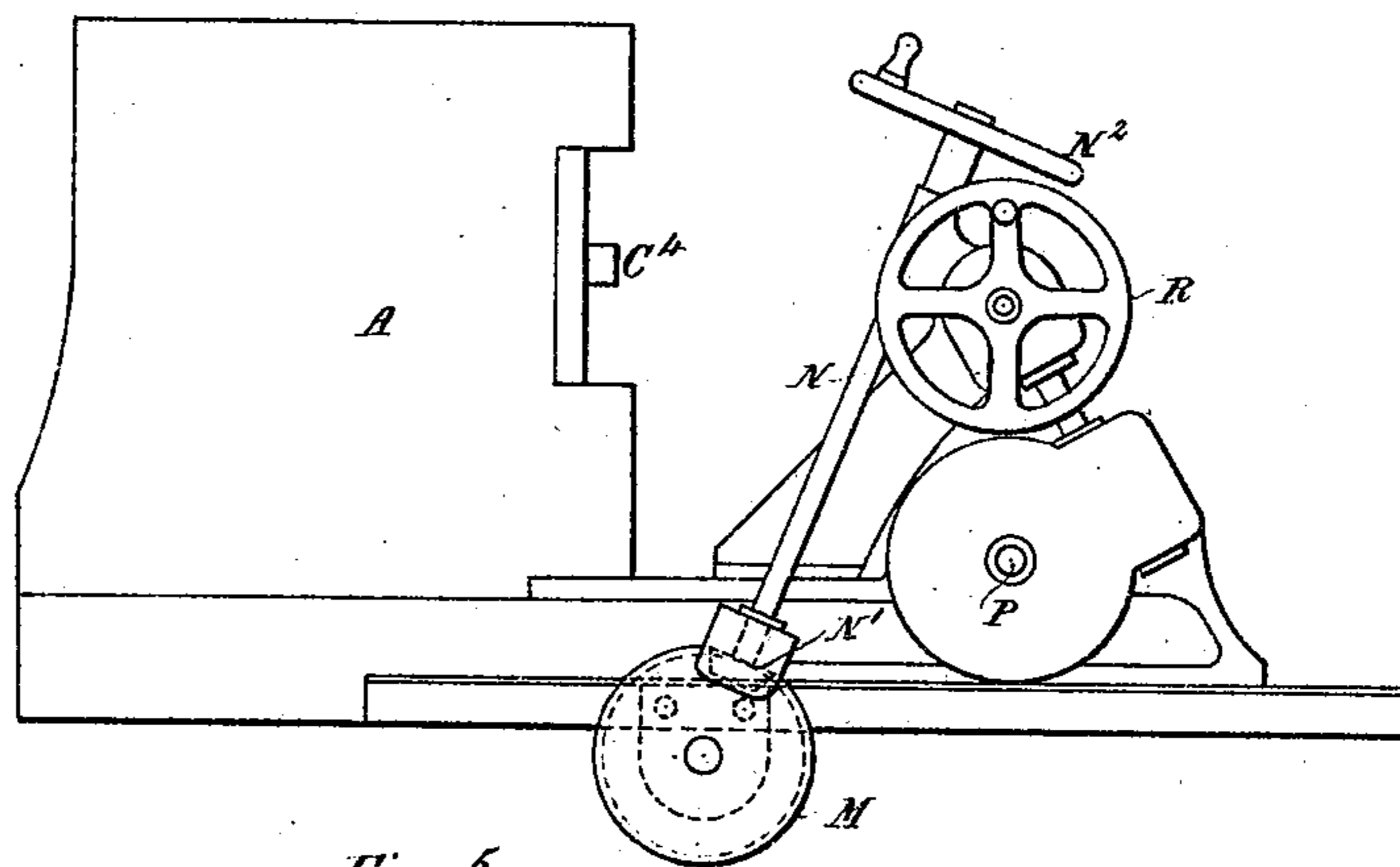
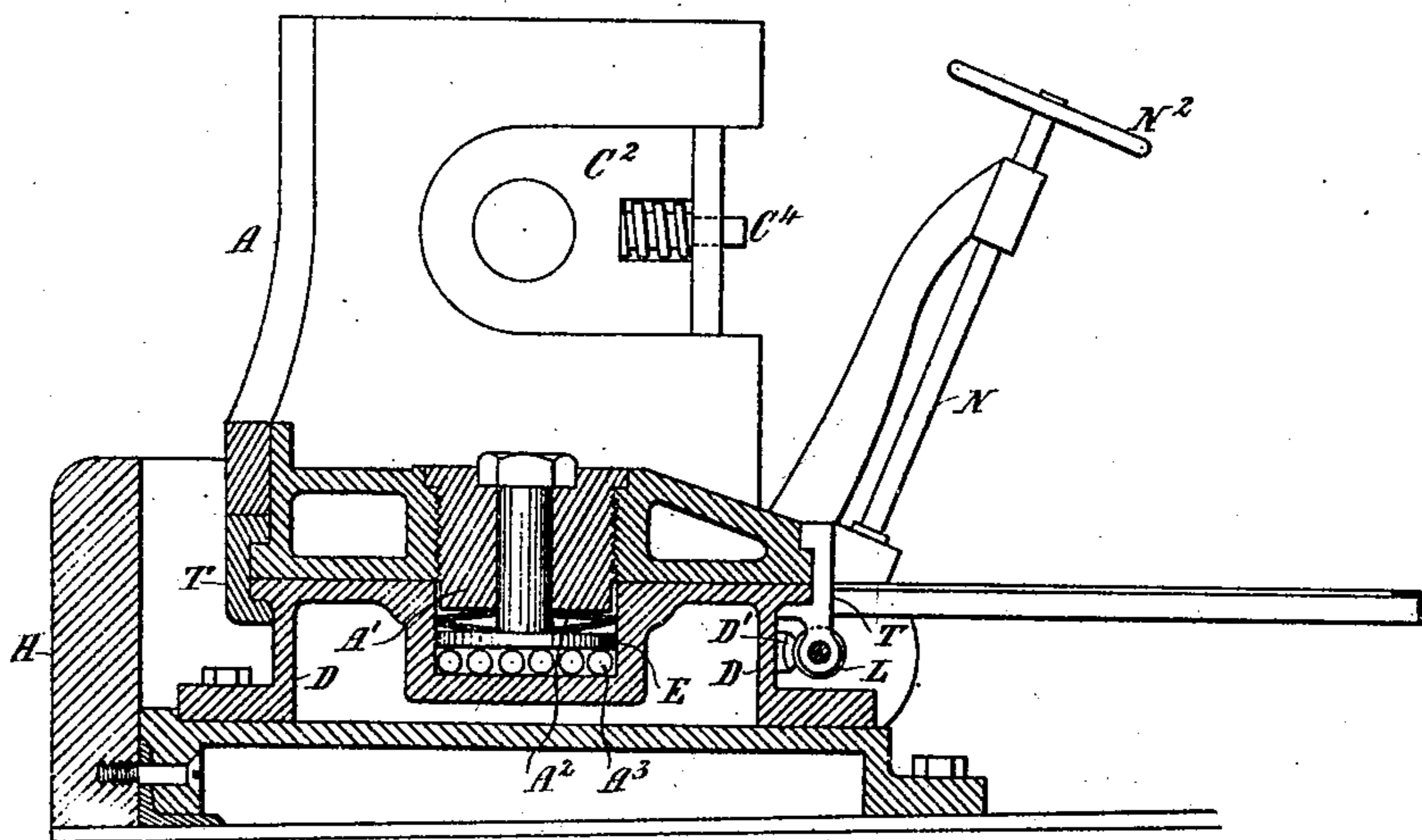


Fig. 5.



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Fig. 7.

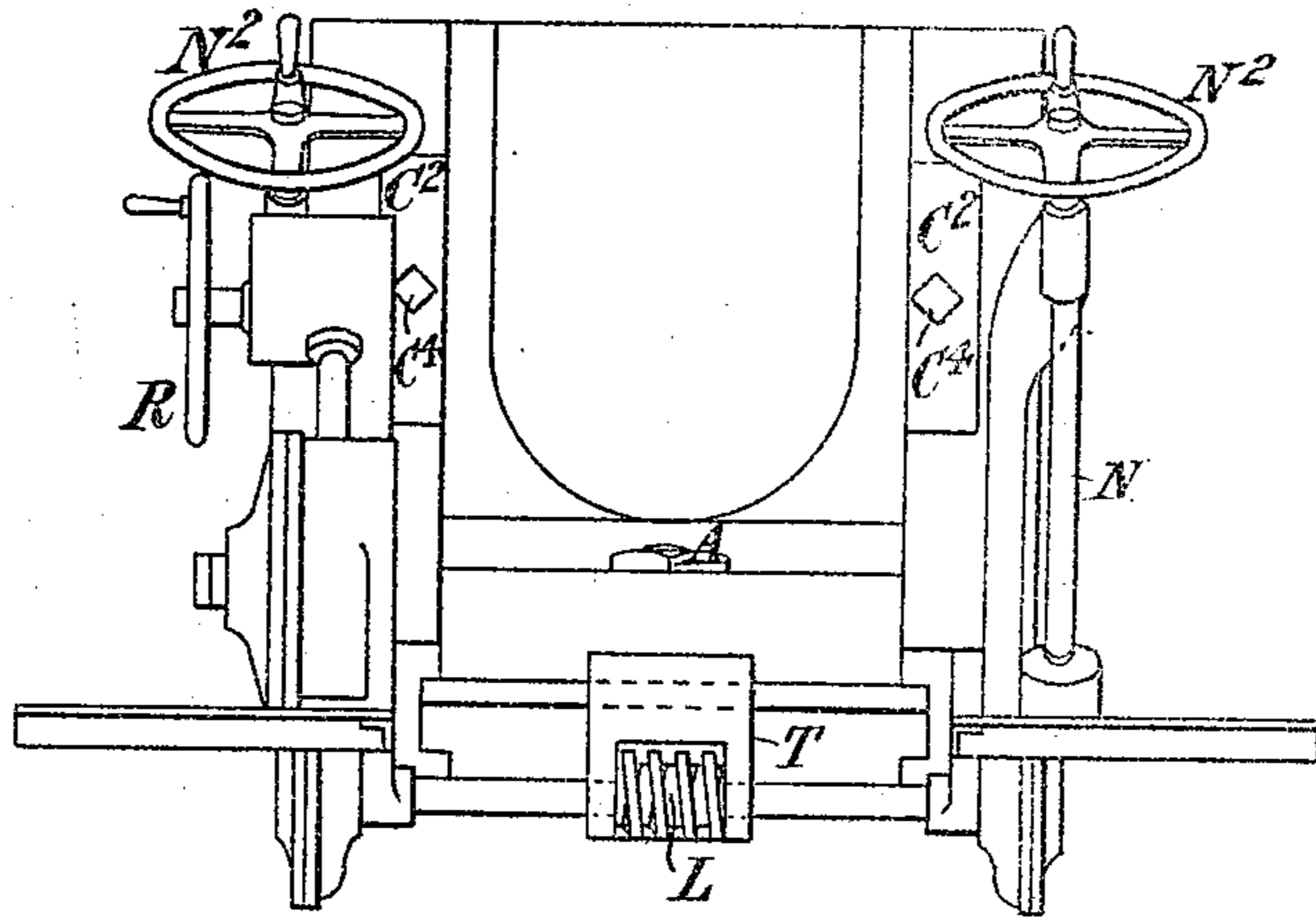
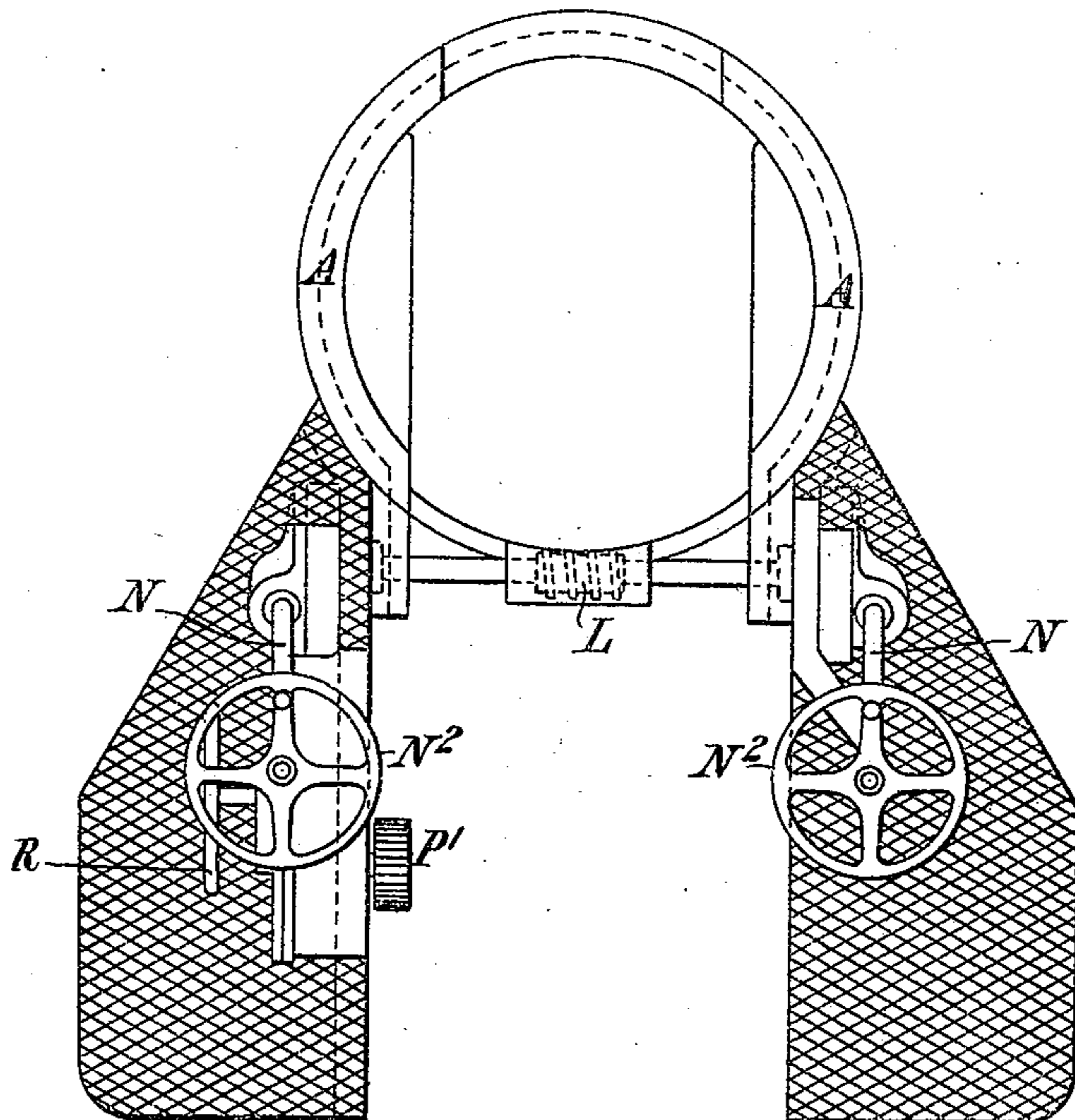


Fig. 8.



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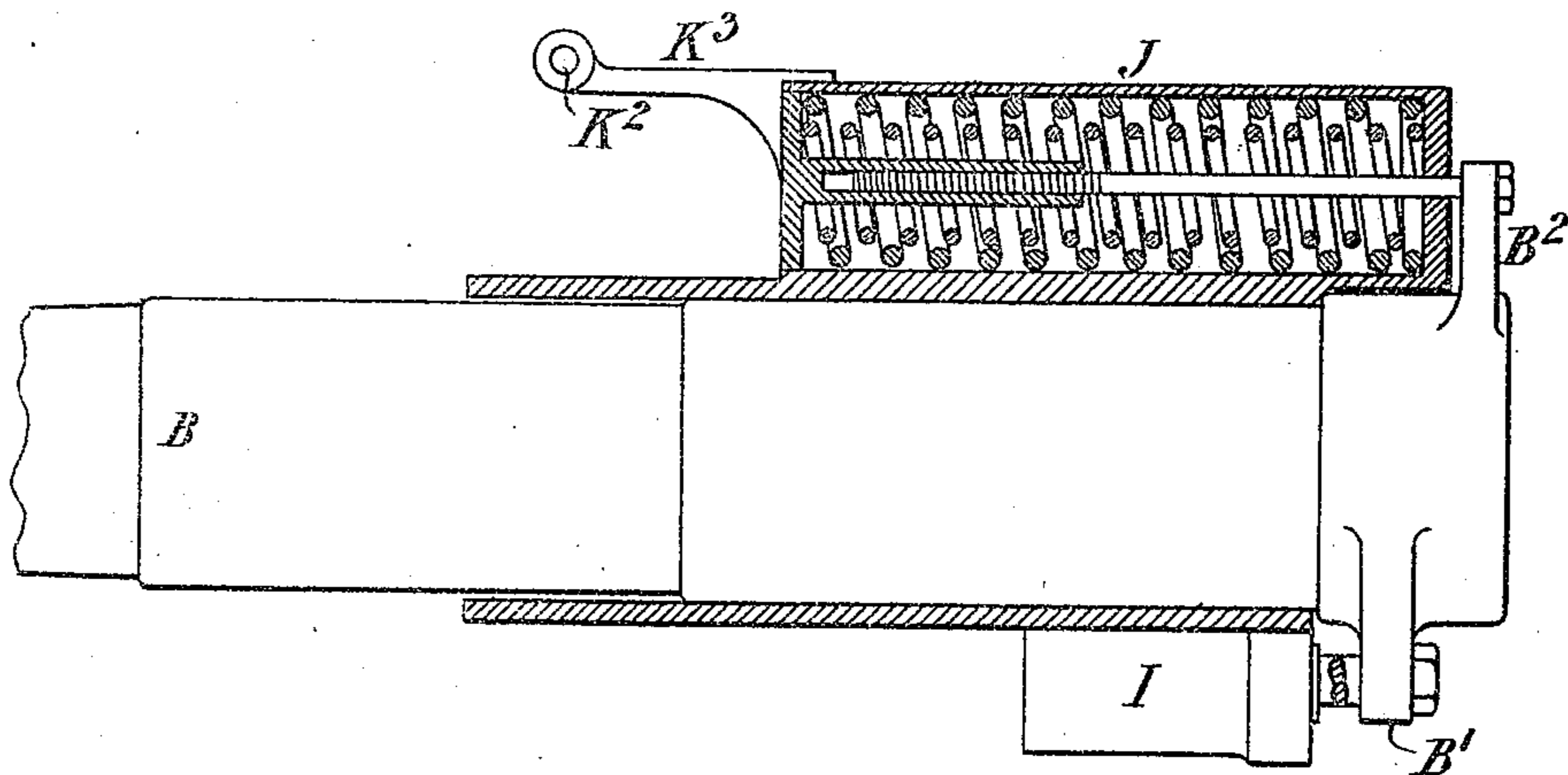
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Fig. 9.



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Fig. 11.

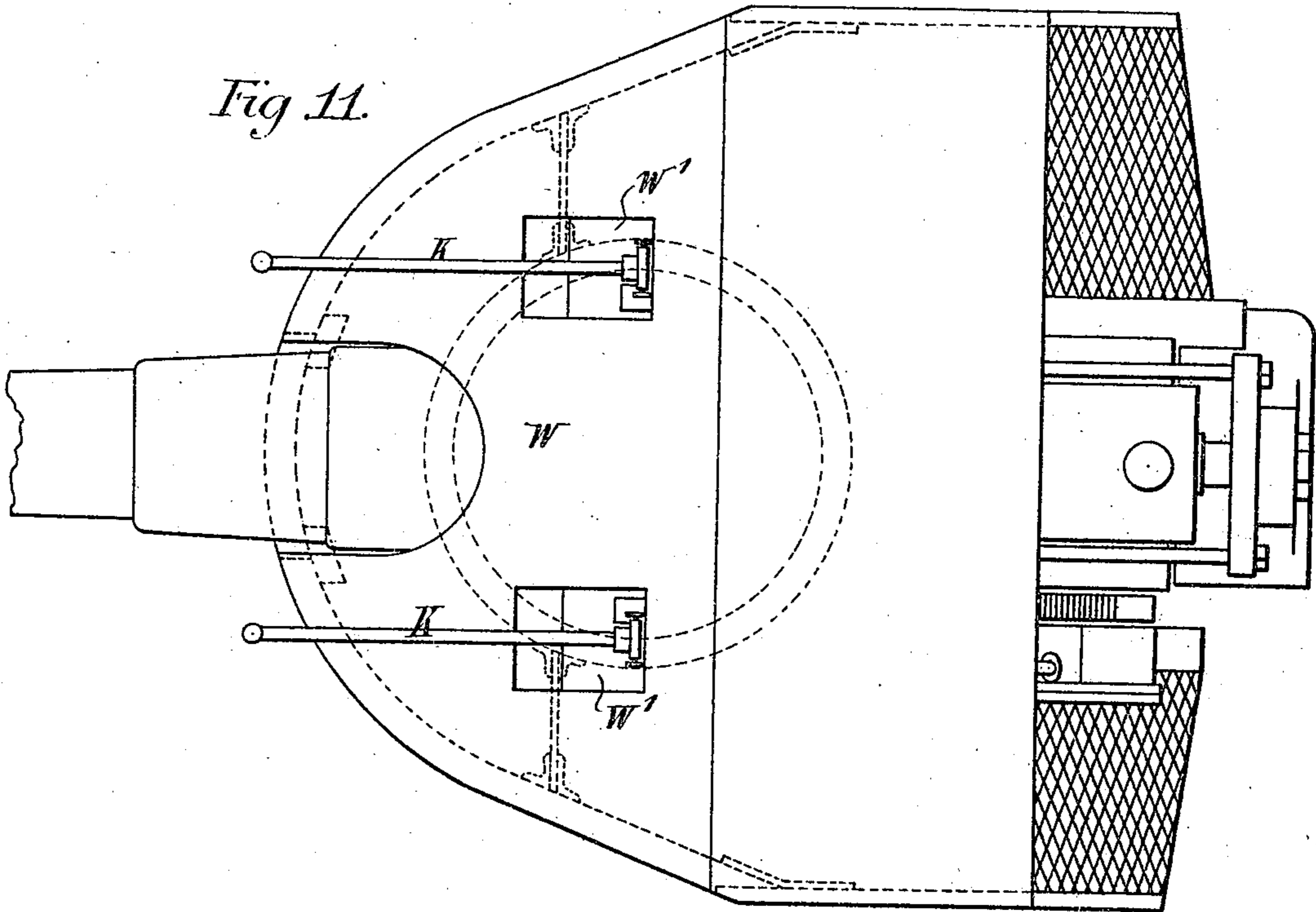
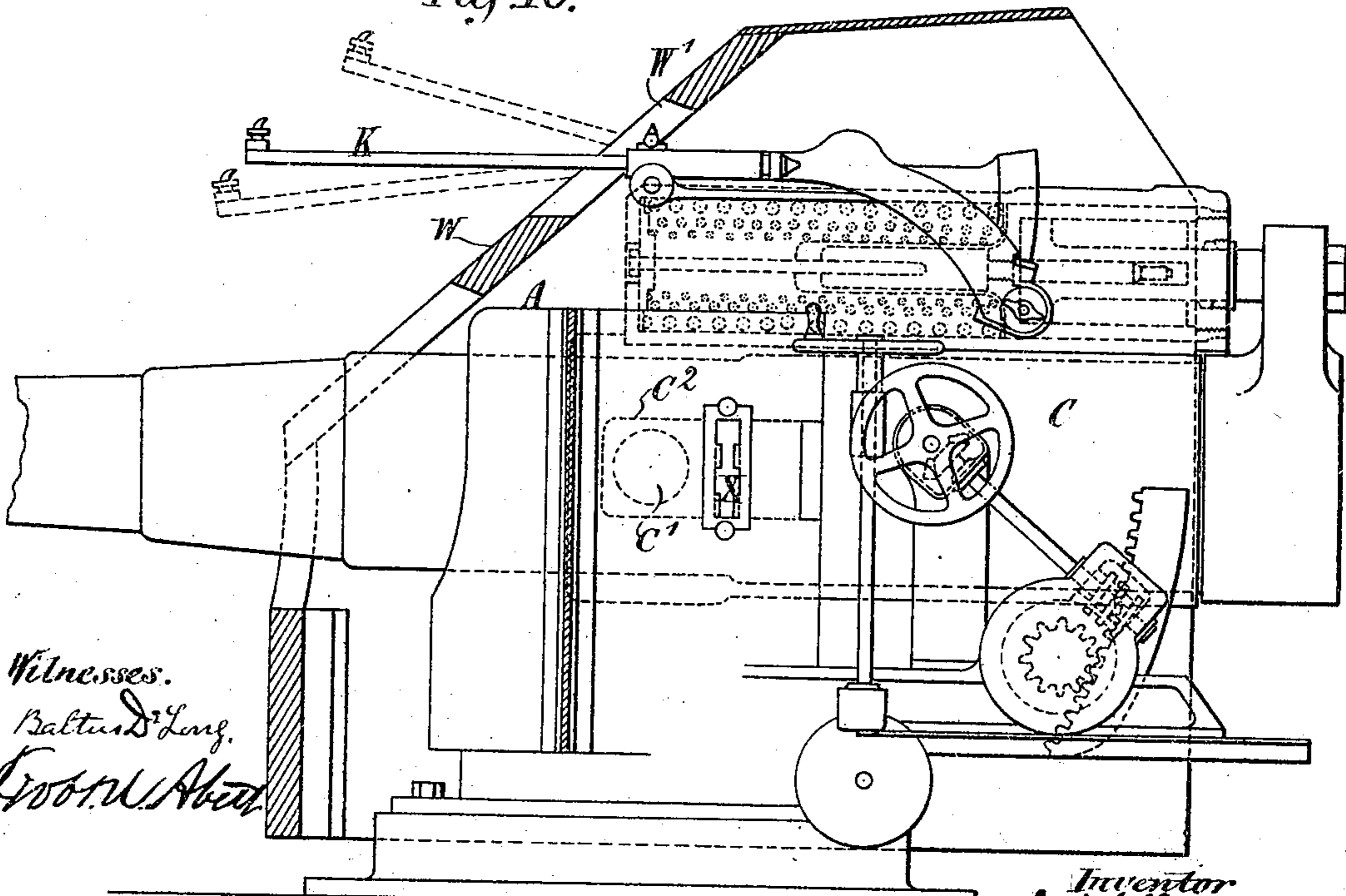


Fig. 10.



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Fig. 13

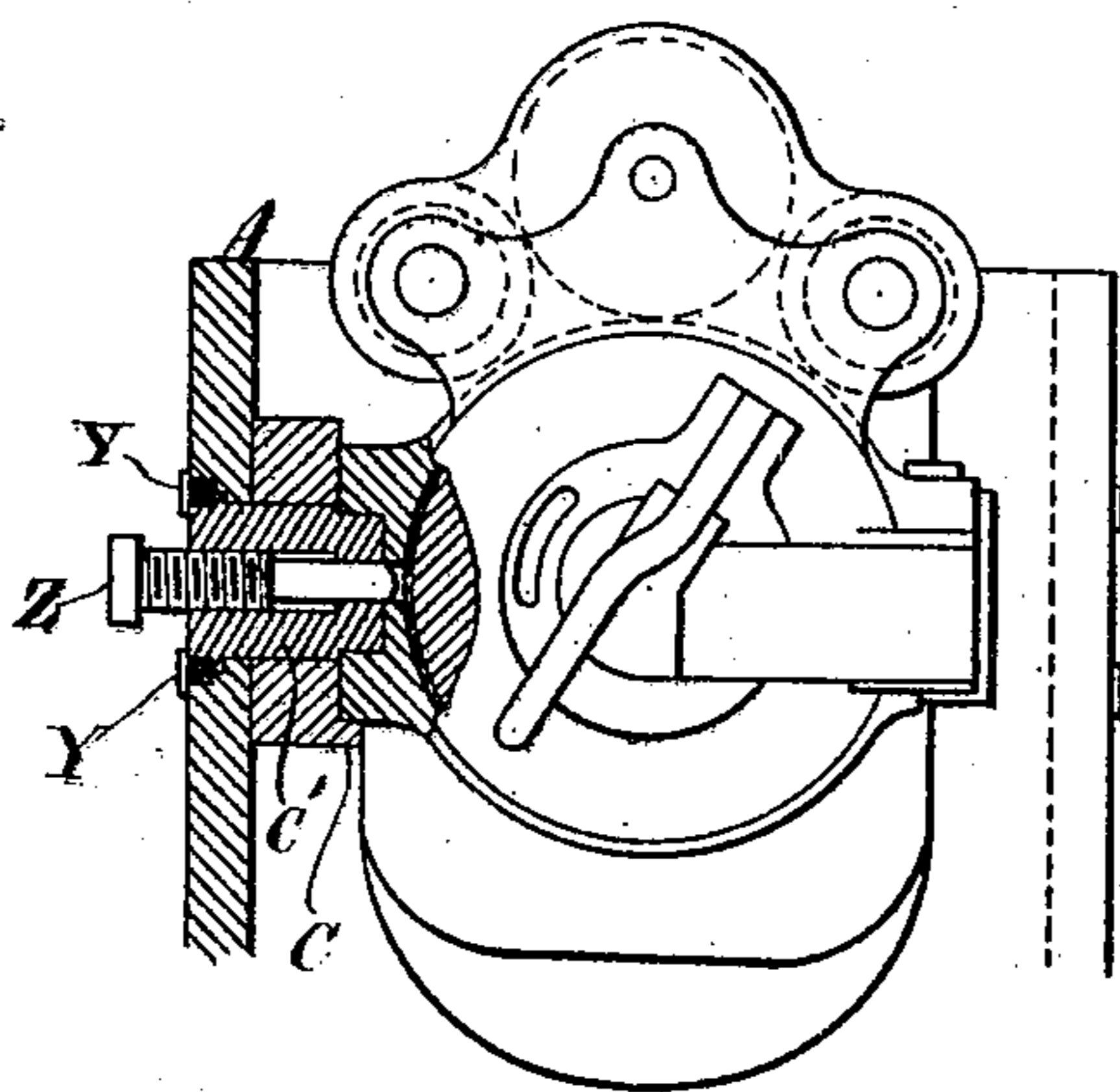


Fig. 12

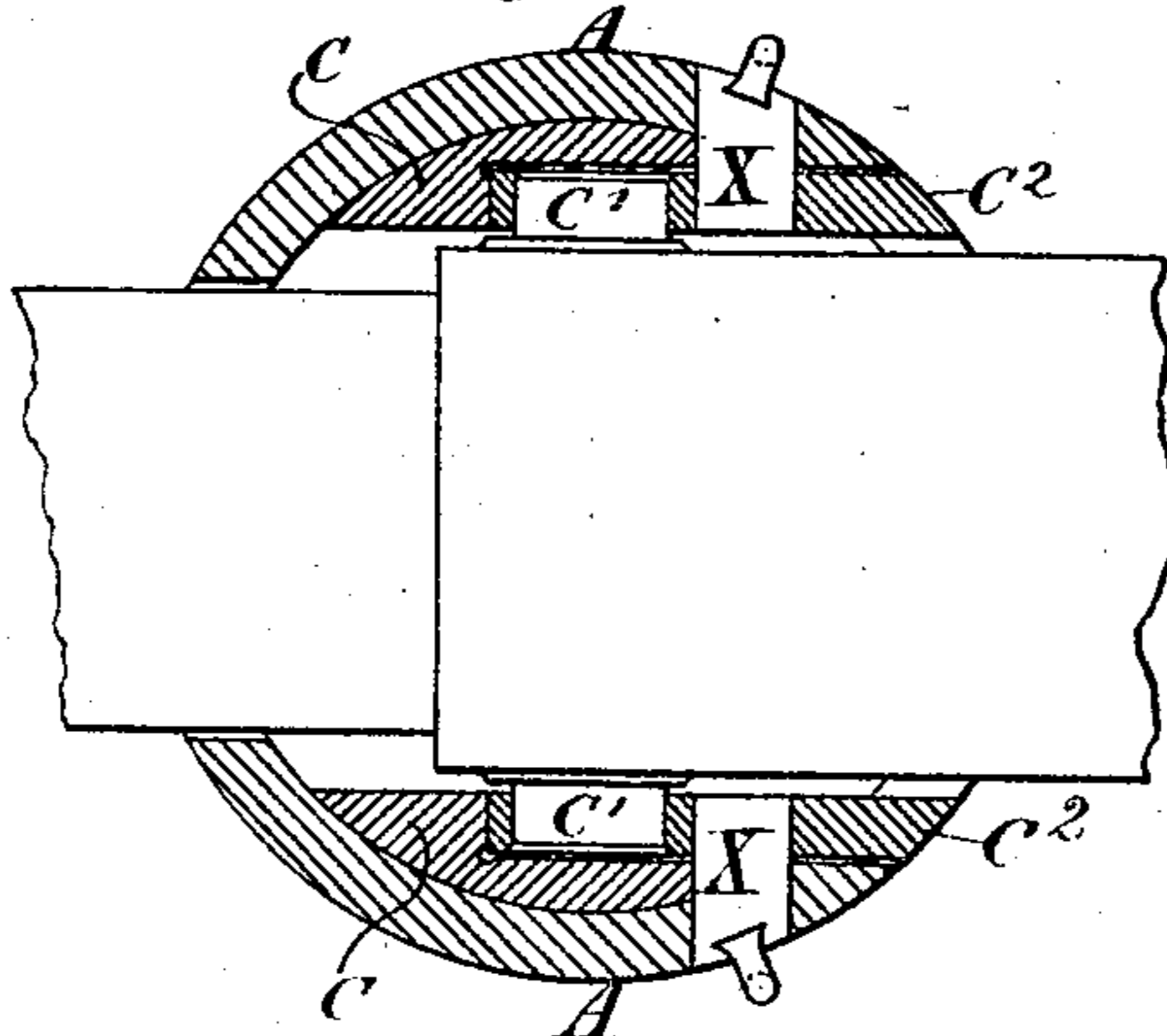
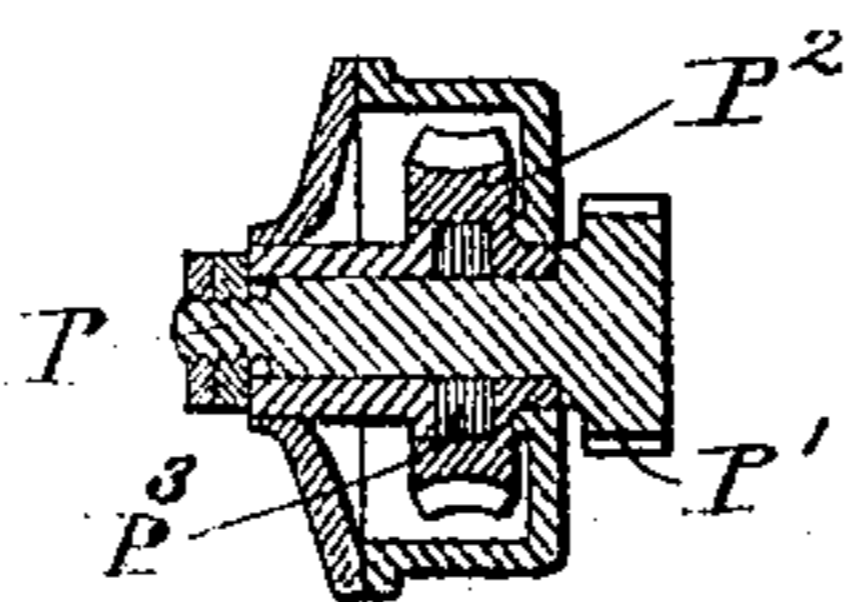


Fig. 14



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UNITED STATES PATENT OFFICE.

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MOUNTING FOR GUNS.

SPECIFICATION forming part of Letters Patent No. 450,829, dated April 21, 1891.

Application filed August 13, 1890. Serial No. 361,912. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH VAVASSEUR, engineer, a subject of the Queen of Great Britain, residing at the London Ordnance Works, Bear Lane, Southwark, London, in the county of Surrey, England, have invented certain new and useful Improvements in Mounting Guns on Board Ship and in Gun-Mountings Generally, of which the following is a specification.

10 The gun is made capable of recoiling in a frame or cradle made similarly to what has heretofore been proposed. The forward end of the cradle I make to lie within a slot formed vertically across the top of a cylindrical block, and provide it with horizontal trunnions which with their bearings are slid into recesses in the block and secured by lock-screws with interrupted threads, wedges, or other means, or I secure the cradle by pivots or trunnions inserted through the block. The bottom of the block rests on the top of a pedestal fixed to a deck, and the block has a vertical pivot descending from it into bearings in the pedestal. Around its outer edge it also carries clips to clip a flange which projects outwards from the top of the pedestal and prevents lifting.

Instead of employing the cylindrical block, I in some cases support the gun in ordinary bearings formed in brackets made on the vertical pivot and surround these brackets with a circular armor-plate; or the block might be made of spherical form with the vertical pivot projecting downward from the lower part of the sphere. When a mounting of this kind is to be used as a between-deck or broadside mounting on board a ship, an opening is formed through the ship's side just large enough to permit of the pedestal and cylindrical block being placed in the opening so that the line of the vessel's side would pass centrally through them, or approximately so. The portion of the pedestal which is outside the side of the vessel is supported by a projecting sponson. The sponson has an armor-plated wall rising up around its outer edge nearly to the level of the under side of the gun when at its maximum depression. At the ends of the sponson the walls (where the

the gun when trained to one or other side will not come in contact with them) may rise higher and be bent inward and made to meet the circumference of the cylindrical pivoting-block of the mounting.

I employ two cylinders to absorb recoil placed one on either side below the gun, with the cylindrical spring-case above the gun. This allows of the axes of the recoil and spring cylinders being placed at a minimum distance from the axis of the gun; or the recoil-cylinders and spring may be above the gun, which allows of a minimum height from deck or platform to center of gun. There may be two recoil-cylinders and the spring placed centrally between them, or one cylinder and spring on the same axis.

I provide, preferably, two sight-bars, one on either side of the gun and carried above the top of the cradle. The sight-bars can be set at any desired angle to the central line of the gun, according to the elevation desired. A sighting port or ports are formed through the ship's side, through which the sight-bars can be protruded. These sight-openings are the only openings through which shot could enter, and being above the gun and at a considerable height above the deck the men working the gun are very efficiently protected.

When the mounting is placed on the upper deck of a ship, it is protected by a suitable outer shield attached to and turning with the mounting. This shield has a lower opening in it, through which the gun works, and two sighting-ports above, through which the sight-bars protrude.

Figure 1 is a side elevation, Fig. 2 a rear elevation, Fig. 3 a plan, and Fig. 4 a part sectional plan, of a gun-mounting constructed as above described and placed in a broadside or between-deck position. Fig. 5 is a vertical section of the cylindrical swiveling-block and of the pedestal on which it rests. Fig. 6 is a side elevation of the cylindrical swiveling-block and the parts carried by it. Fig. 7 is a rear end view, and Fig. 8 a plan, of the block and the parts carried by it. Fig. 9 is a vertical section of the cradle, with the gun contained within it shown in elevation. Fig. 10

shows a side elevation, partly in section, of the mounting as modified for being placed on the upper deck of a ship. Fig. 11 is a plan of the same. Fig. 12 is a horizontal section of part of the same, showing how the trunnion-bearings may be retained by readily-removable blocks or wedges. Fig. 13 is a vertical section showing how the trunnions may be fixed in the cylindrical block and enter recesses in the cradle. Fig. 14 is a vertical section of a friction-clip employed in the apparatus.

In Figs. 1 and 8, A is a cylindrical block, either in one solid piece or formed of a circular base, with a cylindrical armor-plate rising up from it around its circumference, and also with uprights rising up from it to carry the bearings for the trunnions of the cradle.

B is the gun, capable of sliding endwise within a tubular cradle C in the ordinary way, as shown at Figs. 1, 2, and 3. The forward end of the cradle lies within a slot cut across the top of the block, as shown in Fig. 4. The slot through the block is best seen in Figs. 5, 7, and 8. The cradle-trunnions C' are received in bearing-blocks C², which lie within the block, (these bearing-blocks are shown in Figs. 1, 4, 5, 6, and 7,) but can be drawn out backward from it. The bearing-block carries within a recess formed in one side of it a screw C³, (see Figs. 1 and 4,) the threads of which are cut away on one side. The screw can be turned by a key applied to its end C⁴. (See Figs. 4, 5, 6, and 7.) When the side from which the screw-thread is cut away is outward, there is no projection from the bearing-block; but if a half-turn is given to the screw its threads then project outward and interlock into corresponding grooves or recesses in the cylindrical block to which the bearing-block is thus locked. The bearing-blocks may also be locked each by two screws formed as described, one at the top and one at the bottom. When the bearing-blocks are unlocked from the cylindrical block, the gun and cradle, together with its trunnion-bearings, can be drawn backward and removed from the mounting. The cylindrical block rests around its circumference upon the top of a pedestal D, (see Fig. 5,) of about the same diameter. It has also a central vertical pivot A' descending from it, which enters a corresponding circular recess in the pedestal and rests on dished springs A², contained in this recess. Between the springs and the bottom of the recess is a plate E, resting on a ring of anti-friction balls or rollers A³. The springs take the greater part or the whole of the weight of the gun, cradle, and mounting, so that there may be but little friction between the cylindrical block and pedestal near the outer circumference. To prevent the springs lifting the cylindrical block so high as to bring the clips T into hard bearing against the flange of pedestal, the plate has a central stem rising up from it

through the vertical pivot of the cylindrical block, and has a suitably-adjusted nutscrewed onto its upper end.

F (see Figs. 1 and 3) is part of a ship's side having an opening formed through it just large enough for the pedestal and the cylindrical block to be placed in, so that approximately one-half of the block and pedestal may be outside the ship's side. In this way the opening through the ship's side is practically closed, while at the same time the gun can be trained to considerable angles in either direction.

G (see Figs. 1 and 3) is a sponson on the outer side of the ship's side to support the portion of the pedestal which is outside the ship.

H is an armor-plated wall rising up around the edge of the sponson nearly to the level of the bottom of the gun. Above this level the plates forming the wall are bent inward, as shown at Fig. 3, so as to meet the circumference of the cylindrical block. In this way the opening in the ship's side is completely filled in.

I I (see Figs. 1, 2, and 9) are the two hydraulic recoil-cylinders on the under side of the tubular cradle at its rear end.

J is a cylindrical casing containing springs for running the gun out after recoil. It is carried on the top of the rear end of the cradle.

B' are arms on the rear end of the gun, to which the piston-rods of the recoil-cylinders are attached, and B² another arm, to which is secured a rod, which at its front end, has a disk upon it, which bears against the springs contained within the casing J.

K K (see Fig. 1) are sight-bars carried by tubular bearings K', which are jointed at K² to arms K³, which project from the top of the cradle.

K⁴ (see Fig. 1) are sight-openings formed through the ship's side, through which the sight-bars are made to project, so that when in use the back sight may be within or in close proximity to the opening when the gun is at right angles to the ship's side or wall. The sight-bars K can be slid backward through the bearings K' when out of use. The arms K³ can also be slid back, so as to withdraw the bearing K' and joint K² from the sight-opening and allow of the opening being closed. It also admits of the sight-bar being moved backward or forward, so that into whatever direction the gun may be trained the back sight may be brought within or close to the sighting-port. The back sight may either be upon the bar or upon the bearing K'.

The sight-bar can be inclined to any desired extent to the cradle by turning a pinion S', (see Figs. 1 and 2,) carried by an arm S, which extends rearward from the bearing K'. The pinion gears into a curved toothed rack carried by the arm K³. The pinion S' works against a light friction sufficient to keep the arm S in any desired position.

In order to prevent the sight-bars K being inadvertently turned down to such a position as would cause them to be injured by fouling the sighting-port or upper-port sill of gun, a projection S^2 is made on the arm S, the upward movement of which beyond a safe limit is prevented by the overhead stop V and the yielding of the arm S to pressure. Arrangements can also be made to prevent similar risk from the bars being raised too high.

The training of the gun is effected from either side of the mounting by a worm L gearing into the teeth of a rack D' , formed partly around the circumference of the pedestal D. The axis of the worm L is carried by downward projections from the cylindrical block A, and has upon it at each of its ends a bevel-wheel M, into which gears a pinion N' on an axis N, which also is carried in bearings by an arm projecting from the cylindrical block. The axis N has a hand-wheel N^2 on its upper end by which it can be turned.

The elevating of the gun is effected by a curved toothed rack O on the cradle, into which gears a pinion P' on an axis P. On this axis is also a worm-wheel P^2 , held to it by a friction-clip, a vertical section of which is shown in Fig. 14.

Q is a worm gearing into the worm-wheel. The axis of the worm can be driven through bevel-gear from the axis of a hand-wheel R. The bearings for these axes are carried by the arm which projects rearward from the cylindrical block A.

In the modification of the mounting shown at Figs. 10, 11, and 12 and adapted for use on the upper deck of a ship the circular swiveling-block A carries a shield W, with sighting-ports W' for the sight-bars K to be protruded through. These figures also show how the bearings C^2 for the trunnions C' of the cradle C may be retained within the cylindrical block A by blocks or wedges X, which can be drawn out sidewise from the block.

These figures also show that the hydraulic recoil-cylinder and cylinder containing the running-out springs may both be above the gun and in a line with one another.

In the modified way shown at Fig. 13 of supporting the cradle C within the cylindrical block A the trunnions C' might be passed through holes in the sides of the block A and made to enter recesses in the sides of the cradle. Y are screws for retaining the trunnions in their place. Z is a screw screwing through the center of the trunnion. When the screws Y are removed, the trunnion can be withdrawn by screwing in the screw Z and making its end bear against the side of the gun. This figure also shows that the hydraulic recoil-cylinders may be on either side of the cylinder containing the running-out springs and all the cylinders be carried above the gun.

I do not in this application claim, broadly, a sight-bar carried on the top of a cradle; nor

do I broadly claim in this application hydraulic recoil and running-out gear mounted on the top of the cradle, as such subject-matters are claimed in my application, Serial No. 359,184, filed July 18, 1890.

What I claim is—

1. The combination of the opening through the ship's side, the vertically-swiveling circular block and pedestal on which it rests fitting into the opening, the sponson, with armor-wall around its edge, surrounding the portion of the pedestal that projects through the opening, the slot formed through and across the cylindrical block, the cradle lying in the slot supported on trunnions carried by the block, and the sight bar or bars carried by the cradle and protruding through a sighting port or ports formed through the ship's side.

2. The combination of the circular vertically-swiveling block fitting within an opening formed through an armor-wall or ship's side and having a slot formed through and across it, in which lies a gun-cradle the trunnions of which are in a plane passing through the block's axis, or approximately so, so that the block fills the opening in the wall or ship's side and the end of the cradle fills the opening through the block, or nearly so, and a sight bar or bars carried by the cradle protruding through a small sight port or ports, so that the back sight may be within or close to the sighting-port when the gun is at right angles to the wall or ship's side.

3. The combination of the circular vertically-swiveling block fitting within an opening formed through an armor-wall or ship's side and having a slot formed through and across it, in which lies a gun-cradle the trunnions of which are supported by the block in a plane passing through the block's axis, or approximately so, so that the block fills the opening in the wall or ship's side and the end of the cradle fills the opening through the block, or nearly so.

4. A gun-mounting consisting of the circular vertically-swiveling block having a slot formed through and across it, the gun-cradle lying in the slot, the cradle-trunnions supported by the block in a vertical plane passing through the block's axis, or approximately so, and the sight bar or bars carried by the cradle above the gun, with the back sight also in a vertical plane passing through the block's axis, or approximately so.

5. A gun-mounting consisting of the circular vertically-swiveling block having a slot formed through and across it, the cradle lying in the slot, the trunnions projecting sidewise from the cradle, the bearings for the trunnions slid from the rear into recesses in the block, and locking-bolts for locking the bearings into the recesses in the block.

6. A gun-mounting consisting of the circular vertically-swiveling block having a slot formed through and across it, and the cradle lying in the slot and turning upon horizontal

trunnions which are in a vertical plane passing through the block's axis, or approximately so.

7. A gun-mounting consisting of the circular vertically-swiveling block provided with
5 a slot extending through and across it, the cradle lying in the slot, the trunnions projecting sidewise from the cradle, the bearings for the trunnions slid from the rear into re-

cesses in the block, and bolts with interrupted screw-threads upon them for locking the bearings into the recesses in the block. 10

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