

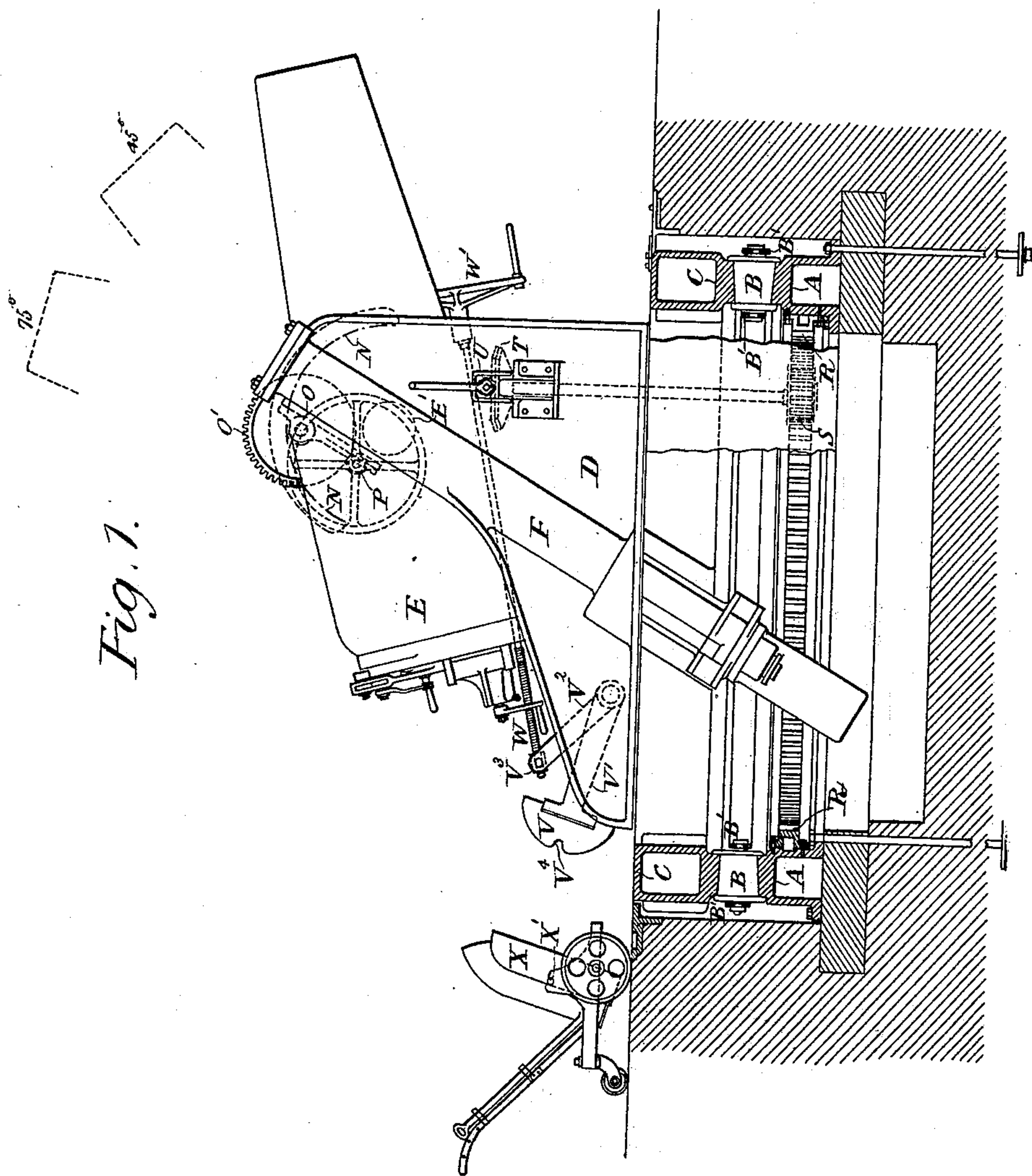
(No Model.)

7 Sheets—Sheet 1.

W. ANDERSON.  
MORTAR MOUNTING.

No. 422,003.

Patented Feb. 25, 1890.



Witnesses  
R. W. Abbott  
Baltus D. Long.

Inventor  
William Anderson  
By his Atty's.

Baldwin Davidson & Wright

(No Model.)

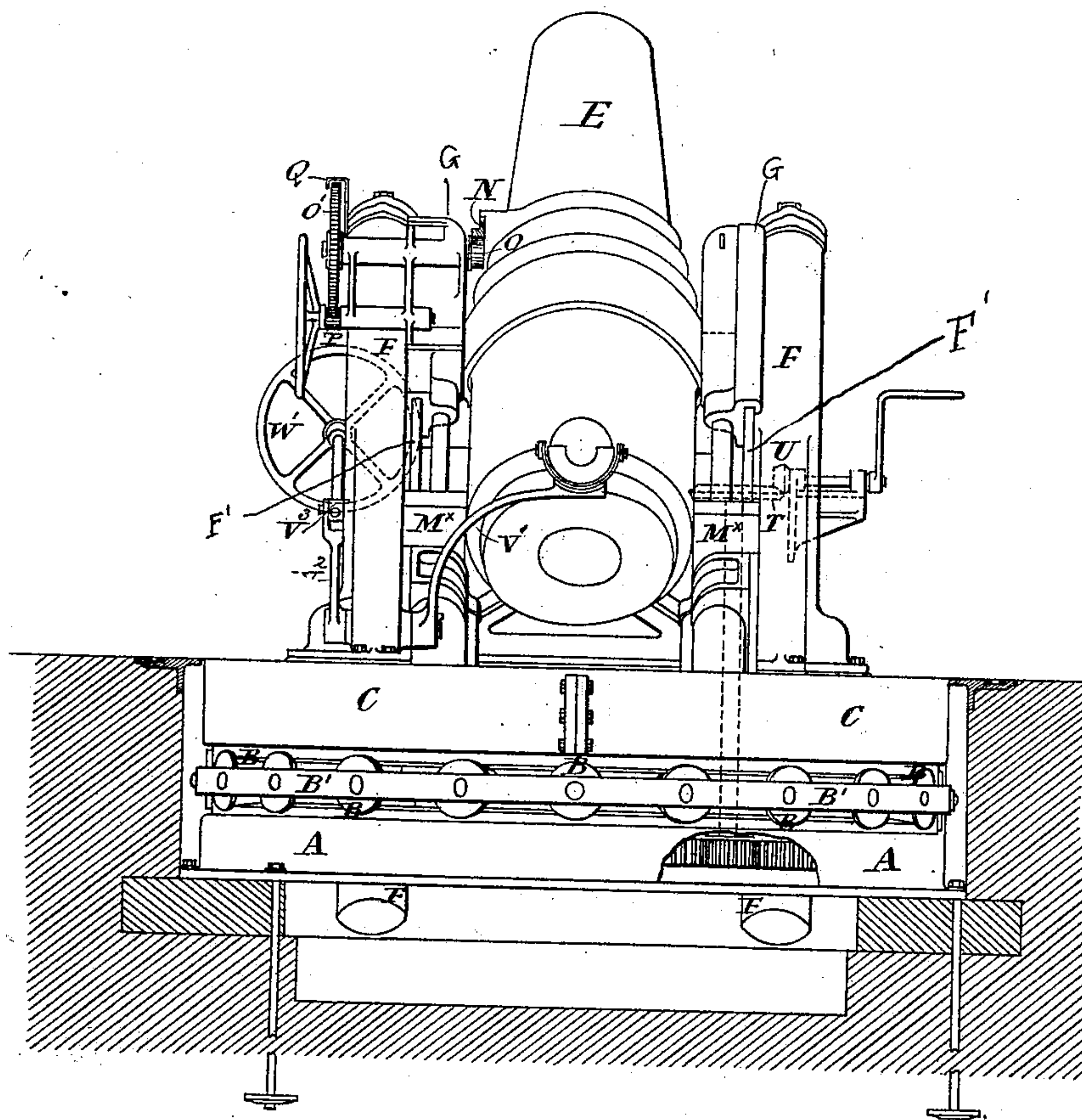
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*Fig. 2.*



Witnesses

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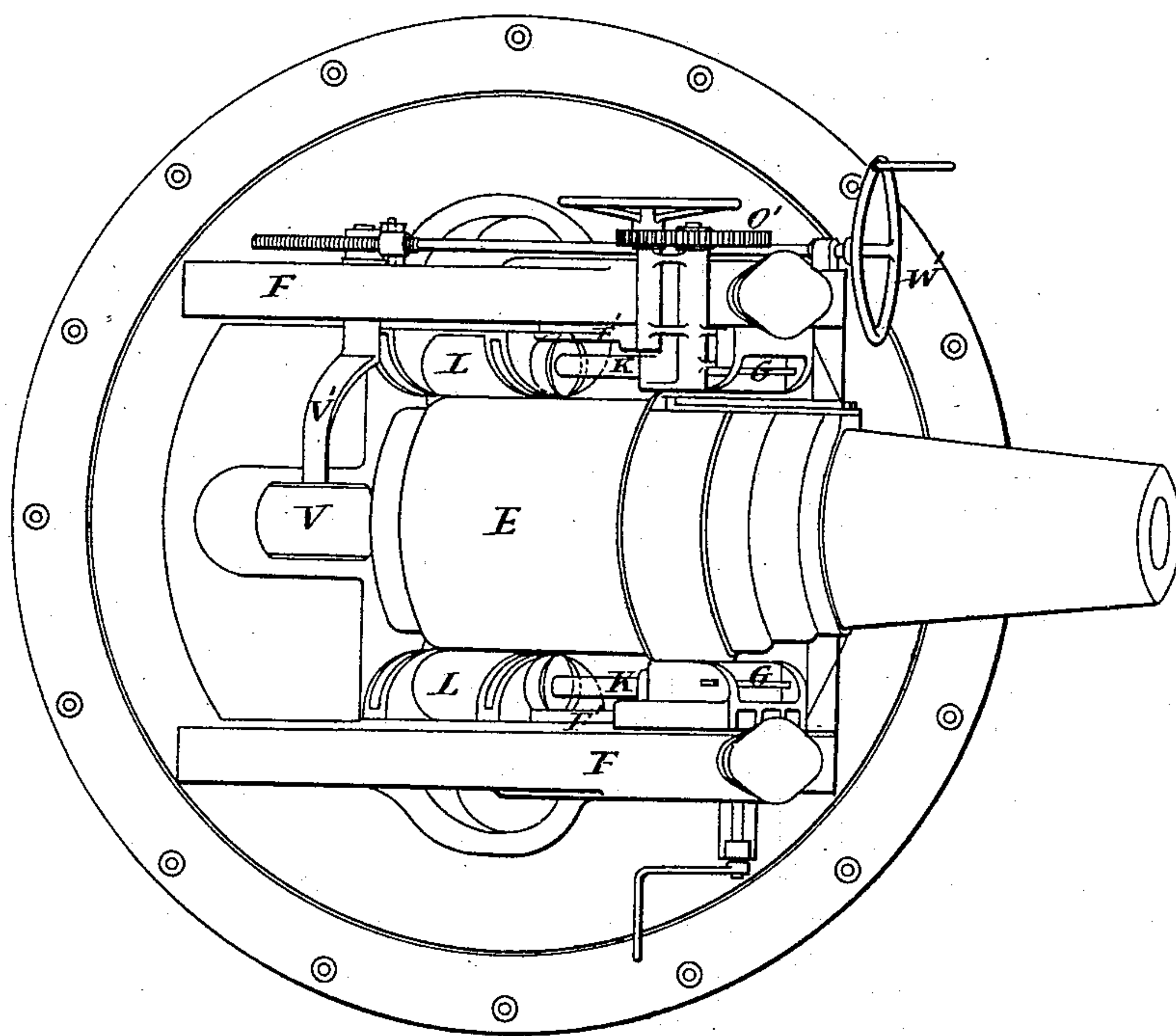
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*Fig. 3.*



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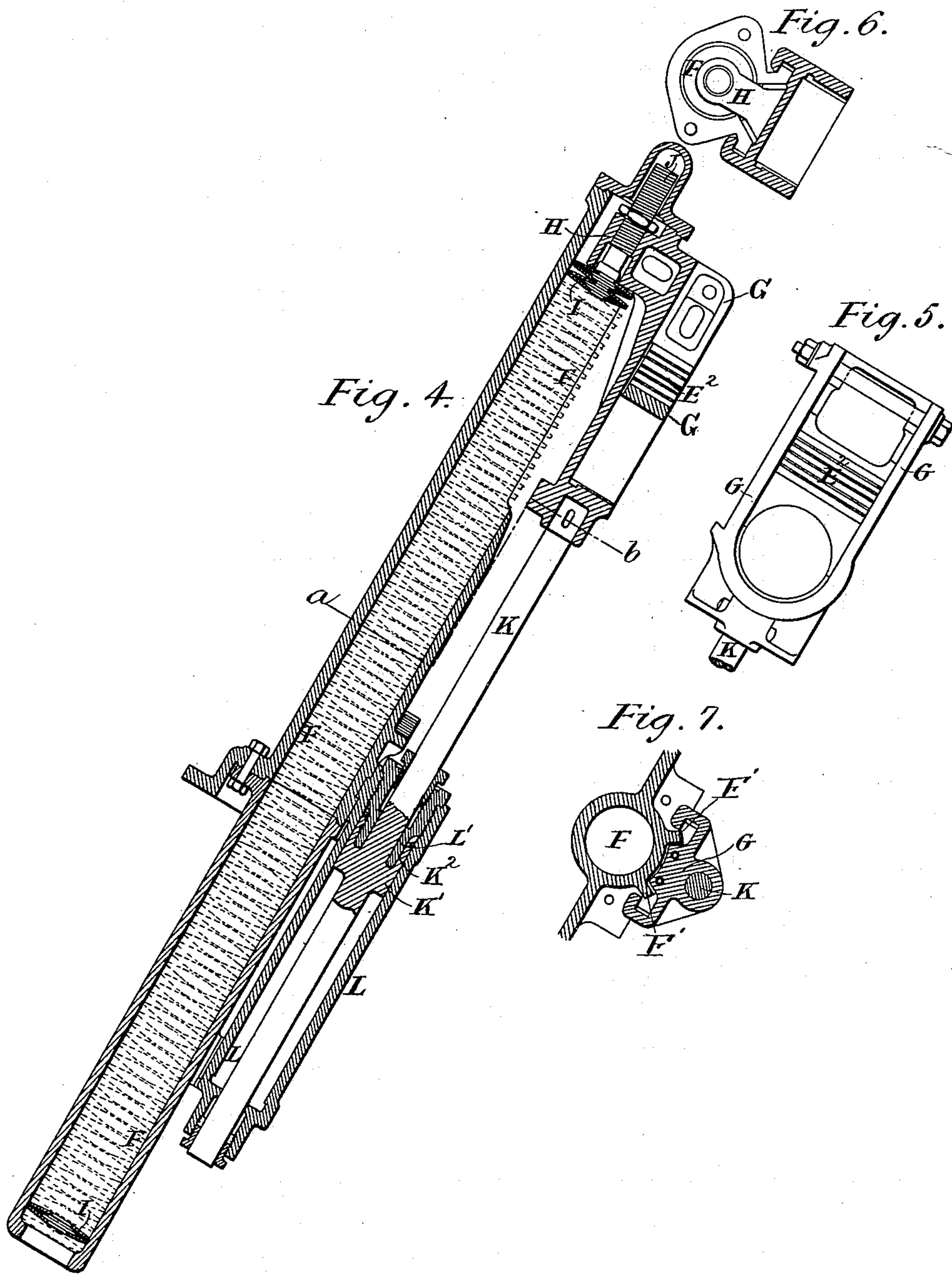
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Fig. 9

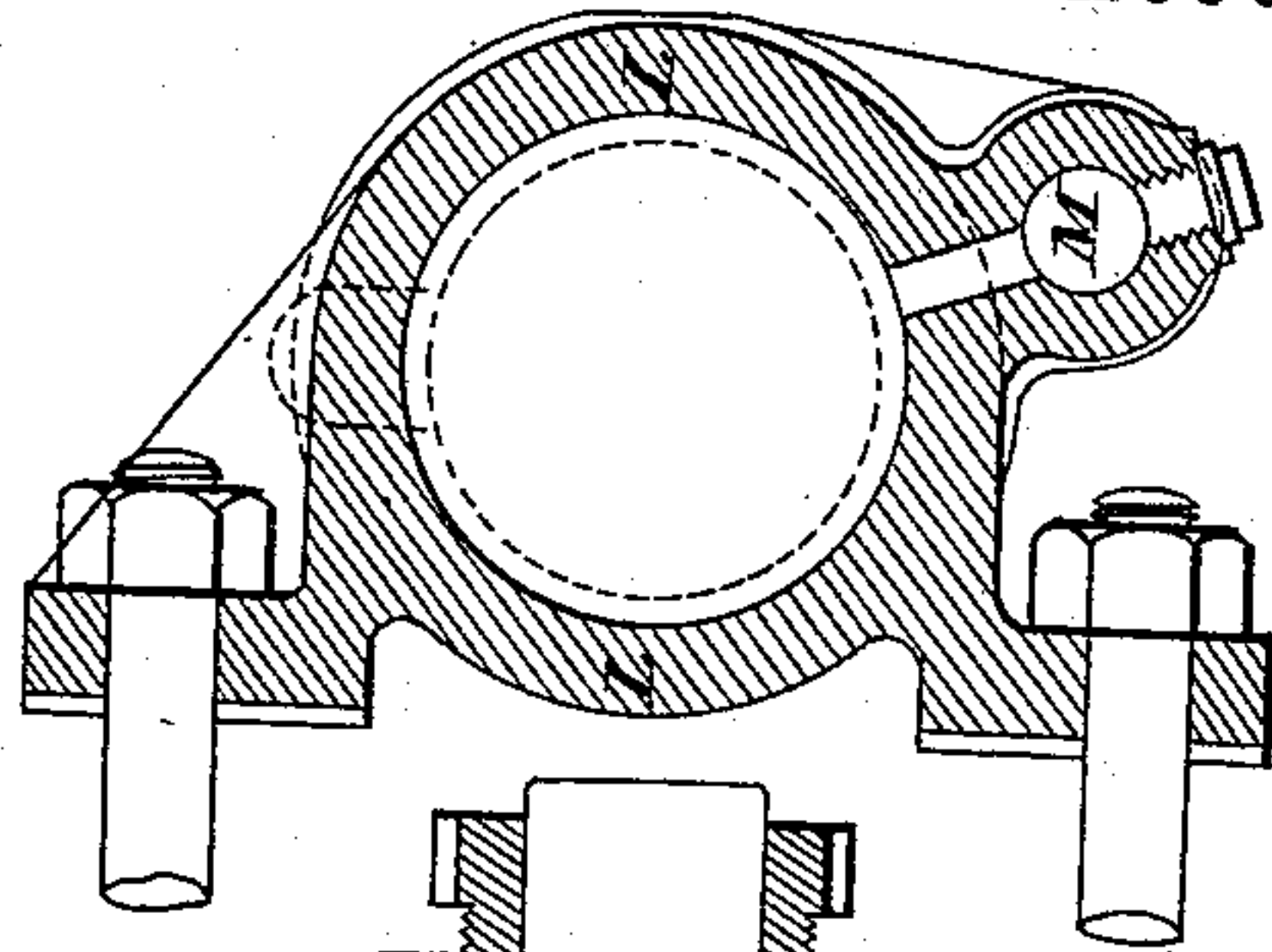
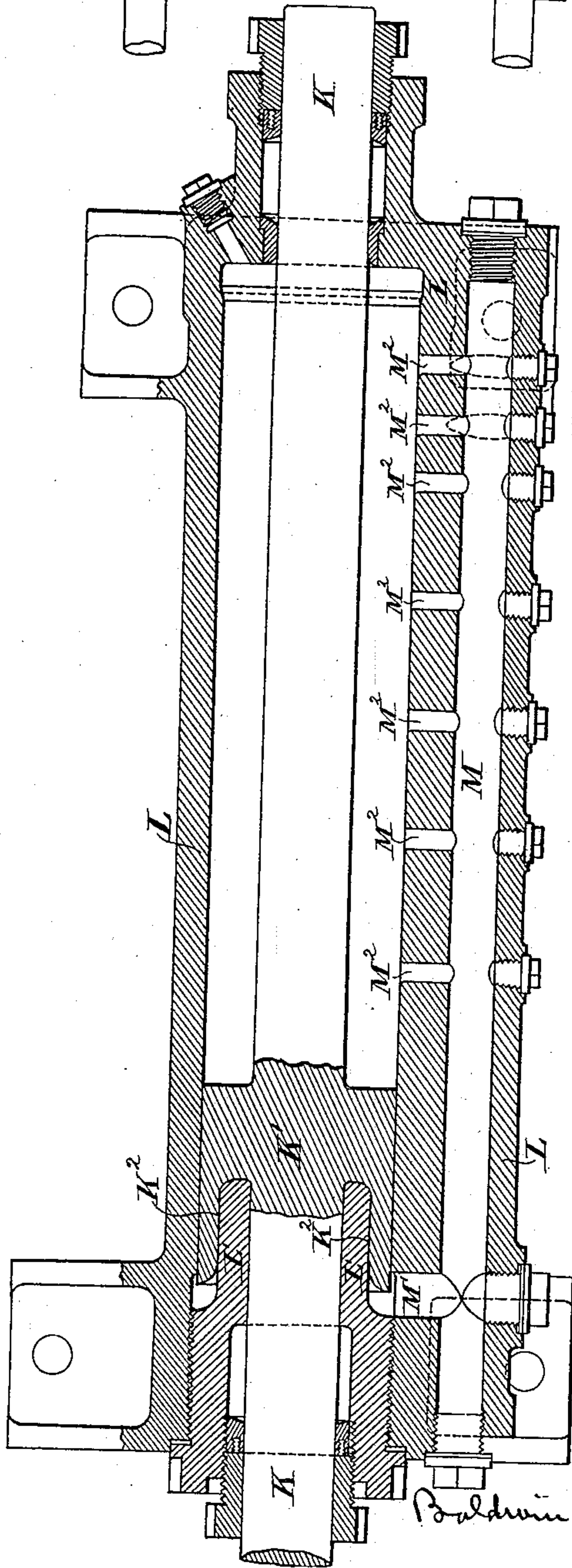


Fig. 8.



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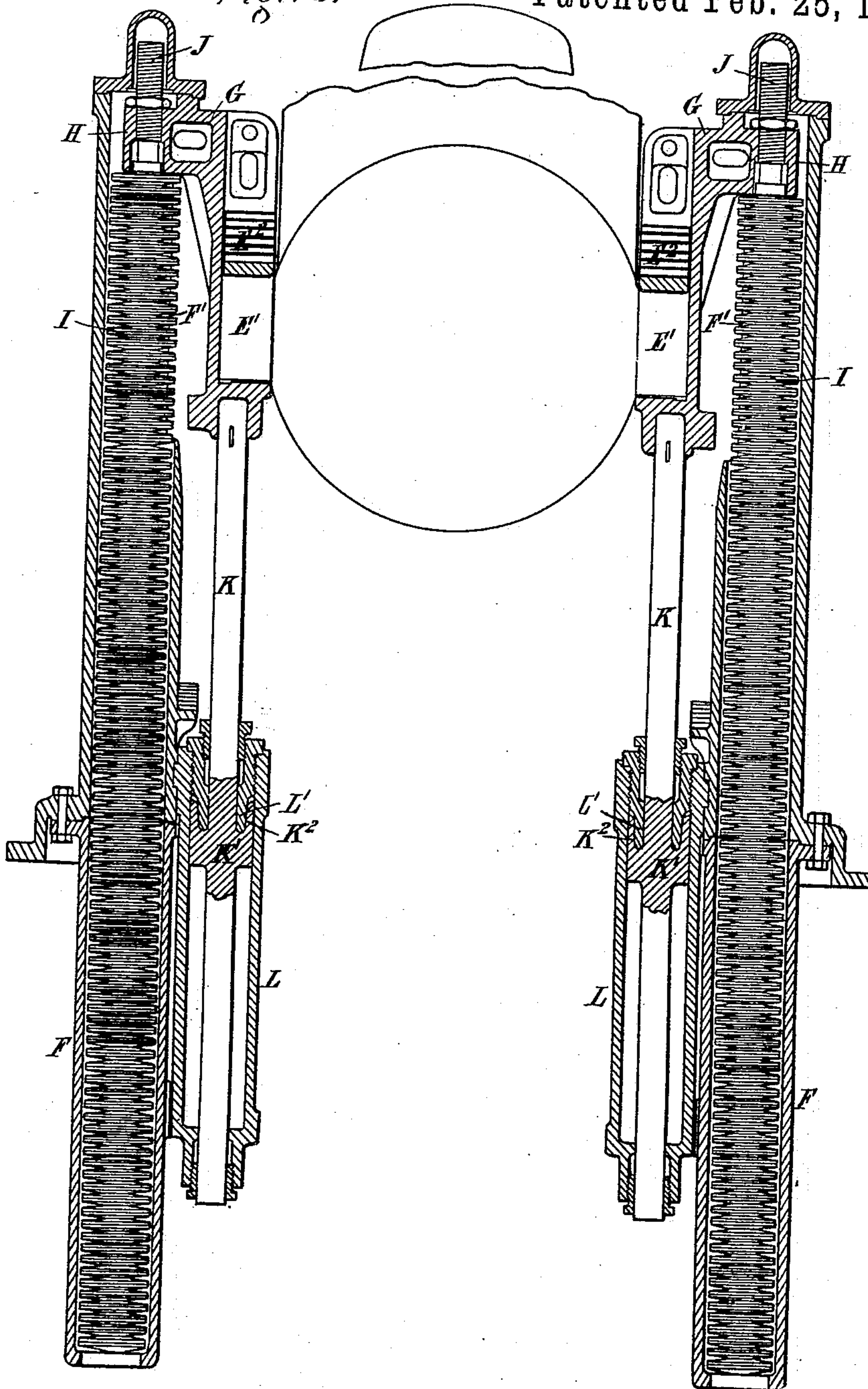
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Fig. 10.

Patented Feb. 25, 1890.



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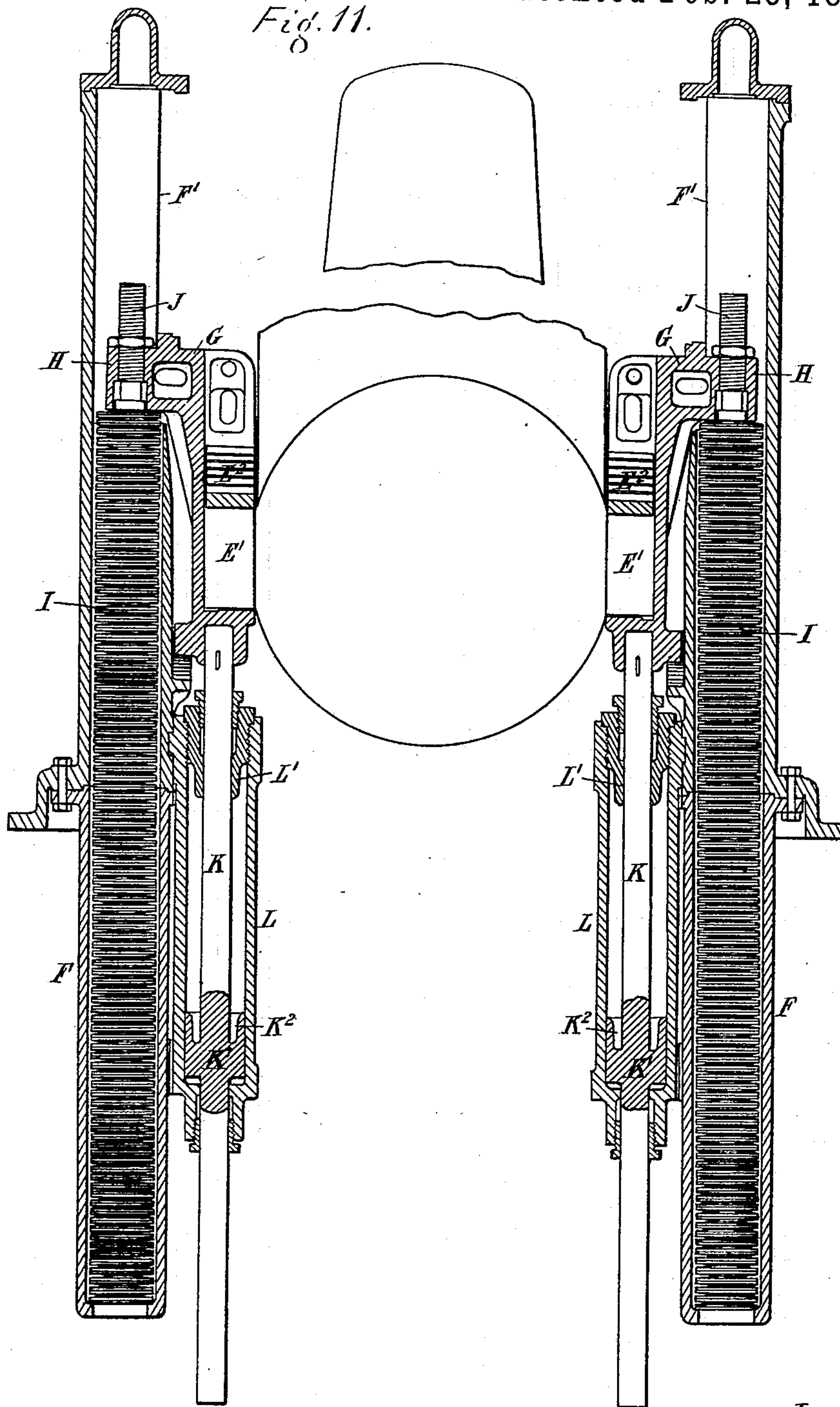
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Patented Feb. 25, 1890.

Fig. 11.



Witnesses  
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# UNITED STATES PATENT OFFICE.

WILLIAM ANDERSON, OF WESTMINSTER, ENGLAND, ASSIGNOR OF ONE-HALF TO LEONID RASKAZOFF, OF ST. PETERSBURG, RUSSIA.

## MORTAR-MOUNTING.

SPECIFICATION forming part of Letters Patent No. 422,003, dated February 25, 1890.

Application filed July 10, 1889. Serial No. 317,002. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM ANDERSON, engineer, a subject of the Queen of Great Britain, residing at 3 Whitehall Place, in the city of Westminster, England, have invented certain new and useful Improvements in Mortar-Mountings, of which the following is a specification.

This invention relates to mortar-mountings in which the recoil is controlled by hydraulic cylinders, and in which the mortar, after recoil, is brought back to its forward position by means of springs. The trunnions of the mortar are supported in carriages which can move along slides which are placed at an angle of about sixty degrees with the horizon. The slides are formed on the inner faces of two similarly-inclined cylindrical casings, which contain the disk-springs used for running out the mortar. The slides are formed somewhat like the bed of a lathe and the carriages are made to embrace them. The upper end of each carriage has a bracket projecting from it into one of the cylindrical casings through a slot formed in its side. This will rest on the upper end of the pile of springs contained in the casing, and by that means will transfer the weight of the mortar to them. To control the recoil each carriage has a rod extending downward from it into a hydraulic cylinder fixed at the side of the cylindrical casing containing the springs. The rod is carried through the cylinder, and within the cylinder has a piston upon it which is an easy fit within the cylinder. The force of recoil will be taken up by the resistance which the fluid will offer to being driven from one end of the cylinder to the other. An exterior passage is formed from one end of the cylinder to the other, which passes into the upper end of the cylinder, and there are a series of openings from it at intervals apart into the interior of the cylinder. The passage of fluid will be comparatively free during the first part of the recoil, and when the piston has passed the last of the openings into the lower part of the cylinder the water in the lower part of the cylinder will only be able to escape between the cylinder and the piston. When the gun is again run up by the springs, it is stopped quietly by

reason of the piston having an annular recess in its upper face into which a corresponding projection from the top gland enters as the gun completes its upward movement. The fluid so imprisoned in the recess can only escape slowly, and so the gun will be brought to rest quietly.

The bed of the mounting is made circular and rests and can be revolved on a circular ring of rollers. Elevating-gear for turning the gun on its trunnions and gear for turning the bed of the mounting are also provided.

The drawings annexed show a mounting constructed according to my invention.

Figure 1 is a side elevation, partly in section, of the mounting. Fig. 2 is a rear elevation, and Fig. 3 a plan, of the same. Fig. 4 is a longitudinal section through one of the carriages which support the mortar-trunnions, and through one of the recoil-cylinders and the cylindrical casing containing the springs. Fig. 5 is an inside face view of the carriage. Fig. 6 is a top view with the caps removed; Fig. 7, a cross-section through the line *a b*. Fig. 8 is a longitudinal section of one of the recoil-cylinders, and Fig. 9 is a cross-section of the same. Fig. 10 is a transverse section of the carriage in the plane of the axes of the cylinders, showing the parts in firing position. Fig. 11 is a similar view showing the parts in recoil position.

A is a base-ring or lower roller-path.

B are rollers at intervals apart resting on the base-ring. They turn on axles fixed to two rings *B'*. The rollers are flanged at each end, and the flanges come against the outer and inner sides of the base-ring.

C is a bed forming the base of the mounting. On its under side it is formed to rest upon the rollers.

D D are two standards rising up from the bed. E is the mortar situated between these two standards.

F F are the cylindrical casings containing the springs. The parts of them which are above the bed C are cast together with the standards. On the inner faces of the casings are also cast slideways *F' F'*, similar in form to the beds of lathes. G G are the carriages, which slide on these beds. They are pro-



vided with bearings for the trunnions  $E'$  of the mortar, and with square caps packed with elastic material  $E^2$  for the purpose of softening the shock in running up after recoil.

5 H are brackets extending from the carriages and entering the casings F through slots in their sides. They carry each a screw J, by which the springs can be more or less compressed to insure the mortar running out  
10 completely.

I are the springs contained in the casings. The casings are made to extend below the bed C, and the portions below the bed are formed of cast-iron cylinders secured at their  
15 upper ends by means of flanges and bolts.

K are piston-rods extending downward from the carriages G. Each rod passes through a stuffing-box at the ends of one of the hydraulic cylinders L. On the rod is a piston  
20  $K'$ , approximately fitting the interior of the cylinder. Outside the cylinder is a passage M, (see Figs. 8 and 9,) which opens at  $M'$  into the upper end of the cylinder and below the piston, when the mortar is in firing position, and  
25 has a series of openings  $M^2$  into the interior of the cylinder. The last of these openings is at a distance, say, of about three inches from the bottom of the cylinder, so that at the end of the recoil the water in this lower  
30 part of the cylinder is imprisoned and can only escape past the piston between it and the sides of the cylinder.

$K^2$  is an annular recess in the upper face of the piston  $K'$ .

35  $L'$  is a corresponding projection on the under side of the gland at the top of the cylinder L. At the end of the running up of the gun the annular projection  $L'$  enters the corresponding recess in the top of the piston,  
40 and the fluid in this recess gets imprisoned and can only escape where they do not accurately fit.

As the carriage buffers and springs at each side of the gun are not connected, cast-steel  
45 lateral guides  $M^x$  are secured to the carriage-slides and adjusted so as to bear against the body of the mortar at its breech end. By this means any tendency to move out of the vertical plane will be counteracted.

50 The elevating-gear is composed of a circular toothed arc N, secured to a hoop shrunk onto the mortar just in front of the re-enforcing hoops. A pinion O gears into this toothed arc. Its spindle is carried in bearings attached to one of the carriages G. The spindle  
55 has upon it a toothed wheel  $O'$ , into which gears a pinion P, which can be turned by a hand-wheel fast on its spindle. The wheel  $O'$  is graduated on its face, and an index Q, attached to the carriage, enables the degrees of  
60 elevation to be read off.

The traversing-gear is composed of an internally-toothed ring R, fixed by flanges and bolts to the base roller-path, and of a toothed  
65 wheel S, which gears into the toothed ring and can be rotated by a bevel-toothed wheel T on its upper end, into which gears a pinion

U, which can be turned by a crank-handle on its axis.

In the drawings the gun is shown in the position into which it is turned to be loaded. For firing it is turned into any position between forty-five and seventy-five degrees to the horizon, as indicated by dotted lines in Fig. 1.

75 The loading-gear shown in the drawings is composed of a short tray V, carried by an arm  $V'$ , pivoted to one of the side standards. On the spindle of the arm  $V'$  is a second arm  $V^2$ , carrying a nut  $V^3$ , into which screws a  
80 long screw W, so that by turning the screw by the hand-wheel  $W'$  on its end the tray can be moved toward or away from the breech end of the gun.

The shot or shell will be carried in a suitable truck, which will deliver it direct to the loading-tray when the latter is depressed into the position shown in Fig. 1. The pivots  $X'$  of a loose tray X, in which the shot or shell rests in the truck, can then be passed into  
90 notches  $V^4$  in the sides of the tray V, so that when the tray V is moved upward it will carry the loose tray X along with it and the shot or shell within the tray.

What I claim is—

95 1. The combination of the gun, the carriages supporting the gun-trunnions, the slides upon which the carriages slide, the spring-containing casings parallel with the slides, the brackets projecting from the carriages into the casings and resting upon the springs, the piston-  
100 rods extending downward from the carriages, and the hydraulic stationary recoil-cylinders in which the pistons carried by the piston-rods work.

105 2. The combination of the gun, the carriages supporting the gun-trunnions, the slides upon which the carriages slide, the spring-containing casings parallel with the slides, the brackets projecting from the carriages into the casings and resting upon the springs, the piston-  
110 rods extending downward from the carriages, the hydraulic recoil-cylinders in which the pistons carried by the piston-rods work, the toothed arc fast with the gun, the pinion O,  
115 the toothed wheel  $O'$ , and the hand-wheel P, for giving the required elevation.

3. The combination of the gun, the carriages supporting the gun-trunnions, the slides upon which the carriages slide, the spring-containing  
120 casings parallel with the slides, the brackets projecting from the carriages into the casings and resting upon the springs, the piston-rods extending downward from the carriages, the hydraulic recoil-cylinders in which the  
125 pistons carried by the piston-rods work, the circular bed upon which the parts are mounted, and the circle of rollers on which the bed rests, and mechanism for slowly turning the bed.

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