

No. 631,203.

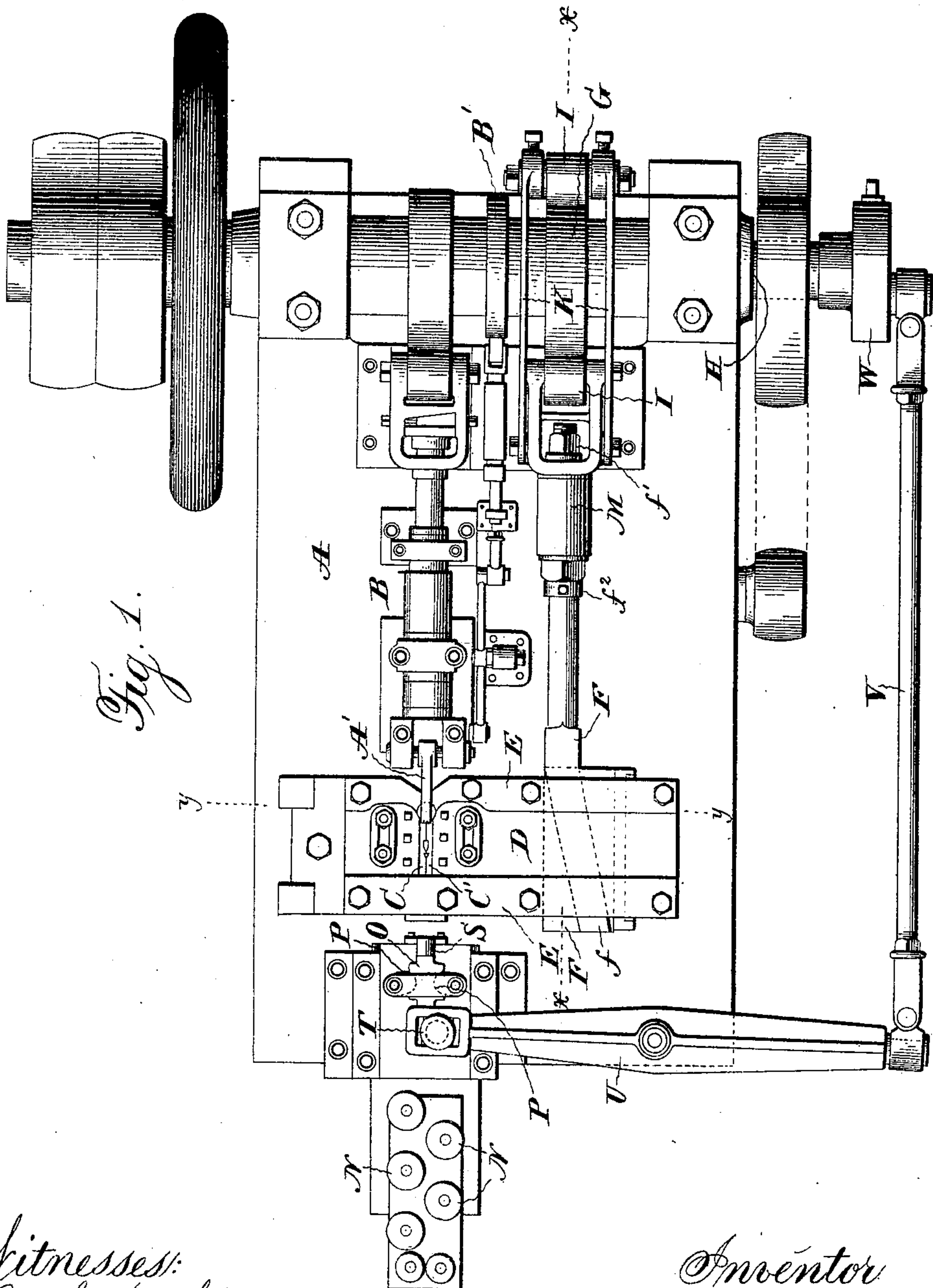
Patented Aug. 15, 1899.

C. A. DIXON.
NAIL MACHINE.

(Application filed July 7, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
Jas. E. Hutchinson.
Henry C. Hazard.

Inventor
Charles A. Dixon, by
Prindle and Russell, his Attys.

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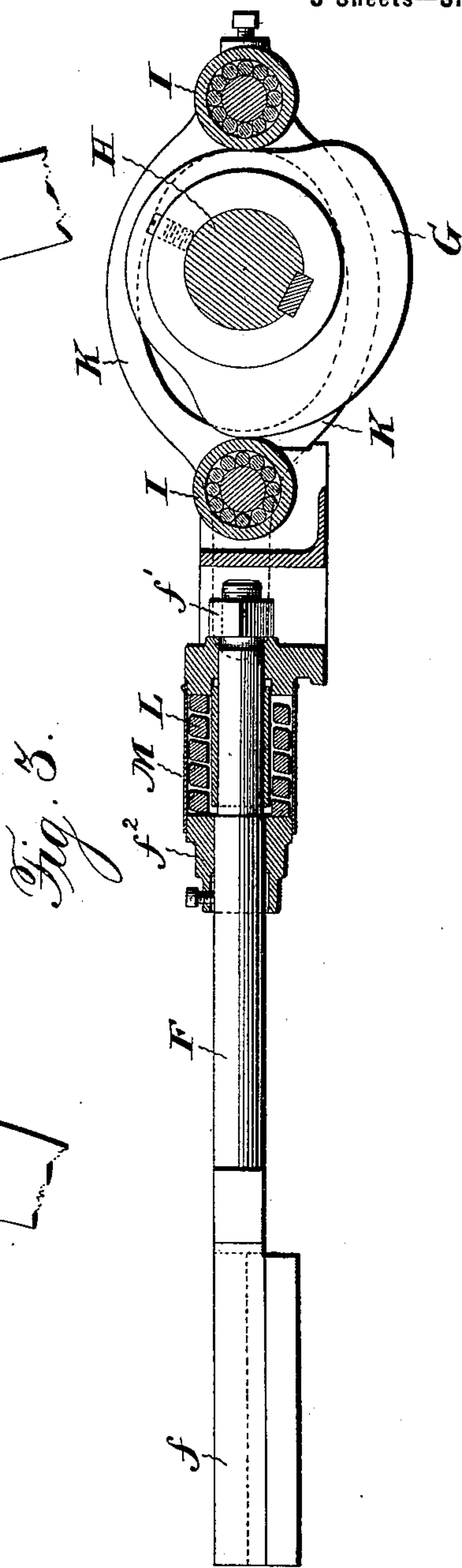
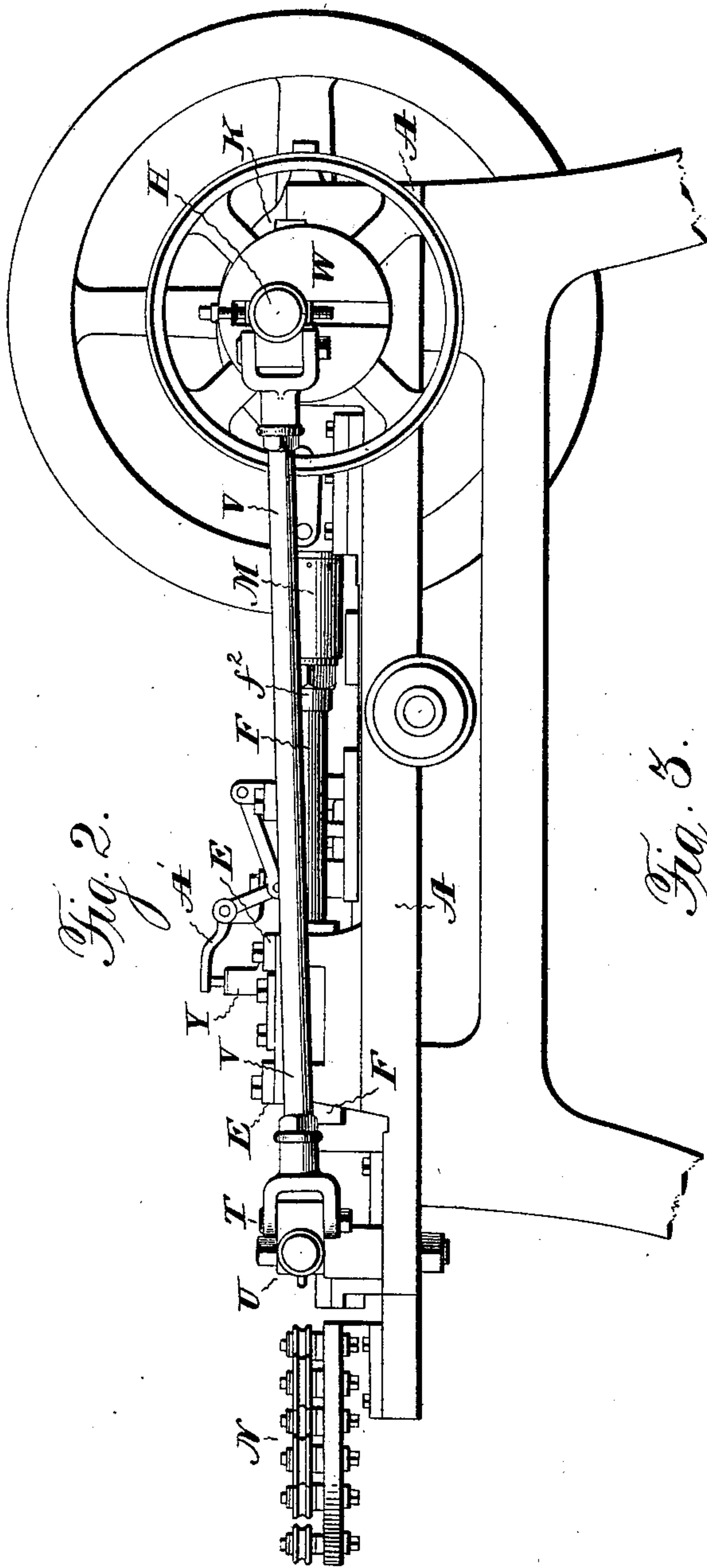
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Fig. 4.

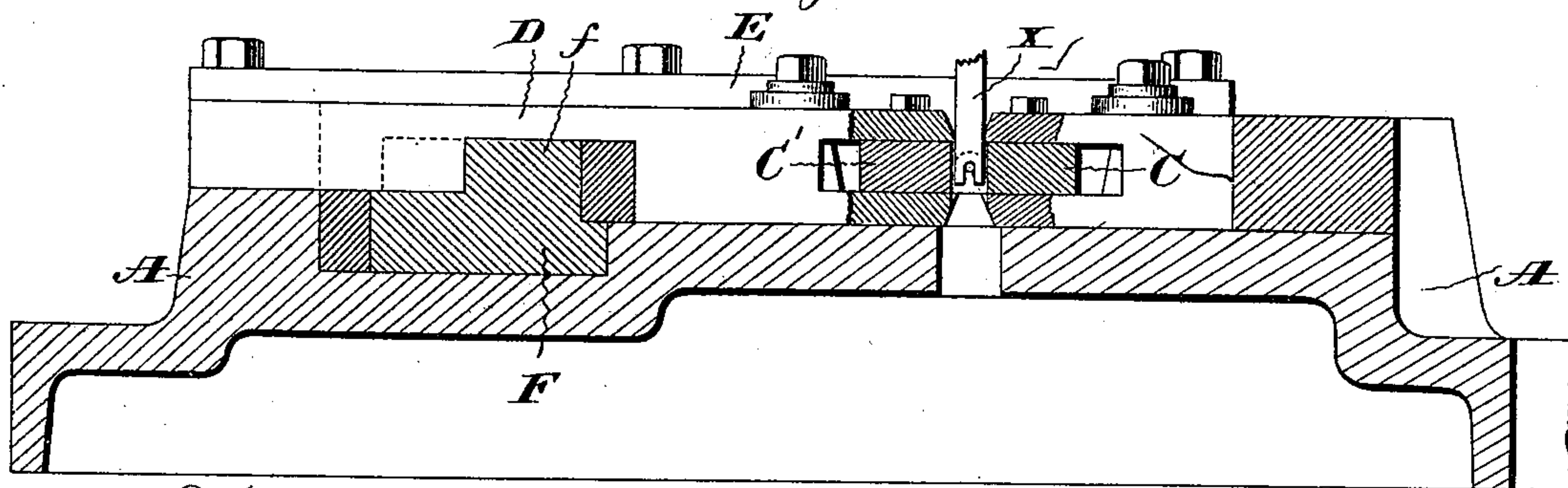


Fig. 5.

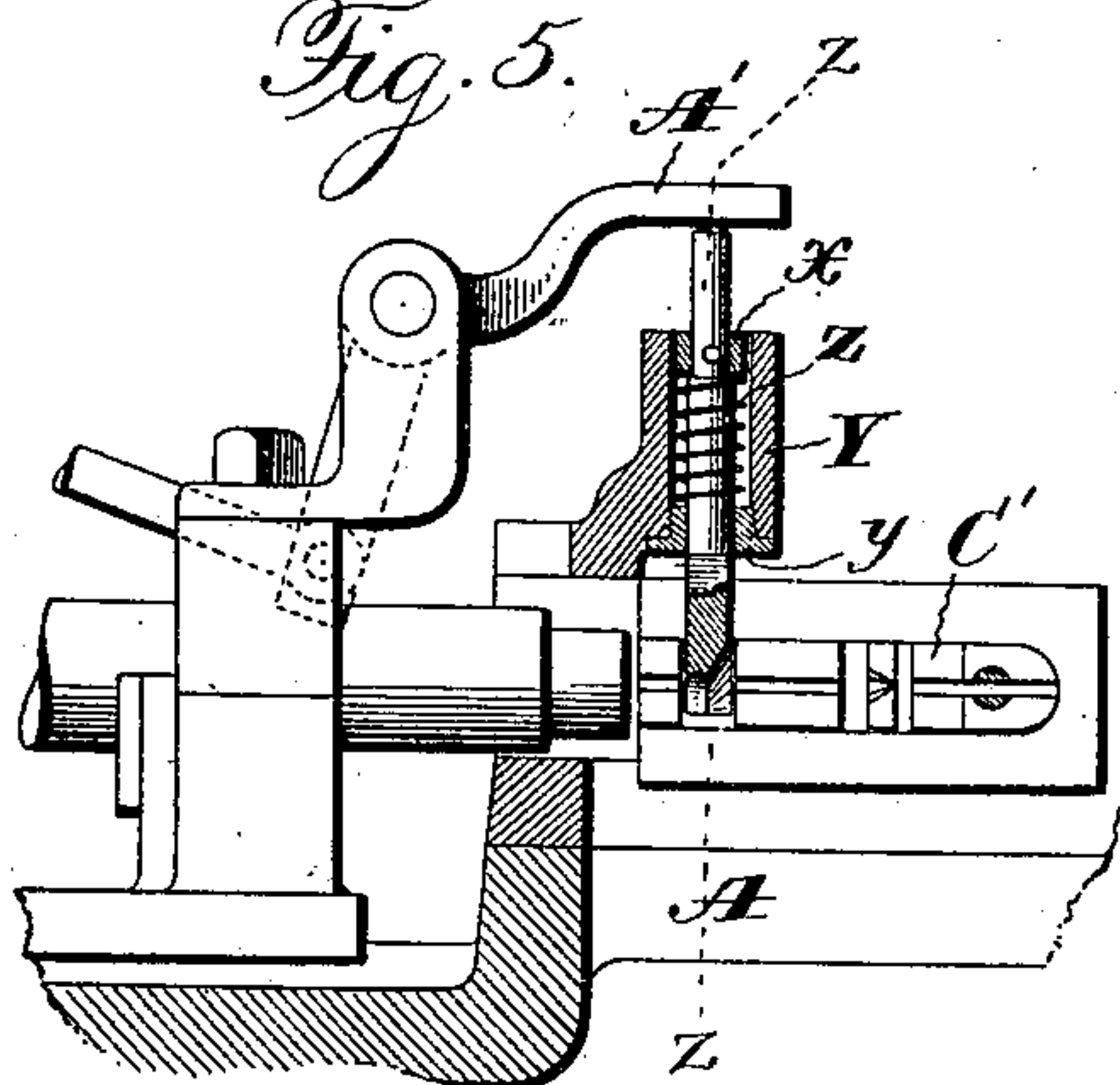


Fig. 6.

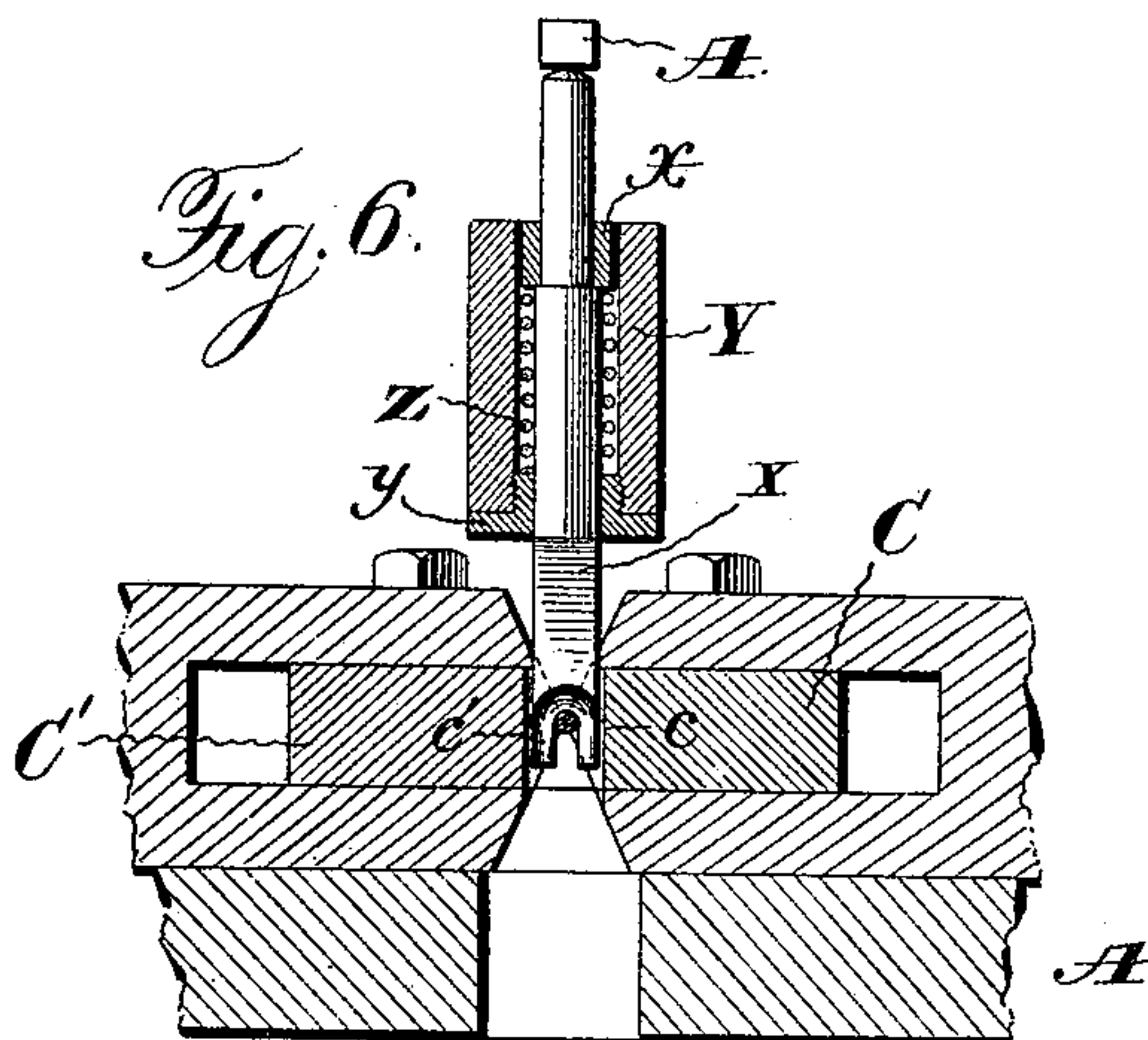


Fig. 7.

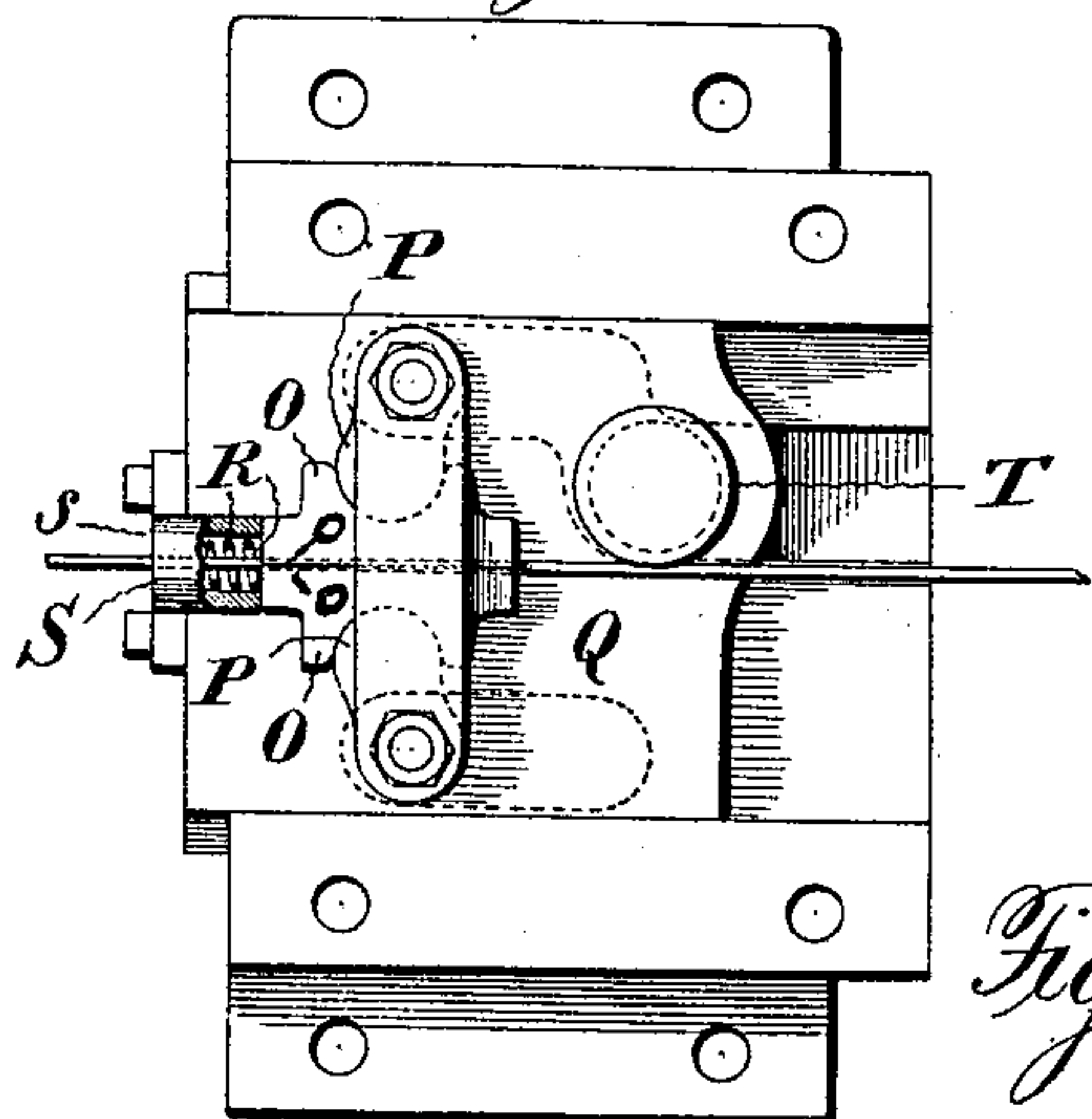


Fig. 8.

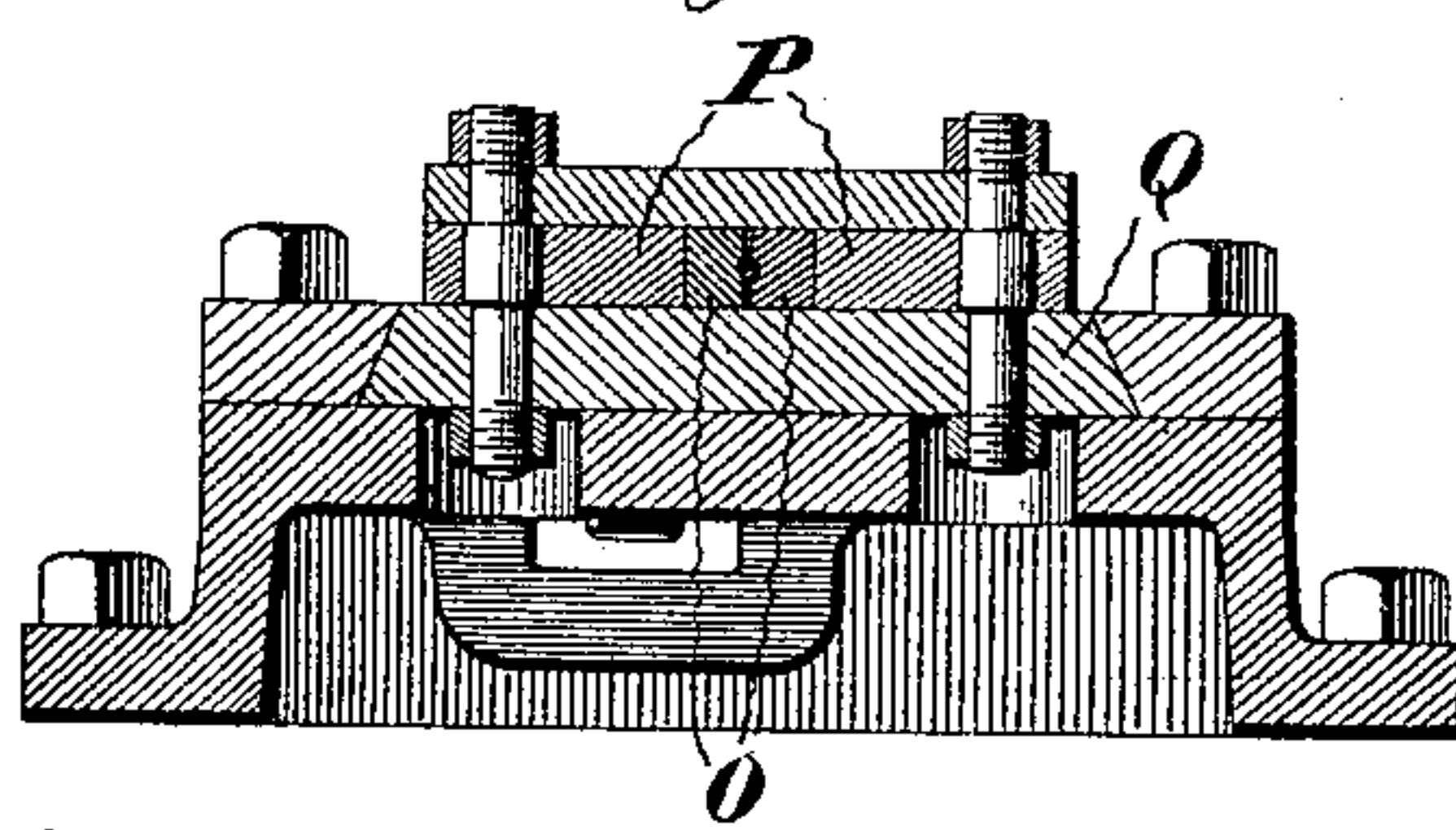
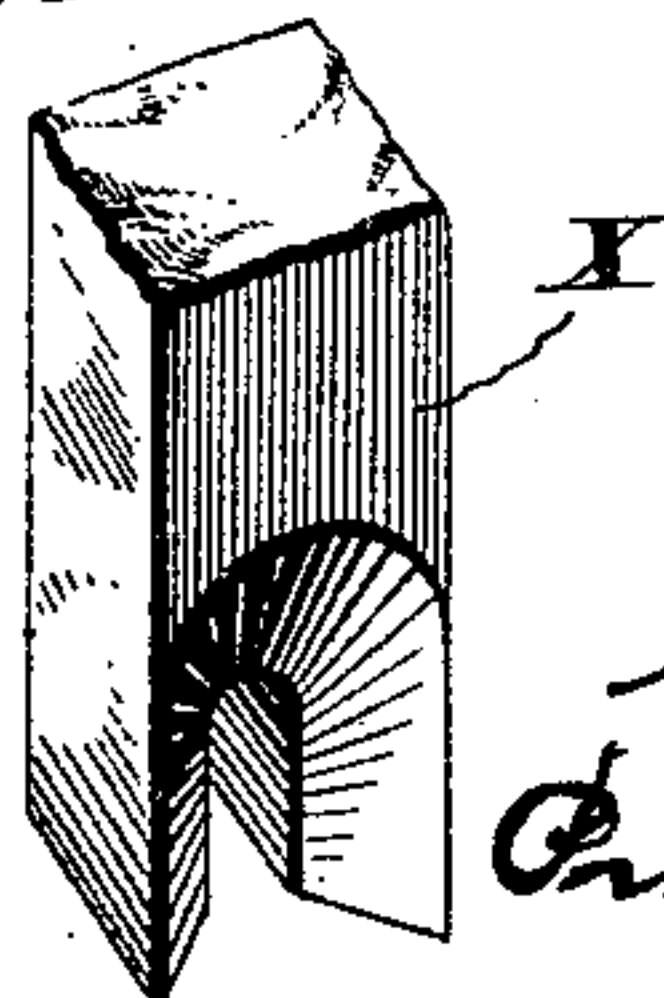


Fig. 9.



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UNITED STATES PATENT OFFICE.

CHARLES A. DIXON, OF NEWBURG, NEW YORK, ASSIGNOR TO THE A. R. WHITNEY & COMPANY, OF NEW YORK, N. Y.

NAIL-MACHINE.

SPECIFICATION forming part of Letters Patent No. 631,203, dated August 15, 1899.

Application filed July 7, 1898. Serial No. 685,327. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. DIXON, of Newburg, in the county of Orange, and in the State of New York, have invented certain new and useful Improvements in Nail-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view of a nail-machine embodying my invention; Fig. 2, a side elevation thereof; Fig. 3, a detail section on the line *xx* of Fig. 1; Fig. 4, a detail section on the line *yy* of Fig. 1; Fig. 5, a detail view, in side elevation, partly in section, of the nail-ejecting mechanism; Fig. 6, a section on the line *zz* of Fig. 5; Fig. 7, a detail top plan view of the wire-feeding mechanism; Fig. 8, a cross-section of the same, and Fig. 9 a detail view of a portion of the knock-out.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to provide certain improvements in wire-nail machines; and to such end said invention consists in the nail-machine having the features of construction substantially as hereinafter claimed.

The class of wire-nail machines to which my invention pertains is one in which wire fed from a reel is cut off in nail lengths and pointed by a two-part die and held by the cutting-off dies while the head is formed by a punch or plunger.

In the carrying of my invention into practice I mount upon a suitable bed-plate A the wire-feeding mechanism, the two-part holding and cutting-off die or clamp, and the head-forming punch or plunger, together with the actuating devices.

As the improvements sought to be covered herein have nothing to do with the head-forming punch or plunger B, it is unnecessary to give any description of it or the means for actuating it, for such are of a construction known in the art.

The two-part cutting-off die or clamp comprises a fixed member C, suitably fastened to the bed-plate, and a movable member C', that is secured to and is carried by a sliding plate D, that is placed in a guideway formed partially by the bed-plate and by bars E and

E, that overhang the top of said plate D. The reciprocation of the movable member is produced by a longitudinally-reciprocating bar F, whose line of movement is at right angles to that of said member, which has on its upper side an obliquely-arranged rib *f*, that engages an inclined groove or slot in the under side of the plate D. A guideway for the bar F is formed in the bed-plate A. It will be observed that the single rib serves to positively move the plate in both directions. For causing the reciprocation of the bar F there is a cam G on the driving-shaft H, with which cam, at diametrically opposite points, engage two rollers I and I, that are carried by a yoke K, to which the bar F is connected. Each side piece of the yoke is in the form of an oval or elliptical frame that surrounds the shaft, and the rollers I and I have roller-bearings. The single cam G by alternately acting on the two rollers I and I acts to positively move the rod F in each direction of its travel.

The end of the bar F passes through the base or connecting piece of the yoke, and upon it is screwed a nut *f'*, against which the yoke pulls in moving the bar to cause the movable clamp member to withdraw from the other. Interposed between said base on the side opposite the nut and between a collar *f*² upon the bar is a coiled spring L, that encircles the rod, through which the power of the cam is applied to the rod to move said movable member C' toward the fixed member to cut off and grip. The spring L is given such strength that under normal conditions it serves to transmit movement to the movable member C'. Should, however, there be unusual resistance to the movement of the latter or any obstruction to its complete travel—as, for example, by the doubling of the wire—the spring will yield, movement of the plate D cease, and thus damage to the machine be avoided.

The spring L is preferably inclosed by a light housing M, fastened at one end to the yoke K, which conceals the spring and protects it from flying particles of wire, dirt, &c.

The wire from the reel after passing through a series of rolls N and N passes between two similar oppositely-placed blocks O and O, having each a longitudinal wire-engaging

groove *o* in its edge that forms an extended gripping-surface that cannot nip or cut or otherwise injure the wire. Engaging a rounded notch in the side of the block opposite
 5 that having the groove is the rounded end of an arm *P*, pivoted to a plate *Q*, that reciprocates in the line of feed of the wire. Said arms incline inward and forward with reference to the wire and the direction of feed, so
 10 that the tendency from the friction of the wire on the blocks is to cause the latter to press inward upon and firmly grip the wire when the plate *Q* moves in the direction to feed and to move from and readily pass
 15 along the wire when the plate *Q* moves in the reverse direction. To insure the gripping of the blocks or jaws on the wire, a coiled spring *R*, inclosed in a housing *s* on a wire-guiding plate or bracket *S*, bears at one end against
 20 the front ends of the two blocks and yieldingly presses them rearward with sufficient force to make certain that they will grip the wire.

Connected to a pivot pin or bolt *T* on the
 25 upper side of the plate *Q* is one end of a lever *U*, that is pivoted to the bed-plate *A* and has its other end connected by a rod or pitman *V* with a crank-disk *W* on the end of the shaft *H*. By the revolution of the latter
 30 the plate is reciprocated and the wire fed to the nail-forming mechanism. The wrist-pin of the crank-disk is adjustable along a radial line to enable the travel of the feeding device to be varied to suit the length of nail to
 35 be made.

For knocking out or removing from the machine the completed nail a knock-out, consisting of a vertically-moving bar *X*, is employed, that is mounted in a position to
 40 strike the nail with its lower end at a point a short distance from its head and eject it downward from the machine through an opening in the bed-plate. The lower end of the bar is forked or bifurcated and is adapted,
 45 even in its highest position, to straddle the wire or nail, with its legs projecting down alongside of the latter, the two clamp parts *C* and *C'* being respectively provided with slots *c* and *c'* in their opposing edges to ac-
 50 commodate such legs and permit the descent of the bar. The surface of the bar adjacent to the fork on the side from which the wire comes is beveled or flared outwardly, so that should the end of the wire be awry or out of
 55 alinement it will strike such surface and be guided into proper central position.

The bar *X* is mounted in a bracket *Y*, which is secured to the top of one of the bars *E*, and has a vertical opening through which the up-
 60 per part of the bar passes, said bar having a bearing at the lower part of the opening in a plug *y*, screwed therein, and at the upper part by a collar *x*, pinned thereon that fits said opening. Within the opening in the
 65 space between the plug and collar and encircling the bar is a coiled spring *Z*, that yieldingly holds the bar in its raised position. For

depressing it to eject or knock out a nail there is employed a lever *A'*, pivoted to a bracket on the bed-plate *A*, with its free end
 70 in position to engage the upper end of the bar and adapted to be rocked to move the bar downward by means of a cam *B'* on the shaft *H*, power from which to the lever is transmitted by suitable connections. I restrict
 75 myself to no particular means for operating the knock-out bar, as under different conditions the operating means will vary.

It will be seen by placing the nail-engaging part of the knock-out so that at all times it is
 80 down in the space between the two clamp parts that said part is made use of as a wire-guide; but very little movement has to be given it to cause it to perform its function, the clamp parts do not have to be separated
 85 before it can begin its descent, and it cannot catch on the clamp parts in its descent.

As the operation of the machine has been sufficiently set forth in the foregoing description, it is considered unnecessary to further
 90 describe it.

Having thus described my invention, what I claim is—

1. In a nail-machine, the combination of the two-part clamp, one of the parts of which is
 95 movable relative to the other, a reciprocating bar, means for transmitting movement of the bar to said clamp part, a cam, a yoke or part engaging the cam, through an opening in which the bar passes, a collar on the bar, and
 100 a spring interposed between the collar and the yoke, substantially as and for the purpose described.

2. In a nail-machine, the combination of the two-part clamp, one of the parts of which is
 105 movable relative to the other, a bar reciprocating in a path that intersects the line of movement of the clamp part, a connection between said bar and part, whereby the latter is positively moved in both directions by the
 110 reciprocation of the bar, a cam, a yoke or part engaging the cam, through an opening in which the bar passes, a nut on the bar on one side of the portion of the yoke through which the bar passes, a collar on the bar on the op-
 115 posite side of the yoke, and a spring between the collar and the yoke, substantially as and for the purpose described.

3. In a nail-machine, the combination of nail-forming mechanism, and a wire-feed
 120 mechanism comprising a reciprocating part carrying wire-gripping jaws that have extended wire-engaging surfaces, and are engaged by pivoted arms, and a spring engaging said jaws, substantially as and for the pur-
 125 pose described.

4. In a nail-machine, the combination of nail-forming mechanism, a reciprocating plate, blocks upon said plate having extended wire-engaging surfaces, arms pivoted to said
 130 plate, that engage such blocks, and a spring engaging the blocks to move them in one direction, substantially as and for the purpose described.

5. In a nail-machine, the combination of nail-forming mechanism and a knock-out having a portion which, when the knock-out is retracted, extends alongside the line of feed of the wire, as it is fed into said forming mechanism, substantially as and for the purpose described.

6. In a nail-machine, the combination of nail-forming mechanism, and a knock-out having a forked nail-engaging end with a wire-guiding surface, which, when the knock-out

is retracted, lies in the line of feed of the wire as it is fed into said forming mechanism, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 22d day of June, 1898.

CHAS. A. DIXON.

Witnesses:

C. L. WARING,
M. MCBURNEY.