(No Model.) 3 Sheets—Sheet 1.

C. T. STARBUCK.

HORSESHOE BLANK FINISHING MACHINE.

No. 581,924. Patented May 4, 1897.

Fig.1.

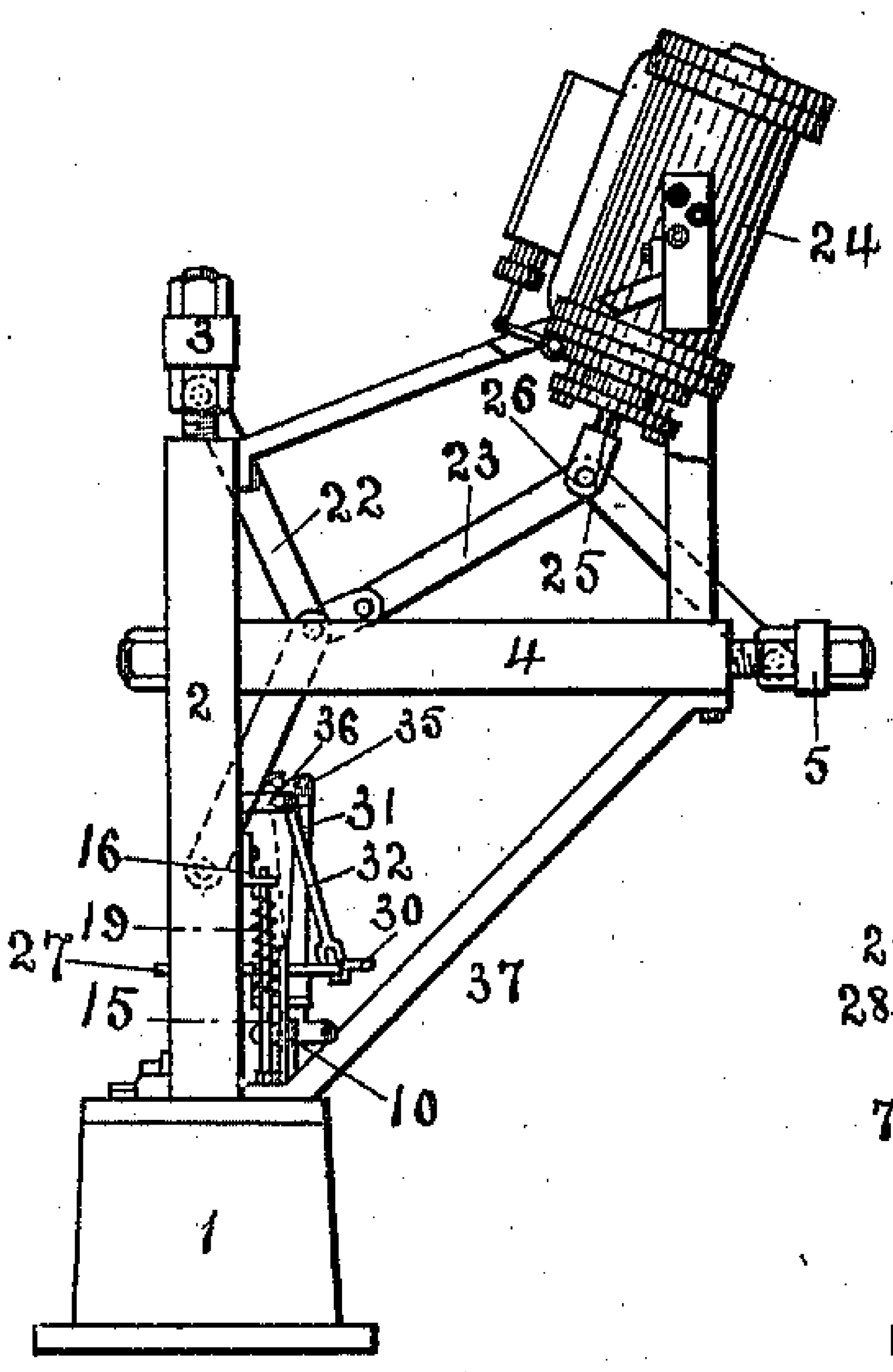


Fig.2.

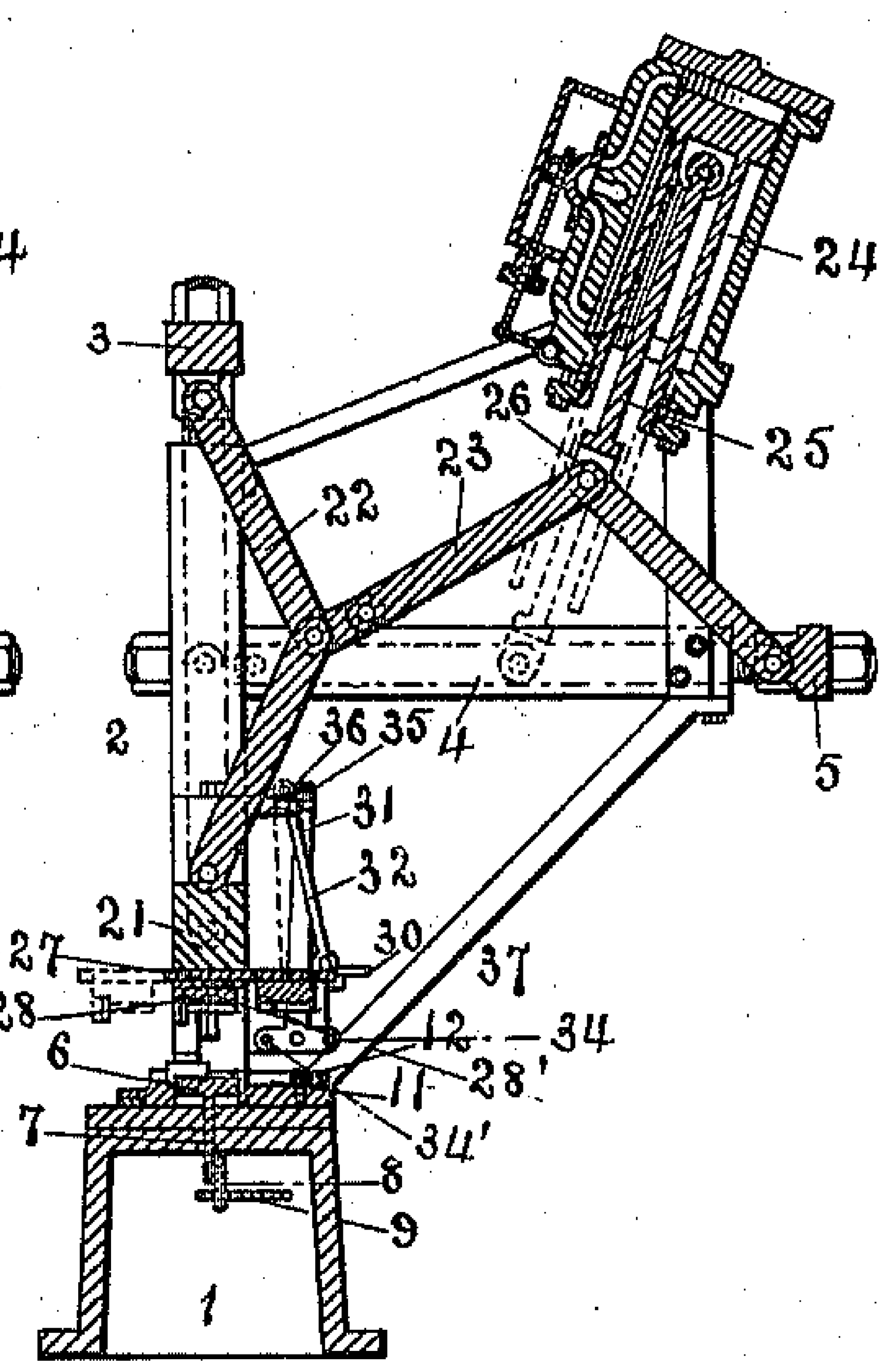


Fig.3.

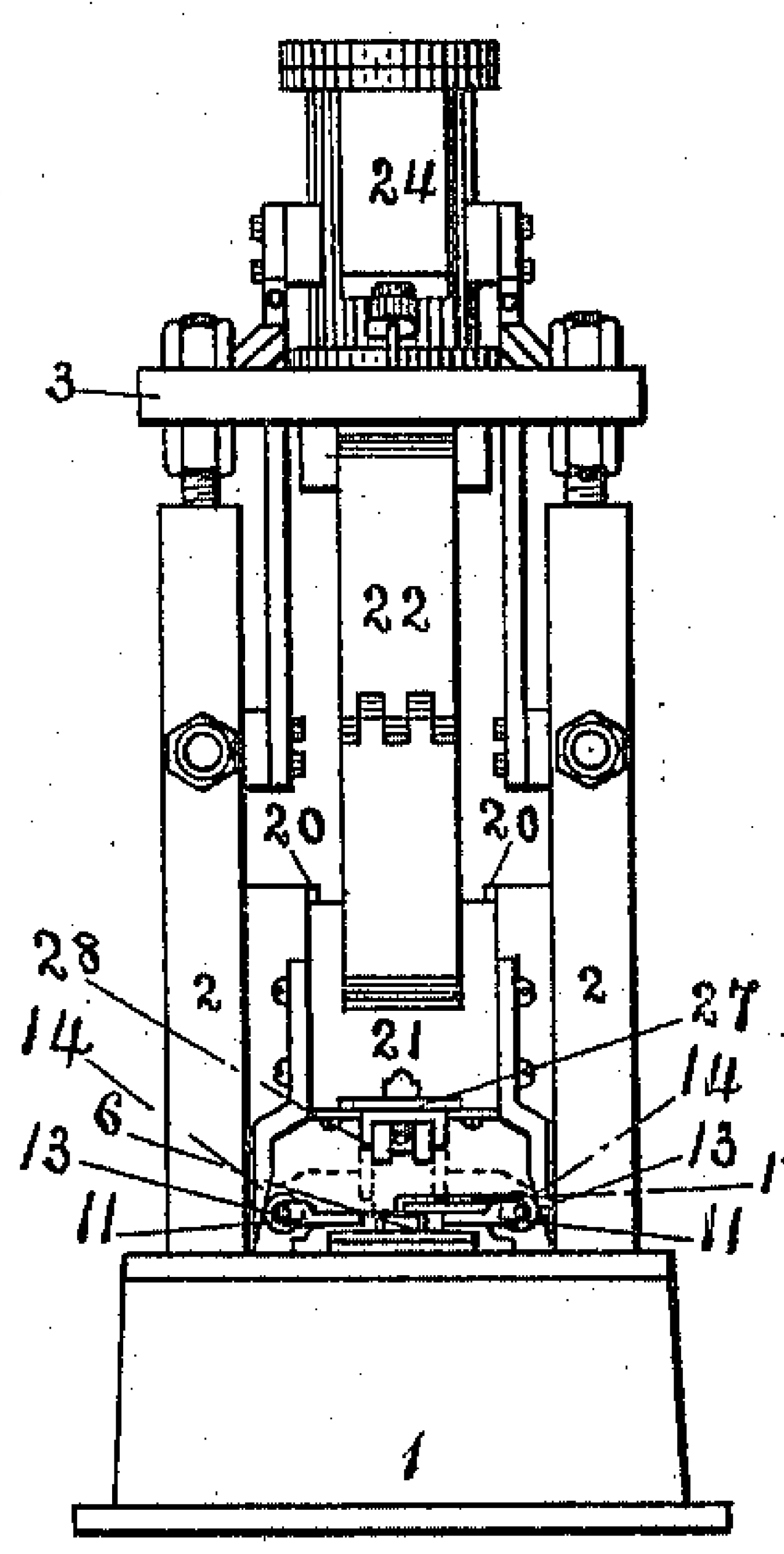


Fig.4.

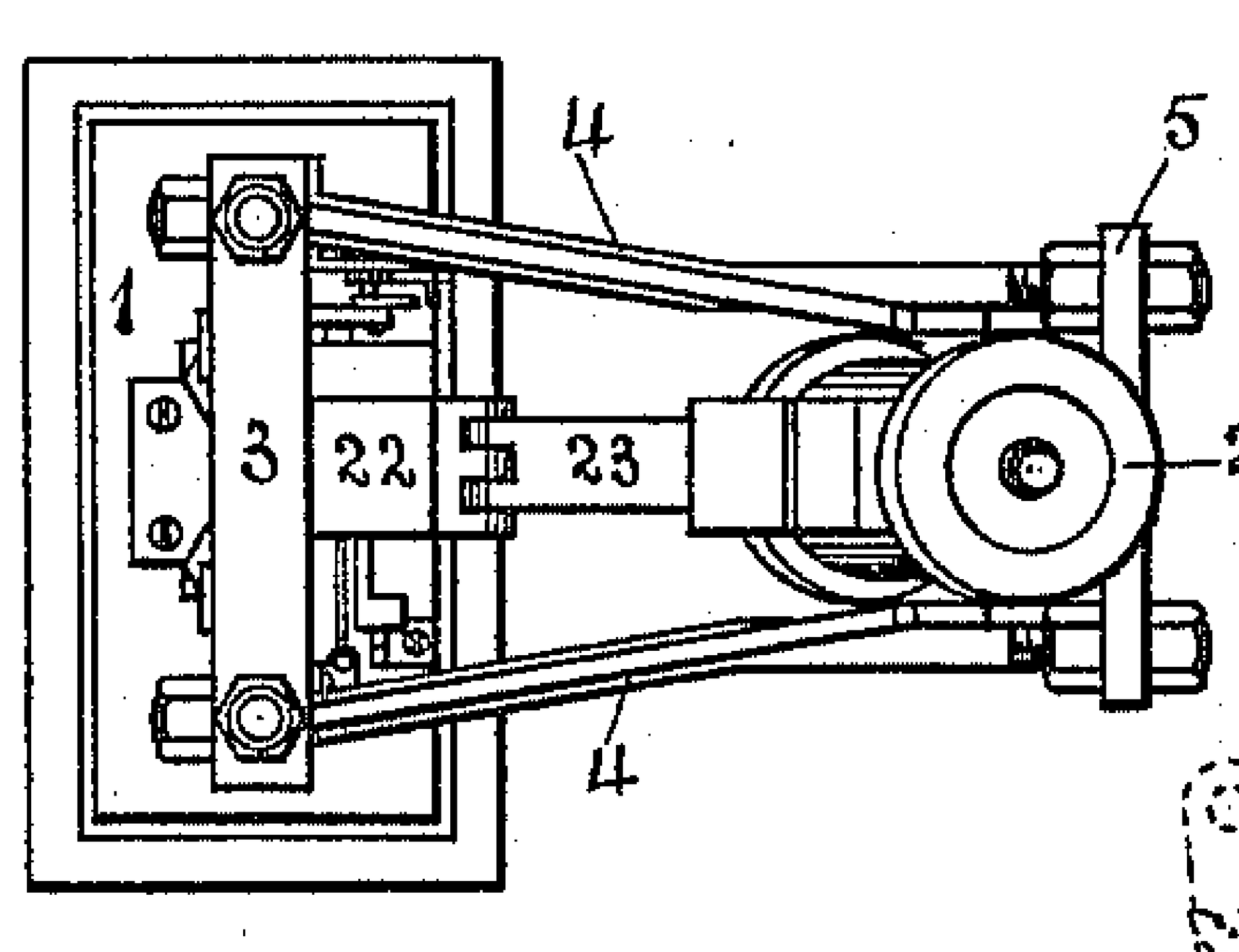


Fig.5.

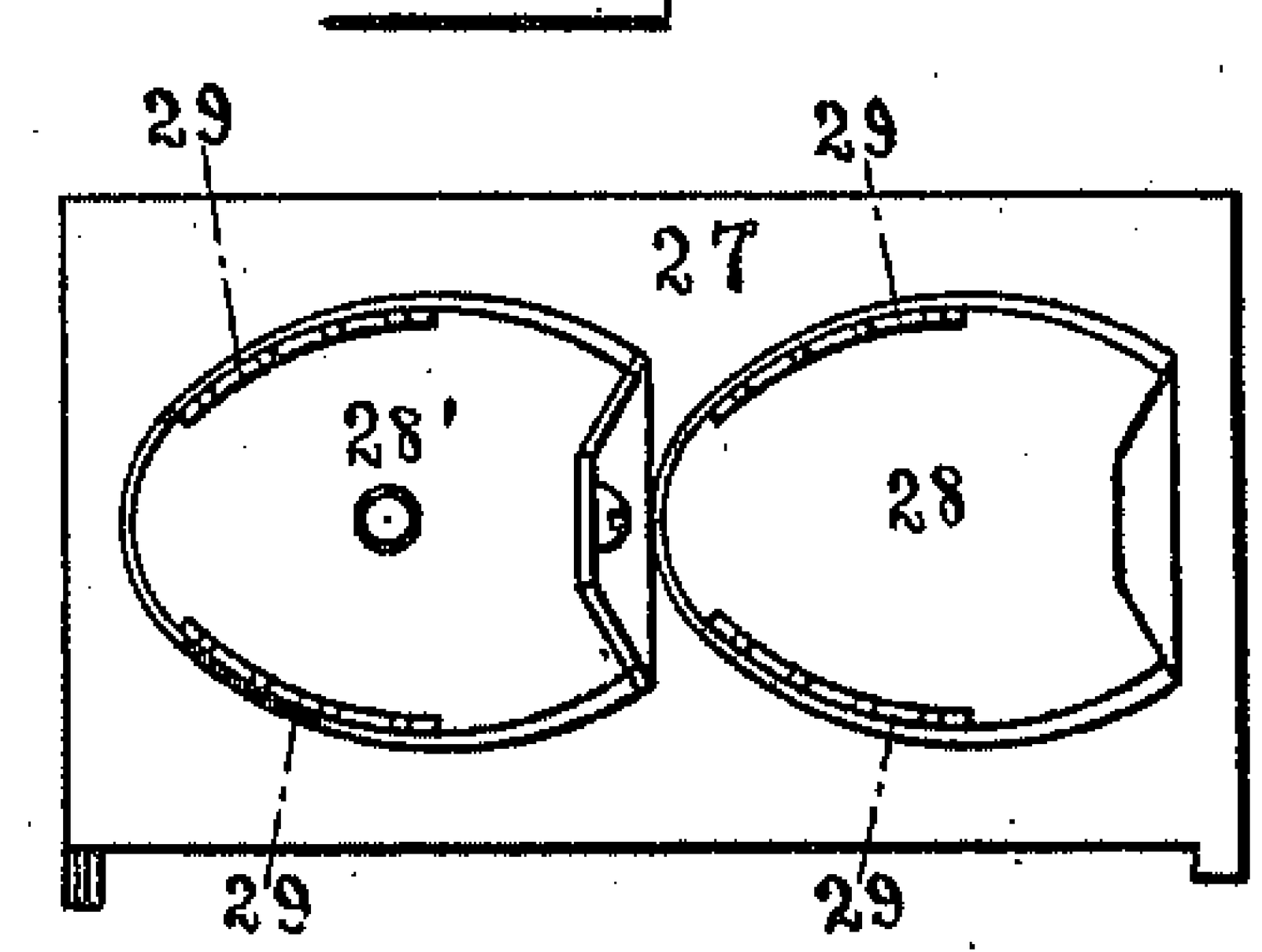


Fig.6.

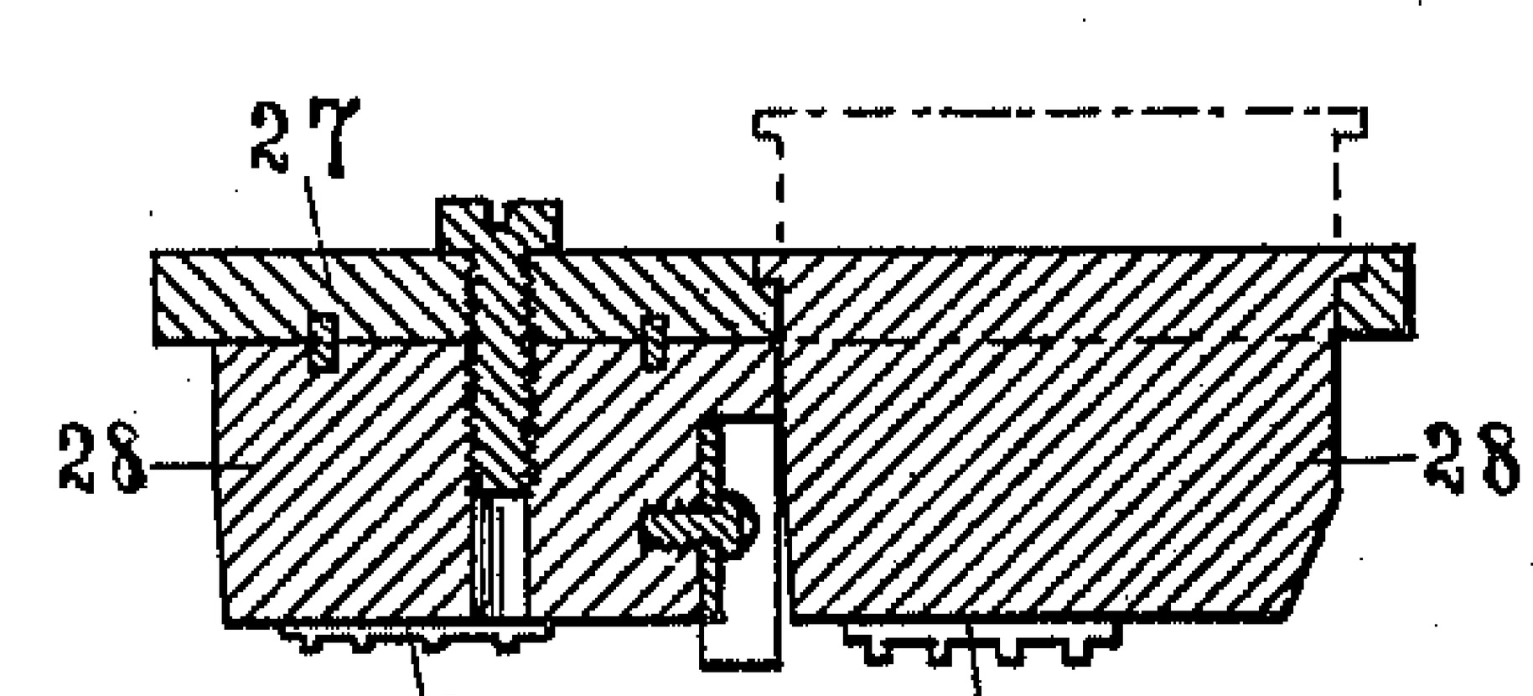
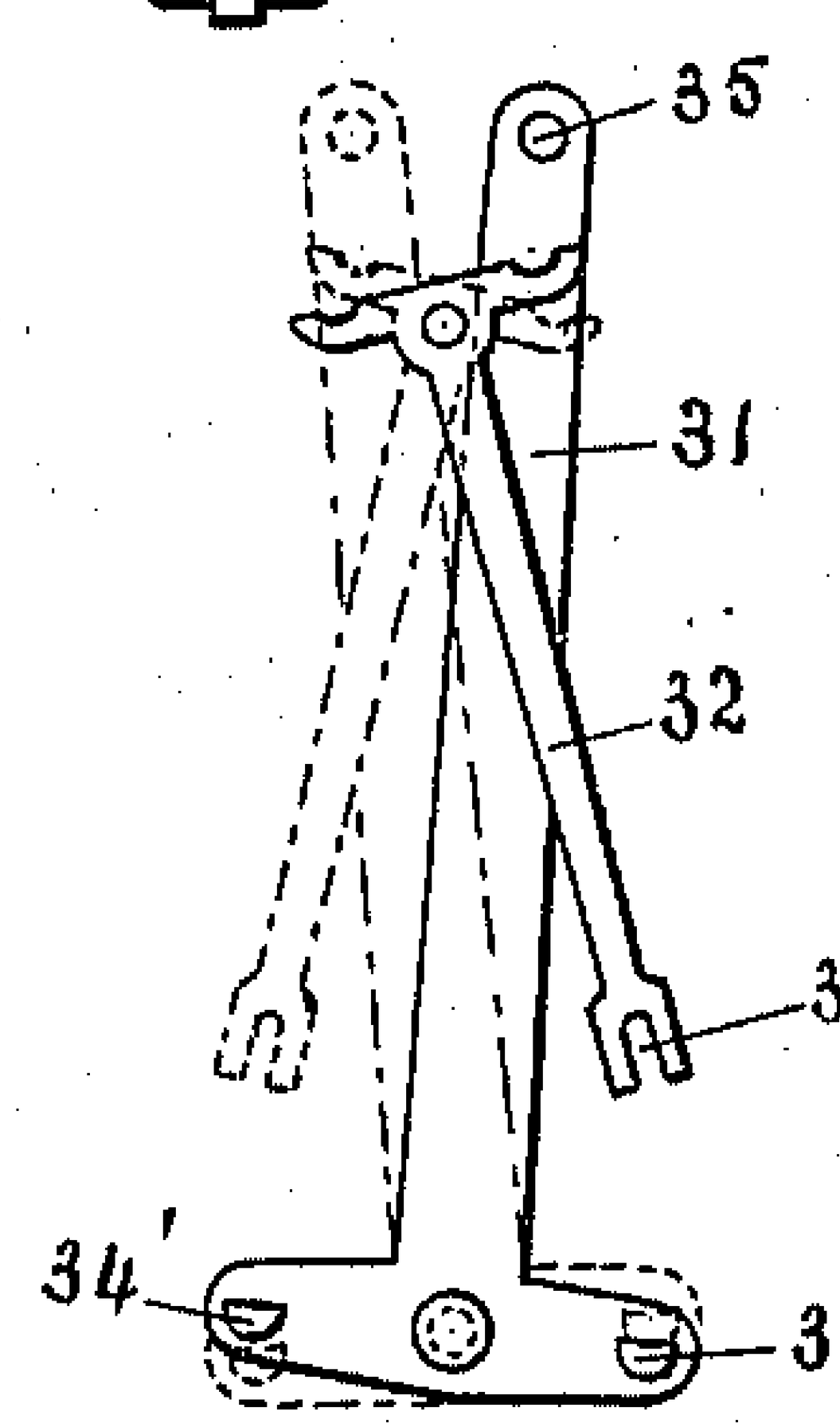


Fig.7.



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By his Attorney P. Byrne

(No Model.) 3 Sheets—Sheet 2.

C. T. STARBUCK.

HORSESHOE BLANK FINISHING MACHINE.

No. 581,924. Patented May 4, 1897.

Fig. 8.

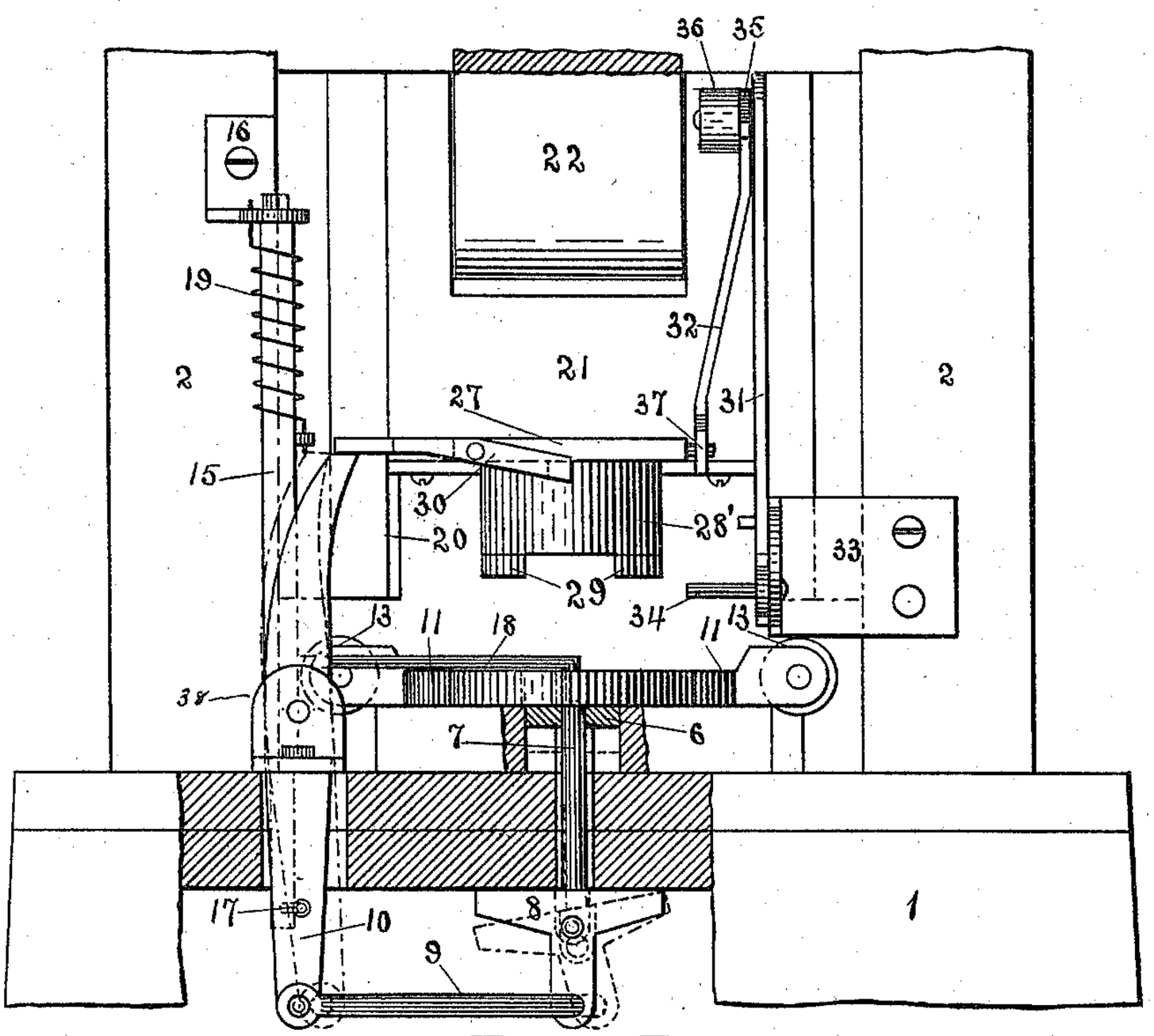
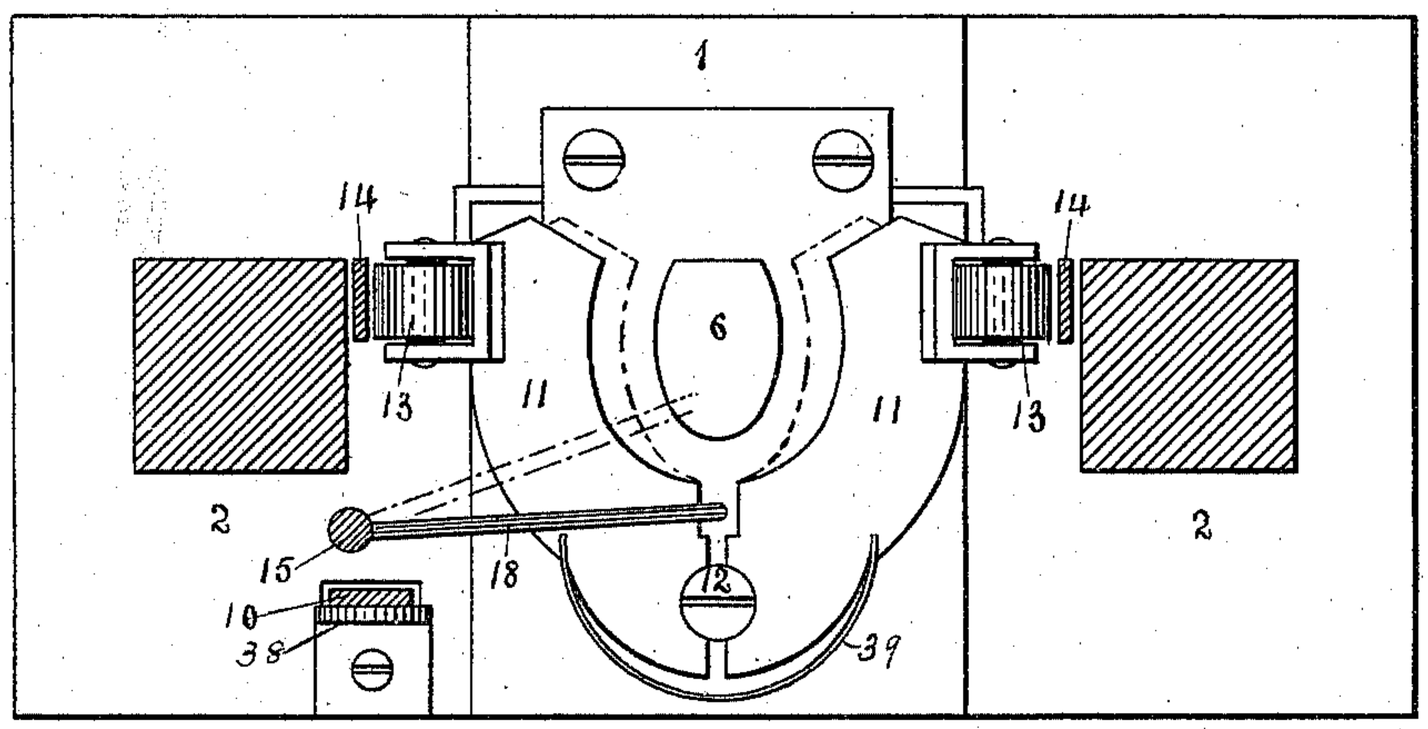


Fig. 9.



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(No Model.)

3 Sheets—Sheet 3.

C. T. STARBUCK.

HORSESHOE BLANK FINISHING MACHINE.

No. 581,924. Patented May 4, 1897.

Fig. 10.

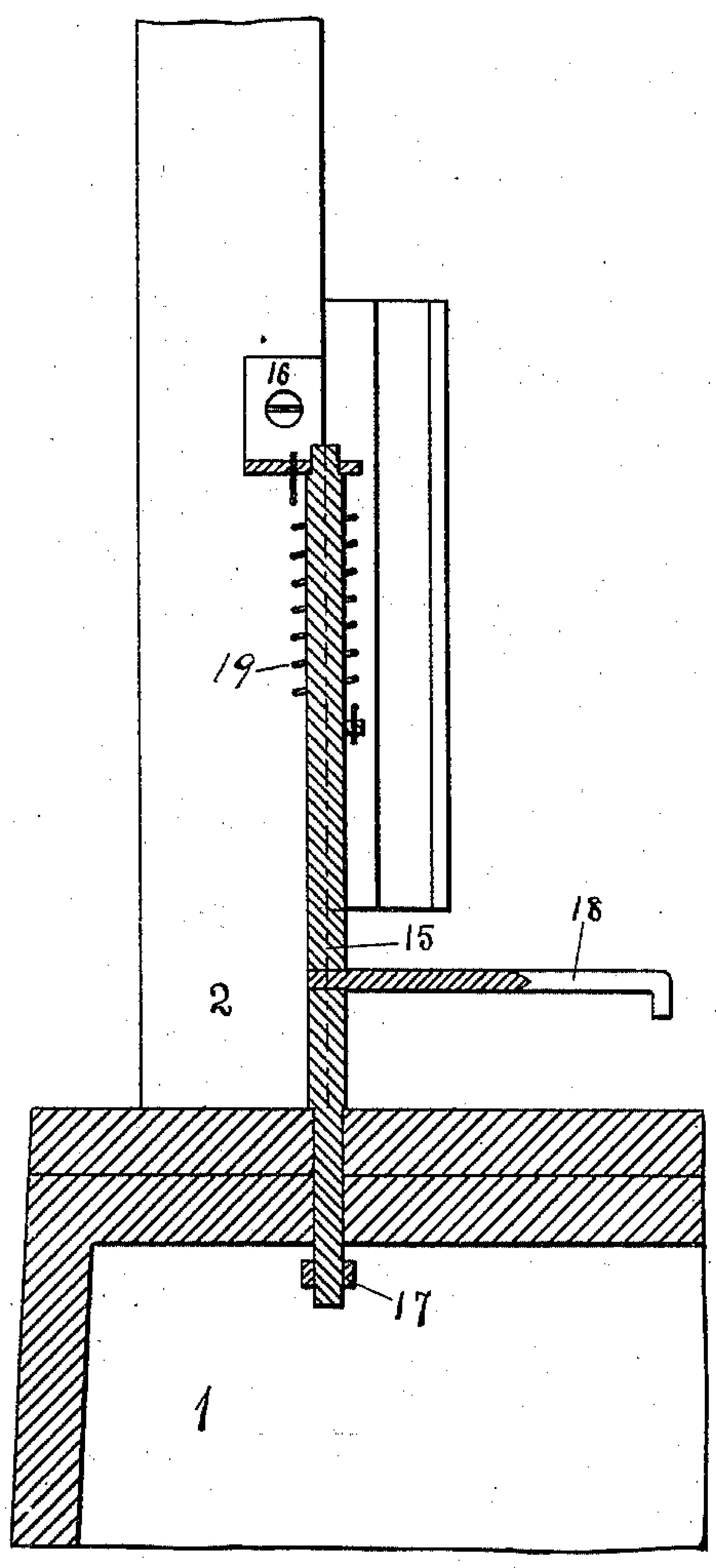
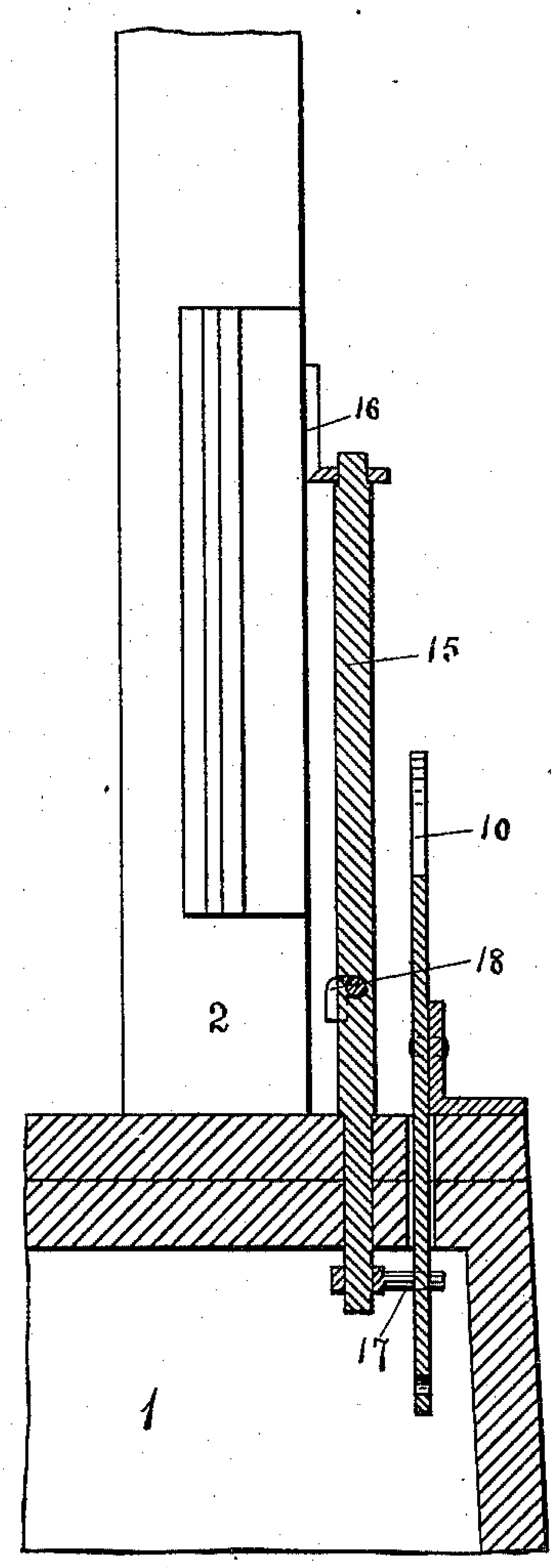


Fig. 11.



Witnesses

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C. B. Rinehart

Inventor

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By his Attorney D. Byrne

UNITED STATES PATENT OFFICE.

CALVIN THOMAS STARBUCK, OF AVONDALE, ALABAMA.

HORSESHOE-BLANK-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 581,924, dated May 4, 1897.

Application filed December 19, 1895. Serial No. 572,686. (No model.)

To all whom it may concern:

Be it known that I, CALVIN THOMAS STARBUCK, a citizen of the United States, residing at Avondale, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Horseshoe-Blank-Finishing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in that class of horseshoe-blank-finishing machines in which a vertically-reciprocating presser in conjunction with side jaws finishes the formation of the shoes; and the objects of my improvements are, first, to provide a horseshoe-blank-finishing machine having a forming-die connected with the base of the machine to form the inside shape of the shoe; second, to provide two side jaws pivotally attached to the base and means to operate the same to press the shoe-blank against the inside, thereby shaping the blank to conform to the space between the jaws and the die; third, to provide a machine having a vertically-reciprocating presser, the presser carrying creasers and punches to crease and punch the shoe-blank; fourth, to provide a horizontal reciprocating slide in the presser-block, the slide carrying two dies having creasers and punches, the dies operating alternately on the blank, as described. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical side view of my improved machine. Fig. 2 is a vertical sectional view of the same through the center. Fig. 3 is a vertical front view of the machine. Fig. 4 is a top view of the same. Fig. 5 is an enlarged detail bottom view of the slide with creasing and punching dies attached. Fig. 6 is a vertical sectional view of the same through the center, the slide being turned to its proper position with the dies on the under side. Fig. 7 is an enlarged detail view of the slide-operating levers. Fig. 8 is an enlarged detail vertical back view of a part of the machine, showing the dies and operating machinery on the back side, a part of the base being broken out to show the connections on the inside. Fig. 9 is an enlarged detail top view of the base to show the forming-die, the jaws, and other attachments. Fig. 10 is an enlarged detail vertical longitudinal sectional view of a part of the machine through the center of the vertical upright 15. Fig. 11 is a detail vertical cross-sectional view of the same through the center of the vertical upright 15.

Similar figures refer to similar parts throughout the several views.

The base 1 is made of cast-iron or other suitable metallic material and can be formed in any desired manner. Two vertical metallic uprights 2 2 extend upward from the base. The uprights are connected at the heads by a beam 3. The beam is connected as shown or in any suitable manner. Two horizontal arms 4 4 extend outward at a right angle from the uprights. The arms are connected at their outer ends by a beam 5, attached thereto. Suitable braces, as shown, are attached in any desired manner to the uprights and arms, the whole constituting the framework of the machine.

The forming-die 6 is made of any desired metallic material and is fitted in a suitable recess formed in the base, and the recess allows the die to drop, when necessary, below the top face of the base. A stem 7 extends downward from the die through the base and connects with a rock-lever 8. The rock-lever bears against the under side of the base-plate. A connecting-rod 9 connects the rock-lever with a vertical lever 10. The vertical lever is pivotally connected to an angle-plate 38, the angle-plate being attached to the upper face of the base. The vertical lever 10 is operated, as hereinafter described, to depress the die and allow the shoe-blank to be removed when finished.

The side jaws 11 11 are made of any desired metallic material and are pivotally connected in any desired manner at their back ends 12 to the face of the base, a spring 39 being attached to the jaws in any suitable manner to keep them extended, as shown. Rollers 13 13 are journaled in the jaw-frames and are operated by downwardly-projecting wedges attached to the presser-block, to be hereinafter described. The presser-block when de-

scending forces the wedges behind the rollers to close the jaws.

A vertical upright 15 is journaled at its lower end in the top plate of the base. The end of the journal extending through the top plate is provided with a crank 17, extending at a right angle, the crank being connected to the bottom part of the vertical lever 10, heretofore described. The top end of the upright is journaled in an angle-plate, the plate being attached to one of the uprights 2. The upright 15 has attached thereto a horizontal arm 18, which extends to the center of the die 6 and is turned downward on the outer end at a right angle. The upright, when turned by the action of lever 10, as hereinafter described, throws the finished shoe by the action of the arm 18 from the machine, a coiled spring 19 being provided to reverse the movement and bring the arm back to place.

Two V-slides 20 20 are attached to the inside of the uprights 2 2. A reciprocating presser-block 21 operates on the slides, the block being pivotally attached to a knuckle-joint lever 22. The knuckle-joint lever has a hinged joint in the center, the upper end of the lever being pivotally attached to the top beam 3 of the frame. A second knuckle-joint lever 23 is pivotally attached at one end to the center of lever 22, the lever 23 being provided with a hinged joint in the center, the outer end being pivotally attached to the connecting-beam 5 of the projecting arms of the frame.

A steam-cylinder 24 of any suitable construction is mounted on braces attached to the projecting arms of the frame. The cylinder is provided with a piston-rod having bifurcated jaws formed on its outer end, the said jaws being pivotally connected to the center hinge of lever 23. The piston-rod when up actuates the lever, as shown. The piston-rod when extended from the cylinder pushes the levers to the position shown by dotted lines, thereby giving a reciprocating motion to the presser-block.

A sliding die-plate 27 is fitted in suitable slides formed on the under side of the presser-block. The die-plate carries two dies 28 28′, the dies being provided with combined crease and nail-hole formers 29 29, the finishing-formers on die 28′ extending below the formers on 28. A trip-lever 30 is pivotally attached at one end of the slide and operates the center former and the throw-off, as hereinafter described. The die-slide is operated by the combined levers 31 and 32, the lever 31 having a T-head formed on its lower end and being pivotally connected to an angle-plate 33, the angle-plate being attached to one of the uprights 2.

The arms of the T-head are provided with pins 34 34′, and the head of the lever is provided with a pin 35, all the pins extending outward at a right angle. The lever 32 has a T-head formed on its upper end and is pivotally connected to an arm 36, attached to the presser-block, the lower end of the lever being provided with a forked end 37, which engages a pin formed on the die-slide plate 27.

In operation, the levers being in the position shown in detail, Fig. 7, the slide would project to the back. If the presser-block is ascending, it will bring the right-hand side of the T-head on lever 32 against the pin 35, projecting from the head of lever 31, and the action of the pin on the lever will throw it to the position shown by dotted lines, thereby forcing the die-slide to the front. When the presser-block descends, the end of the forked lever presses on the projecting pin 34′ of the lever 31, throwing the lever to the position shown by dotted lines, and the next ascent of block will bring the opposite arm of lever 32 in contact with the pin 35, thereby drawing the die-slide to the back, and it will continue to alternate in the same manner with each up-and-down motion of the presser-block. The die-slide when projecting to the front brings the trip-lever 30 in line with the vertical lever 10, and as the presser-block descends the lever trips and passes the head of lever 10 and drops to a horizontal position when it reaches the concave face of the lever 10. On the upstroke lever 10 is pressed back, as shown by dotted lines, to drop the forming-die and to throw the finished shoe out by the swing of the horizontal arm 18, as shown by dotted lines in Fig. 8. On the next downstroke, the die-slide having moved to the back, the trip-lever will not come in contact with lever 10, but it will continue on each alternate stroke to drop the die and discharge the finished shoe, as above described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a horseshoe-blank-finishing machine the combination with a main frame having combined knuckle-joint levers 22 and 23 pivotally attached thereto at one end, a pressing-block pivotally attached to one end of lever 22 the block carrying a sliding die-plate 27, a rock-lever 31 pivotally attached to the frame, a lever 32 pivotally attached to the presser-block the lever being connected by a forked end to a pin formed on the end of the die-plate, substantially as and for the purpose described.

2. In a horseshoe-blank-finishing machine, the combination with a main frame having combined knuckle-joint levers and a presser-block attached thereto, the pressing-block provided with a sliding die-plate carrying a pivotally-connected trip-lever 30, a vertical lever 10 pivotally connected to the base the lever being connected to a rock-lever 8, by means of the rod 9, and the rock-lever connected to a forming-die 6 to actuate the latter, substantially as described.

3. In a horseshoe-blank-finishing machine, the combination with a main frame having combined knuckle-joint levers and a presser-block attached thereto, the presser-block pro-

vided with a sliding die-plate carrying a pivotally-connected trip-lever 30, a vertical lever 10 pivotally connected to the base, the lever connecting with a vertical upright journaled at both ends, the vertical upright provided with an extending arm 17, substantially as and for the purpose described.

4. In a horseshoe-blank-finishing machine, the combination with a main frame having combined knuckle-joint levers and a presser-block attached thereto, two curved jaws pivotally connected to the base, the jaw-frames carrying rollers journaled therein, two wedge-shaped downwardly-projecting arms attached to the pressing-block, the arms operating against the rollers to press the jaws inward as the block descends, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

CALVIN THOMAS STARBUCK.

Witnesses:

JAS. J. CURTIS,

A. J. SULLIVAN.