

(No Model.)

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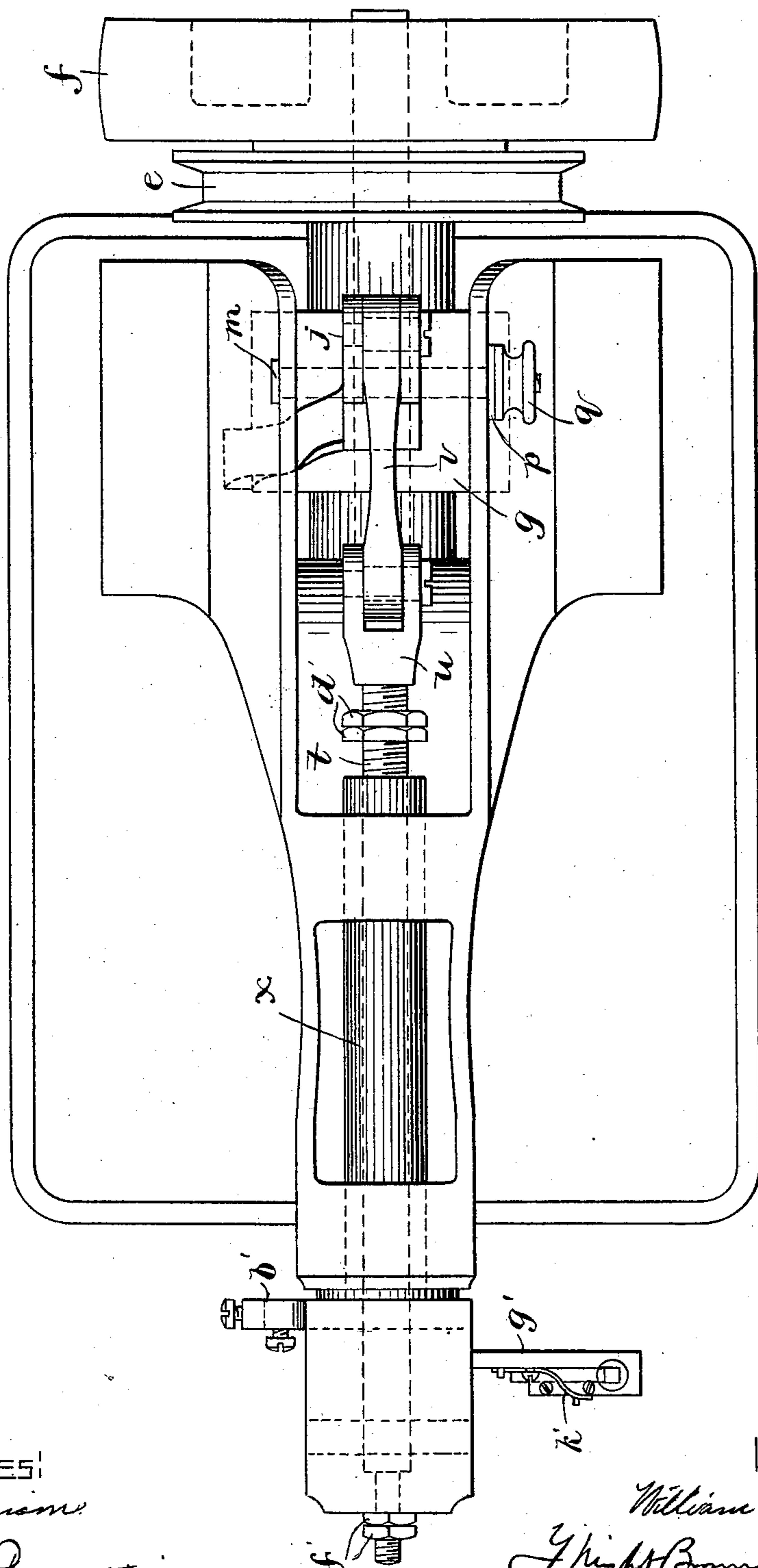
W. C. COLLYER.

SEWING MACHINE FOR LASTING BOOTS OR SHOES.

No. 591,327.

Patented Oct. 5, 1897.

FIG. 1 -



WITNESSES:

*A. D. Hanson*

*P. W. Pizzetti*

INVENTOR:

*William C. Collyer*

*J. Hight Brown & Quincy*  
*Atty*

(No Model.)

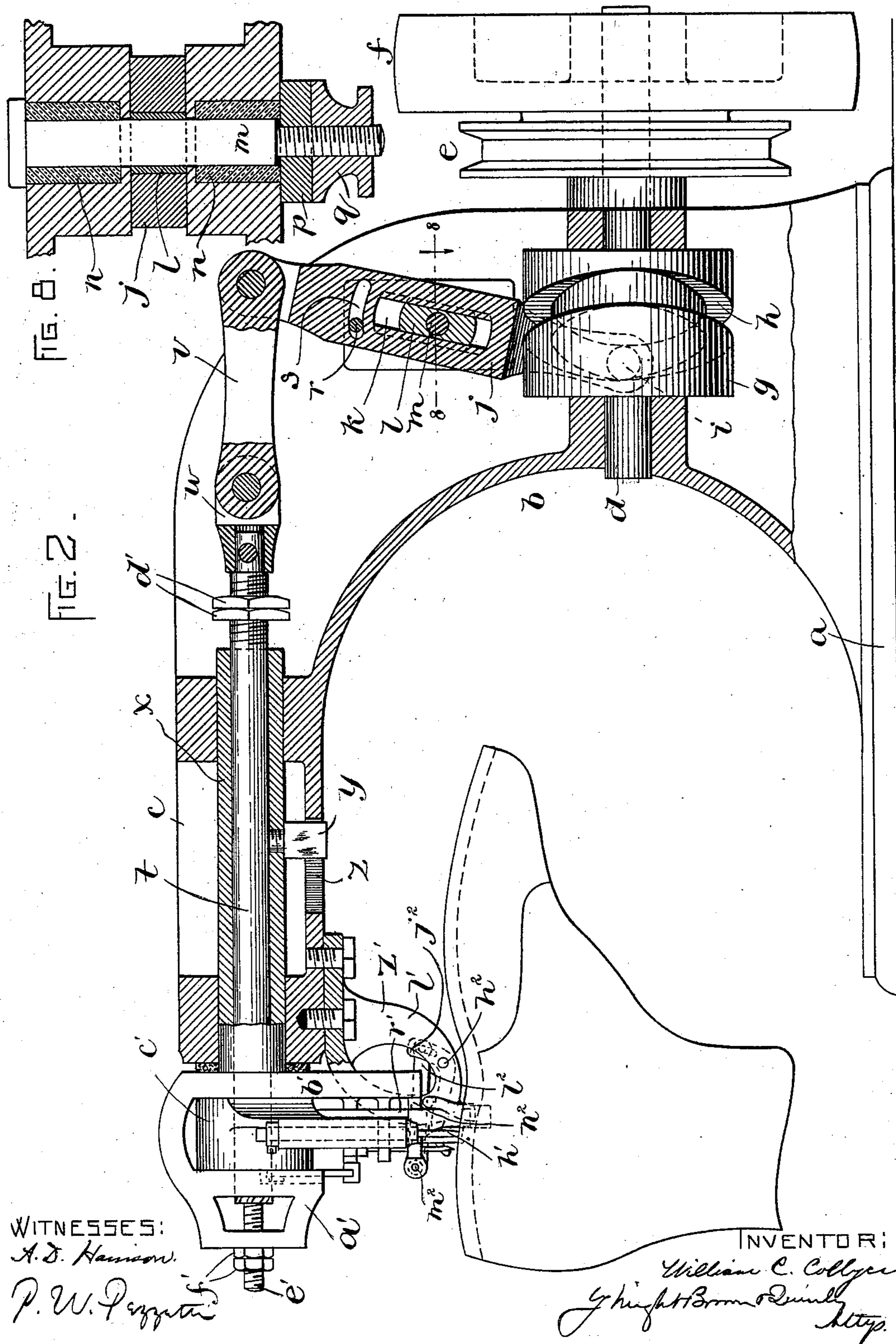
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W. C. COLLYER.

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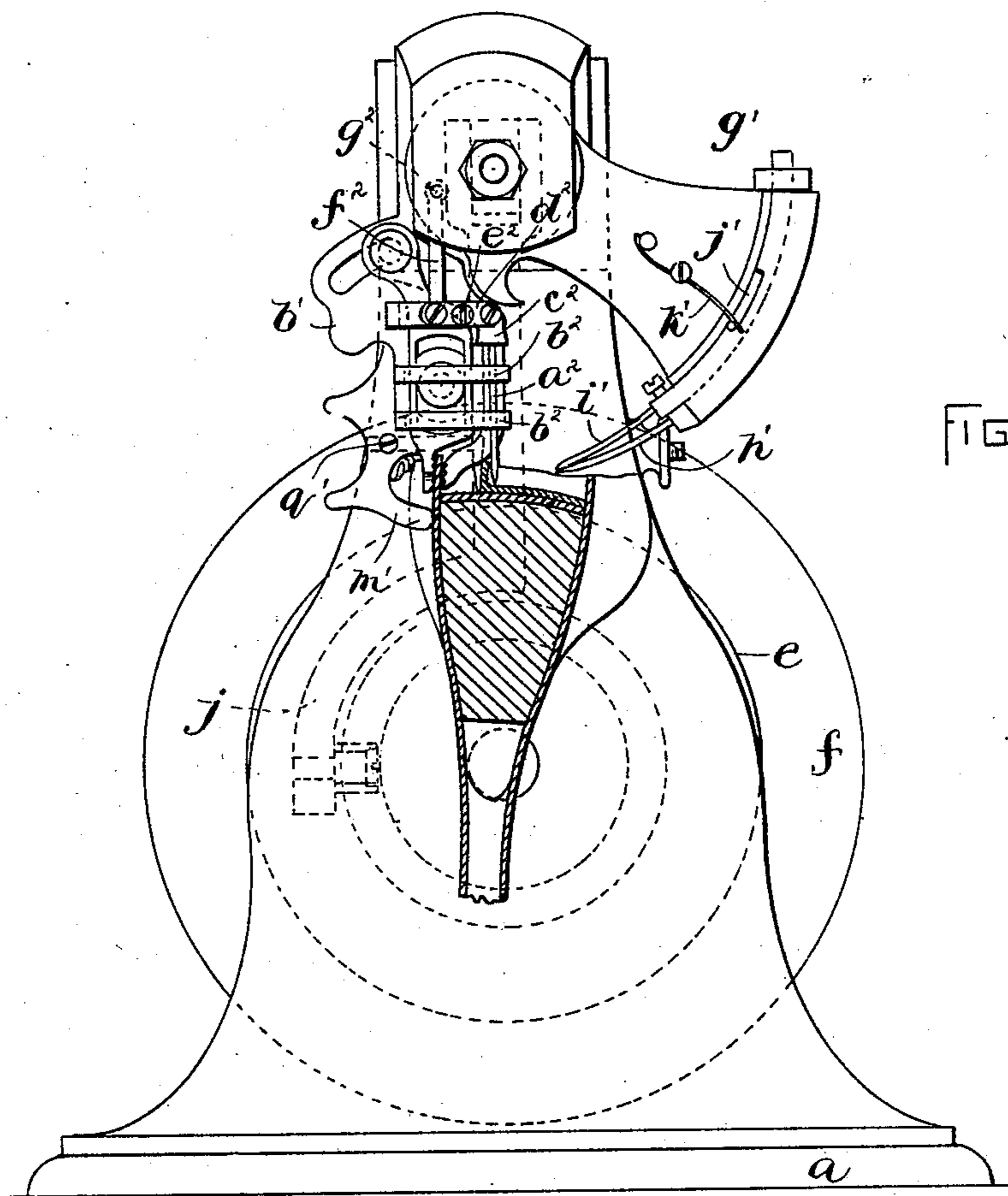


FIG. 3.

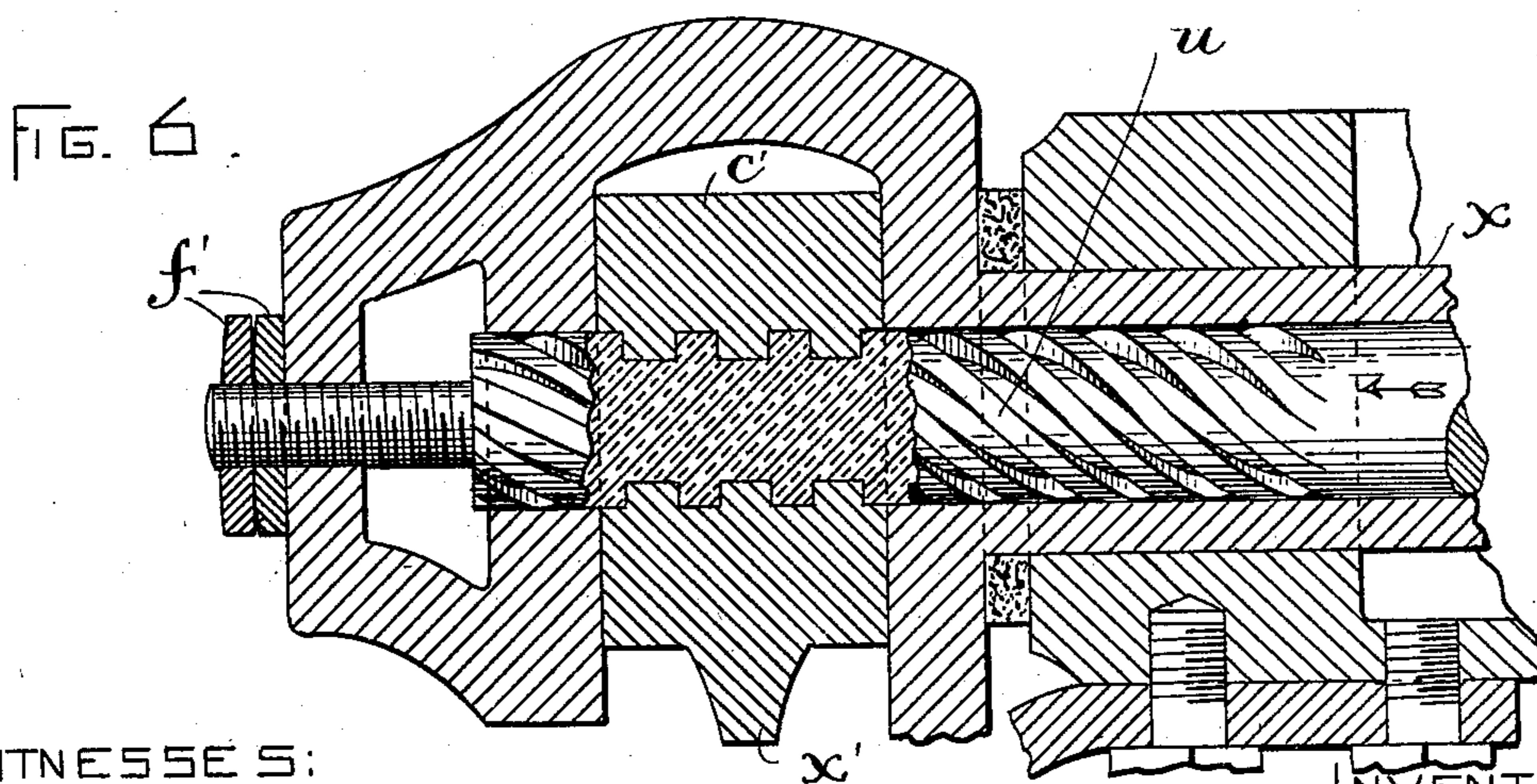


FIG. 6.

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(No Model.)

4 Sheets—Sheet 4.

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FIG. 4.

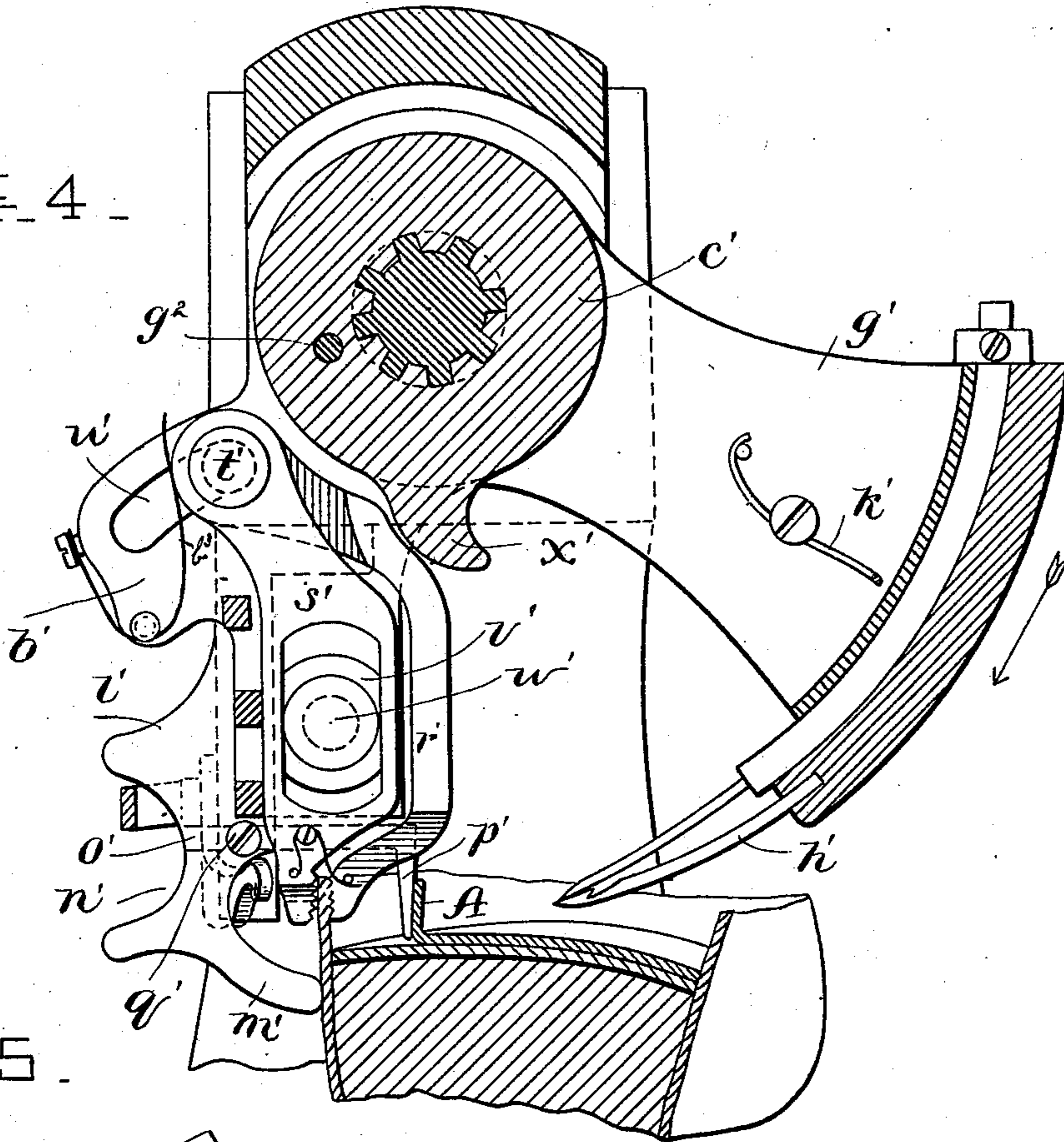


FIG. 5.

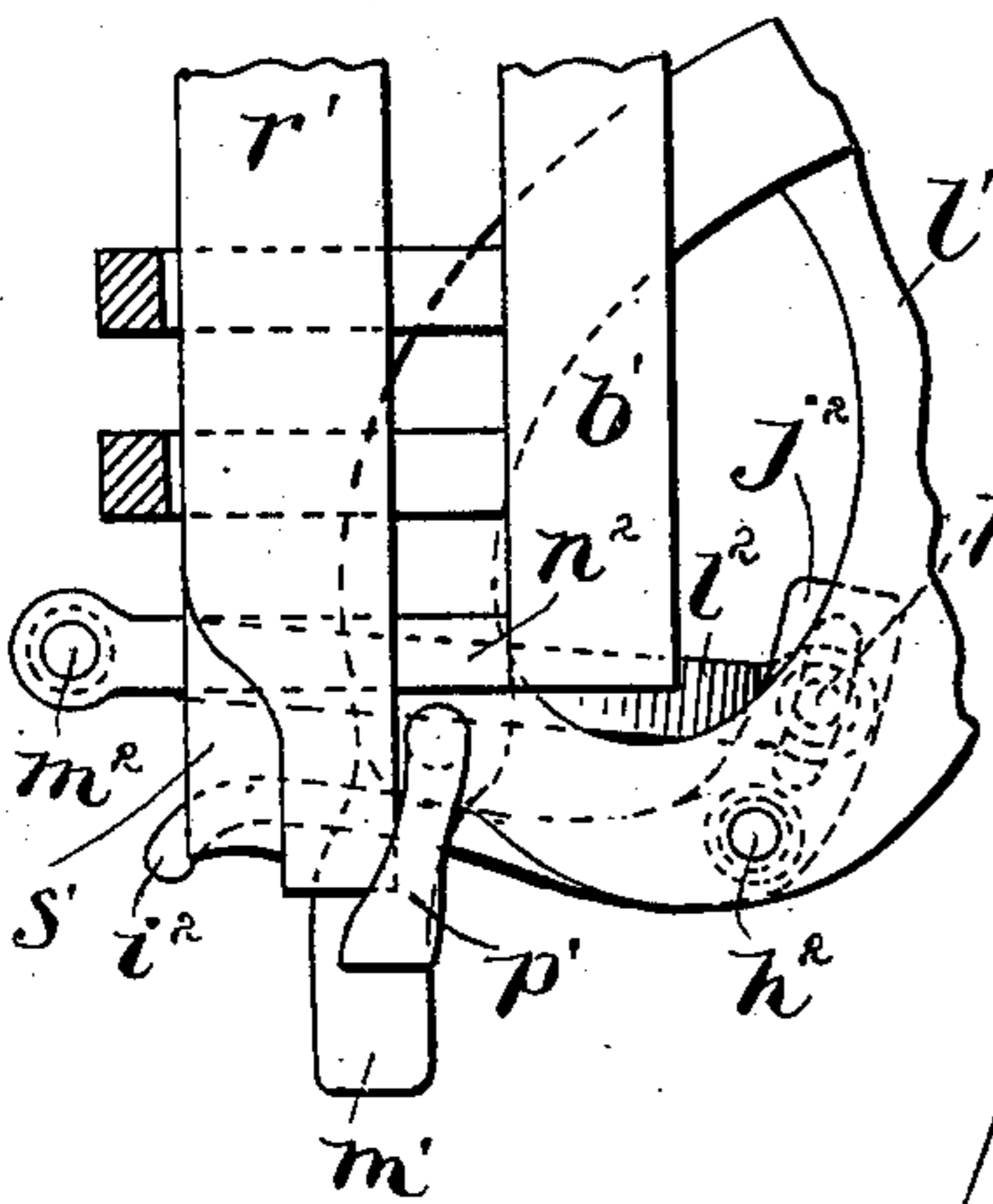
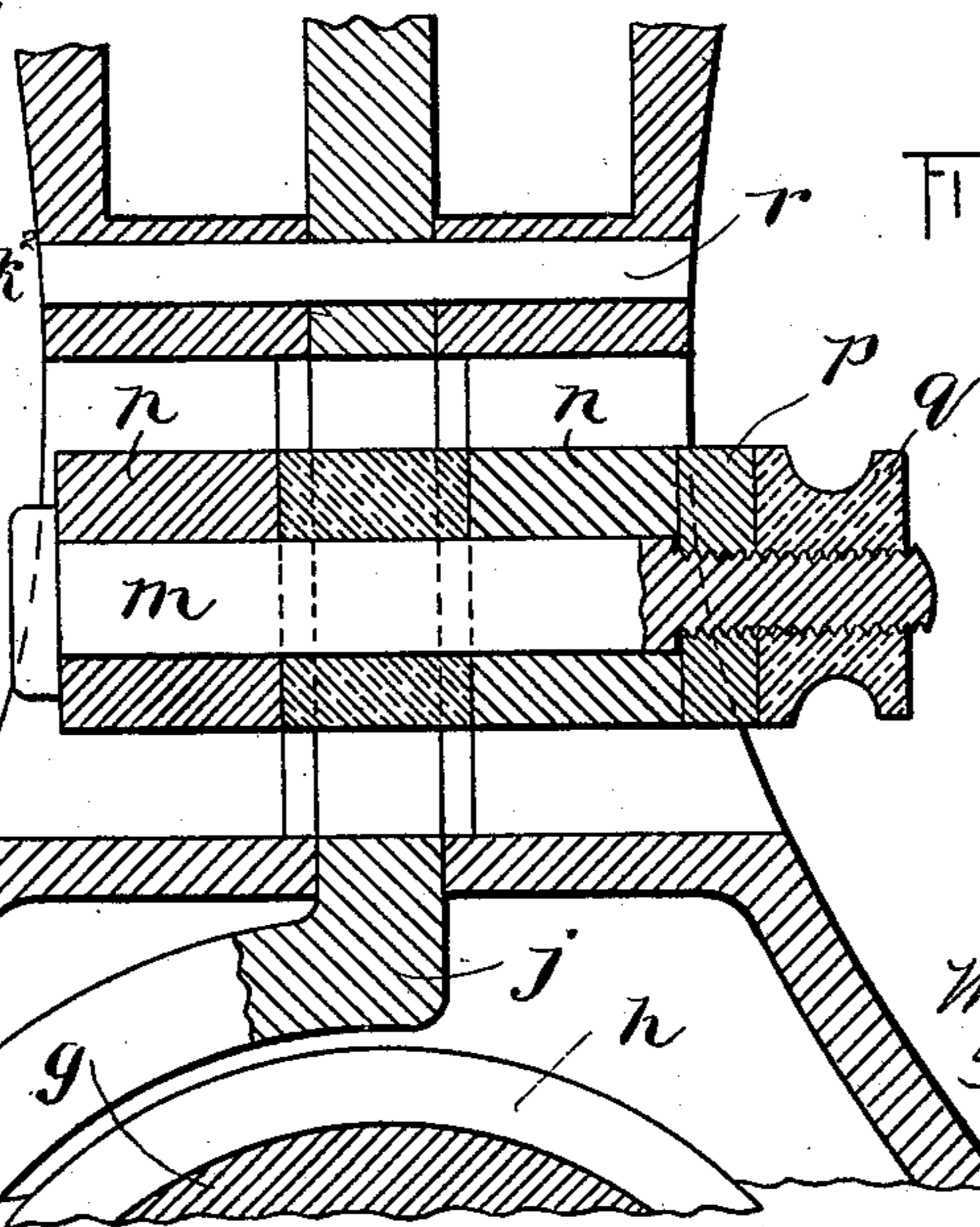


FIG. 7.



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# UNITED STATES PATENT OFFICE.

WILLIAM C. COLLYER, OF READING, MASSACHUSETTS.

## SEWING-MACHINE FOR LASTING BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 591,327, dated October 5, 1897.

Application filed September 8, 1896. Serial No. 605,060. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM C. COLLYER, a citizen of the United States, residing at Reading, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines for Lasting Boots or Shoes, of which the following is a specification.

This invention has relation to sewing-machines for lasting boots and shoes, and has for its object the provision of a machine of the class referred to which shall embody in its construction a minimum of parts to operate with the greatest ease for the accomplishment of the sewing of the upper to the insole with the highest degree of efficiency.

As generally constructed machines of this general class are possessed of a great number of delicate parts which are liable to get out of order and which frequently require to be replaced. In my machine, however, I desire to construct the parts in such way that they shall coöperate in sewing the shoe without any danger of breakage or displacement.

To these ends my invention consists of a machine embodying those features of construction and arrangement which are illustrated by the drawings, and which I shall now proceed to describe in detail, and then set forth in the claims hereto annexed.

Reference is to be had to the accompanying drawings and to the letters marked thereon, forming a part of this specification, like letters indicating like parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a vertical central longitudinal section of the same. Fig. 3 is an end view, the last being shown in section. Fig. 4 is an enlarged end view, partially in section. Fig. 5 is an enlarged view of some of the parts shown in side elevation. Fig. 6 is an enlarged vertical section through the front end of the machine, showing the screw-bar and the parts immediately actuated thereby. Fig. 7 is a sectional view illustrating the means for adjusting the fulcrum for the cam-lever. Fig. 8 is a section on line 8 8 of Fig. 2.

In carrying out my invention, which, as will be understood, is not limited in any way to the precise construction of the parts of

the machine which I shall now describe, I employ a frame having a base *a* and a C-arm, which has a vertical portion *b* and a horizontal portion *c*. In the vertical portion of the arm I journal the main driving-shaft *d*, which is equipped with the usual driving-pulley *e* and clutch *f*. The shaft is provided with a disk *g*, having a cam-groove *h* therein in which lies a pin *i*, extending in from the curved end of a lever *j*. The lever is mounted on an adjustable fulcrum or pin *m*, and is provided with a slot *k* to receive a block *l* for the said pin *m*. The pin is journaled in two vertically-sliding blocks *n n*, held at the desired adjustment by clamping-nuts *p q* on the end of the said pin *m*. By adjusting the pivot-pin the length of the play of the lever *j* may be varied as desired.

*r* is a stationary pin extending to a curved slot *s* in the lever and serving to prevent longitudinal movement of the same.

*t* is a reciprocatory shaft having its forward end formed with threads, as shown at *u* in Fig. 6. Its rear end is connected to the upper end of the lever *j* by a link *v* and a connecting-piece *w*, so that as the lever is rocked upon its fulcrum the screw-shaft *t* will be correspondingly reciprocated, as will be readily understood. The said screw-shaft is mounted in a sleeve *x*, which is adapted to slide longitudinally in bearings on the horizontal portion *c* of the arm, said sleeve being held from rotation by a large-headed screw *y*, extending through a slot *z* in the said arm. The sleeve is formed at its forward end with a bracket having two separated downwardly-extending plates *a'* and *b'*, between which is loosely held a nut *c'*, having threads corresponding to and engaging with the threads on the screw-shaft. The screw-shaft is threaded at its rear end to receive two stop-nuts *d' d'* and has a reduced threaded portion *e'* at its forward end, likewise equipped with two stop-nuts *f' f'*. The distance between the nuts *d' d'* and *f' f'* is greater than the length of the sleeve, including the end plate *a'*, so that the screw-shaft *t* is adapted to move for a portion of each reciprocation relatively to the sleeve, the latter being in such frictional engagement with its bearings that it is not moved until engaged by either the stop-nuts *d'* or the stop-nuts *f'*. Hence, assuming that the parts are

in the positions shown in Fig. 2 during the time that the screw-shaft  $t$  is moved forward before the nuts  $d'$  engage the end of the sleeve  $x$ , the threaded end  $u$  of the said screw-shaft will cause the partial rotation of the nut  $c'$ , and the continued movement of the screw-shaft will cause the advance of the sleeve for a limited distance. Then when the lever  $j$  is moved in the opposite direction, so as to draw the screw-shaft  $t$  backward, the reverse rotary movement of the nut  $c'$  will be effected before the sleeve will be moved back to its original position. The nut  $c'$  is provided with an arm  $g'$ , which acts as a needle-carrier for the needle  $h'$ . A take-off  $i'$  extends from the end of the take-off bar  $j'$ , slidably mounted in the arm  $g'$  and held in the forward position by a spring  $k'$ . A stationary bracket  $l'$  is bolted to the horizontal portion of the C-arm, as shown in Figs. 2 and 4, and is provided with a finger  $m'$ , against which the last is held, as shown in Fig. 4. It is formed with a recessed portion  $n'$  to act as a finger or thumb rest for the operator. A lip-turner and abutment consisting of a bar  $o'$ , having a depending finger  $p'$  on its end, is adjustably secured in the bracket  $l'$  and is held at any desired adjustment by a screw  $q'$ . The finger  $p'$  extends in far enough beyond the end of the rest  $m'$  to bear against and raise the lip on the insole and hold it in a vertical position for the needle to pass through it and likewise resists the thrust of the pincers, to be described.

The plate  $b'$  of the bracket, which is formed with the sleeve  $x$ , has secured to it the pincers for gripping the upper and drawing the edges of the same over the last toward the lip of the insole. The said pincers consist of two jaws  $r'$  and  $s'$ , pivoted together by a pin  $t'$ , which extends through a slot  $u'$  in the plate  $b'$  and held apart by a spring  $a^3$ . The jaw  $s'$  is slotted to receive a block  $v'$ , through which a pin  $w'$  passes into the said plate  $b'$ . The pin acts as a fulcrum for the two jaws, as hereinafter shown, and may be adjusted vertically to vary the throw of the pincers as desired. The nut  $c'$  is formed with a cam-finger  $x'$ , adapted to bear against the jaw  $r'$  of the grippers to cause the upper to be grasped by the grippers and drawn taut over the last, there being a spring  $b^3$  for returning the jaws to their original positions as soon as the pressure of the cam is removed.

In addition to the grippers I employ a device for engaging the insole at the time the needle is passing therethrough to prevent it from wrinkling. The said device consists of a pin  $a^2$ , (see Fig. 3,) which is adapted to reciprocate vertically in bars  $b^2 b^2$ , extending out from the plate  $b'$  and parallel thereto. The pin is mounted in a head  $c^2$ , which is connected to a lever  $d^2$ , fulcrumed at  $e^2$  on the said plate  $b'$  and connected by a link  $f^2$  with a pitman  $g^2$  on the nut. The parts are so arranged that the pin  $a^2$  engages the insole at the same time that the grippers engage

the upper, and they both release the work simultaneously.

The looper  $i^2$  for throwing the thread over the needle is pivoted to the bracket  $l'$  by a pin  $h^2$  and has its shorter end  $j^2$  slotted to receive the pin  $k^2$ , which pivots the link  $l^2$  thereto. The pin  $k^2$  may be adjusted in the slot so as to vary the stroke of the looper. The link  $l^2$  is pivoted at  $m^2$  to a bar  $n^2$ , projecting out from the plate  $b'$ , so that when the bracket on the end of the sleeve  $x$  is moved forward the link  $l^2$ , which is pivoted on the stationary bracket  $l'$ , causes the looper to throw the thread over the end of the needle to be engaged by the hook thereon.

The thread is supplied to the needle in any suitable way by devices, (not shown,) and it will be understood that tension and other devices for the thread may be employed as desired.

The operation of the machine is as follows: Supposing the parts to be in the positions illustrated in Figs. 2 and 4—that is to say, with the lever  $j$  in its rearmost position and the needle withdrawn from the work and the pincers in an inoperative position—a complete rotation of the shaft  $d$  will accomplish the following results: As the cam begins to revolve and to throw the upper end of the lever  $j$  forward the screw-shaft  $t$  is moved through the sleeve  $x$ , the latter remaining stationary until engaged by the stop-nuts  $d'$ . The first movement of the screw-shaft effects a partial rotation of the nut  $c'$ , which causes the cam-finger  $x'$  on the nut to engage the jaw  $r'$  of the pincers, whereby the latter grips the edge of the upper firmly against the jaws  $s'$ . At the same time that this is done the pin  $a^2$  is thrust down into engagement with the insole. A further movement of the nut causes both of the pincer-jaws to be rocked around the pin  $w'$  as a fulcrum, so as to draw the upper taut over the last and toward the lip A of the insole. When this has been accomplished, the needle  $h'$  penetrates the lip  $a'$  and the edge of the upper as far as it will go. All of these motions are accomplished by the movement of the screw-shaft from its normal rearward position to a position at which the check-nuts engage the sleeve  $x$ . When the said nuts engage the sleeve and move it forward, the needle has reached the end of its throw, and the bracket on the end of the sleeve  $x$  in moving forward carries the nut forward and with it the needle, the pincers, and the insole-engaging device, thereby accomplishing the feeding of the shoe laterally ready for another stitch. As the plate  $b'$  of the bracket on the end of the sleeve  $x$  is being moved forward it causes the looper to be actuated to throw the thread over the projecting end of the needle  $h'$ , so that when the screw-shaft is at the end of its forward movement the needle has penetrated the insole and the upper, the pincers are firmly grasping the upper and holding it taut, and the looper has thrown the thread

over the end of the needle. This has all been accomplished by one-half of a revolution of the shaft *d*. During the first part of the other half of the revolution of the said shaft *d* the screw-shaft *t* is drawn rearward until the stop-nuts *f'* engage the end plate *a'* of the bracket. During this short movement of the screw-shaft the nut *c'* is reversely rotated to disengage the cam-finger *x'* from the gripper *r'* for withdrawing the needle *h'* from the work and for withdrawing the pin *a<sup>2</sup>* from the insole. Then the operator holding the last firmly against the rest *m'* the screw-shaft draws the sleeve *x* to its normal rearward position, which in turn draws the nut *c'* and all the parts actuated thereby back to their normal positions, the looper also returning to its normal position during the movement of the sleeve *x*.

From the foregoing it will be observed that I have provided a machine which is peculiarly simple in its construction and highly efficient in operation. It has but a minimum of parts, which are not liable to get out of order and which, if injured, are capable of being expeditiously and easily replaced. Nearly all of the parts are capable of being adjusted to suit the particular requirements of the boot or shoe being operated on, and the whole machine requires but a very small amount of power to operate it.

Having thus explained the nature of my invention and a way of constructing and using the same, without attempting to set forth all of the forms in which it may be embodied or all of the modes of its use, I now declare that what I claim is—

1. A sewing-machine for lasting boots and shoes comprising in its construction, pincers for the upper, a needle, a looper, a longitudinally-reciprocating shaft for operating all of the enumerated elements, and means for actuating said shaft.

2. A sewing-machine for lasting boots and shoes comprising in its construction a needle-carrier having internal threads, a needle mounted on the carrier, a threaded shaft engaging the internal threads of the needle-carrier, and means for reciprocating said shaft.

3. A sewing-machine for lasting boots and shoes, comprising in its construction, a needle, pincers for the upper, and a screw-shaft for causing said pincers to engage the upper and draw it taut over the last.

4. A sewing-machine for lasting boots and shoes comprising in its construction, a needle, a needle-carrier, pincers for the upper, and a screw-shaft for operating the said needle-carrier and the said pincers.

5. A sewing-machine for lasting boots and shoes comprising in its construction, a needle, a needle-carrier, and a screw-shaft for feeding said needle-carrier laterally when said needle is in engagement with the work.

6. A sewing-machine for lasting boots and shoes comprising in its construction, an internally-threaded needle-carrier, a screw-shaft

for oscillating said carrier, and means operated by said shaft for shifting said needle-carrier laterally.

7. A sewing-machine for lasting boots and shoes comprising in its construction a needle-carrier having a cam, and having a threaded aperture, pincers arranged to be operated by said cam, and a screw-shaft passing through said threaded aperture to actuate said needle-carrier.

8. A sewing-machine for lasting boots and shoes comprising in its construction, a needle-carrier, pincers for the upper, and single means for actuating said needle-carrier and said pincers, and then feeding them laterally.

9. A sewing-machine for lasting boots and shoes comprising in its construction, a stationary rest for the last, and a stationary lip-turner or abutment, in combination with a needle-carrier, pincers for the upper, and means for actuating said needle-carrier and said pincers and feeding them laterally.

10. A sewing-machine for lasting boots and shoes comprising in its construction a stationary rest for the last, a needle-carrier and pincers movable relatively to the rest, means for actuating said pincers and said needle-carrier, and devices operated by said means for feeding said pincers and said needle-carrier laterally.

11. A sewing-machine for lasting boots and shoes comprising in its construction, a needle-carrier, pincers for the upper, means for actuating said carrier and said pincers, a stationary rest for the last having a recess to receive the thumb or finger of the operator.

12. A sewing-machine for lasting boots and shoes comprising in its construction, a needle-carrier, pincers for the upper, means for actuating said carrier and said pincers, a stationary rest for the last, and an abutment projecting from the rest to resist the thrust of the pincers.

13. A sewing-machine for lasting boots and shoes comprising in its construction, a needle-carrier, a movable plate, a stationary bracket, pincers mounted on said plate, and a looper mounted on the stationary bracket and connected with said plate so as to be actuated by the movement thereof.

14. A sewing-machine for lasting boots and shoes comprising in its construction, a frame, a non-rotatable sleeve slidably mounted in said frame, and formed with a bracket, a needle-carrier having a threaded aperture and connected with said bracket to rotate relatively thereto and to slide therewith, pincers mounted on said bracket and operated by said needle-carrier, and a screw-shaft for oscillating said needle-carrier and then sliding said sleeve, for the purposes set forth.

15. A sewing-machine for lasting boots and shoes comprising in its construction a frame having an overhanging C-arm, a driving-shaft mounted in the vertical portion of said arm, and a shaft operated by said driving-shaft and mounted in the horizontal part of

said arm, in combination with a needle-carrier, pincers for the upper, and a looper for throwing the thread over the needle, all of which last-mentioned parts are mounted on the outer end of the C-arm.

16. A sewing-machine for lasting boots and shoes comprising in its construction a frame having an overhanging C-arm, a bracket mounted on said arm, a rotatable cam on said arm, a pair of pincers pivoted together at one end, and one jaw of said pincers being pivoted to said bracket, said pincers being arranged with relation to the cam in such way that the cam is adapted to engage the free jaw of the pincers and, gripping it against the other jaw, swing them both about the pivot connecting them to the bracket.

17. A sewing-machine for lasting boots and shoes comprising in its construction a needle-carrier having a needle, pincers for the upper, a reciprocatory shaft for operating said parts, and means for shifting the needle and pincers laterally to feed the work for another stitch.

18. A sewing-machine for lasting boots and shoes comprising in its construction, a needle-carrier provided with a needle, a bracket, pincers pivoted to said bracket and swinging

them bodily about their pivot, a shaft for operating the needle, and a cam on the needle-carrier for actuating the pincers.

19. A sewing-machine for lasting boots and shoes comprising in its construction a needle-carrier provided with a needle, a bracket, pincers pivoted to said bracket, a cam on the needle-carrier for actuating the pincers, a shaft for actuating the needle-carrier, and means operated by the said shaft for feeding the needle-carrier and the bracket with the pincers.

20. A sewing-machine for lasting boots and shoes comprising in its construction a needle-carrier provided with a needle, pincers for the upper, an abutment to resist the thrust of the pincers, a device for engaging the insole, and means operating with the needle-carrier for actuating the pincers and the insole-engaging device simultaneously with said carrier.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 31st day of August, A. D. 1896.

WILLIAM C. COLLYER.

Witnesses:

MARCUS B. MAY,  
A. D. HARRISON.