

(No Model.)

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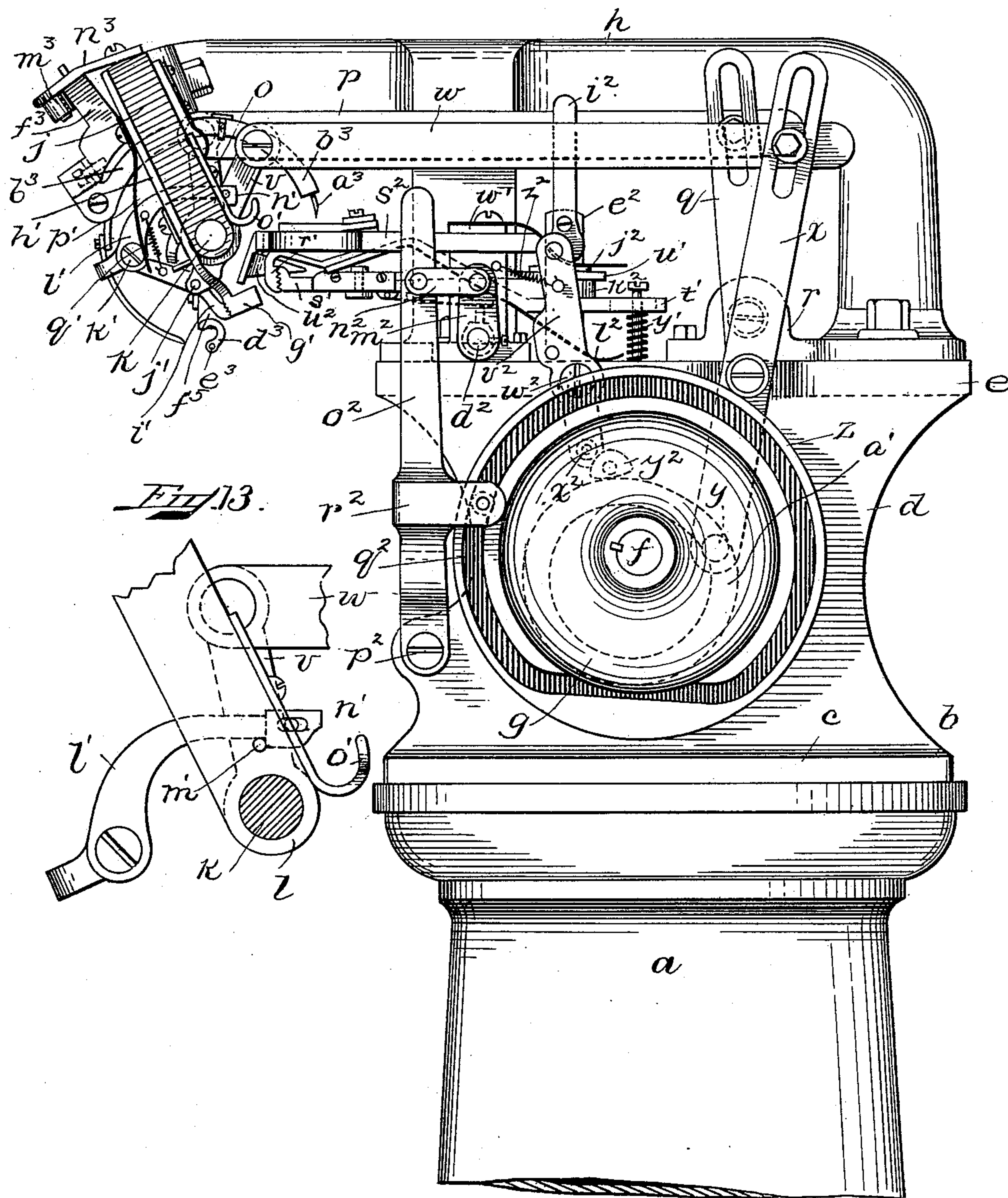
J. E. JACKSON.

SEWING MACHINE FOR LASTING BOOTS OR SHOES.

No. 583,181.

Patented May 25, 1897.

Fig. 1.



Witnesses:
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P. W. Pezzullo

Inventor:
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by *Wm. H. Brown* Attorney

(No Model.)

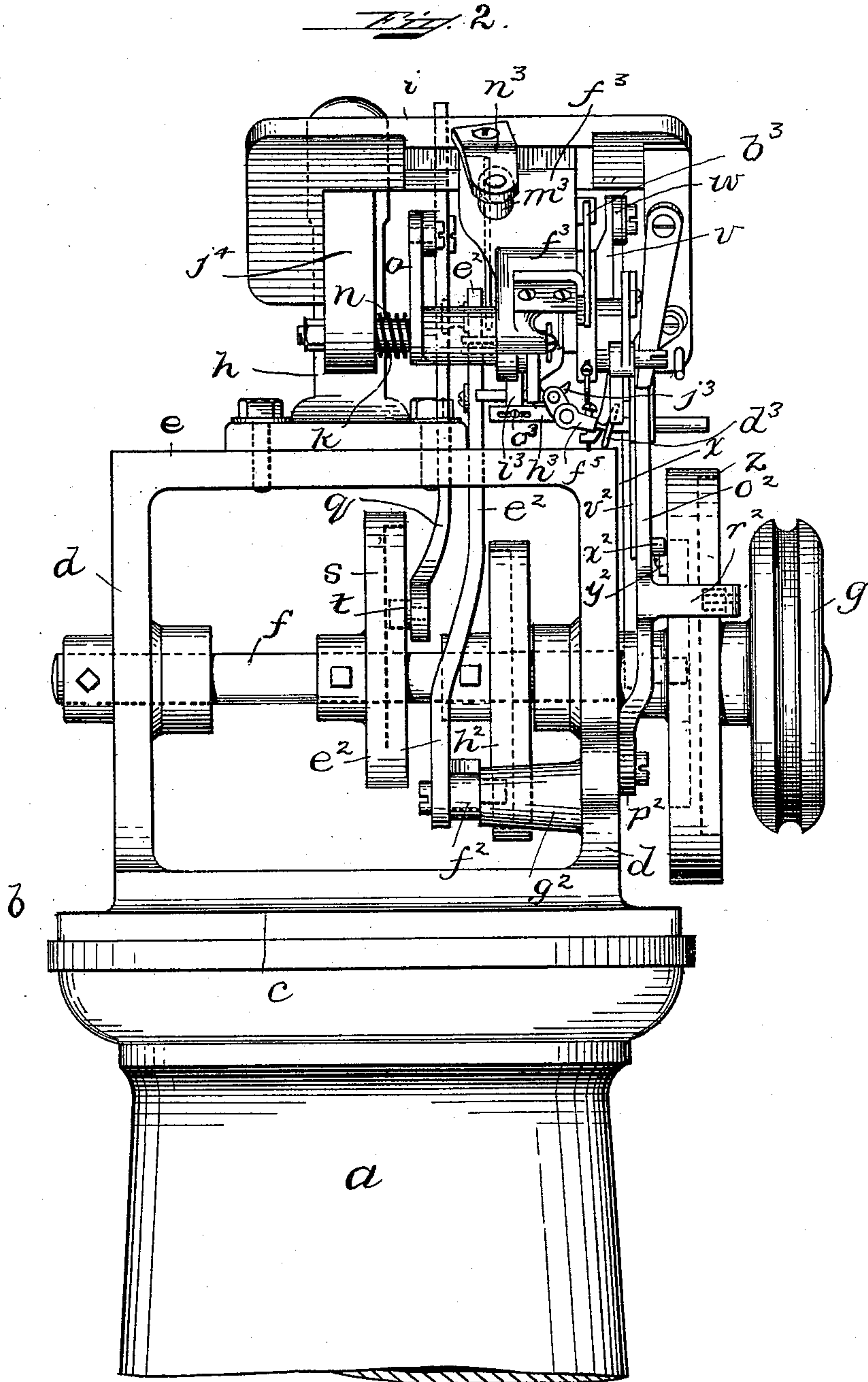
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J. E. JACKSON.

SEWING MACHINE FOR LASTING BOOTS OR SHOES.

No. 583,181.

Patented May 25, 1897.



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(No Model.)

5 Sheets—Sheet 3.

J. E. JACKSON.

SEWING MACHINE FOR LASTING BOOTS OR SHOES.

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Fig. 3.

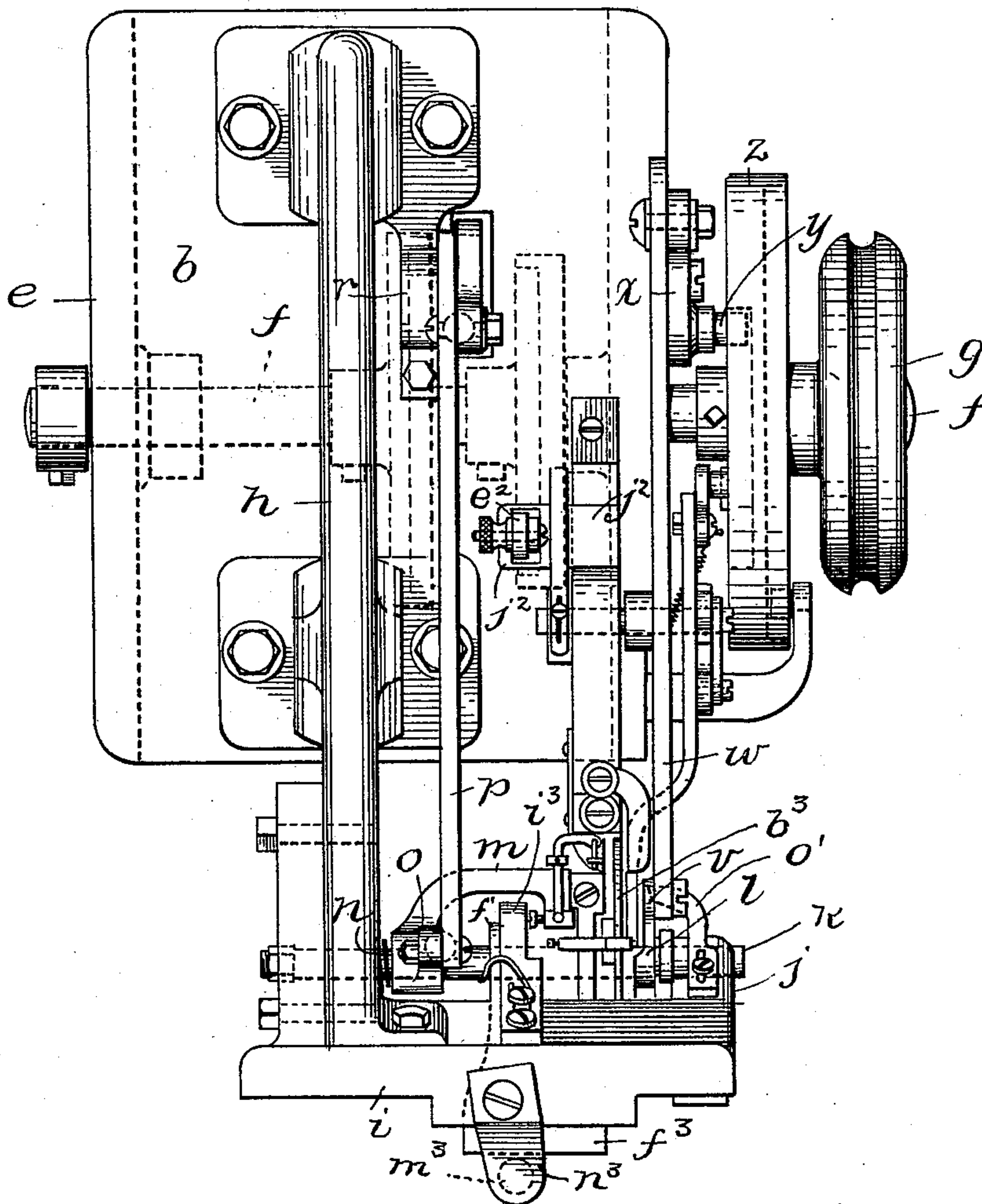
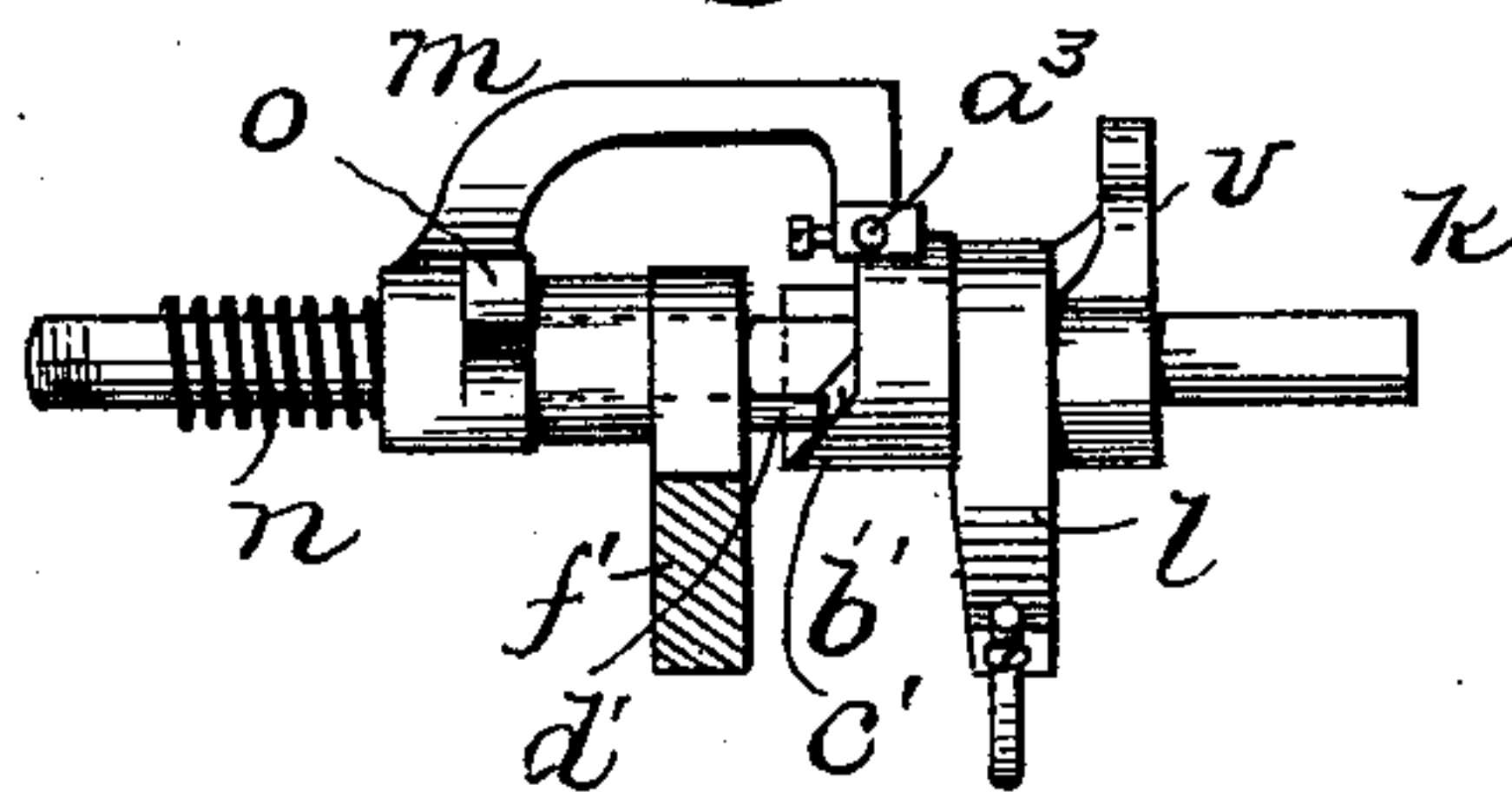


Fig. 4.



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Fig. 6.

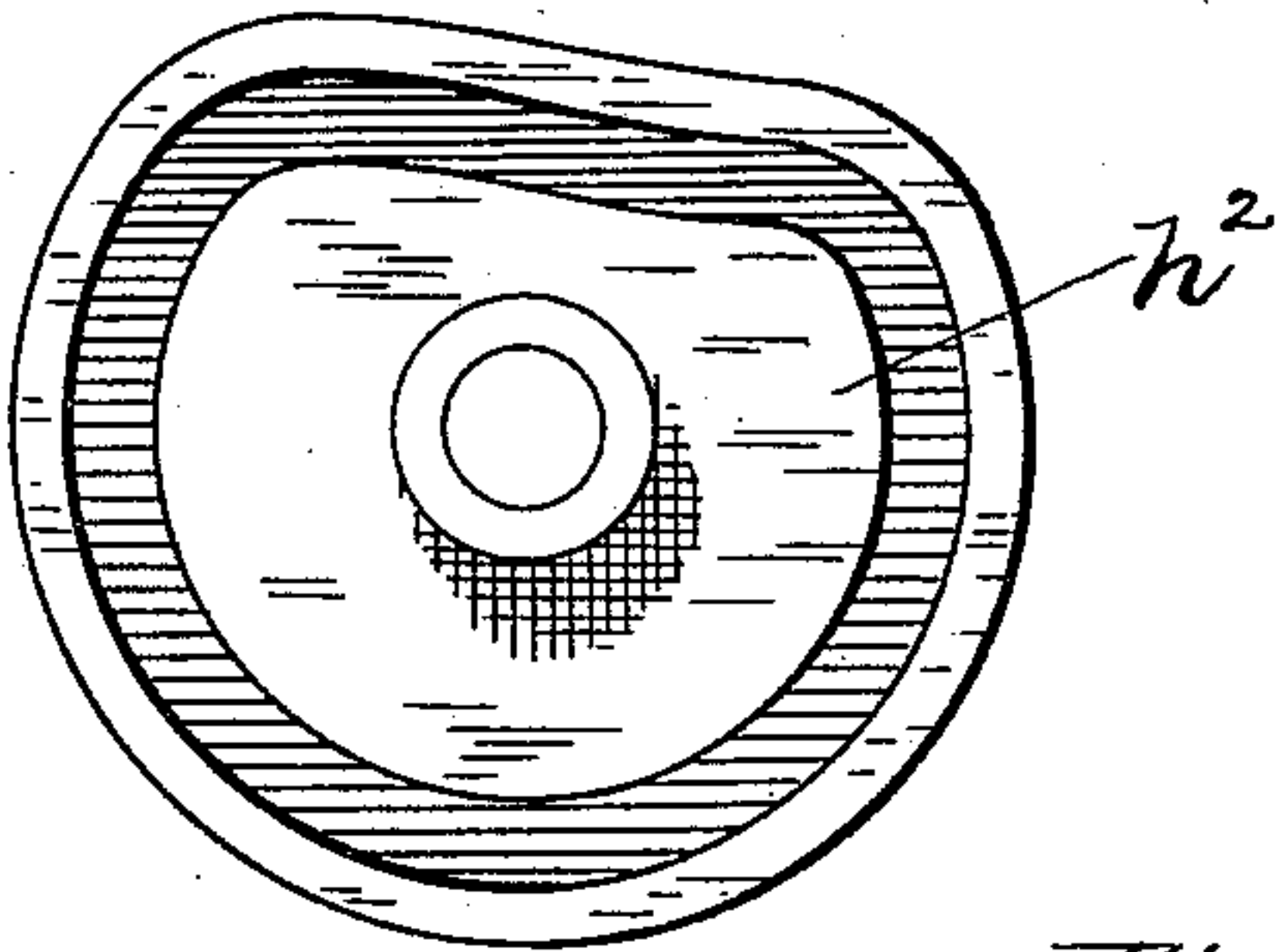


Fig. 7.

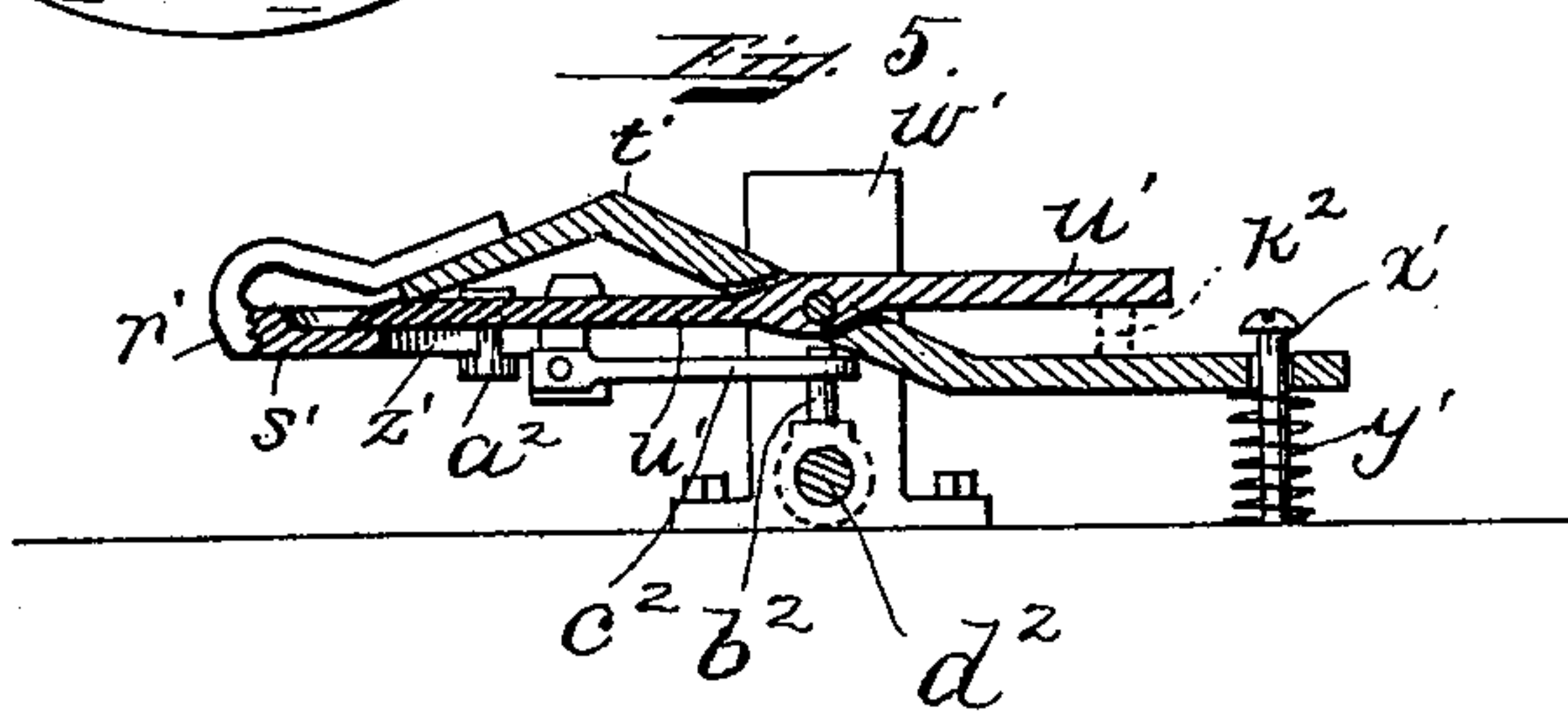
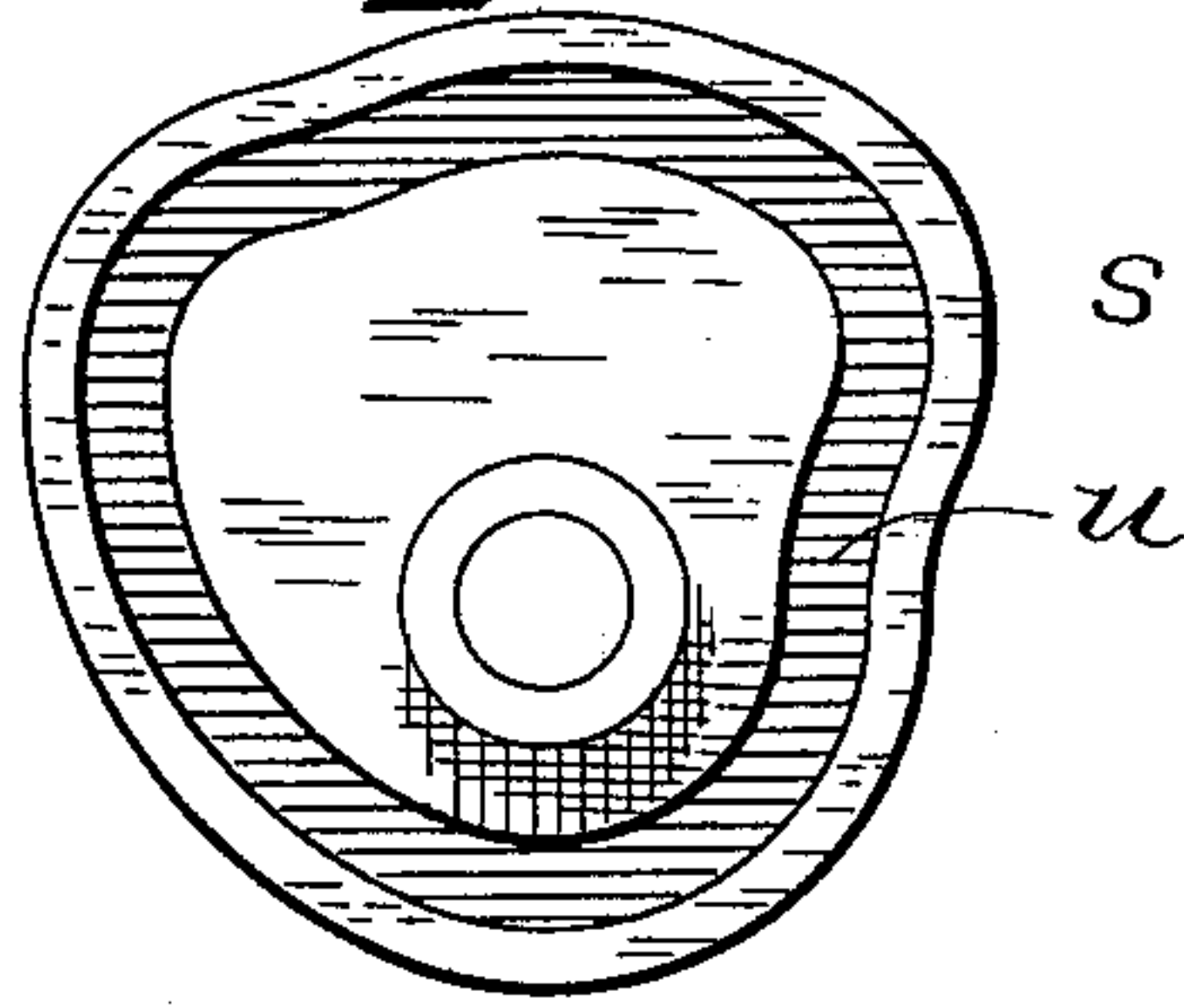


Fig. 8.

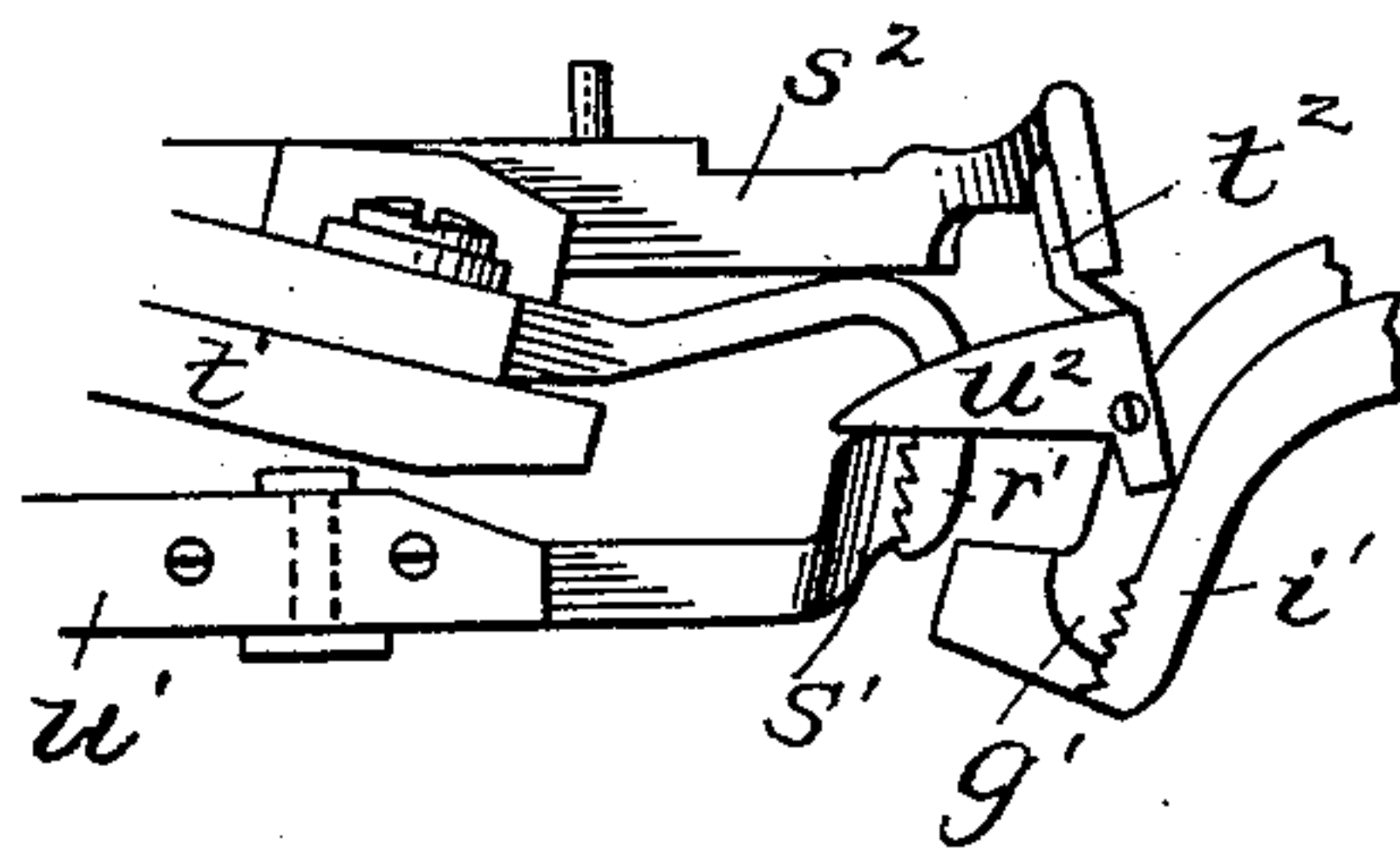


Fig. 9.

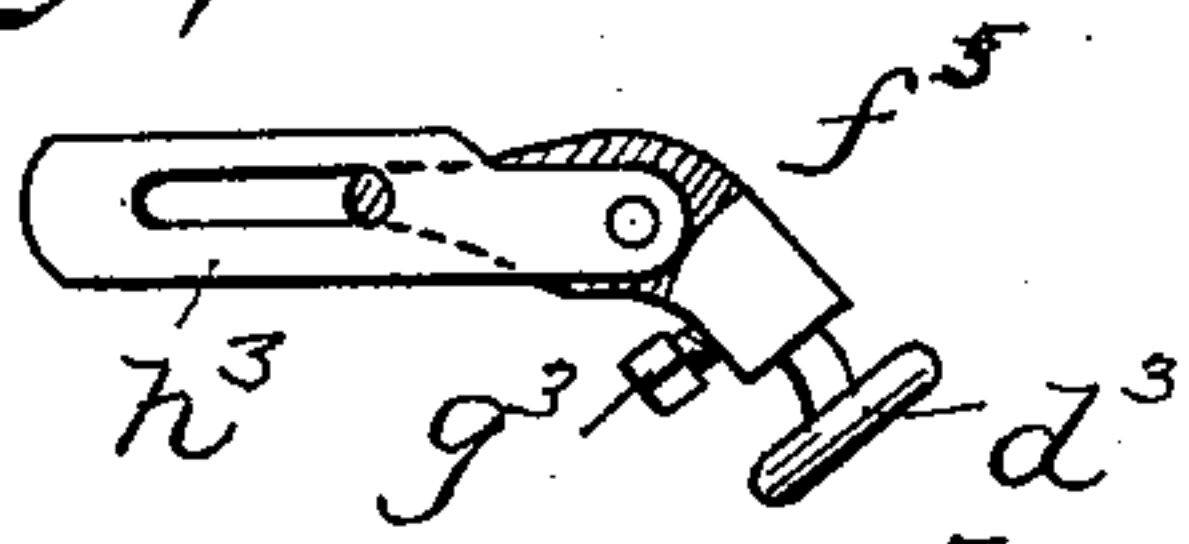


Fig. 10.

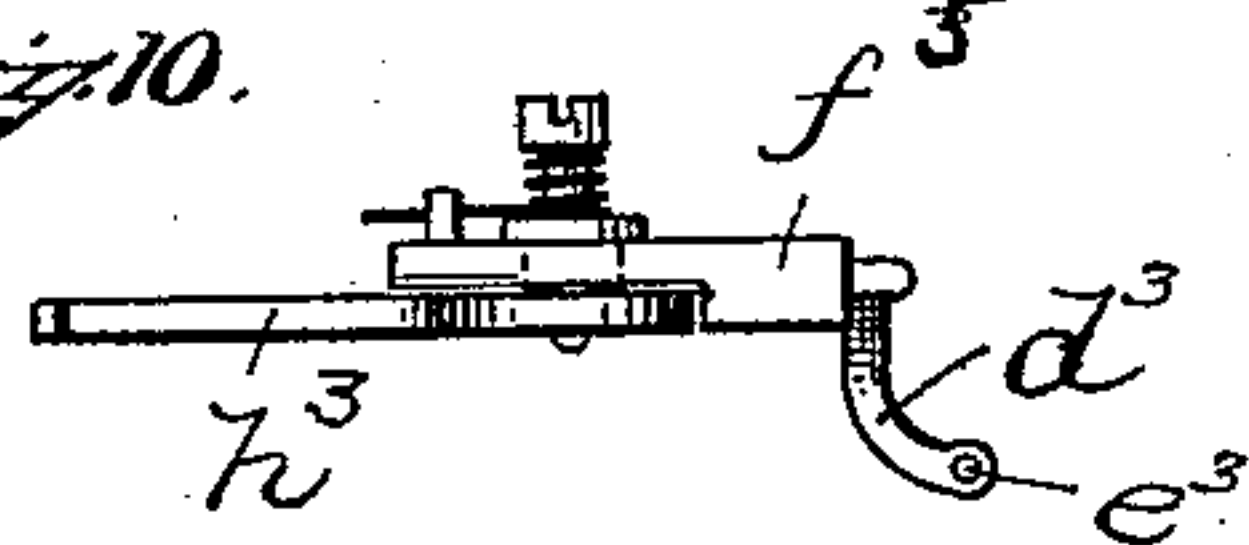


Fig. 11.

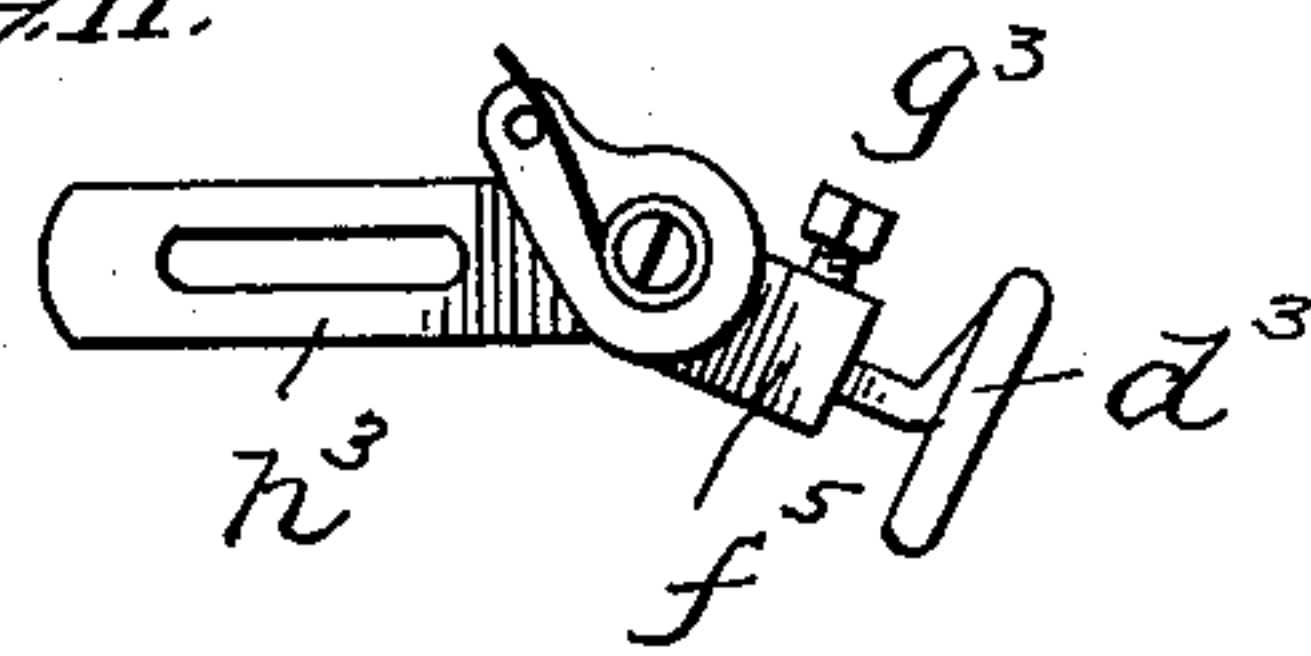
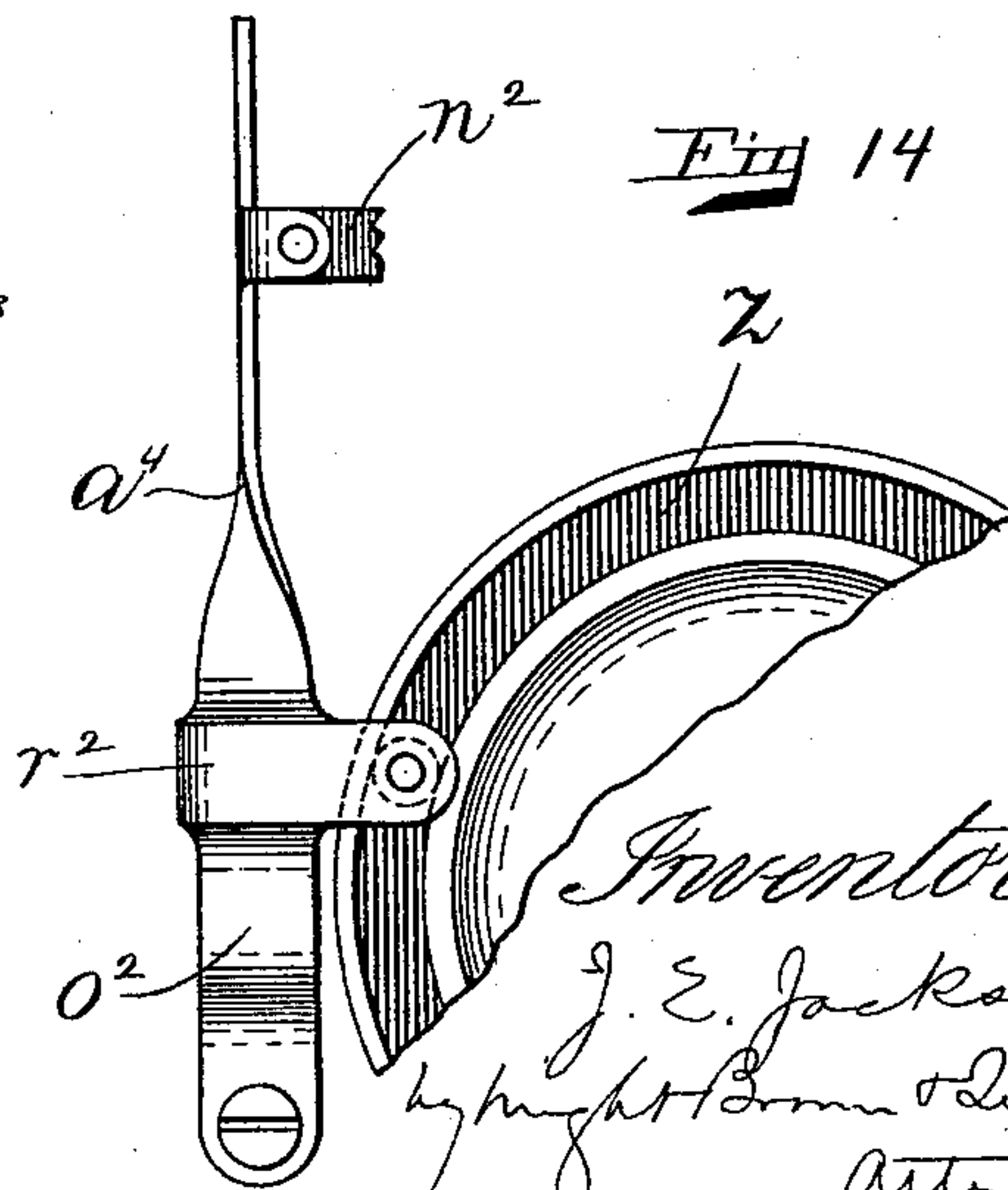


Fig. 14.



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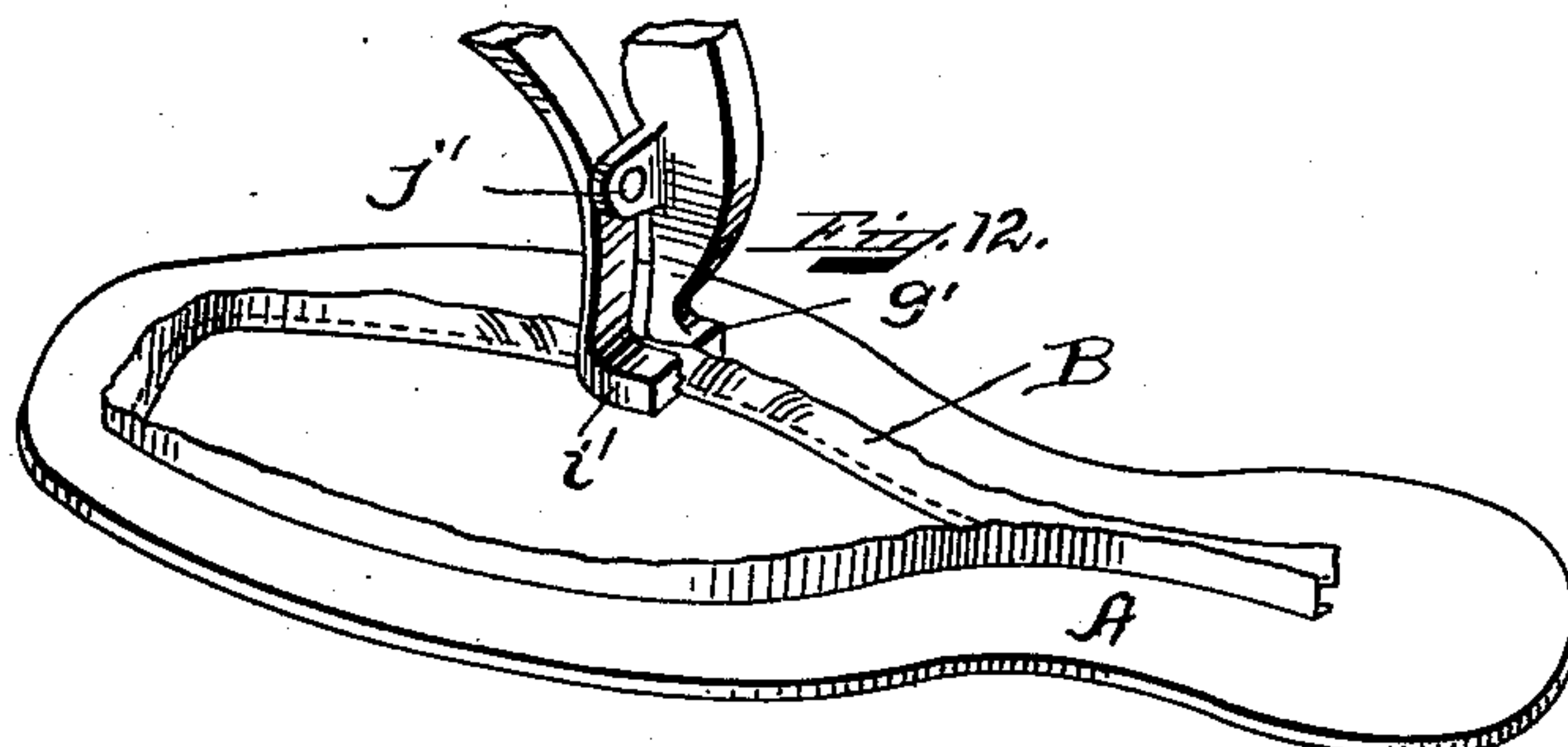
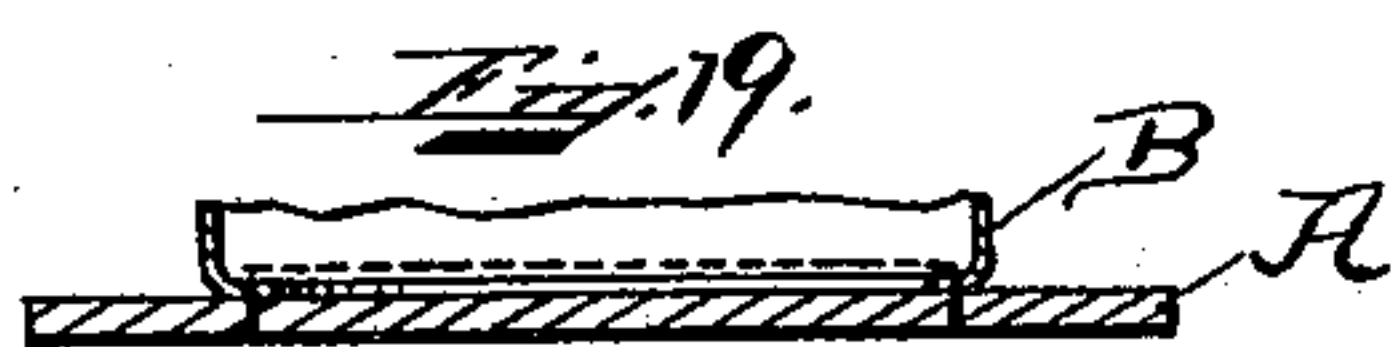
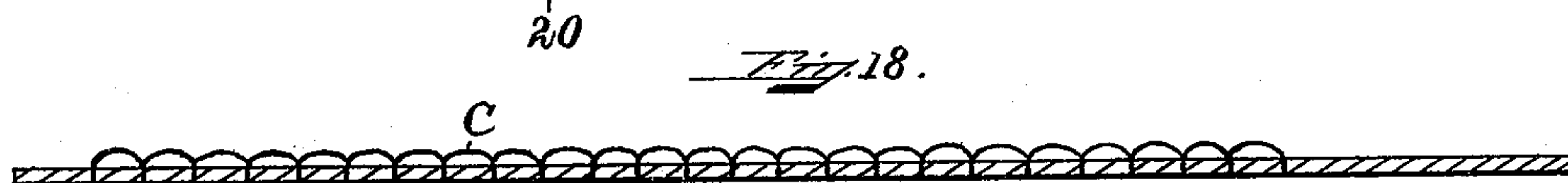
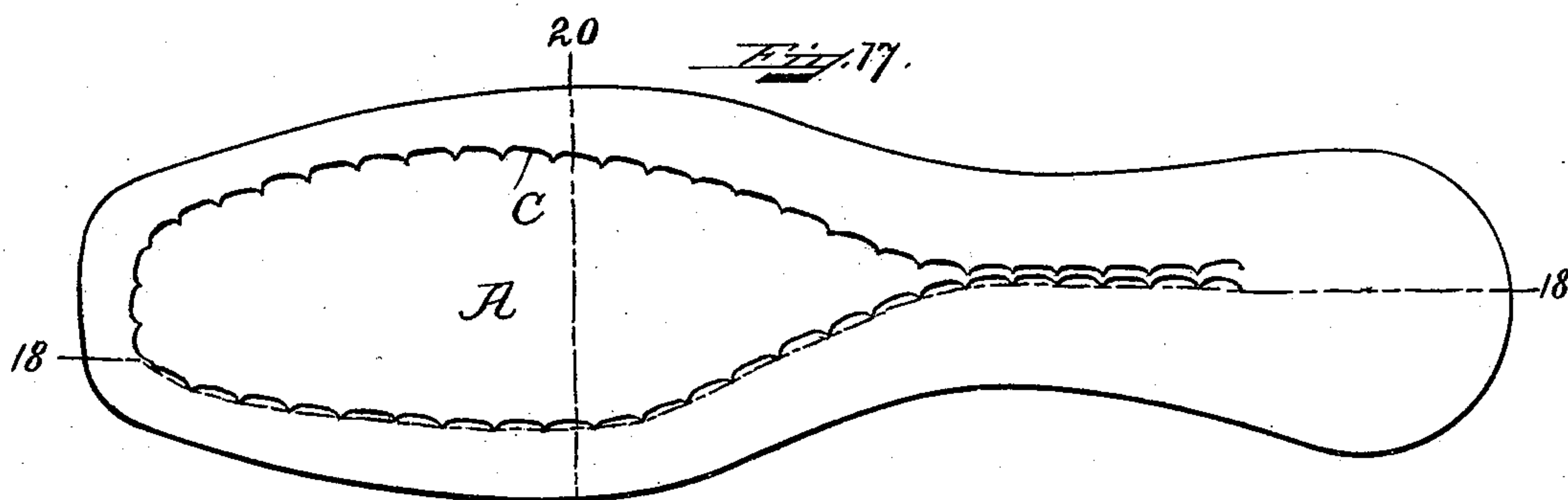
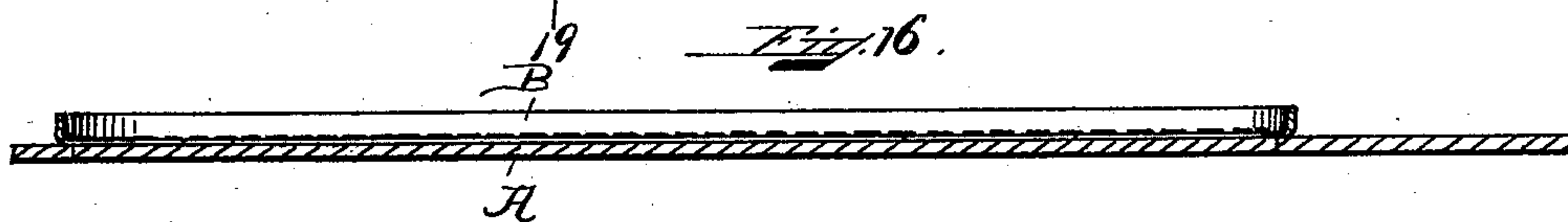
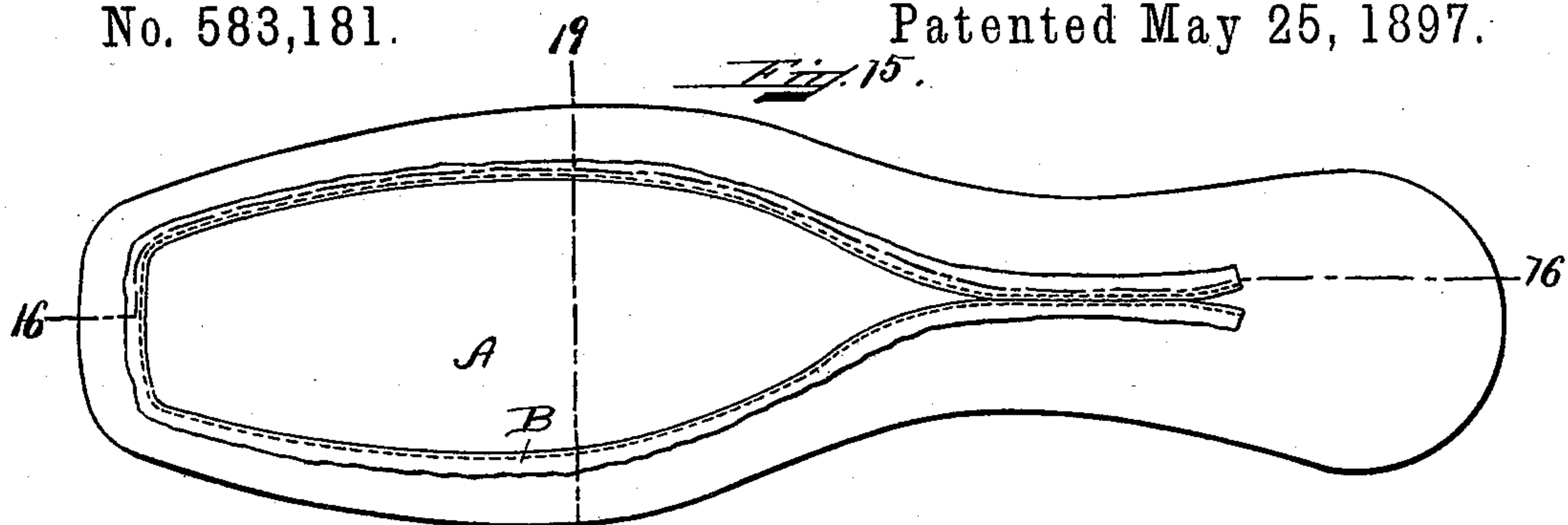
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SEWING MACHINE FOR LASTING BOOTS OR SHOES.

No. 583,181.

Patented May 25, 1897.



Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES E. JACKSON, OF LYNN, MASSACHUSETTS, ASSIGNOR OF THREE-FIFTHS
TO MICHAEL HURLEY AND THOMAS F. HART, OF SAME PLACE.

SEWING-MACHINE FOR LASTING BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 583,181, dated May 25, 1897.

Application filed June 18, 1896. Serial No. 596,046. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. JACKSON, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines for Lasting Boot or Shoe Uppers, of which the following is a specification.

This invention has relation to sewing-machines for lasting boots or shoes; and it has numerous objects, to the principal one of which I shall briefly refer.

The principal object of the invention may be said to be to provide a machine for lasting shoes to operate in such way that the upper shall be first drawn taut over the last and then sewed to the insole, with the result that the upper shall be smooth and unwrinkled at every point. To attain this object, it is necessary that the edge of the upper shall be "shingled," or, in other words, shall be slashed, in order that it may stretch or overlap, as the case may be, to conform to the curves of the insole; and it is further necessary that it should be drawn taut over the last before the stitch is taken.

My invention therefore consists of a sewing-machine provided with means for slashing the edges of the upper and then sewing the latter to the insole, the operations of sewing and slashing being continuous, together with gripping-jaws for engaging the insole and means for drawing the upper taut before the needle enters the work.

The invention likewise consists of improved mechanism for drawing the upper taut over the last and means for engaging the insole to act as an abutment for the thrust of the first said means; and it also consists of a novel means for feeding the work during the operation of sewing, whereby the latter is fed forward automatically to the proper extent for each stitch.

The invention also consists in numerous other features of improvement, to which I shall not now refer, but which will be hereinafter explained at length, and set forth in detail in the claims hereto appended.

Reference is to be had to the drawings and to the letters of reference thereon, the same letters indicating the same or similar parts

or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a side elevation of one form of machine in which my invention is embodied. Fig. 2 is a front elevation of the same. Fig. 3 is a plan view. Fig. 4 shows in detail the means for feeding the work for each stitch. Fig. 5 is a detail view, partly in section, of the pincers for grasping the upper and drawing it taut over the last. Figs. 6 and 7 illustrate two of the cams which are employed. Fig. 8 illustrates the pincers, the grippers for the insole, and the slashing mechanism. Figs. 9, 10, and 11 show in detail some parts of the machine which will be hereinafter fully described. Fig. 12 shows in perspective an insole, together with the grippers for engaging a tape thereon during the operation of sewing. Fig. 13 illustrates in detail some of the parts of the machine. Fig. 14 shows a different form of device for actuating the pincer-jaw. Figs. 15 and 16 illustrate an insole provided with a tape to which the upper is secured by stitches. Figs. 17 and 18 illustrate an insole provided with a line of stitches instead of a tape. Figs. 19 and 20 are sectional views through Figs. 15 and 17, respectively.

It will be understood that while I have shown and shall now proceed to describe one form of sewing-machine in which my invention is embodied, yet I do not wish to be understood as in any wise limiting myself to this particular embodiment of the invention, since many of the features of improvement may be employed in machines of other kinds and other forms.

In carrying out my invention I employ the usual standard *a*, upon which the bed or frame *b* of the machine is mounted. The said frame is provided with a bed-plate *c*, standards *d* for supporting the shaft, and a top plate *e*, upon which the operative parts of the machine are mounted. Power is imparted to the several parts of the mechanism by means of a shaft *f*, suitably mounted in bearings in the side standards *d*. Said shaft is provided with a driving-wheel *g*, to which power may be transmitted in any convenient or desirable way.

h is a gooseneck suitably mounted upon the top plate *e*, and upon the outer projecting end of which are mounted stitching mechanism, the grippers for the insole, and the means for feeding the work laterally for each stitch, as I shall now proceed to describe.

Across the front end of the gooseneck *h* is secured a laterally-extending support *i*, having a depending arm *j*, in which and an arm *j*⁴ of the gooseneck is mounted a shaft *k*, upon which are mounted the awl-carrier *l* and the needle-carrier *m*. The needle-carrier is movable longitudinally of the shaft *k*, being held in its normal position by a spring *n*, abutting against the depending arms *j*⁴. Said carrier is provided with an upwardly-projecting arm *o*, connected by a link *p* with a slotted lever *q*, suitably pivoted in an ear *r* on the top plate and extending down into position to be engaged by a cam *s*, rigidly mounted upon the shaft *f*. The lever *q* has a roller *t*, projecting into a cam-track *u* in the cam-disk *s*, the latter being shown in detail in Fig. 7. When the cam-disk *s* is revolved, the lever *q* reciprocates the link *p*, which in turn causes an oscillation of the needle-carrier *m*. The awl-carrier *l* is mounted upon the shaft *k* and is provided with an upwardly-extending arm *v*, pivoted to a link *w*, the latter being connected to a lever *x*, mounted upon one of the standards *d* and having on its lower end a roller *y*, projecting into a cam-slot *a'* in the inner face of a cam-disk *z*, fixed upon the shaft *f*. The cams *s* and *z* are of such peculiar shape that the awl is first driven through the work while the needle remains in its raised position, and the awl and the needle are both rocked together until the needle penetrates the work and engages the thread on the under side thereof preparatory to drawing it up there-through, and there are combined with these parts such mechanism that when the needle reaches the end of its throw the awl is moved farther backwardly and the needle and the work engaged thereby are both fed laterally to present a new portion of the work to the grippers and pincers, as will be hereinafter described.

The means for moving the needle-carrier longitudinally of the shaft *k* consist of a sleeve *b'*, rigidly connected with the awl-carrier and provided with a cam-face *c'*, with which is engaged a pin *d'*, projecting from an arm *f'*, extending down from a plate *f*³, sliding with the needle-carrier, said plate *f*³ being held in place against the plate *i* on the gooseneck by a roller *m*³, journaled in a bracket *n*³, rigidly secured to said plate *i*. The arm *f'* is separated from the needle-carrier by a sleeve or hub *e'*. The cam-sleeve *b'* is so arranged with relation to the pin *d'* that the latter is not forced longitudinally of the shaft *k* until the needle has reached the end of its throw and has engaged the work, so that the work may be fed along with the needle.

While any stitch-forming mechanism may be employed that is well adapted for the pur-

pose, yet I sometimes prefer to use that which is illustrated in the drawings. The needle *a*³ is suitably mounted in its carrier *m*, it being provided with the usual cast-off, for which there is a friction-strip *b*³, mounted on the plate *f*³, sliding with the needle-carrier. The looping mechanism is illustrated in detail in Figs. 9, 10, and 11. It consists of a curved arm *d*³, having an eyelet at *e*³ for the thread. The arm is held in a pivoted lever *f*⁵ by a set-screw *g*³, the lever *f*⁵ being pivoted in a slotted bar *h*³, mounted upon a bar *i*³, rigid on the gooseneck. A cam *j*³ on the awl-carrier engages the end of the lever *f*⁵ of the looper and carries the arm *d*³ and the thread therewith down past the needle, so as to form a loop on the same.

I have not shown in detail the needle, the cast-off, and the friction-strip for the cast-off, as they do not form an essential part of my invention, and I lay no claim to the same. The looper, however, is peculiar in that it is mounted on a bar rigidly secured to and extending down from the gooseneck, being operated by the awl-carrier. The bar *h*³, on which the looper-lever is mounted, may be adjusted back and forth by reason of the slot through which the screw *o*³ passes to secure it to the arm *i*³.

I shall now proceed to describe the grippers for engaging the insole and the pincers for drawing the upper taut over the last and hold-it while the needle is passed therethrough.

The grippers consist of a fixed serrated jaw *g'* on the end of a strip *h'*, secured to one of the arms *j*. The movable jaw *i'* is pivoted at *j'* in an eye, projecting from the strip *h'*. It has pivoted to it at *k'* a curved arm *l'*, the latter having its end extending in over the shaft *k*. (Shown in Figs. 1 and 13.) The awl-carrier *l* is provided with a pin *m'*, adapted to intermittently engage a head *n'* on the end of the curved arm *l'*. When the awl-carrier is moved during the last part of its throw, the pin *m'* engages the head *n'* and drawing upon the arm *l'* rocks the jaw *i'* away from the jaw *g'* of the grippers, so as to release the work. As the pin *m'* forces the arm *l'* forward the head engages a hook *o'*, which lifts it from engagement with the pin *m'*, and a spring *p'* forces the jaw *i'* shut, drawing the arm *l'* back into its normal position. A small helical spring *q'* connects the arm *l'* with the jaw-lever, so as to draw the former down into position to be engaged by the pin *m'*, it being free to rise for allowing the said pin *m'* to slip thereunder when the movement of the awl is reversed. In Fig. 12 the grippers are shown as clasping a tape B, stitched to an insole A, as I shall hereinafter explain.

The pincers for engaging the edge of the upper and drawing it taut over the last are shown in detail in Fig. 5, to which reference is to be had. The pincers consist of two jaws *r'* and *s'*, respectively. The jaw *r'* is mounted upon the end of a pivoted lever *t'*

and the jaw s' is slidingly connected with a pivoted lever u' , the two levers being both pivoted upon a pivot-rod v' , suitably journaled in standards w' in the bed-plate. The levers are crossed, the lower end of lever t' being apertured to receive a stop screw or pin x' , there being a spring y' coiled around said pin or screw and pressing against the end of the said lever. The jaw s' has an extension z' , projecting through an aperture in which is a stud a^2 , said extension being connected with a crank-pin b^2 by means of a link c^2 . The stud a^2 is riveted or otherwise secured in the lever u' and serves as a guide for the extension z' of the movable jaws s' . The crank-pin b^2 extends up from a shaft d^2 , mounted in the standards w' . It will be observed that when the shaft d^2 is oscillated the jaw s' will be reciprocated relatively to the lever u' . The two levers are bodily rocked by means of a vertically-reciprocating rod e^2 , pivoted to a lever f^2 , which latter is pivoted at one end in a boss g^2 , extending out from one of the side standards d and having on its other end a roller extending into a cam-slot in a disk h^2 , mounted on the shaft f . The cam-disk h^2 is shown in detail in Fig. 6. The cam-slot is of such shape that the link or bar e^2 will be held in its lowest position throughout the greater portion of a rotation of the disk, but will be elevated during a short period of time while the disk traverses about one-fourth of its rotation. At the upper end the link e^2 is provided with a cam-lever i^2 , bearing against a plate j^2 , which projects over and rests upon the top of lever u' . The last said lever u' is provided with a pin k^2 , abutting against lever t' , so that when the link e^2 is forced downward the cam-lever i^2 bodily rocks levers t' and u' and throws grippers r' and s' upward. The spring y' , together with a spring l^2 , forces the levers into their normal position when the pressure upon the lever u' is removed, as will be understood. For sliding the jaw s' through the medium of the shaft d^2 I employ a crank m^2 on the end of the latter. The crank is connected by a link n^2 with a lever o^2 , pivoted to one of the side standards d at p^2 . The disk z is provided on its outer face with a cam-groove q^2 , into which a roller on the end of an arm r^2 on the lever o^2 extends. As the disk z rotates the shaft d^2 will be rocked at intervals, drawing the jaw s' toward and from the jaw r' .

The parts are so timed that when the front ends of levers t' and u' are depressed by reason of the elevation of the link or bar e^2 the jaw s' will be withdrawn. Then it will be thrust back to engage the jaw r' and the two will be bodily lifted by the bar or link e^2 . It happens, when a tip is to be sewed on with the upper, that the pincer-jaws cannot come as close together as when no tip is sewed, and hence I usually construct the lever o^2 as shown in Fig. 14—that is to say, it is given a quarter-turn at a^4 and has its upper end tempered so as to provide a yielding

spring which will allow the jaws to grip two thicknesses of material without those dangerous results which are apt to be reached when no spring action is allowed for.

The manner in which the grippers, the pincers, the needle, awl, and the other parts which I have described cooperate will be explained later on.

I shall now describe the knife and its coacting parts, by means of which the edge of the upper is shingled or slashed during the operation of sewing the upper to the insole.

s^2 is a longitudinally-reciprocatory bar provided with a downwardly-extending end piece t^2 , to which is secured a triangular knife u^2 , projecting rearwardly. The rear end of the bar s^2 is pivoted to a lever v^2 , the latter itself being pivoted at w^2 to the frame of the machine. The said lever v^2 has on its lower projecting end a roller x^2 in the path of a cam pin or projection y^2 on the disk z . The bar is normally held in its forward position by means of a spring z^2 , connected to the lever v^2 and to the standard w' . When the cam pin or projection y^2 engages the roller x^2 , it draws the knife sharply rearward and causes it to penetrate the edge of the upper, which at this time is held taut by the grippers and the pincers. The said knife is preferably formed with a sharp point and with two cutting edges, so that instead of cutting the upper from the edge it penetrates the upper and cuts it in both directions.

In sewing the upper to the insole the latter, which is indicated by A, is provided, as has been before stated, with a tape B, sewed thereon at some little distance from the edge of the same, as shown in Figs. 12, 13, 14, and 17, but while I prefer to employ an insole of this nature it will be understood that I may employ an insole having a thread C, formed in loops thereon, as shown in Figs. 15, 16, and 18, or else, if desired, I may sew the upper to a welted insole.

When the machine is to be employed in the operation of sewing an upper to an insole, the following steps are performed by the various parts of the machine: Assuming that the parts are in the position shown in Fig. 1, and that the tape B has been grasped between the grippers i' and g' , and the edge of the upper has been drawn taut over the last by the pincers and is firmly gripped by the same, the rotation of the shaft f causes the link w to be forced forward, throwing the arm v of the awl-carrier forward and causing the awl to penetrate the tape and the upper. During this movement of the awl the cam projection y^2 on the cam-disk z engages the roller x^2 of the lever v^2 , drawing the slasher-blade rearward with a quick movement, and since the upper is held taut at this time by the pincers the knife makes a cut in the edge thereof, as has been explained. The knife is not held in its rearward position, but immediately returns to its normal position. Then the awl starts back toward its normal

position, and as it moves back the needle follows it closely, being drawn down by the link p and the lever q , as has been stated. When the needle reaches the end of its throw, the
 5 cam h^2 causes the bar or link e^2 to rise and release the pincer-levers t' and u' , and at about the same time the cam-slot q^2 in the disk z throws the lever o^2 rearward, and the shaft d^2 , being rocked, draws backward the
 10 jaw s' . When this is being performed, the pin m' on the awl-carrier engages the head n' on the curved arm l' and causes the jaw i' to move away from the jaw g' of the grippers. The tape and the upper now being both
 15 released the continued movement of the awl causes the cam-face of the hub b' to engage the pin d' and force the needle-carrier along the shaft k , the needle during this movement remaining stationary. The further move-
 20 ment of the awl causes the head n' on the curved arm l' to engage the hook o' , with the result that the said head is released from the pin m' , allowing the jaw i' of the gripper to engage a fresh portion of the tape and clamp
 25 it against the stationary jaw g' . At the same time the lever o^2 rocks the shaft d^2 forward and the jaw s' of the pincers engages the upper and forces it upward until it is clamped between the said jaw and the jaw r' . When
 30 this has been done, the bar or link e^2 is depressed and the cam-lever i^2 engages the pincer-lever u' , drawing the upper firmly over the last. By this time the forward motion of the awl has stopped and the shaft f
 35 has nearly completed one rotation. As it completes its rotation, however, the awl is carried from its foremost position to the position shown in Fig. 1. When this has been done, the shaft f has made a complete rota-
 40 tion, and as it rotates continuously the parts perform the same functions as I have described. The grippers may be said to act as an abutment for the thrust of the pincers, inasmuch as the insole is pressed tightly
 45 against and is held by the same.

While I have herein stated that the needle-carrier, by which the feeding of the work is accomplished, is moved longitudinally of its supporting-shaft by the awl-carrier, yet it
 50 will be understood that I do not limit myself to machines employing an awl, since the awl may be dispensed with and any other mechanism for accomplishing the same purpose in the same way may be employed in lieu thereof.

55 By employing a slasher-blade for shingling the edges of the upper I am enabled to sew the upper upon the insole in such way that when the operation is completed the upper is smooth and unwrinkled, since the cut edges
 60 will overlap at the toe and along the outward curves and will gap or stretch at the inward curves, as at the shank, so as to allow the leather of the upper to adapt itself to the peculiar shape of the last on which it is formed.

65 The movement of the pincers is such that one jaw of the same reaches down and engaging the upper draws it taut over the last

and then grips it against the other jaw. The two jaws then firmly clamping it draw it up
 70 into position where it may be engaged by the needle and firmly sewed to the tape on the insole.

The coöperation of the slasher-knife with the needle and the grippers and pincers is peculiar and produces a novel and important
 75 result. As has been stated, the shingling or cutting of the edge of the upper allows the edge to either overlap or strike under the insole, according to the conformation of the
 80 latter, and in rounding the toe the overlapping of the cut edges is accomplished automatically. The upper is held taut and slashed, and the needle is passed through it and the
 85 tape, and then when the pincers grip the upper in a new place, the last now being moved to a sufficient angle relatively to the latter, the edge of the upper is drawn taut, so as to overlap the previous strip or cut-edge. This
 90 occurs continuously until the toe is rounded, with the result that the slit edges overlap and form a neat flat plait at the toe. The last is moved in the hands of the operator for
 95 the pincers to grip the upper while the needle is in the stock, so that the last is swung around the needle as a pivot in rounding the toe, and the pincers must necessarily draw the upper to overlap the preceding slit edge.

Having thus described one form of machine in which my invention may be embodied, without having attempted to set forth all of
 100 the forms in which the various parts thereof may be embodied, I now declare that what I claim is—

1. A sewing-machine for lasting boots and shoes provided with grippers for the insole, 105 and pincers for the upper, combined with means for causing the grippers and the pincers to intermittently release the work, and means for feeding the said work when it is released as aforesaid, substantially for the 110 purposes set forth.

2. In a sewing-machine for lasting boots and shoes, the combination with the sewing mechanism, of a pincers for the upper, a gripper for positively gripping and holding the insole 115 to resist the thrust of the pincers, means for causing the pincers to intermittently release the upper, and an automatic feeding mechanism for feeding the work when the upper is released by the pincers. 120

3. In a sewing-machine for lasting boots and shoes, the combination with a pincers for drawing the upper taut over the last and holding it in a taut condition, grippers for positively gripping the insole to resist the thrust 125 of the pincers, and a needle, of means for causing the pincers to release the upper, and means for moving the needle and the work laterally when the upper is released.

4. In a sewing-machine for lasting boots and shoes, the combination with the needle, of an intermittently-acting gripper having two jaws for the insole, and an intermittently-acting 130 pincers for the uppers.

5. In a sewing-machine for lasting boots and shoes, the combination with gripper-jaws for the insole, a pincers for the upper, an awl, and a needle, of means for causing the pincers and gripping-jaws to grasp the work when the awl penetrates the latter and for causing them to release the work when the needle has penetrated it, and means for moving the needle laterally, for the purpose set forth.

6. In a sewing-machine for lasting boots and shoes, the combination with the gripper for a tape or similar device on an insole, a pincers for the upper, and stitching mechanism for sewing the upper to the tape, of an awl, and means coacting therewith for causing the gripper to release the tape intermittingly, for the purpose set forth.

7. In a sewing-machine for lasting boots and shoes, the combination with the stitching mechanism, of a pincers for the upper having two jaws, and means for moving the pincers bodily to carry the edge of the upper toward the stitching mechanism, said pincers having one jaw movable independently of the other jaw for drawing the upper taut over the last before it is engaged between the two jaws thereof.

8. In a sewing-machine for lasting boots and shoes, the combination with the stitching mechanism, of pincers for the upper, consisting of two pivoted levers, each having a jaw on the end, one of said jaws being movable relatively to its lever, for the purpose set forth.

9. In a sewing-machine for lasting boots and shoes, the combination with the stitching mechanism, of a pincers for the upper, consisting of two pivoted levers, each provided with a jaw, one of said jaws being movable relatively to its supporting-lever, means for swinging said levers on their pivot, and means for moving said movable jaw relatively to its lever, for the purpose set forth.

10. In a sewing-machine for lasting boots and shoes, the combination with the stitching mechanism, and a pincers for the upper, of means for feeding the work laterally, and a knife movable independently of the pincers.

11. In a sewing-machine for lasting boots and shoes, the combination with the stitching mechanism, and a pincers for the upper, of means for feeding the work laterally, a movable knife, and means independent of the pincers for moving the knife to engage and cut the upper.

12. In a sewing-machine for lasting boots and shoes, the combination with a stitch-forming mechanism, and a pincers for the upper, of a knife movable relatively to said pincers to cut the edge of the upper, and means for moving said knife when the pincers has engaged the upper.

13. In a sewing-machine for lasting boots and shoes, the combination with a stitch-forming mechanism, of a movable knife, and means movable independently of said knife for drawing the upper taut over the last prior to the movement of the knife.

14. In a sewing-machine for lasting boots and shoes, the combination with a stitch-forming mechanism, and a gripper for the insole, of a movable knife, and means for moving said knife to engage and cut the upper.

15. In a sewing-machine for lasting boots and shoes, the combination with a needle-carrier, and an awl-carrier, of a looper mounted on a stationary support, and a cam operated by the awl-carrier for causing the looper to throw the thread over the needle.

16. In a sewing-machine for lasting boots and shoes, the combination with a needle-carrier, and an awl-carrier, of a looper mounted on a stationary support, and a cam operated by the awl-carrier for causing the looper to throw the thread over the needle, said looper consisting of a pivoted lever and a curved arm adjustably held in said lever.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 10th day of June, A. D. 1896.

JAMES E. JACKSON.

Witnesses:

C. F. BROWN,
MARCUS B. MAY.