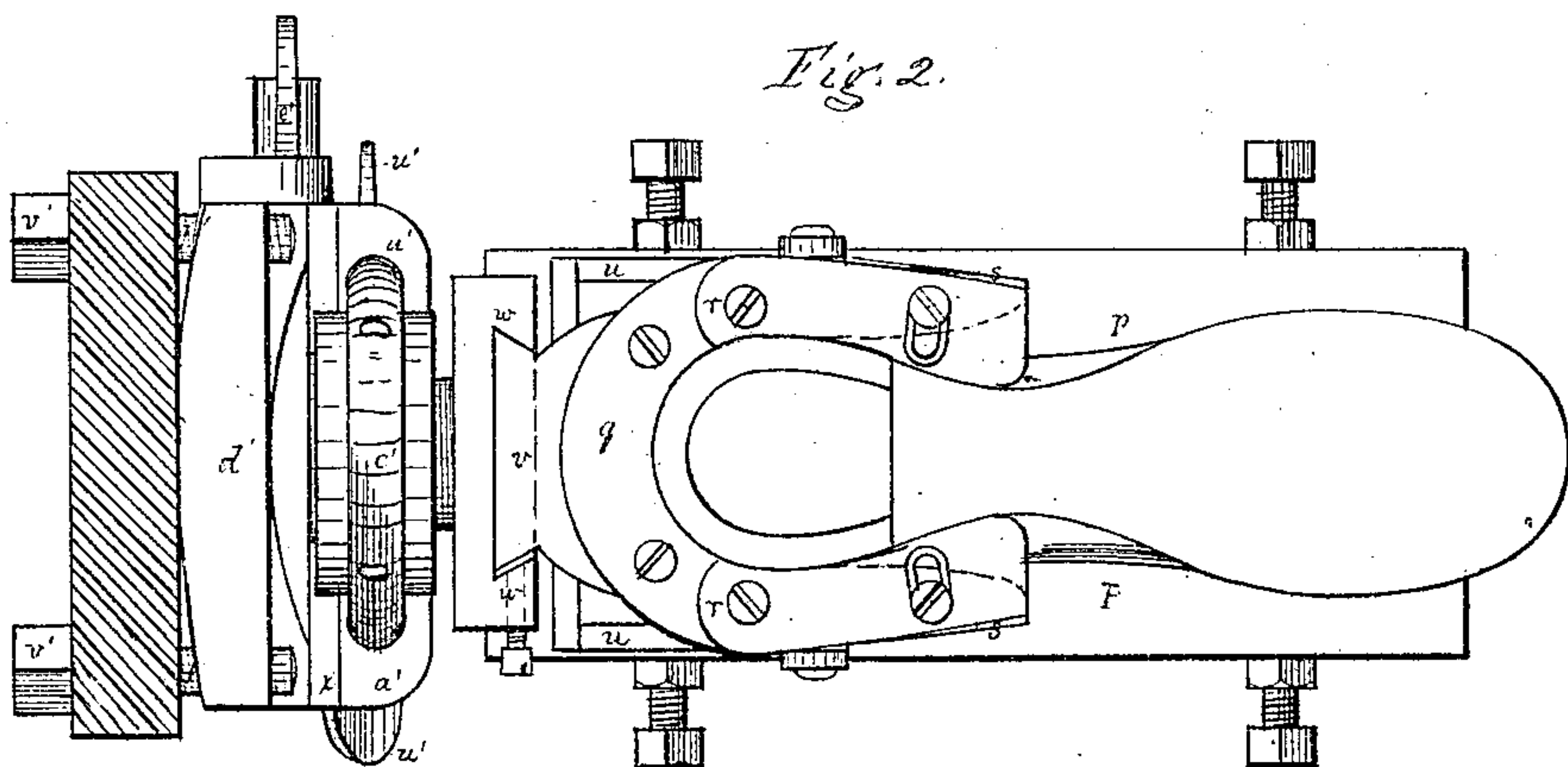
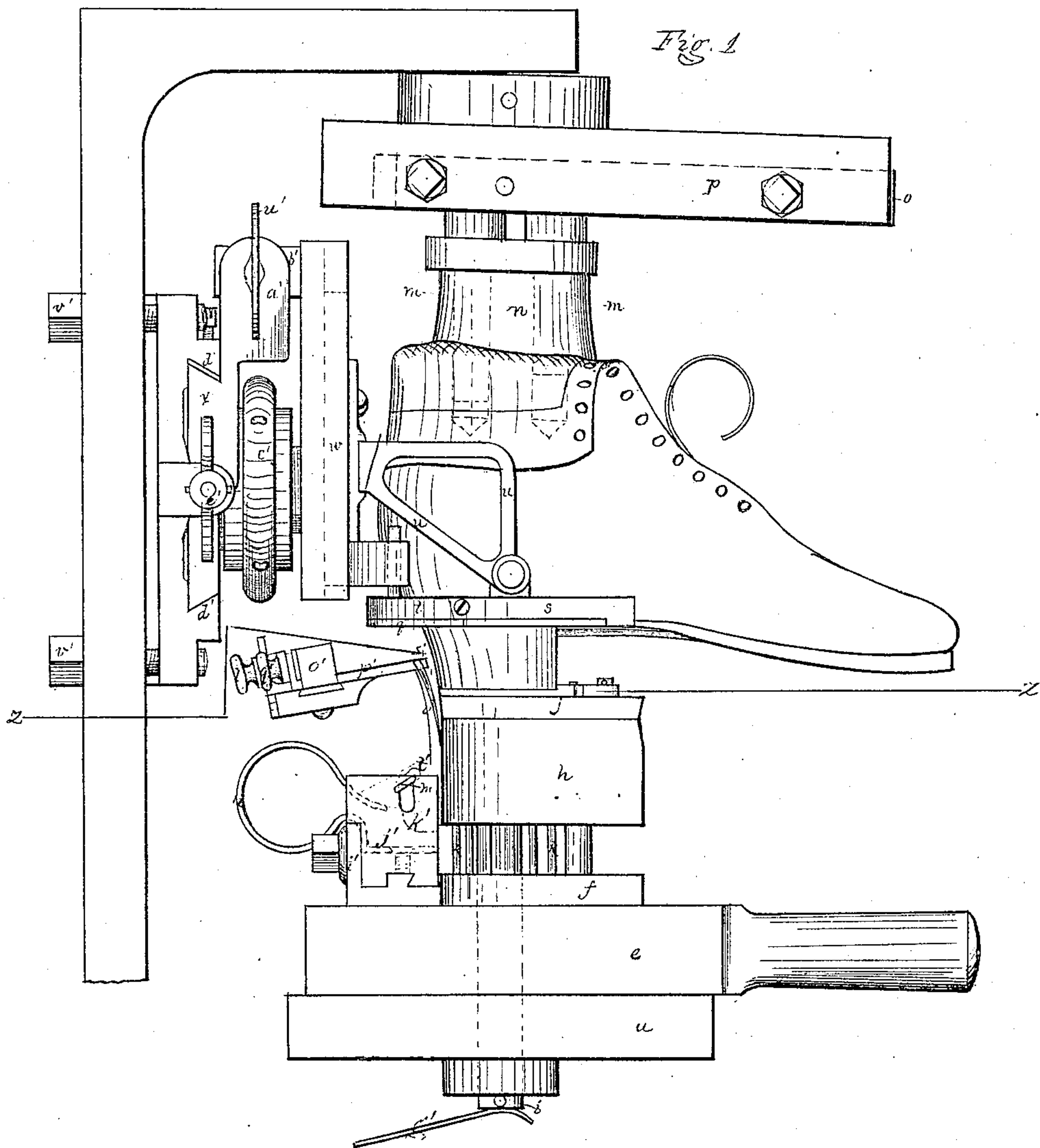


C. W. GLIDDEN.
MACHINE FOR HEELING SHOES.

No. 103,735.

Patented May 31, 1870.



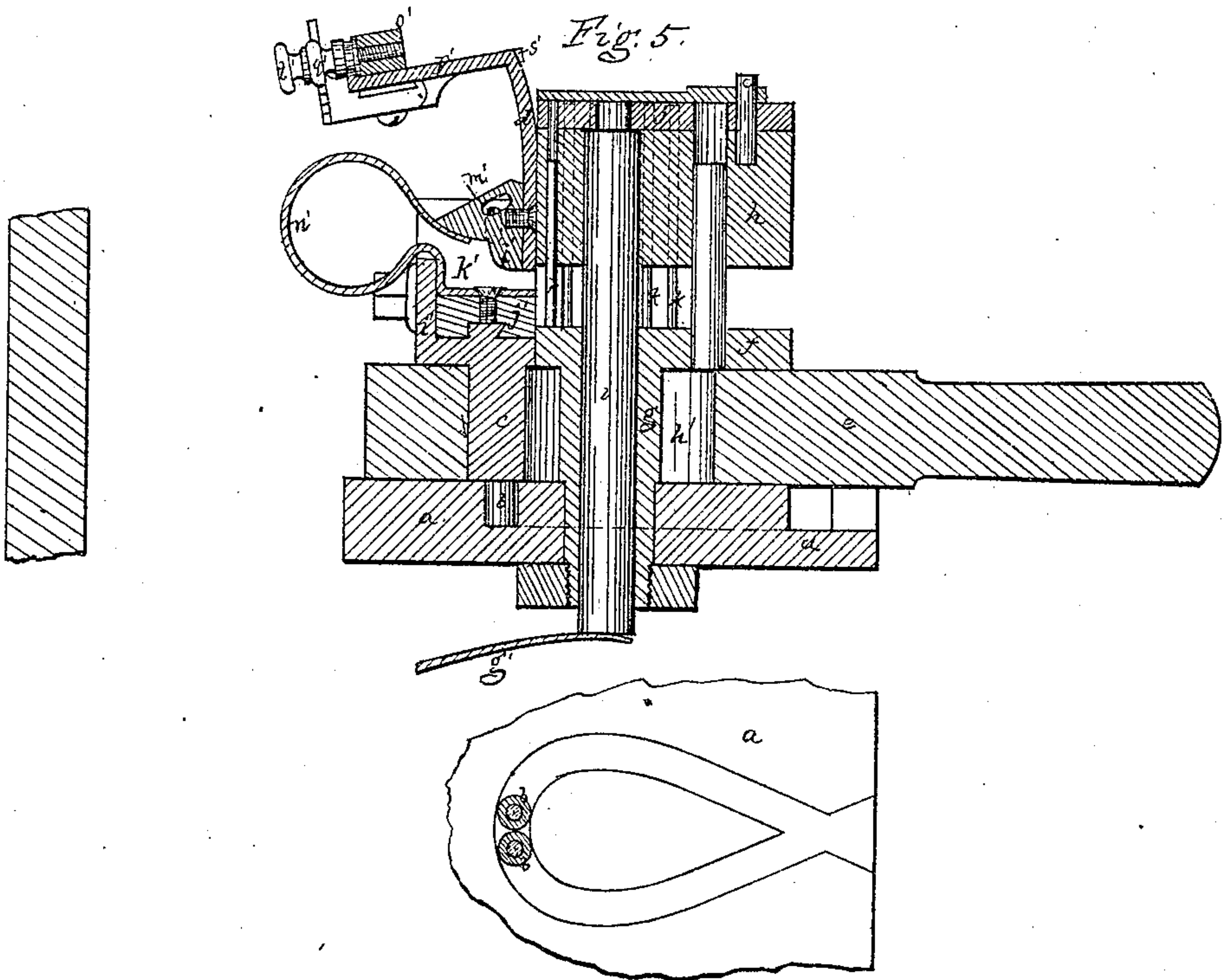
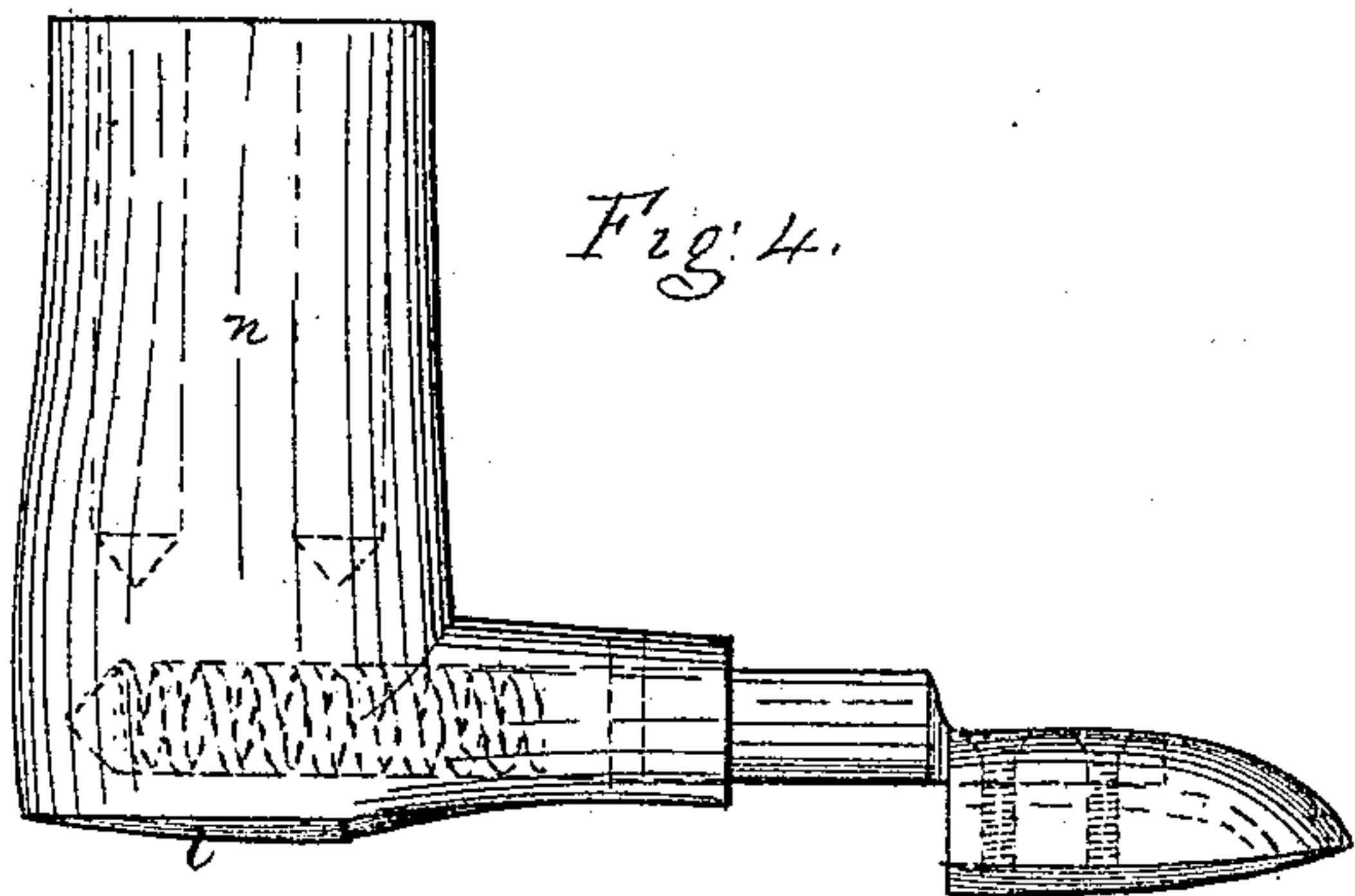
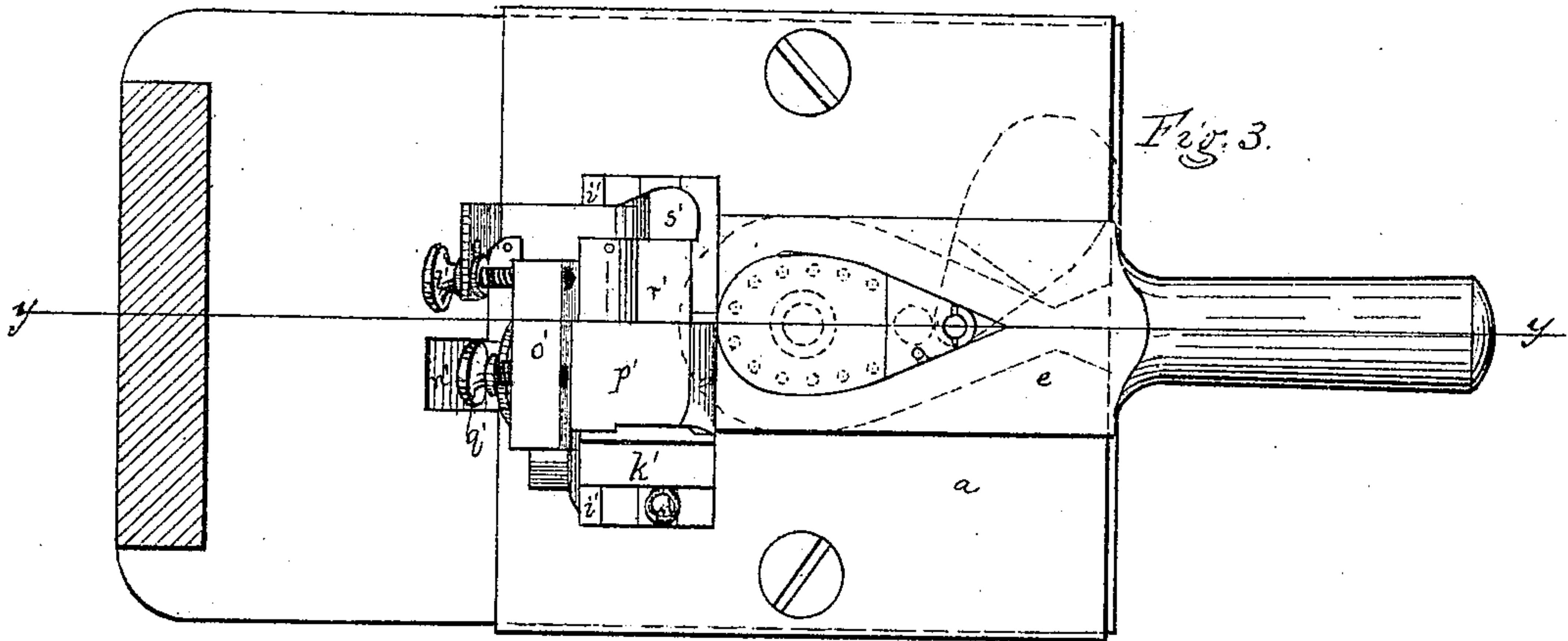
Witnesses } C. Warren Brown
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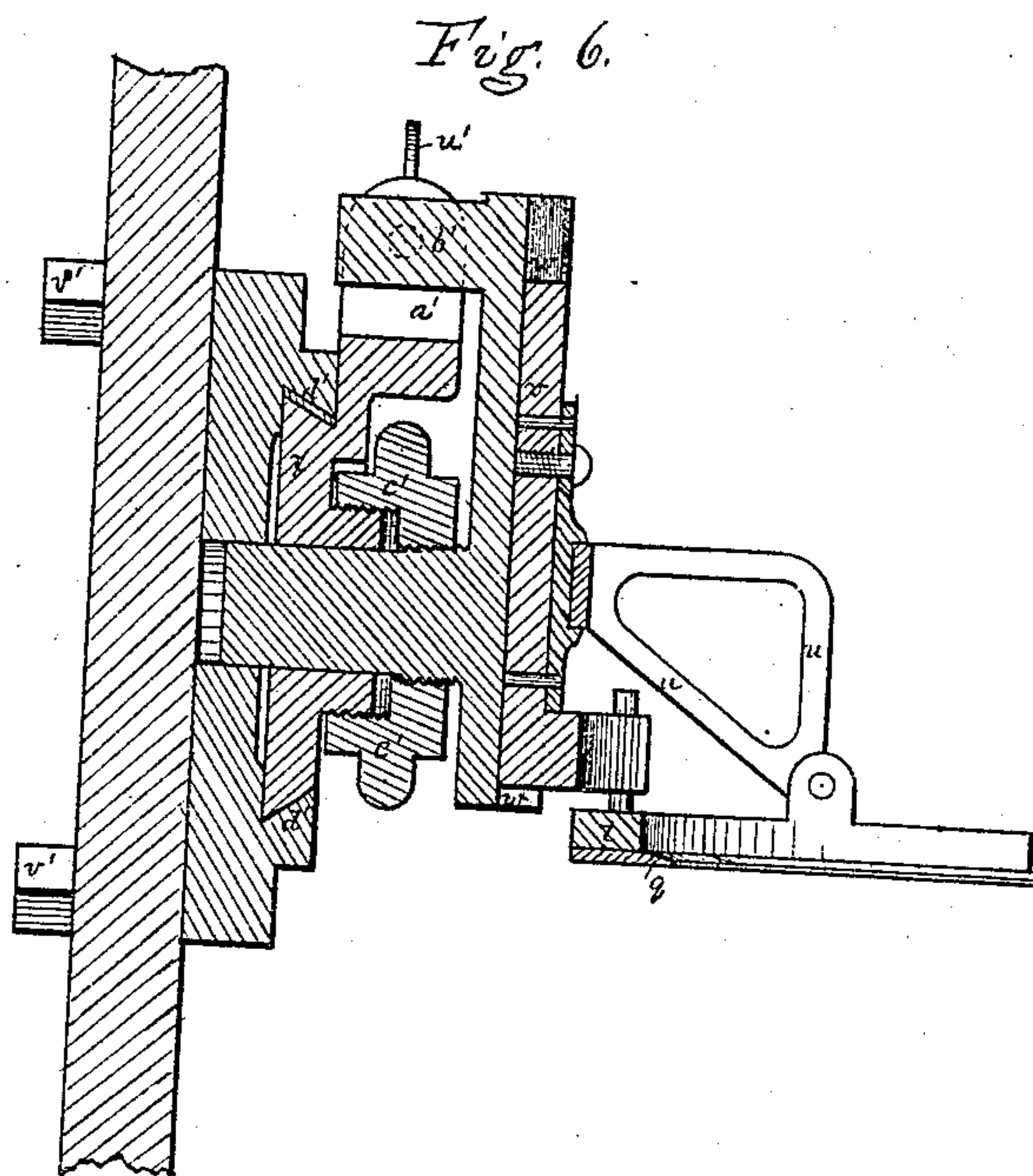
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United States Patent Office.

CHARLES W. GLIDDEN, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GORDON McKAY, TRUSTEE.

Letters Patent No. 103,735, dated May 31, 1870.

IMPROVED MACHINE FOR HEELING BOOTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, CHARLES W. GLIDDEN, of Lynn, in the county of Essex and State of Massachusetts, have invented Improvements in Machines for Heeling Boots and Shoes; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to certain novel devices, arrangements, and combinations of parts, by which a heel-blank, made up of lifts of leather preferably, or of other suitable material, and preferably first pierced with holes to receive and guide nails, is nailed and compressed upon the heel-seat of a sole of a boot or shoe, and then has its curvilinear outline shaved to the desired form.

The machine herein shown may be considered as based upon those shown and described in the United States Patents No. 41,038, granted December 22, 1863, for the invention of George W. Ellis, and No. 36,607, granted October 7, 1862, for the invention of said Ellis and myself.

As the machine is complex, the motor which is employed to move the parts which drive the nails and compress the heel is not shown, as it may be varied, and does not form part of the invention to be herein shown and described.

The drawing shows, in—

Figure 1, a side elevation of so much of a heeling-machine as contains an embodiment of my invention; in

Figure 2, a reversed plan of what is seen beyond the plane of the line *z z*, fig. 1; and, in

Figure 3, a plan of what is seen below the plane of the line *z z*, fig. 1.

Figure 4 is a side elevation of the boot or shoe-holder, on which are placed boots or shoes to receive the heels which are to be nailed and shaved or cut to form.

Figure 5 is a vertical central section, taken in the plane of the line *y y*, fig. 3.

Figure 6 is a vertical central section, taken through the devices which adjust the counter-protector.

a is a bed-plate, intended to be supported and guided by the frame of the machine, so that it may be raised and lowered from beneath by a toggle-joint, in which bed-plate is cut a guide-groove, seen in dotted lines in fig. 3, into which groove projects two pins or rolls *b b* from a stud *c* fixed to the compound carriage which sustains and carries the cutter *d*.

Secured to the bed-plate *a*, so as to stand above it the distance of the thickness of the lever *e*, is a plate, *f*, approximating in plan to the plan of a heel, said plate having a sleeve, *g*, integral therewith, and resting with a shoulder on the bed-plate *a*, and passing

through it to the other side of the bed-plate, where it is secured by a nut.

Above plate *f* is a block, *h*, which has a stem, *i*, passing down through sleeve *g*, block *h* being kept by a spring, acting through stem *i*, always above plate *f*, except at times when pressure from below, exerted against a heel, forces block *h* toward plate *f*, said block and plate being kept from turning relatively to each other by a guide-pin fixed in the plate *f*, over which pin the block slides.

On the top of block *h* are fitted interchangeable plates, one being shown at *j*. These plates *j* are made of different sizes, within reasonable limits, and control the size of the tread-portion of the heels to be formed, because the knife bears at one end, and is guided against the outline of the piece *j*, which may be in position on block *h*.

The block *h* and the tops *j* thereof, are drilled around their convex outlines with straight parallel holes, at such distances apart as are desired for the insertion of nails at the tread of a heel, and steel wires *k*, with ends square to their axes, are dropped in said holes, resting freely on plate *f*. Said wires are to be made of lengths to suit circumstances, as will be explained beyond; but it will now be seen that if block *h* is sustained above plate *f*, at some distance from it, the holes in which the nail-drivers *k* work may each receive, above each driver, a nail, head down and point up, so that if a heel (especially if previously pierced with holes to receive nails) is firmly held over the block *h*, the nails therein must, by the resistance of the drivers *k*, when plate *f* is forced toward block *h*, be forced out of the block into the heel.

The top of the block *h* itself forms the smallest guide which the tread-cutting end of the knife *d* can have, and the changable tops *j* increase from that size. When it is intended to have the nail ends show flush with the surface of the tread-lift on the heel, the drivers *k* must be made of such length that their upper ends come flush with the upper surface of the block *h*, or the upper surface of *j*, when the upper surface of plate *f* and the lower surface of block *h* are brought into contact by the force which drives the nails into the heel.

The shoe to which a heel is to be nailed is placed upon a kind of last seen in fig. 4, which is best made of metal, the only part of which that needs to fit the shoe is the heel-surface *l*, against which the nail points clinch. Over this part *l*, in the leg-portion of the last, two socket holes are made, which slide upon two pins *m m*, the shoulders of which come against the upper end of the leg part *n* of the last. The toe part of the last is arranged as a slide, which is forced outward by a spring contained in the heel-part, so that one last will answer for several lengths of shoes, the parts

the last being kept from accidental dismemberment by check-pins working in suitable slots.

The pins *m* are fixed in a slide, *o*, which is fitted so as to be moved in ways *p*, which are attached to a large adjusting-screw, not shown, and having its axis about in line with the axis of the sleeve *g*.

The ways *p* are so connected to the adjusting-screw that they may be vibrated slightly, both vertically and horizontally, to aid in the proper adjustment of boots and shoes, the side vibration being most needed in adjusting shoes which are "rights and lefts," so as to throw the toe of a shoe a little to the right or left of the center line. This side vibration of the ways *p* does not need to be of great extent, and may be determined by adjustable stops attached to the frame of the machine, but not shown in the drawing, against one or the other of which the one side or the other of the ways *p* is brought, according as the shoe is right or left, or the operator may swing the ways *p* to either side without the stops, as far as he judges necessary.

In placing a shoe upon, or in removing it from the last-holding pins, the slide is drawn forward, to give ample room to the operator, and, when properly placed on the pins, the slide, and the shoe with it, is pushed back so as to bring the heel-seat over the nailing apparatus.

As the heelless shoe on the last is forced back to the position in which it is to be supplied with a heel, it is driven upon a thin rim of metal, which enters the crease between the upper and the rear part of the sole, said rim forming a fender to keep the knife from roughening and cutting the upper as it is drawn around the heel. This rim is marked *q* in the drawing, and is itself jointed at *r*, so as to expand to let the shoe enter it, and so as to contract again to fit the form of the shoe where it narrows from the heel to the shank, springs *s* being applied to the jointed ends of the rim to force them inward toward each other, which springs allow the outward yielding of said ends.

The rim is fitted to and is sustained upon a frame, *t*, which is of horseshoe or U-shape, and this is pivoted to a kind of bracket, *u*, which is fastened to a slide, *v*, connected to a combination of parts, which, by adjustment, can be made to vary the position of the rim *q*, so as to suit any kind of presentation that may be given to a shoe.

Slide *v*, moving up and down, gives facility to fit the rim into the crease at any reasonable distance from the shoulders on the last-pins, and is guided in ways *w*, which are pivoted on a horizontal trunnion, which can turn and also slide in a bearing in the direction of the length of its axis, the trunnion being fixed to the ways *w*, and its bearing being formed in the cross-slide *x*, which has on its upper edge two ears, *a'*, loosely embracing a projection, *b'*, by which the ways *w* can be inclined through the action of the set-screws *u'*.

To adjust the ways *w* toward and back from the heel, a right-and-left hand screw-coupling nut, *c'*, is introduced between ways *w* and cross-slide *x*, which coupling takes hold at one end upon screw-threads made on the trunnion, and at the other end upon screw-threads made on a boss on the cross-slide *x*, around the trunnion bearing, so that by turning the screw-coupling nut *c'* in one direction or the other, the necessary forward and back adjustments of the rim *q* are made.

The cross-slide *x* is fitted in ways *d'*, and can be moved in them by turning the screw *e'*, so as to set the rim *q* to one or the other side, or on the center line, and the back of the ways *d'* is made convex, and is held to the frame of the machine by screws *v'*, by adjustment of which the rim *q* is affected as to its position.

By these provisions for setting and changing the position of the rim *q* any form of shoe may be suited, but when a machine is once adjusted to any special kind of work, the adjustments which have to be made

as shoe after shoe is operated upon are but slight and not frequent.

Before nailing a heel to a boot or shoe in this machine, it is preferably pierced with holes corresponding in position to the localities of the drivers in the block *h*, and, where the heel tapers, it is preferably pierced by a machine, making use of bent awls, playing through an awl-block, having taper holes, as described in an application for United States Letters Patent by John Gilson, executed as of even date herewith.

Suppose, then, a heel properly pierced, and ready to be placed on the block *h* or its top *j*, and the drivers *k* therein of such a length as to come flush with the surface of *h* or *j*, when the block *h* and plate *f* are brought into contact, the block *h* is held, by its spring *g'*, away from plate *f*, the grooved plate *a* being at its lowest position from which it is to be raised by the action of a toggle-joint, or other suitable means, then all the drivers except two or three are to be charged with nails, point upward, and in the heel, those holes which correspond with the drivers not supplied with nails, have nails inserted so as to form register-pins, by which the heel is registered in position over the drivers, or all the nails may be entered in the holes made for their reception in the heel, and the projecting nails are then thrust into the holes over the drivers.

The soled but heelless shoe is then, with its last, placed upon the last-pins with the rim *q* in the crease between the upper and the sole, and ascent of plate *a* and the parts connected therewith, brings the heel properly upon the heel-seat part of the sole, the block *h* slides down on the drivers, and the drivers rise through the block *h* and force the nails into and through the heel and sole and clinch their points upon the surface *l* of the last, the heel at the same time being greatly solidified and condensed between said surface *l* and the block *h* or plate *j*, and in that condition the heel is ready to be shaved or cut to form.

Beneath the rim *q* is the edge of the rear or heel-seat portion of the sole which has been pared and fitted to the size and form of the shoe, and, to conform to which, the heel is to be shaped by cutting away the surplus material, the edge of the heel-seat portion of the shoe serving as a pattern or templet to guide the upper part of the knife to cause it to cut the upper part of the heel, in conformity with the shape of the heel-seat part of the sole.

The lever *e*, which is worked by hand to carry the cutter *d* around the heel to shave it, is slotted, as seen at *h'*, so as to embrace and move upon sleeve *g*, the pin *c*, from the ways *i'*, of the knife carriage *j'*, fitting in a hole bored in lever *e* to receive said pin.

The knife-carriage *j'* receives, between two ears *k'*, a block, *l'*, to which the lower part of the knife is secured, said block filling the space between ears *k'*, which, and the block, are pierced with oblong holes, which receive a split or staple-formed pin *m'*, the object of which is to keep the lower end of the knife within certain limits while allowing it to yield within those limits. The carriage *j'* is made adjustable on the ways *i'*, so that the knife may be set, as it is worn by sharpening, with its edge about in the vertical plane passing through the axial line of lever *e*, which plane passes midway between the two guide-rolls or pins *b b*. A C-spring, made fast to the carriage *j'*, has its free end bearing under the block *l'*, and forces the knife up to its work without rigidly holding it, and allowing the knife to follow the heel-seat and heel-tread guides.

The upper part of the knife is bent sharply to the rear, and carries a complex arrangement of adjustable guides. A piece, *o'*, is dovetailed on the part *p* of the knife, and is made to slide back and forth thereon by turning screw *q'*. On that end of *o'*, nearest the knife-edge, is dovetailed a piece, *r'*, the front edge of which, adjacent to the knife-edge,

acts as a gauge against the edge of the heel-seat part of the sole, and as the knife-edge is ground away, the piece *r'*, being adjustable on piece *o'* in the direction of the length thereof, is kept constantly close to the edge of the knife.

A piece, *s'*, is fitted to gauge *r'*, so that by turning screw *t'* its end can be projected toward the shoe, beyond the operative edge of gauge *r'*. The object of this piece *s'* is to strike against the edge of the sole in the shank of a shoe, and thus throw the knife back and prevent it from cutting the sole-edge beyond the place covered by the heel.

To shave the heel, the operator turns the lever so as to bring the knife-edge front of and toward the breast of the heel, and the C-spring forces the knife upward and toward the heel, so that the surface *p'* of the knife bears against the under surface of rim *q*, the edge of gauge *r'* against the edge of the heel-seat part of the sole, and the lower part of the knife against *h* or *j*, as the case may be, and, as the knife is drawn around the heel, the tendency of the cut is to cause said gauges to hug against said guides. To steady the rim-frame *t*, and to aid the brackets *u* in holding it, the rear of the frame engages with steady-pins in projections from the slide *v*.

As in the use of this machine it is not common to cup out the seat-face of the heel, and as the shank of a shoe is rounded back into the heel-seat, it is necessary to compress the material of the heel more at the breast than at the sides or edges, and hence I make the surface of the heel-part of the last, as seen in fig. 4, inclined from the rear toward the breast-line, so that along the breast of the heel the leather is more compressed than elsewhere, especially at the center of the shank.

A similar result may be obtained by dropping the rear of the surface on which the heel is placed.

There is seen in the drawing an adjunct, for so covering heels with a tread-lift as to hide the nails from view, but as it is the invention of William F. Spinney, and described in his application for United States Letters Patent executed as of even date herewith, further reference thereunto is not needed here.

Without Spinney's improvement, I cover the heads of the heel-nails with a tread-lift by leaving the drivers short, so that they will not come within about the tenth of an inch of the surface which acts on the lift through which the nails enter the heel, and thus the nails will be driven and the heel compressed with the nails projecting beyond the lift through which they enter. Then I lower the plate *a* and raise the ways *p* a distance about equal to the thickness of the tread-lift, which I use to cover the projecting nails. This lift I place on the surface of *h* or *j*, and then cause the bed *a* to rise, which will force the lift upon the projecting nails, and will cover them with a lift, which is thus made an integral part of the heel. Some of the leather of this covering lift is forced into the holes in which the drivers work, and is left projecting in bunches, which have to be trimmed off.

When a heel has been shaved, the plate *a* and the parts connected therewith are lowered, and the slide

o and the shoe drawn forward, the shoe is detached from the last and another substituted, which is then thrust into the rim *q*, a new heel is placed over the nails from the drivers, or is prepared with nails, and the nailing and compressing operation is performed and followed by the shaving operation, as before set forth, and the work is continued and adjustments of the parts made from time to time by the described devices, as the sizes or forms of boots or shoes are changed.

The knife can be readily removed from the machine, and can be stripped from the parts fastened to it, for thorough grinding.

I claim—

The rim *q*, arranged to enter the crease between the "upper" and the sole, and to hold and locate the work, when made with hinged side pieces, which operate in connection with springs *s*, substantially as set forth.

Also, the arrangement of rim *q*, so as to turn in the directions allowed by the pivots in the brackets *u*, and by the trunnion on the ways *w*, substantially as and for the purpose specified.

Also, the arrangement of the rim *q*, so that it can be moved from side to side, from front to rear, and up and down, substantially as and for the purpose specified.

Also, the combination, with the frame of the rim *q*, of the steady-pins, for the purpose set forth.

Also, the relatively inclined arrangement of the surfaces between which the heel is compressed, so that they shall compress the material more at the front or breast than at the rear of the heel, substantially as and for the purpose specified.

Also, the arrangement of the knife upon a block, set so as to move freely within a limited range, with reference to the carriage *j'*, and under the influence of the spring *p'*, substantially as and for the purpose specified.

Also, the gauge *r'* attached to, carried by, and made adjustable upon the piece *o'*, carried by the knife itself, and with reference to the knife-edge, substantially as and for the purpose specified.

Also, the gauge *s'* attached to, carried by, and made adjustable upon the gauge *r'*, and operative upon the edge of the shank of the sole, substantially as and for the purpose specified.

Also, the combination, with the driver-block *h*, of the extension pieces *j*, substantially as and for the purpose described.

Also, the arrangement of the drivers *k*, with regard to their operative lengths within the driver-block *h*, so that, when they act, they shall not reach to the upper surface of *h* or *j*, and shall leave the nails projecting from the heel, for the purpose specified.

Also, the arrangement of the last-holder with the ways *p*, so that it can be swerved from side to side, substantially as and for the purpose specified.

CHARLES W. GLIDDEN.

Witnesses:

J. B. CROSBY,
C. WARREN BROWN.