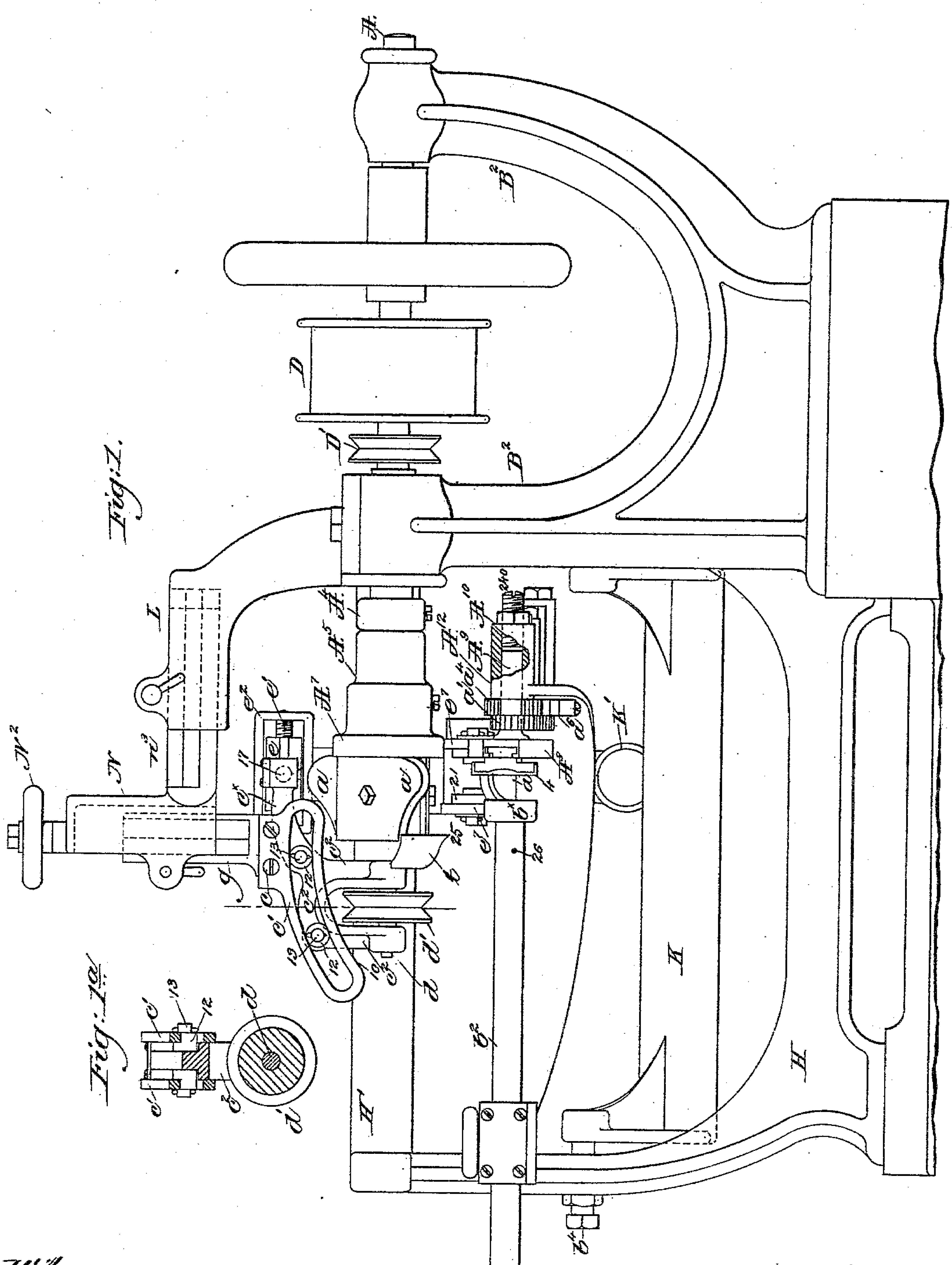
(No Model.)

4 Sheets—Sheet 1.

C. W. GLIDDEN.

HEEL TRIMMING MACHINE.

No. 411.655. Patented Sept. 24, 1889.



Witnesses.
Fred. S. Greenleaf
Frederick L. Emery

Inventor.
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(No Model.) 4 Sheets—Sheet 2.

C. W. GLIDDEN.

HEEL TRIMMING MACHINE.

No. 411,655. Patented Sept. 24, 1889.

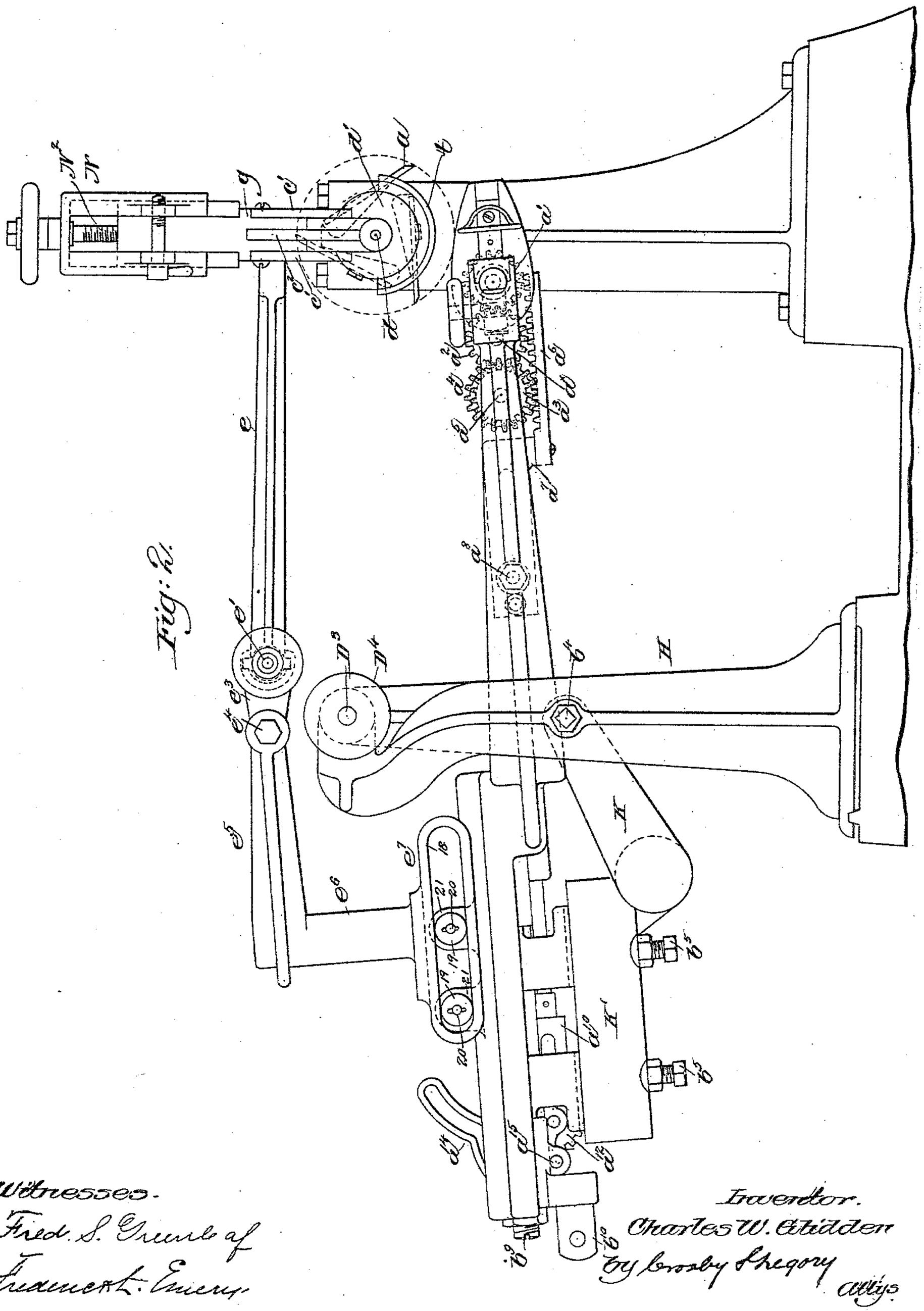

Fig: 2.

Witnesses.
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(No Model.) 4 Sheets—Sheet 3.

C. W. GLIDDEN.

HEEL TRIMMING MACHINE.

No. 411,655. Patented Sept. 24, 1889.

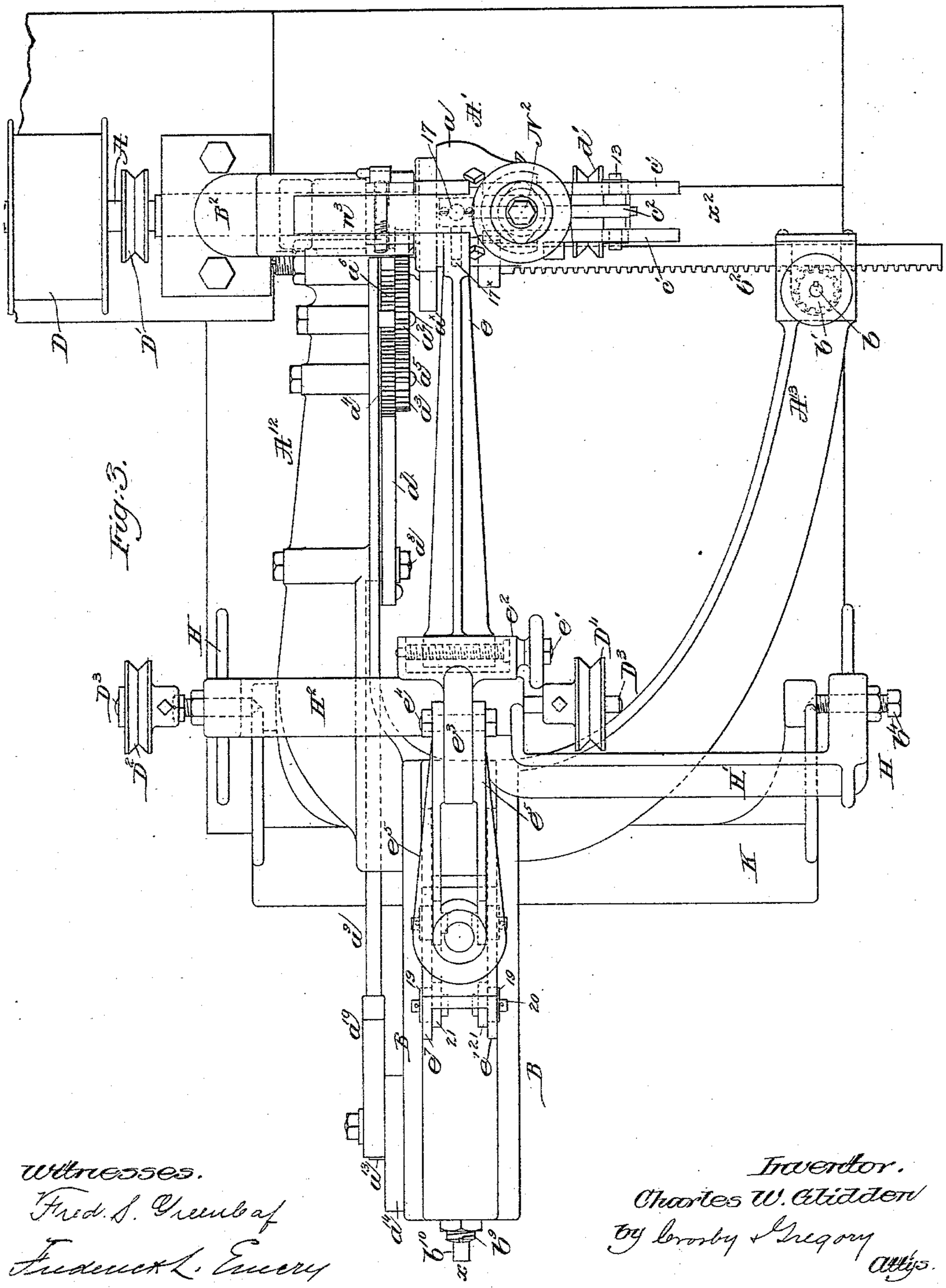

Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

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HEEL TRIMMING MACHINE.

No. 411,655. Patented Sept. 24, 1889.

Fig. 6.

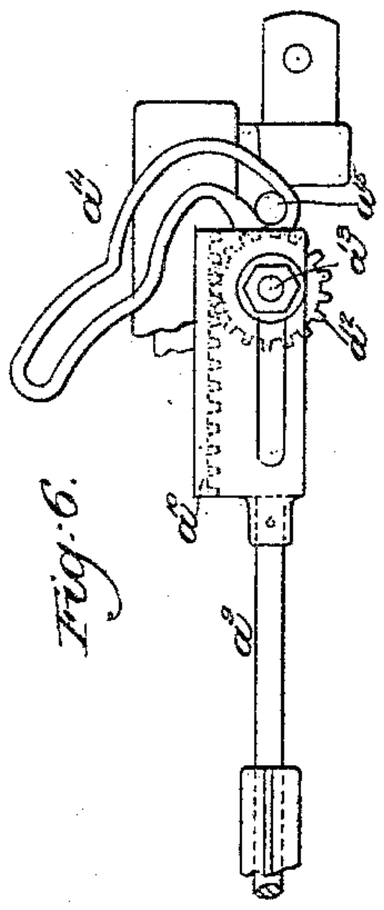


Fig. 9.

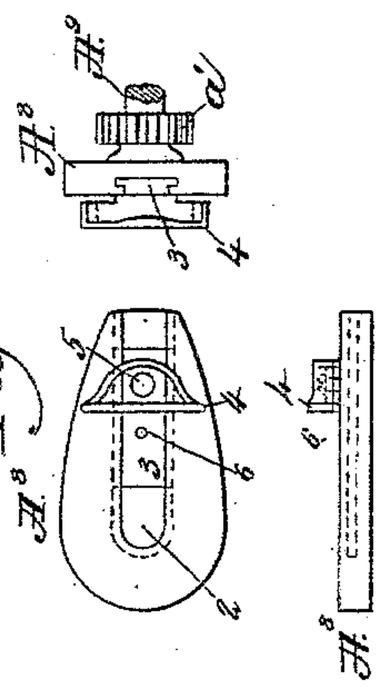


Fig. 5.

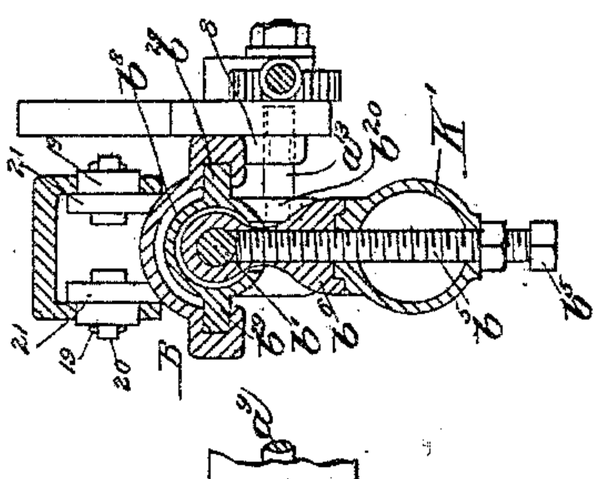


Fig. 8.

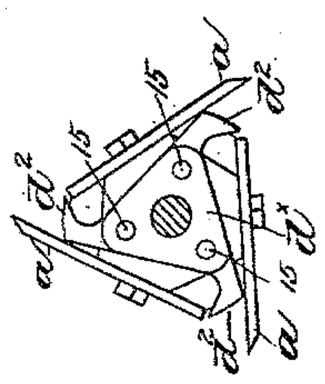


Fig. 4.

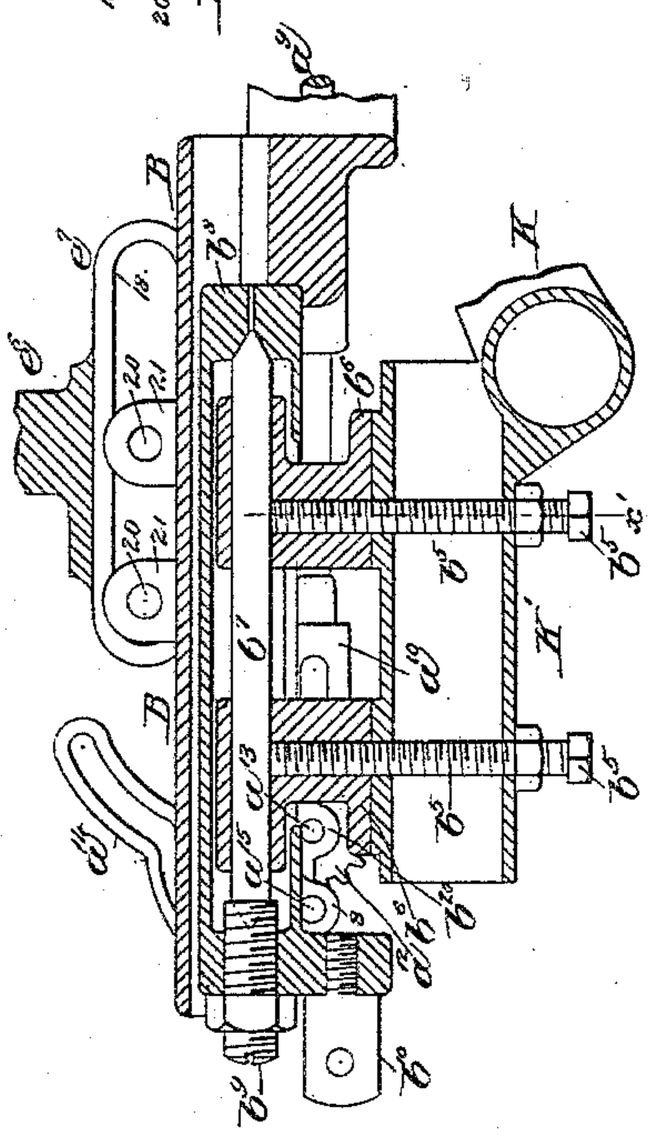
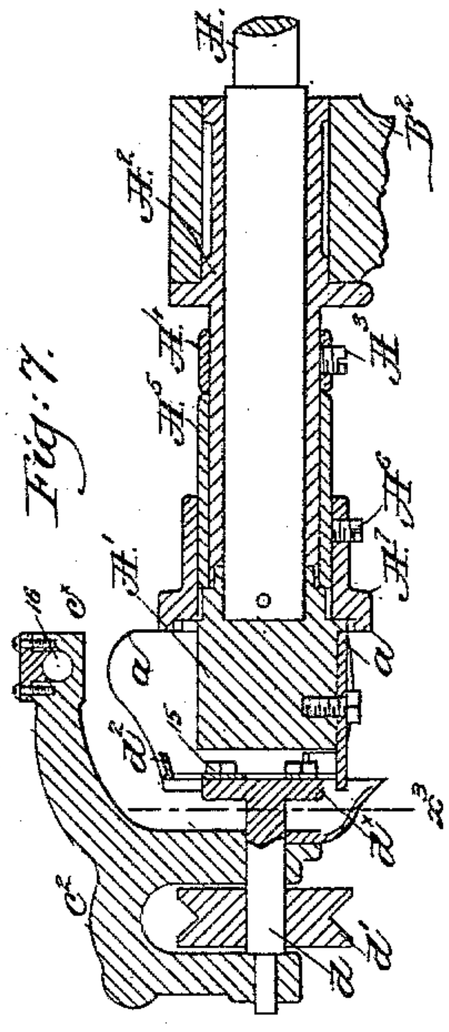


Fig. 7.



Witnesses.
Fred S. Greenleaf
Frederick L. Emery.

Inventor.
Charles W. Glidden
by Lemby & Gregory
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UNITED STATES PATENT OFFICE.

CHARLES W. GLIDDEN, OF LYNN, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE, OF CAMBRIDGE, MASSACHUSETTS.

HEEL-TRIMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 411,655, dated September 24, 1889.

Application filed May 28, 1888. Renewed May 18, 1889. Serial No. 311,306. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. GLIDDEN, of Lynn, county of Essex, and State of Massachusetts, have invented an Improvement in Heel-Trimming Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention is an improvement on that class of machines having a rotary cutter, and, as herein shown, the machine has a jack to hold the shoe having the heel to be trimmed, my invention being herein shown as applied to a machine of a class represented in United States Patent No. 267,544, dated Nov. 14, 1882. The machine described in the said patent has a rock-shaft provided with a rearwardly-extended arm, on which is pivoted a three-armed jack free to rock on its pivots and to rise and fall at its shoe-carrying end as the operator, rotating the shoe by hand, keeps the heel-pattern pressed against the guide-plate at the rear side of the cutter employed to trim the heel. In my experiments with this class of machines I have ascertained that the jack, besides its two motions provided for in the said patent, should have a third or longitudinal or sliding movement while the heel is being trimmed at its sides or between the corners of the breast and the rounded rear part of the heel, for by such sliding movement of the jack the trimming is better done and the work is kept better in view of the operator. I have provided the machine herein described with means whereby this longitudinal movement of the jack (very nearly like the jack in the said patent) is made automatic.

The machine is provided with a cam, which at the proper times, as will be described, acts to move the jack longitudinally, the cam being herein shown as set in motion by the shaft of the heel or heel-pattern. I have also combined with the rotary cutter a rand or counter guard, which I have supported in a peculiar manner—viz., in a carriage mounted upon curved tracks, the said carriage being made movable at the proper times thereon toward and from the rotary cutter having blades adapted to trim the main body of the heel, I denominating the said cutter as a "molded" cutter because its blades are and will be shaped or molded at their edges to correspond with the shape which it is desired to give to the heel in the direction of its height. The movement of the rand or counter guard, as described, enables it to uncover more or less of the molded cutter, according to whether the molded cutter is acting upon the rear part or sides of the heel, the said movement being made automatic by the movement of the jack, the cutter being connected to the carriage which supports the rand or counter guard. I have also made the said carriage to hold a shaft having at one end a rand-cutter, the said shaft having a pulley for the reception of a belt by which to rotate it at the desired speed.

Figure 1 is a front elevation of a heel-trimming machine embodying my invention. Fig. 1ª is a detail showing the carriage and the tracks. Fig. 2 is a left-hand end elevation of the machine shown in Fig. 1. Fig. 3 is a top or plan view thereof. Fig. 4 is a sectional detail of a part of the machine, taken in the line x, Fig. 3. Fig. 5 is a section of Fig. 4 in the dotted line x'. Fig. 6 is a detail supposed to be taken from the rear side of Fig. 4, but reversed to show the cam and some of the means for moving it to impart to the jack its longitudinal movement. Fig. 7 is a partial section of the machine in dotted line x^2, Fig. 3, chiefly to show the molded cutter, its actuating-shaft, the rand-cutter, the rand or counter guard, and carriage supporting the latter. Fig. 8 is a partial section in the dotted line x^3 of Fig. 7, looking to the right, the rand or counter guard and carriage being, however, omitted, the view being made chiefly to show the shape of the rand-cutter and the location of its cutting-edges with relation to the knives or blades of the molded cutter; and Fig. 9 shows several details of the heel-pattern against which the tread end of the heel is clamped.

The standard B^2, the arm L thereon, its stem n^3, made adjustable in the arm L, the screw N^2, to raise and lower the stem g, the frame H, and the rock-shaft K, mounted upon point-screws and carrying a jack, to be described, are and may be all substantially as in United States Patent No. 267,544, with the

exception that the frame H is herein stationary and extended upwardly, as will be described.

The standard B^2 receives in it the rotating cutter-carrying shaft A, to the forward end of which is attached, in usual manner, a molded cutter A′, having blades, as *a*, the cutting-edges of which are shaped to correspond with the shape of the heel in the direction of its height. The shaft A is extended through a long sleeve-like bearing A^2, (see Fig. 7,) upon which is secured by a screw A^3 a collar A^4, the said sleeve-bearing being surrounded between the said collar A^4 and a shoulder at the end of the hub of the molded cutter by a sleeve A^5, to which in turn, by a screw A^6, is secured a guard A^7, against the periphery of which at the rear side of the molded cutter bears the heel-pattern A^8. The heel-pattern A^8 is connected to the end of a short shaft A^9, having its bearings in a hub A^{10} at the front end of the arm A^{12} of a jack, the other arm being shown at A^{13}, the said arms being shaped (see Fig. 3) to form a nearly U-shaped yoke. The inner end of the shaft A^9 abuts against a stop-screw 240 in the hub A^{10} and prevents undue longitudinal movement of the shaft. The shaft A^9, carried by the arm A^{12} of the jack, has fast upon it at the rear side of the heel-pattern a gear *a*′, (see Figs. 1, 2, and 9,) which engages an intermediate gear a^2, (see Figs. 2 and 3,) supported on a suitable stud $a^\times$ on the arm A^{12}, the said intermediate gear engaging the teeth of a toothed gear a^3 and rotating the same as the operator, grasping the shoe in his hand, turns the heel thereon under the molded cutter. The gear a^3 has fast to it a toothed gear a^4, both loose on a suitable stud a^5, carried by the jack, the gear a^4, of larger diameter, engaging the teeth of a rack-bar a^6, connected to and forming part of a slide a^7, slotted, as shown by dotted lines in Fig. 2, and adapted to slide backward or forward on the guide-stud a^8 of the arm A^{12} of the jack, the said slide having extended back from it a rod a^9, (shown in Figs. 3, 4, and 6,) to which is attached a rack-plate a^{10}, the teeth of the said rack-plate engaging a toothed gear a^{12}, loose on a stud a^{13}, extended laterally from one side of the depending part b^{20} of a rocker b^8, to be described. The toothed gear a^{12} has a sleeve which carries a cam a^{14}, into the slot of which is entered a roller or other pin a^{15}, extended from a depending flange 8 (see Figs. 4 and 5) of the rigid extension or saddle portion B of the jack A^{12} A^{13}, which carries the shoe the heel of which is to be trimmed.

The heel-pattern A^8 is slotted, as at 2, (see Fig. 9,) to receive a slide-block 3, to which is attached the rest 4, against which is placed the breast of the heel, the screw 5, attaching the said rest to the block, in practice being extended through and clamping the said block to the heel-pattern plate, the block having a pin 6 to enter the tread of the heel. The arm A^{13} of the jack has at its end a short shaft *b*, provided with a pinion *b*′, (shown by dotted lines, Fig. 3,) which engages teeth of a slide-rod b^2, of usual construction, and provided at its inner end with a suitable head to bear against the neck of a last, if in the shoe, or against the inner sole of the shoe to thus clamp the heel in position in usual manner against the heel or pattern plate.

The rocking lever K, supported upon point-screws b^4 in the stationary frame H, has extended from it at or near the center of its length an arm or extension K′, preferably made tubular for lightness, to which extension, by set-screws b^5, are attached blocks b^6, (see Fig. 4,) the latter receiving and having fixed in them by the said screws b^5 a pivot-pin b^7, the pointed ends of which serve as the journals for a rocker b^8, the said rocker at its outer end having a bearing-screw b^9, which is provided with a conical recess to fit one end of the pivot-pin b^7.

The rocker b^8 (see Fig. 5) has at its opposite sides wings or tracks b^{29}, which are embraced by the guideways of the saddle-like extension B of the jack, the said saddle-like extension being free to slide longitudinally upon the said tracks b^9, thus permitting the jack to be moved longitudinally, as when the side of the heel is being trimmed, the rocker b^8, having the ways on which slides the saddle portion of the jack, itself rocking upon the pivot-pin b^7 and permitting the jack to tip, as required, as when the molded cutter is trimming about the rear part of the heel.

In practice the lug b^{10} at the end of the rocker b^8 will have attached to it a treadle-rod, as in the patent referred to. The stem *g*, at its lower end at each side, has a plate *c*′, having a track 10, (see Fig. 1,) upon which track rest and travel rolls 12 on studs 13 at each side of a carriage c^2, (shown separately in Fig. 1ª,) the said carriage having suitable bearings for the reception of a shaft *d*, having fast upon it between the said bearings a belt-pulley *d*′, and at the inner end of the shaft is a head $d^\times$, to which, by suitable screws 15, is attached a rand-cutter d^2, it having, as shown, three blades having upturned lips, as best shown in Fig. 7, to overlap, as it were, the cutting-edges of the knives or blades *a* to thus avoid a fin. The carriage c^2 has an extension $c^\times$, provided with a hole or socket 16, in which is placed the round head (see dotted lines, Fig. 3,) of a connecting-pin 17, the shank of which enters loosely a hole $17^\times$ in the end of an arm *e*, which arm at its rear end is threaded to receive a screw, as *e*′, free to rotate in a yoke e^2 at one end of an arm e^3, pivoted at e^4 upon an arm e^5, the said arm having a tubular shank e^6, forked or bifurcated at its lower end to constitute two slotted feet e^7, the said slotted feet having surfaces 18, (see Figs. 3 and 4,) which rest on rolls 19 of studs 20, extended from ears 21, erected upon the saddle-like extension B of the jack, the said rolls rolling in the slots of the said feet when the jack and its saddle-like exten-

sion B is moved longitudinally, the ears 21 within and between the opposite feet causing the arms e^6 to follow the jack and saddle in their rocking movement, and consequently as the jack and saddle are rocked the pin 17, carried by the arm *e*, (the said pin entering the hole i^6 of the extension $c^\times$ of the carriage c^2,) causes the said carriage to move toward and from the molded cutter in such direction as to cause the lip 25 of the rand or counter guard *b*—it entering the rand-crease—to follow the contour of the edges of the knives or blades *a* of the molded cutter as more or less of the cutters or blades are being uncovered, the direction of movement of the rand or counter guard being controlled further by the shape of the track upon which the rolls 12 of the carriage c^2 ride.

In this my invention the curve of the track 10, upon which the rolls 12 run, is described from a center common to the curve given to the outer or heel-seat end of knives or blades *a*, the said center being designated in Fig. 1 by 26. The frame H is extended above the jack and provided with a cross-bar H′, which is prolonged by a hollow post H^2, which is connected with the upright H at the opposite side of the machine, as best seen in Fig. 3. The shaft A has fast upon it a pulley D, which receives any usual driving-belt by which to rotate the shaft, the said shaft having a second belt-pulley D′, from which will extend a belt (not shown) over a belt-pulley D^2, fast on a shaft D^3, extended through the hollow portion H^2 of the cross-bar H′, the said portion being made tubular for such purpose, the opposite end of the shaft B^3 having fast upon it a belt-pulley D^4, which in practice will receive and drive a belt, (not shown,) which will be extended over the pulley *d′*, before described as fast on the shaft *d* of the rand-cutter. The screw *e′* is restrained from longitudinal motion in the head e^2 of the arm e^3; but by the rotation of the said screw the arm *e*, and with it the carriage c^2, may be adjusted with relation to the arm e^3 according to the thickness of the heel being trimmed.

In another application, Serial No. 275,880, filed on the 2d day of June, 1888, I have shown a carriage, substantially such as herein shown; but the same is represented as mounted upon links, and so the said carriage, with its rand or counter guard and rand-cutter, is not herein broadly claimed.

I do not desire to limit my invention to the exact construction of the jack herein shown or to the exact construction of the means employed for giving to the jack, in addition to its rising and falling and rocking movement, a sliding movement, as described.

The operator, having jacked the shoe through the action of the spindle b^2, which confines the tread-lift of the heel closely against the pattern-plate, and while the forward end of the jack is depressed through the usual treadle common to the patent referred to, removes his foot from the treadle and permits the pattern-plate of the jack to rise in contact with the pattern-guide, with the corner of the breast of the heel in position to be acted upon by the rotary trimming-cutter. In this condition of the parts, the toe of a shoe being a little above the horizontal and with the toe of the shoe pointed toward the operator, and the operator grasping the same, he commences to turn the shoe, depressing the toe, such movement of the shoe acting quickly through the gears and devices described carried by the jack to turn the cam a^{14} and push the jack forward rapidly toward the operator, this forward motion taking place while the cutter, which is always in rotation, acts to trim the heel from one corner of the breast to the commencement of what is to be the substantially circular rear part of the heel. As soon as that portion of the heel which is to be trimmed substantially circular arrives under the cutter the longitudinal motion of the jack is suspended, by reason of the shape of the cam, until the operator has turned the shoe sufficiently to effect the trimming of the substantially circular rear part thereof, the toe of the shoe at such time being below a longitudinal line and pointed away from the operator. The substantially circular part of the heel having been trimmed, the operator, by the further movement of the shoe through the gearing connected with the pattern-plate and between it and the said cam a^{14}, causes the said cam to continue to slide the jack toward the operator, while the rotary cutter acts to trim the opposite side of the heel, or from the substantially circular part thereof to the breast corner opposite that where the trimming was commenced. It will be noticed that the position of the top-lift end of the heel with relation to the center of the rotary cutter is determined by the pattern-plate, which bears against the pattern-guide, as in the patent referred to, and it will be remembered that the edge or lip of the rand or counter guard enters the rand-crease, and the shoe, by reason of the usual weights or attachments upon the jack, is pressed up firmly against the said rand or counter guard, so that it acts to position the heel-seat end of the heel with relation to the center of the cutter. It will be noticed that when the substantially circular rear part of the heel is being trimmed the said heel, owing to its pitch, and being pressed upwardly against the two fixed points—namely, the pattern-guide and the rand or counter guard—must have a tendency to tip, the extent of tipping depending upon the pitch of the heel, or the difference in size between the top-lift and the heel-seat end of the heel. To accommodate for this tipping of the jack the latter has been mounted upon the rocker b^8. As the shoe is tipped, as described, the carrier c^2, to which the rand or counter guard is attached, is moved automatically and positively by or through the connection previously described between the said carrier and the jack, thus moving the

rand or counter guard to uncover more of the cutting-edges of the blades, the carrier at such time being moved upon the track 10, and as the carrier is so moved it is tipped positively to thus enable it to remain with its edge parallel to and to properly enter the rand-crease.

In the machine herein described it will be noticed that the rand-crease is not depended upon, as has heretofore been the case, to move the rand or counter guard to uncover more or less of the cutting-edges of the plates; but, on the contrary, the said rand-guard is moved positively, which results in the more symmetrical trimming of the heel, especially such heels as contain soft stock, which is very apt to be the case in shoes of low cost.

I claim—

1. In a heel-trimming machine, the combination, with a rotary cutter and a jack to hold the shoe the heel of which is to be trimmed, of a pattern-plate and operative mechanism to automatically impart to the said jack a longitudinally-sliding motion while the said cutter acts to trim the sides of the heel, substantially as and for the purposes described.

2. In a heel-trimming machine, a rocking lever and a rocker-frame pivoted thereon, having a track, combined with a jack and with a cam to slide the jack longitudinally upon the said track, substantially as described.

3. In a heel-trimming machine, a rocking lever and a rocker-frame pivoted transversely thereon, having a track, combined with a jack having an extension B fitted to and adapted to slide longitudinally upon the said track, and with a cam intermediate the said rocker-frame and jack to automatically move the jack longitudinally upon the rocker-frame, substantially as described.

4. The combination, in a heel-trimming machine, of the following instrumentalities, namely: a rotary cutter, a sliding jack to hold the shoe the heel of which is to be trimmed, a rocking support for the said jack, a pattern-plate, and a cam moved by it to change the relative positions of the jack and cutter, substantially as described, whereby the heel is presented to the action of the cutter by a substantially right line movement when the side of the heel is being trimmed, substantially as described.

5. The rocking lever, the rocker mounted thereon and provided with a track, the jack mounted to slide upon the rocker, and a cam to move the jack longitudinally with relation to the cutter while the sides of the heel are being trimmed, combined with the pattern-plate, the gears, guard a^9, and rack bars or plates to actuate the said cam as the pattern-plate is rotated, substantially as described.

6. In a heel-trimming machine, a rotating molded cutter and a carriage having an attached rand or counter guard, combined with a track, as 10, upon which the counter-guard-supporting carriage travels when uncovering more or less of the knives or blades of the molded cutter, substantially as described.

7. In a heel-trimming machine, a rotating cutter and a carriage having an attached rand or counter guard, combined with a track upon which the said counter-guard-supporting carriage travels when uncovering more or less of the knives or blades of the cutter, and with a tipping jack and connections between the said jack and carriage to automatically move the carriage, substantially as described.

8. In a heel-trimming machine, a rotating cutter and a carriage having an attached rand or counter guard, combined with a track, as 10, upon which the said carriage is supported and travels when uncovering more or less of the knives or blades of the cutter, and with an independently-rotating rand-cutter carried by the said carriage, substantially as described.

9. In a heel-trimming machine, a rotating cutter, a carriage, a rand or counter guard, and a rand-cutter mounted in the said carriage, a track upon which the said carriage moves, and a tipping jack, combined with connections, substantially as described, between the said jack and carriage, to operate substantially as described.

10. The rotary cutter and the jack to hold the shoe the heel of which is to be trimmed, combined with a track, as 10, an independent carriage upon said track, a rand or counter guard attached to the said carriage, the shaft d, having its bearings in the said carriage, the rand-cutter attached to the said shaft d, and connections between the jack and carriage, whereby the jack as it is tipped also moves the carriage on the said track and with it the said rand-cutter and rand-guard, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES W. GLIDDEN.

Witnesses:
GEO. W. HAMMATT,
H. P. FAIRFIELD.