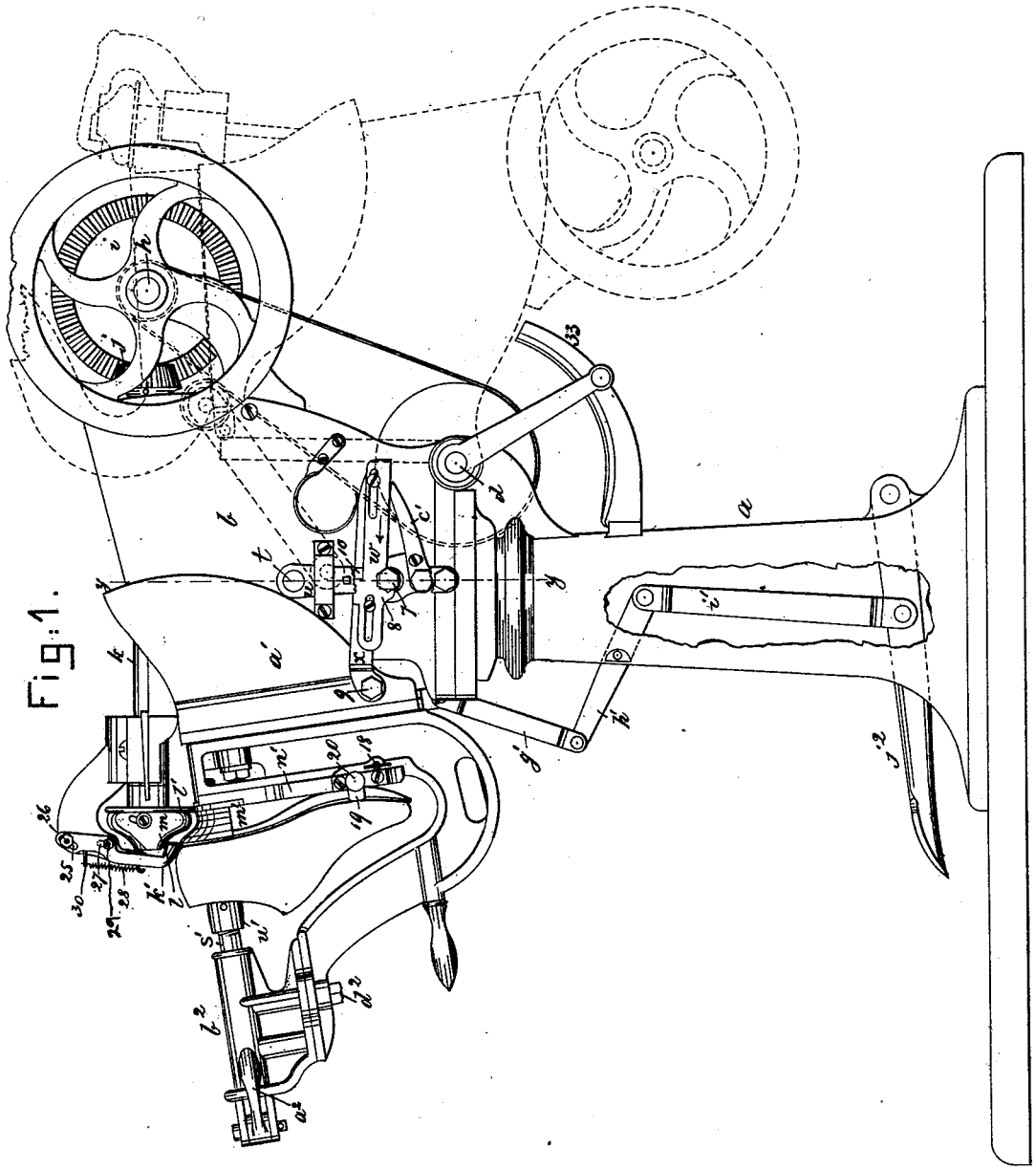
4 Sheets—Sheet 1.

C. W. GLIDDEN.
Heel-Trimming Machine.

No. 221,676. **Patented Nov. 18, 1879.**

Fig. 1.



Witnesses.
Jos. P. Livermore
H. E. Whitney.

Inventor.
Charles W. Glidden
by Crosby & Gregory, Attys.

4 Sheets—Sheet 2.

C. W. GLIDDEN.

Heel-Trimming Machine.

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Fig. 2.

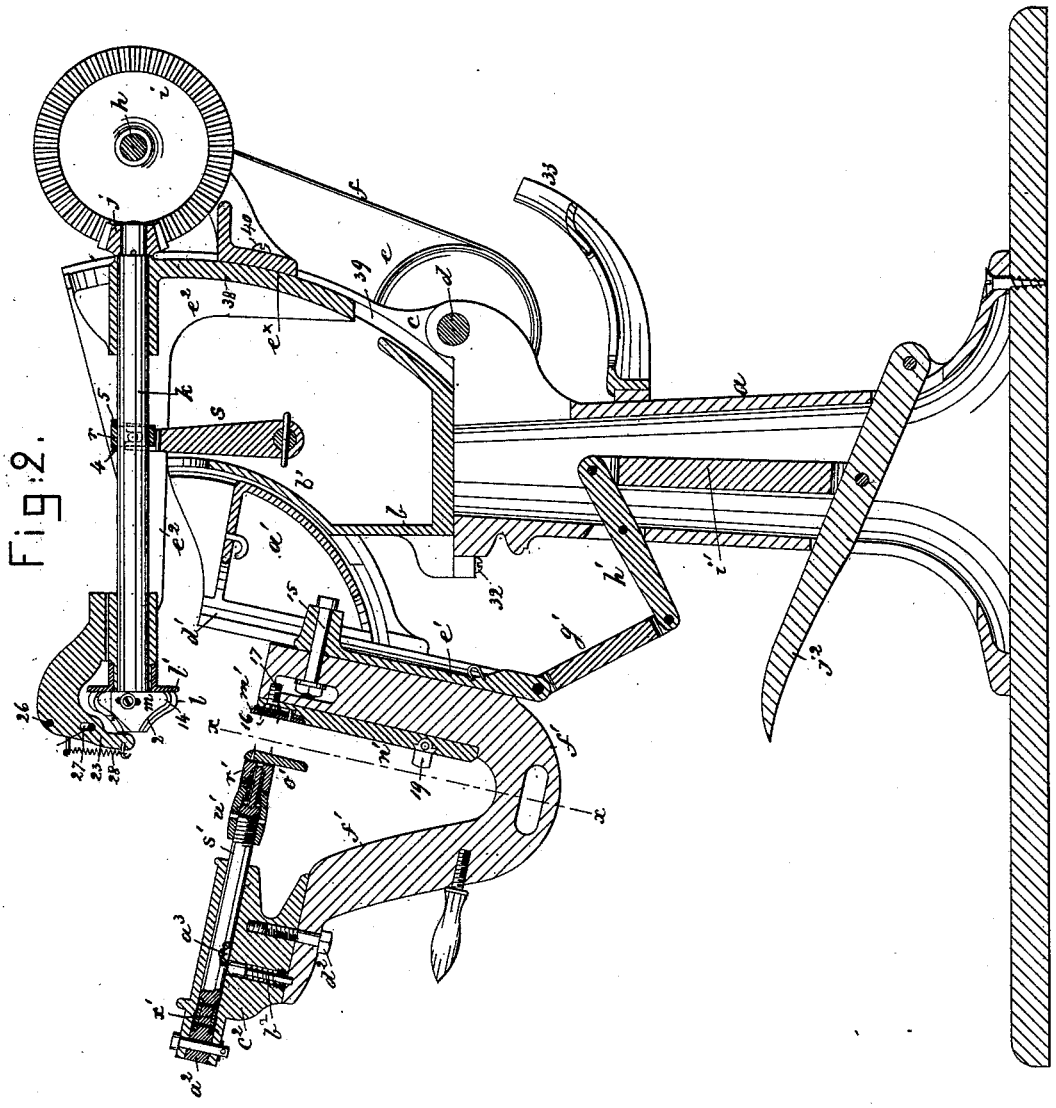

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Fig. 3.

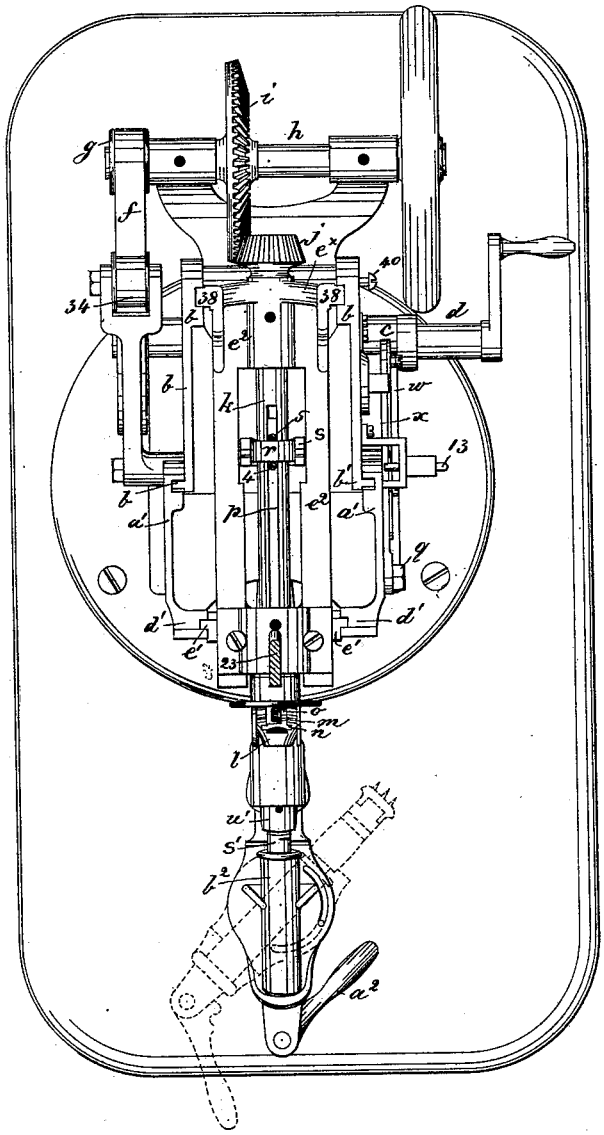

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Fig: 4.

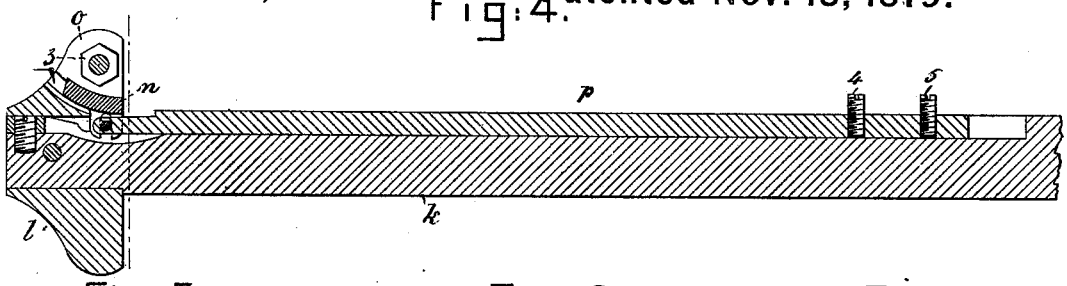


Fig: 5.

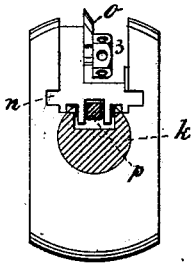


Fig: 6.

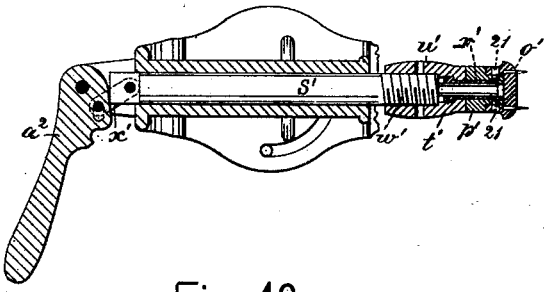


Fig: 7.

Fig: 10

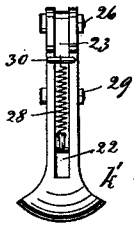


Fig: 9.

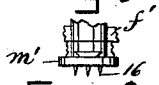


Fig: 8.

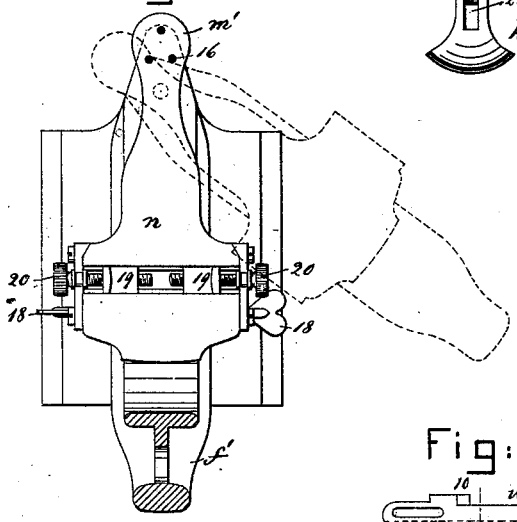


Fig: 11

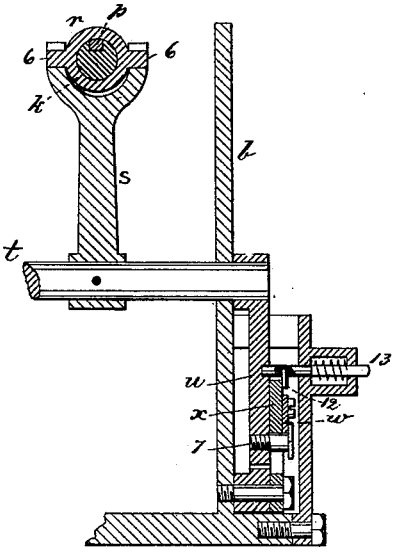
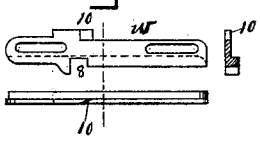


Fig: 12.



Witnesses.

Jos. P. Livermore

N. E. Whitney.

Inventor.

Charles. W. Glidden

by Crosby & Gregory, Attys

UNITED STATES PATENT OFFICE.

CHARLES W. GLIDDEN, OF LYNN, MASSACHUSETTS.

IMPROVEMENT IN HEEL-TRIMMING MACHINES.

Specification forming part of Letters Patent No. **221,676**, dated November 18, 1879; application filed August 25, 1879.

To all whom it may concern:

Be it known that I, CHAS. W. GLIDDEN, of Lynn, county of Essex, 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.

This invention relates to mechanism for trimming heels of boots and shoes; and the object of my invention is to so organize the machine that it may also trim French or Pompadour heels, or heels which extend from the end of the sole well into the shank, by means of a rotary cutter, the said heels being undercut at any desired angle.

In this my improved machine I employ a rotary cutter to trim the heel while the shoe or boot is held upon a jack, and the supporting mechanism for the jack is so made that, besides imparting rotary motion to the shoe, the jack may also be rocked to place the axis of the heel being trimmed at a greater or less inclination with relation to the axis of the rotary cutter or its shaft, so as to vary the pitch or inclination of the heel, as may be desired.

My improved rotary cutter is provided with an auxiliary intermittingly-operated cutter adapted to be thrown out at the proper time to cut and govern the depth of the concavity at the rear of the heel.

A single knife adapted and shaped to cut the sides of the heel and form a certain amount of concavity when cutting at the rear of the heel, where the incline is greater, would fail to form the bottom of the concavity at the rear of the heel, so as to appear as deep as at the side of the heel; but by means of the auxiliary cutter, thrown into operation only when the rear of the heel is being trimmed, this difficulty is obviated.

In connection with the rotary cutter I employ a gage, which, as it rises to uncover the cutting-edge of the main cutting-knife, moves laterally in the direction of the sweep of the edge of the said knife, enabling more of the edge of the blade to act upon the heel, this provision permitting heels of different height and inclination to be readily cut.

Figure 1 represents, in side elevation, a heel-trimming machine containing my improvements, the jack being in position to trim the rear of the heel, the dotted lines showing the position into which the jack and cutter-shaft and mechanism may be placed, if it is desired to run the cutter-shaft in a vertical rather than horizontal position; Fig. 2, a longitudinal vertical section of Fig. 1, the jack being lowered and the shoe removed; Fig. 3, a plan or top view of Fig. 1; Fig. 4, a detail of the rotary cutter, its shaft, and the auxiliary carriage for the cutter; Fig. 5, a section on the dotted line, Fig. 4; Fig. 6, a longitudinal section of the jack-spindle; Fig. 7, a face view of the rest or presser at the right-hand end of Fig. 6. Fig. 8 is a section on the line *x x*, Fig. 2, showing the sole holding and clamping plate and heel-form; Fig. 9, a detail showing the heel-form and its pins; Fig. 10, a front view of the gage to bear upon the upper or counter of the shoe, it running in the usual rand-crease, it being located in front of the rotary cutter; Fig. 11, a section of part of the machine on the line *y y*, Fig. 1; and Fig. 12, a side view of the shifting-plate.

The frame-work of the machine consists of a standard, *a*, and the top part, *b*, mounted thereon, but provided with ears *c*, fitted to the main or power shaft *d*, so as to enable the top part, *b*, to be turned from its full-line position, Figs. 1 and 2, to the dotted-line position, Fig. 1, if it is desired to have the cutter-carrying shaft in vertical rather than in horizontal position.

A belt-pulley, *e*, on shaft *d*, by a belt, *f*, on pulley *g*, drives the cross-shaft *h*, having a bevel-wheel, *i*, which engages a bevel-pinion, *j*, on and turns the cutter-carrying shaft *k*, having at its outer end the rotary cutter-head *l*, provided with one or more adjustable blades or knives, *m*, the cutting-edges 2 of which are shaped to conform with the shape it is desired to trim the sides of the heel.

At the center of the cutter-head is a groove to receive a carriage or holder, *n*, for an auxiliary blade or knife, *o*, adjustably attached thereto by the set-screw 3. This carriage or holder is connected with a link or rod, *p*, fitted into a groove in the cutter-shaft *k*, (see Figs. 3, 4, 5,) and the rod *p* has two pins or projections, 4 5, to be engaged by a collar, *r*, having hubs 6, adapted to be engaged by the ears of an arm, *s*, on the rock-shaft *t*, having its bear-

ings in the frame *b*. An arm, *u*, at the end of the said rock-shaft is extended downward, as shown clearly in Fig. 11, and near its lower end is provided with a pin, 7, adapted to be engaged by the hook or projection 8 of the slide-bar *w*, (see Fig. 12,) adjustably connected with a link, *x*, pivoted to the sliding frame *a'* at 9, the said frame being grooved to fit the curved ribs or track *b'* on the frame *b*, so that the said frame *a'* can be moved thereon in the arc of a circle toward and from the shaft *k* to give to the jack and shoe held by it a rocking motion.

The shifting-plate has an incline, 10, which, as the frame *a'* is raised almost to the position shown in Fig. 1, strikes a projection, 12, on a spring-pressed pin, 13, and withdraws the inner end of the said pin from engagement with the arm *u*, so that the projection 8 of the slide-bar *w* may engage the pin 7 and move the arm *u* and rock-shaft and arm *s*, and throw forward the rod *p* to move outward the carriage *n*, thereby causing its blade or cutter *o* to be so moved outward and left for an instant in such position that the cutting-edge of the said cutter *o* will be more distant from the center of shaft *k* than are the extreme ends 14 (see Fig. 2) of the knives *m*. While the knife *o* is so held out the rear of the heel is cut, it being held on the jack as in Fig. 1. This auxiliary cutter or blade *o* acts only in the bottom of the concavity made at the heel between its ends by the point or end 14 of blade *m*, and cuts or hollows out the bottom of the said concavity only at the rear of the heel, where the inclination or slope from the large end of the heel to the small or top-lift end is greater than at the sides of the heel, such extra concaving of the rear of the heel by a separate and independent cutter giving to the heel for its entire contour the appearance of having its most concaved portion of equal depth, whereas, were it not for such independent cutter *o* cutting only at the rear of the heel, the depth of the concavity at the rear of the heel would appear too shallow.

While the sides of the heel are being trimmed the frame *a'* is depressed or thrown down from its position in Fig. 1, and as the link *x* and slide-bar *w* are drawn outward in the direction of the arrow thereon the carriage *n* and knife *o* are drawn back, and the short arm of the elbow-lever *c'*, acted upon by arm *u*, is turned so that its long arm strikes and lifts the link *x* to disengage the hook 8 of the slide-bar from the pin 7. This curvilinear movement of the frame *a'*, supporting the rotary jack-frame, shoe-holding spindle, and sliding carriage *e'*, enables the jack to be rocked so as to incline the axis about which the jack rotates in a direction so that it is not parallel with the axis or shaft of the rotary cutter, and by such additional rocking movement to the jack-frame it is possible to automatically trim the class of heel herein referred to.

The circularly-moving frame *a'* has guiding grooves or ways *d'* to receive the edges of the jack-carriage *e'*, upon which the jack-frame *f'* is pivoted at 15, the said carriage *e'* being connected by the toggle-jointed levers *g' h'* with a link, *i*, attached to a foot-lever, j^2, so that the said carriage and jack may be raised or lowered by the action of the foot, so as to keep the heel being trimmed held close up to the cutter.

In front of the cutter-head *l* is a rand or counter gage, *k'*, the lower end of which should be kept bearing upon the counter in the heel-rand crease; and at the rear of said cutter-head is a heel-plate gage, *l'*, which should be kept in contact with the heel-form plate *m'*, having heel-holding pins 16. This form-plate is of the size and shape of the top-lift end of the heel, and the counter is of the shape in which the large or top end of the finished heel must be left.

To keep the gages *k' l'* in contact with the counter and form-plate, as described, the frame *a'* will be raised or depressed, as may be necessary, the operator holding the jack-frame by hand and turning the jack-frame and shoe clamped thereon about the pivot 15, the vertical movement of the carriage *e'* permitting the heel and shoe to be moved toward and from the cutter.

The heel-form is made removable, so as to readily place upon the jack-frame or the holding-plate *n'* thereon a form of any desired shape or size, according to the shape desired for the top-lift end of the heel. This holding-plate *n'* is pivoted at its upper end, as at 17, Fig. 2, and has adjusting-screws 18 at its lower end to adjust it laterally to provide for properly placing the heels for right and left shoes, and has clamps 19, operated by adjusting devices or screws 20, to clamp the edges of the sole of the shoe to hold it in place.

The form-plate *m'*, at its rear side, (see Fig. 2,) has a dovetailed projection to enter a dovetailed groove in the plate *n'*.

The rest or pressing-plate *o'* is pivoted at 21 upon the hub *p'* of a sleeve, *r'*, on the reduced end of the longitudinally-moving jack-spindle *s'*, and is thereby permitted to tip so as to adjust itself to the interior of the shoe-heel. To enable this one spindle and hub and plate *o'* to hold heels of different thicknesses, the hub and plate are made adjustable in the following manner, viz: The hub of the sleeve *r'* has a collar, *t'*, which is embraced by a projection within the nut *u'*, fitted upon the screw-threaded end *w'* of the spindle *s'*. This spindle is at its outer end connected by link *x'* with a pivoted hand-lever, a^2, and has at its under side (see the sectional view, Fig. 2) a depression, a^3, which, when the spindle is drawn back, permits the spring-held locking-pin b^2 to rise from engagement with the frame *f'*, when the bearing c^2 for the spindle pivoted at d^2 may be turned aside, as in Fig. 3, for placing a shoe upon or removing one from the spindle and rest *o'*.

The gage *k'* (shown enlarged in Fig. 10) has its lower face made dishing, (see also Fig. 1,)

and is slotted at 22 to receive the end 23 of a stationary arm of the bracket e^2, which contains the bearings for shaft k. The upper ends of the gage k' are provided with diagonal or cam slots 25, to receive a pin, 26, fixed in the arm 23. A pin, 29, fixed to the gage near its central part, enters a slot, 27, in the arm 23, and a spiral spring, 28, is connected at its upper end with the loop 30 fixed on the gage, and at its lower end with an eye attached to the arm 23. As the blades m of the cutter cut into the heel the gage k' must gradually rise, and its lower end must approach the center of the shaft k, to which the cutter-head is secured. By reason of the inclined slots 25 and 27 and the pins 26 29, this lower end of the gage k', as it rises, is gradually moved outward away from the gage l', following the direction of the edge 2 of the cutter or blade m, and the said gage therefore never interferes with the blade, and uncovers more or less of the edge of the blade, according to the height and inclination of the heel.

By detaching the screw 32, Fig. 2, the frame b may be turned up, as in dotted lines, Fig. 1.

With the jack composed of the pivoted frame f', and holding devices to clamp the shoe and heel firmly in position, and the carriage e', and circularly-moving frame a', it is possible to present the heel in such position to the cutters that a rotary cutter may be made to cut and shape any common heel or French or Pompadour heel, such as described.

The shoe-heel may have substantially a universal movement under the cutter.

If desired, the bracket e^2, carrying the shaft k, may also be moved about a center.

I have shown the rear part, $e^\times$, of the bracket (see Fig. 2) made as a sector, provided with segmental rims 38, fitted to guideways 39 made in frame b, a screw, 40, holding the rear part, $e^\times$, and frame b together, when desired. When this bracket and shaft are permitted to tip or rock, then the jack need not rock.

The motion of the jack derived from the movement of the jack-carrying frame a' as it moves in the arc of a circle gives to the jack and shoe-heel a rocking motion.

When the frame b is turned up, as in dotted lines, Fig. 1, the lever g' is disconnected from the carriage.

I claim—

1. In a heel-trimming machine, a rotary cutter-head and cutting-blades m, to shape the heel, combined with a rotating jack, a sliding carriage, upon which the jack is pivoted, and a movable frame, substantially as described, to support the sliding and rotating jack, to permit the axis of the jack to be inclined in position with relation to the axis of the cutter-shaft, to thereby enable the jack and shoe to be rocked and changed in position, substantially as described.

2. The jack-spindle and rest or pressing-plate, combined with the jack-frame and adjustable plate and heel-form, to adapt the jack to hold right and left shoes to be heeled, substantially as described.

3. The jack-spindle provided with a depression, a^3, devices to move the spindle longitudinally, the bearing, and locking device, combined with the jack-frame, substantially as described.

4. The revolving cutter and rotating jack-frame, combined with the pivoted plate n', its heel-form, and clamps to embrace the edges of the sole of the shoe, and adjusting devices for the clamps, substantially as described.

5. A rotating cutter, combined with an auxiliary cutter mounted upon a carriage, and adapted to be thrown into action intermittingly, as described, to deepen the concavity at the rear of the heel between its ends, as set forth.

6. The rotating cutter-carrying shaft and the sliding rod therein, combined with the carriage and auxiliary and intermittingly-operated cutter o, substantially as set forth.

7. The rotary cutter-carrying shaft and sliding rod to move the auxiliary cutter, combined with the collar, its operating-arm s, and connections between it and the movable jack-frame, to automatically move the arm and rod and throw the cutter o outward when the rear of the heel is being trimmed, as set forth.

8. The rotary cutter-head and its fixed cutting-blade and gages l' k', combined with a rotating and rocking jack, substantially as described, and a heel-form thereon, against which the gage l' travels, while the gage k' moves in contact with the counter of the shoe, substantially as set forth.

9. A rotating cutter-head and its blade, combined with a gage, k', supported in front of the cutter, substantially as described, and adapted to rise and move outwardly, substantially as described, along the irregular curved edge of the blade, substantially as set forth.

10. The frame b, pivoted upon the driving-shaft d, and the rotary cutter-carrying spindle mounted therein, combined with the rotating, sliding, and rocking jack, to permit the spindle to be run in a horizontal or vertical position, as may be desired, and the shoe-heel to be presented to it to be trimmed in either position of the shaft, substantially as described.

11. The jack-frame pivoted upon the sliding carriage and held in the circularly-moving frame, combined with the links and treadle, to move the carriage and jack toward and from the cutter, 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:
G. W. GREGORY,
N. E. WHITNEY.