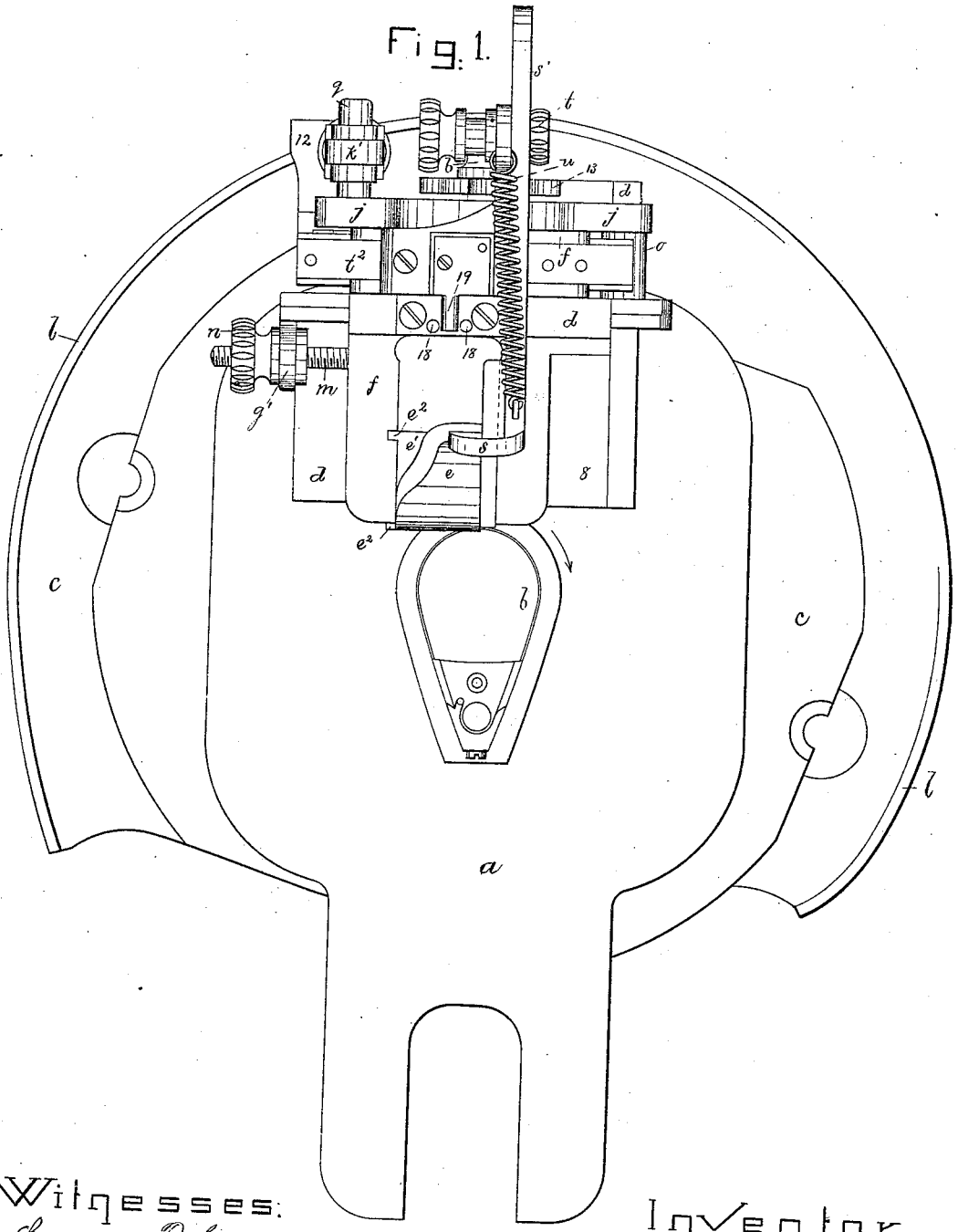
3 Sheets—Sheet 1.

C. W. GLIDDEN.
Heel-Trimming Machines.

No. 217,866. Patented July 29, 1879.

Fig. 1.



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Attys

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Fig. 2.

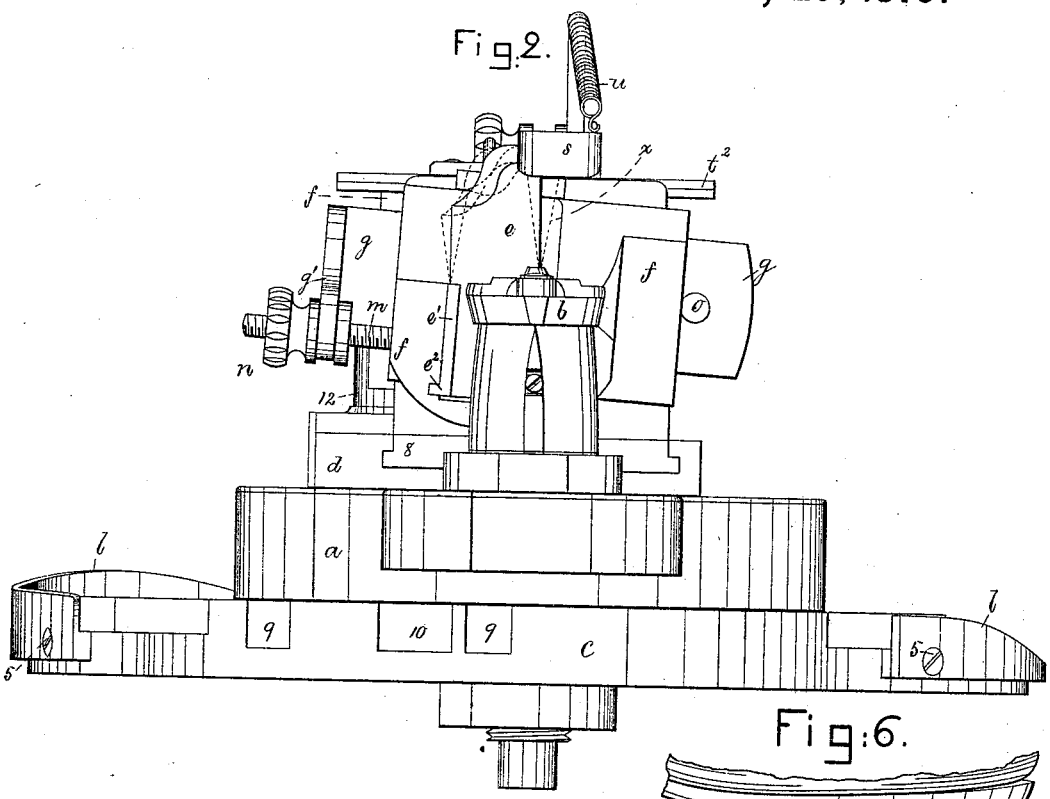


Fig. 6.

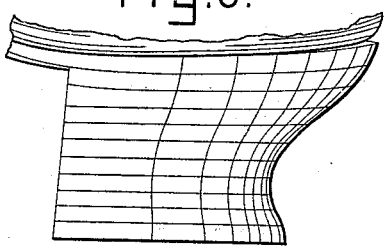
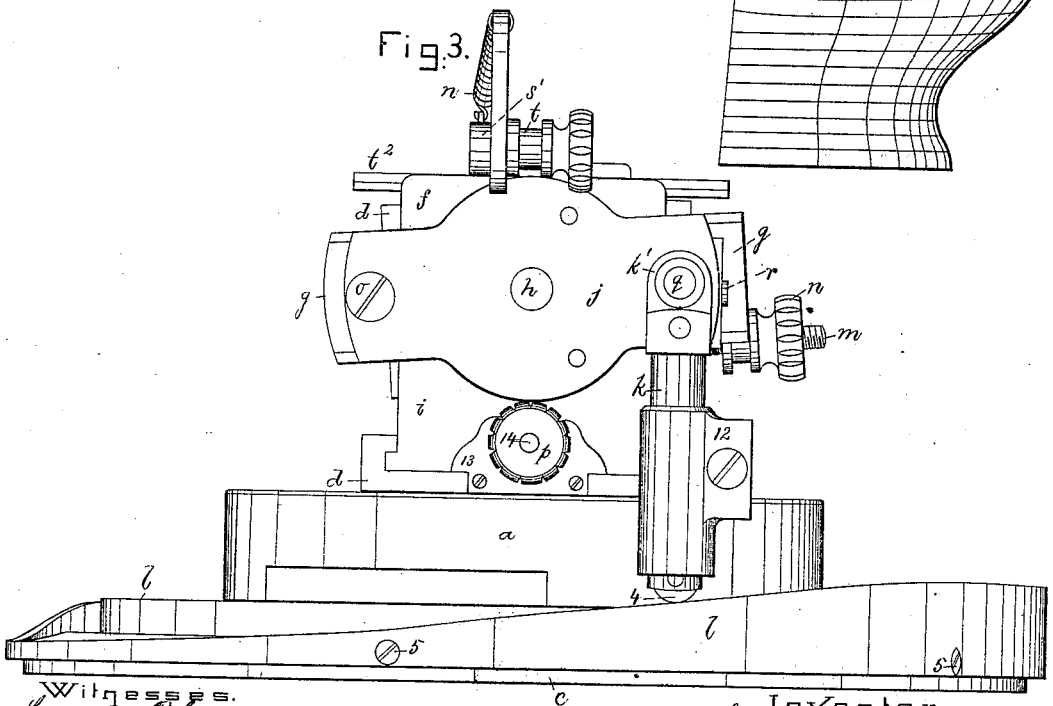


Fig. 3.



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3 Sheets—Sheet 3.

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Fig. 5.

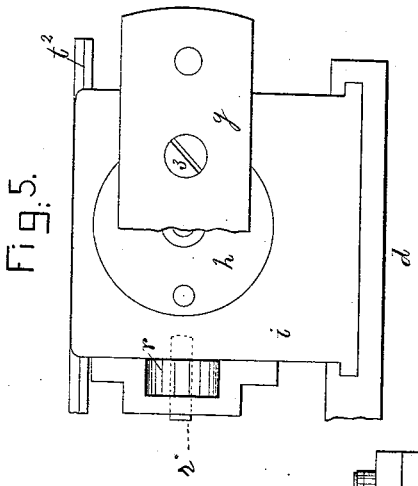
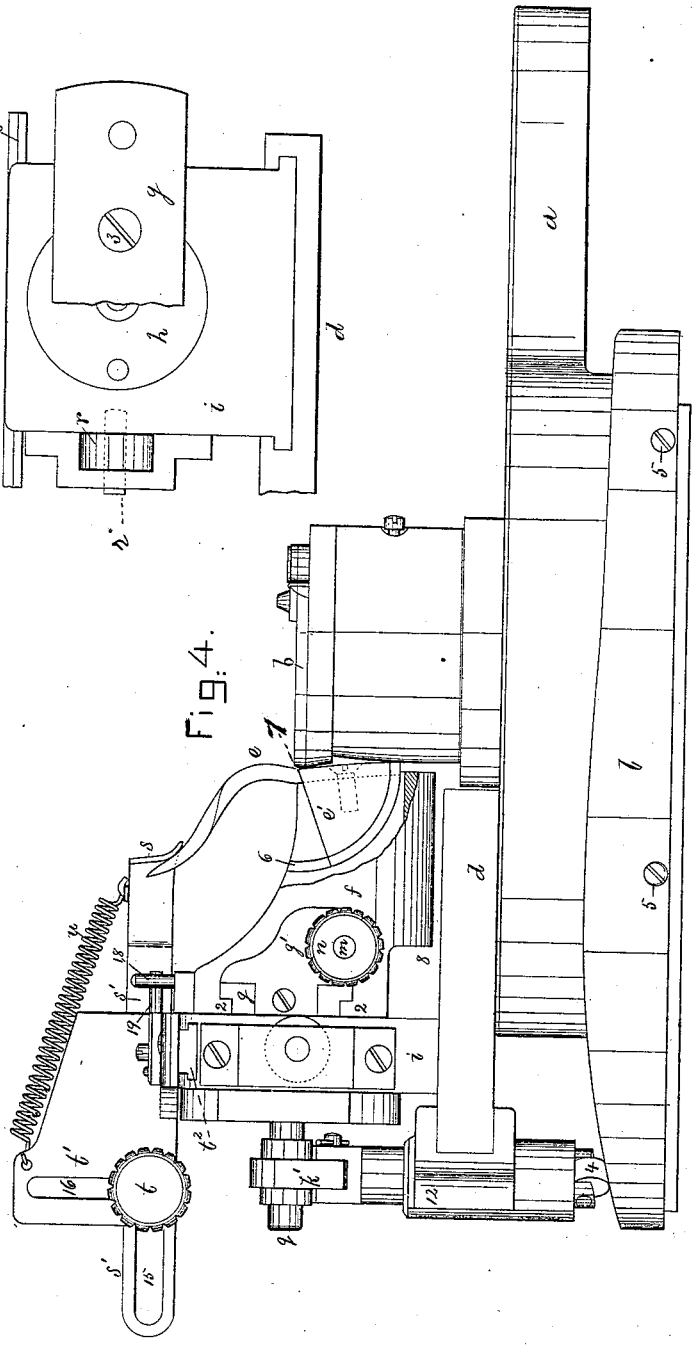


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES W. GLIDDEN, OF LYNN, MASSACHUSETTS.

IMPROVEMENT IN HEEL-TRIMMING MACHINES.

Specification forming part of Letters Patent No. **217,866**, dated July 29, 1879; application filed June 6, 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 improvements in heel-trimming machines, the object being to automatically trim and shape a Pompadour or ogee heel, or a heel which is made quite concaved, and which has the top lift end thrown or projected forward toward the shank portion of the shoe. All previous attempts to trim this class of heel automatically have been more or less unsuccessful, because of the impossibility of trimming close to the heel-seat and the heel-support which acts as the pattern for the lower end of the heel.

Before this invention the heel-trimming knife has been so mounted as to rock or move in a radial direction backward and forward from the heel support or pattern as the knife-holder on a turn-table was made to travel about the heel-support by the usual lever, pins on the said turn-table entering grooves in a stationary plate to control the presentation of the edge of the knife to the heel at the proper angle. In addition to these usual motions to the knife I have herein provided for giving it a fore-and-aft or tipping motion, it being in a direction substantially at right angles to its usual rocking motion; or, in other words, I so support the knife and its holder that the knife rocks about centers or axes of motion substantially at right angles to each other.

In practice, the axis for the tipping motion of the knife may and preferably will be in such direction with relation to the heel being trimmed that if prolonged it would intersect, or nearly so, the axis of the heel. This tipping motion of the knife is made automatic through the agency of a pattern-surface shaped in accordance with the heel to be produced.

In operation, the knife as it reaches the rear of the heel has its cutting-edge in a substantially vertical position; but before the knife reached that position it was so tipped that its upper end was in advance of its lower end, and after passing the rear of the heel the knife is tipped in the opposite direction to enable its lower end to travel in advance of its upper end. This tipping of the knife changes the position of its cutting-edge vertically with relation to a radial plane of which the axis of the heel is the center.

The peculiarly-shaped heels to be trimmed in this machine may be considered as having what is denominated a "winding surface," rather than a plane surface, and to properly cut a winding surface requires frequent changes of inclination of the knife.

The particular manner herein shown for supporting the said knife to permit it to rock or move backward and forward is believed to be novel.

In this my present invention the knife-holder is supported by a plate on an annular block, the axis of which is substantially horizontal, and if prolonged would intersect, or nearly so, the axis of the heel, and the knife-holder, through suitable intermediate connections or devices, is controlled as to its movements by a pattern surface or cam, which, at the proper times during the movement of the knife about the curved part of the heel, acts to tip the knife-holder, placing its upper end back or in advance of its lower end, as may be found necessary to successfully trim a heel having a shape such as herein described, or having a winding surface.

The knife, in this instance, has a sector-like base, and its center of motion, when rocking or moving backward and forward radially, is substantially in line with the surface of the heel support or pattern, such construction of the knife and its base enabling it to be held more securely and with less liability of coming into injurious contact with the said heel-pattern.

Figure 1 represents, in top view, sufficient of a heel-trimming-machine to illustrate my improvement; Fig. 2, a front elevation thereof; Fig. 3, a rear elevation; Fig. 4, a side elevation; Fig. 5, a detail to be referred to; and Fig. 6, one form of heel such as this machine is adapted to trim smoothly and to pattern.

In this present invention, as in United States Letters Patent No. 116,765, August 17, 1875, to which reference may be had, I employ the following devices, viz: The trimming-lever *a*, the heel support or pattern *b*, the station-

ary or form plate *c*, provided with the two grooves 9 10, that receive within them two pins (not shown) of the turn-table plate *d*, these two grooves and turn-table, as in the said patent, acting to control the presentation of the edge of the knife *e* to the heel, so that the angle at which it meets and enters the leather in its travel about the heel shall be such as to cut with the greatest ease and advantage possible.

In that patent the trimming-knife holder is shown as adjustably held on a plate attached directly to the turn-table; but in this my present invention, as the knife is to have imparted to it a tipping motion in addition to the motions imparted to it by the mechanism described in the said patent, I have placed the knife-holder *f*, provided with lips 2, upon and so as to embrace the flanged edges of a plate, *g*, attached by one or more screws, 3, to an annular block, *h*, held in a bearing-block, *i*, the base 8 of which is fitted to slide in grooves in the turn-table *d*, the said annular block having attached to it at its rear end a lever or arm, *j*, which at one end has connected with it a foot, *k*, extended through a bearing or guide block, 12, the said foot being provided with a roller, 4, which rides on the pattern-surface *l*, herein shown as a cam-shaped plate, removably attached by screws 5 to the stationary form-plate *c*, to permit the connection with the said form-plate of a pattern-plate having a configuration or shape suitable for the shape of the heel it is desired to produce or trim.

The knife *e* is directly attached to a segmental base, e^1, flanged at e^2, to enter curved grooves 6 made in the knife-holder *f*, (see Fig. 4,) the said grooves being struck or defined from the point 7, substantially at the level of the heel-support *b*, so that the said knife in its rocking or backward and forward motions, as when the sector e^1 moves in the said grooves 6, has its center of motion substantially at the level of the heel-support.

A screw, *m*, connected with the knife-holder is engaged by a thumb-nut, *n*, grooved annularly, so as to be embraced and held by an ear, *g'*, of the flanged plate *g*, and by turning the said nut the knife-holder may be so adjusted horizontally that the cutting-edge of the knife may be always kept on a line with the center about which the turn-table *d* moves, so as to properly and smoothly trim the heel.

The arm *j* is connected at one end by a suitable screw-bolt or stud, *o*, with the turn-table plate *g*.

The knife-holder and knife and the bearing-block *i* may be adjusted toward and from the axis of the heel-support in a radial direction by means of a thumb-nut, *p*, annularly grooved to be held by the lug 13, connected with the said bearing-block, the said thumb-nut acting upon a screw, 14, rigidly attached to the said bearing-block *i*. During this adjustment the pin *q* of the lever *j* slides in the head *k'*, which head is pivoted to the upper end of the foot-piece *k*.

As the knife-holder and annular block are moved by the pattern-surface *l*, friction of parts is reduced by means of an anti-friction roller, *r*, on a stud, *r'*. (See Fig. 5.)

The gage *s*, the face of which is adapted to travel in contact with the heel-seat of the upper, while its back acts as a forward stop for the upper end of the knife in its radial movement toward the heel, has its backwardly-extended shank *s'* slotted at 15, or otherwise adapted to be fitted to a stud, *t*, or holder extended loosely through a slot, 16, in the upright part t^1 of a slide-plate, t^2, guided and adapted to be moved horizontally in grooves or ways at the top of the bearing-block *i* by means of suitable connections (shown as pins 18) rising from the knife-holder plate *f*, which engage a stud, 19, of the said plate t^2, thereby causing the said plate t^2 to be moved longitudinally as the knife-holder is moved to tip the knife, the gage being thereby kept in proper position with relation to the upper end of the tipping-knife under its change of vertical position derived from the rocking motion of the plate *g*.

The spiral spring *u* acts to draw the gage backward. The gage is held pressed forward by the upper end of the knife, it being drawn forward toward the axis of the heel by reason of the engagement of the edge of the knife with the material of the heel being trimmed. Instead of this particular form of gage I may employ any other suitable gage—as, for instance, the gage shown in another application for patent filed by me concurrently with this, to which reference may be had.

In other heel-trimmers heretofore in use the cutting-edge of the knife remained in the same vertical plane with relation to a radial line drawn from the edge of the said knife to the axis of the heel, the said knife commencing and completing its motion or travel with only the rocking motion, or a motion radially toward and from the heel—the motion common to the machine described in the patent.

I have demonstrated for this class of Pompadour or ogee heel that the edge of the cutter, occupying a vertical position as it commences to trim the left side of the heel, (looking at the shoe from its front,) will very soon cut into the sole and stop the knife or spoil the heel unless the upper end of the knife is made to lead or incline forward in the direction of movement of the said knife, so that the cutting-edge of the knife occupies a position substantially as designated by the dotted lines *x*, (see Fig. 2,) the full vertical line immediately at the left of the said dotted line indicating the edge of the knife when in vertical position, as at the extreme rear of the heel, and the dotted line immediately at the left of this vertical full line indicates the position with relation to a vertical line that the cutting-edge of the knife assumes after leaving

the extreme rear of the heel as the knife travels in the direction of the arrow.

By giving the knife a tipping motion, as described, under the control of a pattern-surface, I am enabled to so present the cutting-edge as to make it follow and evenly cut a heel, the lower or top lift end of which is carried well into or toward the shank, and which is of a different outline from the heel end of the sole.

If it were not for this tipping motion, the edge of the knife held up vertically, as in full lines, Fig. 2, would, with a heel of the class represented in Fig. 6, soon run out of the true line, either at bottom or top, and fail to cut the heel to the pattern; but by giving the knife the tipping motion its cutting-edge may be presented at the proper cutting-angle closely in the line upon which it is desired to cut the heel at its extreme top and bottom.

The particular devices for imparting tipping motion to the knife may be varied without departing from my invention.

The lever *a* will be moved in any usual way—as, for instance, in United States Patent No. 166,795, August 17, 1875.

In earlier forms of heel-trimming machines the knife has been supported loosely upon a horizontal pin below the top of the heel-support, it entering a slot in the base of the knife.

I claim—

1. In a heel-trimming machine, the knife and means, substantially as described, to impart to it the tipping motion set forth as the knife trims the heel, as and for the purpose set forth.

2. In a heel-trimming machine, a knife-holder, a knife, a pattern-surface adapted to impart to the knife a tipping motion, and intermediate mechanism between the said knife-holder and pattern-surface, and means to move the said holder and knife to trim a heel, substantially as described.

3. In a heel-trimming machine, the rocking knife *e*, combined with a gage to rest upon the heel-seat between the free upper end of the knife and the heel-seat, substantially as described.

4. A knife and knife-holder supported by and made movable about an axis at right angles, or substantially so, with the axis of the heel, combined with a pattern-surface and intermediate connecting mechanism to operate the said knife, substantially as described.

5. A knife-holder supported by and made movable about an axis at right angles, or substantially so, with the axis of the heel, combined with a sliding gage and connecting mechanism between them to move the gage in unison with the tipping movement of the knife carried by the knife-holder, substantially as described.

6. The combination of the stationary plate with the pattern-surface, adapted to control the tipping motion of the knife, substantially as described.

7. The turn-table plate and its bearing-block *i*, combined with the annular block, its plate *g*, the knife-holder, and lever *j*, substantially as described.

8. The knife-holder, grooved as described, combined with the knife and its segmental base, adapted to turn in the holder as the knife is rocked, substantially as described.

9. The foot combined with the lever *j* by means of a pin fitted loosely in the head of the foot, to permit the bearing-block and knife-holder to be adjusted radially, 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.