

No. 616,214.

Patented Dec. 20, 1898.

W. H. UNDERWOOD.

HAIR CLIPPER.

(Application filed Aug. 9, 1886.)

(No Model.)

Fig. 1.

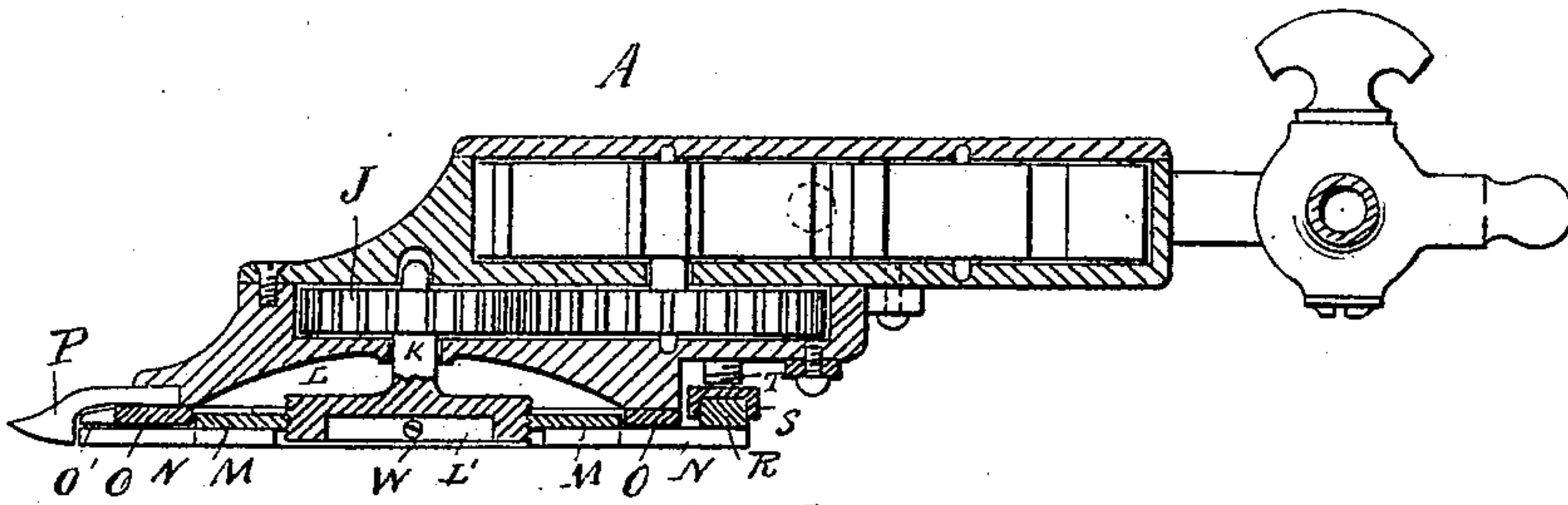


Fig. 2.

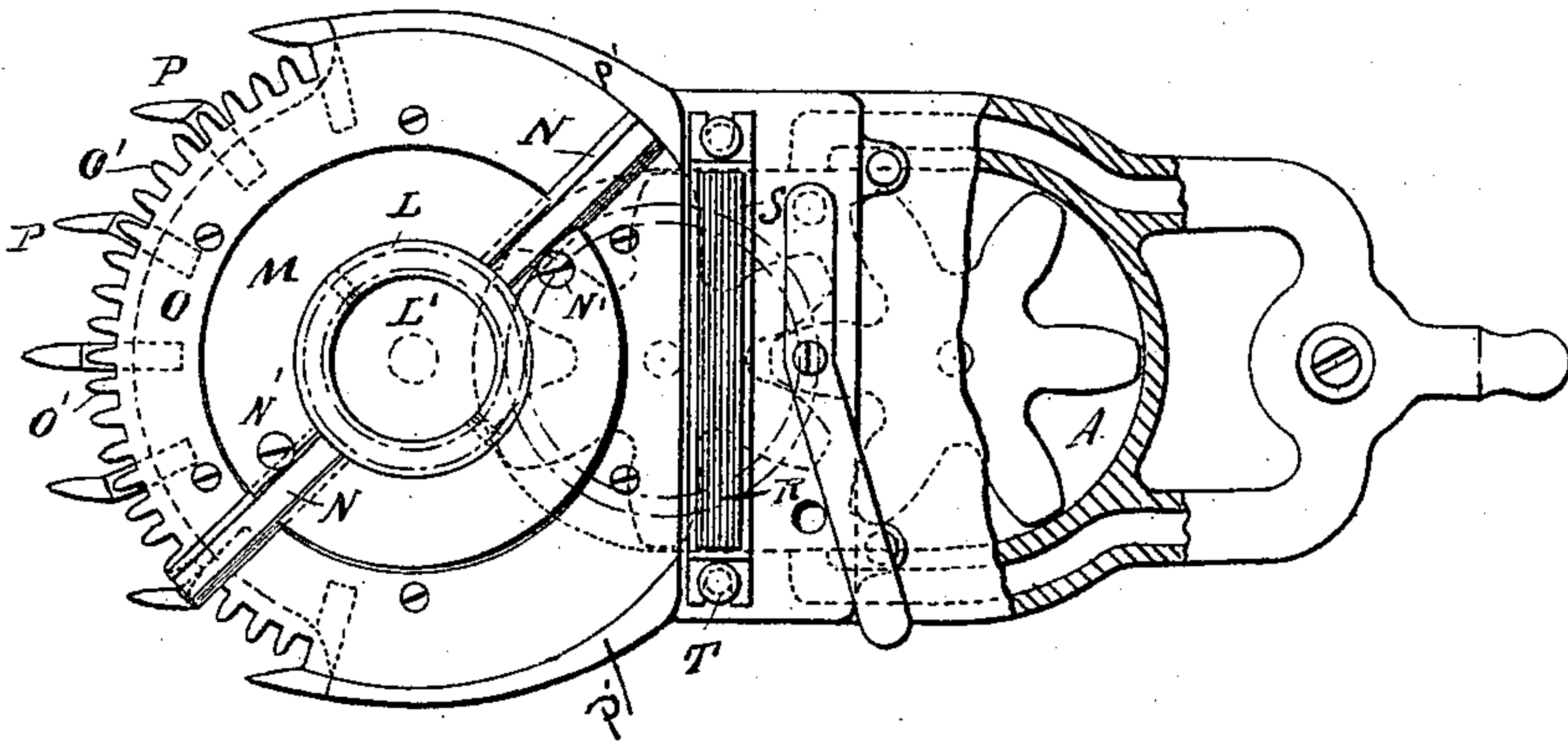


Fig. 3.

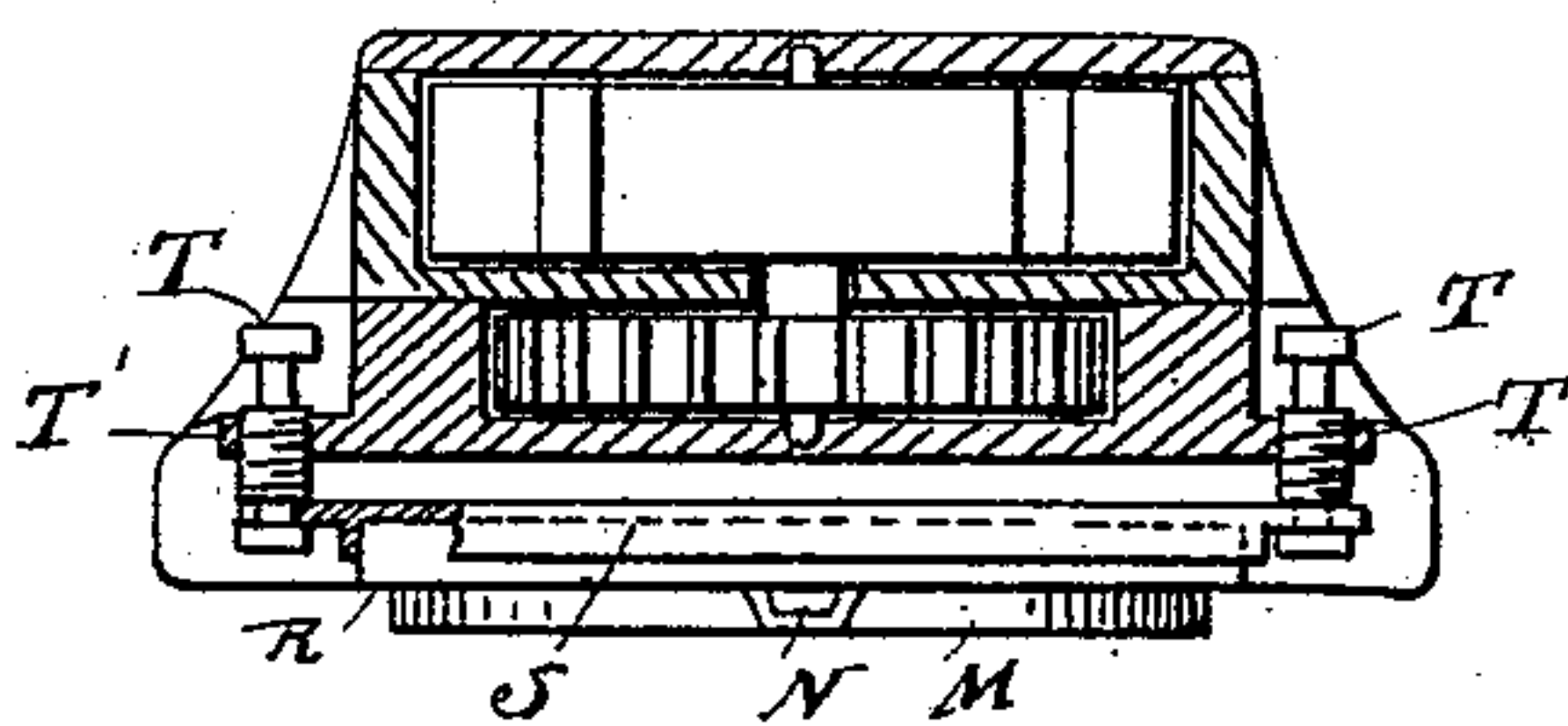


Fig. 5.

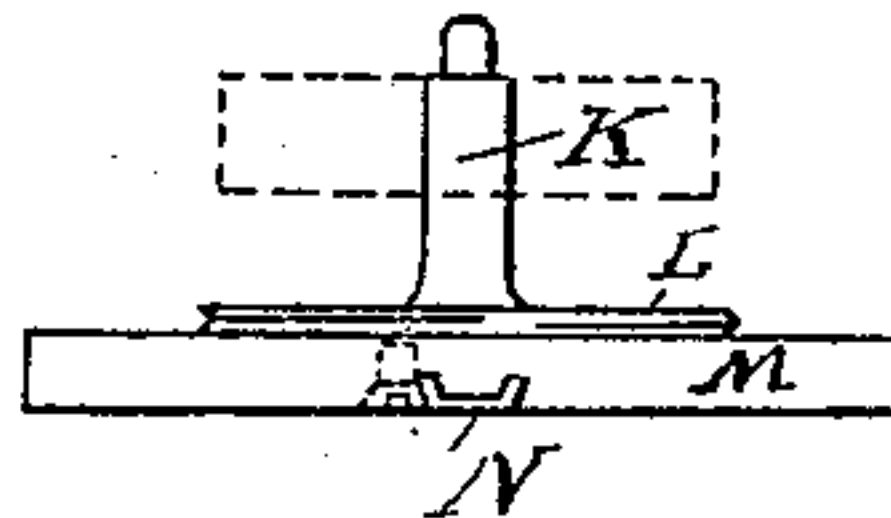


Fig. 4.



Fig. 7.

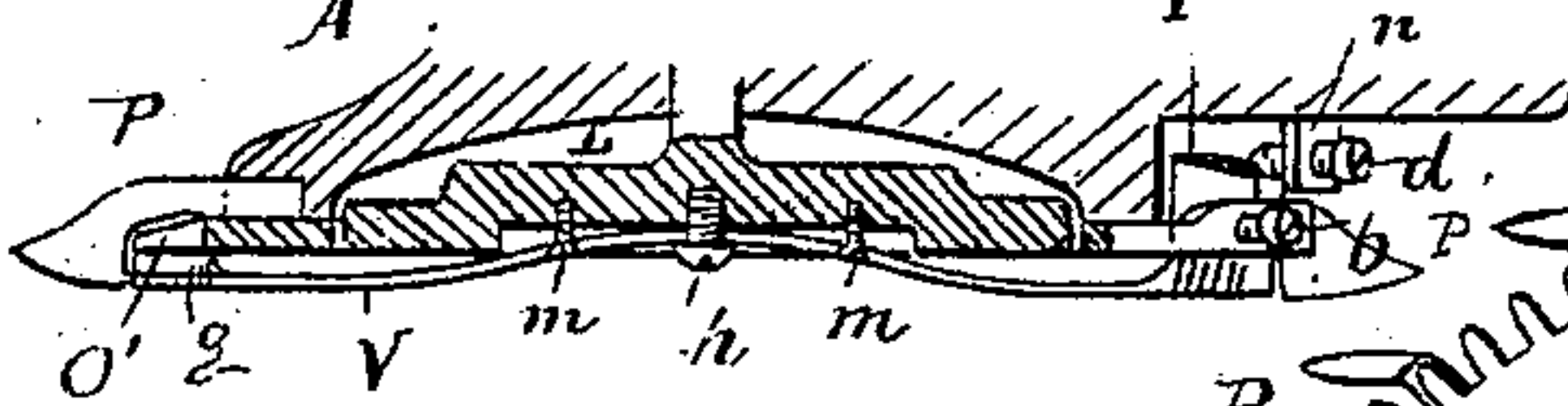


Fig. 6.

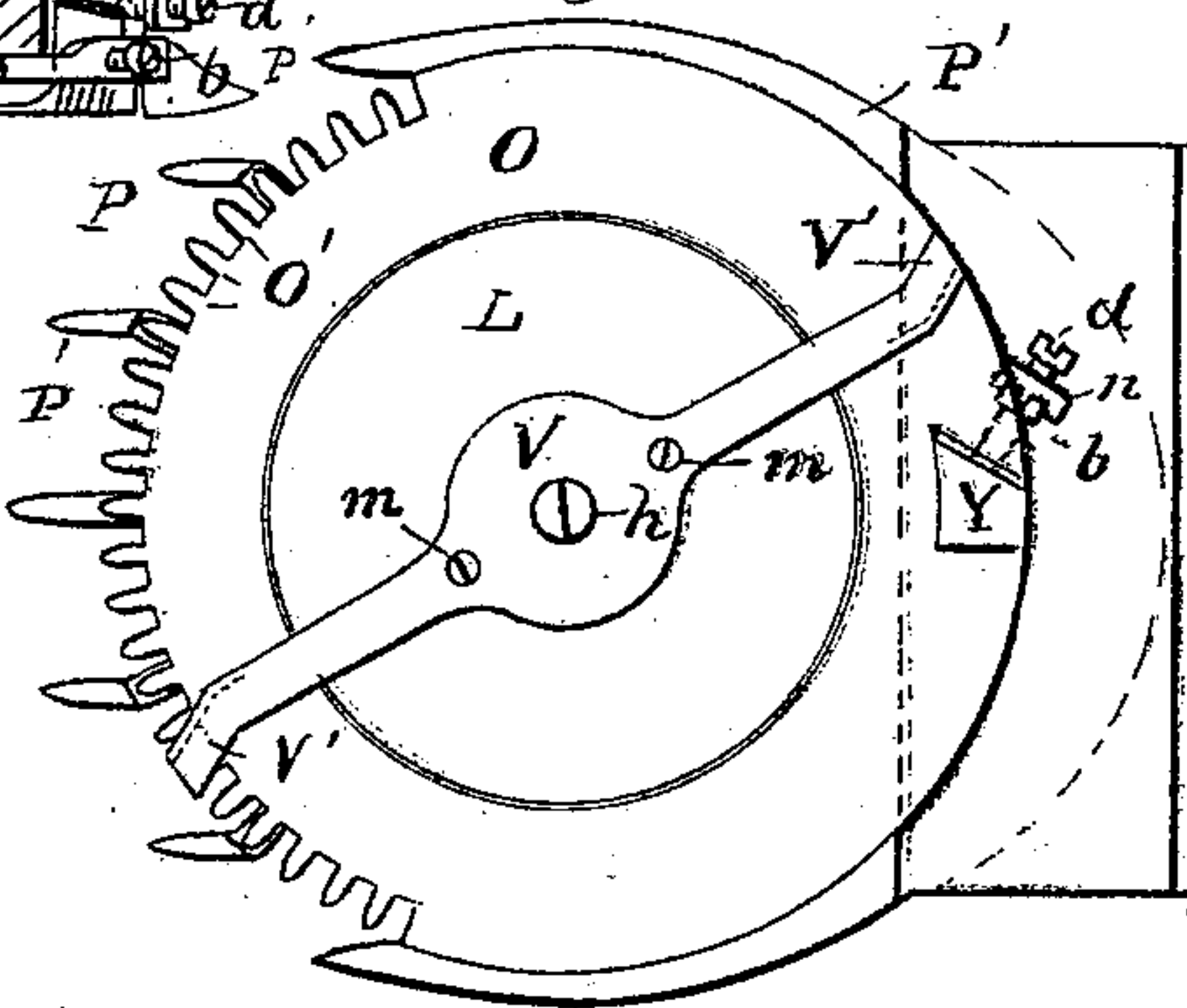
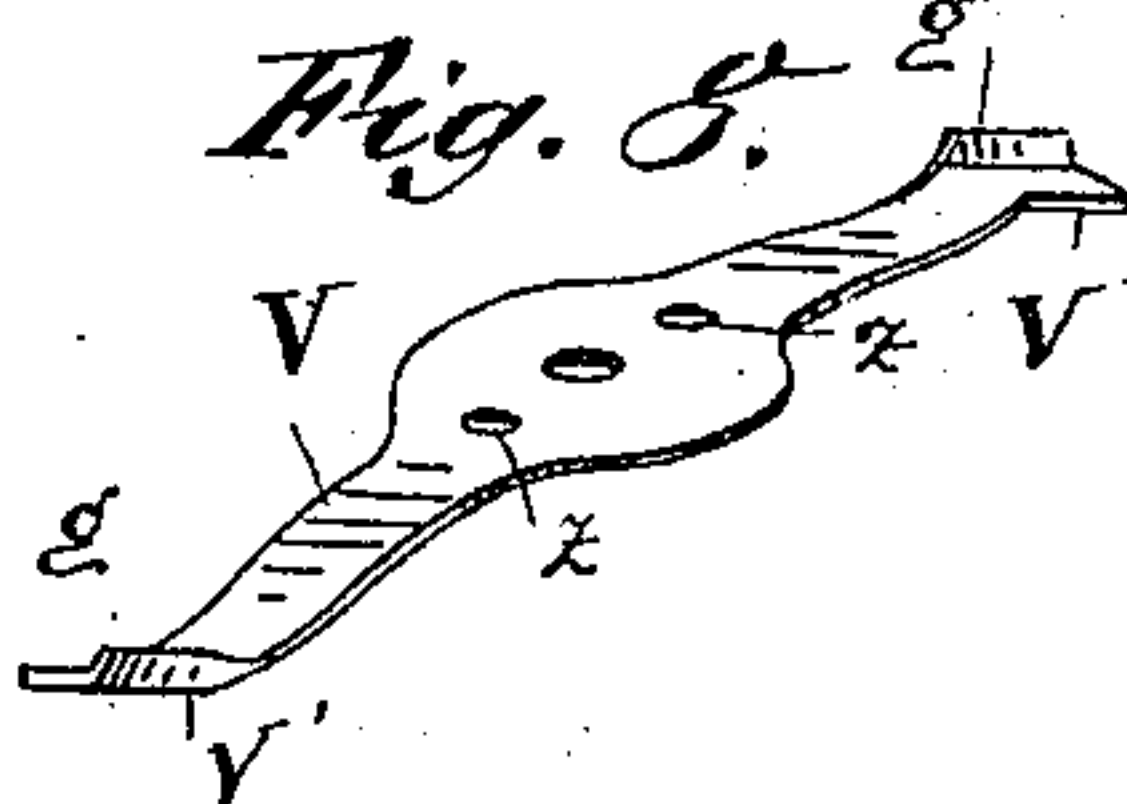


Fig. 8.



Witnesses:

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# UNITED STATES PATENT OFFICE.

WALTER H. UNDERWOOD, OF DENVER, COLORADO.

## HAIR-CLIPPER.

SPECIFICATION forming part of Letters Patent No. 616,214, dated December 20, 1898.

Application filed August 9, 1886. Serial No. 210,466. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER H. UNDERWOOD, a citizen of the United States, and a resident of Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Hair-Clippers, of which the following is a specification.

This invention relates to improvements in devices for clipping hair, wool, and other fibrous material, and pertains especially to that class of such devices which employ or operate with or by a rotary cutter; and the object of my invention is generally to provide an effective clipper of simple and durable construction.

The invention aims in part to provide an effective means for constantly maintaining a cutting edge or edges on the knife or cutter while in use and without requiring the removal of said cutter from its bearings. This feature of the invention consists in providing in a clipping device having a revolving knife or cutter coacting with a toothed plate an abrading-surface, against which the edge or edges of the cutter next the toothed plate revolves.

The invention also consists in the construction and combination of parts and details, all as will be fully specified hereinafter and then pointed out in the claims.

The accompanying drawings, forming a part of this specification, illustrate a preferred construction and modifications thereof embodying the various features of the invention, and a full description will now be given of such preferred construction and modifications in connection with said drawings and the features constituting the invention afterward specifically pointed out in the claims.

In said drawings, Figure 1 is a longitudinal sectional view of my improved clipper. Fig. 2 is a plan view of the same, parts being shown in section. Fig. 3 is a cross-sectional view of the clipper. Fig. 4 is a detail perspective view of the knife. Fig. 5 is a side view of the disk on which the knives are held. Fig. 6 is a plan view of the under side of the clipper, showing the construction of the spring-knife, the device for adjusting the same, and also a modified construction of the stone or abrader and the devices for securing

and adjusting the same. Fig. 7 is a longitudinal sectional view of Fig. 6. Fig. 8 is a detail perspective view of the knife shown in Fig. 6.

The casing A, which forms a convenient handle for the entire device, contains a pneumatic motor suitably constructed and arranged for driving the knife in either direction. Any other suitable motor or driving device which meets the requirements—for instance, an electric motor or a flexible shaft—may be used in place of the pneumatic motor. On the bottom or lower face of the casing A is fastened the toothed ring or comb plate O, which is provided with teeth O' on that part where the cutting is to be done. A number of guard-fingers P extend from the casing A over and beyond the teeth O'. The bottom edges of said fingers P, beyond the ends of the teeth O', extend slightly below the back or bottom surface of the revolving knife or cutter. The ends of the fingers are pointed to permit of ready passage through the hair or wool to be clipped. A curved guard-flange P' is provided at that portion of the comb-plate which is not toothed and extends, preferably, the same distance below the bottom surface of the revolving knife or cutter as the bottom edges of the fingers P.

The comb-plate O is provided with an abrading-surface, which may be formed in any suitable manner and which may be of any suitable material and of any desired extent. As shown in the drawings, it forms a part only of the surface of the plate O, and in the construction shown in Figs. 1 to 3 it is formed by an oil-stone R or other suitable abrading-piece or sharpener, secured in a recess or opening in the plate O in any suitable manner, as in a box or frame S. The ends of said box are supported by screws T, passed through lugs T' on the sides of the casing A, or the box is connected in any other suitable manner with the screws, so that the box and the stone in the same can be moved up or down by turning the screws. The stone or abrader is to be so adjusted that its face is in the same plane as the face of the comb-plate O, or nearly so, the exact position being regulated according to the requirements of the revolving knife. If desired, an abrading-wheel may be used in place of the oil-stone or like abrader. This



feature of the invention is effectually applicable to other forms of hair-clippers—as, for example, one which consists of a toothed ring or comb plate beneath and a rotary knife  
5 above or to clippers differing in other respects from that shown.

It will be understood that the abrading-surface may be provided in other ways, as may be found suitable or desirable—as, for  
10 example, as shown in Fig. 6, the abrader may consist of a piece Y, held in a recess of the ring O by the screw b. The back of the abrader, as shown in Fig. 6, is beveled, and on said  
15 bevel the screw d can act, which is held in the lug n of the casing A, by means of which screw d the abrader can be shifted until it is in the proper position in relation to the revolving knife or cutter, and then the said  
20 abrader can be locked in position by means of the screw b. In constructing the clipper the position of the abrader in the plate may be changed at will as long as it is so located that the cutting edges of the knives or cutters can sweep over it during their rotation.

25 In the construction shown in Figs. 1 and 2 the knife or cutter N is mounted on the cutter-head M, which is screwed on the threaded disk L, from which the stem or spindle K extends upward through the bearings in the  
30 casing A. On the upper end of the spindle K the cog-wheel J is mounted and communicates the driving power from the motor in the casing A to the knife or cutter. The cutter-head revolves within the comb-plate O. The  
35 cutter-head M is provided with one or more dovetailed grooves in its under side for receiving the inner ends of the cutters N, which are U-shaped in cross-section, the sides of the U being inclined from each other, as  
40 shown in Fig. 4. The cutters N can be shifted in the direction of their length in their grooves and can then be locked in place by means of the screws N' in the cutter-head M and adjacent to the edges of the grooves in  
45 said cutter-head. The knives N are especially adapted for cutting coarse material and can be adjusted to revolve nearer to or farther from the comb-plate O by turning the cutter-head M on the threaded disk L. When in  
50 the proper position, the cutter-head M is fastened firmly on the disk L by means of the set-screws W in the sides of a recess L' in the under side of the disk L. As the cutters N are U-shaped in cross-section, they can cut  
55 when revolving in either direction.

For clipping wool and other fine material the spring-cutter V (shown in Fig. 8) is preferably substituted for the cutters N. This  
60 cutter may consist of a single piece V, of steel, having its ends V' bent and provided with flanges g, on the edges of which the cutting edges are formed, or the said cutting edges may be formed on the cutter V in any other suitable manner. By providing the  
65 blades with flanges the blades are strengthened and stiffened at their ends where this is necessary, and thus a small amount of metal

can be used in making the blade both light and strong, and thereby also reducing friction. If desired, the cutting edges of the cutter V  
70 may be made U-shaped in cross-section, as in the cutter N, thus admitting of cutting while revolving in either direction. As shown, the cutter V is held at its middle portion by a screw h to the under side of the disk L, and  
75 through apertures z in said cutter V screws m are screwed into the disk L at either side of the screw h. The cutter V is preferably so formed that its spring-tension tends to keep its cutting edges from the face of the comb-  
80 plate O. The screws m act on the cutter V to press the cutting edges of the same against the face of the comb-plate with greater or less force, according to their adjustment, and when the said screws m are loosened the  
85 spring-tension of the cutter moves its cutting edges a greater or less distance from the face of the plate O. The pressure of the cutting edges on the face of the plate O can thus be adjusted very accurately. The cutting edges  
90 may be at an angle to the radial line or radial, as may be desired.

If desired, the spindle K of the disk L may be so journaled that it is not perpendicular to the plane of the face of the comb-plate,  
95 but is so inclined that the extreme cutting edges of the cutter V are in contact with the outer edge of the plate O at that portion where it is toothed, thus increasing the efficiency of the clipper for certain kinds of  
100 work.

The operation is as follows: Rotary motion is communicated to the cog-wheel J from the motor in the casing A. The cutting part of  
105 the clipper is thus revolved, and the cutters N or V rotate over the toothed ring or comb-plate O and cut off the material projecting between the teeth O' as the clipper is advanced—as, for example, over the skin of  
110 the animal. The cutting edges of the cutters also pass over the face of the abrader and are thus sharpened and trimmed continually while the tool is in operation.

The face of the abrader is to be advanced as it wears away, so that its position is always  
115 practically the same.

What I claim is—

1. The combination with a stationary plate provided at its periphery with a series of cutting-teeth and upon its face with an abrading-surface, of a revolving knife or cutter  
120 comprising separated arms having sharpened side edges, said side edges being in contact with the plate to coact with the teeth thereof and to be sharpened by their movement over the abrading-surface, substantially as described.

2. The combination with a stationary plate provided at its periphery with a series of cutting-teeth and upon its face with an abrading-surface extending through a portion of  
130 the movement of the knife or cutter, of a revolving yielding knife or cutter held into firm contact with the face of the plate and



coacting with the teeth of said plate and sharpened by its movement over said abrading-surface, substantially as described.

3. The combination of a stationary plate  
5 having cutting-teeth and provided with an abrading-surface formed by a piece of abrading material held in a recess or opening of said plate, and a revolving knife or cutter comprising separated arms having sharpened  
10 side edges coacting with the cutting-teeth and sharpened by its movement over said abrading material, substantially as described.

4. The combination with a stationary  
15 toothed plate, of an abrading-piece in a recess or opening in the plate, screws for adjusting the position of the abrading-piece in relation to the plane of the surface of the plate, and a revolving knife or cutter comprising separated arms having sharpened side  
20 edges which rest in contact with the surface of the plate and coact with the teeth thereof, the said edges being sharpened by their movement over the said abrading-piece, substantially as described.

25 5. The combination with a stationary toothed plate, of a box or frame, an abrading-piece in said box or frame, screws for adjusting the box or frame in relation to the plane of the surface of the toothed plate, and  
30 a revolving yielding knife or cutter held in firm contact with the face of the plate and coacting with the teeth of said plate and sharpened by its movement over said abrading-piece, substantially as described.

35 6. The combination with a stationary toothed plate provided with an abrading-surface extending through a portion of the movement of the knife or cutter, of a revolving  
40 yielding knife or cutter having one or more flanged blades coacting with the teeth of said plate and sharpened by its movement over said abrading-surface, substantially as described.

45 7. In a hair-clipper, the combination with a toothed plate, of a revolving spring-knife, screws for adjusting independently the pressure of each blade of said spring-knife on the surface against which it revolves, and means for revolving the knife, substantially as here-  
50 in shown and described.

8. The combination with a stationary plate provided at its edge with a series of cutting-teeth and guard-fingers, of a movable yield-

ing cutting-blade having a cutting edge in contact with and adapted to coact with the  
55 cutting-teeth, the main body of said blade being out of contact with the stationary plate, and means for moving the blade, substantially as described.

9. The combination with a stationary plate  
60 provided at its periphery with a segmental series of separated guard-fingers, and with a corresponding series of cutting-teeth arranged intermediate the guard-fingers, said fingers extending beyond and below the plane of the  
65 cutting-teeth, of a yielding blade provided at its side with a cutting edge held into close contact with the face of the plate and adapted to coact with the cutting-teeth thereof, and means for imparting a rotary movement to  
70 the blade, substantially as described.

10. The combination with a stationary plate provided at its periphery with a segmental series of separated guard-fingers and with a  
75 corresponding series of cutting-teeth arranged intermediate the guard-fingers, said fingers extending beyond and below the plane of the cutting-teeth, of a yielding blade provided at its side with a cutting edge held into close  
80 contact with the face of the plate, and adapted to coact with the cutting-teeth thereof, means for imparting a rotary movement to the blade, and an abrading-surface arranged in the path of movement of the cutting edge  
85 of the blade to make contact therewith during the rotary movement of the blade, substantially as described.

11. The combination with a stationary plate provided at its edge with cutting-teeth and  
90 guard-fingers, of a movable yielding cutting-blade having a cutting edge in contact with and adapted to coact with the cutting-teeth, the main body of said blade being out of contact with the stationary plate, means for moving the blade, and an abrading-surface in the  
95 path of movement of the cutting edge of the blade, with which surface the edge of the blade is adapted to make contact in its movement, substantially as described.

Signed at New York, in the county of New  
York and State of New York, this 3d day of  
August, A. D. 1886.

WALTER H. UNDERWOOD.

Witnesses:

OSCAR F. GUNZ,  
J. H. GUNZ.