(No Model.) 3 Sheets—Sheet 1.

E. TWEEDY & G. YULE.

HAT PARING MACHINE.

No. 327,122. Patented Sept. 29, 1885.

Fig. 1.

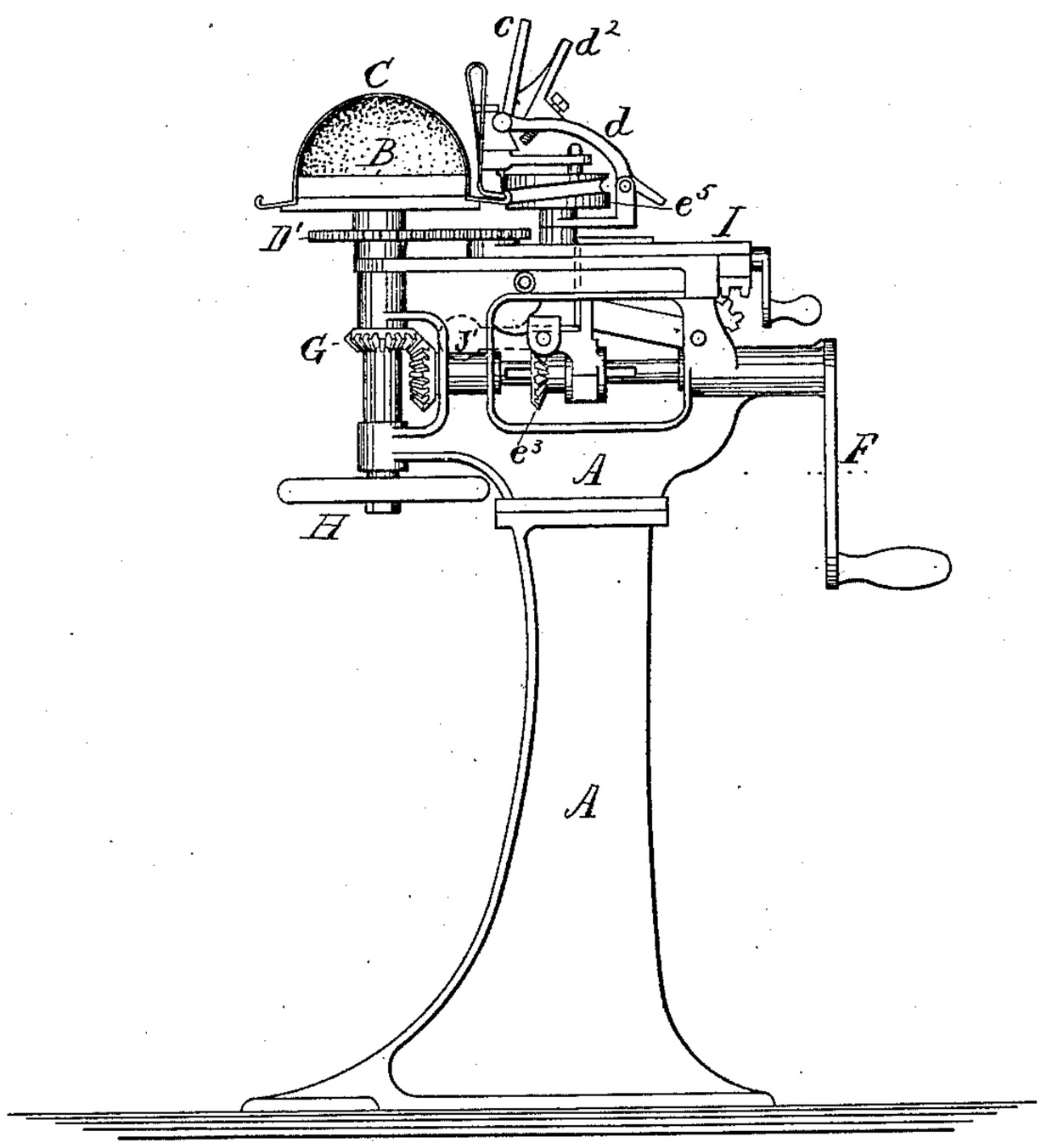
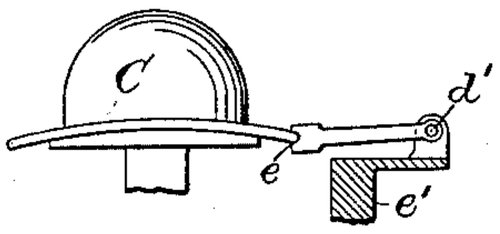


Fig. 4.



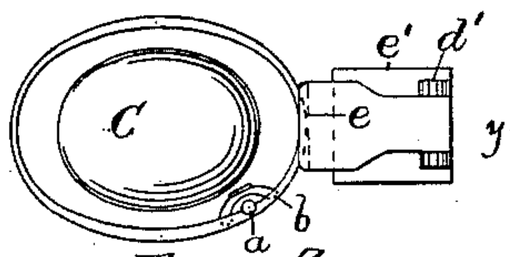
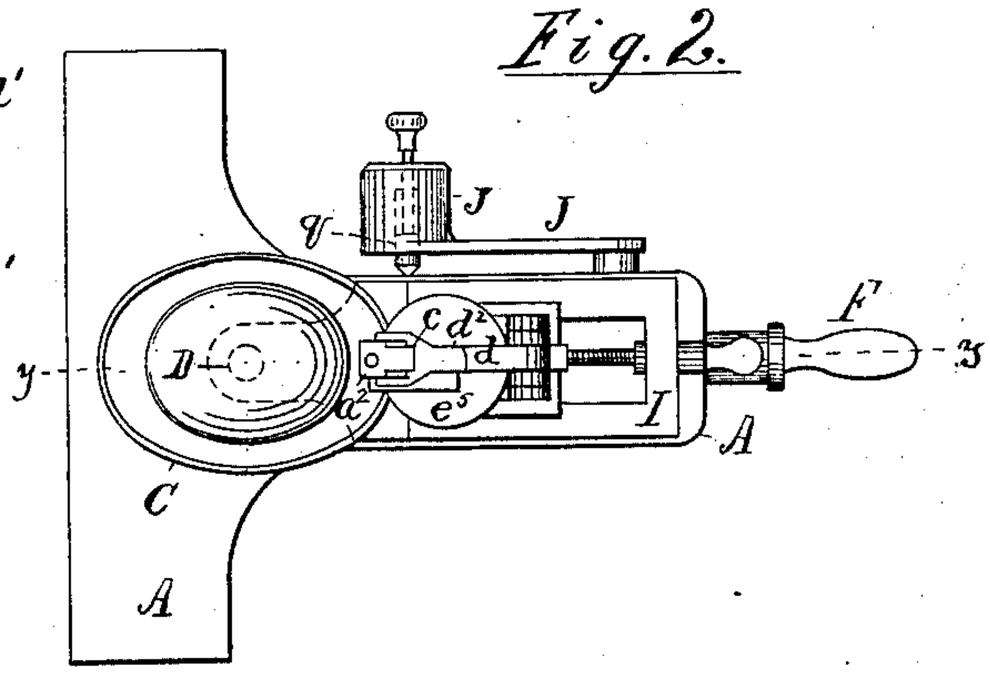


Fig. 3.

Fig. 2.



Attest:

L. Lelly

Henry J. Theberath.

Inventors.

Edmund Tweedy & Geo. Yule

per Thos. S. Crane, Atty.

(No Model.) 3 Sheets—Sheet 2.

E. TWEEDY & G. YULE.

HAT PARING MACHINE.

No. 327,122. Patented Sept. 29, 1885.

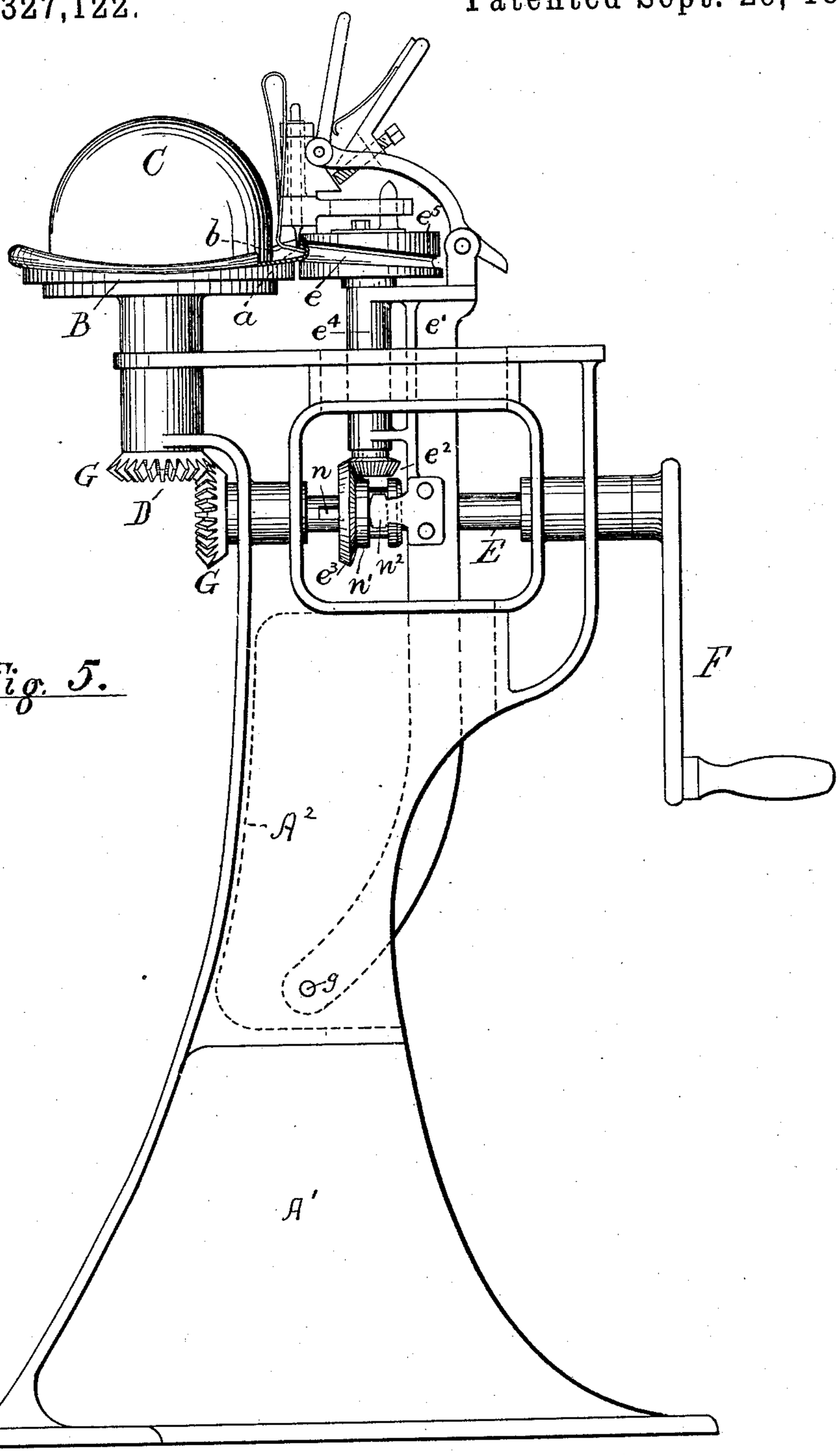


Fig. 5.

Attest.
L. Lolly
Henry J. Sheberath

Inventors.
Edmund Tweedy & Geo. Yule
per Thos. S. Crane, atty.

(No Model.)

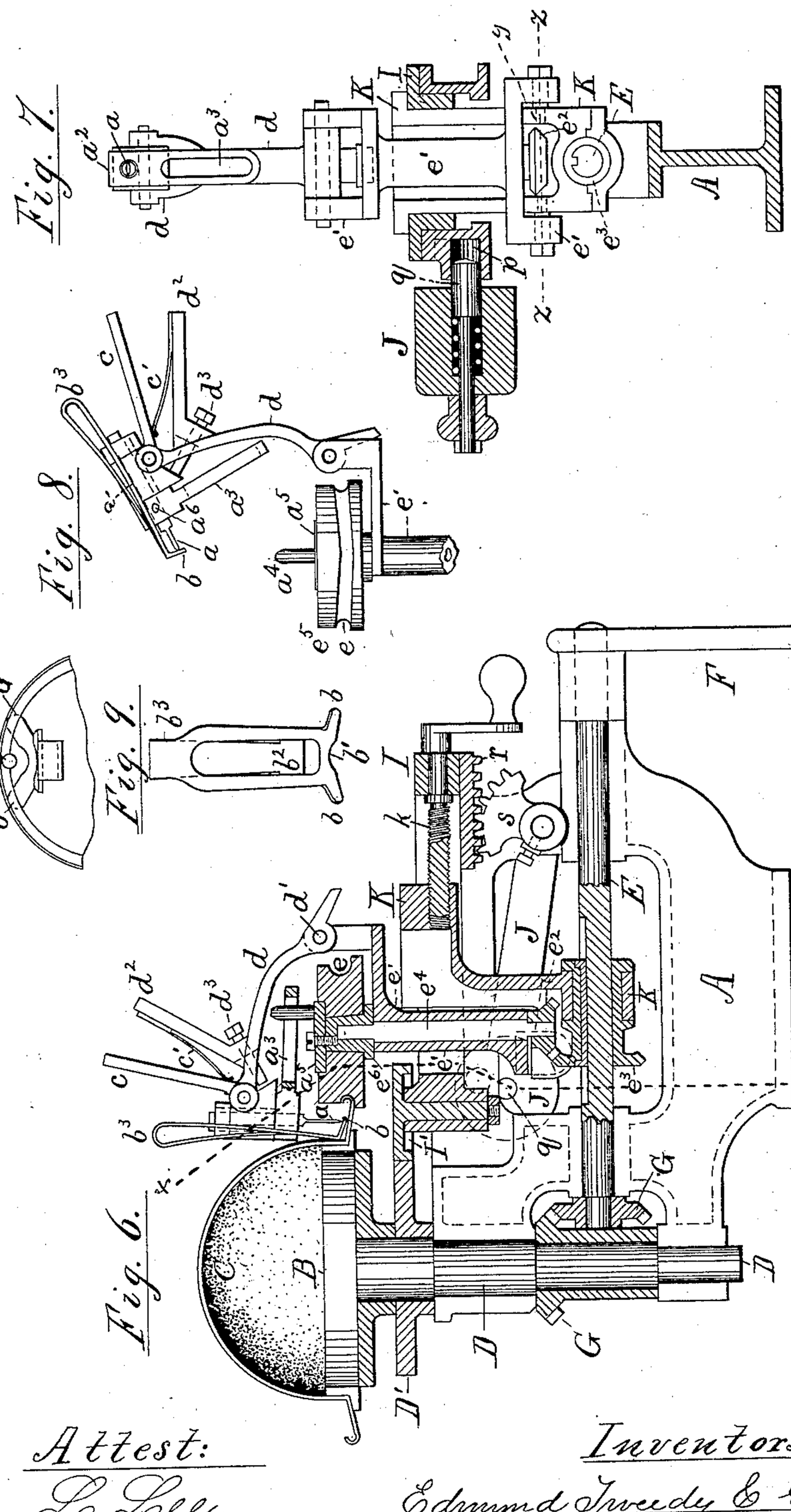
3 Sheets—Sheet 3.

E. TWEEDY & G. YULE.

HAT PARING MACHINE.

No. 327,122. Patented Sept. 29, 1885.

Fig. 1.



Attest:

L. Lee.

Henry J. Theberath

Inventors.

Edmund Tweedy & Geo. Yule

per Thos. S. Crane, Atty.

UNITED STATES PATENT OFFICE.

EDMUND TWEEDY, OF DANBURY, CONNECTICUT, AND GEORGE YULE, OF NEWARK, NEW JERSEY, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE HAT CURLING MACHINE COMPANY, OF DANBURY, CONN.

HAT-PARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 327,122, dated September 29, 1885.

Application filed September 4, 1884. (No model.)

To all whom it may concern:

Be it known that we, EDMUND TWEEDY and GEORGE YULE, citizens of the United States, residing, respectively, at Danbury, Connecticut, and Newark, New Jersey, have invented certain new and useful Improvements in Hat-Paring Machines, fully described and represented in the following specification, and the accompanying drawings, forming a part of the same.

This invention consists in the combination, with a paring-knife, of a grooved or channeled gage fitted closely to the hat-brim curl and serving, in certain instances, to sustain the curl when devoid of much stiffening; in other modifications to vibrate the knife in relation to the exterior of the curl, and, in other instances, to afford the knife-holder an independent vibration upon a cam-moved carriage.

It also consists in a rotary gage, in means for rotating the gage twice for each revolution of the hat, and in means for pressing the hat-curl elastically into the grooved channel.

It also consists in details of construction specifically claimed herein.

The grooved gage is made to support the curl during the paring operation by making the grooved "channel" or "gage" *e*, as it is termed herein, to fit the curl closely and to thus prevent the felt from yielding to the knife when not highly stiffened. As the width or shape of the curl commonly varies at different parts of the brim, we form the groove in a rotating disk and rotate the latter so as to present the proper part of the groove or channel to the curl. To secure an exact correspondence of a variable channel with a curl of corresponding variation, we rotate the disk by positive mechanism at the proper relative speed. The means for pressing the curl into the channel we have herein called an "inner gage," as it would alone gage the vibration of the knife as effectually as the channeled gage.

Our invention also includes means for sustaining the gage or gages upon a freely-vibrating holder or arm, and for vibrating the knife in relation to the gage or curl.

In the drawings, Figure 1 is a side elevation of a machine, illustrating our improvements. Fig. 2 is a plan of the same. Figs. 3 and 4 are diagrams showing the action of a non-rotating gage. Fig. 5 is a side elevation of a machine embodying merely the essential elements of our invention. Fig. 6 is a vertical section of all the operative parts of the complete machine on line *y y* in Fig. 2. Fig. 7 is a transverse section of the same machine on line *x x* in Fig. 6, the gear-wheel e^3 and the gage e^5 being omitted from the view, and the tool-carrier turned upward, as in Fig. 8. Fig. 8 is a detached view of the gage and part of the gage-holder with the tool-carrier and its supporter retracted from the gage. Fig. 9 is a front view of the inner gage and knife; and Fig. 10 is a plan of part of a curled brim with the inner gage inserted in the curl.

To illustrate the principle of the invention, we will first refer to Fig. 5, in which A′ is the frame of the machine; B, the hat-clamp; C, a hat fixed thereon; D, the clamp-spindle; E, a driving-shaft for rotating the clamp; F, a hand-crank; and G are bevel-gears for connecting the shaft and spindle.

The gage-disk is shown at e^5, and is mounted upon the upper end of a gage-holding arm, *e*′, which is pivoted at a point, *g*, upon the frame directly beneath the knife *a*. The frame is formed with a central opening, A^2, merely indicated by dotted lines in Fig. 5, for the insertion of the vibrating holder *e*′, and the latter is vibrated solely by the curl of the hat, grasped between the channel *e*, formed in the edge of the disk, and a hooked piece or inner gage, *b*, fitted to press elastically into the curl. The groove *e* is made of varying width to fit the hat-curl shown in the figure, and is rotated upon its arbor e^4 by bevel-gears connecting with the shaft E.

A gear, e^2, is fitted to the lower end of the arbor, and a gear, e^3, is fitted to slide upon a feather, *n*, on the shaft E, and is formed with a groove in its hub *n*′, by which it may be shifted.

A fork, n^2, is attached to the holder-arm, and is fitted to the grooved hub, so as to hold the gear e^3 constantly in contact with its mate when the holder vibrates.

The means for adjusting the paring-tool and

gages will be described in connection with the construction shown in the other figures; but it is obvious that with the curl clamped between the gages, as described, the gage-holder must be vibrated as the hat rotates; and the knife, mounted upon such vibrating holder, would follow the required elliptic path about the hat.

The operation of the invention will be further described in connection with the other figures, in which A is the frame of the machine; B, the hat-clamp; C, a hat clamped thereon; D, the rotating hat-clamp spindle; E, the driving-shaft, and F a hand-crank thereon.

G are bevel-gears for driving the spindle, and H is a hand-wheel for operating the hat-clamp, which term is used herein to include any means for rotating and sustaining the hat for the operation of the paring-tool.

a is the tool or knife removably fitted in the center of a sleeve, *a'*, which, with a head, a^2, to which the inner gage, *b*, is attached, constitutes the tool-holder. The tool-carrier is formed as a lever, *c*, pivoted to the supporter *d*, and is formed with a handle at its upper end, and a socket for the sleeve *a'* at its lower end. The supporter *d* is pivoted to the gage-holder *e'* at *d'*, so as to participate in every movement of the outer gage, e^5, which is affixed to the holder, and is formed with a handle, d^2, and a spring, *c'*, which operates to press the tool-carrier, holder, and inner gage, *b*, elastically away from the hat-clamp and toward the outer gage.

d^3 is a set-screw fitted to the supporter to regulate such movement of the tool, the point of the screw bearing upon the outer side of the head a^2.

The gage e^5 is shown as a rotary disk mounted upon an arbor, e^4, fitted vertically in the gage-holder, and connected with the shaft E by a gear, e^2, attached to its lower end.

The gage is provided with a groove or channel, *e*, which receives and guides the hat-curl during the paring operation, and which is shown of variable depth and width in the figures, so that when properly rotated it will fit the varying contour of the hat-curl at the front and side of the brim. As such variation is twice repeated on opposite sides of the hat the gage e^5 is made to rotate twice for each revolution of the hat-clamp, by the sliding gear e^3, fitted to the shaft E in contact with the gear e^2, and of just twice the diameter.

I is a carriage fitted movably upon the top of the frame A, and pressed toward the hat-clamp by a lever and weight, J'. A roller, I', upon the carriage bears against a cam, D', on the clamp-spindle, and thus vibrates the carriage in a manner approximating to the vibrations of the gage toward the hat-clamp, and the gage-holder *e'* is adjusted to and from the hat-clamp to suit hats of different sizes by an adjusting-slide, K, fitted movably upon the carriage, and held thereto in any desired position by a setting-screw, *k*.

The gage-holder is pivoted to the adjuster at the point *g*, where the gears e^2 and e^3 are in contact, as is clearly shown by the line *z z* in Fig. 7, and the gage-holder is thus able to vibrate differently from the carriage I, and the automatic vibrations of the latter may thus be made to serve for approximately holding the gage-holder in the curve traversed by the gage and supporter about the hat, even when the styles and shapes of the latter differ from that of the cam D'.

A vibrating carriage and adjuster are not essential to the operation of the gage-holder, as the latter is fully adapted by the pivotal connection at its lower end to vibrate the supporter and tool-carrier in the desired manner under the agency of the gage or gages connected with it.

The lever J is shown connected with the carriage by a rack, *r*, and segment *s*, and is shown in Fig. 7 provided with a spring-bolt, *q*, fitted to a hole, *p*, in the frame A when the lever is raised, and the weight may thus be sustained when the operator desires to exchange a hat, and the gage e^5 thus be held from contact with the brim.

a^3 is a slotted arm affixed to the tool-holder head and projected across the upper side of the disk e^5, and a^4 is a crank-pin fitted to the surface of the disk and inserted in the slot of arm a^3, so as to oscillate the arm twice for each rotation of the hat.

The arm and disk are shown disengaged in Fig. 8, the slot being adapted to slip off of the crank-pin a^4 when the supporter is raised, and to readily fit upon the same again if guided toward it when the supporter is lowered.

The crank-pin is affixed to the disk by a foot and bolt, a^5, and may thus be changed for one of different radius when it is required by the curve of the ellipse; or the pin may be made adjustable in the disk, as in other machines where a varying stroke is required.

When in operation, the position of the supporter is nearly horizontal, so that the attached tool-carrier may be lifted almost vertically when the supporter is turned about its pivot, and the carrier itself stands vertically when in operation, so that the attached tool-holder and inside gage may be moved horizontally away from the curl by pressing the handle of the carrier (the lever *c*) toward the handle d^2 of the supporter in opposition to the spring *c'*. The gage *b* may therefore be inserted within the curl by first pressing the handles together, as shown in Fig. 6, and lowering the supporter and carrier until the knife and gage *b* stand between the inner edge of the curl and the hat-crown, when the release of the handles will allow the spring *c'* to throw the gage *b*, which is made thin enough to fit within the narrowest part of the curl, into the hook of the curl, and by the reaction of the spring upon the supporter and the freely movable gage-holder, will draw the grooved gage e^5 into close contact with the curl and hold it there while the hat is pared.

The set-screw d^3 is adjusted so that the spring c' may operate to press the shank of the knife into close contact with the edge of the disk or gage e^5, and to hold the shank in contact therewith during the rotations of the latter. The edge of the disk in which the channel e is formed may be made concentric with the arbor and the channel eccentric, as shown in Figs. 3, 4, and 5, or the bottom of the channel may be made concentric and the periphery of the disk eccentric, or of any required shape, to secure the variable depth desired in the channel when paring curls of varying width.

The inner gage being pressed into the curl by the spring c', might be rigidly attached to the knife-holder were the curl of uniform depth; but to press the curl elastically into a varying channel the gage b is preferably made as a spring, b^3, and is shown in Figs. 6, 8, 9 and 10 as attached by a foot, b^2, to the inner side of the head a^2 upon the tool-holder, the body of the spring being bent upward to gain flexibility, and slotted where it is bent down toward the edge of the knife, so as to pass at each side of the tool-holder and stand at each side of the tool-shank.

The end of the gage is formed with a central notch or opening, b', through which the point of the knife may be allowed to extend, but not below the level of the gage-points at each side of the notch. The gage thus acts as a guard to prevent the cutting of the under brim by the point of the knife.

With the construction described, the operator locks the carriage in an operative position while applying a hat to the hat-clamp, and when the same is secured thereon he draws the spring-bolt from the hole p and allows the roller I′ to rest against the cam D′. He then raises the supporter, and after pushing the gage e^5 into contact with the curl lowers the knife and inner gage into contact with the curl. The spring c' then presses the knife-shank against the periphery of the gage e^5, and the spring b^3 presses the inner gage into the curl and clamps the curl against the channel e during the operation of the machine. When the tool is properly adjusted, the operator effects the paring by a single revolution of the crank F, and the hat is then removed by a reversal of the operation just described.

The knife-shank is formed as a round stem secured in the holder-head by a screw, a^6, and the stem may be permitted to rest directly against the periphery of the disk e^5, or may be provided with some bearing-shoe for such purpose. In either case, the shank of the knife is affected by the variable depth of the groove e, and such shank is therefore claimed in combination with the disk and channel herein.

To pare a curl of varying depth, the knife-holder requires a vibration relative to the bottom of the gage-channel e, and such vibration is effected herein by having the knife-shank rest against the edge of the disk e^5. Such vibration may be effected by a separate disk, if desired, or by other equivalent means, as the essential feature of the invention in this respect is the vibration of the knife relative to the gage during the paring operation.

It is obvious that the curl is pared much more accurately when the movements of the knife are gaged literally by the curl itself, and that the curl is less likely to be distorted or the knife operated improperly when the movements of the gage itself are governed by mechanism elastically clamping the curl instead of by independently-actuated mechanism, as heretofore.

For paring hats having curls of uniform width or depth, the channel could be made in a convex or straight surface, or in a concave surface, fitted to the side of the hat, and the knife could be mounted in any suitable manner in contact with the edge of the gage. Such a straight gage is shown in Figs. 3 and 4, with the gage e fitted to the shape of a uniform curl and adapted to follow the bend or set of the hat-brim by a hinged connection, d^4, to the pivot d' upon the holder e'. The inner gage is represented at one of the quarters of the hat in Fig. 3 as operating to twist the knife tangential to the hat-curl, as hereinafter described. For a variable curl, however, the rotary gage is particularly adapted, as its surface may be constructed to rotate at the same speed as the curl in contact with the channel e, and being rotated in the same direction continuously has no tendency to drag upon the hat-brim and to distort the curl while paring.

With the positive gearing for rotating the gage twice during one revolution of the hat, the variable channel in a single gage may be made to serve for any size of hat, as the brim would simply drag an imperceptible amount in contact with the gage when of different circumference from the double of the gage-channel, which would be proportioned to suit some hat of average size, and would be just equal in its circumference to half the circumference of the hat-curl.

For convenience in making and changing the rotary gage when the shape or style of the curl is varied, the disk e^5 is made of wood clamped upon a metallic hub, e^6, by the foot or plate a^5, and is thus cheaply altered to suit any change in the style of the channel e.

It will be seen that the outer gage would serve alone to vibrate the knife-carrier in the desired curve if the gage were elastically pressed toward the curl; but such pressure might tend with semi-stiff hats to deform the curl somewhat during the paring operation, and the function of the inside gage, b, is therefore to effect the movements of the knife-carrier at the sides of the brim in lieu of a pressing agent, the curl being held or clamped between the two gages during the paring operation in such manner as to actuate the knife-carrier without any perceptible strain upon the curl.

The pivoting of the gage-holder, as at g, is

intended to obviate or diminish the strain upon the curl by lessening to the utmost the friction of the gage-holder's vibrations.

The vibrating movement imparted to the pivot by the cam and the carriage I also serves to diminish the tipping of the gage-holder and the friction of its movement on the pivot.

With stiff hat-brims the curl would have sufficient strength to vibrate the tool by the use of either an inner or outer gage operating in conjunction with a spring or weight to press it toward the curl, and in such case the inner gage could be used alone, and its points lettered *b* in Fig. 10 could be made to twist the edge of the knife tangentially to the brim-curl by spreading them apart, as shown in Figs. 10 and 3, and causing them to oscillate the sleeve *a'* in the carrier, as such points are pushed in and out by the changing curve of the curl. To produce an elastic pressure of the outer gage toward the hat-curl, the gage-holder *e'* may be provided with a weight affixed to an arm extended from the fulcrum in the proper direction. Such an arm, adapted to press the outer gage against the curl, is shown in dotted lines J' in Fig. 1, and a spring applied to the gage-holder in a suitable manner would obviously produce the same effect.

From the above description it will be seen that either gage may be pressed toward the curl by a spring or weight, or operated by an opposed gage fitted to the opposite side of the curl.

We have claimed specifically the use of a spring or weight in another patent application, No. 142,209, filed September 4, 1884, and have therefore claimed herein for vibrating the knife in the required curve merely the use of a gage.

We are aware of C. H. Reid's patent, No. 301,278, dated July 1, 1884, and hereby disclaim the said patent.

We have not claimed the guard *b* herein, but have claimed the same in a co-pending application, No. 142,209, filed September 4, 1884, with various other specifications of the machine herein described.

What we claim, and desire to secure herein, is—

1. The combination, with means for paring the hat-brim curl, of a brim-gage having a channel adapted to receive and guide the curl in relation to the paring-tool during the paring operation.

2. The combination, with means for paring the hat-brim curl, of a brim-gage having a channel adapted to receive, fit, and support the curl during the paring operation.

3. The combination, with means for paring the hat-brim curl, of a rotary brim-gage having a channel adapted to receive and support the hat-curl during the paring operation.

4. The combination, with means for paring the hat-brim curl, of a rotary brim-gage having a channel of variable depth adapted to receive and support the hat-curl during the paring operation.

5. The combination, with means for paring the hat-brim curl, of a rotary gage having a channel of variable depth to receive the curl and a shank connected with the paring-tool and resting upon such rotary gage during the paring operation.

6. The combination, with a rotating hat-clamp, of a paring-tool mounted upon a vibrating gage-holder with a rotating gage having a channel to receive and support the hat-curl during the paring operation.

7. The combination, with a rotating hat-clamp, of a gage-holder sustaining an outer gage, a paring-knife, and an inner gage, and means, as spring b^3, for pressing the two gages toward one another upon the opposite sides of the hat-curl.

8. The combination, with a rotating hat-clamp, of a gage-holder sustaining an outer gage, a paring-knife, and an inner gage, and the hat-curl being clamped elastically between the two gages and operating to vibrate the gage-holder and knife in relation to the hat-clamp.

9. The combination, with a gage-holder vibrated in relation to the hat-clamp by gages pressed elastically together upon the inner and outer sides of the hat-curl, of a paring-knife and means for vibrating it in relation to the curl in contact with the gage.

10. The combination, with a rotating hat-clamp, of a paring-tool mounted upon a vibrating gage-holder, a rotating gage having a channel adapted to fit the hat-brim curl, and means for rotating such gage during the paring operation.

11. The combination, with a rotating hat-clamp, of a paring-tool mounted upon a pivoted arm and a gage attached to the arm and pressed upon the hat-brim to vibrate the arm and knife during the paring operation.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

EDMUND TWEEDY.
GEORGE YULE.

Witnesses:
THOMAS E. TWEEDY,
THOS. S. CRANE.