

(No Model.)

3 Sheets—Sheet 1.

E. TWEEDY & G. YULE.
HAT PARING MACHINE.

No. 327,123.

Patented Sept. 29, 1885.

Fig. 1.

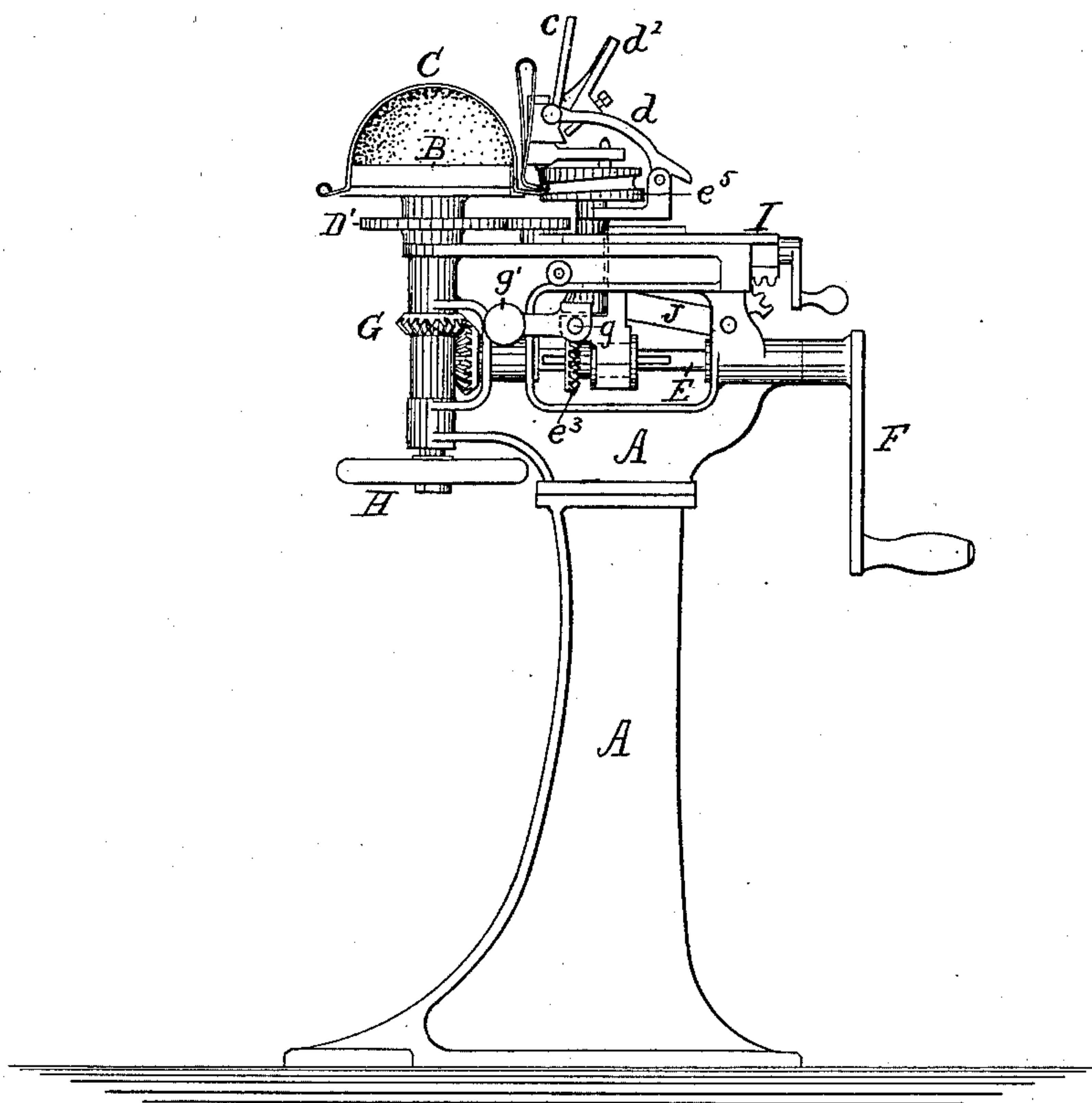
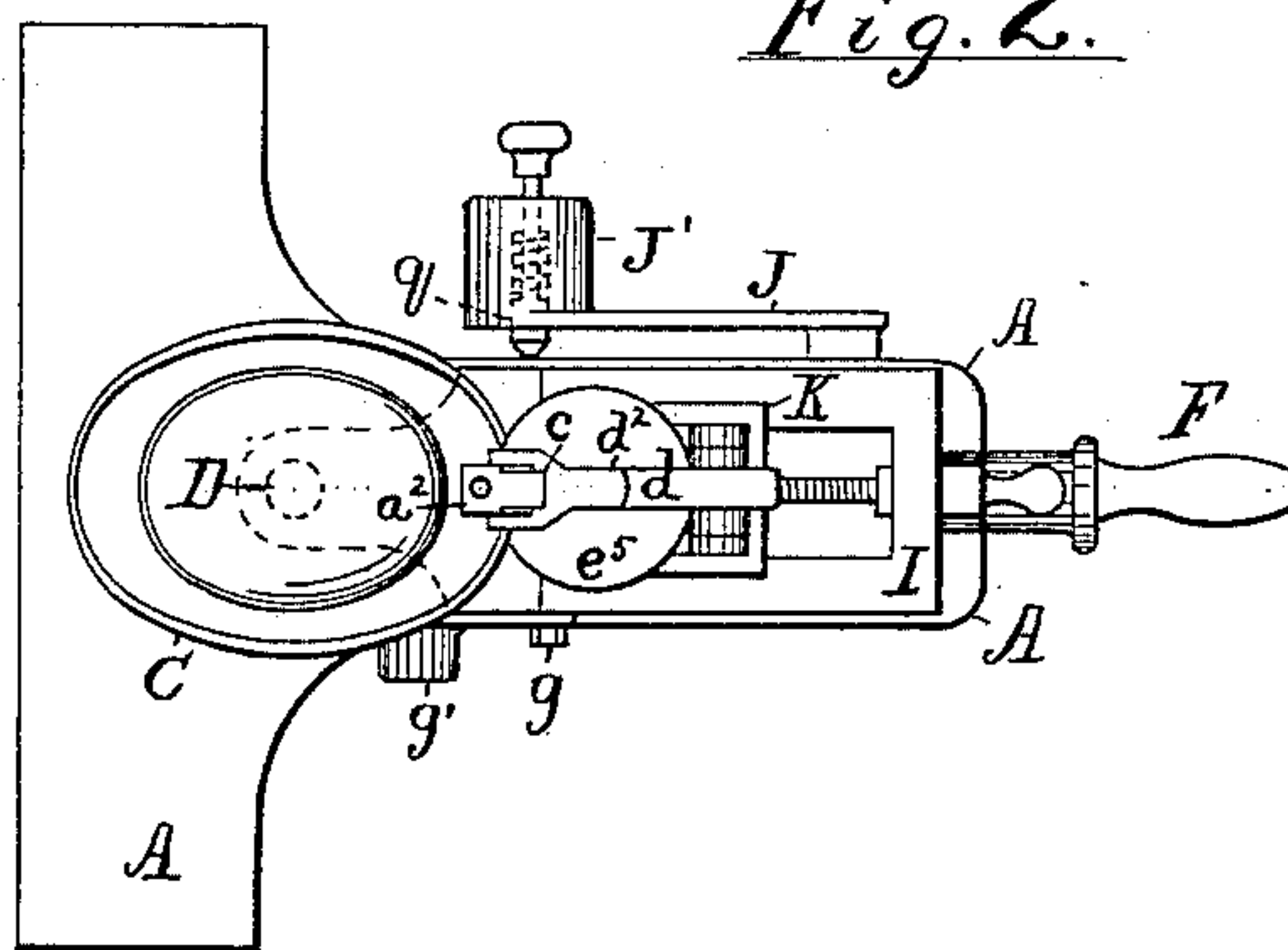


Fig. 2.



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Edmund J. J. & Geo. Yule

Henry J. Theberath per Thos. S. Cramer, Atty.

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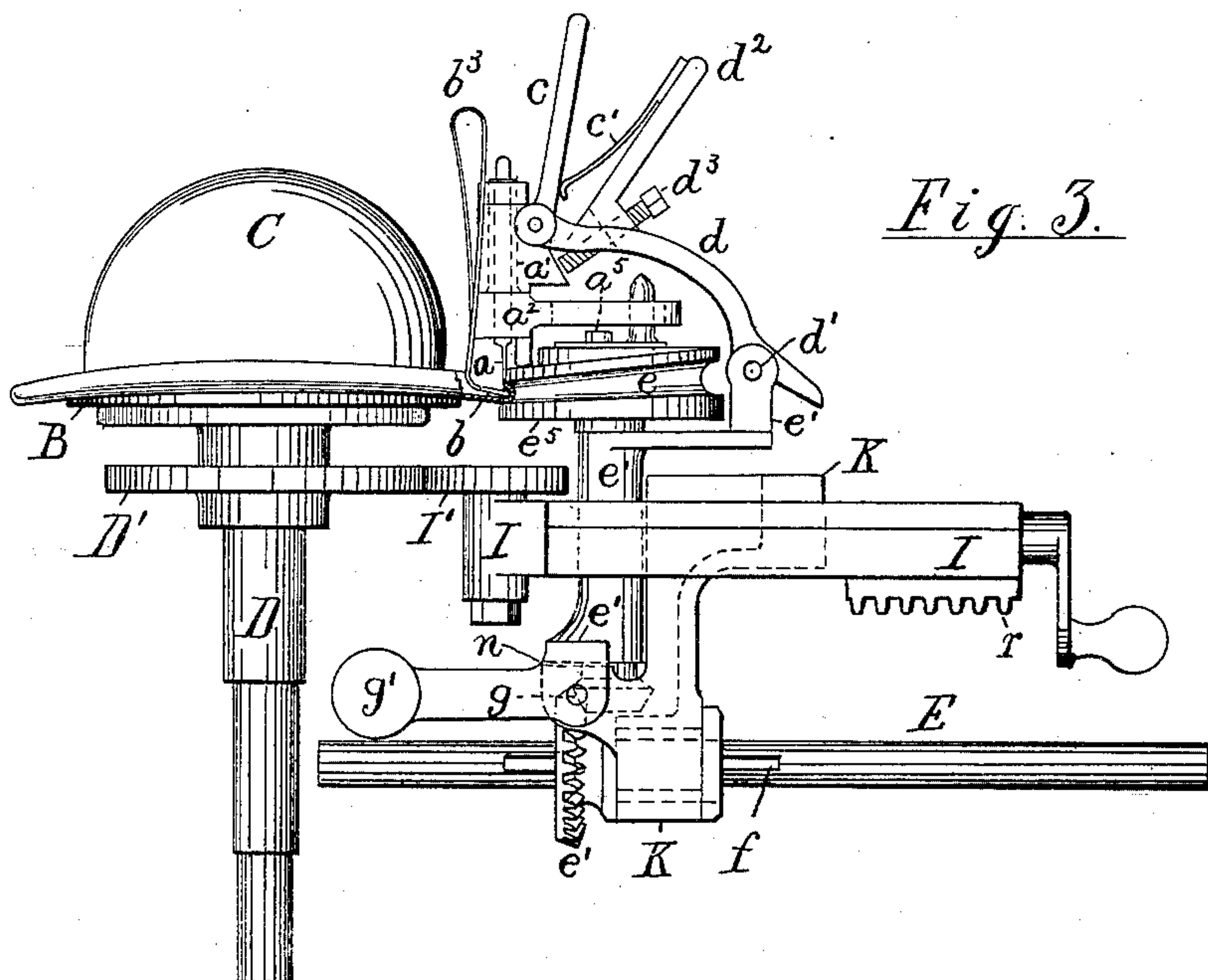


Fig. 3.

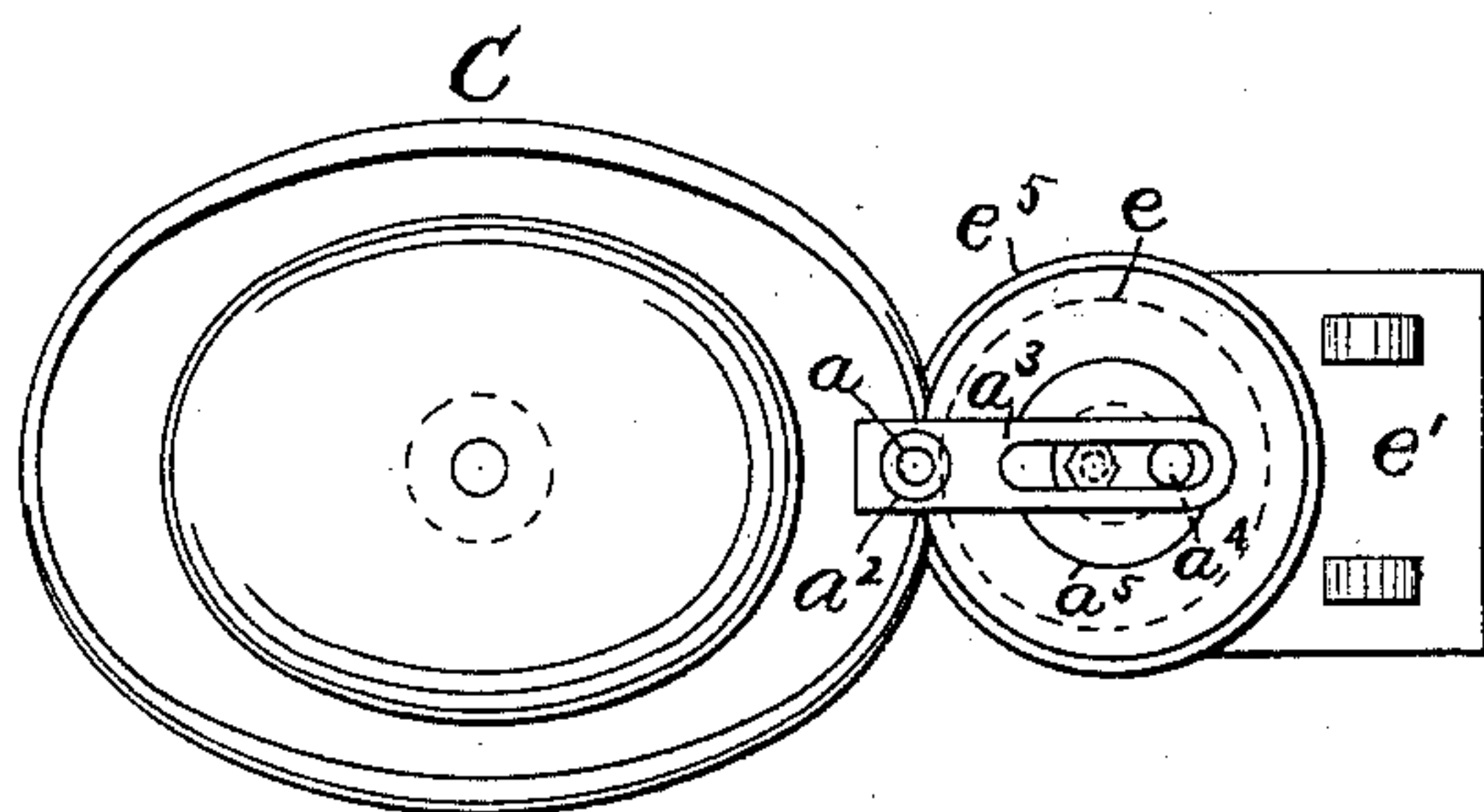


Fig. 4.

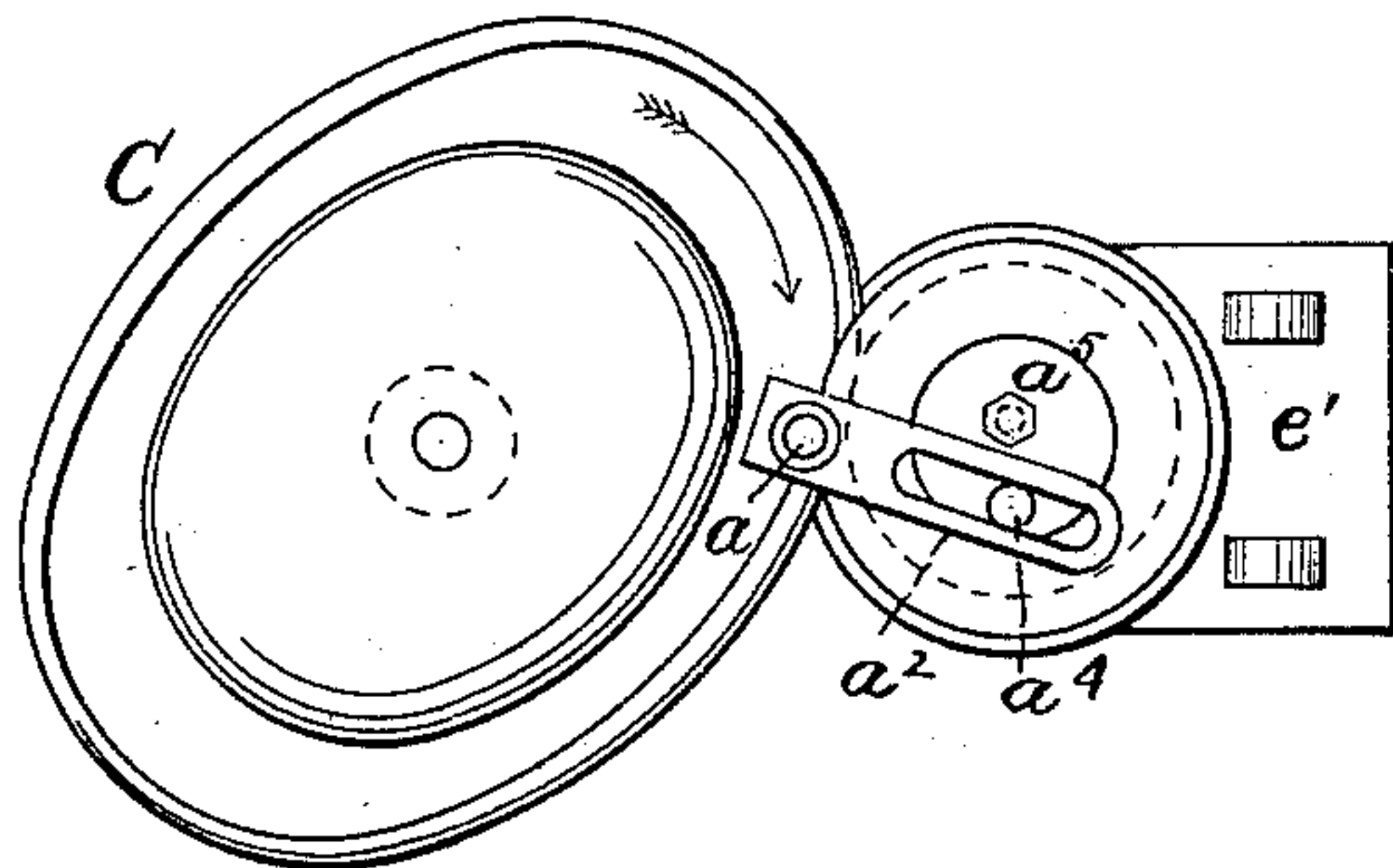


Fig. 5.

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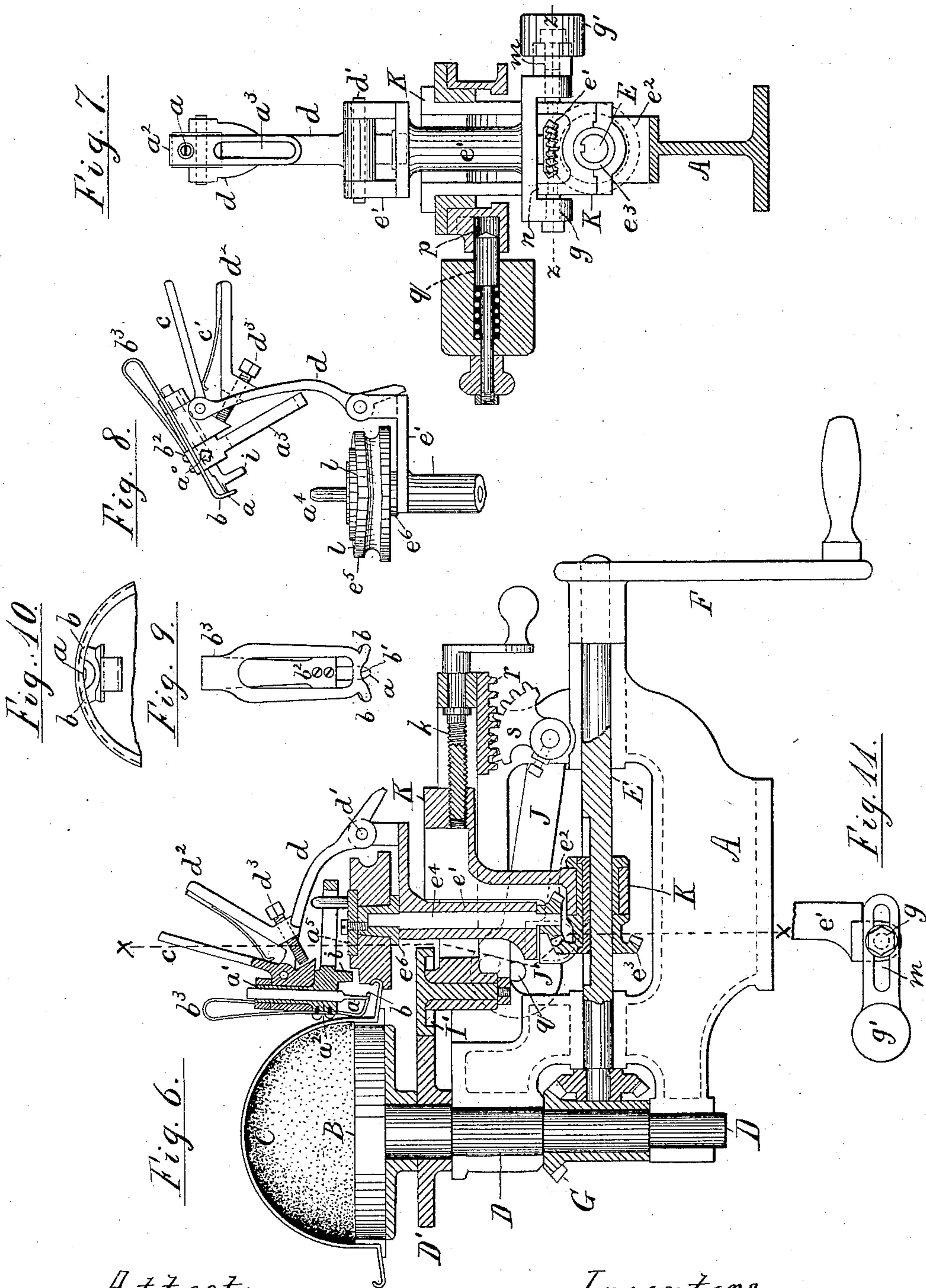
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Inventors.

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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. 327,123, 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.

The object of this invention is to utilize the hat-brim curl itself in guiding the paring-knife around the hat; and to effect this object without undue strain upon the curl we mount the knife and a suitable gage to bear against the curl upon a carriage, which is moved by positive mechanism approximately in the desired path around the hat.

Heretofore it has been necessary in some hat-curling machines to incur great expense in obtaining a separate cam for each variation in the shape of the curled hat-brim, so as to positively guide the paring-knife in the desired path; and to avoid this difficulty a mechanism is described in United States Patent No. 301,278, dated July 1, 1884, by which the cam or templet is entirely dispensed with, and the tool-carrier is independently movable and provided with a hook fitted within the curl and a shoe fitted outside the same to move the carrier and knife in the desired path. With the latter construction it is obvious that the entire weight of the tool-carrier and its attachments must be vibrated twice for each revolution of the hat by the pressure of the elliptic curl alternately against the hook and shoe. With this construction the knife is very imperfectly guided by any curl of insufficient stiffness, as upon a semi-stiff hat, and the shoe and hook applied to opposite sides of the curl are incapable of uniformly fitting the same at different points owing to its elliptic form and the constant change of curvature as the curl rotates.

It is obvious that if the shoe M and hook L be fitted to the curl at the side of the hat the curled brim will sink more into the center opening of the shoe when the latter is at the

front or rear of the brim, and thus recede from the hook L and lose the guidance which the latter should afford at such point in the brim.

As the movement of the tool is effected by the shoe when moving from the side to the front of the brim, and by the hook when moved from the front to the side, it is obvious that such hook and shoe cannot impart a continuous movement to the knife-carrier, but that the latter and the paring-tool will cease to be moved when the hook lost its contact with the curl, as must occur at the front and rear of the brim with the shoe described in the said patent.

Our invention obviates such defect in the operation of the shoe and hook by substituting therefor a pair of gages, one of which is pressed toward the other, so that they are adapted to clamp the hat-curl with equal efficiency at either the side or front of the brim.

In our construction we do not dispense with the cam, templet, or former, but retain it to vibrate the paring-tool approximately in the desired path, and we combine with the tool inner and outer gages adapted to clamp the hat-curl elastically upon its inner and outer sides, so as to enable the curl to move the knife exactly in the desired curve.

The first part of our improvement, therefore, consists in the combination, with a rotating clamp and a carriage vibrated by a connection thereto, as by a cam on the spindle of the hat-clamp, of a gage-holder mounted movably upon said carriage, and provided with a paring-knife, and means for clamping the hat-brim curl so that the gage-holder and knife may be vibrated by the curl independently of the vibrating carriage. By this mechanism we can pare hats of slightly different curve without changing the cam which vibrates the carriage, and yet secure a bodily movement of the tool-carrier which will approximate so nearly to the true curve, that the hat-felt itself will be required to vibrate the carrier very little. This improvement makes the guiding of the tool by the curl itself practicable, while in the said Reid's patent the shoe M is compelled to effect all the

movement required of the tool-carrier, and would severely strain a hat having only a semi-stiff curl.

In our combination the knife and gage-holder are mounted movably upon the carriage to which the positive vibrating movement is imparted, and, being thus moved very nearly in the desired path by its support upon such carriage, very little strain is imposed upon the curl in shifting the gage and its holder upon the carriage, to conform their movement exactly to the required curve.

The invention also consists in a swiveled holder for the knife, a tool-carrier for moving such holder, a supporter to which the carrier is pivoted, a gage-holder mounted to move freely under the influence of the gage, a carriage moved in unison with the gage-holder by separate mechanical means, as a cam, an adjusting mechanism movably fitted to the vibrating carriage, and a pivotal connection between the adjuster and the gage-holder whereby the latter may be adapted to movements differing from those automatically imparted to the carriage by the cam.

It also consists in means for vibrating the knife in relation to the bottom of the curl so as to vary the depth of the finished curl, and in certain means for rotating the gage so as to present a channel of variable depth or width, or both, to a curl of corresponding form.

The inner gage is called a "guard" herein, to conveniently distinguish it from the outer gage, and because it exercises the function of protecting the felt from the knife-point.

In the drawings, Figure 1 is a side elevation of a machine provided with these improvements. Fig. 2 is a plan of the same. Fig. 3 is a side view enlarged of the hat-clamp and spindle, the driving-shaft and the carriage, adjuster, gage-holder, knife-holder, tool-carrier, and the supporter for the latter detached from the frame of the machine. Fig. 4 is a plan of a hat with the gage-holder, the gage and the tool-holder, the tool being represented in contact with the curl at the front of the hat. Fig. 5 is a similar view with the tool represented in contact with one of the quarters of the hat-brim. Fig. 6 is a central vertical section of all the operative parts except the ones cylindrically shaded and the hand-crank. Fig. 7 is a transverse section on line $x x$ in Fig. 6 with tool-holder turned up. 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 guard inserted in the curl. Fig. 11 is a detached view of the adjustable weight g .

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 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 guard 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 thus serves to carry both the knife and the outer gage or guard, b , and is pivoted to the gage-holder e' at d' , so as to participate in every movement of the 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 c , its holder a^2 , and guard b elastically away from the hat-clamp.

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, J, 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 pivot g , when 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'. The pivoting of the gage-holder upon the carriage thus compensates for any difference in the shape of the hat and

the cam D' , and entirely obviates the strain that would be thrown upon the curl were it grasped by mechanism having a positive elliptic movement independent of the hat.

5 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 thus be held from contact with the brim.

15 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 in Figs. 4 and 5 in two distinct relations to the hat, and serve to incline the edge of the paring-knife in the direction of the elliptic curve usually formed by the hat-curl. 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.

30 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 guard 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 guard 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 guard 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 guard, 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.

60 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.

65 The guard 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 guard elastically into a varying curl it 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 guard 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 points at each side of the notch.

With the construction described the operator locks the carriage in an inoperative 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 guard 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 guard into the curl and protects the felt from the knife-point 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.

Beside the motion required to guide the knife in an elliptic path about the hat-brim the tool requires a vibration relative to the bottom of the gage-channel e to pare a curl of varying depth, 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. The adjuster K is intended to set the pivot g (upon which the gage-holder is movable) to and from the hat-clamp to suit different sizes of hats; and the only function of the vibrating carriage is to move the pivot g approximately in unison—that is, at the same time for the same distance—with gage e^5 , so that the gage-holder and all its attachments carrying the knife may be tipped as little as possible from their normal position shown in Figs. 3 and 6 when the gage is vibrated by the hat-brim.

The pivoting of the gage-holder upon the carriage compensates, however, for any dif-

ference in the shape of the hat and cam D', and entirely obviates the strain that is thrown upon the curl when it is grasped and trimmed by mechanism having a positive elliptic movement relative to the hat. The vibrating movement imparted to the pivot by the cam and carriage I also serves to diminish the tipping of the gage-holder and the friction of its movement on the pivot. At g' in Figs. 1, 2, and 3 is shown a weighted arm attached to the pivot g , and operating through the gage-holder to press the gage e toward the hat-brim, and to keep the gage firmly in contact with the curl during the paring operation. To prevent such weight from tipping the gage-holder too far, as when the slide I is retracted, the lugs n , formed upon the adjuster on the pivot g , are flattened, and fitted to corresponding surfaces upon the holder e' , as shown in Figs. 3 and 7. The lugs n thus serve as stops to check the tipping of the gage-holder toward the hat when the entire paring mechanism is retraced to change the hat from the block. The weight g' may be fitted adjustably upon its arm to vary the pressure of the gage upon the hat-brim in proportion to the stiffness of the curl, or the arm may be slotted, as shown at m , in Figs. 7 and 11, so as to move the weight to and from the pivot for the same purpose, the pivot-bolt serving to clamp it when adjusted.

It is obvious that a spring could be applied to the holder e' to produce the same effects as the weight g' , and we do not therefore limit ourselves to the precise construction herein shown. The vibrating movement imparted to the pivot by the cam and carriage I also serves to diminish the tipping of the gage-holder and the friction of its movement on the pivot.

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 hats of average size, and would be just equal in 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 requires, 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 . To prevent the cutting of the under brim by the knife-point, and to sustain the extreme edge of the curl more effectively while paring the same, the guard may be made to oscillate vertically, and to thus press firmly upon the upper side of the hollow within the curl. This movement is effected by forming a stop, i , upon the head a^2 , as shown in Fig. 6, or upon the shank of the knife, as shown in Fig. 8, and providing a seat, l , upon the upper side of the

disk e^5 parallel with the upper edge of the channel e . The guard, being attached to the knife-holder, is thus held at a uniform distance from the upper edge of the channel, and operates to sustain the edge of the curl against it and to hold the knife as far as possible from the under brim. The gear e^2 is called a "tipping-gear" in the claims, to distinguish it from the gear e^3 , which is fitted to slide upon a feather, f , upon the shaft F.

We hereby disclaim the subject-matter of the fifth claim of United States Patent No. 301,278, showing a tool-carrier moved by a non-elastic hook, and a shoe fixed upon such carrier, restricting our invention to the combination, with such a tool-carrier, of a pair of elastic gages clamped upon the hat-curl, and a positive mechanism for vibrating the said tool-carrier approximately in the desired path. By forming the rotary grooved gage to fit one side only of the hat-brim, and rotating it twice during the paring operation, we greatly simplify the formation of the varying channel in the edge of the gage-disk e^5 , and as both sides of the hat are alike secure the desired result of fitting and sustaining the curl while paring.

Having thus set forth the nature of our invention, what we claim herein is—

1. The combination, with a rotating hat-clamp, of a carriage vibrated by positive mechanism connected with the hat-clamp, a tool-holder mounted upon said carriage and independently movable thereon, and a paring-tool mounted upon said holder with inner and outer gages fitted to the inner and outer sides of the curl, and operated thereby to guide the paring-tool in the required path about the hat, substantially as set forth.

2. The combination, with a rotating hat-clamp, of a carriage vibrated by positive mechanism connected with the hat-clamp, an arm pivoted upon the vibrating carriage with its free end adjacent to the hat-brim curl, and a paring-tool mounted upon the pivoted arm, with inner and outer gages arranged at the inner and outer sides of the tool, and constructed to clamp the hat-curl elastically and to vibrate the arm upon its pivot, substantially as and for the purpose set forth.

3. The combination, with the rotating hat-clamp B, of the carriage I and cam D', the vibrating gage-holder e , pivoted on the carriage, the gage e , grooved to fit the hat-curl and operating to vibrate the holder by contact therewith, and the paring-knife hinged to a supporter, d , upon the holder e , and provided with an elastic knife-guard, b , fitted within the curl of the hat, substantially as herein set forth.

4. In combination with the rotating hat-clamp and a vibrating holder to support the tool-carrier, the means for inserting the knife-guard inside the curl, which consists in the tool-carrier having the knife a and hook-guard b at one end, and formed with a handle, c , at the other end, and hinged or pivoted upon the holder at a point above the paring-

tool, so as to withdraw the guard from the hat-curl by a movement toward the hat-crown when actuated by the handle, and a spring, as c' , for pressing the guard into the curl when in operation, substantially as herein set forth.

5 5. The mechanism for inserting the knife-guard inside the curl, consisting in the combination, with a vibrating gage-holder, of a supporter hinged upon the gage-holder, as described, and the tool-carrier having the knife and hook-guard at one end, and formed with a handle at the other end, and hinged or pivoted upon the free end of the supporter, the whole arranged and operated for inserting the knife-guard inside the curl and removing the same therefrom, substantially as herein described.

6. The construction for vibrating the knife in relation to the curl, consisting in the rotary gage grooved to fit the hat-curl, the pivoted carrier sustaining the knife, a shank connected with the knife, and a spring or weight for pressing the shank against the rotary gage during the paring operation.

25 7. The combination, with the rotating hat-clamp, of the cam D' , and the vibrating carriage I, the gage-holder e' , pivoted to the carriage I, the gage e^5 , rotated by the shaft e^4 upon the gage-holder, the tool-holder a^2 , mounted by a sleeve, a' , in a socket in the lever c , pivoted upon the gage-holder, the tool-holder being provided with a slotted arm, a^3 , and the crank-pin a^4 , fitted to the slotted arm and attached to the rotating gage.

35 8. The combination, with a rotating hat-clamp, of the cam D' , the carriage I, and the pivoted gage-holder e' , provided with inner and outer gages, and a paring-knife, and being vibrated by the hat-curl independently of the carriage, a weight or spring operated to press the carriage toward the hat-clamp, a catch for holding the carriage away from the hat-clamp, and stops, as n , combined with the carriage and gage-holder to prevent the tipping of the holder toward the hat when the carriage is retracted.

50 9. The combination, with a rotating hat-clamp, of the cam D' , the carriage I, the adjuster K, held movably upon said carriage, and provided with the pivot g , and the gage-holder pivoted upon the said pivot, and provided

with a paring-tool and inner and outer gages for clamping the brim of the hat, as and for the purpose set forth.

10. The combination, with the hat-clamp 55 B, its spindle D, and the driving-shaft E, geared thereto at right angles, of the carriage I, the gage-holder e' , provided with the paring-tool and the tipping-gear e^2 , and pivoted to the adjuster at the intersection of the tipping and sliding gears, and the gage rotated by connection with the tipping-gear, substantially as and for the purpose set forth.

11. The combination, with a pivoted gage-holder, of an outer gage, and a knife-carrier 65 mounted upon the gage-holder so as to vibrate therewith, and a guard, b , elastically attached to the knife carrier or holder, and adapted to press inside the curl adjacent to the knife-point, and to protect the knife-point and to press the hat-curl against the outer gage, substantially as herein set forth.

12. The combination, with the paring-knife, of an elastic guard adapted to press inside the hat curl, as described, and formed with a central aperture for the point of the knife, as and for the purpose set forth.

13. The combination, with a rotating hat-clamp, of a rotary gage having a channel of variable height to fit the hat-curl, a paring-knife provided with a stop fitted to rest on the upper edge of the gage, and a seat formed for the stop on the gage and adapted to adjust the knife automatically to the height of the curl.

14. The combination, with a rotating hat-clamp, of a vibrating gage-holder having a paring-tool mounted thereon, with a rotating gage having a channel formed in its edge of the same length as the semi-circumference of the hat, and adapted to exactly fit one-half of the hat-brim, and means for rotating such gage twice for each rotation of the hat, as and for the purpose set forth.

In testimony whereof we have hereunto set 95 our hands in the presence of two subscribing witnesses.

EDMUND TWEEDY.
GEORGE YULE.

Witnesses:

THOMAS E. TWEEDY,
THOS. S. CRANE.