

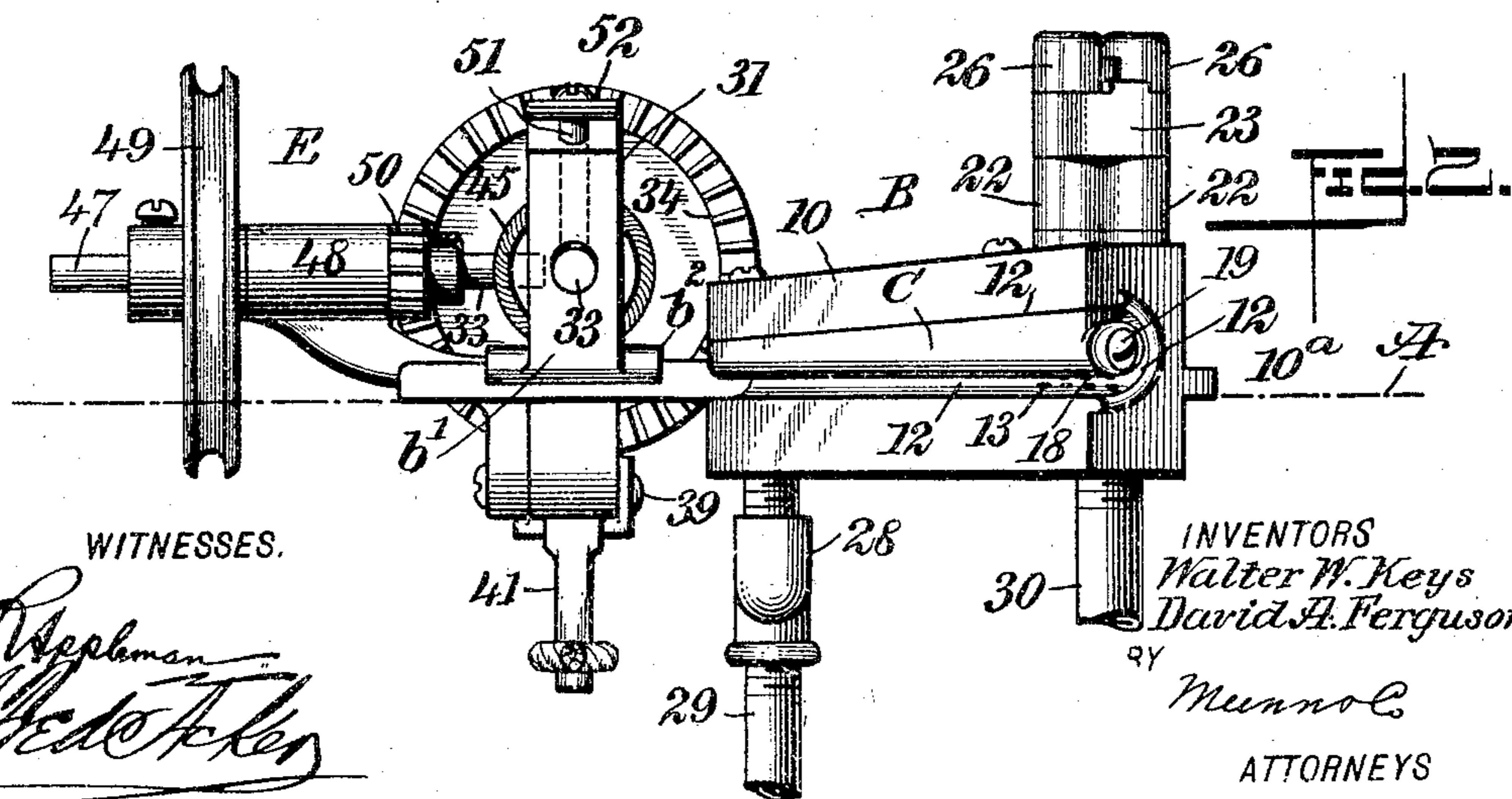
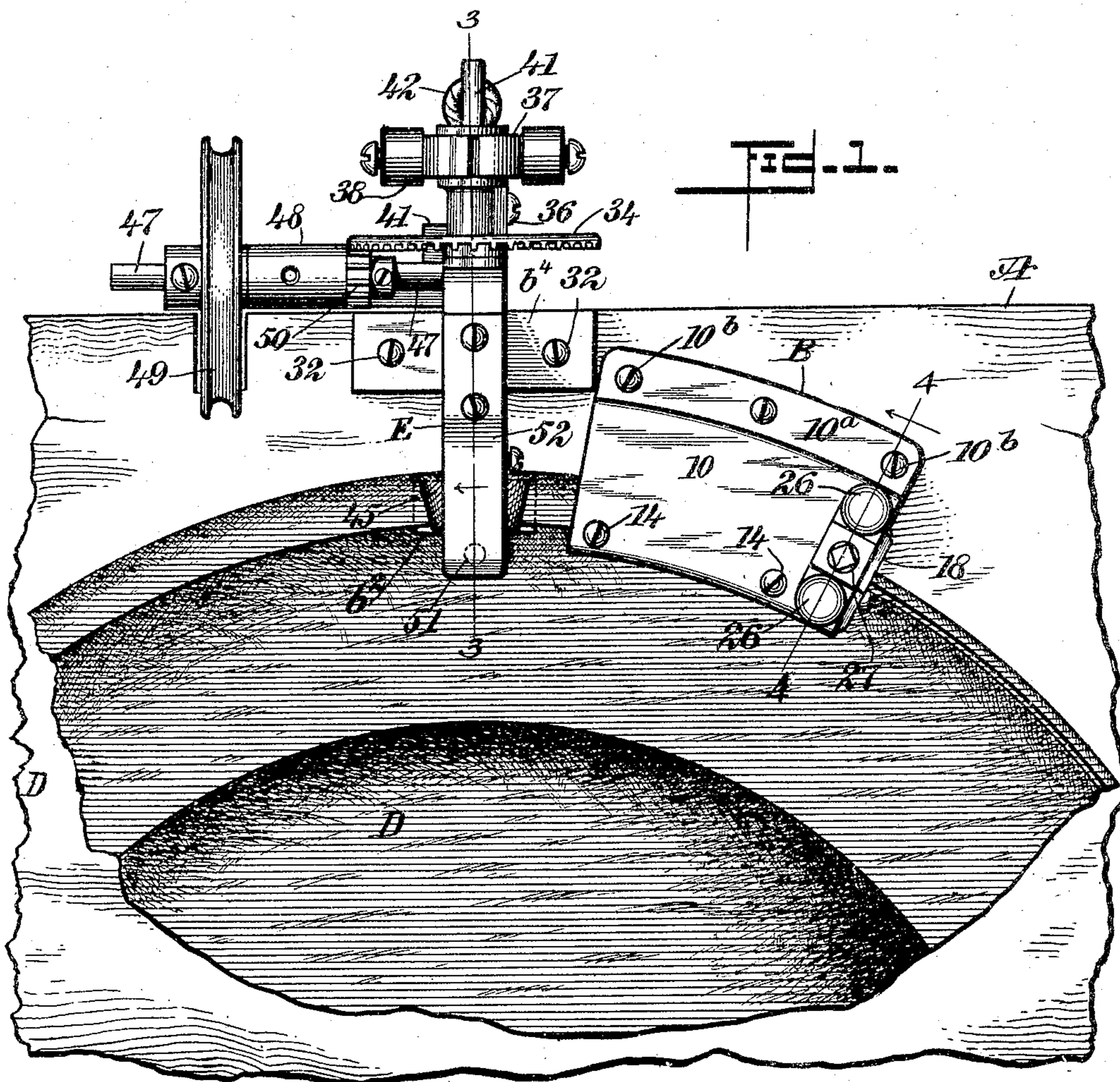
No. 793,590.

PATENTED JUNE 27, 1905.

W. W. KEYS & D. A. FERGUSON.  
MACHINE FOR CURLING HAT BRIMS.

APPLICATION FILED JAN. 28, 1904. RENEWED JUNE 6, 1905.

2 SHEETS—SHEET 1.



**WITNESSES.**

*W. R. Appleman*  
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INVENTORS  
Walter W. Keys  
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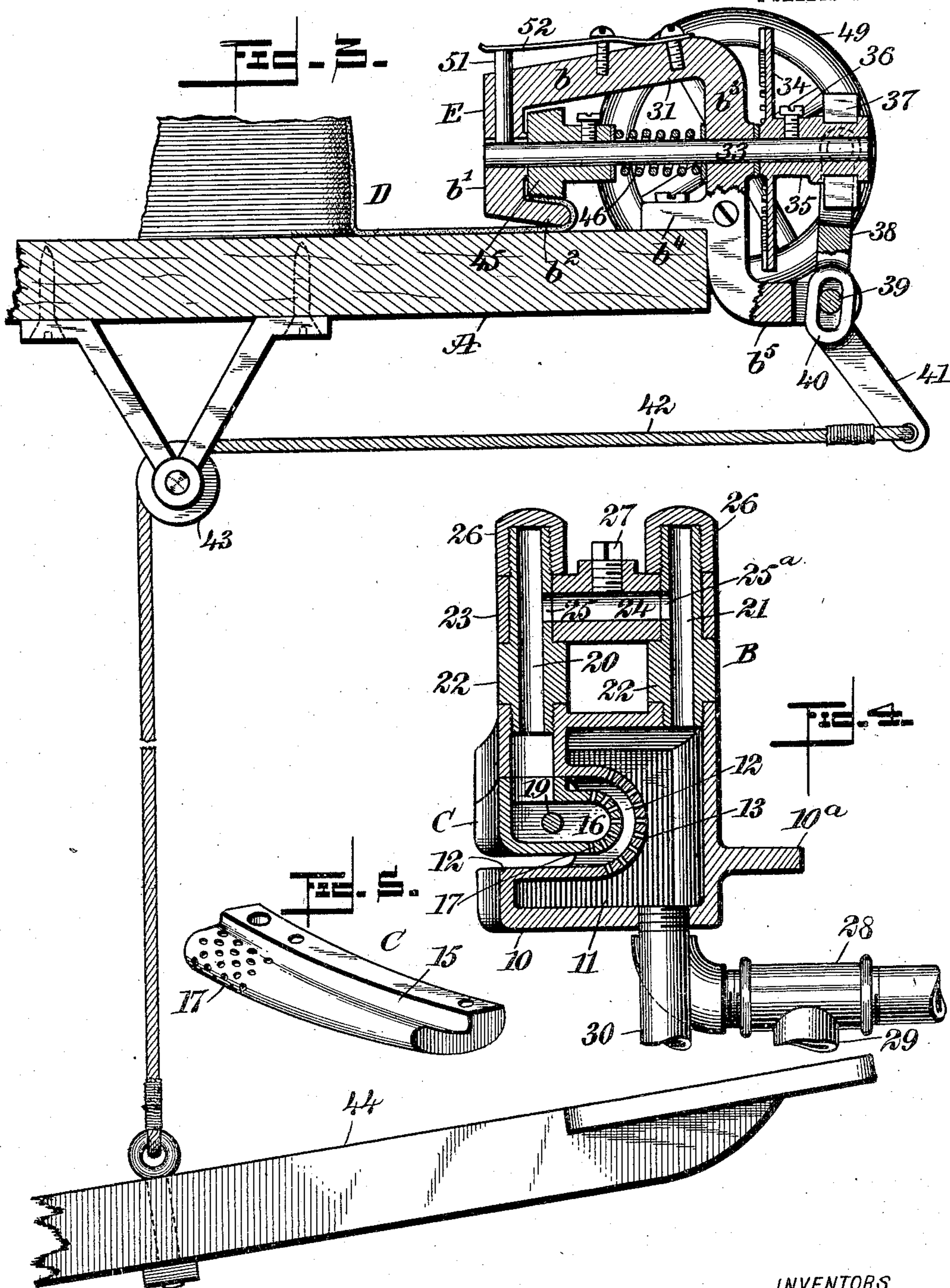
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# UNITED STATES PATENT OFFICE.

WALTER W. KEYS AND DAVID A. FERGUSON, OF YONKERS, NEW YORK.

## MACHINE FOR CURLING HAT-BRIMS.

SPECIFICATION forming part of Letters Patent No. 793,590, dated June 27, 1905.

Application filed January 28, 1904. Renewed June 6, 1905. Serial No. 264,013.

*To all whom it may concern:*

Be it known that we, WALTER W. KEYS and DAVID A. FERGUSON, citizens of the United States, and residents of Yonkers, in the county of Westchester and State of New York, have invented a new and Improved Machine for Curling Hat-Brims, of which the following is a full, clear, and exact description.

The purpose of our invention is to provide a simple, durable, and economic device for curling hat-brims by steam and to so construct a feed device for the curling-shackle that it retains the curl in the brim and may be released at any time from action on the brim, permitting the ready withdrawal of the brim from the curling-shackle, and, furthermore, to so construct the curling-shackle that the steam will be equally distributed at the top and bottom of the curl in the brim which is produced by the shackle.

Another purpose of the invention is to provide a feeding device and a curling-shackle which may be closely associated and which will act to feed the brim to the shackle and retain the curl produced by the shackle without any detrimental action on the curled portion of the brim.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the device applied to a table, illustrating a hat in process of having its brim curled. Fig. 2 is a front elevation of the two parts constituting the complete device. Fig. 3 is a vertical section, on an enlarged scale, taken practically on the line 3 3 of Fig. 1. Fig. 4 is a vertical section, also on an enlarged scale, taken practically on the line 4 4 of Fig. 1, the section being taken through the curling-shackle; and Fig. 5 is a detail perspective view of the curling member of the shackle removed therefrom.

A represents a table; B, a curling-shackle for a hat D; C, the curling-iron in the shackle,

and E represents a feed for the brim of the hat. The body 10 of the curling-shackle is provided with a flange 10<sup>a</sup>, by means of which it is secured to the table A through the medium of screws 10<sup>b</sup> or their equivalents. The body 10 of the curling-shackle is provided with a chamber 11, extending from end to end, which chamber is closed on all sides except where connections are made, to be hereinafter described. The body 10 of the curling-shackle at what may be termed its "forward longitudinal edge" is provided with an outer chamber 12, and the forward edge of the said body 10 is more or less concaved. The exterior chamber 12, which is open at the front and at each end, is oval in cross-section, longitudinally curved and longitudinally tapering, being larger at one end than at the other, and at the larger end of the outer chamber 12 apertures 13 are made in the back wall, as is best shown in Fig. 4.

Within the outer chamber 12 of the body of the curling-shackle the curling-iron C is located. (Shown in detail in Fig. 5.) This iron C is given a corresponding curvature and taper to those of the outer chamber 12 and is snugly fitted to the outer upper portion of said chamber, being secured in position by screws 14 or like devices.

The curling-iron C is preferably hollow, so that it may be quickly heated, and is provided with an undercut shoulder 15 at its upper forward portion, which shoulder faces the inner or apertured wall of the outer chamber 12 in the said body 10 of the curling-shackle. The groove formed by the said shoulder 15 is deepest at the narrower end of the said curling-iron, and the inner edge of the curling-iron, or that which faces the inner wall of the outer chamber 12 of the curling-shackle, is more or less curved, the curvature of the inner edge of the curling-iron corresponding, though in a less degree, to the curvature of the said rear wall of the outer chamber 12, as is also shown in Fig. 4, and when the curling-iron C is in position in the said outer chamber 12 of the curling-shackle a space intervenes between the said curling-iron from the shoulder 15 to the lower outer edge of the curling-

iron and the corresponding portions of the chamber 12, which space is sufficient to admit of the introduction of the brim of the hat.

The curling-iron C is permanently closed at its smaller end and is open at its wider end, and adjacent to the wider end of the said curling-iron C a partition 16 is formed, thus producing a chamber at the said wider end of the curling-iron, and the inner curved edge portion of the curling-iron at the said chamber therein is provided with series of apertures 17, so that the said apertures 17 in the curling-iron are opposite the apertures 13 in the inner wall of the outer chamber 12 of the body of the curling-shackle. The open wider end of the curling-iron C is normally closed by means of a plate 18, and this plate is held in position by means of a screw 19, passed through the plate and into the partition 16, as is shown in Fig. 4.

Two pipes 20 and 21 are located at that end of the body at which the wider portion of the outer chamber 12 occurs. One of these pipes (the pipe 20) leads into the apertured chamber in the curling-iron C, while the other pipe 21 leads into the main chamber 11 of the body of the shackle, as is shown in Fig. 4. Each pipe is preferably provided with an exteriorly-enlarged lower section 22, forming upper and lower shoulders, the lower shoulders resting upon the upper face of the body 10 of the shackle, while the upper shoulders constitute bearings for a cross-head 23, having a bore 24 at its central portion, which bore has communication through openings 25 and 25<sup>a</sup>, produced in the pipes 20 and 21, with the interior of said pipes or tubes, and preferably the upper ends of the pipes or tubes 20 and 21 are threaded to receive cap-nuts 26, which have bearing on the cross-head or yoke 23, holding it in place, and a screw-plug 27 is located in the said cross-head, communicating with the bore 24, so as to relieve the chamber formed in the cross-head and the other chambers of the shackle from undue pressure when desired. A pipe 28, connected with any source of steam-supply, is also connected with the main chamber 11 in the body of the shackle, ordinarily at its bottom portion, and a pipe 29 is connected with the steam-pipe 28, which pipe 29 is an air-pipe and supplies air to the steam before it enters the chamber 11 to promote the circulation and to rarefy the steam. Furthermore, the main chamber 11 of the body of the shackle is provided with a drip or exhaust pipe 30, through which the products of condensation pass.

It will be observed that the steam mixed with air enters the main chamber 11 and then passes up through the pipe 21, from thence to the pipe 20 through the bore in the yoke or cross-head 23, and then down into the apertured chamber at the wider end of the curl-

ing-iron C. Thus it will be observed that the curling-iron is heated throughout its length, and when the brim of a hat is introduced into the space between the curling-iron and the body of the curling-shackle B the brim is gradually curled, and the steam when the curl is being fixed impinges upon both the inside and the outside of the brim at its curled section by reason of the steam escaping through the apertures in the curling-iron and the apertures in the inner wall of the outer chamber 12 of the curling-shackle.

The feed device E is of simple construction, and its frame 31 consists of an upper member *b* and an inner downwardly-extending vertical member *b'*, terminating in a downwardly and outwardly inclined anvil block or bearing *b''*, which when the feed device is attached to the table A is slightly above the upper face of the table at its lower end, as is shown in Fig. 3. In the further construction of the frame 31 of the feed device a rear downwardly-extending member *b'''* is formed, integral with which a horizontal plate *b<sup>4</sup>* is formed, or said plate is attached to the member *b'''*, and this plate is adapted to rest upon the top of the table A, being secured in position by screws 32 or their equivalents, and in the final main construction of the said frame 31 a foot-piece *b<sup>5</sup>* is formed at the bottom of the member *b'''*, which foot *b<sup>5</sup>* extends horizontally outward and is bifurcated at its outer end, as is also shown in Fig. 3. A shaft 33 is journaled in the outer member *b'''* and the inner member *b'* of the said frame, and near the outer end of the shaft 33 a gear 34 is secured, preferably having teeth upon its inner face, and the hub 35 of this gear is secured to the shaft 33 by a set-screw 36 or the like. A clamp 37 is loosely placed in a recess on the outer end of the hub 35 of the said gear 34, and the upper end of a shifting arm 38 engages with this clamp, the lower portion of the said shifting arm 38 being made to enter the bifurcated portion of the member *b<sup>5</sup>* of the frame 31, where the said shifting arm is formed into a loop 40, through which a pivot-pin 39 is passed into the members of the bifurcated portion of the said part *b<sup>5</sup>* of the frame 31, and at the lower end of the shifting arm 38 a downwardly and outwardly extending branch member 41 is formed or is attached, and a rope, chain, or cable 42 is attached to this lower member 41 of the shifting arm, the rope, chain, or cable being passed over a pulley 43, for example, supported from the table A, and is carried down to a connection with a foot-treadle 44.

A feed-wheel 45 is located above the anvil block or bearing *b''*, which wheel is more or less conical and is provided with a roughened peripheral surface, the hub of the said wheel being secured to the shaft 33 in any suitable or approved manner, and a spring 46 is coiled around the shaft 33, having bearing against

the hub of the wheel 45 and against the outer vertical member  $b^3$  of the frame 31, so that when the treadle 44 is pressed downward the feed-wheel 45 is carried from over the anvil block or bearing.

The brim of the hat is passed between the anvil block or bearing  $b^2$  and the feed-wheel 45, and as the shaft 33 is revolved the brim of the hat is engaged by the two parts named and is consequently drawn through the curling-shackle, and when the hat is to be removed the shaft 33 is drawn outward in the manner described against the tension of the spring 46. This feed-wheel 45, in addition to serving as a feed, likewise tends to press and hold the formed brim in proper position.

A drive-shaft 47 is journaled in the downwardly-extending rear member  $b^3$  of the frame 31 at one side of said member, as is shown in Fig. 1, and in an arm 48, which extends from the same side of the aforesaid member  $b^3$ , as is also shown in Fig. 1, and the said drive-shaft 47 is provided with a drive-pulley 49, adapted to be belted with any source of power, and a pinion 50 is likewise secured to the drive-shaft 47, the teeth of which pinion mesh with the teeth of the gear-wheel 34.

In order that the driven shaft 33, carrying the feed-wheel 45, shall revolve freely in its bearings and yet have end movement, we preferably pass a pin 51 down through the top member  $b$  of the frame into the inner vertical member  $b'$  to a bearing upon the shaft 33, and this pin 51 is in engagement with the free end of a spring 52, which at its other end is secured in any suitable or approved manner upon the upper portion of the aforesaid frame 31. The feed device E is placed quite near the delivery or contracted end of the curling-iron forming a portion of the curling-shackle B.

It may be here remarked that the application of steam to the brim of a hat in the curling operation not only mellows the stiffening in the brim, but also produces a better curl and also obviates charring and cracking of the brim. Further, the employment of a single beveled feed-roller or one of conical shape coming in direct contact with the curl of the brim in connection with the anvil block or shoe  $b^2$  avoids all possible dragging action on any one point of the curl, and the said feeding device also serves to retain the curled portion of the brim in its proper shape after it has left the curling-shackle, and it is possible to instantly release the hat from the feed device at any time, and at such time the brim of the hat can be quickly withdrawn from the curling-shackle without injury to the curl of the brim. It may be furthermore stated that when gas is employed as a heating agent, which is almost universally the custom, an uncertain degree of dry heat is obtained, whereas when steam is used, and particularly when

the steam is applied as described, a moist and uniform heat is obtained, which acts with the best possible results upon the material to be treated.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A curling-shackle for hat-brims, a steam-feed connected therewith, and an air-pipe connected with the steam-feed, substantially as described.

2. A curling-shackle for hat-brims, a steam-feed connected therewith, a discharge for condensation from the shackle and an air-supply connected with the steam-feed, as set forth.

3. The combination of a curling-shackle for hat-brims, and a feed device provided with a feed-wheel, an adjacent bearing, and means for moving the feed-wheel relative to the bearing, the brim of the hat being received between the said wheel and the said bearing, as set forth.

4. The combination of a curling-shackle for hat-brims and a feed device adjacent to one end of the curling-shackle, which feed device comprises a frame having an inclined anvil block or shoe, a beveled feed-wheel above the said block or shoe, means for moving the wheel from over the block or shoe, and a driving means for the feed-wheel, as described.

5. In a device for curling the brims of hats, a frame having an anvil block or shoe, a shaft mounted to slide and turn in said frame, a feed-wheel on the shaft, means for sliding the shaft, and means for revolving said shaft, as set forth.

6. In a device for curling the brims of hats, a curling-shackle comprising a body having a chamber therein, extending practically from end to end, and an outer segmental chamber longitudinally tapering and in communication with the inner chamber of the body, a steam and air supply for the said inner chamber, and a drip-outlet therefrom, a curling-iron of less dimensions than the outer chamber of the body and corresponding in contour thereto, the said curling-iron being suspended in the said outer chamber and provided with a partition at one end forming a chamber at such end, and apertures connecting the chamber of the curling-iron with the outer chamber of the body of the shackle, the said curling-iron being provided with an undercut shoulder at the upper portion of the edge which faces the inner wall of the outer chamber of the body, and a tubular connection between the chamber of the body and the partitioned end of the said curling-iron, as described.

7. In a device for curling hat-brims, a body provided with a main chamber and an outer chamber oval in cross-section and longitudinally tapering and curved, the rear wall of the outer chamber at the wider end thereof being provided with apertures communicating

with the main chamber of the body, a curling-  
iron of substantially the same shape as the  
said outer chamber and provided at its wider  
end with apertures communicating with the  
5 said outer chamber, tubular connections be-  
tween the main chamber of the body and the  
apertured portion of the curling-iron, an  
undercut shoulder extending longitudinally  
along the upper face of the inner portion of  
10 the said curling-iron, being deepest at the nar-  
rower end of the said iron, a steam-supply for  
the main chamber of the body, and an offtake  
from said chamber, as set forth.

8. In devices for curling hat-brims, a feed  
15 mechanism comprising a frame having a shoe  
or anvil block at one end, which shoe or anvil  
block is downwardly inclined, a revoluble and  
sliding shaft located above the anvil block or

shoe, being journaled in the said frame, a con-  
ical exteriorly-roughened feed-wheel carried 2  
by the shaft and normally located over the  
anvil block or shoe, a spring located between  
the said feed-wheel and frame and coiled  
around the said shaft, a driving mechanism 2  
for the said shaft, and a shifting device con-  
nected with the shaft, whereby to impart end  
movement thereto when desired, as described.

In testimony whereof we have signed our  
names to this specification in the presence of  
two subscribing witnesses.

WALTER W. KEYS.  
DAVID A. FERGUSON.

Witnesses:

FRANK W. KEYS,  
JAS. P. SANDERS.