

W. DEMUTH.

MACHINE FOR CURLING HAT BRIMS.

No. 301,693.

Patented July 8, 1884.

Fig. 1

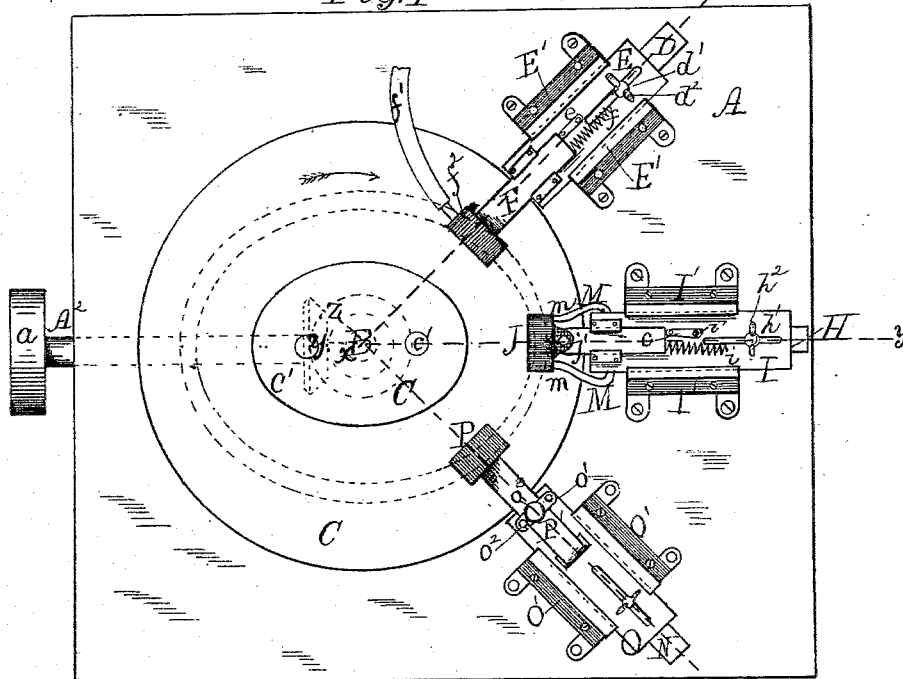
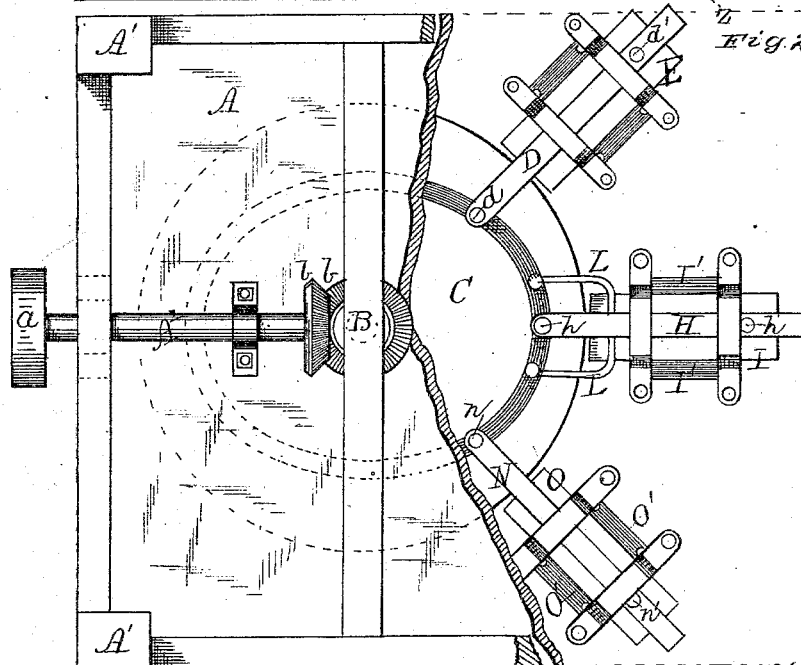


Fig. 2



WITNESSES:

J. C. Turner  
J. S. Barker

INVENTOR:

William Demuth  
by Doubleday & Blair  
attys

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Fig. 3

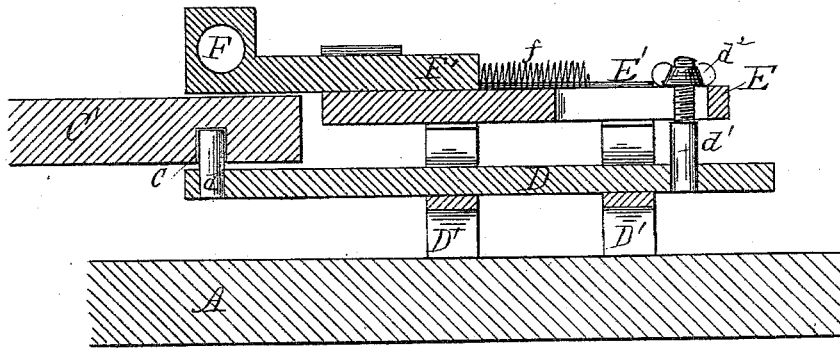


Fig. 4

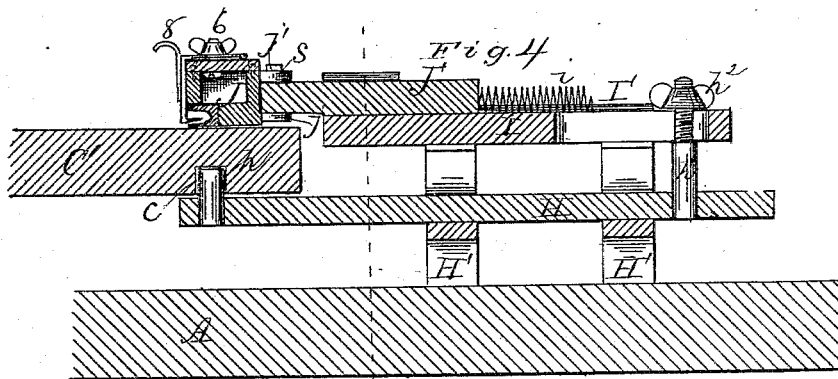
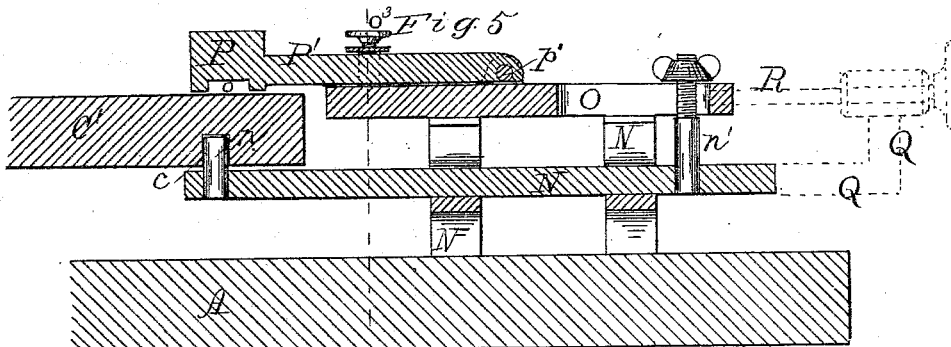


Fig. 5



WITNESSES:

J. C. Turner  
J. S. Barker

INVENTOR:

William Demuth  
by Doubleday & Bliss  
attys

(No Model.)

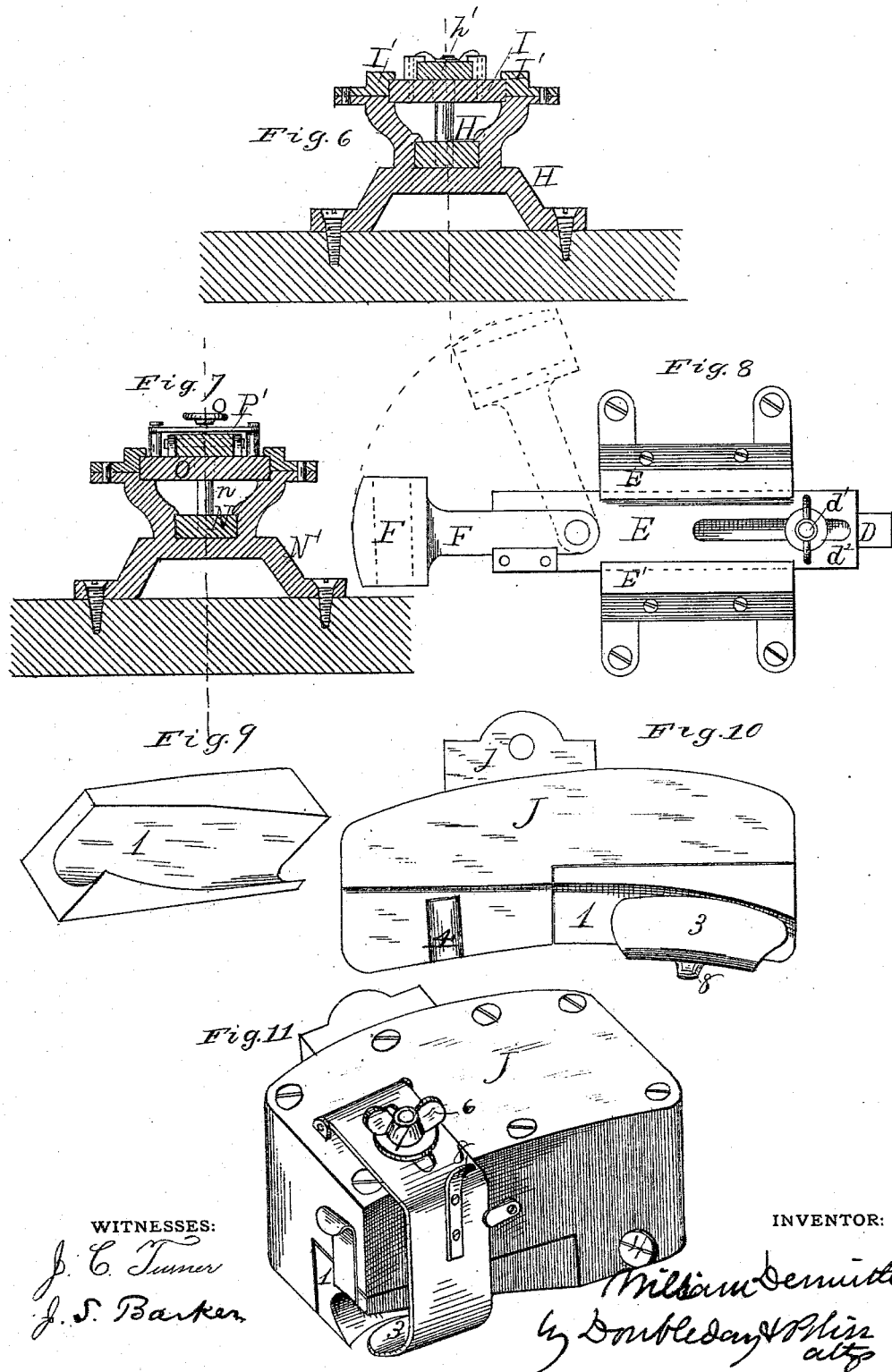
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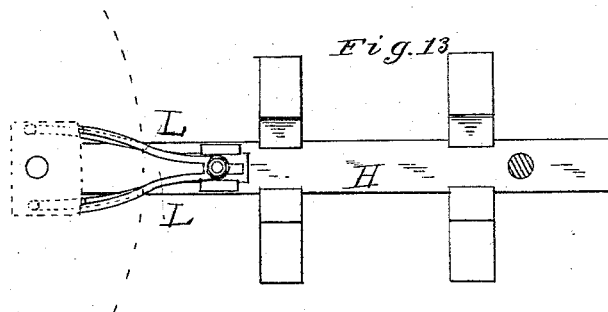
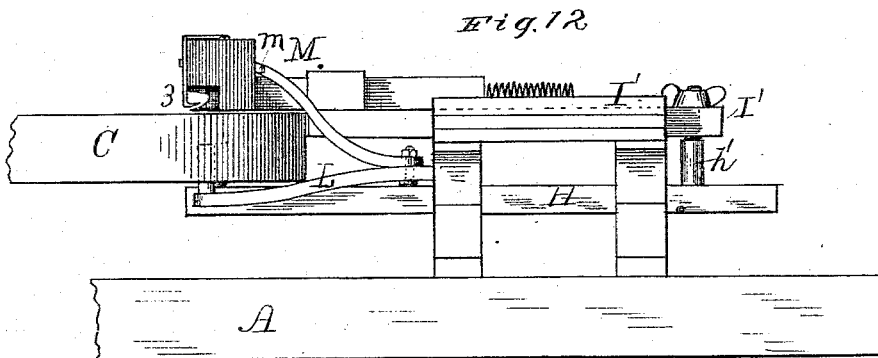
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by Doubleday & Co.  
attys

# UNITED STATES PATENT OFFICE.

WILLIAM DEMUTH, OF ELIZABETH, NEW JERSEY.

## MACHINE FOR CURLING HAT-BRIMS.

SPECIFICATION forming part of Letters Patent No. 301,693, dated July 8, 1884.

Application filed August 25, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM DEMUTH, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Machines for Curling Hat-Brims, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a top or plan view of my invention. Fig. 2 is a bottom view. Fig. 3 is a vertical section on line *xx*, Fig. 1. Fig. 4 is a vertical section on line *yy*, Fig. 1. Fig. 5 is a vertical section on line *zz*, Fig. 1. Figs. 6, 7, and 8 are detached views, showing the construction of the carriers and their supports. Figs. 9, 10, 11 are detached views of the curling-tool. Figs. 12, 13 are detached views of devices which assist in controlling the movement of the curling-tool.

A is the bed-plate, supported on legs A' A'.

B is a vertical shaft rotated by bevel-gears *b b* and shaft A<sup>2</sup>, carrying a pulley, *a*, at its outer end. This pulley is mounted loosely on the shaft, and connected therewith by means of a sliding clutch and a shifting-lever, the clutch being held out of engagement by a spring, except when forcibly held in engagement by means of a foot-lever; but as the clutch, the lever, and the spring may be of any usual or approved construction and arrangement which shall be adapted for the purpose, they need not be specifically described.

C is a metal plate provided on its under surface with a cam-groove of the form corresponding to the outer edge of the brim of the hat when finished.

C' is a hat-supporting block, secured centrally to the upper surface of plate C by one or more pins entering holes *c'* in the hat-block, it being of course understood that a number of different-sized blocks may be used, in order to fit accurately the inner surfaces of different-sized hats, so as to insure that they shall be rotated by the plate and block without slipping thereon.

D is a sliding bar mounted in suitable supports below the plane of the lower face of ro-

tating plate C, and carrying at its inner end an upwardly-projecting spur, *d*, provided, by preference, with an anti-friction roller, which traverses the cam-groove *c*.

*d'* is a screw-threaded standard projecting upwardly from the outer end of sliding bar D, and passing through a slot in a carrier, E, which is fitted to slide in suitable supports toward and from the rotating plate.

*d''* is a clamping thumb-nut, by means of which the sliding bar and carrier E may be clamped to each other, the bolt *d'* being preferably constructed with a wide shoulder, between which and the nut the carrier may be gripped. In practice I prefer to make this carrier dovetailed in cross-section and mount it in corresponding ways, E' E'.

F is a heater provided with a laterally-extending arm, F', which is supported in suitable ways upon the upper surface of the carrier.

*f* is a spiral spring attached at one end to the heater-arm F', and at its opposite end to a stud or eye projecting from the upper surface of the carrier; the tension of the spring acting to draw the heater and its supporting-arm outward—that is, away from the rotating plate.

*e* is a cam pivoted to the upper surface of the carrier E, and acting to thrust the heater and its supporting-arm inward toward the rotating plate, thus increasing the tension of the spring *f*.

*f'* is a flexible gas-tubing, connected at one end to a gas-pipe, *f''*, and at its opposite end to a burner arranged inside the heater, but not shown, any usual construction of burners or other contrivances being employed for that purpose.

From an examination of the drawings it will be understood that when the parts are in the position shown and the plate C is rotated the carrier E and its attached heater will slide toward and from the hat-block in a path corresponding to the shape of the hat-rim, and in direct contact therewith, the plate being moved in the direction indicated by the arrow, Fig. 1, so that the rim of the hat will be warmed, and thereby rendered soft and pliable, so as

to obviate all liability of fracture or other injury when the brim is being curled by a device which I will now proceed to describe.

H is a second sliding bar, mounted in suitable supports attached to the bed-plate, and carrying at its inner end an upwardly-projecting stud, and preferably an anti-friction roller,  $h$ , which traverses the cam-groove  $c$ .

$h'$  is a screw-threaded bolt or a stud projecting upwardly from the outer end of the sliding bar H through a slot in a carrier, I, which is by preference dovetail shape in cross-section, and supported in ways  $I'I'$ , so as to travel with sliding bar H, to which it may be clamped by means of a thumb-nut,  $h''$ , the bolt or stud  $h'$  being by preference constructed with a shoulder,  $h'''$ , between which and the thumb-nut the carrier can be gripped.

J represents the shell, body, or case of a curling-tool, provided upon its outer face with two lugs or ears,  $j j$ , which engage with the upper and lower faces of a supporting-bar,  $J'$ , to which the body J is pivoted by a pin,  $j'$ . Supporting-arm  $J'$  is mounted on the upper face of carrier I in such manner that it can slide therefrom toward and from the rotating plate.

$i$  is a spiral spring, connected at one end to the supporting-arm  $J'$  and at its opposite end to an eye or stud on carrier I, the tension of the spring operating to draw the body or shell J outward, or away from the rotating plate.

$i'$  is a cam pivoted to carrier I, and connected to thrust the body or shell J inward, or toward the center of the rotating plate.

Any desired or approved construction of curling devices may be arranged within the shell or body J; but in practice I prefer to use a pick-up and abutment, 1, arranged to move up and down within the case, and to be thrust downward by means of a spiral or other spring, 2, in connection with a thumb-piece, 3, over which the brim is to be turned, and a roller, 4, to traverse the turned-over or curled portion of the brim. The thumb-piece 3 may be connected with the body by means of a bolt and thumb-nut, 6, passing through a slot in the thumb-piece; or it may be provided with a laterally-extending arm, 7, the arm 7 being hinged to the body under such an arrangement of parts that, by means of the projecting lip 8, the thumb-piece may be conveniently removed from underneath the curled-over portion of the brim. Under either construction and arrangement of parts, the thumb-piece should be first removed from underneath the curled part of the brim, after which the cam  $i'$  may be released, when the spiral spring will withdraw the body J from above the rim, and thus release it, so that the hat can be conveniently removed from the block and rotating plate.

I have found in practice that although the curling or turning-over devices thus described will operate, yet in order to produce the best results I prefer to add thereto guiding devices, which shall compel the shell or body J to swing

upon the pivot  $j'$  and conform more closely to the outline of the outer edge of the hat-brim; and for this purpose I propose to employ the following devices:

L L is a U-shaped or bent bar, carrying at its outer ends two upwardly-projecting studs, and preferably anti-friction rollers, which traverse the cam-groove  $c$ . The legs of this bar may be bent upwardly, so that its outer closed end shall be in substantially the plane of the rotating plate, or a little above it.

M M is a correspondingly-formed U-shaped bar adjustably attached at its closed end to the bar L L, and formed at its end into eyes, which are connected with lugs at  $m m$ , projecting horizontally from the outer vertical face of the body or shell J; and as the distance between the studs or anti-friction rollers is equal to the length of the body J, it will be seen that the position of this body or shell will be automatically and positively shifted about its pivot  $j'$ , to correspond with the outline of that portion of the hat-brim which is passing it, (said body.)

N is a sliding bar mounted in suitable ways or other supports, and carrying at its inner end an upwardly-projecting stud, and preferably an anti-friction roller at  $n$ , which traverses the groove  $c$  in the rotating plate.

$n'$  is a threaded stud or bolt projecting upwardly from the outer end of bar N, and passing through a carrier, O, which is also, by preference, dovetailed in shape in cross-section, and supported in correspondingly-shaped ways  $O'O'$ , so as to travel with the sliding bar N.

P is a presser, which consists of a block of metal provided on its under surface with a curved recess,  $o$ , adapted to receive and rest upon the upper surface of the turned-over or curled part of the brim, the width of the recess being such as to insure that neither its inner or outer wall shall come in contact with either the outer edge of the brim or the inner edge of the turned-over portion. The presser is provided with a horizontal supporting-arm,  $P'$ , which is hinged to the carrier O at  $p'$ ; and  $o'$  is a latch pivoted to the carrier at one end, and provided with an open slot at its opposite end, where it passes underneath the head of a button-headed stud or pin,  $o''$ , to hold the groove in firm contact with the hat-brim. When preferred, a set-screw may pass through the latch at  $o'$ , to adjust the pressure of the groove upon the hat-brim; or a spring might be interposed between the latch and the upper face of the arm or bar  $P'$  for the same purpose.

It is ordinarily desirable that the curled or turned-over portion of the brim should be wider at the sides of the hat than either in front or behind—that is, at the ends of the oval—and in order to insure this result I make the cam-groove C longer in its greater diameter in proportion to its width at its shorter diameter than is the ellipse represented by the outer edge of the hat-brim after it has been

trimmed to proper shape for curling, as is indicated by the dotted lines upon the rotating plate in Fig. 1, in which the outer ellipse represents the outline of the hat-brim, the inner ellipse representing the outline of the cam-groove in the under side of the plate.

My machine may be operated as follows: By releasing all of the thumb-screws, each of the carriers may be withdrawn to such distance as will permit the hat to be placed upon the rotating plate and block C', after which the heater is moved inward until it rests upon the upper surface of the hat-brim, near its edge, the cam *e* being in the position indicated in Fig. 1. The carrier I is next moved inward until the turning-over devices and the roller 4 are in proper position to turn over the outer edge of the rim to the desired width or extent. So, also, the presser may be placed in position to properly traverse the turned-over or curled brim, it being, of course, understood that each of the carriers shall be firmly clamped to its respective sliding bar after these adjustments have been made. When this has been done and the heater has been raised to the proper temperature, the machine may be started, and as the hat-brim passes slowly under the heater it will be sufficiently softened, so as to admit of its being turned over without being fractured or otherwise injured. As the heated portion of the brim passes the parts 1 2 3 4, the rim will be turned over, and as it continues to revolve the turned-over portion, in passing under the presser, will be not only partially cooled, but also pressed down. When desired, after one or more complete revolutions have been made, the heater and turned-over devices can be withdrawn by releasing the cams *e* & *e'*, the rotation being continued such time as shall be required in order to "set" the curl effectually.

As a modification, (shown in Fig. 8,) I propose to pivot the heater-arm F' to the carrier E, (instead of having it slide thereon,) so that it can be swung in a vertical plane to remove it from contact with the hat-brim, and with such construction I propose to employ a stationary gas-jet below the point to which the heater is thus moved. So, also, under some circumstances, I propose to use a stationary gas-jet projecting up through the carrier E, and withdraw the heater far enough so that it shall rest above the jet.

In Fig. 5 I have shown a modification of structure which I propose to apply to each of the sliding bars and carriers, in which each bar is provided at or near its outer end with a standard, Q, having a right-hand threaded seat near its upper end, the carrier having a corresponding upwardly-projecting stud or post with a left-hand threaded seat, these parts being connected by means of a right and left screw, R. These devices I propose to employ in place of the upwardly-projecting screw-threaded posts and thumb-nuts, which are attached to the outer ends of the sliding bars

and pass through longitudinal slots in the carriers.

I do not wish to be limited to the precise form of the devices shown for turning over the edge of the hat, as many modifications thereof might be used—such, for instance, as are in common use in hand-curling employments. Nor do I wish to be limited to operating the sliding bars, or either of them, by means of a cam-groove and engaging spur or anti-friction wheel on the bar, because under some circumstances I may provide the plate with a downwardly-projecting flange or rim of proper contour, and provide the bar with two pins or anti-friction wheels a short distance apart and adapted to engage with opposite sides of the flange. It will of course be understood that in order to provide for the curling of the desired number of sizes of curls a number of rotating plates of different sizes and having different forms of grooves or flanges should be used.

I am aware that hats have been curled by mounting the same on a horizontal rotating plate in combination with mechanism for turning over the edge of the hat-brim, and that the position of the turning-over or "curling" mechanism has been regulated by cam-grooves on the upper surface of the rotating plate, and hence I do not claim such combination, broadly; but among other advantages possessed by my machine is this: By forming the grooves in the under side of the rotating plate I am enabled to make the cam-grooves of even less diameter than the hat-brim to be curled, and therefore I can make my machine much more compact than would be possible if the groove or grooves were made upon the upper surface of the plate, and therefore necessarily outside of the hat-brim.

What I claim is—

1. In a machine for curling hats, the combination of the following elements, namely: the stationary supporting-frame, a rotating plate adapted to receive and carry the hat, and provided with a cam-groove, a reciprocating carrier mounted upon the stationary supporting-frame, curling mechanism supported on the reciprocating carrier, and a guiding mechanism attached to the reciprocating carrier and engaging with a cam-groove for controlling the position of the curling mechanism, substantially as set forth.

2. In a machine for curling hats, the combination of the following elements, namely: a stationary supporting-frame, a rotating plate adapted to receive and carry the hat, and provided with a cam-groove, a reciprocating carrier mounted upon the stationary frame, a curling mechanism mounted on the reciprocating carrier, means for adjusting the curling mechanism upon the carrier toward and from the rotating plate, and a guiding mechanism attached to the reciprocating carrier, and engaging with a cam-groove, substantially as set forth.

3. In a machine for curling hats, the combination of the following elements, namely: a stationary supporting-frame, a rotating plate above the frame adapted to receive and carry the hat, and provided upon its under surface with a cam-groove, a reciprocating carrier mounted upon the supporting-frame, a curling mechanism mounted on the reciprocating carrier, and means for adjusting the curling mechanism upon the carrier toward and from the rotating plate, and a guiding mechanism attached to the reciprocating carrier, and projecting beneath the rotating plate and engaging with a cam-groove, substantially as set forth.

4. In a machine for curling hats, the combination of the following elements, namely: a supporting-frame, a rotating plate adapted to receive and carry the hat, and provided with a cam-groove, a reciprocating carrier, a curling mechanism pivoted to the reciprocating carrier, a guiding mechanism attached to the carrier and engaging with a cam-groove, and a guiding mechanism attached to the pivoted curling mechanism, and also engaging with a cam-groove, substantially as set forth.

5. In a machine for curling hats, the combination of the following elements, namely: a rotating plate, adapted to receive and carry the hat, and provided with a cam-groove, a reciprocating carrier, a curling mechanism

pivoted upon the reciprocating carrier, means for adjusting the curling mechanism upon the carrier toward and from the rotating plate, a guiding mechanism attached to the reciprocating carrier and engaging with a cam-groove, and a guiding mechanism having two parts, one of which is adjustable relative to the other, and connecting the pivoted curling mechanism with a cam-groove, substantially as set forth.

6. In a machine for curling hats, a curling mechanism having an adjustable thumb-piece adapted to be removed from underneath the curled-over portion of the brim without moving the other portions of the curling devices, substantially as set forth.

7. In a machine for curling hats, the combination of the rotating plate, the sliding carrier, the sliding supporting-arm, the spring for withdrawing the supporting-arm from the axis of the rotating plate, and means for locking the sliding arm after it has been thrust toward the shaft of the rotating plate, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM DEMUTH.

Witnesses:

J. E. WHEELER,  
HORACE L. HOBBIE.