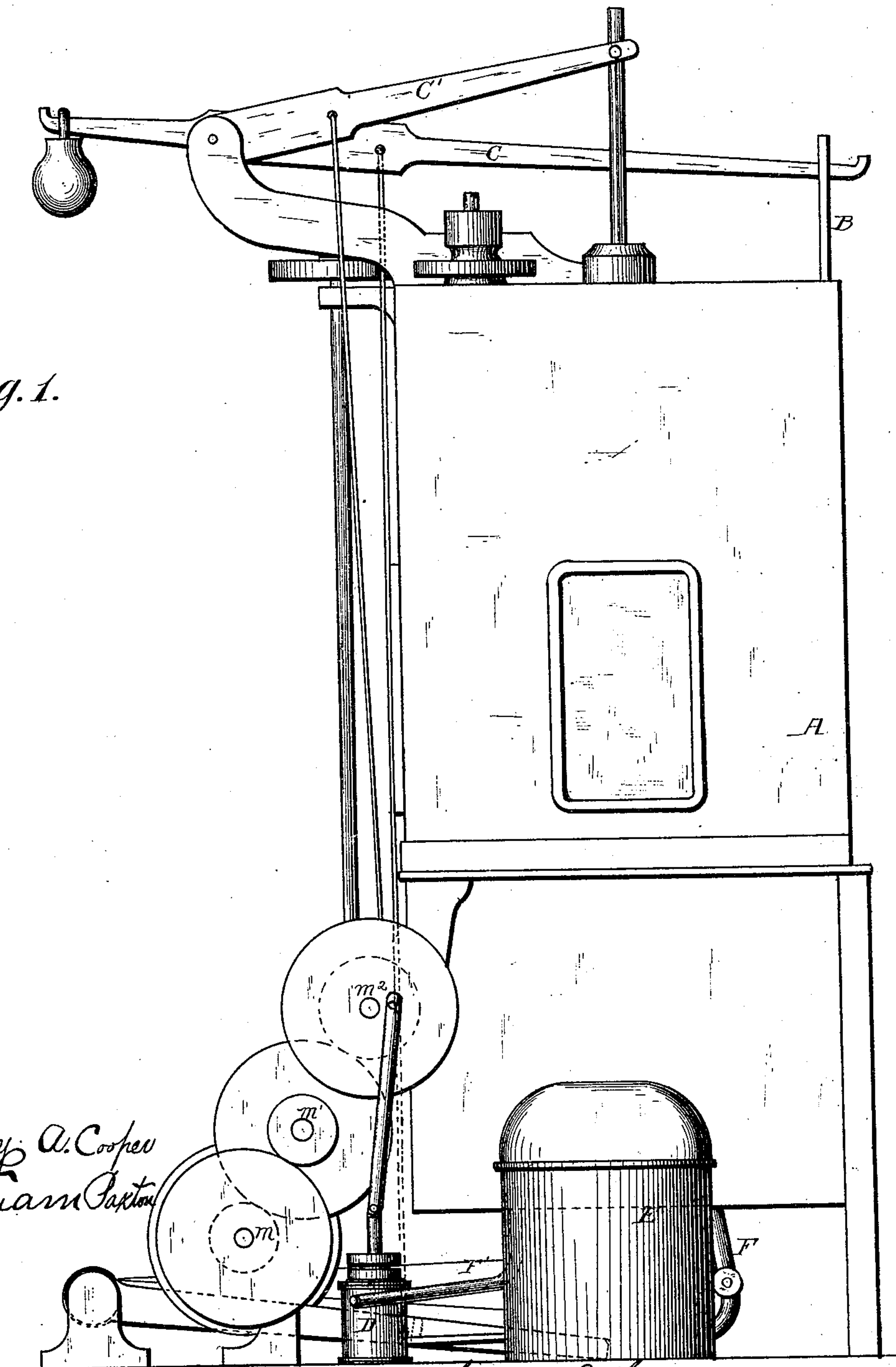


H. A. HOUSE & D. WHEELER.  
Blocking, Stretching, and Finishing Hats.  
No. 212,554. Patented Feb. 25, 1879.

Fig. 1.



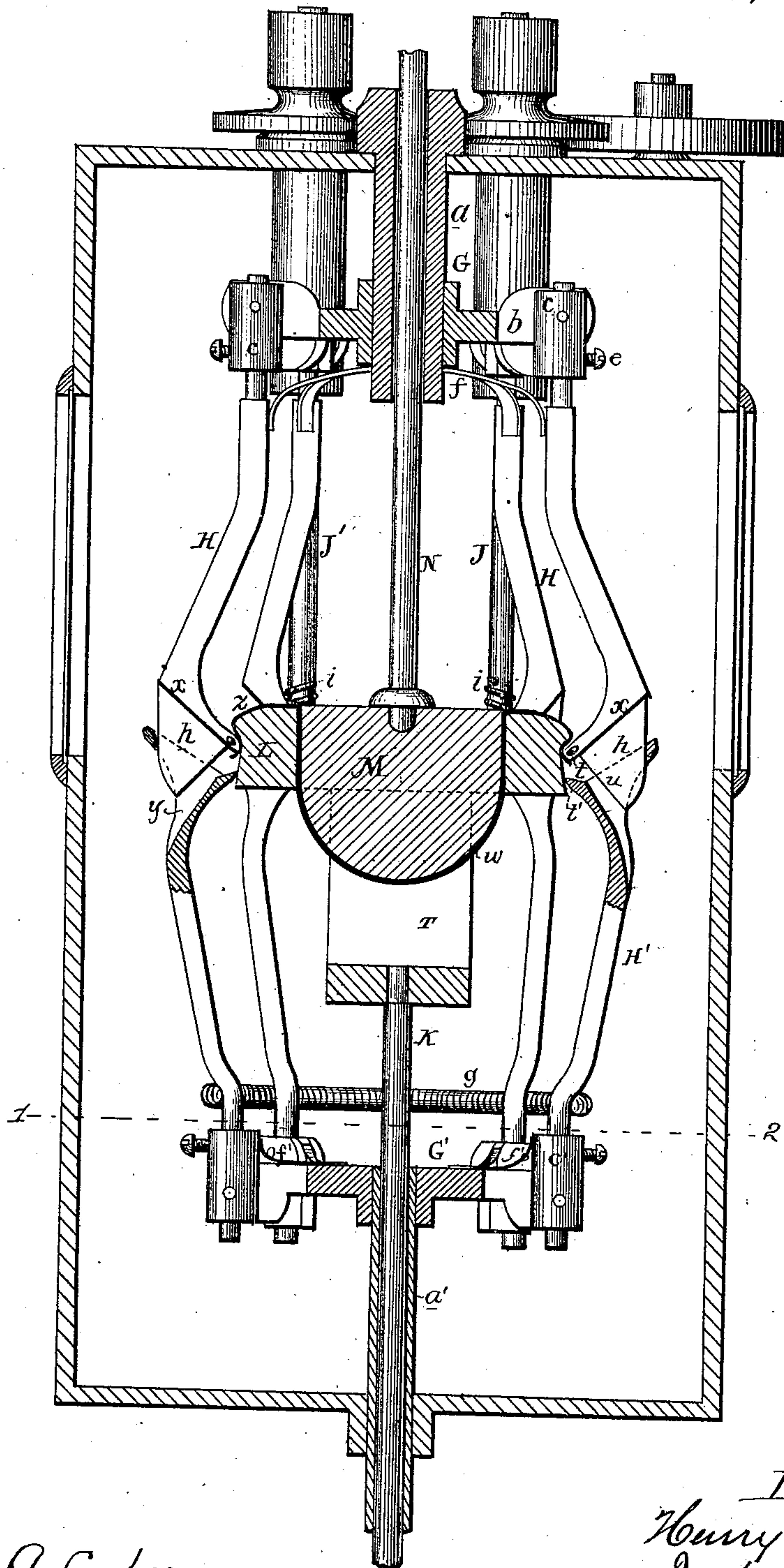
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William Paxton

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Dwight Wheeler By their attorney  
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Fig. 2.



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Fig. 3.

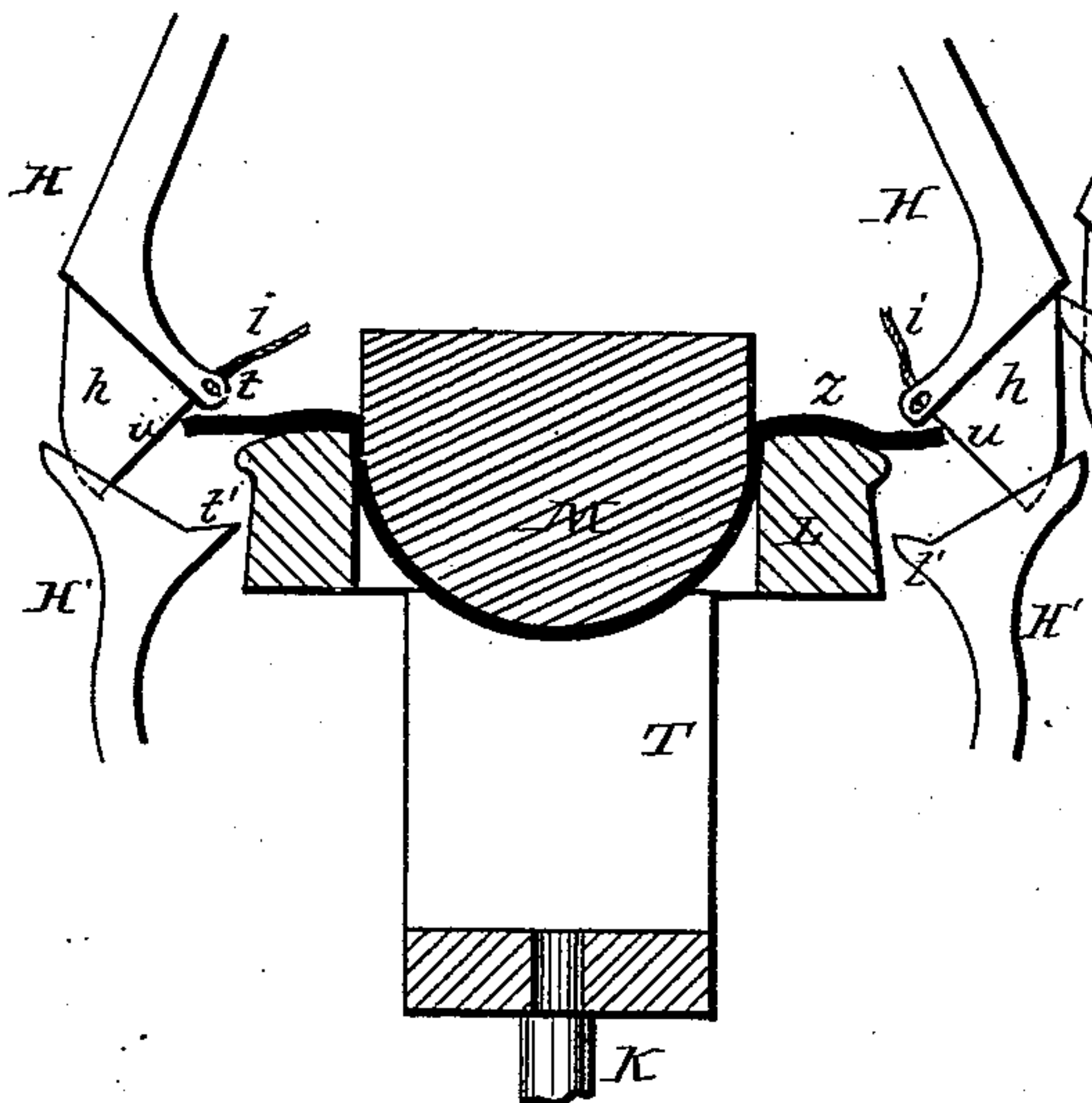


Fig. 4.

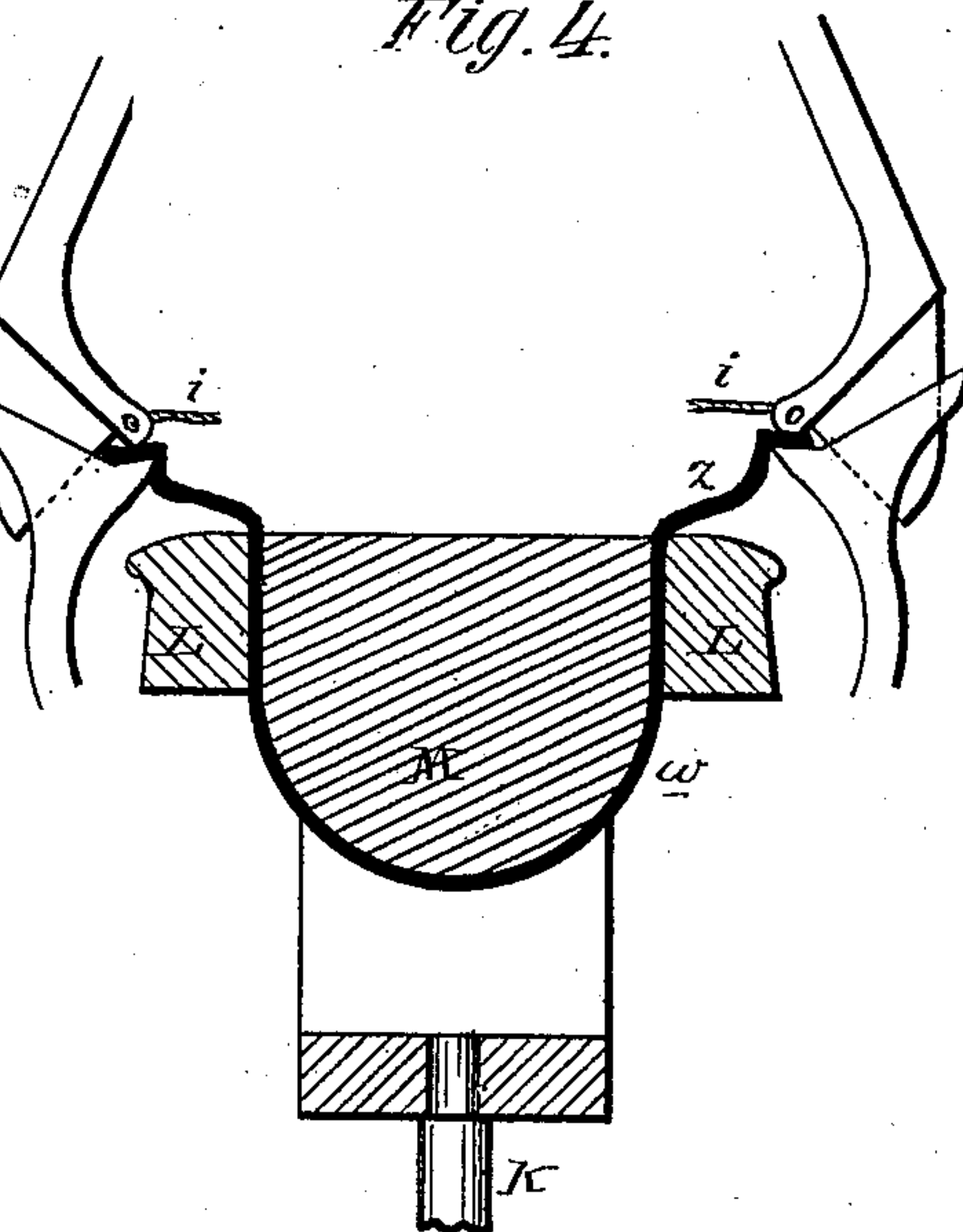


Fig. 5.

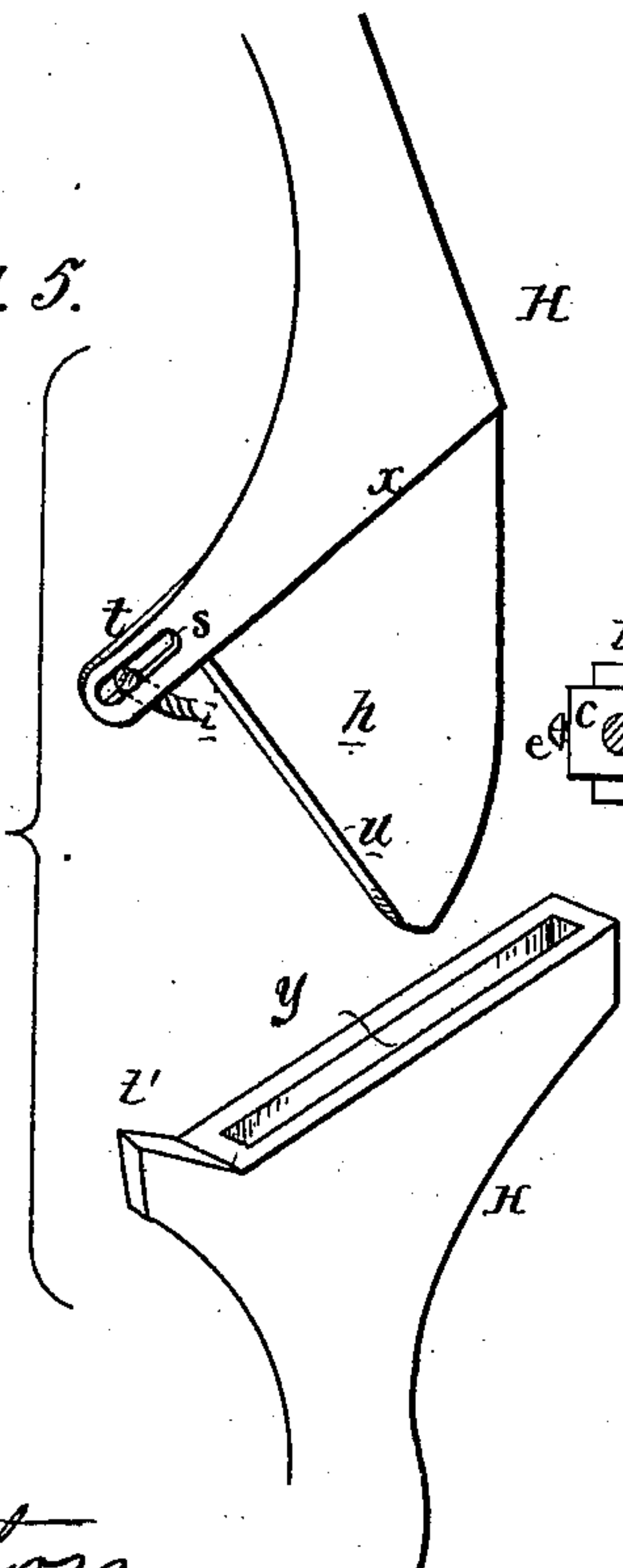
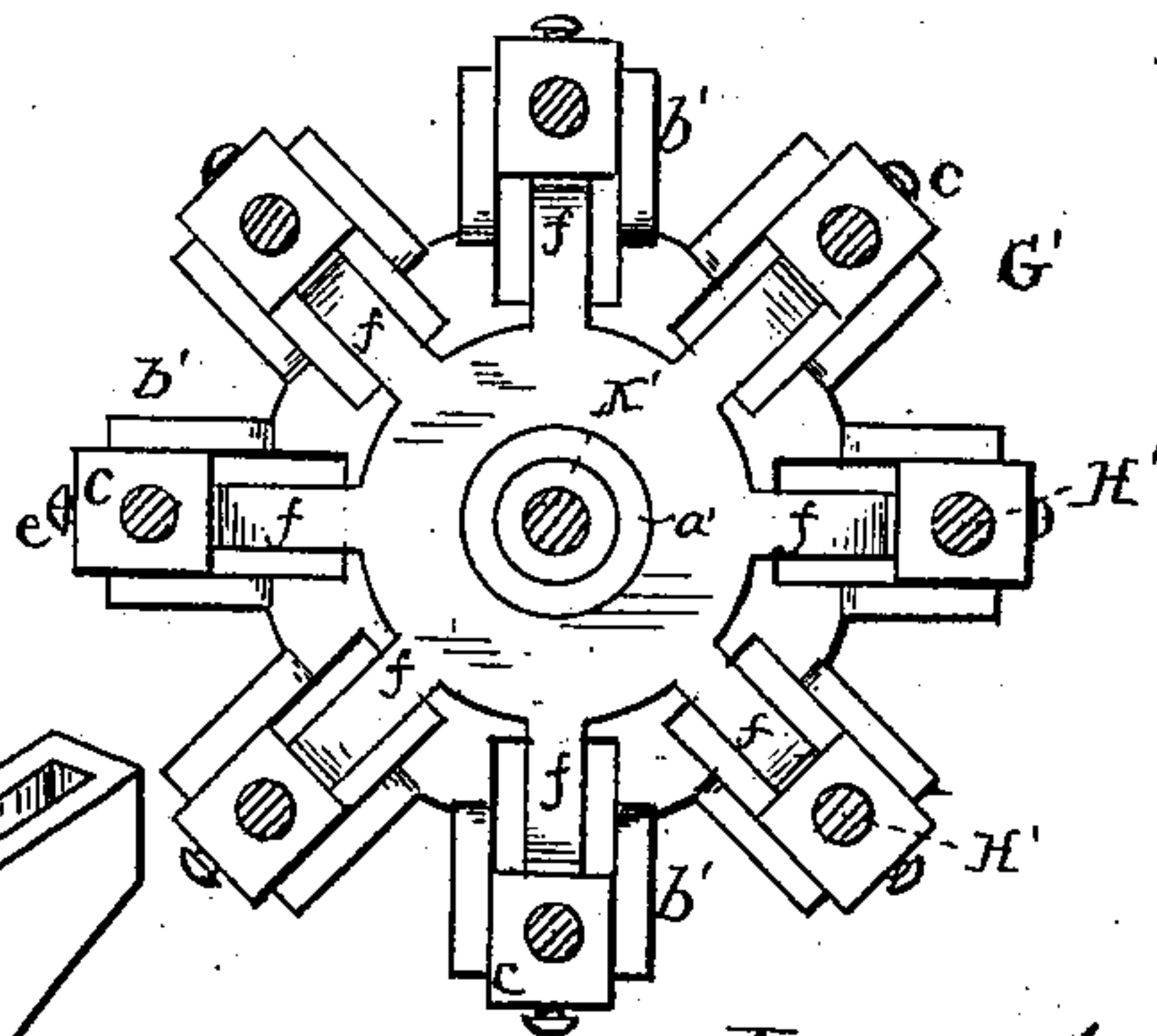


Fig. 6.



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# UNITED STATES PATENT OFFICE.

HENRY A. HOUSE AND DWIGHT WHEELER, OF BRIDGEPORT, CONNECTICUT.

## IMPROVEMENT IN BLOCKING, STRETCHING, AND FINISHING HATS.

Specification forming part of Letters Patent No. **212,554**, dated February 25, 1879; application filed November 23, 1878.

*To all whom it may concern:*

Be it known that we, HENRY A. HOUSE and DWIGHT WHEELER, of Bridgeport, Fairfield county, Connecticut, have invented Improvements in the Manufacture of Hats, of which the following is a specification:

Our invention is an apparatus constructed, as fully described hereinafter, to perform automatically the different operations required to finish a felt hat, the same operating in a chamber in which the hat can be manipulated under the action of steam or other fluid at any desired temperature.

In the drawings forming part of this specification, Figure 1 is an external view, showing one form of apparatus for carrying out our invention; Fig. 2, a front view, the front of the casing removed; Figs. 3, 4, 5, detail views illustrating the operation of the devices; and Fig. 6, a section on the line 1 2, Fig. 2.

A represents a casing or chamber within which is located the hat-finishing machine. It will be understood, however, that any desired number of machines may be in one chamber. Opposite each machine is an opening closed by a sliding or swinging door, B, operated by a lever, C, at the top of the case, and on the base are mounted an air-pump, D, and condenser E, communicating with each other, the condenser also communicating with the chamber A, through a pipe, F, an inlet steam-pipe, F', communicating with the chamber, and each pipe having a valve or cock.

On a stud, *a*, at the top of the case, is a frame, G, having radial slotted arms *b*, in each of which is pivoted a block, *c*, socketed to receive the upper end of an arm, H, secured adjustably by a set-screw, *e*, in the block.

On a hollow shaft, *a'*, sliding in an opening in the bottom of the casing, is secured a frame, G', with radial arms carrying a series of socketed blocks, *c'*, and adjustable arms, H'. Springs *f* on each frame throw the arms outward, and an elastic band, *g*, encircles and prevents the arms H' from spreading to too great an extent. Each arm H' terminates in a thin blade, *h*, and is provided with an inclined shoulder, *x*, and finger *t*, having a slot, *s*, through which a cord, *i*, passes (and through the slots in all the arms) to one of two parallel vertical shafts, J J', geared together and

arranged adjacent to the arms. Each arm H' has a slot, *y*, adapted to receive the blade *h*, and terminates at the inner edge in a finger, *t'*. Through the shaft *a'* extends a shaft, K, carrying at the upper end a U-shaped bracket, T, with dowel-pins on which to center the usual brim-block L, and to the latter is adapted the usual head-block M, having a socket to receive the end of a rod, N, sliding through the stud *a*, and connected at the upper end to a lever, C', above the case.

In suitable bearings turn three shafts, *m m<sup>1</sup> m<sup>2</sup>*, geared together and provided with cam-wheels and appliances for operating the pump D, the shafts J J' N *a'* K, lever C, and cocks in the pipes F F', as fully described hereinafter.

It will not here be necessary to describe fully these appliances, as they will form the subject of a separate application for Letters Patent, and may be modified in many ways to produce the desired movements.

In the usual process of finishing hat-bodies by hand much time is lost in moving the blocks to and from the oven. The hat cools while being removed and cannot be well blocked. It is apt to be stretched unequally, so that it is thin at parts and wears unequally. The tying-cord wears rapidly away and is expensive to replace, and the necessity of waiting while the blocked body cools after forming delays the operations and increases the expense.

Another objection is the escape of steam from the ovens in removing the hats, the same condensing on the walls or other places and dropping upon and injuring the hats.

The object of our invention is to remedy these difficulties, which we effect by finishing the hat wholly by automatic appliances in the presence of a surrounding heated atmosphere, which is exhausted from the chamber the instant the heating of the body is completed.

In carrying out our invention we employ the above devices, or any whereby the same operations may be effected, as follows: The body *w* is first placed in the brim-block, and the plug or body-block M is placed loosely in the body, as usual.

The arms H H' and bracket T being in the position shown in Fig. 2, and the door B being open, the brim-block is placed on the bracket



by the attendant, when the door will be automatically closed. The shaft K then rises, carrying the blocks upward and the brim  $z$  against the edges of the blades  $h$ , Fig. 3, after which the shaft  $a'$  is elevated, carrying upward the arms  $H'$ , which, bearing against the rear edges of the blades  $h$ , force the latter inward as the edges of the arms  $H'$  approach the shoulders  $x$  of the arms  $H$ .

As the ends of the arms approach each other the brim, bearing on the inclined edges  $u$  of the blades  $h$ , is gradually forced inward until the extreme edge of the brim, to the extent of about one-fourth of an inch, is firmly gripped between the fingers  $t t'$ , as shown in Fig. 4.

The cock of the pipe is now opened, and the chamber will be filled with steam, hot air, or other gas or vapor, which will soften the body prior to and during manipulation by the automatic devices.

The shaft K and its blocks now rise, when the brim will be drawn tightly and uniformly over the block and down below the cord-groove to the position shown in Fig. 2, when the shafts  $J J'$  will rotate and tighten the cord or band  $i$  against the brim, holding it securely in the groove or below the shoulder of the brim-block while the head-block is forced downward by the descent of the shaft N, the lower arms  $H'$  having meanwhile descended to permit the cord to be drawn tightly.

The cock of the pipe F is now opened, when the steam will exhaust into the condenser E, the door B will be elevated, and the cold air will rush in and chill and set the body in its shape. The shafts  $J J'$  will then turn in a reverse direction, the cord or band  $i$  will be relaxed, the arms  $H$  will swing out, and the blocks descend to a position to be removed by the operator, who removes the body and replaces it by another, which is treated like the first.

It will be apparent that the steam exhausted into the condenser E cannot escape into the room; that the cord  $i$ , not being knotted, will not rapidly wear away, and that as the body is stretched from all sides at once, and while surrounded by a heated atmosphere, it will yield uniformly without rupture.

It will also be obvious that the loss of time in removing and replacing the blocks, and in cooling the body, incident to ordinary modes of manufacture, is avoided.

We do not limit ourselves to the appliances described for operating on the body while sur-

rounded by a heated fluid, as various other mechanisms might be employed—as radial bars, with nippers for seizing the brim, a clamp or biting-fingers for holding the turned-down brim to the block, &c. We prefer the mechanism described, however, as it is simple and effective.

We are aware that hats after being stretched and blocked on finishing-blocks have been subjected to the action of steam in a closed chamber to stiffen the same, and do not claim, broadly, heating hats in a closed chamber; but

We claim—

1. As an improvement in the manufacture of felt hats, stretching and blocking the same while under the influence of a surrounding fluid heated until the body is formed and set and then cooled.

2. In the manufacture of felt hats, subjecting the body while being stretched to the action of a surrounding hot fluid, and then displacing said fluid by cold air, as set forth.

3. The combination, with a closed chamber containing the hat stretching and forming mechanism, of a steam-pipe and pump or its equivalent, whereby steam may be quickly introduced into and withdrawn from said chamber, substantially as set forth.

4. The combination, with the crown and rim forming blocks, of grippers arranged around the same and appliances whereby said blocks and grippers are operated to draw the brim over the brim-block and the crown-block is then forced in, as set forth.

5. The combination, with the blocks and grippers, of a cord or band and appliances for tightening the same after the brim has been drawn over the block, as set forth.

6. The combination of the arms  $H H'$ , blocks and cord  $i$ , carried by one set of arms, substantially as set forth.

7. The arms  $H$ , having blades  $h$ , in combination with the slotted arms  $H'$  and block-supporting appliances, and with operating devices, substantially as described.

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

HENRY A. HOUSE.

DWIGHT WHEELER.

Witnesses:

HARRY A. HOUSE, Jr.,

ALFRED B. BEERS.