

(No Model.)

2 Sheets—Sheet 1.

G. ATHERTON.

APPARATUS FOR PRESSING, SHAPING, AND CURLING HATS AND HAT BRIMS.

No. 567,573.

Patented Sept. 15, 1896.

FIG. 2.

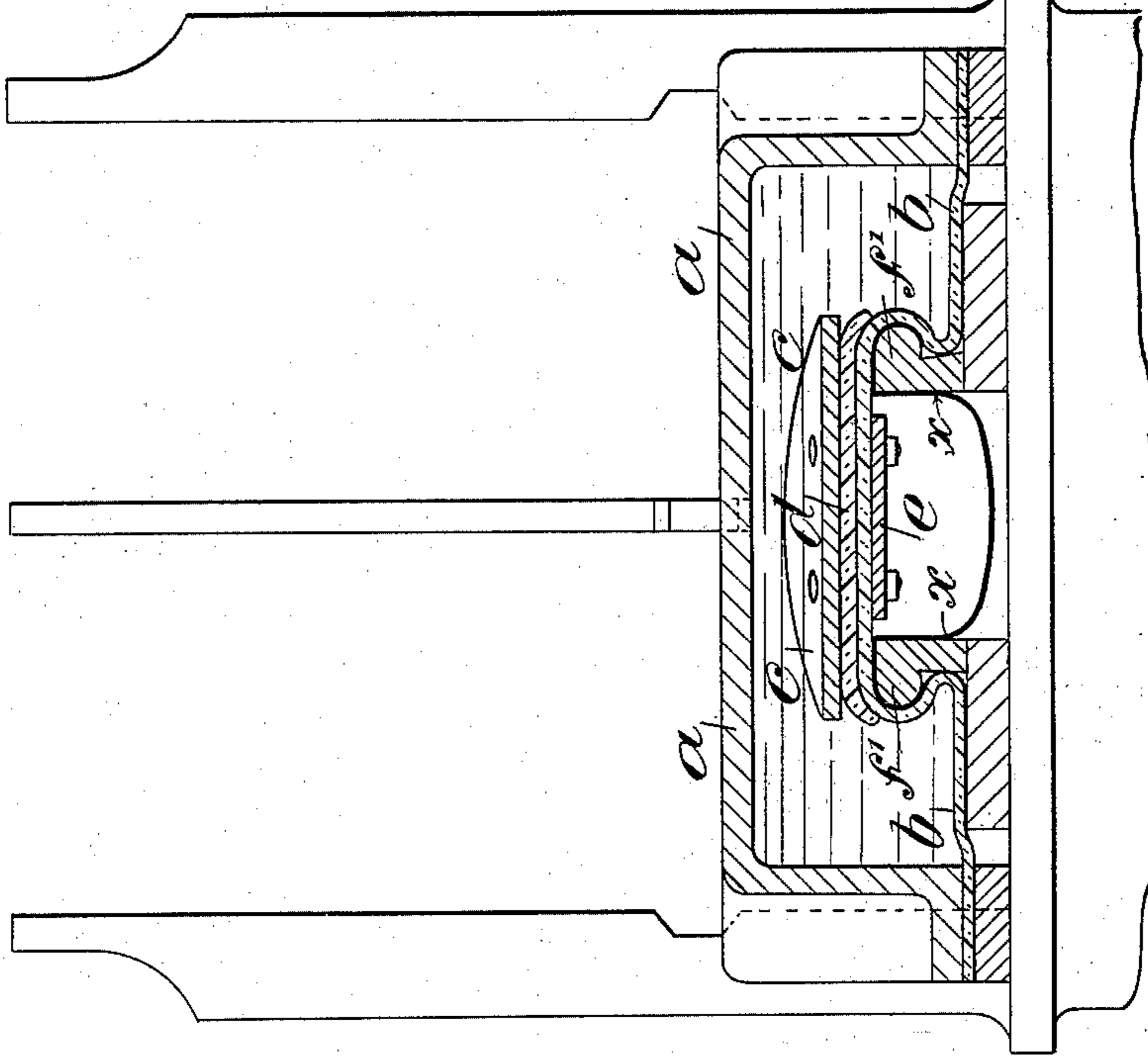
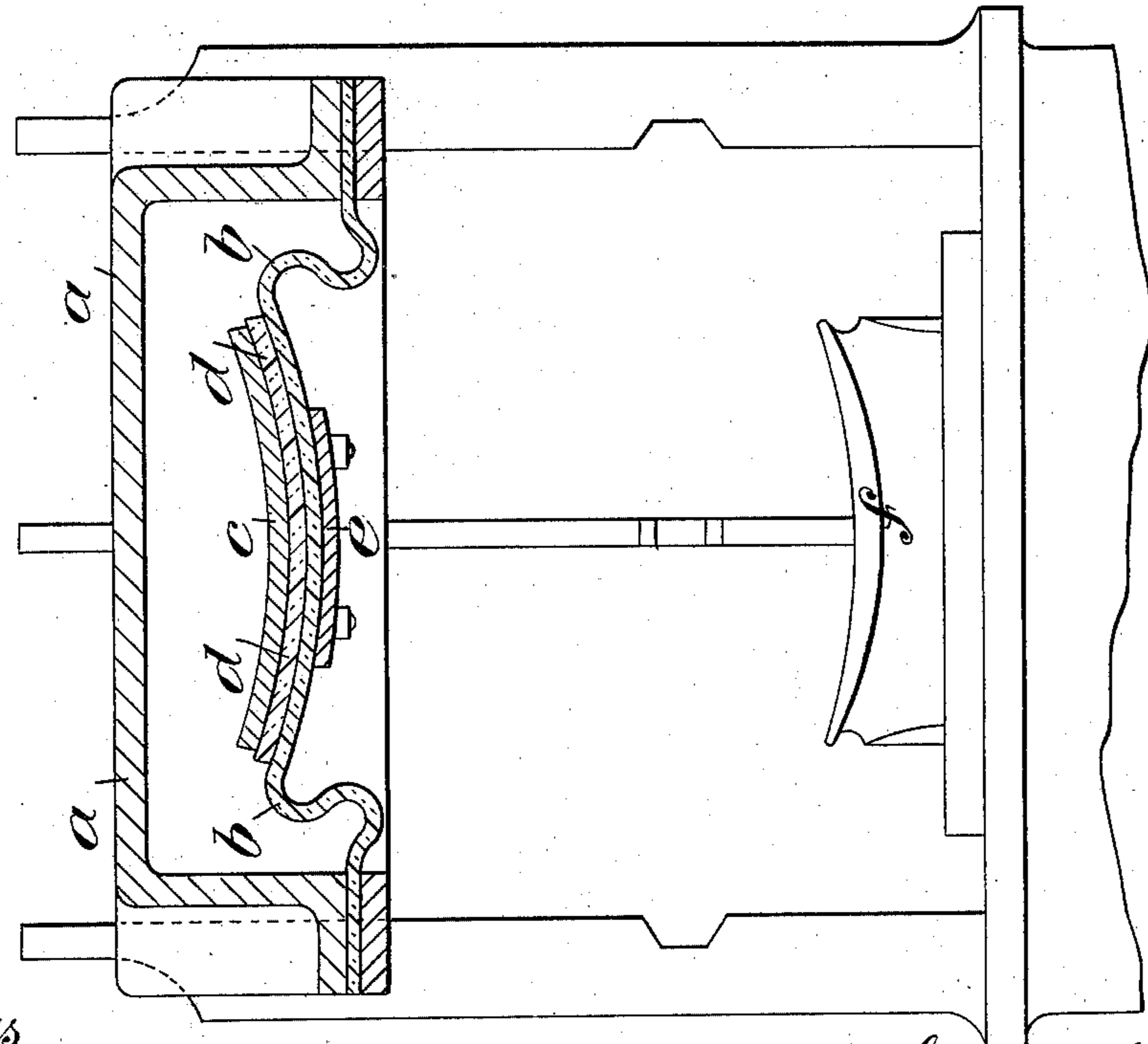


FIG. 1.



Witnesses  
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H. van Dusen

INVENTOR  
Giles Atherton  
By his atty. *Reynolds*

(No Model.)

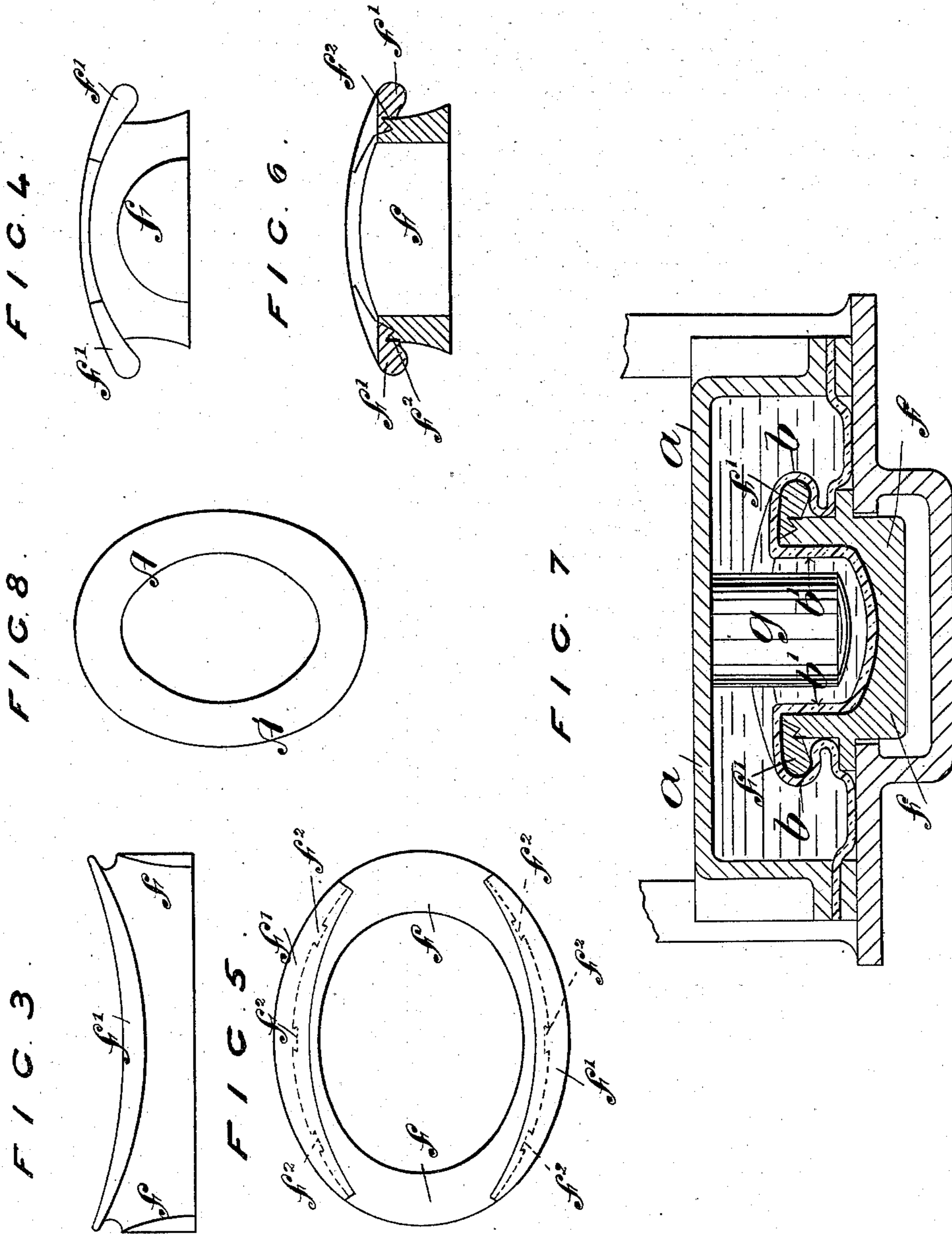
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Witnesses.  
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# UNITED STATES PATENT OFFICE.

GILES ATHERTON, OF STOCKPORT, ENGLAND.

APPARATUS FOR PRESSING, SHAPING, AND CURLING HATS AND HAT-BRIMS.

SPECIFICATION forming part of Letters Patent No. 567,573, dated September 15, 1896.

Application filed June 11, 1895. Serial No. 552,396. (No model.) Patented in England July 20, 1894, No. 13,594.

*To all whom it may concern:*

Be it known that I, GILES ATHERTON, hatter's engineer, a subject of the Queen of Great Britain and Ireland, residing at Stockport, in the county of Chester, England, have invented certain new and useful Improvements in Apparatus for Pressing, Shaping, and Curling Hats and Hat-Brims, (for which I have obtained a patent in Great Britain, No. 13,594 of 1894, dated July 20,) of which the following is a specification.

My invention relates to the shaping and curling of hat-brims and to the pressing, shaping, and curling of hats and hat-brims.

Prior to my invention, in the combined apparatus used for shaping and curling hat-brims, an india-rubber bag or diaphragm, usually of a dished or saucer shape, was used, contained and suspended or upheld by a central bolt in a so-called "cupola" or pressure-box and subject to the fluid-pressure, so that when the hat was placed in the matrix-base, the brim resting upon the curl-plates or matrices, the expanded bag or diaphragm was stretched and pressed down on the brim, so as to shape it to the curvature and curl of the matrices. The bag or diaphragm was therefore subjected to considerable and fatiguing stretching and strain at each operation, so that it was apt to be ruptured and to spoil the goods. In conjunction with the said bag or diaphragm it was customary to use brow-blocks or filling-pieces which fitted inside the hat and prevented the bag or diaphragm from entering the interior of the hat. Brow-blocks required to be provided for each size of hat, but in spite of their use the material of the bag was often forced by the pressure between the brow-blocks and the inner band of the hat, with the result that the bag was sometimes nipped or cut and so damaged.

Under my invention I am enabled to dispense with the use of brow-blocks, and to save their cost and also the time usually spent in removing, replacing, and changing them; and by an improved shape or configuration of the bag or diaphragm, combined with a novel mode of stiffening and supporting the central part of the rubber bag or diaphragm, I prevent accidents to the bag, so that as a result I simplify and cheapen the parts of

the apparatus and increase its reliability, utility, and efficiency.

The annexed sheets of drawings will render my invention more fully understood.

On Sheet 1, Figure 1 is a sectional view of the usual hydraulic stiff-hat-curling machine or press to which my improved diaphragm and other parts are shown applied. The section is taken in the direction of the greatest length of a hat. The parts are shown as they appear when the "cupola" or hydraulic-pressure box is raised and the machine is not in the act of pressing. Fig. 2 is a cross-sectional view at right angles to Fig. 1, in which the cupola *a* is shown lowered and the hydraulic pressure admitted into the box and behind the diaphragm *b*, so as to press and curl the hat. On Sheet 2, Fig. 3 is a side view of my improved hat-matrix base fitted with curling-matrices or curl-plates which are made to be easily detachable from the base and from the hat-brim. Fig. 4 is an end view of the matrix-base and matrices. Fig. 5 is a plan view of the same. Fig. 6 is a cross-section of the base and curl-plates. Fig. 7 refers to my improved means for pressing, shaping, and curling the hat and hat-brims at one operation. Fig. 8 is a view of a presser or protecting plate which I may use when pressing hat-brims.

According to my invention the bag or diaphragm *b*, instead of being of the usual saucer shape upheld by a central bolt, as heretofore, is made of such a shape that it is self-supporting in the cupola, (see Fig. 1,) and is sufficiently slack to adapt itself to the curl of the matrices without the excessive strain and stretching which the former diaphragm had to undergo in performing its duties. The improved formation of the diaphragm *b* is most perceptible from the sectional view in Fig. 1, which represents the diaphragm as it appears when not under pressure. The S-shaped contour of the sides bears up the main portion of the diaphragm and also gives it sufficient slack to roll or lie around the curl of the matrices when subjected to pressure without being so much stretched or distended as was the case with the old form of diaphragm. This self-supporting quality of my improved diaphragm enables me to dispense with the old central up-

holding-bolt. To the central part of the diaphragm, and preferably on the upper side, I apply a curved or dished metal plate *c*, which extends above the curl plates or matrices of the frame beneath. This dished plate *c* is shaped or bent to a medium curve between the maximum and minimum curves of the usual type of hat-brims, and a thickness of rubber *d* is interposed between the bag and the plate. Consequently by the yielding of the rubber thickness *d* the curve of the plate *c* can accommodate itself to all general shapes of hat-brims. Opposite to the curved plate *c*, and on the other side of the bag or diaphragm *b*, I place a washer-plate *e* and bolt or secure the two plates together, as indicated in the drawings, the thickness of the bag *b* and the interposed rubber packing *d* being held and nipped between the two plates *e* and *c*. The said washer-plate *e* is of less size than the interior of the hat *x*.

I do not limit myself to the location of the dish-shaped plate *c* on the outside of the diaphragm or bag, nor to the manner of holding it by means of bolts.

When the cupola has been brought down over the hat and matrices and the hydraulic pressure admitted, as in Fig. 2, the pressure compels the flexible diaphragm *b* to lie closely down upon and against the hat-brim and curl, and press it to the shape, curve, and curl fixed by the matrices, but without unduly distending the material of the diaphragm.

As before stated, the diaphragm, by means of its S-shaped sides, is self-supporting, as shown in Fig. 1, but when the hydraulic pressure is applied, as in Fig. 2, the diaphragm, by means of this pressure and the shape of the mold *f*, assumes the position shown in Fig. 2.

That portion of the bag or diaphragm *b* which extends across the annular space between the washer-plate *e* and the inside of the hat cannot be easily forced down by the hydraulic pressure between the washer-plate *e* and the inside of the hat *x*, because it is backed and supported by the dished plate *c* and packing, so that the bag is not nipped and cut, as sometimes happens in the old or existing apparatus.

The described improved arrangements enable me to dispense with brow-blocks, so that the necessity of having a supply of these to suit various sizes is obviated and the time consumed in removing and changing these blocks for different sizes of hats is saved.

In order to prevent any possibility of any portion of the bag or diaphragm *b* being forced between the plate *e* and the inside of the hat, and also to finish the brim of the hat and preserve the sharpness of the inner edges, I might provide presser or protecting plates, such as at A, (see Fig. 8,) the said presser or protecting plates consisting of dished metal plates conforming to the curve of the brim and made of sufficient strength to resist bending pressure at the edges. Such a presser-

plate is laid upon the hat-brim when the bag and cupola are in the position shown in Fig. 1. In the protecting-plate A shown and described there is a hole in the middle of the plate to admit the washer-plate *e*, but when no such washer-plate *e* or other projection exists on the lower side of the diaphragm the plate A need not be cut out in the center.

When the cupola is brought down and hydraulic pressure is admitted to the bag in the usual manner, *i. e.*, when the parts are in the position shown in Fig. 2, the plate A preserves the sharpness of the inner edge of the hat and also gives a smooth finish to the surface of the brim. To avoid confusion the presser or protecting plate A is not shown in Figs. 1 and 2.

Under my improvements the usual matrix-base *f* is fitted or formed at its upper portion with the usual brim shaping and curling matrices or plates *f' f'*. These might either be made in one piece with the base, as hitherto, or, in accordance with my invention, they might be made in detachable segments or parts which would lift away with the hat when removed from the press.

The enlarged views, Figs. 3, 4, 5, and 6, illustrate the base *f* fitted with the said removable brim-curling plates *f' f'*. Each side of the matrix-base *f* is checked out and formed with any suitable number of dovetail recesses which receive corresponding dovetails *f<sup>2</sup>* on the curl-plates. To give it a better hold, the back of the curl-plate itself is formed of a wedge shape, as shown at Fig. 6, engaging with a similarly-formed cutting or recess in the side of the matrix-base *f*. The curl-plates *f' f'* are thus so loosely applied that they lift away with the hat with the utmost ease, while at the same time they are so firmly supported in position that no amount of pressure can dislodge or loosen them. On the contrary the greater the pressure the more firmly are the curl-plates locked in position. The side dovetails *f<sup>2</sup>* might be dispensed with and the security of the curl-plates trusted entirely to the wedge-shaped hold shown in Fig. 6. A material advantage gained from the use of such detachable side curl-plates is that better shapes can be produced, as the loose curl-plates can be removed without straining the curl of the hat-brim.

Although I have described my invention as applicable to the combined operations of shaping and curling, I might apply it to the brim-curling operation alone.

My invention extends also to the pressing of hats as well as the shaping and curling of hat-brims. I propose to press, shape, and curl the hat at one operation instead of by two or three operations, as at present. In carrying out this part of my invention I combine in one apparatus the hat-press and mold and the brim shaping and curling surfaces or matrices.

Fig. 7 is a sectional view of the hat-mold surrounded by the lowered cupola. The bag

or diaphragm *b* is of the improved shape already described with reference to Figs. 1 and 2, and is made with a central pap or "teat" *b'*. To economize water, I fix a filling-up body, such as *g*, in the cupola, and projecting downward, so as to partly occupy the teat of the pressure-bag *b*. The teat of the bag enters the interior of the hat when the press is at work and is forced by the hydraulic pressure against the interior of the hat, thereby pressing the exterior of the hat against the interior of the mold *f*, so as to finish and form the hat. At the same time the overlapping upper part of the bag *b*, which, as already said, is especially shaped to effect this result without undue strain or distention, lies over and curls and shapes the brim, as clearly shown in Fig. 7 of the drawings. The brim is formed by the removable curling and shaping side plates or matrices *f' f'* precisely as in the curling and shaping apparatus described in the first part of this specification. When the pressure has been released and the cupola raised, the hat may be lifted out, bringing with it the separable parts or side curl-plates *f' f'*, which may then be removed from the brim-curls.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination, the mold, the flexible bag with means for applying the pressure thereto, a dished metal plate *C* curved to a medium shape between the maximum and

minimum curves of the usual hat-brims and arranged above the flexible bag and a rubber layer between the flexible bag and said dished plate whereby hat-brims of different curves may be dealt with, the said upper metal plate giving the approximate shape to the pressure-bag while the interposed rubber compensates for variations from this approximate shape substantially as described.

2. In combination, the mold, the cupola and the flexible bag having corrugated or **S**-shaped sides to support the bag within the cupola, said **S**-shaped sides being maintained normally in this form to support the bag when pressure is removed therefrom substantially as described.

3. In combination, the mold, the flexible bag with means for applying the pressure thereto, the metal plate *C* carried thereby above said bag, the rubber layer *d* between the same and the bag and the plate *e* carried by the bag and fitting within the opening of the mold, the said upper metal plate giving the approximate shape to the pressure-bag while the interposed rubber compensates for variations from this approximate shape substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GILES ATHERTON.

Witnesses:

D. FULTON,  
R. IBBERSON.