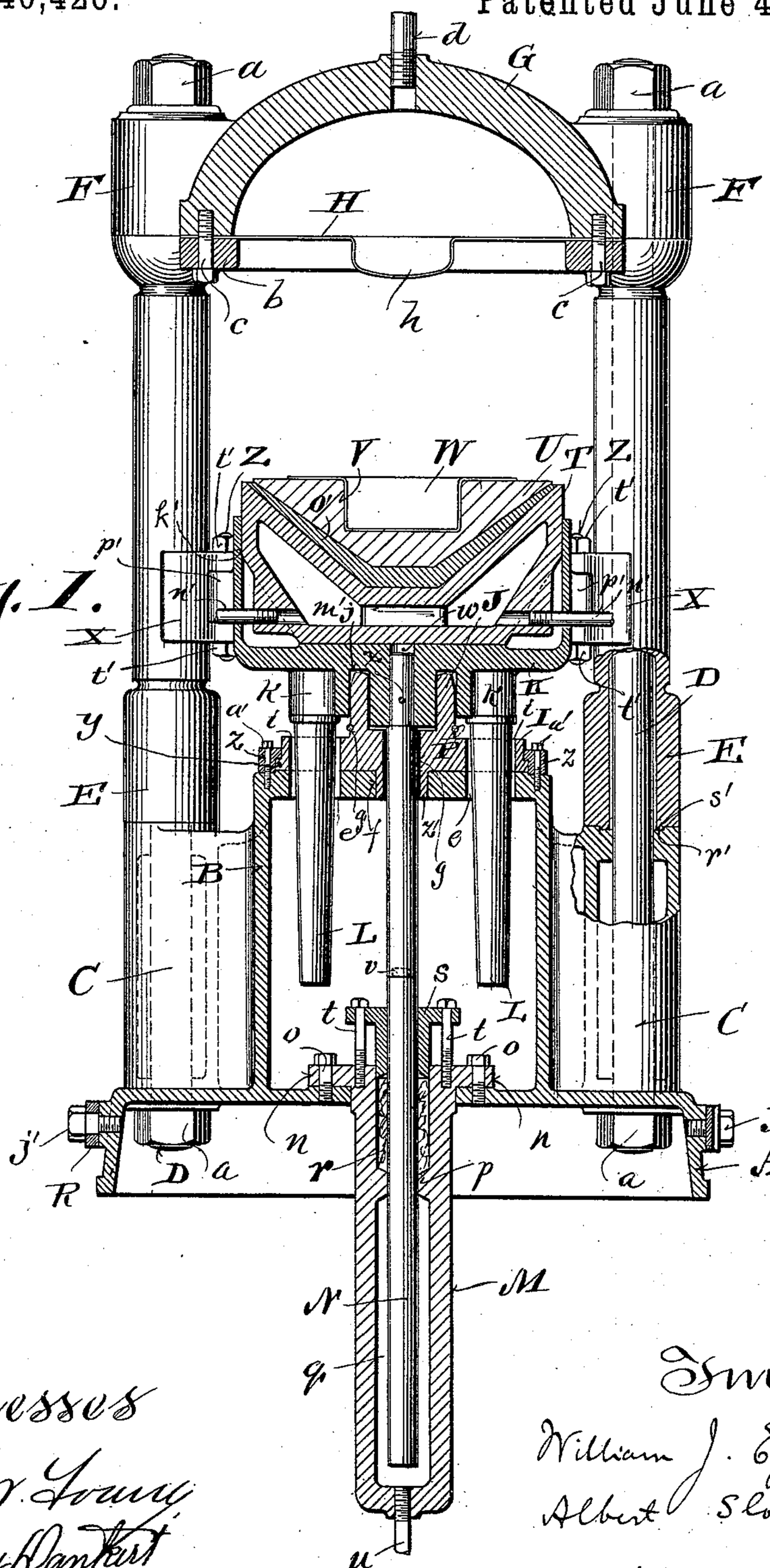
(No Model.) 4 Sheets—Sheet 1.

W. J. EGAN & A. SLOCUM.

HAT PRESSING MACHINE.

No. 540,426. Patented June 4, 1895.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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HAT PRESSING MACHINE.

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Fig. 2.

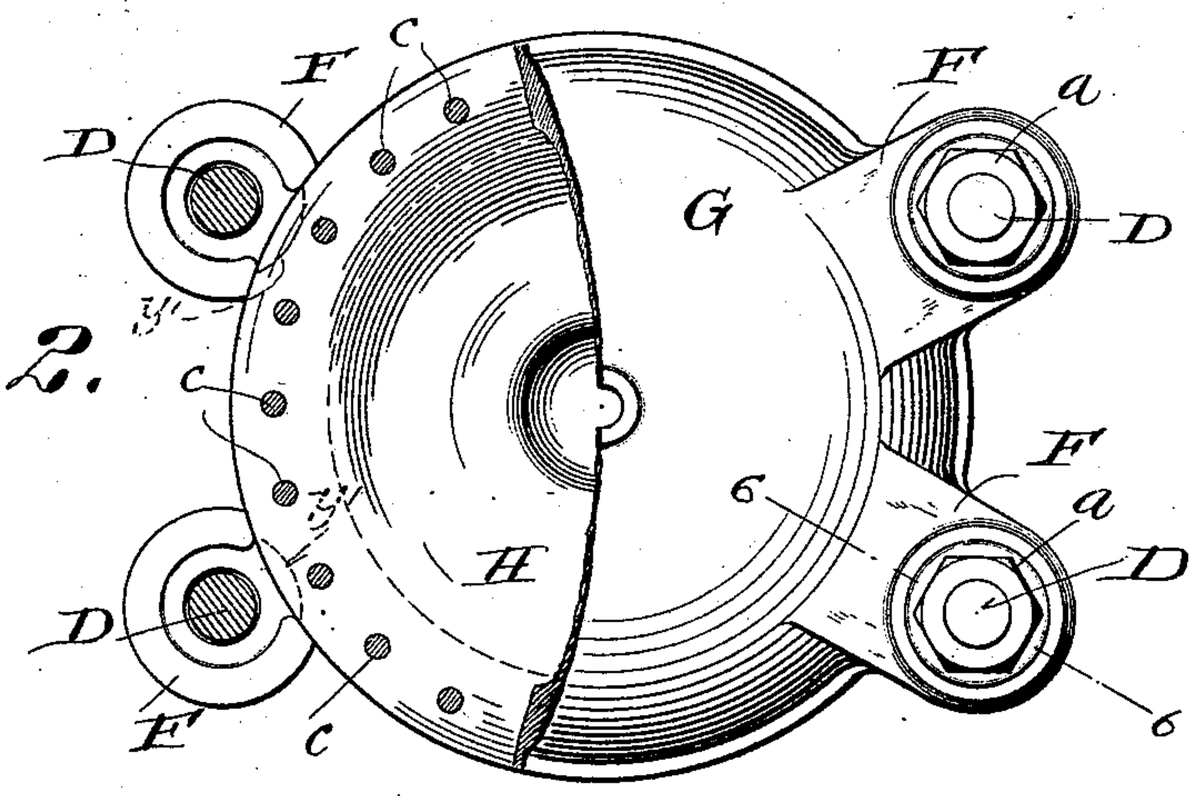


Fig. 3.

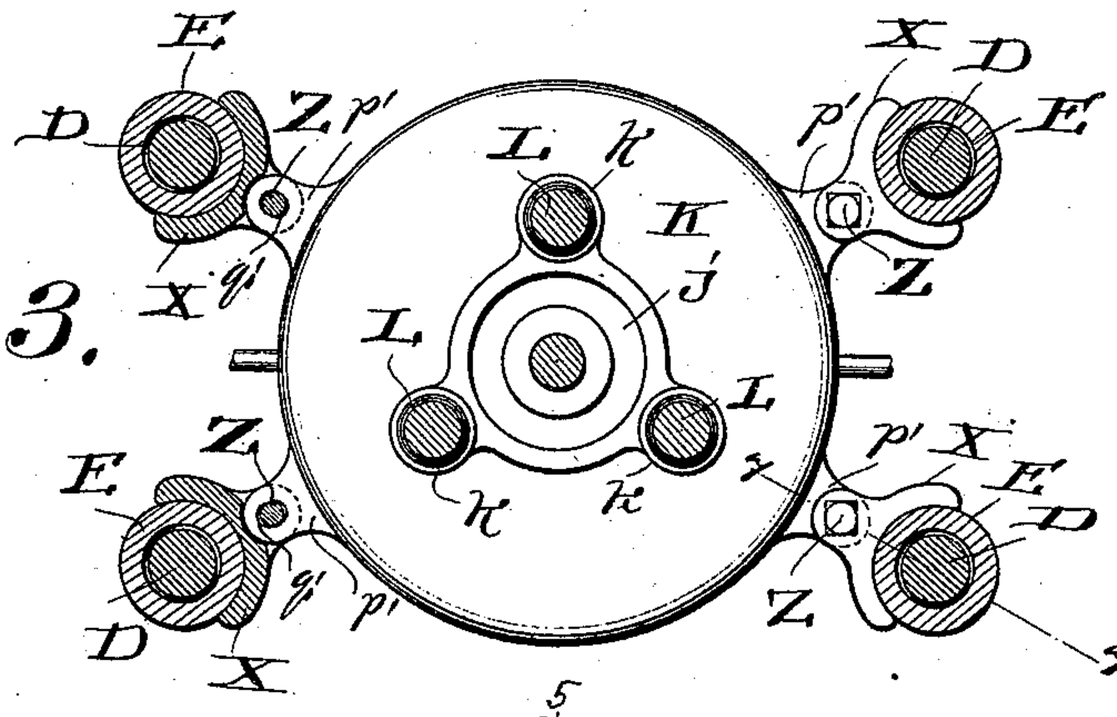
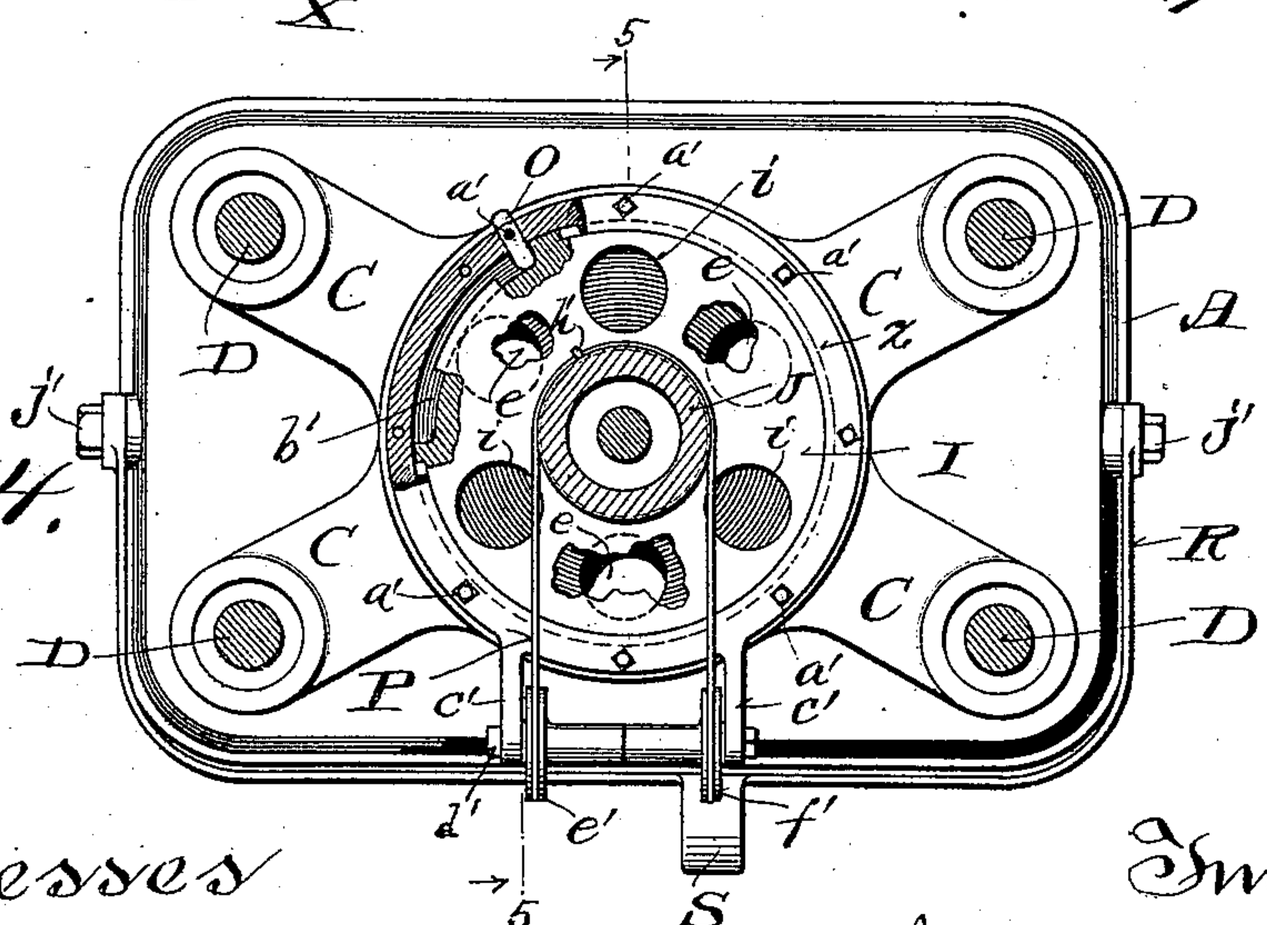


Fig. 4.



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W. J. EGAN & A. SLOCUM.

HAT PRESSING MACHINE.

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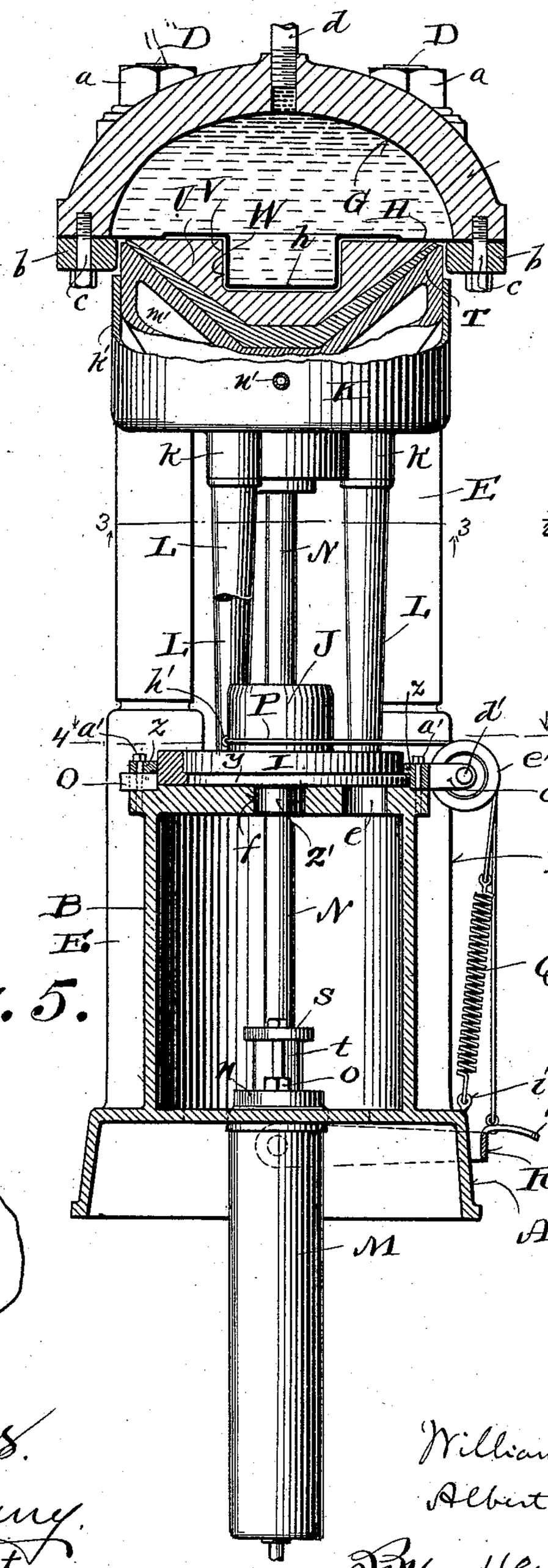

Fig. 5.

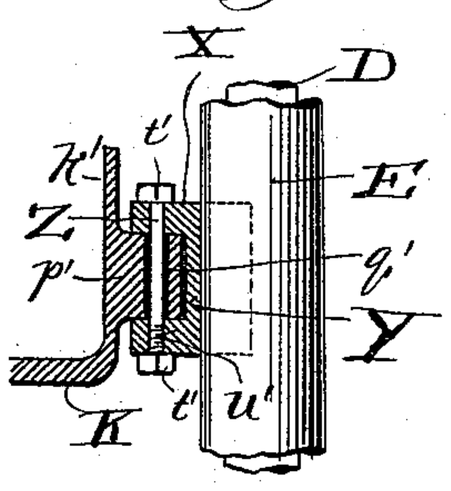

Fig. 7.

Fig. 8.

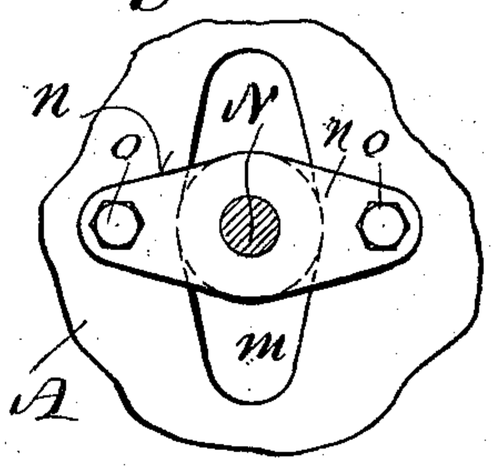

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Fig. 9.

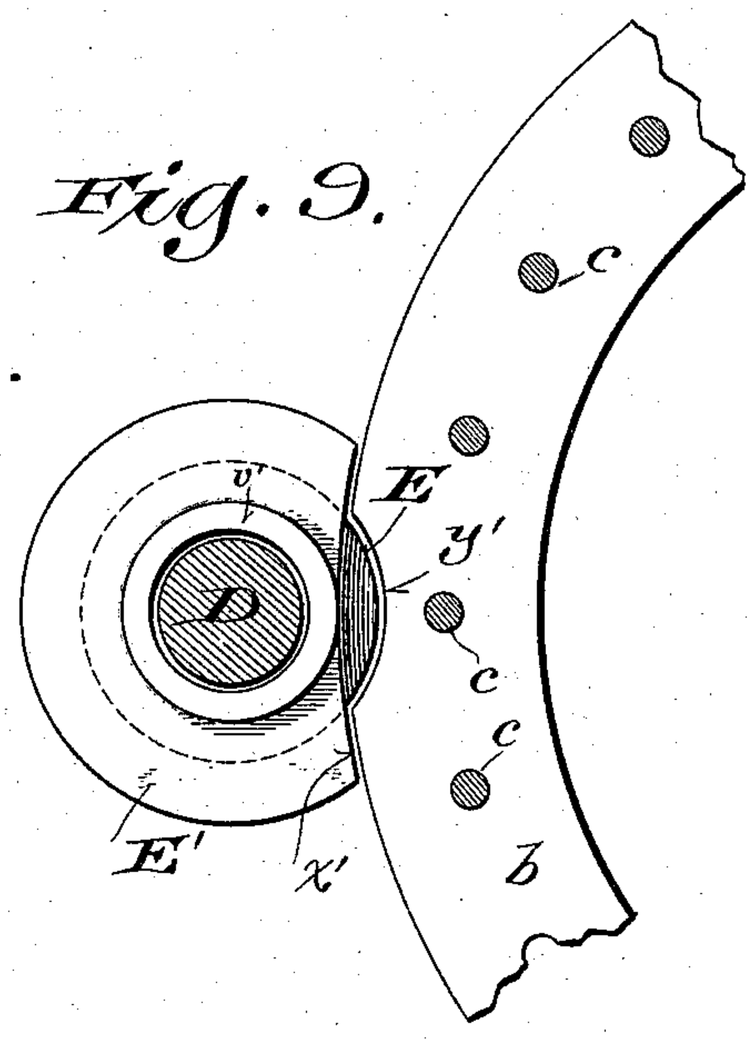


Fig. 6.

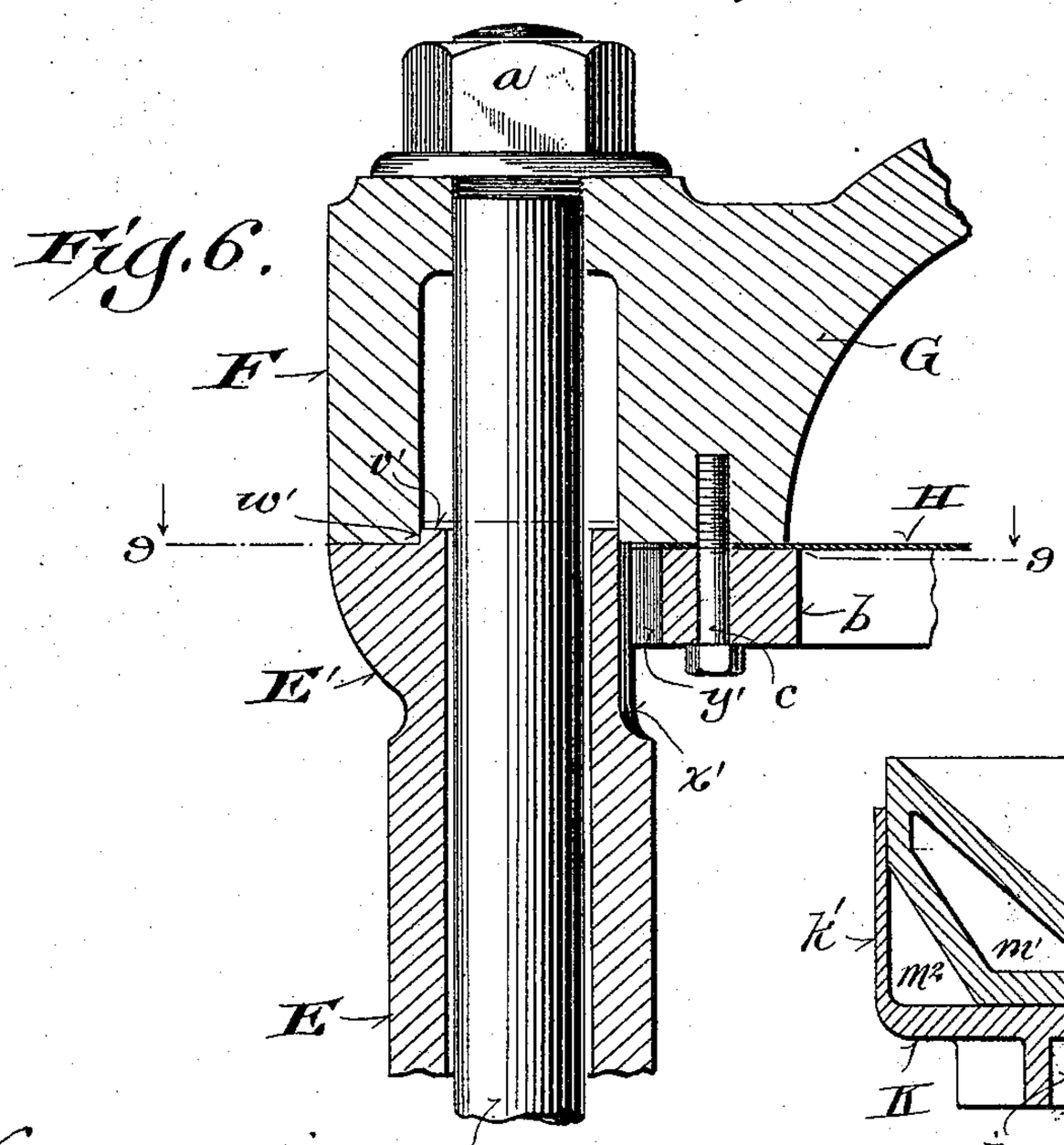
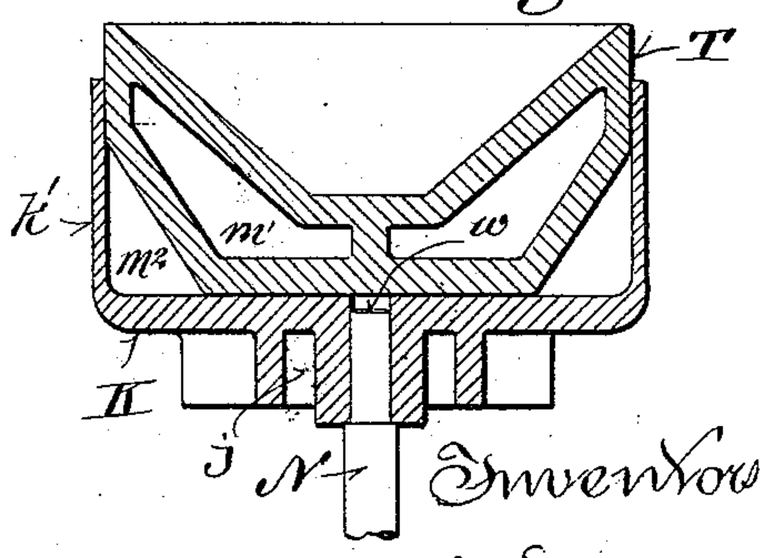


Fig. 10.



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UNITED STATES PATENT OFFICE.

WILLIAM J. EGAN AND ALBERT SLOCUM, OF MILWAUKEE, WISCONSIN.

HAT-PRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 540,426, dated June 4, 1895.

Application filed June 18, 1894. Serial No. 514,869. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM J. EGAN and ALBERT SLOCUM, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Hat-Pressing Machines; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to machines for pressing hats, especially those made from straw and analogous material, and consists in certain peculiarities of construction and combination of parts, all as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a front elevation of a device embodying our present invention, partially broken away and partly in central vertical section to better illustrate details of construction. Fig. 2 is a plan view of the dome of the machine, partially broken away to illustrate the arrangement of the flexible diaphragm beneath. Fig. 3 is a horizontal sectional view on the line 3 3 of Fig. 5, looking up. Fig. 4 is a horizontal sectional view on the line 4 4 of Fig. 5, looking down. Fig. 5 is a side elevation of said device, partially broken away and partly in section, on the line 5 5 of Fig. 4. Fig. 6 is a detail sectional view on the line 6 6 of Fig. 2. Fig. 7 is a like view on the line 7 7 of Fig. 3. Fig. 8 is a detail of the platform and water-cylinder. Fig. 9 is a detail horizontal sectional view on the line 9 9 of Fig. 6. Fig. 10 is a central vertical sectional view of the die-seat holder and heat-shield and die-seat, taken on a line at right angles to the section line showing said parts in Fig. 1.

Our device is designed to press straw hats into shape, being the final mechanical operation upon untrimmed hats, after sewing, sizing, and blocking, and completes the hat, with the exception of such grades of hats as require trimming, such as the sweat-leathers, linings, and outside trimmings, and it relates to that class of hat-pressing machines in which the hat previously formed to nearly the right shape by sewing and blocking is placed in a hollow or female die of the proper form, and subjected to a powerful hydraulic pressure transmitted through a flexible diaphragm formed of vulcanized india-rubber or other suitable material.

Referring to the drawings, A represents a suitable platform, from which rises a hollow standard or box-base B, preferably cast integrally with said platform, there being laterally projecting lugs or wings C C extending from the box-base B toward the corners of the platform, as shown, said wings being vertically hollow, at their outer portions, to receive the bolts D D which pass through said hollow wings, and through the hollow columns E E which rest on said wings, said bolts also passing through vertically hollow lugs F F projecting from the sides of the dome G, and these bolts D D being screw-threaded at both ends and fitted with nuts, *a a*, when the parts are put together, as best shown in Fig. 1. On the under side of said dome is an open or annular clamping plate *b*, between which and the corresponding bottom edge of said dome is held the edge of the described flexible diaphragm H, the said dome and plate being united by a series of studs *c c c*. The flexible diaphragm H (called in the trade a "hat-bag") is formed with a central depression *h* of the general shape of a hat-crown, and by reason of the flexibility of the material of which it is formed this general shape is readily extended by the hydraulic pressure of water introduced into the dome through the pipe *d* to closely conform to the shape of the face of the particular die employed when the device is in use.

The top of the described hollow standard or box-base B is cast solidly with its walls provided with a series of perforations *e e e* arranged adjacent to its periphery, and with a central perforation *f*. Resting upon this described base top is an oscillating locking plate I having a downward projecting centering hub *z'*, fitting within the said hole *f*, and a central perforation *g*, and a series of peripheral perforations *i i i*, which at certain times register with the described openings *e e e*, as shown in Fig. 1, while at other times they do not, when the device is in the locked position shown in Figs. 4 and 5. The upper surface of this locking-plate I is preferably provided with an annular flange J, forming with the corresponding annular recess *j* in the under

side of the die-seat-holder K, an air-cushion, as hereinafter more particularly described. The said die-seat-holder K is further provided on its under side with a series of sockets *k k k* having interior screw-threads, within which are screwed the upper ends of legs L L L adapted to pass down through the described series of holes—*i*, *e*, in the locking-plate I and top of the box-base B when the parts are in the position shown in Fig. 1, and to rest upon the top of said locking-plate, when the latter has been turned, as hereinafter described, and the parts are in the position best shown in Fig. 5.

The bottom of the box-base B is provided with an oblong opening *m*, to enable the similarly shaped lateral extensions or arms *n n* on the water-cylinder M to be passed up through, and then be turned one-quarter around, and secured, as by bolts or studs *o o* as shown in Fig. 1. This cylinder is provided with a central bore, divided near its upper end by means of an inner annular flange *p*, into a lower water-chamber, *q*, and an upper shorter chamber *r* filled with a suitable packing (preferably fibrous) forming a stuffing-box, whose upper end receives a gland *s*, secured in place by bolts or studs *t t* whose screw-threaded lower ends pass down into suitable screw-threaded sockets in the top of the water-cylinder M, as shown in Fig. 1, and the bottom of this cylinder is further provided with a water-pipe *u*.

N is a plunger, in the form of a long cylindrical rod (which may, for convenience, be made in sections, as indicated by the line *v*, just above the gland in Fig. 1) and the upper end of this plunger is preferably reduced in diameter, and inserted within a central opening *w* in the described die-seat-holder K, being secured therein by any suitable means, such as the pin *x*, the said plunger N passing through the described central perforation *g* in the hub *z'* and locking-plate I, all as best shown in Fig. 1.

The locking-plate I is formed with an annular rabbet or shoulder *y* on its peripheral edge, and a similarly (but inversely) shouldered ring *z* surrounds the same, and is secured to the top of the box-base B, as by cap-screws *a' a'*, and the said locking-plate, at its periphery, is cut out (that is the lower projecting shoulder *y* is removed) for about one-sixth of its circumference, as shown at *b'* in Fig. 4, and a horizontal square opening is cut through the ring *z*, and into the top of the base-box B, and a key or stop O is fitted in said opening and preferably secured by the passage therethrough of one of the described cap-screws *a'*, as best shown in Figs. 4 and 5. Projecting outwardly from the described ring *z* are two bracket arms *c' c'* cast therewith, and perforated near their ends to receive a short shaft *d'* on which are mounted two chain sheaves *e' f'* having long inwardly projecting hubs, so that each sheave will run close to its adjacent bracket arm, in line with the chain-groove *g'* in the annular flange J on the locking-plate I. P is a chain, in said groove, and rigidly fastened, as by a stud or studs *h'*, and beyond the fastening point, on one side, the said chain P runs over the sheave *e'* and connects with a stout spiral spring Q, which in turn is secured as by a screw-eye *i'* to the platform A, while beyond the fastening point, on the other side of said annular flange J, the chain P runs over the other sheave *f'*, and down to a treadle R, next described. The treadle is yoke-shaped and secured by trunnions *j' j'*, to the platform A, and the said treadle has a foot-plate S, located adjacent to the line of the sheave *f'*.

The die-seat-holder K is formed with an upward extending flange *k'* forming a heat-retaining jacket, and heat-shield, within which is located the die-seat proper, marked T, of the shape in section best shown in Fig. 1, there being a steam space *m'* within said die-seat, and communicating steam-pipes *n' n'* leading thereto from an outside source of steam-supply, not shown, and there being a large annular air-space *m²* entirely surrounding the die-seat T, between its outer wall, and the flange *k'* of the die seat holder K, through which air-space the described steam inlet and outlet pipes *n' n'* extend, the inner ends of said pipes being inserted in transverse bores formed in said outer wall of the die-seat and communicating with said steam space, as stated, and shown in Fig. 1. Above this die-seat is shown a removable bushing or false seat *o'* which can be taken out, or changed, to suit different sizes of dies, and above this is seen the die U, formed of cast zinc, with a recess V of the required shape to receive the hat (W) to be pressed, said recess being a little larger than the central depression *h* of the flexible diaphragm H. From the flange or jacket *k'* of the die-seat-holder K there project lugs *p'* formed with vertical bores *q'* therethrough.

X X represent guide shoes, having external concavities to receive and fit against the described columns E E and also provided with recesses Y in their shanks to receive the described lugs *p'*, and when the parts are put together, bolts Z of a less diameter than that of the bore *q'* in the said lugs *p'* are inserted through openings in the shanks of the said guide-shoes X and through said bores *q'*, and when the proper adjustment has been made, the nuts on said bolts Z are tightened, and therefore the guide-shoes will be kept exactly in proper position during the operation of the device.

The upper opening through the shanks of the guide-shoes X for the bolts Z is smooth bored, but the lower opening is screw-threaded and the lower part of the bolt is screw-threaded to fit the same, as shown at *u'* in Fig. 7, besides which both ends of the bolts Z are screw-threaded, so that there are nuts *t' t'* at both

ends of said bolts, above and below the shanks of the guide-shoes X, as also shown in said Fig. 7.

The frame-work of this device is very strongly and accurately put together, as is essential on account of the tremendous strain to which the device is subjected in operation and the necessity for perfect alignment. The projecting lugs or wings C C are counter-bored on top, as shown at r', and the bottom of the columns E E which rest thereon are formed with corresponding downward projections s', accurately turned to fit the said counter-bores r', all as shown in Fig. 1. Similarly, as shown in Fig. 6, the upper ends of these columns E are provided with projections v' accurately turned to fit counter-bores w' in the lugs F of the dome G, and the heads E′ of these columns E (which are of increased diameter over that of the columns below to insure greater rigidity and hence more perfect alignment) are cut out, on their inner sides, as shown best at x' in Fig. 6, to receive the described annular clamping-plate b, which plate (as shown by the dotted lines y' in Fig. 2 and full lines y' in Figs. 6 and 9) is itself cut out, in order that said plate b may clear the columns E when it is lowered with the die-seat-holder K k', as hereinafter described. The columns E, below their heads, and above their bases, are preferably of less diameter than at the latter points, to effect a saving of material and secure increased space for the vertically movable parts between said columns.

The operation of this device will be readily understood from the foregoing description of its construction, taken in connection with the accompanying drawings. In starting the machine, the parts are in the positions shown in Fig. 1. A hat (W) is placed within the recess V of the die U, steam having previously been admitted to the space m' within the die-seat T through the pipes n' until the die is heated to about 300° Fahrenheit. Next, water, at a pressure of about six hundred pounds to the square inch is admitted through pipe u to the water-chamber q in the water-cylinder M (said pipe u being shown as entering through the bottom of said cylinder M, but its exact point of entrance being immaterial so long as it directly communicates with said chamber q), which forces up the plunger N, raising with it the die-seat-holder K, and contents and attachments, up to a position high enough to enable the legs L L L to clear the top of the locking-plate I. When this is done, the spring Q retracts, thereby drawing on the chain P over the sheave e' and turning the locking-plate I, so that it assumes the relative position with respect to the box-base B shown in Figs. 4 and 5, and preventing, thereby, the return of the legs to their former position, when pressure from the dome is applied, as hereinafter explained. Next, water, at the necessary pressure suitable to the nature of the goods to be pressed, is introduced into the dome G, through the pipe d (which pressure may be all the way from one pound to two thousand pounds to the square inch) which expands the flexible diaphragm H against the hat W, dilating the depression h and filling it out within the hat-crown, as shown in Fig. 5, thereby pressing said hat absolutely to the shape of the die. When this is done, the water is exhausted (by means of an ordinary exhaust valve, not shown, on the pipe d) from the dome G, and as the pressure is released from above the die, and still retained within the water-cylinder M, the latter pressure serves to raise the legs L L L sufficiently above the locking-plate I to free the latter from contact therewith, and then the operator places his foot upon the foot-plate S of the treadle R, and this draws on the chain P over sheave f' and turns the locking-plate I, thereby causing the holes i in said plate to register once more with the holes e in the top of the box-base B, in line with legs L L L, and then the water within cylinder M is exhausted (by any approved form of exhaust valve, not shown, in the pipe u) and this permits the descent of the plunger N, and again depresses the legs L L L, through the described holes, back to the position shown in Fig. 1, when the hat just pressed can be removed, and another hat put in its place.

Whenever it is necessary to remove the flexible diaphragm H, for repair, or replacement, or for any other reason, the die-seat-holder K k' is elevated to the position shown in Fig. 5, and the nuts on the lower screw-threaded ends of the studs c c c are removed (leaving the studs proper projecting down from the dome G) and then the annular clamping plate b will drop down and rest on the top edge of the flange k' of the die-seat-holder K. Then the water is let out of the cylinder M, and the locking-plate operated by the treadle, all as before described, and this lowers the die-seat-holder and the plate b carried thereby, when the flexible diaphragm H can be readily removed and replaced, and then by the reintroduction of water, under pressure, into the cylinder M the die-seat-holder is again raised, carrying the plate b with it back to its former position, when the nuts can be quickly screwed onto the ends of the studs c c c, and the device is once more ready for operation.

Should the legs L L L ever become broken or injured, the injured member can be readily removed from its socket k, and replaced by a perfect leg, without detriment to the rest of the device.

In order to obviate friction in the oscillation of the locking-plate I, it is necessary that said plate should have the described centering hub z', as otherwise it would be practically impossible, or exceedingly difficult, to move the locking-plate I, by means of the described treadle mechanism.

By reason of the described construction of the oscillating locking-plate I with its upward

projecting annular flange J, and the corresponding annular recess *j* in the under side of the die-seat-holder K, an air-cushion is formed when the two parts come together, which is of great value and importance, as it breaks the momentum obtained by the die-seat-holder and contents in its rapid descent to an open position, and by reason of the construction of the flange *k'* on said die-seat-holder K not only does the same serve as a heat-retaining jacket and prevent the radiation of heat from the die-seat T in an obvious manner, but it also forms a heat-shield, and enables the operator to work with comfort, despite the high degree of temperature to which said die-seat is necessarily raised during the operation of pressing the hats, and this we regard as one of the most valuable features of our present invention, as by its use and the consequent air-space m^2 thereby formed, an operator can remain at his work the entire day unaffected by the intense heat of the die, which latter is further economically kept at the proper heat without loss by radiation, as would otherwise occur.

Although especially designed for straw-hats our machine is equally well adapted for pressing hats of felt, or other material.

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

1. In a hat-pressing machine, the combination with a hollow base or standard, having a top provided with a central perforation and a series of perforations adjacent to its periphery, of vertical guides supporting an expansible fluid chamber, another fluid chamber connected to said base, a vertically movable plunger communicating with said last named chamber, a die-seat and holder supported on said plunger, an oscillating locking plate resting on said base top, and provided with a series of perforations adapted to register with those in said base-top, a spring connected to said locking-plate for moving the latter and thereby throwing the perforations therein out of line with those below and a series of legs depending from said die-seat-holder in line with the perforations in the base-top.

2. In a hat-pressing machine, the combination with a hollow base or standard, having a top provided with a central perforation and a surrounding series of perforations, of vertical guides supporting an expansible fluid chamber, another fluid chamber connected to said base, a vertically movable plunger communicating with said last named chamber and carrying a die-seat-holder on its upper end, guide-shoes on said die-seat-holder in engagement with said vertical guides, an oscillating locking plate resting on said base-top and having a hub fitting within the central perforation in the latter and provided with a central vertical perforation, and a surrounding series of perforations adapted to register with those in said base top, a series of legs depending from said die-seat-holder in line with the perforations in the base-top, a retracting spring connected to said locking-plate for moving the latter and thereby throwing the perforations therein out of line with those in the base-top below, and a treadle pivoted to said base or standard and flexibly connected to said locking plate for oscillating the latter in opposition to the movement caused by said spring, and bringing the perforations in said locking-plate in line with the perforations in the base-top below and the legs above.

3. In a hat-pressing machine, the combination with a hollow base or standard, having a top provided with a central perforation and a surrounding series of perforations, of a circular oscillating locking-plate resting on said base-top, and having a hub fitting within the central perforation in the latter, and provided with a central vertical perforation and a surrounding series of perforations adapted to register with those in said base-top, said locking plate being formed with an annular peripheral rabbet or shoulder, cut away or removed between certain points of said periphery, an inversely shouldered ring surrounding the said locking plate and secured to the base-top, a key or stop projecting horizontally into the base-top and through the said ring, and located between the walls of the cut-away portion of the locking-plate periphery, a fluid operated plunger passing through said base-top and said locking plate, a die-seat-holder supported on and secured to said plunger and having depending legs in line with the perforations in said base-top, and means for moving said oscillating locking-plate in either direction, as required.

4. In a hat-pressing machine, the combination with a suitable base or standard, of guide-columns rising therefrom, a fluid-receiving dome secured to and supported upon said columns, the base of said dome being formed of an expansible flexible diaphragm, and an open or annular clamping plate detachably secured to said dome beneath said diaphragm and having its periphery notched to fit against said guide-columns, and form a clearance therefor, in the downward movement of said clamping plate when detached.

5. In a hat-pressing machine, the combination with a suitable platform, of a box-base or hollow standard rising therefrom, and provided with hollow wings, counterbored at their tops, hollow guide-columns, resting on said wings and provided with central downward projections fitting within the said counterbores therein, and said columns having central upward projections at their tops, a dome provided with laterally projecting and vertically hollow lugs, said lugs resting on the said columns and being centrally counterbored to receive the described upward projections thereon, vertical bolts passing through said hollow lugs, columns and wings, and being screw-threaded at each end, and fastening nuts upon both ends of said bolts.

6. In a hat-pressing machine, the combina-

tion with a die-seat-holder having a vertical upward extending outer flange, of a die-seat supported within said holder, the upper portions of said die-seat and said flange being in contact, with an interposed air-space below said line of contact, and said die-seat being formed with an internal steam-space wholly independent of said air-space, and steam-supply pipes passing through said flange and communicating with said steam-space, whereby the said flange subserves the double purpose of a heat retaining jacket and a heat-shield.

7. In a hat-pressing machine, the combination with a suitable platform and base, of guide-columns rising therefrom, a fluid-cylinder connected with said base, and a fluid-impelled vertically-moving plunger communicating with said cylinder, a die-seat-holder supported on and secured to the upper end of said plunger, lugs projecting from said die-seat-holder formed with horizontally-elongated vertical bores therethrough, guide-shoes having external concavities to receive and fit against the said guide-columns, and provided with recesses in their shanks to adjustably receive the said lugs, securing-bolts passing through bores in the said shanks and lugs, and tightening-nuts on the ends of the said bolts.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

WILLIAM J. EGAN.
ALBERT SLOCUM.

Witnesses:
H. G. UNDERWOOD,
N. E. OLIPHANT.