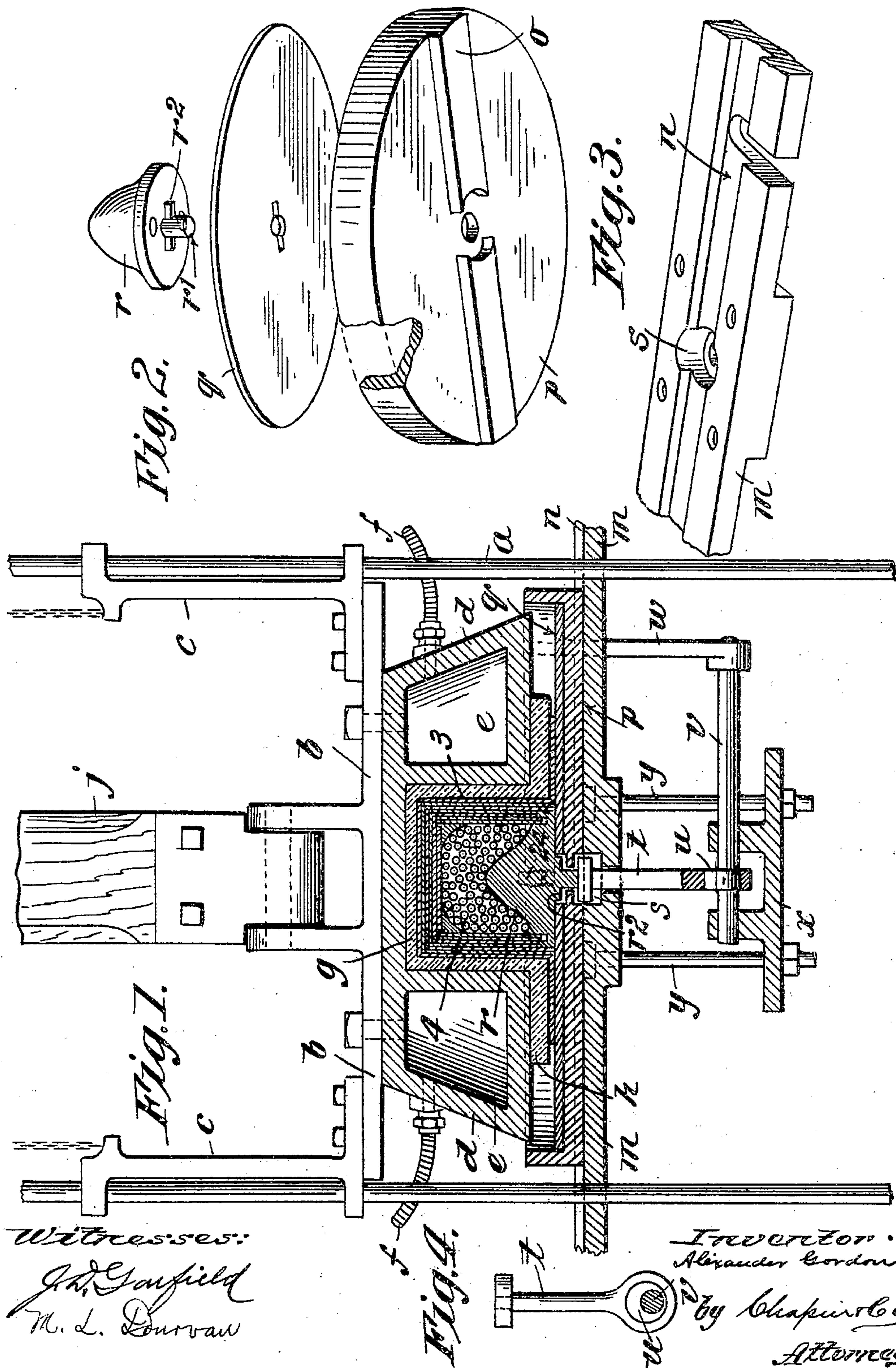


No. 801,002.

PATENTED OCT. 3, 1905.

A. GORDON.
HAT PRESSING MACHINE.
APPLICATION FILED SEPT. 3, 1904.

2 SHEETS—SHEET 1.

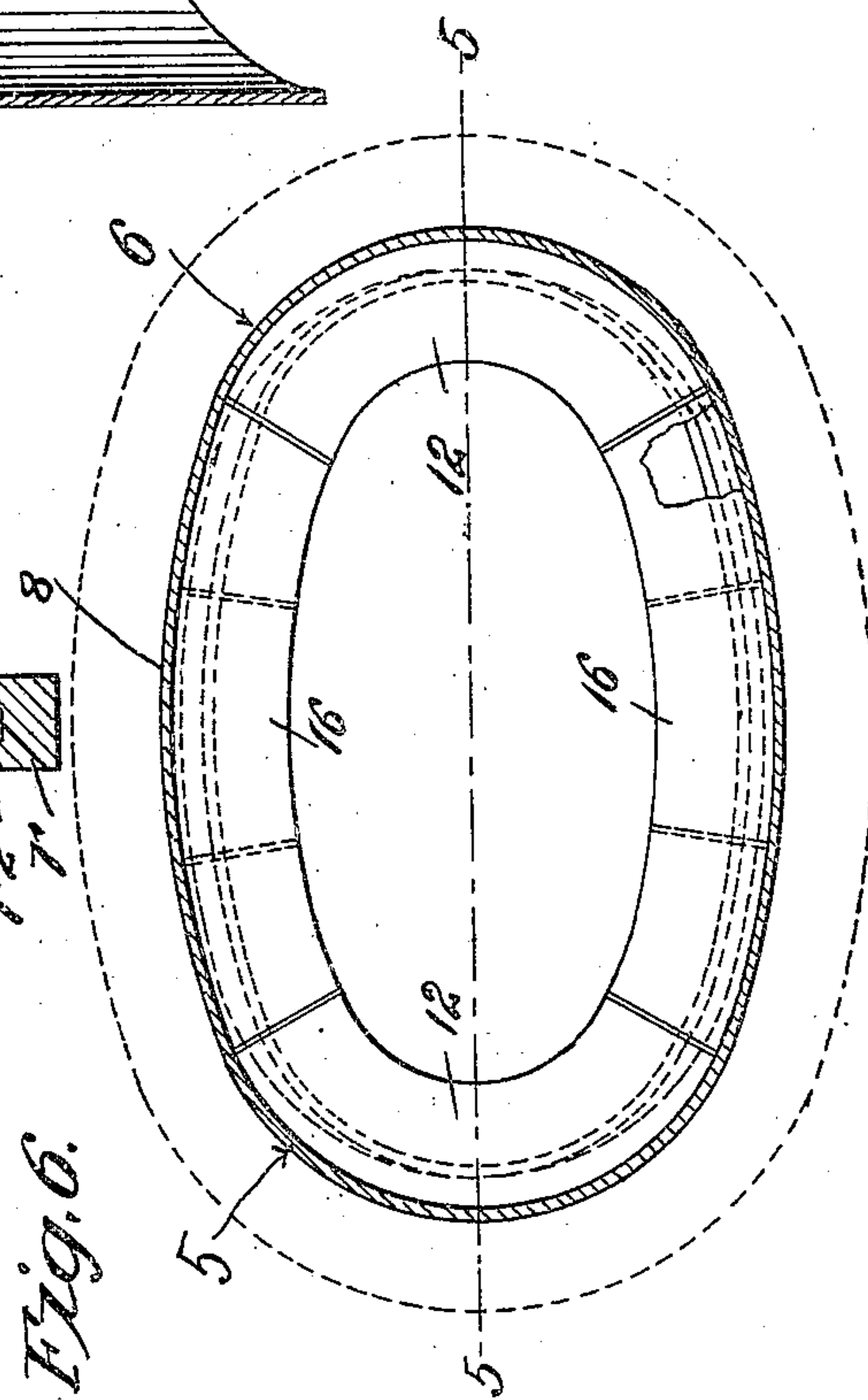
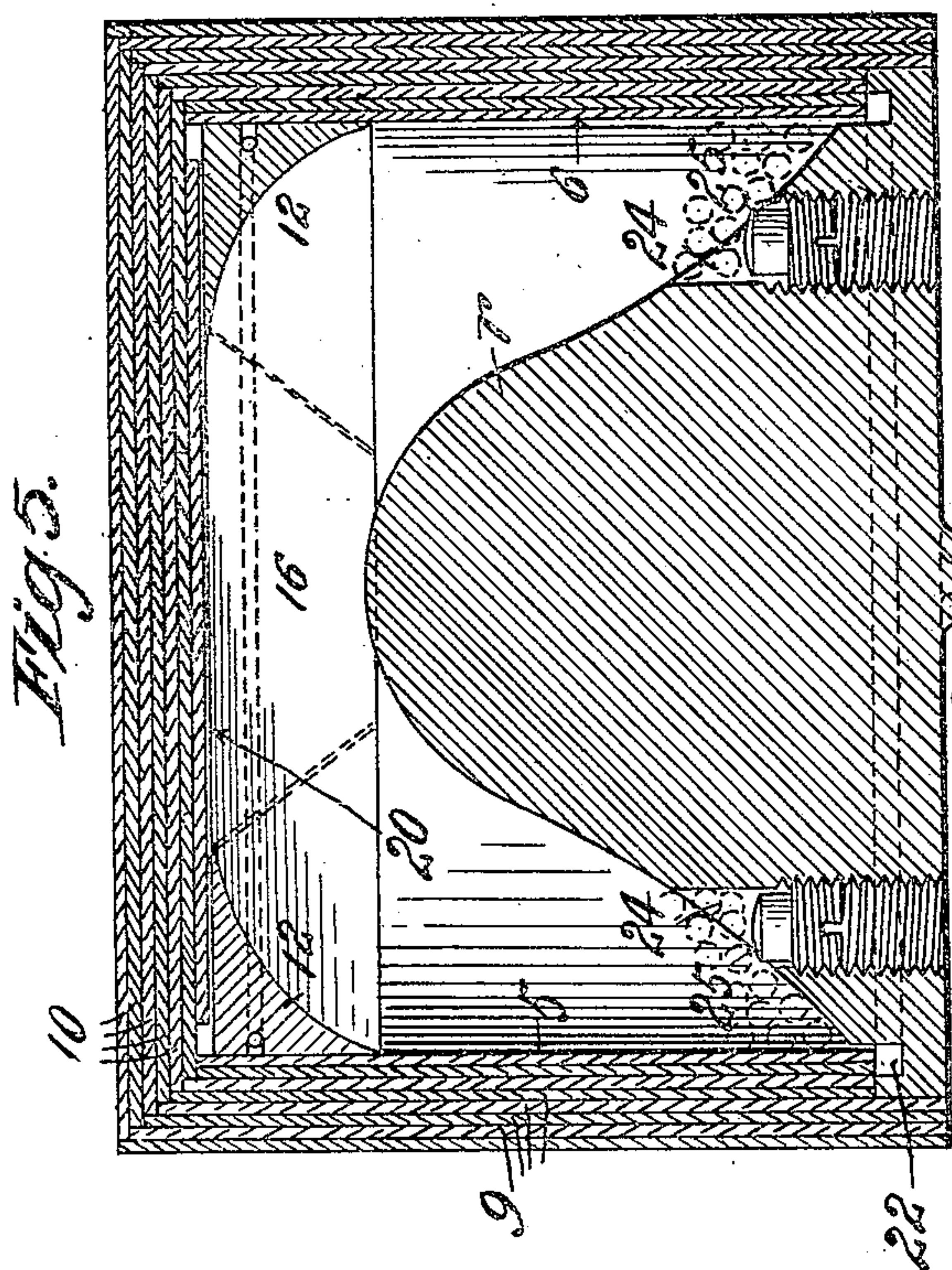
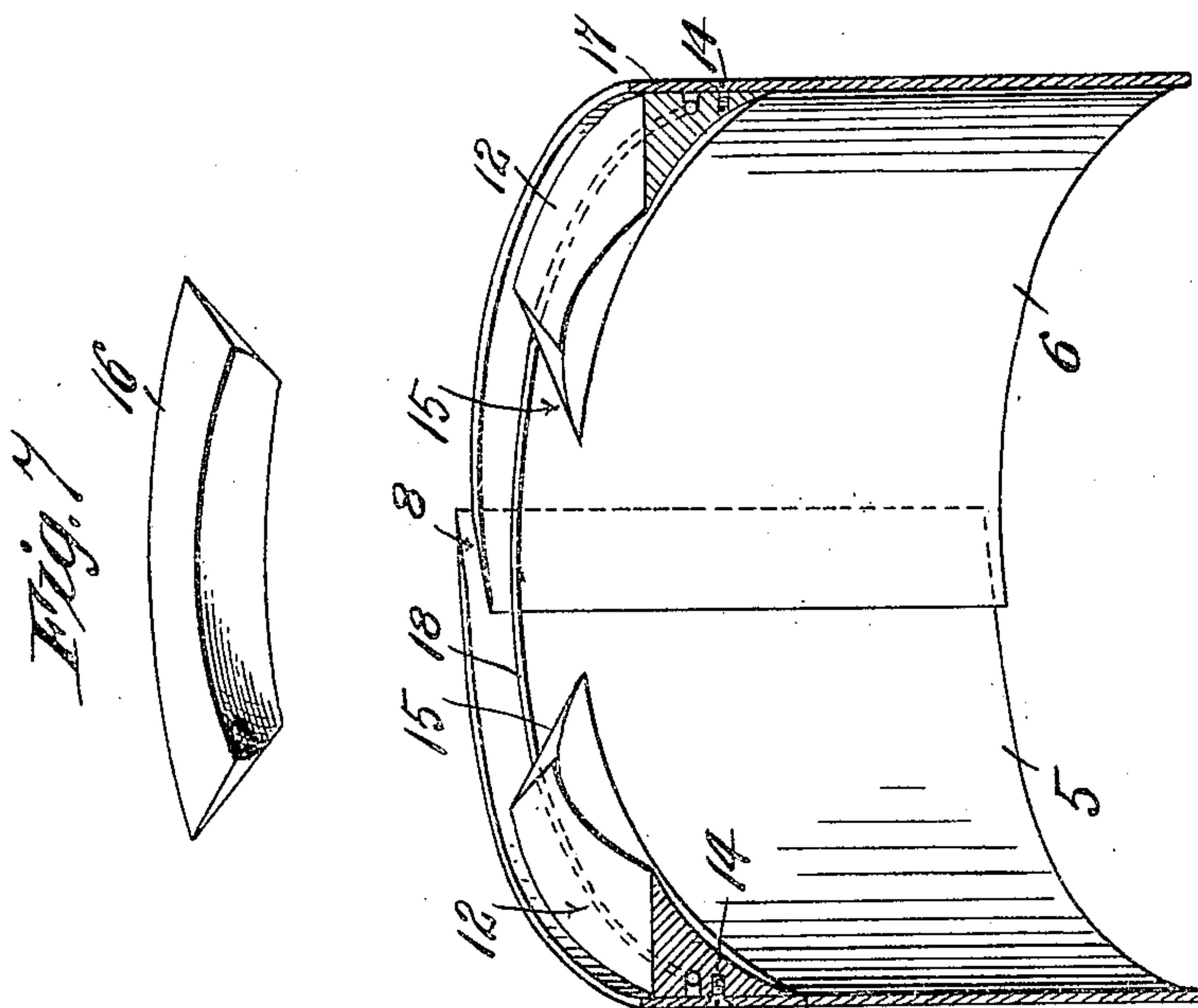


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ALEXANDER GORDON, OF NORTH DANA, MASSACHUSETTS.

HAT-PRESSING MACHINE.

No. 801,002.

Specification of Letters Patent.

Patented Oct. 3, 1905.

Application filed September 3, 1904. Serial No. 223,212.

To all whom it may concern:

Be it known that I, ALEXANDER GORDON, a citizen of the United States of America, residing at North Dana, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Hat-Pressing Machines, of which the following is a specification.

This invention relates to hat-pressing machines, the object of the invention being to provide a machine of this character adapted to press into shape a flat-crowned straw hat, for example, whereby a sharp corner may be formed at the edge of the crown where it meets the side thereof. Various machines have been constructed for this purpose, notably those using hydraulic pressure; but these leave much to be desired as far as the formation of a sharp bend in the edge of the crown is concerned.

A further object of this invention is to provide improved means whereby the pressure may be so applied to the sides and to the top of an expansible die that this edge may be pressed firmly well into the corners of the block to form this bend at the edge of the crown.

A further object of the invention is to improve the construction of the expansible die and accessory parts thereof whereby the pressure applied to the hat may be exerted uniformly against the latter in all directions; and the invention embodies, furthermore, certain novelties in the construction, which will be fully described in the following specification, all being clearly summarized in the claims appended thereto.

While the invention as illustrated herein is embodied in a machine adapted especially for use in the manufacture of straw hats, it is obvious that without material change it may be employed in the manufacture of any hat which must be shaped under pressure.

In the drawings forming part of this application, Figure 1 is a sectional elevation of a hat-pressing machine embodying this invention and showing a portion of the table and frame to support the same. Fig. 2 is a perspective view of certain parts of the device located on the table of the machine and shown in their separated relations. Fig. 3 is a perspective view of a portion of the table. Fig. 4 is a detail view of a plunger which actuates certain of the parts located on the

table. Fig. 5 is an enlarged sectional elevation of an expansible pressing-die, the plane of the section being on line 5 5, Fig. 6. Fig. 6 is a plan view of the same. Fig. 7 is a perspective view of a portion of the metal lining of the expansible die shown in Fig. 5, showing the manner of fitting the corner-pieces therein.

In its general disposition this machine is similar to others which have been built for the same purpose—that is to say, suitable uprights *a* are provided, four in number, laid out in rectangular form and extending from floor to ceiling, so that the frame *b*, also of rectangular shape, may by means of the standard *c* at the corners of said frame engage these uprights to slide freely thereon. To the frame *b* is secured the heated mold or head *d*, which is bolted to the under side of the frame and is of suitable oval shape and provided with a chamber *e*, through which, by means of the pipes *f*, steam may circulate to maintain it at the right temperature.

The mold proper for the hat is represented by *g* and is made of suitable metal and consists practically of a lining applied to or a part set into a proper-shaped cavity in the head or mold *d*. This lining or part is carried out under the base of the mold, as shown at *h*, and may be integral with that portion in said cavity or not, and it extends over the brim of the hat. This mold is hung on the end of an arm *j*, which, by means of a suitable crank (not shown) raises and lowers the mold, as required. All this is common in this class of machines, and it is sufficient to say that the mold in this construction and the mode of operating it are substantially the same as now practiced, and when the mold is moved downward over the die on which a hat has been fitted the arm *j* toggles and holds the hat under pressure as long as desired.

Extending between the uprights *a* is a table *m*, (a portion of which is shown in Fig. 3,) which consists of a relatively narrow metal bed having a longitudinal groove therein, in which the rib *o* on the bottom of the circular plate *p* fits. In this plate is a thick rubber cushion *q*, and on this cushion the cone *r* is supported, having a stem *r'*, as shown in Fig. 2 particularly, extending through said cushion and through the bottom of the plate *p*, its lower end projecting into the cavity *s* in the table *m*. The stem *r'* is pro-

vided with a cross-bar r^2 or some similar device whereby the cone may always be located in the proper position relative to the die by the engagement of said bar r^2 with a suitably-shaped groove in the plate p . This is shown in Fig. 1. It is in the cavity s that the head of the plunger t is located, (which plunger is shown in Fig. 4,) and the lower end of the plunger is connected with the shaft v by means of an eccentric u . On the outer end of this shaft is a suitable lever w to rotate the shaft, whereby the plunger t may be forced against the stem r' of the cone r to force the latter into the dense material which fills the expansible die. The latter being of resilient material, when the plunger t is withdrawn the cone will again be forced out of the die by the contraction of the walls of the latter. The shaft v is carried in bearings on a suitable base x , which is supported on bolts y , secured to the under side of the table in a depending position. Thus we have a table on which the plunger t is supported and provided with the cavity s , in which the head of the plunger may lie below the surface of the bottom of the groove n in said table.

On the table m we have the plate p , with a rib thereon which fits the groove in the table, and this plate carries an expansible die which as a whole may be indicated by 3. Comprised in this die is the cone r , the die and the cone being supported on the rubber cushion q , and the mold d fitting over the die. Thus the plate p may slide between the uprights a to the right or left of the position shown in Fig. 1 to have a hat put onto the die or removed therefrom, and the plate p may then be slid back under the mold or head b and the latter be moved down to embrace the hat on the die, at which time the lever w is swung up to force the cone r into a mass of hard-steel balls 4, which are located in the die between the inner surface thereof and the surface of the cone r . The forcing of the cone into the balls 4 crowds the latter in every direction against the walls of the die, and as the balls are relatively small and packed closely into the space between the die and the cone but relatively slight movement of the latter is necessary to expand the die. To permit the expansive action of a force of this character on all parts of an expansible die, it is self-evident that the die must be lined with some metal which will prevent the balls from embedding therein. Furthermore, this lining must be capable of expansion, and its corners must be filled in so that the balls cannot possibly bridge the corner at any point, and thereby neutralize to a certain extent the expansion of the die in a manner which will form a good sharp corner at the edge of the crown in the manner described. Having these ends in view, the die comprises a sheet-steel lining for the vertical walls thereof, con-

sisting of two parts 5 and 6, (illustrated in Figs. 6 and 7,) which, as shown, will form when placed together as in Fig. 6 the necessary oval shape to receive the die, their edges overlapping, as at 8, and being beveled off to slide freely one on the other to a certain extent. This lining is fitted into the expansible die 3, which is made up of a series of annular bands 9, of rubber or rubber mixture combined with a suitable fabric, the height of which bands or rings 9 increases from the interior outward by so much as is necessary to represent the thickness of the oval disks 10, which form the upper surface of the die. Before the lining parts 5 and 6 are introduced into the die or before the building up of the die around these pieces the corner-filling pieces (shown in Fig. 7 particularly) are secured to each of the parts 5 and 6. These corner-pieces consist of the curved end portions 12, which fit the small ends of the die and are secured, by means of screws 14, rigidly to the lining-pieces. The ends of these portions 12 extend only part way around both sides of the lining-pieces and have their ends beveled off, as at 15, and another corner-filling portion 16, whose ends are beveled to correspond with the beveled ends of the pieces 12, is fitted into each side of the lining and is of such length as to extend considerably beyond each side of the overlapping ends of said lining-pieces. A groove 17 is cut in the wall of the corner-pieces adjacent to the surface of the lining in all of the corner-filling parts, and the wire 18 is located in this groove, with its ends tightly joined together, whereby the parts 16 may be loosely held in proper relation to the parts 12. In this way, although the lining-pieces 5 and 6 may separate more or less under pressure, the wire 18 will maintain the parts 16 in substantially the same plane as the parts 12. These corner-pieces, as shown in the drawings, are substantially triangular in cross-section, and the plane of the upper surface thereof lies just below the edge of the lining-pieces 5 and 6, and on this upper surface lies the metal disk 20, which is of such a width that it will fit loosely within the up-standing edges of the lining-pieces 5, whereby it may be possible for the contraction of the die to take place to its fullest extent without permitting the edge of the lining at any point to come in contact with the edge of said plate.

In making up the expansible die the preferred manner of construction is to line the mold g with sheet-lead or some similar metal which can be fitted closely therein and the thickness of which will represent the thickness of the hat. The bands 9 and the disks 10 are then fitted in the mold and the lining of the latter fitted in position and the corner-filling pieces secured in the manner de-

scribed to the lining, the cone-shaped member *r* also being fitted into the open side of the die. The outer one of the bands 9 and the outer disk 10 are made of a mixture
 5 which when vulcanized will be somewhat harder than the interior bands, to the end that where the upper edge of this outer band and the edge of the outer disk 10 come together a sharp corner will be formed sufficiently resistant to be forced into the corner
 10 of the mold to form at the edge of the crown of the hat the sharp bend required. Thus after the die has been made up, as described, and the cone-shaped member *r* fitted in the
 15 open side thereof the die is subjected to heat and vulcanized, the edge of the open side of the die being made to adhere to said cone-shaped member.

The cone *r* may be of cast-iron or other
 20 suitable metal, the shape of which transversely and longitudinally should conform generally to the oval shape of the hat. The die in cross-section is made substantially as shown in Fig. 5, and around the lower edge
 25 thereof and at right angles to the flat base a groove 22 is formed substantially in the plane of the metal lining-pieces 5 and 6, which enter the open side of the groove, the latter being deep enough to permit vertical
 30 movement of the cone *r* without causing the lower edge of the lining-pieces to contact with the bottom of the groove. The outer edge of the cone *r* is perpendicular to the
 35 lower edge of the expansible perpendicular wall of the die composed of the strips 9. Extending through the cone from the bottom thereof are two holes 24, closed by screws 25,
 40 whereby the steel balls 4 may be introduced into the interior of the die and the space between the latter and the cone be completely filled. It is of course obvious that when this
 45 space is so filled and the cone is then thrust forcibly into this mass of balls the die will be expanded in every direction and the pressure of the balls against the corner-filling pieces
 50 12 and 16 will be directly in the line of the corner to be formed on the edge of the crown, and this part of the hat will be thrust forcibly into the sharp corner of the mold, to which it
 55 will gradually conform itself. Of course it will be readily understood that the mold *g* may be removed from the head *d* and another substituted therefor adapted to another size
 of hat and that a like change may be made in the expansible die.

While the construction shown in this and described herein is the preferred embodiment of my invention, it will of course be understood that a departure therefrom as regards many of the details of construction herein described may be made without departing from the invention.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent of the United States, is—

1. In a hat-pressing machine, a mold, a hollow elastic die to fit into the mold, said die having one open side; a cone-shaped member to fit into the open side of the die and secured to the borders of said open side, there
 70 being a space between the inner walls of the die and said member; a filling for said space consisting of metal balls, and suitable mechanism to force said cone-shaped member into
 75 said space.

2. In a hat-pressing machine, a mold, an expansible die to receive the hat, said die being open on its lower side, a cone-shaped member to fit into the open side of said die,
 80 the edges of the latter being secured to the edge of the cone-shaped member, there being a space in the die between said cone-shaped member and the inner wall of the die; a material composed of substantially uni-
 85 form units to fill said space, suitable mechanism to force the cone-shaped member into the said material, the die and hat being inclosed within the mold, and means to heat the latter.

3. In a hat-pressing machine, a mold, and
 90 means to heat the same, there being a cavity in said mold to receive a die; an expansible die having side walls and top of resilient material, the under side of the die being open; a
 95 cone-shaped member secured in the open side of the die to close the same, and a material composed of substantially uniform units to fill the space between said member and the inner wall of the die, a sheet-metal
 100 lining for the die, expansible in a plane parallel with the top of the latter, and means to force said member into said material, the die being inclosed by the mold.

4. In a hat-pressing machine, a mold, and
 105 means to heat the same; a table, a plunger on the table and means to actuate the same vertically, a hat-receiving die having an expansible side wall and top, the die being open at the under side; a cone-shaped member to fit the open side of the die, a plate slidable on
 110 said table, and a stem on said member extending through a hole in the plate, together with means to locate said stem and plunger in line, whereby actuation of the plunger on the table may force said member into said
 115 die to expand the latter, the die being inclosed by said mold.

5. The combination with a mold of a hat-pressing machine, of an expansible die, the side wall and top of which are composed of
 120 resilient material, the under side of said die being open; a cone-shaped member to fit the open side of said die, and means to secure the edge of said member and the edge of the die together, a body of material composed of
 125 substantially uniform units located between said member and the inner walls of the die, a metal lining for the die expansible therewith,

together with movable corner-filling pieces for the interior of the die.

6. The combination with a mold of a hat-pressing machine, of an expansible die, the
5 side wall and top of which are composed of resilient material, the under side of said die being open; a cone-shaped member to fit the open side of said die, and means to secure the edge of said member and the edge of the

die together, a body of material composed of 10 substantially uniform units located between said member and the inner walls of the die, and a metal lining for the die expansible therewith.

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