

No. 816,237.

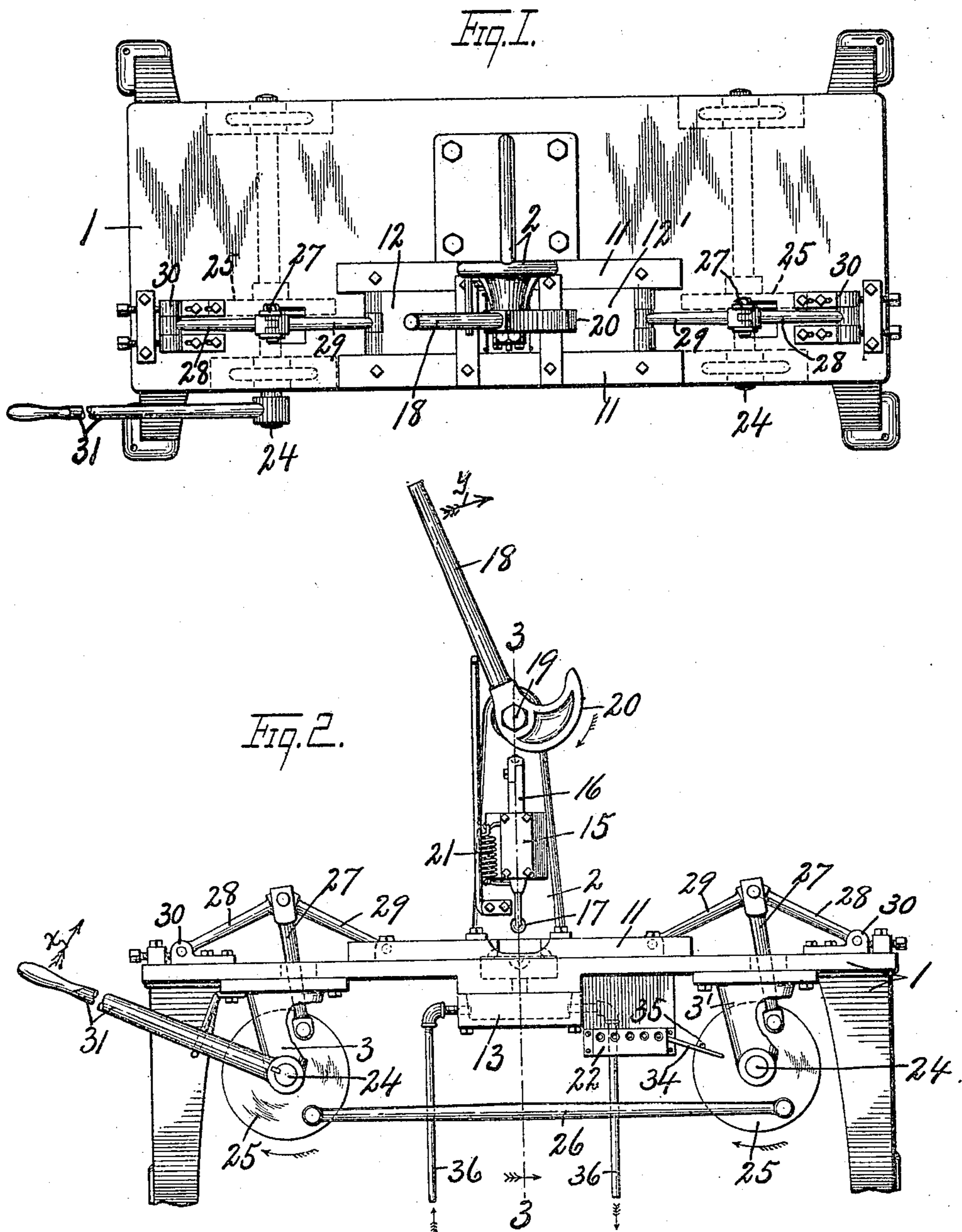
PATENTED MAR. 27, 1906.

P. KOHLBRENNER.

MACHINE FOR FORMING HOLLOW SPLIT BUSHINGS.

APPLICATION FILED JULY 6, 1904.

2 SHEETS—SHEET 1.



WITNESSES.

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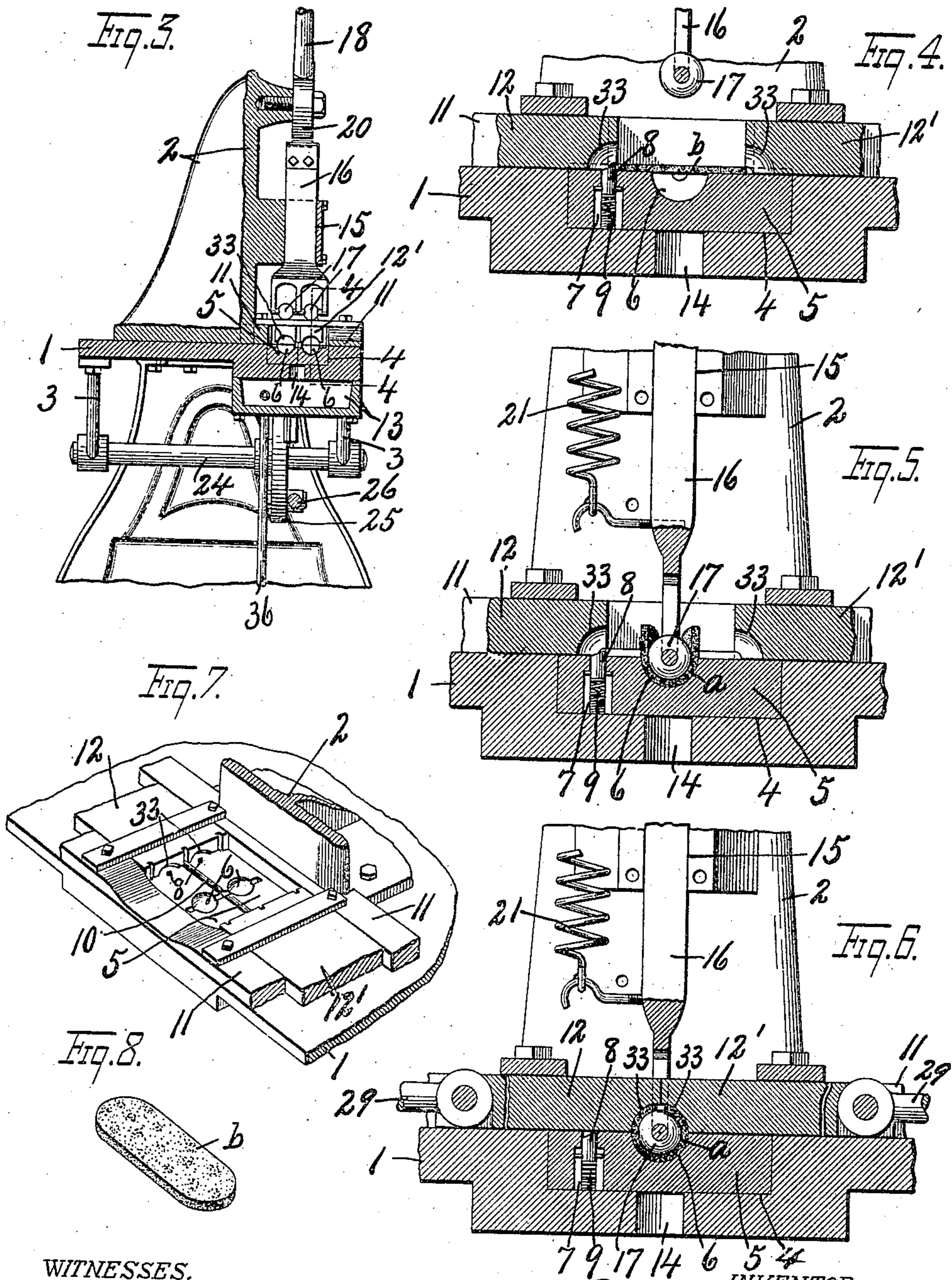
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Fig. 9.



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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR FORMING HOLLOW SPLIT BUSHINGS.

No. 816,237.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed July 5, 1904. Serial No. 215,423.

*To all whom it may concern:*

Be it known that I, PETER KOHLBRENNER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Machines for Forming Hollow Split Bushings, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention relates to a machine for forming hollow split bushings, and is specially adapted for manufacturing spherical leather packings for thill-couplings, in which a sectional draft-eye having spherical sockets is clamped upon a coupling-pin having a spherical surface. This packing is first pressed into the desired form to closely fit in the draft-eye and upon the coupling-pin, and it is then assembled by springing it apart at 20 the longitudinal division and then slipping it over the spherical surface of the coupling-pin, whereupon it automatically springs into engagement with said spherical surface.

My object is to press the packing into a permanent form of substantially the same contour which it would assume when clamped upon the coupling-pin by the draft-eye sections, so as to avoid any abrasion or distortion of the packing during the application or 30 use.

Other objects and uses relating to the mechanism for producing these hollow bushings or packings will be brought out in the following description.

35 In the drawings, Figures 1 and 2 are respectively top plan and side elevation of a press or packing-forming machine embodying the features of my invention. Figs. 3 and 4 are sectional views taken, respectively, on lines 3-3 of Fig. 2 and 4-4 of Fig. 3. Figs. 5 and 6 are sectional views similar to Fig. 4, showing the parts in their successive positions assumed while forming the packing. Fig. 7 is a perspective view of a fragmentary 45 portion of the machine, showing particularly the lower bed-plate and female dies thereon. Figs. 8 and 9 are perspective views, respectively, of the undeveloped blank and the completed bushing or packing formed 50 from the blank.

Similar reference characters indicate corresponding parts in all the views.

In carrying out the object stated I provide a suitable table or bed 1, with a substan-

tially central upright standard 2 and with depending brackets 3 and 3', which are disposed substantially equidistant from and at opposite sides of the standard 2. The top of the bed 1 is formed with a recess 4, substantially midway between its ends, and in this recess is fitted a female die 5, having one or more (in this instance two) spherical recesses 6 in its top face and also provided with a corresponding number of vertical sockets 7 at one end or side of the recesses 6. In these vertical sockets are movable stop-pins or abutments 8, which are spring-pressed upwardly by springs 9, so that their upper ends project a slight distance above the top face of the die 5 and constitute abutments or centering-stops, against which the edges of the packing-blanks are caused to engage, so as to aline or center said blanks with their respective recesses 6. These recesses are located side by side and are separated by a longitudinal rib 10, formed on the upper face of the die 5 to form an abutment or guide for the adjacent longitudinal edges of the blanks which are placed by hand upon the die.

Secured to the upper face of the bed 1 are parallel longitudinal ribs or guides 11, which extend along the opposite longitudinal edges of the die 5 to further facilitate the centering of the blanks over the recesses 6 and also for the purpose of forming guides for transversely-movable dies 12 and 12', which will be presently described.

A hollow steam-chamber 13 is secured to the lower side of the bed-plate 1 directly beneath the die 5 and communicates with the chamber 4 through a passage 14, so that the steam from the chamber 13 impinges directly against and heats the die 5, the opening 14 being directly beneath the recesses 6 in the upper face of the die, so that the walls of the recesses 6 are heated to as high a temperature as possible with steam for the purpose of shrinking the leather and making its form more permanent when completed.

Mounted upon the bracket 2 in a vertical guide 15 is a reciprocating plunger 16, having upon its lower end a number of spherical dies or balls 17, corresponding to the number of recesses 6, so that when the plunger 16 is moved downwardly these balls or spherical dies 17 enter their respective recesses 6 to partially form the packing, the forming of which will be presently described.

The means for operating the vertical movable plunger 16 consists of a hand-lever 18, which is pivoted at 19 to the upper end of the standard 2 and is provided with a lower cam-face 20, which rides upon the upper end of the plunger 16, thus depressing said plunger as the lever is moved in one direction, said plunger being returned to its normal up position by a spring 21.

10 Journalled in the brackets 3 are rock-shafts 24, upon each of which is secured a disk 25. These disks are eccentrically connected to each other by a connecting-rod 26 and are also connected to the transversely-moving dies 12 12' by pitmen 27 and toggle-levers 28 and 29. The toggle-arms 28 are pivotally anchored at one end to brackets 30, which are adjustably secured to the top face of the bed 1, the other ends of said arms 28 being pivotally connected to the upper ends of the pitmen 27. The toggle-arms 29 are also pivotally connected at one end to the upper ends of the pitmen 27, and their other ends extend toward each other and are pivotally secured to the outer ends of the transversal sliding dies 12 12'.

A hand-lever 31 is secured to the rock-shaft 24 for rocking said shaft, and thereby simultaneously rocking the disks 25 through the medium of the connecting-rod 26. This rocking movement of the disks 26 transmits reciprocal motion to the dies 12 through the medium of the pitmen 27 and toggle-arms 28 and 29, the pitmen being connected to the disks 25 in such manner as to simultaneously flex or extend the toggle-arm to move the dies 12 toward and from each other.

The meeting faces or ends of the dies 12 are formed with quarter spherical recesses 33, which when brought together into registration with their respective recesses 6 in the die 5 form complete spherical sockets of slightly-greater diameter than but concentric with the spherical dies 17 when in their operative positions for forming the packings. This movement of the dies 12 toward each other is accomplished by rocking the lever 31 upwardly in the direction indicated by arrow *x*, Fig. 2, during which operation the toggle connection for each die 12 is extended, so that the pivot connecting the toggle-arms to the pitmen lies in a direct line with the pivots which connect said toggle-arms to the bracket 30 and die 12, thereby establishing a dead-lock to hold the dies 12 for any period of time under pressure against the ends of the bushing or packing, as *a*. (Best seen in Figs. 4, 5, 6, 8, and 9.) When the lever 31 is rocked downwardly to the position seen in Fig. 2, the toggle of each die 12 is flexed to separate the meeting ends of the dies 12 a sufficient distance to permit the blanks, as *b*, to be readily placed in the proper position by hand upon the top face of the die 5.

65 Any suitable counting device, as 22, is at-

tached to the bed of the machine and is operated at each return movement of the lever 31 by means of an arm 34, connected to the counting mechanism and brought into action by a pin 35 on one of the disks, as the right-hand disk 25, Fig. 2.

In the operation of forming the hollow bushings or packings steam is circulated through the chamber 13, through suitable steam-pipes 36, until the die 5 is heated to the desired temperature, and, assuming that the levers 18 and 31 are in their normal positions, (seen in Figs. 1 and 2,) in which case the dies 12 are separated and the spherical die 17 is elevated in a plane above the dies 12, then the operator places the blanks *b* upon the upper face of the die 5 and across the recesses 6, so that the edges of the blanks abut against the stop-pins 8 and rib 10. This latter operation is termed "centering" of the blanks with the dies 5 and 17, and as soon as the blanks are thus properly placed the upper spherical die 17 is forced downwardly by rocking the lever 18 in the direction indicated by the arrow *y*, Fig. 2, thereby bringing the cam 20 into operative engagement with the plunger 16. This causes the spherical die 17 to depress the centers of the blanks into the recesses 6 with considerable pressure, and while the die 17 is thus holding the blank firmly in said recesses 6 the lever 31 is then operated in the direction indicated by the arrow *x*, Fig. 2, to force the dies 12 toward each other into engagement with the upwardly-projecting ends of the packing until said ends are firmly pressed against the spherical die 17, as seen in Fig. 6, it being understood that these upwardly-projecting ends, which are best seen in Fig. 5, are engaged by the walls of the recesses 33 of dies 12, thereby completing the operation of forming the blank into a hollow spherical bushing. The dies are allowed to remain in their closed position, as seen in Fig. 6, until the leather bushing is shrunk and set under the pressure and heat of the dies. This whole operation requires but a small fraction of a minute; but as soon as the packing is permanently set the dies 12 and 17 are forced to their inoperative positions, as seen in Fig. 2, whereupon the packings are removed by hand from the spherical dies 33 ready to be inserted in the thill-couplings.

The dies 12 and 12' slide upon the top face of the die 5, and the upper end face of the stop-pin 8 is beveled, so that when the die 12 is brought forward it rides upon the bevel-face of and depresses the stop-pin against the spring 9, which operates to return the pin to its up position when the die 12 is drawn back.

The openings for the clamping-bolts of the brackets 30 are slightly elongated, as seen in Fig. 1, to permit adjustment of said brackets and their connections with the dies 12 and 12' and to compensate for wear of the dies or joints.

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

1. A machine for pressing flat leather strips into spherical form comprising a die having a semispherical recess, means for holding the strip centrally over the recess, a spherical die and actuating means therefor to press the center of the strip into the recess, and additional dies engaging the ends of the strip and pressing them against the opposite sides of the spherical die while the latter is in the recess, and means to actuate the additional dies back and forth.

2. A machine for pressing flat leather strips into spherical form comprising a die having a semispherical recess and an abutment at one side of the recess against which one end of the strip abuts to center it over the recess, a spherical die and actuating means therefor to press the center of the strip into the recess, additional dies sliding upon the face of the first-named die to engage and press the ends of the strip upon opposite sides of the spherical die while the latter is in the recess of the first-named die, said second dies having their meeting end faces formed with concave recesses corresponding to the spherical die.

3. In a machine for forming spherical

leather packings, a female die having a semispherical recess, a male die having a spherical surface, means to move one of said dies toward and from the other to press the center of the packing into the recess, means to heat one of the dies, additional dies having concave faces to engage and press the ends of the packing on the male die, a toggle connected to each additional die, means to adjust said toggle, and further means to flex and extend said toggles.

4. In a machine for forming spherical split-leather bushings, the combination with a spherical male die and a female die having a semispherical recess, one die being movable toward and from the other to press the center of the bushing into the recess, additional female dies operable to press the ends of the bushing upon the male die, toggles connected to operate the additional dies, eccentrics connected to actuate the toggles, and means connected to actuate both eccentrics simultaneously.

In witness whereof I have hereunto set my hand this 29th day of June, 1904.

PETER KOHLBRENNER.

Witnesses:

H. E. CHASE,  
HOWARD P. DENISON.