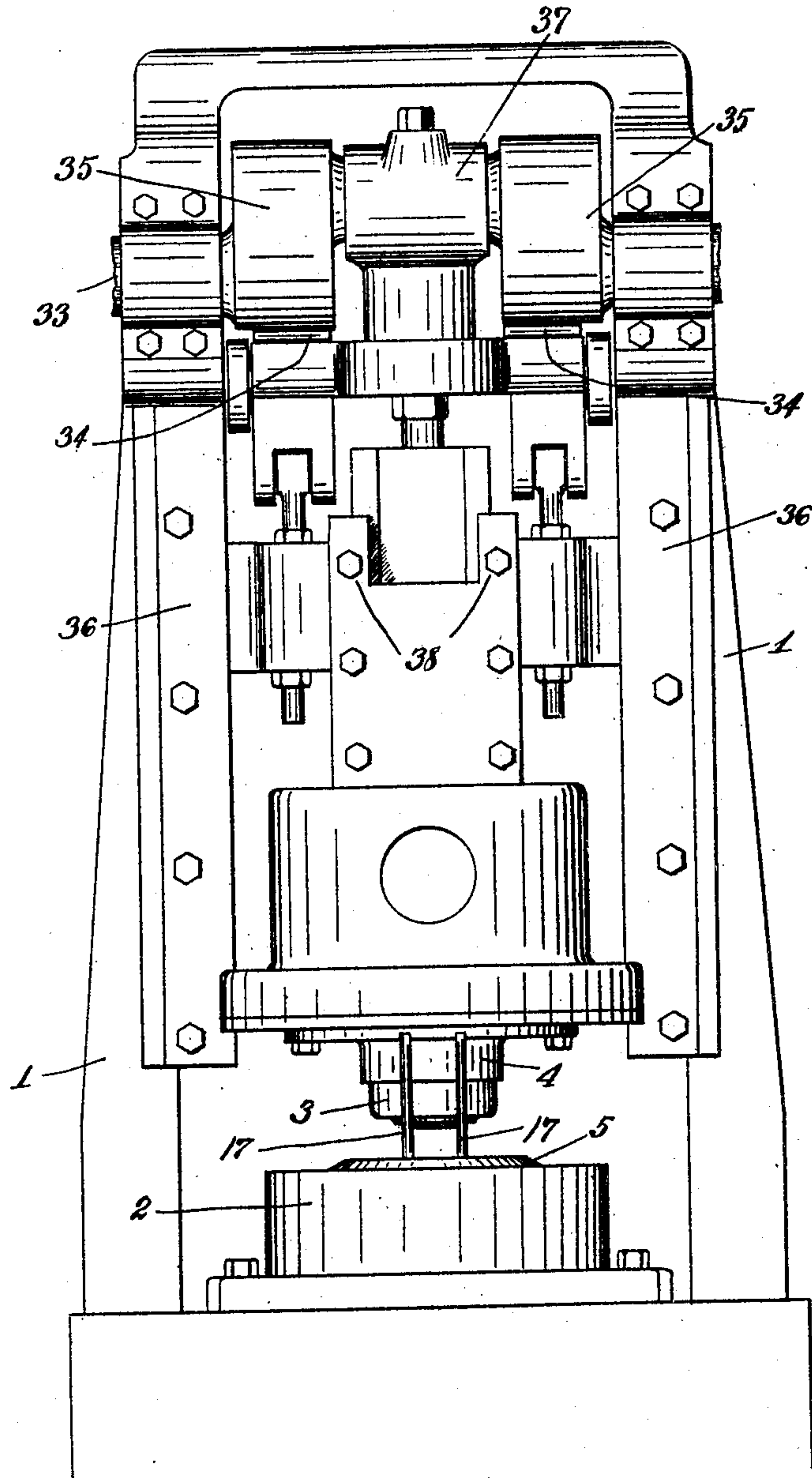


No. 796,534.

PATENTED AUG. 8, 1905.

J. J. RIGBY.  
DOUBLE ACTION PRESS.  
APPLICATION FILED JAN. 18, 1904.

4 SHEETS—SHEET 1.



*Fig. 1*

Witnesses  
*Fran Honigsberg.*  
*Annie Wisemann.*

*John J. Rigby* Inventor  
By his Attorneys  
*Decker & Spaulding*



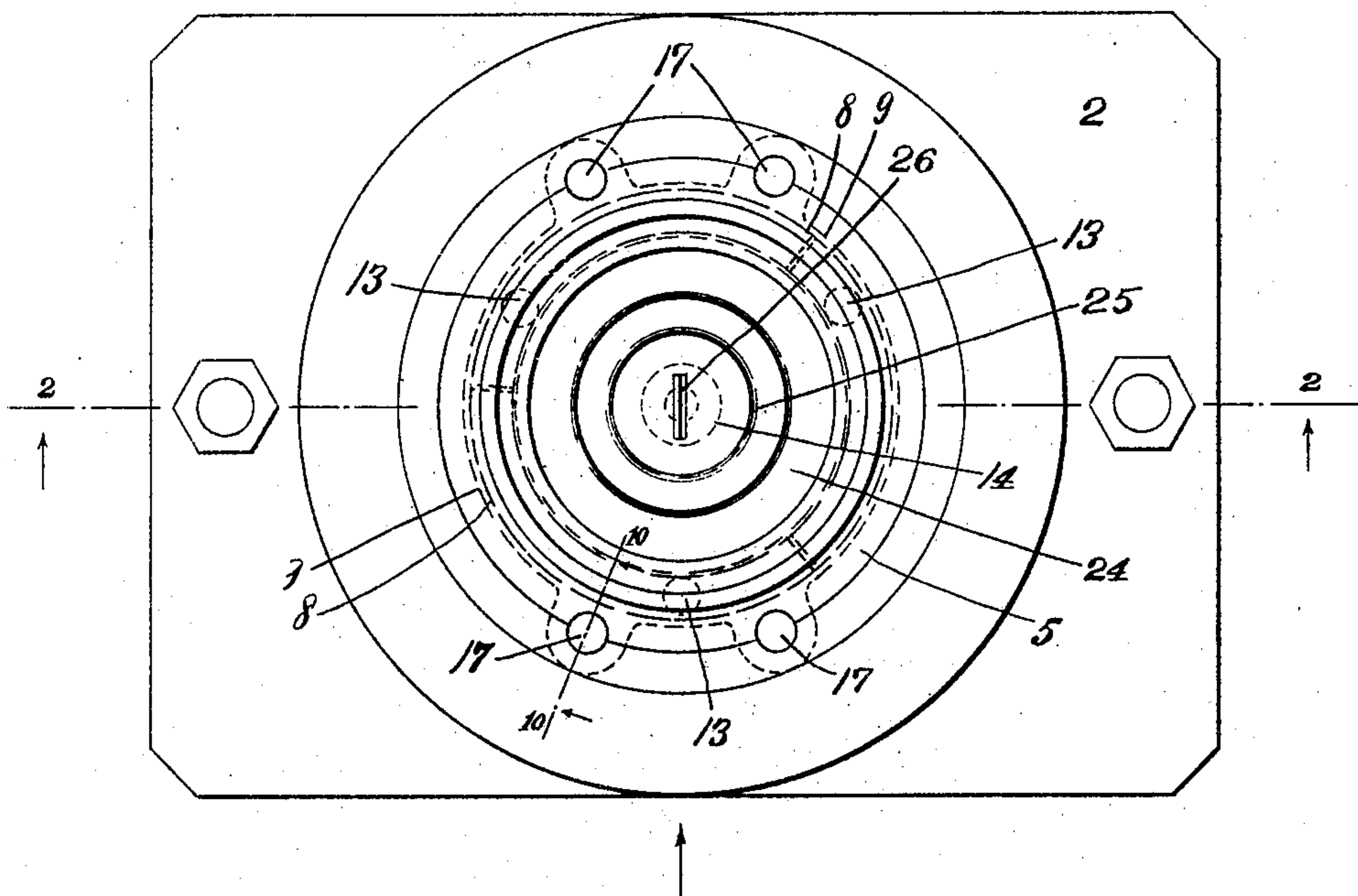




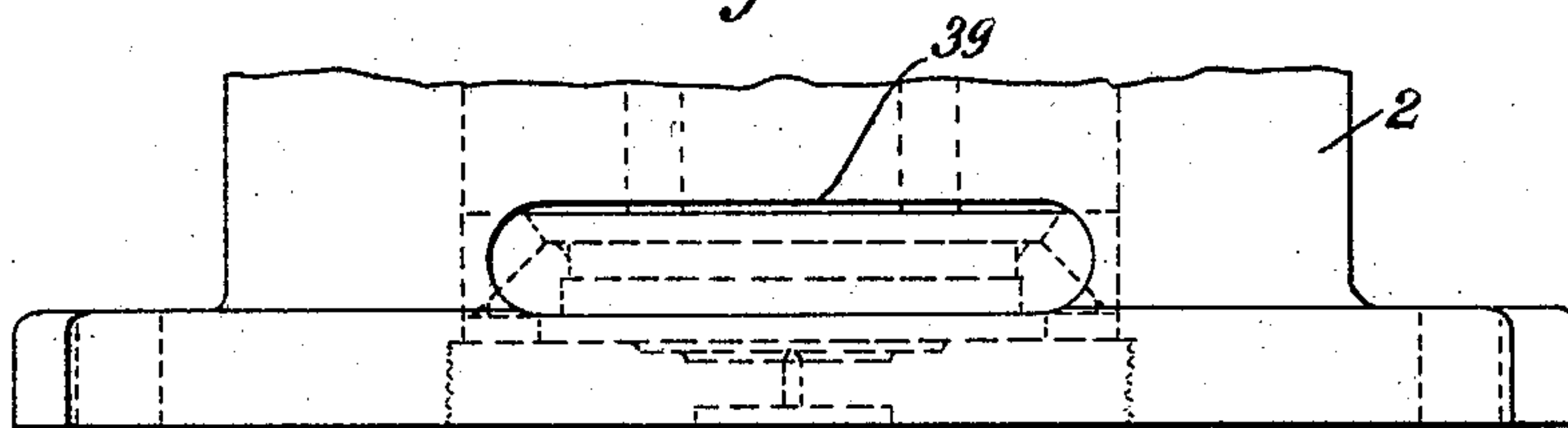
J. J. RIGBY,  
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4 SHEETS—SHEET 4.

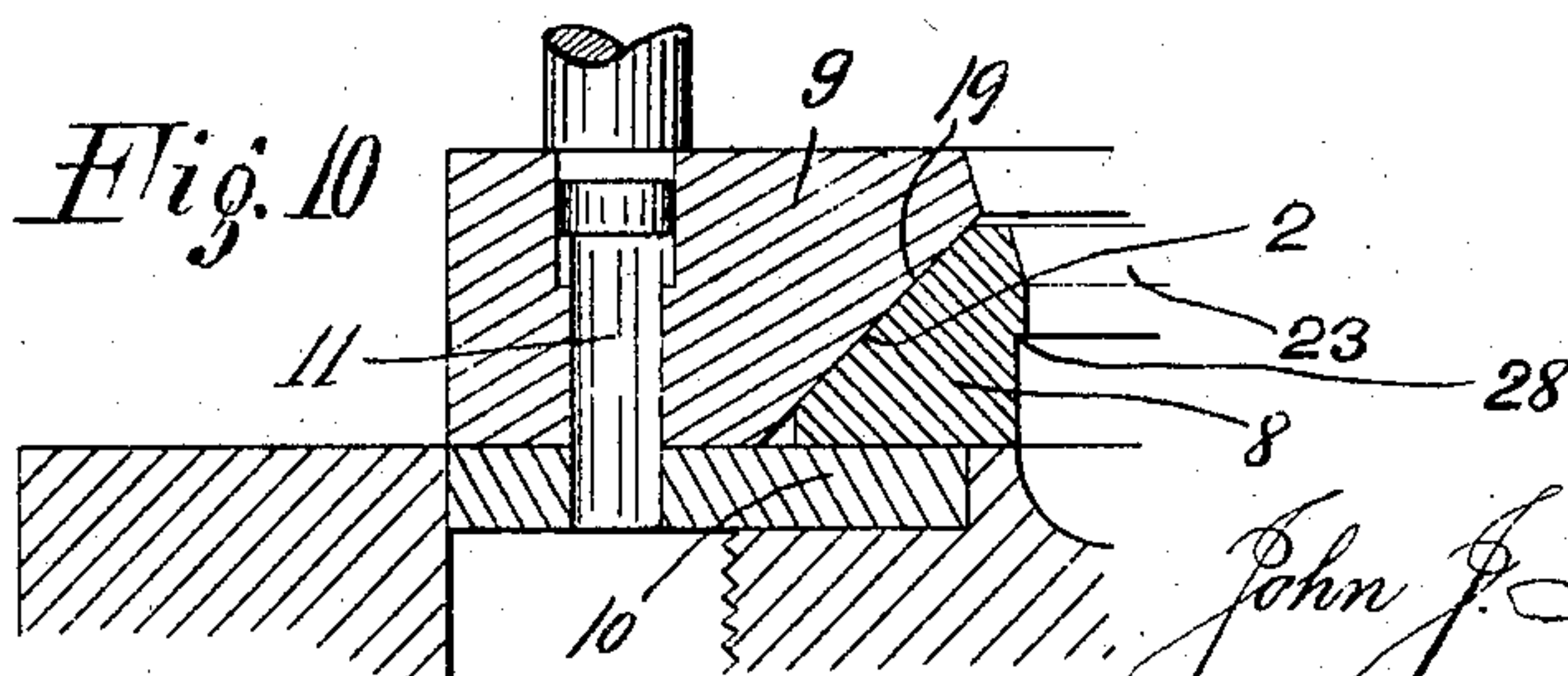
*Fig. 8*



*Fig. 9*



*Fig. 10*



Witnesses  
Ivan Konigsberg  
Anne Wessmann

John J. Rigby  
Inventor  
By his Attorneys  
Deeken & Spaulding



# UNITED STATES PATENT OFFICE.

JOHN J. RIGBY, OF NEW YORK, N. Y., ASSIGNOR TO E. W. BLISS COMPANY,  
A CORPORATION OF WEST VIRGINIA.

## DOUBLE-ACTION PRESS.

No. 796,534.

Specification of Letters Patent.

Patented Aug. 8, 1905.

Application filed January 18, 1904. Serial No. 189,393.

*To all whom it may concern:*

Be it known that I, JOHN J. RIGBY, a citizen of the United States of America, and a resident of the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Double-Action Presses, of which the following is a specification.

My invention has reference to double-action presses, and relates more particularly to a press for cutting and drawing a blank of sheet material and for setting down a flange on the same in one operation. Heretofore two separate machines have been necessary to perform these operations—one for cutting and drawing the blank and the other for setting down the flange of the same.

My invention contemplates the construction of a press or machine in which a sheet of material is cut, drawn, and a flange set down in a single operation.

Besides the obvious saving of time and expense effected by the use of my invention there is also the additional advantage obtained by the factor of safety. Heretofore the blank after being cut and drawn has had to be taken by the operator and placed upon the setting-down die. This has occasioned numerous accidents, owing to the operator failing to withdraw his hands in time. All this is obviated by my invention, inasmuch as the operator has only to feed the sheet to the press, which latter then acts automatically to perform the operations set forth above.

In the present instance I have shown my invention applied to a press for making lids for coffee-pots or the like; but it is obvious that its application can be extended to the manufacture of other articles as well.

In carrying out the above objects I employ a die comprising an upper stationary ring for cutting and drawing up the blank, an intermediate stationary ring of a slightly-greater diameter than the upper ring, and a lower vertically-movable and contractible ring adapted to be held normally in its uppermost and expanded position. The structure of the die is completed by a bottom member for shaping the blank and between which and the contractible ring the flange of the blank is set down. The punch member comprises an outer slide or blank-holder for cutting the blank and an inner slide or punch for drawing up the blank

and for carrying it into position for the setting-down operation. The sheet is fed to the press in any suitable way, whereupon the outer slide or blank-holder descends and cuts the blank. Then it dwells. Next the punch descends and draws up the blank in the upper stationary ring. The punch has a continuous motion, but is provided with a head adapted to yield when drawing the blank. By this means the punch loses in this instance about one-half an inch of its stroke while drawing the blank. After the punch has lost this motion it moves the blank into the intermediate stationary ring. This ring being of a diameter slightly greater than the drawing-up ring will allow the head of the punch, and with it the blank, to drop in addition to the regular downward and continuous motion imparted to it in the usual way, thereby making up the motion lost previously in drawing up the blank. The contractible and vertically-movable ring is contracted and moved downward by the action of the punch at this moment; but the dropping of the head of the punch enables the blank to reach the bottom of the die ahead of the said ring, so as to enable the said contractible ring to close in over the blank while acting upon the same to set down the flange. The punch and the blank-holder then ascend, and the contractible ring assumes its normal position, whereby the blank drops out of the machine by gravity or otherwise.

Other improvements will appear as the specification proceeds.

In the accompanying drawings I have shown my invention embodied in a suitable form; but changes may of course be made without departing from the said invention.

In the said drawings, Figure 1 is a general view of a double-action press of a well-known type, showing my invention applied to the same. Fig. 2 is a sectional view through the die, punch, and blank-holder on the line 2 2 of Fig. 8, showing the press in its open position. Fig. 3 is a view similar to Fig. 1, with the parts in their closed position. Figs. 4, 5, and 6 are detailed views showing the punch and blank in various positions during the operation of the press. Fig. 7 shows the development of the blank. Fig. 8 is a plan view of the die member. Fig. 9 is a detailed view of the die, showing the ejection-port for the



blank. Fig. 10 is a sectional view of the lower contractible and vertically-movable ring on the line 10 of Fig. 8.

Similar characters of reference indicate corresponding parts in the different views.

1 indicates a framework of any suitable construction for properly supporting the various parts comprising the machine.

2 is the die member, and 3 denotes the punch, while 4 is the blank-holder.

The die is composed of an upper stationary ring 5, having the cutting edge 6 and the drawing-up portion 7, constituting in connection with the punch and blank-holder a means for cutting and drawing up the blank in the usual way. The said die is further provided with a lower contractible and vertically-movable split ring 8, supported by the ring 10, carrying the ring 9. The rings 9 and 10 are adjustably secured together by means of one or more pins 11, so as to allow the ring 8 to expand and contract. The ring 10 is carried by the plate 12 and rests directly upon the uprights 13, carried by the said plate 12. This plate 12, and consequently the contractible ring, is held normally in its uppermost position by the rubber spring 14, mounted upon the bolt 15, attached to the framework 16. The ring 8 is moved downward by means of the punch and conveniently through the instrumentality of the pins 17, carried by the rings 9 and acted upon by the plate 18. When the punch descends, the plate 18 coming in contact with the pins 17 will move the ring 9 downward, and this latter being provided with the inclined surface 19, engaging with the opposed inclined surface 20 on the ring 8, will move the latter downward and at the same time contract the said ring 8.

Between the upper stationary ring and the lower contractible and vertically-movable ring is an intermediate ring 21, of a slightly-greater diameter than the drawing-up ring. This ring is provided with an inclined surface 22, which upon coming in contact with the opposed inclined surface 23 of the ring 8 will expand the same as it rises.

The bottom member 24 is provided with a central depression 25 and knife 26 for cutting a hole in the blank, surrounded by a circumferential ledge 27. The central depression is formed to shape the blank properly. The ring 8 is further provided with a circumferential ledge 28, adapted to extend over the blank to force the metal in between the circumferential ledge 27 and the lower surface of the ring 8, so as to set down the flange.

The punch is provided with a head 28<sup>a</sup>, adapted to yield when drawing the blank, so that a motion of about one-half an inch is lost during the drawing up of the blank. This head 28<sup>a</sup> is attached to the member 29 by means of the screws 30, the head 31 of which

plays in the hole 32 of the said head. The blank-holder is operated in this instance from the shaft 33 by means of the rollers 34 and cams 35 and slides in the ways 36. The punch is conveniently operated from the same shaft by means of the crank-pin 37 and slides in the ways 38.

A sheet of material is fed to the machine in any suitable way, whereupon the blank-holder descends and cuts the blank. Then it dwells and the punch descends, forcing the blank into the drawing-up portion 7, thereby drawing up the blank, and while so doing the head of the punch yields and loses a motion in this case of one-half an inch. The continued motion of the punch moves the blank which is now drawn up into the intermediate stationary ring. This ring being of a diameter somewhat greater than the drawing-up ring will free the punch and blank from the jammed position occupied in drawing up ring and will allow the head of the punch to make up the lost motion by dropping down, carrying the blank with it, in addition to its regular continued motion. Simultaneously with this the plate 18 comes in contact with the pins 17, carried by the ring 9, thereby moving the latter downward, and with it the contractible ring 8, which at the same time is also contracted, owing to the inclined surfaces 19 and 20. The punch and blank, however, owing to the additional motion imparted by the dropping of the head, has reached the bottom of the die ahead of the contractible and vertically-movable ring 8, so that as the latter descends and contracts the circumferential ledge 28 on the said contractible ring 8 will move in over the blank and force it down, the surplus metal entering in between the circumferential ledge 27 of the bottom member and the lower portion of the contractible ring, thereby setting down the flange of the blank. In addition to this the blank is properly shaped by the bottom member and has incidentally a hole cut in it by the knife 26. The ring 8 in moving down has compressed the rubber spring 14. After the operation above set forth has been completed the punch and blank-holder will ascend in unison and the rubber spring 14 will return the ring 8 to its normal, which is its uppermost, position. When the inclined surface 23 of the ring 8 comes in contact with the inclined surface 22 of the intermediate ring 21, it will expand as it rises, this movement being permitted by the adjustable connection between the rings 9 and 10.

Such phrases as "rings," "circumferential," &c., should of course be construed to cover other than circular forms, as the construction of the press, so far as my invention is concerned, would be precisely the same with a square or irregular-shaped article.



The press will generally be mounted slantingly on a suitable framework, so that when the contractible ring 8 rises the blank will drop out through the ejection-port 39.

What I claim is—

1. In a press, the combination of a die, comprising: an upper stationary ring, a lower contractible and vertically-movable ring, and a bottom member, and a punch and blank-holder coöperating with the same.

2. In a press, the combination of a die, comprising: an upper stationary ring, a lower contractible and vertically-movable ring normally in its uppermost and expanded position, a circumferential ledge on said contractible ring, a bottom member, a blank-holder, and a punch adapted to cut and draw up the blank, means for moving the vertically-movable ring downward and at the same time contracting it, the arrangement of the parts being such that the blank and punch reach the bottom of the die ahead of the vertically-movable ring, the ledge of the vertically-movable ring moving in over the blank and acting upon the same.

3. In a press, the combination of a die, comprising: an upper stationary ring, a lower contractible and vertically-movable ring normally in its uppermost and expanded position, a circumferential ledge on said contractible ring, a bottom member, a blank-holder, and a punch adapted to cut and draw up a blank, means for moving the vertically-movable ring downward and at the same time contracting it, the arrangement of the parts being such that the blank and punch reach the bottom of the die ahead of the vertically-movable ring, the ledge of the vertically-movable ring moving in over the blank and setting down a flange between the movable ring and the circumferential ledge of the bottom member.

4. In a press, the combination of a die, comprising: an upper stationary ring, a lower contractible and vertically-movable ring normally in its uppermost and expanded position, a circumferential ledge on said contractible ring, a bottom member, a blank-holder and a punch adapted to cut and draw up a blank, means for moving the vertically-movable ring downward and at the same time contracting it by the action of the punch, the arrangement of the parts being such that the blank and punch reach the bottom of the die ahead of the vertically-movable ring, the ledge of the vertically-movable ring moving in over the blank and acting on the same.

5. In a press, the combination of a die, comprising: an upper stationary ring, a lower contractible and vertically-movable ring normally in its uppermost and expanded position, a circumferential ledge on said contractible ring, a bottom member, a circumferential ledge on said bottom member, a blank-holder

and a punch adapted to cut and draw up a blank, means for moving the vertically-movable ring downward and at the same time contracting it by the action of the punch, the arrangement of the parts being such that the blank and punch reach the bottom of the die ahead of the vertically-movable ring, the ledge of the vertically-movable ring moving in over the blank and setting down a flange between the said movable ring and circumferential ledge of the bottom member.

6. In a press, the combination of a die, comprising: an upper stationary ring, an intermediate ring of a diameter greater than the stationary ring, a lower contractible and vertically-movable ring normally in its uppermost and expanded position, a circumferential ledge on the said contractible ring, a bottom member, a blank-holder and a punch adapted to cut and draw up the blank, a yielding head on the said punch adapted to yield on the draw, means for moving the vertically-movable ring downward and at the same time contracting it by the action of the punch, the arrangement of the parts being such that when the blank and punch enter the intermediate ring the yielding head of the said punch will drop so that the blank and punch reach the bottom of the die ahead of the vertically-movable ring, the ledge of the vertically-movable ring moving in over the blank and acting upon the same.

7. In a press, the combination of a die, comprising: an upper stationary ring, an intermediate ring of a diameter greater than the stationary ring, a lower contractible and vertically-movable ring normally in its uppermost and expanded position, a circumferential ledge on the said contractible ring, a bottom member, a circumferential ledge on the said bottom member, a blank-holder and a punch adapted to cut and draw up the blank, a yielding head on the said punch adapted to yield on the draw, means for moving the vertically-movable ring downward and at the same time contracting it by the action of the punch, the arrangement of the parts being such that when the blank and punch enter the intermediate ring, the yielding head of the said punch will drop so that the blank and punch will reach the bottom of the die ahead of the vertically-movable ring, the ledge of the vertically-movable ring moving in over the blank and setting down the flange between the said movable ring and the circumferential ledge of the bottom member.

8. In a die, the combination of an intermediate stationary ring, a vertically-movable and contractible ring, a ring 10 supporting the said vertically-movable ring, a ring 9, an adjustable connection between the rings 10 and 9, opposed inclined surfaces on the vertically-movable ring and the ring 9, and on the ver-

tically-movable ring, and the stationary ring, means for forcing the ring 9 downward thereby carrying the vertically-movable ring with it, and contracting the same, means for returning the vertically-movable ring and the rings 10 and 9 to their uppermost positions whereby the vertically-movable ring is expanded by reason of the opposed inclined surfaces be-

tween the vertically-movable ring and the intermediate stationary ring.

Signed at Brooklyn, New York, this 16th day of January, 1904.

JOHN J. RIGBY.

Witnesses:

OTTO S. BEYER,

CHAS. J. ELLSWORTH.