No. 694,892. Patented Mar. 4, 1902.

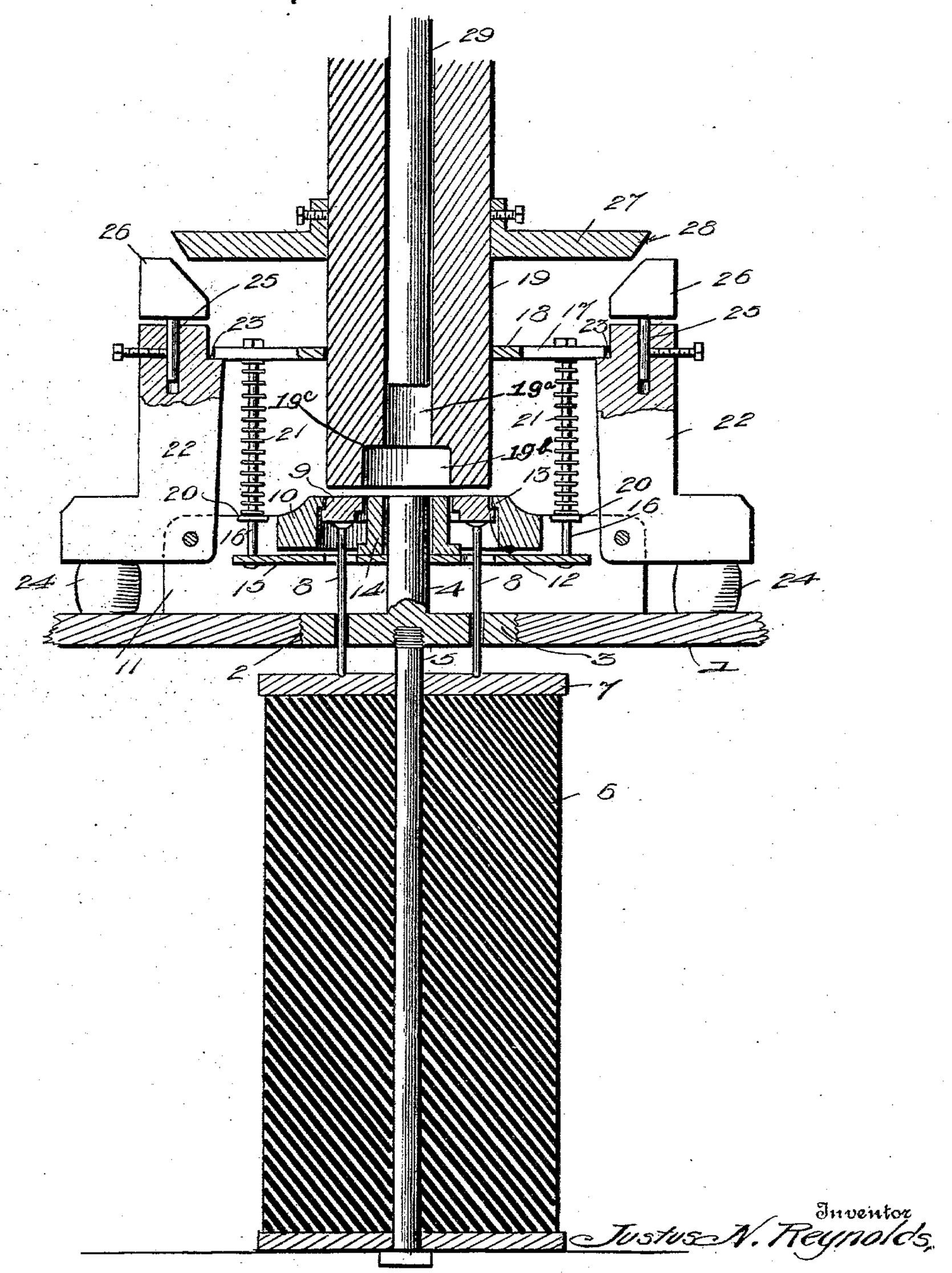
J. N. REYNOLDS.

DIE FOR DRAWING SHEET METAL.

(Application filed May 25, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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Witnesses
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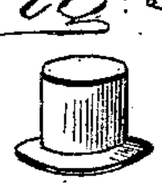
Geo. Ackman

Fig. 3.



By Victor J. Evans
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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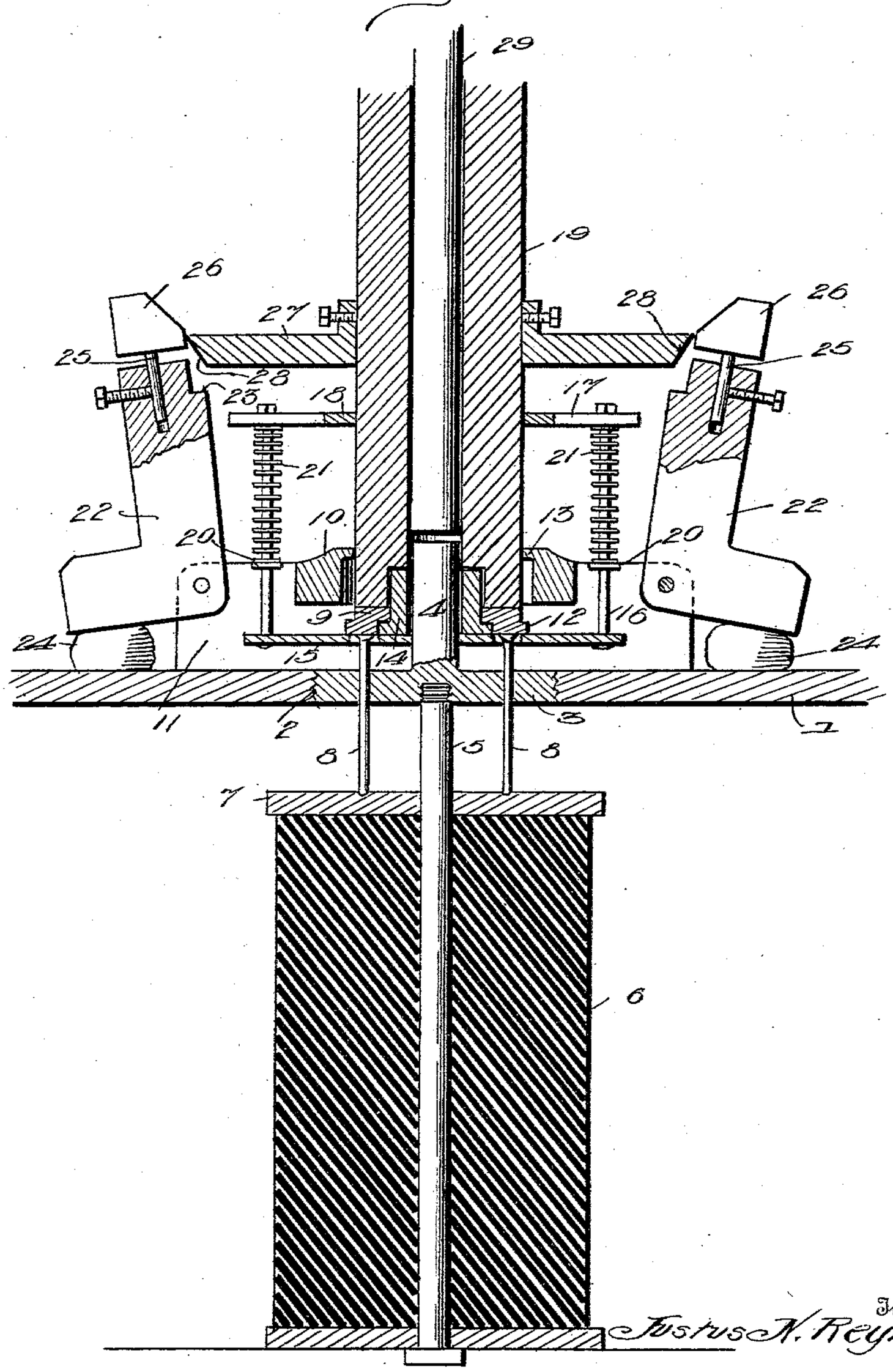
(Application filed May 25, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

JUSTUS N. REYNOLDS, OF LEMONT, ILLINOIS.

DIE FOR DRAWING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 694,892, dated March 4, 1902.

Application filed May 25, 1901. Serial No. 61,909. (No model.)

To all whom it may concern:

Be it known that I, JUSTUS N. REYNOLDS, a citizen of the United States, residing at Lemont, in the county of Cook and State of Illinois, have invented new and useful Improvements in Dies for Drawing Sheet Metal, of which the following is a specification.

This invention relates to new and useful improvements in dies for drawing sheet metal; and its primary object is to provide a device of this character which is adapted to cut the blank and draw the same two or more times all at one operation.

With this and other objects in view the invention consists in the novel construction and combination of parts hereinafter more fully described and claimed and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is a vertical section through the device prior to its operation. Fig. 2 is a similar view after the shaping of the metal, and Fig. 3 is a product of the machine.

Referring to the drawings by numerals of reference, 1 is the base of the machine and is provided with a threaded aperture 2, within which is screwed a disk 3, having a stem 4 extending therefrom. A rod 5 extends downward from the disk 3 and through a rubber spring 6. A plate 7 rests upon the upper end of the spring 6 and is slidably mounted on a rod 5, and extending from this plate are pins 8, which project through the disk 3. These pins are secured at their upper ends to a follower or presser-ring 9, which is vertically movable within a female cutting-die 10, secured to or formed with castings 11. The presser-ring 9 is provided at its lower edge with an annular flange 12, which is adapted to normally contact with a flange 13, formed within the die 10 and serving to limit the upward movement of the presser-ring. An annular drawing-die 14 incloses the stem 4 and projects into the presser-ring 9. This die is secured upon a bolster-plate 15, which is supported, by means of rods 16, from arms 17, extending from a collar 18, loosely mounted upon the male cutter-die 19. The rods 16 are slidably mounted in stationary strips 20, secured to the castings 11, and springs 21 encircle them and bear at opposite ends upon the strips 20 and the arms 17, thereby serving to support the annular die 14 normally in the position shown in Fig. 1.

Angular arms 22 are pivoted in the castings 11 at opposite sides of the dies and are recessed at their upper ends, as at 23, so as to engage the arms 17 and support them in normal position. Rubber springs 24 serve to hold the arms 17 and 22 normally in engagement with each other.

A stem 25 is adjustably secured in the upper end of each arm 22 and is provided with a head 26, having an inclined upper edge. A disk 27 is secured to the die 19, and the inclined edge 28 thereof is adapted to contact with the heads 26 and throw the arms 22 outward, as hereinafter described.

The cutter-die 19 is provided with a central opening 19^a, in which a rod 29 is mounted therein. The working end of the cutter-die 19 is enlarged, as at 19^b, to receive the stem 4 and the annular die 14. An annular shoulder 19^c is formed between the openings 19^a and 19^b in the working end of the cutter-die, adapted to be engaged by the drawing-die 14.

The operation is as follows: A sheet of metal is placed upon the cutter-die 10. The male die 19 is then moved downward, thus causing the cutting edge to cut out the blank in the usual manner, and as the die 19 continues to descend the blank is drawn down over the annular die 14. The follower or presser-ring 9 is pressed down during this operation and serves to keep the metal smooth. As soon as the ring 9 reaches the limit of its downward movement the disk 27 contacts with the heads 26 and throws the arms 22 outward, thereby releasing the arms 17 and permitting the die 19 to press the ring 9 further down, carrying the bolster-plate 15 and the annular die 14 therewith. As the annular die 14 moves downward the metallic disk will be held by the stationary stem 4, and as the die 19 continues on its downward movement the central bore thereof will shape the blank over the stationary stem 4, thereby forming the cap or cylindrical body of the product, and the lower edges of the blank will be caught and stamped between the annular shoulder 19^c and the annular die 14, thereby forming the annular flange on the

article, as shown in Fig. 3. During the stamping operation the blank is guided and kept smooth by the outer periphery of the annular die 14 and inner periphery of the bore of the die 19. The product is removed from the bore of the die 19 by forcing the rod 29 downward. The disk 27 is adjustably secured in position, and the interval between the two drawing operations can be readily regulated either by adjusting said disk or the heads 26. When the cutter-die 19 returns to its first position after the above operation, the springs 6, 21, and 24 will return all the parts to normal position.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made without departing from the spirit or sacrificing any of the advantages thereof, and I therefore reserve the right to make all such changes as fairly fall within the scope of my invention.

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

1. The combination with a combined punch and female drawing-die; of a fixed female cutter-die, a stationary stem, an annular drawing-die, a bolster-plate for said annular die, a sliding collar on the punch, arms thereto, rods connecting said arms and plate, pivoted arms normally engaging the arms of the collar, and means for disengaging said arms during the downstroke of the punch.

2. The combination with a combined punch and female drawing-die; of a fixed stem and female cutter-die, an annular drawing-die surrounding said fixed stem, a presser-ring between said drawing-die and female cutter-die, a bolster-plate for said annular die, a sliding collar on the punch, arms thereto, rods connecting said arms and plate, pivoted arms normally engaging the arms of the collar, and means for disengaging said arms during the downstroke of the punch.

3. The combination with a combined punch and female drawing-die; of a fixed stem and female cutter-die, an annular drawing-die, a bolster-plate, a sliding collar on the punch, arms thereto, rods connecting the plate and arms, springs for holding the plate normally lifted, pivoted arms, springs for holding the same normally in engagement with the arms of the ring, adjustable heads thereto, and an adjustable disk to the punch adapted to contact with the heads and throw the arms out of engagement during the downstroke of the punch.

In testimony whereof I affix my signature in presence of two witnesses.

JUSTUS N. REYNOLDS.

Witnesses:

A. S. DETTERING,

H. J. PRICE.