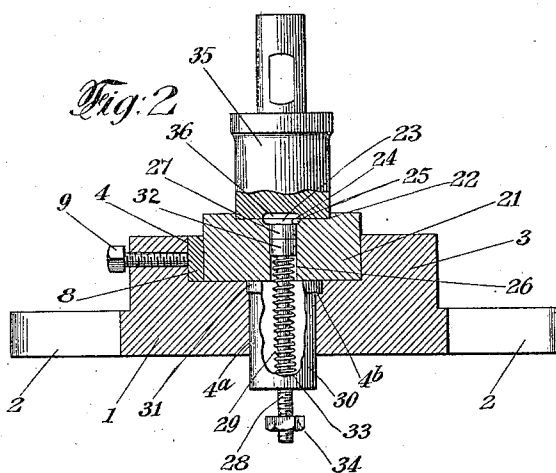
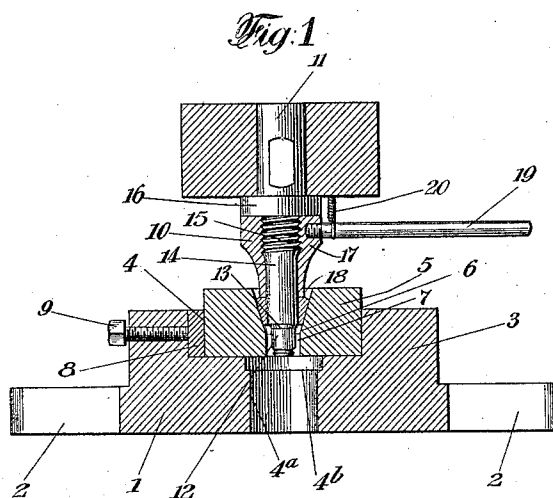


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RING FORMING APPARATUS.
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RING-FORMING APPARATUS.

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To all whom it may concern:

Be it known that I, HENRY HENRICH, of New York, in the county of New York, and in the State of New York, have invented a certain new and useful Improvement in Ring-Forming Apparatus, and do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates particularly to the provision of dies of a certain character and apparatus used in connection therewith.

The object of my invention is to simplify the construction of apparatus used for forming rings, to make it stronger and to provide means for insuring that the central opening in the formed blank is perfectly cylindrical.

Further objects of my invention are to provide an apparatus in which a blank can be formed having its upper and lower edges rounded and in which the blank can be formed without danger of breaking the dies.

Still a further object of my invention is to provide a means whereby the formed blank may be readily removed from the male die.

I have shown one form of my invention in the accompanying drawings, in which—

Figure 1 is a vertical section of the apparatus used for forming the ring blank in the first operations; Fig. 2 is a vertical cross-section of the apparatus used for forming the ring blank in the last stages; Fig. 3 is a vertical section of the blank from which the ring is formed; Fig. 4 is an elevation of the ring blank after it has passed through the first forming operation; Fig. 5 is an elevation of the same showing the ring blank after it has passed through the second operation; and Fig. 6 is an elevation of the finger ring blank ready for rolling.

In the drawings, 1 represents a metal base. The base 1 has two slots 2 to receive bolts or other means for attaching the base to a support. At the center of said base there is a raised portion 3 having a central opening 4. The base 1 has a cylindrical opening 4^a of small size extending entirely through the base, which opening has at its upper end an annular shoulder 4^b. In the first and second stages of the formation of the finger ring blank an apparatus such as that shown in Fig. 1 is used. In this figure I have shown a female die 5 located in the opening 4. This die has a conical opening 6 in its center and located near the top

thereof, which opening communicates with a cylindrical opening 7 at the bottom of the die. The raised portion 3 is provided with a sliding block 8 which is rendered adjustable by means of a screw 9, the purpose of which is to tighten the female die 5 in place. A male die or punch 10 is used in the apparatus shown in Fig. 1. This die comprises a shank 11 which is adapted to be attached to and operated by any suitable mechanism. The lower end of the male die 10 comprises a cylindrical extension 12 adjacent to a shoulder 13. Above the shoulder 13 there is located a cylindrical portion 14 of larger size, and above this the male die carries a screw-thread 15, immediately above which is located a cylindrical flange 16. The male die 10 is provided over the screw-thread 15 with a sleeve 17 having a flat shoulder 18 on its lower end and a handle 19. As shown in Fig. 1, the sleeve 17 is normally screwed upwardly against the flange 16, owing to the influence of a spring 20, one end of which is attached to the handle 19 and the other end of which is attached to any suitable portion of the operating machine, such, for example, as the portion which is attached to the shank 11. After the blank has been formed in the apparatus shown in Fig. 1, it is then subjected to an apparatus such as that shown in Fig. 2. This comprises the base 1 and a female die 21 having a circular depression 22 in the center of which there is located a conical opening 23, at the lower end of which there is a shoulder 24. Between the conical portion 23 and the shoulder 24 there is a curved surface 25 to give the formed blank rounded edges. A cylindrical opening 26 passes from the conical opening entirely through the female die 21.

In connection with this apparatus, I make use of a cylindrical pin 27 which is adapted to be maintained in the center of the conical opening 23 by means of a spring-pressed plunger 28 normally pressed upwardly by means of a spring 29 which is carried in a barrel 30 having a flange 31 at its upper end to rest against the shoulder 4^b. The plunger 28 has at its upper end a flange 32 to limit the movement of the spring 29 at one end thereof, and the interior of the barrel 30 is provided with a flange 33 at its lower end to limit the movement of the spring at its lower end. A nut 34 is screw-threaded to the lower end of the spring-pressed plunger

28 to prevent it from being withdrawn from the barrel 30.

In connection with the female die already described, I use an upper female die 35 having an opening 36 exactly corresponding in shape with the conical opening 23. The diameter of the upper female die 35 is such as to fit within the circular depression 22 in the lower female die, so as to give the parts a proper relative position.

In the operation of the device, the base 1 being equipped with the parts as shown in Fig. 1, a blank 37 in the shape of a washer and made, for example, of gold alloy, is inserted over the lower cylindrical portion 12 of the male die 10 until it rests against the shoulder 13. The male die 10 is then lowered by any suitable mechanism, thereby forcing the blank 37 into the conical opening 6 of the female die. In this stage of the formation of the blank, the upper edge of the formed blank is caused to rest against the shoulder 18 of the sleeve 17 and is forced downwardly in the conical opening 6 by reason of this fact. It will be noted, however, that the lower edge of the formed blank is not forced against any shoulder or abutment of any kind and, consequently, there is no danger of the dies being broken.

The blank is, as a result, given a form like the blank 38 shown in Fig. 4. This blank 38 is then turned upside down and formed again in the same apparatus. The blank thus formed has now been given the shape of the blank 39 shown in Fig. 5. At the end of each of these forming operations the formed blank adheres closely to the stem of the male die 10 but the blank is readily removed from said die by turning the sleeve 17 a portion of a revolution, so as to loosen the blank upon said die. When the blank has been removed in this manner and the handle 19 has been released, the sleeve 17 returns to its normal position under the influence of the spring 20, and other blanks can be put through the same forming operation without the necessity of adjustments. After the blank has been formed in the manner described, it is placed in the apparatus shown in Fig. 2 between the two female dies 21 and 35. The blank is then given the shape of

the blank 40 illustrated in Fig. 6 having a sharp circular edge 41 in the middle of the ring and rounded edges 42 at the top and bottom of the ring. By giving the blank rounded edges, the necessity of subsequently forming the blank in a rolling machine or turning machine of any kind so as to reduce angular edges, is avoided. In the last stage of the formation of the blank, the cylindrical pin 27 is ordinarily removed with the blank from the apparatus, because of the fact that the ring adheres tightly to the pin and said pin is removed from the ring subsequently in any convenient manner.

While I have described my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit of my invention which is set forth in the appended claims.

I claim:

1. In a ring forming apparatus, a female die, a male die, a rotatable sleeve on said male die and means for moving it downwardly when rotated.

2. In a ring forming apparatus, a female die, a male die, a rotatable sleeve on said male die, and means including a handle for moving it downwardly when rotated.

3. In a ring forming apparatus, a female die, a male die, a rotatable sleeve on said male die, means for moving it downwardly when rotated, and a spring for resetting said sleeve.

4. In a ring forming apparatus, a female die, a male die, a rotatable sleeve on said male die, means including a handle for moving it downwardly when rotated, and a spring for resetting said sleeve.

5. In a ring forming apparatus, a female die, a male die, a rotatable sleeve on said male die, means including a handle for moving it downwardly when rotated, and a spring attached to the handle for resetting said sleeve.

In testimony that I claim the foregoing I have hereunto set my hand.

HENRY HENRICH.

Witnesses:

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