

(No Model.)

H. V. BERNHARDT.  
APPARATUS FOR FORMING RINGS.

No. 473,139.

Patented Apr. 19, 1892.

Fig. 1.

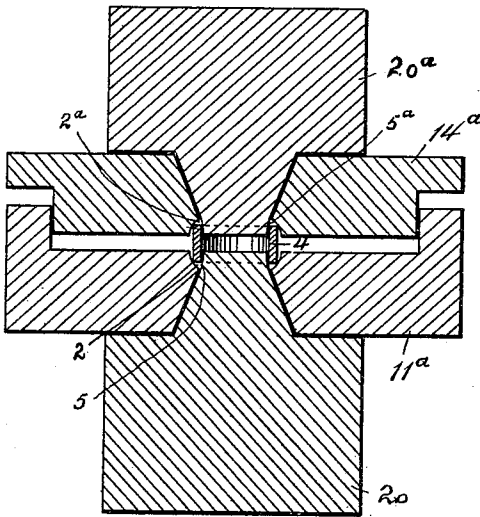


Fig. 2.

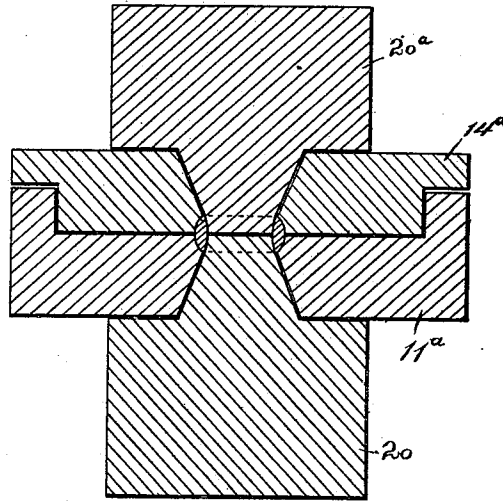


Fig. 3.

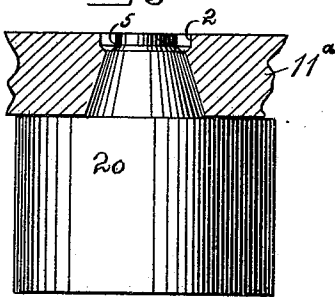


Fig. 4.

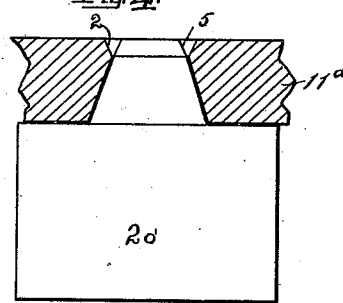


Fig. 5.

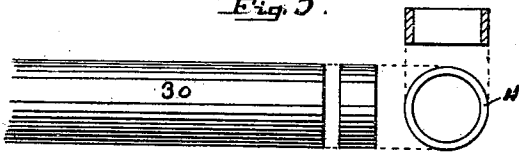


Fig. 6.



Fig. 7.



Fig. 8.

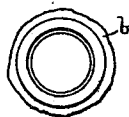


WITNESSES:

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Fig. 9.



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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR FORMING RINGS.

SPECIFICATION forming part of Letters Patent No. 473,139, dated April 19, 1892.

Application filed June 16, 1891. Serial No. 396,438. (No model.)

*To all whom it may concern:*

Be it known that I, HERMAN V. BERNHARDT, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Apparatus for Forming Rings, of which the following is a specification.

My invention relates to the manufacture of seamless rings, the main object of the invention being to produce an apparatus whereby by a single operation tubular blanks may be pressed to the desired form in cross-section; and to the end named it consists of certain novel constructions, arrangements, and combinations of elements to be hereinafter described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar reference-figures indicate corresponding parts in all the views.

Figure 1 is a central sectional view of the apparatus which I prefer to employ in carrying out my improved method of forming rings, the parts being represented as they appear after the tubular blank has been adjusted to place, but before the dies and the mandrel-sections have been forced together. Fig. 2 is a similar view, the parts, however, being shown as they appear after the formation of the ring. Fig. 3 is a side view of a lower mandrel-section of modified form, a portion of the lower die being shown in section. Fig. 4 is a similar view of another modification. Fig. 5 is a view of the seamless tube from which I prefer to cut my annular blanks. Figs. 6, 7, 8, and 9 are views of the product of my apparatus.

In the drawings above referred to 20 and 20<sup>a</sup> represent the mandrel-sections, and the approaching ends of these sections are each shaped to form one-half of the inner face of the ring, as is clearly shown at 5 5<sup>a</sup>. The dies 11<sup>a</sup> 14<sup>a</sup> are apertured to receive the mandrel-sections, and by preference the several parts are shaped as shown in the drawings.

In forming a ring a tubular blank 4 is placed as represented in Fig. 1, and then by means of a proper press the die 14<sup>a</sup> and the mandrel-section 20<sup>a</sup> are forced downward upon said blank, the pressure being applied to the edges

and outer and inner faces of the blank both above and below the vertical axis of the blank and the downward movement of the parts being continued until they are in the position in which they are represented in Fig. 2.

In Figs. 3 and 4 I illustrate how by slight changes at the points 2 2<sup>a</sup> and 5 5<sup>a</sup> rings of almost any form in cross-section may be made.

The tubular blanks may be made in any desired manner; but I prefer to cut them from a seamless tube, as 30. (See Fig. 5.)

If desired, the die-faces and the mandrel-sections may be slightly cut away at points adjacent to the recesses 2 2<sup>a</sup>, 5, and 5<sup>a</sup>, and then rings with double fins, such as shown in Figs. 8 and 9, may be produced.

In case the rings made as hereinbefore described are to be used as finger-rings they would ordinarily be subjected to the action of a rolling and sizing machine—such, for instance, as the one described in Letters Patent of the United States No. 426,707.

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

1. The combination, with a pair of dies, of an independent or separate sectional arbor or mandrel, each of the dies being made with a section adapted to shape one-half of the outer surface of a ring and each of the mandrel-sections being made with a section adapted to shape one-half of the inner surface of a ring, substantially as described.

2. The combination, with a pair of dies formed with recesses 2 2<sup>a</sup>, of mandrel-sections formed with recesses 5 5<sup>a</sup>, the dies and mandrel-sections being separate, substantially as described.

3. The combination, with a pair of dies that are centrally apertured, of mandrel or arbor sections which fit within the die-apertures, the parts being shaped so that the mandrel-sections bear upon the dies, whereby pressure applied to the mandrel-sections serves to press the dies together.

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