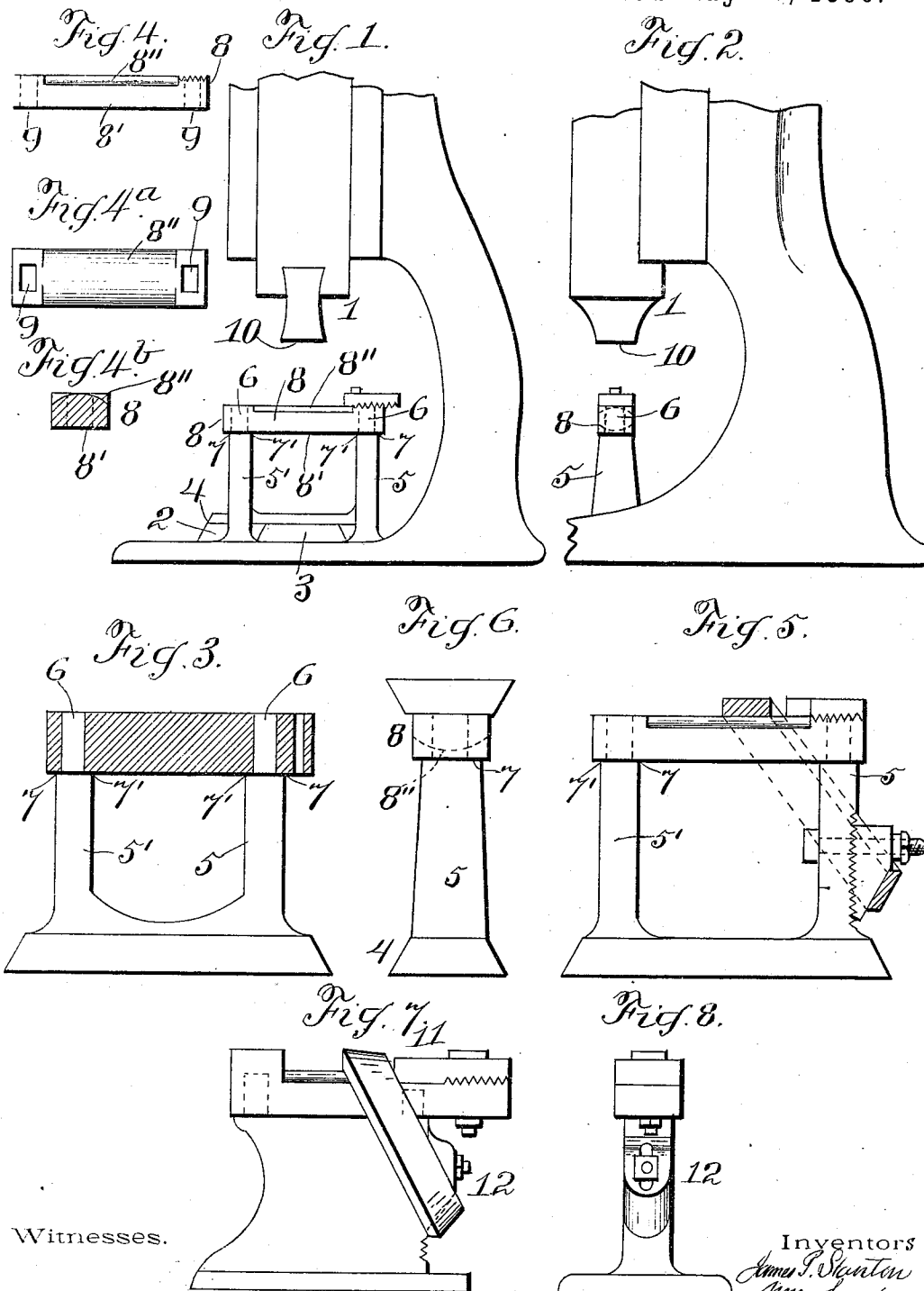


(No Model.)

J. P. STANTON & W. LEWIS.
APPARATUS FOR FORGING METALLIC RINGS.

No. 560,443.

Patented May 19, 1896.



Witnesses.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FORGING METALLIC RINGS.

SPECIFICATION forming part of Letters Patent No. 560,443, dated May 19, 1896.

Application filed November 19, 1895. Serial No. 569,479. (No model.)

To all whom it may concern:

Be it known that we, JAMES P. STANTON, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, and WILLIAM LEWIS, residing at Camden, in the State of New Jersey, citizens of the United States, have invented certain new and useful Improvements in Apparatus for Forging Metallic Rings; and we do hereby declare the following to be a sufficiently full, clear, and exact description thereof as to enable others skilled in the art to make and use the said invention.

This invention relates to the forging of seamless or weldless rings of cast-steel, and has for its object the economical and rapid production of such rings of cylindric and conical forms, of accurate shape and uniform quality of material in all parts thereof.

To accomplish these ends, this invention consists in an improved form of dies or attachments to the anvil and hammer whereby the ring, while in course of stretching or drawing, is equally supported in its entire breadth, so that the impingement of the hammer on the metal shall be uniformly effective, and in an adjustable support and gage, in connection with the anvil, whereby the ring during forging is presented in the proper position to effectively receive the hammer-blow at such angle to its axis as to procure the desired taper.

The construction and operation of this invention is hereinafter particularly described and shown in the accompanying drawings, in which—

Figure 1 shows a front elevation of the apparatus as applied to an anvil and hammer for drawing cylindric rings. Fig. 2 shows a side elevation thereof. Fig. 3 shows in partial vertical section the anvil. Figs. 4, 4^a, and 4^b, respectively, show in side, plan, and transverse section the die or anvil-face. Fig. 5 shows the invention as applied to drawing or stretching conical rings. Fig. 6 shows in end elevation the anvil as adjusted for flattening the edges of the ring after drawing it. Fig. 7 shows a modified form of the device as applied to drawing a conical ring, and Fig. 8 shows an end elevation thereof without the ring.

Referring to the drawings, 1 represents the ram of a hammer, which may be either of the

direct steam-propelled type or a belt-driven hammer.

2 represents the anvil-block with the usual gate or recess 3 for receiving swages or dies or other anvil-faces.

4 is a lower die-frame, having pillars 5 and 5' extending upward therefrom and provided with tenons 6, and shoulders 7, on which fits reversibly the die-face 8. The die-face 8 is formed with mortises 9 in it, which fit on the tenons 6, and faces which rest firmly on the shoulders 7. One side, 8', of the die-face 8 is made flat throughout and parallel with the lower face of the hammer-face 10, and the other surface, 8'', is of convex cylindric form, with its axis parallel with the length of the hammer-face 10. As above described, the dies are adapted to drawing or stretching cylindric rings. A piece of steel with a slot cut in it and opened out into a link form is placed with one side or end between the pillars 5 and 5', and the die-face 8 is placed through it with the convex side 8'' upward. Then the hammer is put in operation and the ring turned slowly at intervals between the hammer-strokes. When the ring approaches the desired size, the die-face 8 is raised, the ring removed, and the face 8 replaced with its flat side 8' upward. The ring is then placed on its edge on the surface 8' and the hammer again operated and the edges of the ring are then flattened.

The support afforded by the pillars 5 and 5' to the die-face 8 secures the full effect of the hammer-blow on the steel, which in an over-hung horn is in a great measure lost in the spring of the horn, and the easy reversal of the die 8 saves a reheating of the ring during the change.

In forging taper or conical rings—such, for instance, as are employed in the construction of knitting-machines—the die 8 is arranged as shown in Figs. 5, 7, and 8. In Fig. 5 the die 8 is shown as supported on pillars 5 and 5', and the ring after being forged as before to a cylindric form, approaching the size of the desired conical form, is taken off the die 8 and suspended upon the top of the die 8, with one edge resting against a shoulder 11, formed on or secured to the die 8, the lower part of the ring hanging with its edge against a gage 12 on the pillar 5, and the hammer is oper-

ated, the edge of the ring resting against the shoulder 11 and on the die 8 is stretched and the ring slowly turned between the hammer-strokes until it assumes a conical form. The degree of taper is regulated by the relative adjustment of the gage 12 to the shoulder 11. In Fig. 7 the gage 12 is fixed and the shoulder 11 made adjustable, and in Fig. 8 both are shown as adjustable and the die 8 supported continuously from the anvil by a single pillar 5" instead of the pillars 5 and 5'. By use of dies thus constructed the fullest efficiency of the hammer-stroke is utilized and side or lateral stress on the hammer is avoided, and by reason of the facility and promptness with which the die can be reversed the necessity of such frequent reheating of the ring is avoided and the properties of the steel are left unimpaired.

20 Having described this invention, what we claim is—

1. In dies for forging metallic rings; a die having a reversible top provided with opposite convex and flat surfaces and mortises, in combination with a support having shouldered tenons arranged to fit in said mortises in reversed positions substantially as described and shown.

2. In dies for forging conical rings a die having a flat face and an opposite convex face, a shoulder on said convex face, and means of reversibly supporting said die, in combination with a gage located obliquely below said die and means of adjustably supporting said gage relatively to the shoulder on the convex die-face substantially as and for the purpose set forth.

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