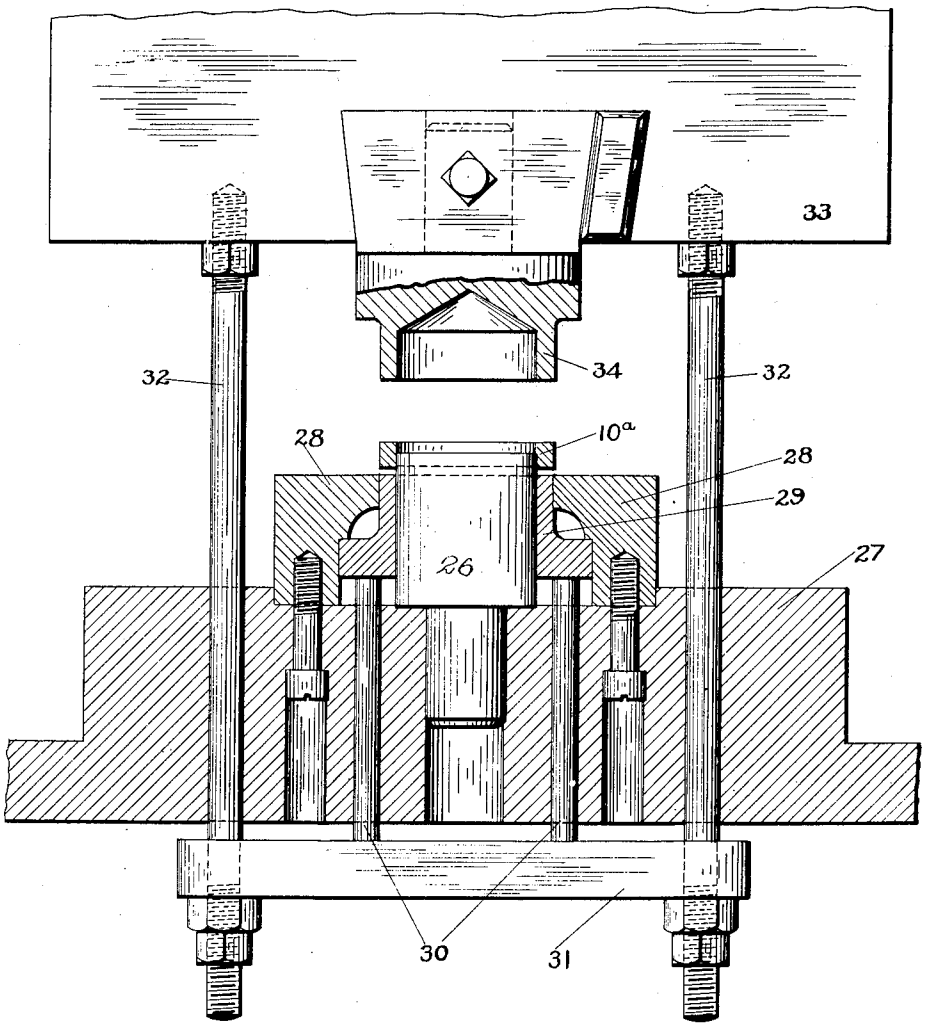
A. W. LIMONT.

METHOD OF SIZING METAL BANDS.

APPLICATION FILED JUNE 28, 1918.

1,382,734. Patented June 28, 1921.



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METHOD OF SIZING METAL BANDS.

1,382,734. Specification of Letters Patent. Patented June 28, 1921.

Original application filed February 20, 1917, Serial No. 149,875. Divided and this application filed June 28, 1918. Serial No. 242,401.

To all whom it may concern:

Be it known that I, ALEXANDER W. LIMONT, a citizen of the United States, residing in Bridgeport, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Methods of Sizing Metal Bands, of which the following is a full, clear, and exact description.

This invention relates to an improved method of sizing metal bands, such as projectile bands of copper or other soft, ductile metal, as set forth in my application, Serial No. 149,875, filed February 20, 1917 (Patent No. 1,274,359, granted July 30, 1918) of which the present application is a division.

The primary object of the present invention is to provide an improved method of bringing a roughly finished band accurately to the required dimensions in a simple and economical manner. In the manufacture of projectile bands, the greatest accuracy is required and if there is the slightest deviation from the standard dimensions, the band is rejected. Any difficulty in this respect is overcome by practising my improved method, by which the bands can be very readily and quickly brought to the required size and shape, the possibility of error being reduced to a minimum.

To these and other ends, the invention consists in the novel steps and procedure to be hereinafter described and claimed.

In the accompanying drawing, I have shown a vertical, central section of a press adapted for the carrying on of my improved method. The press shown in the drawing comprises a fixed mandrel 26 of cylindrical shape rising from a bed plate 27, the diameter of said mandrel corresponding to the internal diameter of the band to be formed. Around the mandrel 26 is a die 28 having a cylindrical inner surface corresponding in diameter to the external diameter of the band to be formed, the cylindrical inner surface of the die facing and being concentric with the upper part of the mandrel. A sizing sleeve 29 is adapted to slide up and down between the mandrel and die, said sleeve being mounted on rods 30 supported by a plate 31, which plate 31 is, in turn, supported by rods 32 from the gate 33 of the press. The main part of the sizing sleeve 29 is cylindrical in shape, its inner surface conforming snugly to the exterior surface of the mandrel and its outer surface conforming snugly to the inner cylindrical surface of the die 28. The upper edge of said sizing sleeve is squared off preferably, so as to form a band with a squared off edge, and the upper part of the sleeve corresponds in interior and exterior diameter respectively with the band to be formed. Another sizing sleeve 34, generally similar to the sleeve 29 and having its lower cylindrical part of the same dimensions, is adapted to enter the space between the mandrel and die when the gate is lowered.

The roughly finished cylindrical band, which is preferably formed in the manner set forth in my prior application, is placed around the mandrel, as shown at 10^a, and on the first part of the downward movement of the press, the plate 31 is lowered so as to let the sleeve 29 down on to the support 27 and thereby permit the blank to move down into the die. While in the die and around the mandrel, the blank is compressed by the downward pressure of the upper sizing sleeve, its upper edge being engaged by the upper sizing sleeve which is coextensive therewith, and its lower edge being similarly engaged and supported on the lower sizing sleeve. The pressure exerted causes a displacement of the metal in the blank, which is copper or like ductile metal, and it will be understood, therefore, that the metal of the blank will be forced to fill exactly the space defined between the mandrel and die and the sizing sleeves. As this space will correspond in all its dimensions to the band which it is desired to form, it will be apparent that the roughly finished band will be perfected in shape and brought very accurately to the required dimensions. The band makes contact from top to bottom with the mandrel and the opposing surface of the die.

When the proper pressure has been exerted and the required dimensions obtained, the pressure on the blank is removed by raising the gate of the press with the sleeve 34. As the gate moves upward, it carries the rods 32, plate 31 and pins 30, and this causes the lower sleeve to be raised sufficiently to

move the finished band up out of the die. In this manner, the finished band is ejected from the die. It will be observed, from the drawing, that the parts are so proportioned that when the pressing of the blank commences, its upper surface is substantially flush with the upper surface of the die, and the upward movement of the band after the pressing operation is necessary to remove the band from the die and mandrel or facilitate such removal.

Various changes in the method herein described may be made without departing from the scope of the invention as defined in the claims.

I do not claim herein the illustrated mechanism for sizing metal bands, as the same is claimed in my application, Serial No 277,662, filed February 17, 1919.

What I claim is:

1. The method of sizing a projectile band or the like of soft ductile metal, which comprises interposing the same in the space between a concentric die and mandrel, supporting the band from beneath in a movable manner so that it may be raised out of the die, exerting downward pressure on the band while in the die to cause it to fill the space between the mandrel and the die and bring it accurately to the required size, then removing the pressure on the band, and finally ejecting it from the die.

2. The method of sizing a metal band, which comprises placing the same in a suitable die and around a mandrel, supporting the band in the die from beneath, exerting pressure on the upper edge of the band while in the die to cause it to contact from the top to bottom with the mandrel and the die and bring it accurately to the required dimensions, then removing the pressure on the upper edge of the band, and then exerting pressure on the band from beneath to move it out of the die.

3. The method of sizing a metal projectile band, which comprises placing it in a suitable die around a mandrel, supporting it from beneath by a member movable relatively to the die and the mandrel, positioning said member so as to create a space of the required size between it and the mandrel and the die, exerting pressure on the upper edge of the band to displace the metal therein and cause it to fill such space, and finally lifting said movable member and thereby the finished band to eject the latter from the die.

4. The method of sizing projectile bands and the like, which comprises placing the band in the space between a concentric mandrel and die, supporting the band in said space from beneath, and exerting pressure on the band from above to cause it to fill the space between the mandrel and the die, and then raising the band to eject it from the die.

5. The method of sizing a projectile band or the like, which comprises interposing the roughly finished band in the space between a concentric mandrel and die with the band horizontally arranged, supporting it from beneath so that its lower edge is substantially below the upper surface of the die and so as to leave a space between the mandrel and the die in which the band may be radially expanded, exerting pressure on the band from above and forcing its upper edge down into the die to cause it to fill the space between the mandrel and the die, removing the pressure on the band after the same has been accurately brought to size, and lifting the finished band out of the die.

6. The method of sizing a projectile band or the like, which comprises supporting it from beneath between a stationary mandrel and die, exerting pressure on the band from above to cause it to contact from top to bottom with the mandrel, and then lifting the band to eject it from the die.

7. The method of sizing a projectile band of copper or like ductile metal, which comprises supporting the same from beneath in the space between a stationary concentric mandrel and die, exerting pressure on the band from above to cause it to make full contact with opposing surfaces of the mandrel and the die and thereby bring it accurately to the required size, then removing the downward pressure on the band, and finally exerting upward pressure on the band to move it up out of the die.

8. The method of sizing a metal band having cylindrical inner and outer surfaces and flat edges, which comprises placing said band in a suitable die around a mandrel, supporting the band from beneath in the space between the mandrel and die, and exerting pressure on the band from above to cause it completely to fill the space between the mandrel, die and means which supports the band from below.

9. The method of sizing a projectile band having cylindrical inner and outer surfaces and flat edges, which comprises placing said band around an upstanding mandrel and within a suitable die, supporting the band from beneath to hold it in place between the mandrel and the die, then pressing down against the upper edge of the band so as to cause the inner surface of the band to conform from top to bottom with the outer surface of the mandrel and the outer surface of the band to conform from top to bottom with the inner surface of the die, and then lifting the band to eject it from the die.

In witness whereof, I have hereunto set my hand on the 24th day of June, 1918.

ALEXANDER W. LIMONT.