

No. 810,241.

PATENTED JAN. 16, 1906.

M. WIKSTROM.
APPARATUS FOR REDUCING THE ENDS OF TUBES.
APPLICATION FILED SEPT. 10, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

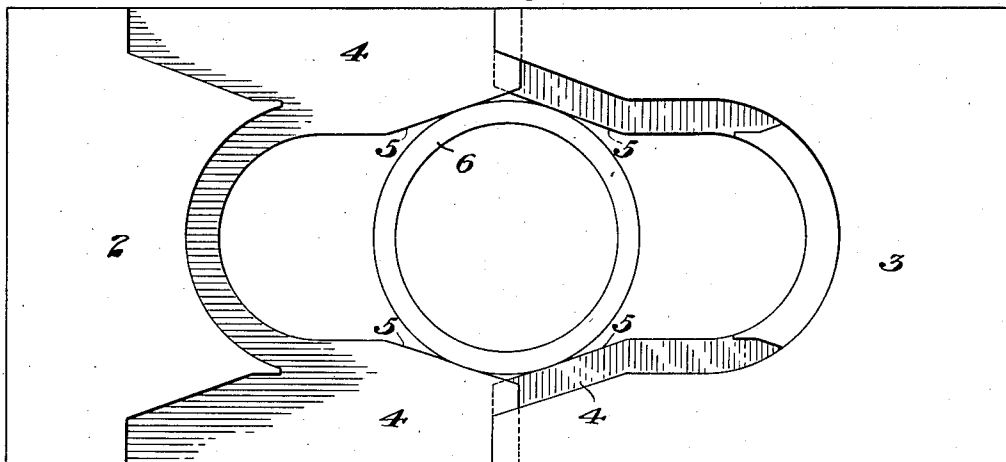


Fig. 2.

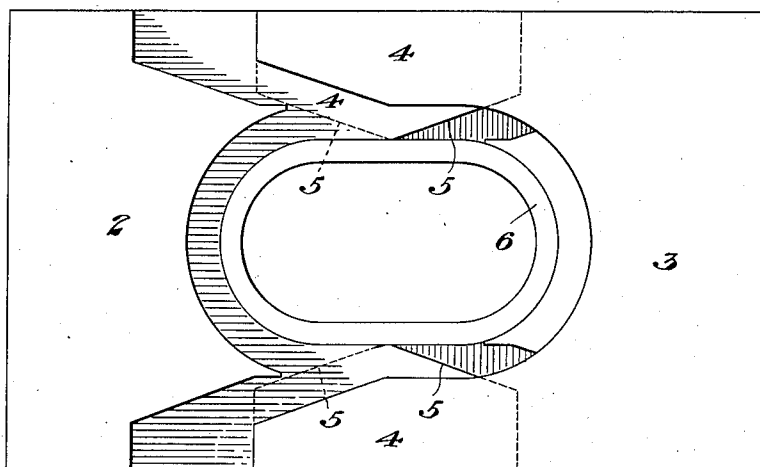
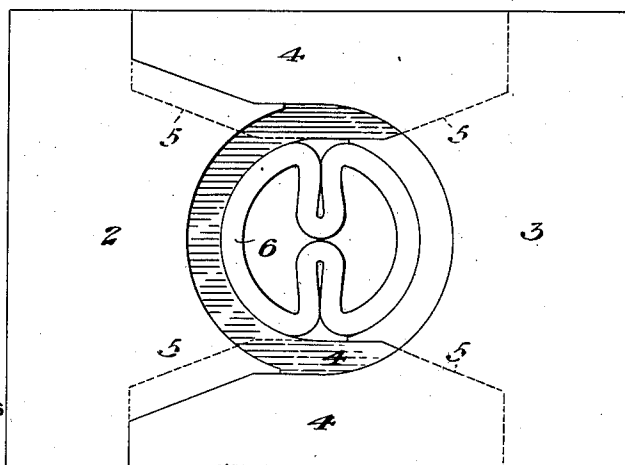


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

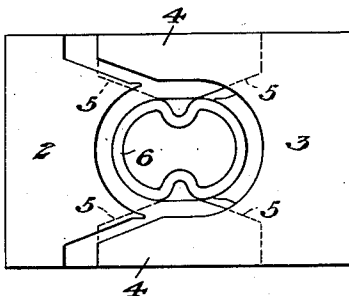


Fig. 5.

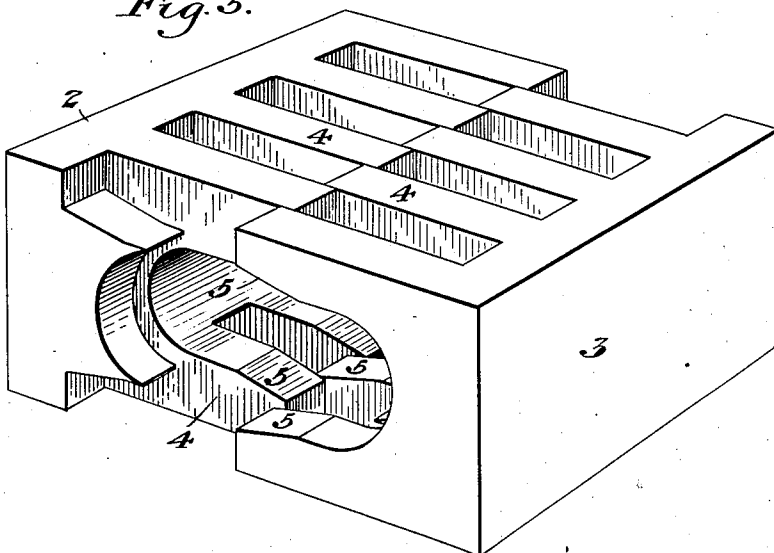
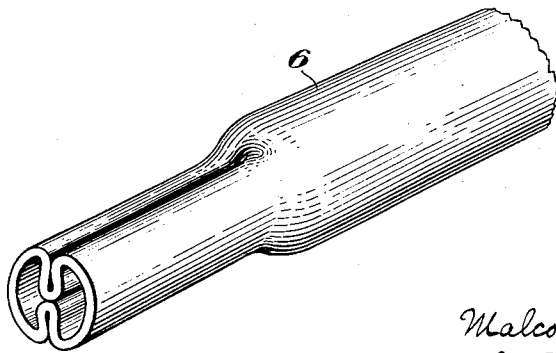


Fig. 6



WITNESSES

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UNITED STATES PATENT OFFICE.

MALCOLM WIKSTROM, OF SHELBY, OHIO, ASSIGNOR TO SHELBY STEEL TUBE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

APPARATUS FOR REDUCING THE ENDS OF TUBES.

No. 810,241.

Specification of Letters Patent.

Patented Jan. 16, 1906.

Application filed September 10, 1904. Serial No. 223,966.

To all whom it may concern:

Be it known that I, MALCOLM WIKSTROM, of Shelby, Richland county, Ohio, have invented a new and useful Apparatus for Reducing the Ends of Tubes, of which the following is a full, clear, and exact description reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows in front elevation dies constructed in accordance with my invention, these dies being in their fully-opened position and the tube to be reduced having been inserted therein. Fig. 2 is a like view showing the second stage of the operation, in which the dies have moved together sufficiently to flatten the tube to an oval form and to cause it to fill the cavity of the dies, but without changing the length of the circumference of the tube. Fig. 3 is a similar view showing the final position of the die. Fig. 4 shows, on a smaller scale, a position of the dies intermediate between Figs. 2 and 3. Fig. 5 is a perspective view of the dies when open, and Fig. 6 is a perspective view of the reduced tube.

In the operation of cold-drawing seamless tubes it is necessary to reduce, or "point," as it is generally termed, one end of each tube—that is to say, to reduce its diameter so that it can be pushed far enough through the die through which it is to be drawn to allow the tongs to grip it. Heretofore it has been the practice to reduce the tubes either by swaging mechanism and toggle-joint machines or by the use of hammers provided with half-round or V-shaped dies or by the use of swaging-rolls. Each of these modes of operation has certain disadvantages, and all of them are slow, requiring several blows of the dies or hammer and turnings of the tube before the swaging can be finished, and it is also difficult to perform the operation so as to make the reduced end of the tube concentric with the tube-body.

The purpose of my invention is to provide means by which the pointing of the tube can, if desired, be accomplished at a single operation of the dies and symmetrical and concentric points be produced without difficulty. The operation is performed with such regularity as to reduce the waste of the tube to a minimum.

In the drawings, 2 3 are the parts of the die. They are made so as to work together, each being preferably formed with a series of comb-like projections 4 for interfitting with and sliding upon similar projections on the other die.

When the dies are at full open position, (shown at Fig. 1,) they afford a middle recess with angular top and bottom surfaces 5, adapted to engage the circumference of the tube 6, which is to be reduced. The tube 6 is placed in the dies when in this position, and the parts of the dies are then brought together, either by strong pressure applied with a hydraulic press or otherwise or by means of the blow of a hammer. The first part of the approach of the dies causes the inclined surfaces 5 5 to act upon the tube at diametrically opposite points and to flatten it into the form shown in Fig. 2. This is done without reducing the circumference of the tube, which when in this shape will approximately fill the die-cavity and will be of substantially elliptical form in cross-section. During the further approach of the dies into the position shown in Fig. 3, the tube being held by the flat portions of the die-cavity at opposite sides and being subjected to compression at the ends by the approaching dies, its sides will fold in toward each other into the final shape. (Shown in Fig. 3.) The operation thus comprises an initial contraction of the die-cavity on opposite sides, so as to flatten the tube, and then a compression of the tube on the other sides by which it is folded in on the flattened surfaces. The end thus made will be perfectly concentric with the tube, and being made by the dies and always of the same length the waste can be reduced to a minimum.

If desired, the dies may be caused to approach so as to afford a final cavity of less cross-section than shown in Fig. 3, in which case the end will be still further reduced in diameter.

Within the scope of my invention as defined in the claims the apparatus may be modified in various ways by those skilled in the art, since

What I claim is—

1. Apparatus for reducing the ends of tubes, comprising dies adapted to hold the tube in flattened condition at opposite sides, and

when so held to subject it to compression at the other sides at opposite points to cause the non-flattened sides to approach each other; substantially as described.

- 5 2. Apparatus for reducing the ends of tubes, comprising dies having an initial cavity for the end portion of the tube, acting portions which first flatten the tube in said cavity, and other acting portions which subsequently
10 compress the non-flattened sides of the flattened tube at right angles to the direction in which it was flattened, to force said sides toward each other and thereby cause them to fold inwardly; substantially as described.
- 15 3. Apparatus for reducing the ends of tubes, comprising dies having a plurality of interfitting slots and projections recessed to form an initial cavity for the tube, and having acting portions which first flatten the tube to
20 general oval form without materially changing the length of its circumference, and subsequently compressing the non-flattened sides of the tube toward each other; substantially as described.

- 25 4. The combination of die parts formed

with interfitted comb-like projections having an initial cavity adapted to compress and flatten the tube in one direction and when more fully closed to compress the tube at right angles thereto; substantially as described. 30

5. The combination of interfitting die parts having when fully opened middle inclined surfaces 5 which flatten the tube, and end portions 6 adapted to compress the non-flattened sides of the tube after it has been flattened by the surfaces 5; substantially as described. 35

6. In apparatus for reducing the ends of tubes, dies having surfaces which first flatten the tube, and other surfaces which subsequently compress the non-flattened sides toward each other to therewith cause opposite portions of the flattened sides to fold inwardly toward each other; substantially as described. 40

In testimony whereof I have hereunto set my hand. 45

MALCOLM WIKSTROM.

Witnesses:

B. F. LONG,
SADIE BUCK.