June 12, 1923. 1,458,604

W. L. WOODWARD

METHOD FOR MAKING ZINC TUBING

Filed Jan. 24, 1921

Fig. 1

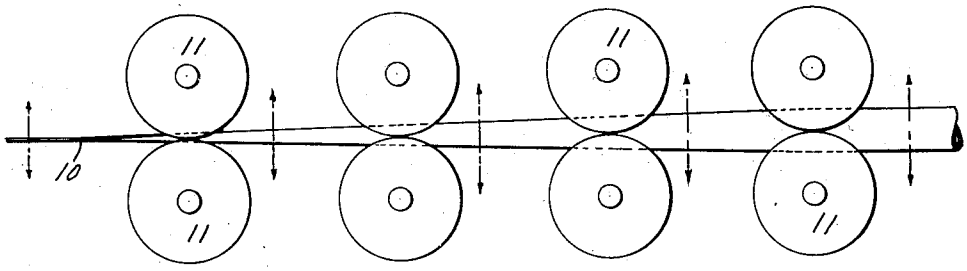


Fig. 2

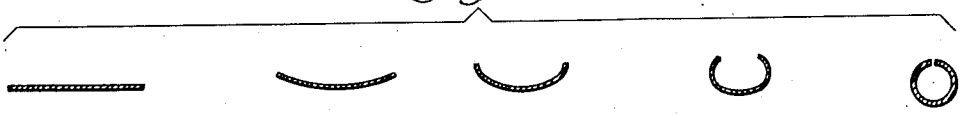


Fig. 3

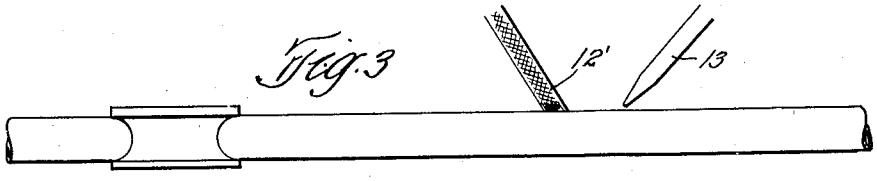


Fig. 4

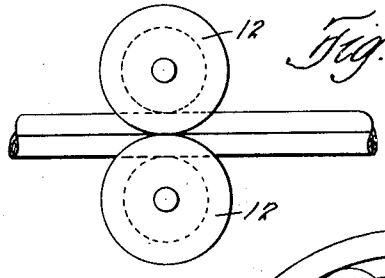


Fig. 5

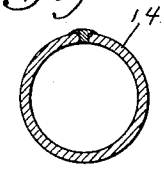


Fig. 6

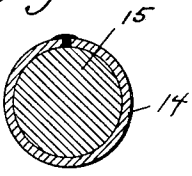


Fig. 7

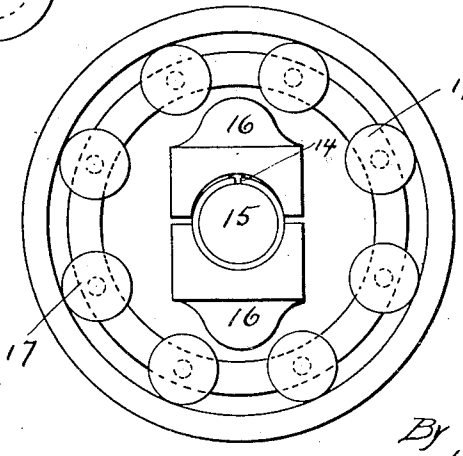
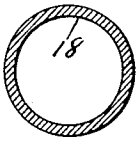


Fig. 8



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Patented June 12, 1923. 1,458,604

UNITED STATES PATENT OFFICE.

WILLIAM L. WOODWARD, OF LAKEWOOD, OHIO.

METHOD FOR MAKING ZINC TUBING.

Application filed January 24, 1921. Serial No. 439,364.

To all whom it may concern:

Be it known that I, WILLIAM L. WOODWARD, a citizen of the United States, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Methods for Making Zinc Tubing, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to the method for making zinc tubing, the object being to provide a seamless tube which can be subsequently drawn and worked and which can be used substantially the same as seamless tubes of other metals now in common use.

With these objects in view the invention consists in the various steps and the means for accomplishing said steps, all of which will be fully described hereinafter and pointed out in the appended claims.

In the drawings forming a part of this specification, I have diagrammatically indicated the various steps of the process and also one form of apparatus for carrying out the same and in which Fig. 1 indicates a series of rolls through which a strip of zinc is passed for the purpose of transforming said strip into an open tube and Fig. 2 is a view showing the cross-sectional shape of said strip during its passage through the rolls; Fig. 3 is a side view illustrating the manner of welding the meeting edges of the tube; Fig. 4 is a top plan view showing said tube passing between the presser rolls, Fig. 5 is a transverse sectional view of the tube after the joint has been welded; Fig. 6 is a view showing said tube placed upon a mandrel; Fig. 7 is a view illustrating one form of swaging device and Fig. 8 is a transverse sectional view of the finished tube.

In carrying out my invention I employ a strip of sheet zinc 10 of suitable dimensions to produce a tube of definite size. This strip of sheet zinc is passed through a series of shaping rolls 11 so that the strip in passing through the entire train or series of rolls is transformed from a flat strip into an open tube or cylinder as most clearly shown in Figs. 1 and 2.

The open tube is then passed between presser rolls 12 and beneath a wick 12′ preferably of asbestos and containing a suitable flux and also beneath a gas welding torch or burner 13, the presser rolls serving to maintain the edges of the tube in proper contact and direct the seam beneath the wick and also beneath the welding torch or burner and in this manner the seam has imparted thereto a proper amount of flux to produce an efficient weld through the application of heat from the welding torch or burner.

In this manner, a seamless tube is produced, but in making the weld the seam of the tube and the portions thereof adjacent thereto have become more or less crystallized which would prevent the tube being subsequently drawn, bent or otherwise worked; and with the object of restoring the molecular homogeneity of the seam and tube as a whole I swage, hammer, roll or otherwise work the welded tube along the line of the weld until the crystallized portions have been broken up and had the same properties of ductility, malleability, etc., imparted thereto as the remaining portions of the tube, or in other words the molecular formation of the welded seam is transformed to correspond with the molecular formation of the remainder of the tube so that the tube 18 is molecularly homogeneous throughout and after the tube has been so treated, it can be drawn, bent and otherwise worked in the same manner as tubes of brass, steel or other material. In Fig. 7 I have indicated one form of device for accomplishing this, and in which the welded tube 14 is placed upon a mandrel 15 and then subjected to swaging and hammering through hammers 16, actuated by balls or rollers 17 held in a proper device for causing quick sharp blows to the hammers.

A seamless tube of zinc is lighter than a tube of brass of the same dimensions and is capable of use for a large number of purposes where brass or steel tubing would not be suitable, but so far as I am aware seamless zinc tubing has not been employed for the reason previously stated, namely, that in effecting the weld, the ductile and malleable properties of the zinc have been destroyed, but by means of my improved method I am able to provide a seamless zinc tube which has all the characteristics of other seamless tubes.

Having thus described my invention, what I claim is:

1. The herein described method of making seamless zinc tubes which consists in shaping a strip of zinc into tubular form, weld-

ing the joint thereof and subsequently restoring the molecular homogeneity of the tube as a whole.

2. The herein described method of making seamless zinc tubes which consists in shaping a strip of zinc into tubular form, welding the joint of said tube, and then mechanically treating the welded portion of the tube to transform the molecular structure thereof to correspond with the molecular structure of the remaining portion of the tube.

3. The herein described method of making seamless zinc tubes which consists in shaping a strip of metal into the form of a tube, welding the joint of said tube and then breaking up the crystalline formation of the weld and transforming the same into a condition similar to the remainder of the tube.

In testimony whereof, I hereunto affix my signature.

WILLIAM L. WOODWARD.