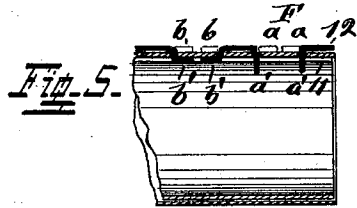
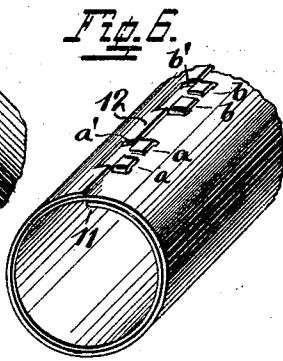
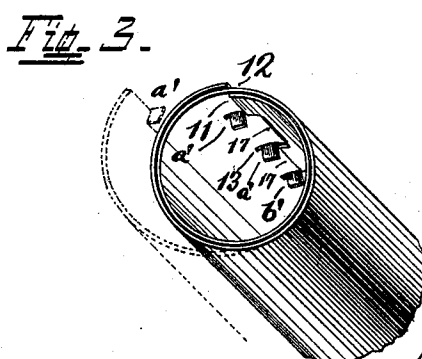
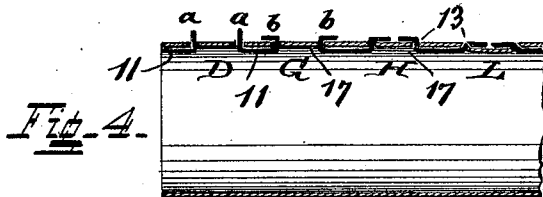
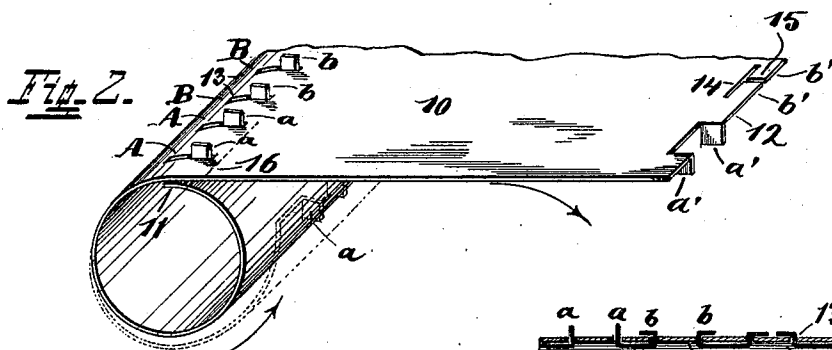
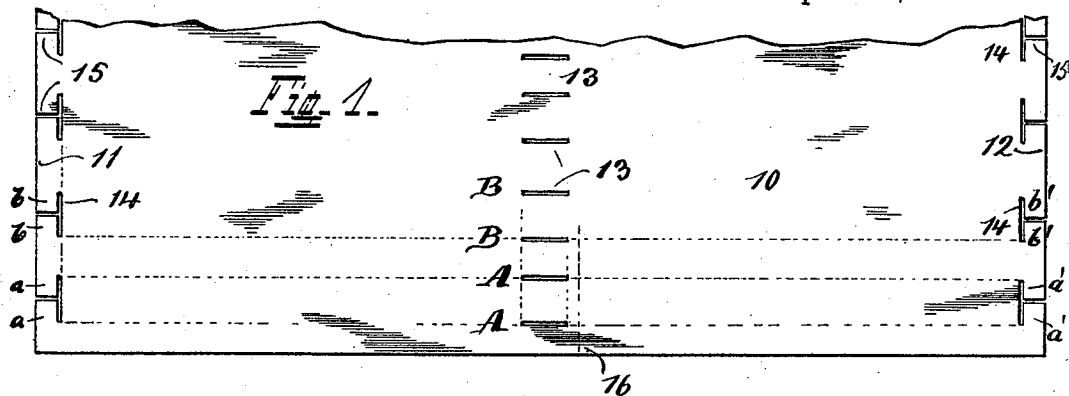


(No Model.)

W. T. CRESSLER.
TUBING.

No. 581,414.

Patented Apr. 27, 1897.



Attest
Arthur Kline
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Inventor
Will T. Cressler
by C. Spengel Atty.

UNITED STATES PATENT OFFICE.

WILL T. CRESSLER, OF NORWOOD, OHIO.

TUBING.

SPECIFICATION forming part of Letters Patent No. 581,414, dated April 27, 1897.

Application filed June 15, 1896. Serial No. 595,615. (No model.)

To all whom it may concern:

Be it known that I, WILL T. CRESSLER, a citizen of the United States, and a resident of Norwood, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Tubing; and I do declare the following to be a clear, full, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, attention being called to the accompanying drawings, with the reference letters and numerals marked thereon, which form a part of this specification.

This invention relates to improvements in the manufacture and construction of tubing out of sheet metal where such tubing is of double thickness, which thickness is attained by coiling or rolling the sheet of metal upon and around itself. In most of the tubing as heretofore constructed out of such material the connection at the resulting seam is generally completed by the application of solder, brazing, or welding. The strength of the joint resides in the strength of the brazed or welded connection, and if such ever becomes defective the mainstay of the seam is gone and the same will readily open.

The object of my invention is therefore to provide in the construction of such tubing of double thickness a new seam which is not dependent on solder or a similar chemical connection to complete the connection and to hold the seam intact, but is complete in itself by the mere mechanical connection.

In the following specification, and particularly pointed out in the claims, is found a full description of the invention, its mode of manufacture, parts, and construction, which latter is also illustrated in the accompanying drawings, in which—

Figure 1 shows in a plan view a part of a sheet of metal prepared and ready to be formed into a tube after the plan of my improved construction. Figs. 2 and 3 show various succeeding stages of procedure in the manufacture. Fig. 4, in a longitudinal section, shows the condition of the seam when arrived at the stage illustrated in Fig. 2. Fig. 5, in a similar view, shows the same parts when arrived in the condition as shown

in Fig. 3. Fig. 6 shows in a perspective view the connection completed.

In the drawings, 10 indicates a sheet of metal cut to the width necessary to construct a tube of a certain diameter and double thickness. The length of the same is not material. About midway between the edges 11 and 12 thereof there are openings 13, in the form of rectangular slots, and all of which run at right angles to and between the sides 11 and 12. A certain distance in from these latter, such distance being about equal to and not more than half of the length of slots 13, there are other slots 14, which are all in line with each other, transversely as well as longitudinally. The length of these slots is about equal to the distance between two adjoining ones of slots 13. The dotted lines in Fig. 1 show this relation of all the slots to each other plainly. Midway from each of slots 14 and outwardly toward the edges of the sheet the metal is split, as shown at 15. A sheet thus prepared is now ready to be formed into a tube, the manufacture proceeding as follows:

Taking the sheet as it is presented in Fig. 1, the edge 11 of the sheet is bent downwardly and brought around inwardly and up again against the under side of the sheet, about midway between the sides thereof, forming a tubular roll. Before this is done, however, portions of the metal (designated by *a a b b* and bounded by lines represented by side 11 of the sheet, slits 15, and slots 14) are bent upwardly on the remaining line on which they are connected yet to the balance of the sheet, as shown in dotted lines in Fig. 2, forming projecting lugs *a a b b* thereat, which when edge 11 has arrived in the position mentioned in the preceding sentence, and by reason of the arrangement of the parts as to location, are adapted to enter slots *A A B B* of slots 13 thereat, as shown in Fig. 2, and within which slots they assume a position as shown at *D* in Fig. 4. The other part of the sheet is now wrapped around the roll thus formed, corresponding parts of the metal, designated by *a' a' b' b'* near the other edge 12, having first, like parts *a a b b*, been bent downwardly, as shown by dotted lines in Fig. 3, which parts in the form of lugs *a' a' b' b'* are adapted, by reason of their properly-designed

location, to also enter slots A A B B of slots 13, occupying that part thereof which remains yet open, the other part, as will be remembered, being occupied by lugs *a a b b*. This condition of the parts is shown in Fig. 3, and at F in Fig. 5.

It is seen that groups of parts—that is, of slots and lugs coming together and entering in immediate engagement at certain points—are designated by groups of similar letters to permit the same parts to be traced and followed through the different stages of construction. Thus, for instance, in the group *a A a'*, *a* and *a'* designate the two lugs from different edges of the sheet which meet in one of the slots 13, (designated by A.) The protruding part of the lugs is finally flattened down to clench and overlap the metal around slots 13, through which they project. As to lugs *a* this may be done as soon as they have arrived in the position shown in Fig. 2, or it may be deferred until lugs *a'* have also arrived in their position, after which the two sets of lugs may be mashed down at once. This may be done in any suitable way, but preferably by power-driven machinery, to obtain a close and compact seam. The flattening may be as shown at G in Fig. 4 or as shown at H in same figure, the latter form being preferred, however, as then only two thicknesses of metal come together, which may be crowded down into the space and opening 17 first occupied by the lugs while flat with the sheet yet and created after they are bent for entering slots 13. (See L, Fig. 4.) In the form shown at G in same figure three thicknesses of metal would come together, and while as efficient for locking it would not make as smooth a joint.

As will be seen, a perfectly-locked seam is obtained, which requires neither soldering or brazing nor any other means to complete the connection and hold it closed. Some suitable substance or filler like putty, paint, or solder may be applied, however, to merely fill out only the crevices to prepare a smooth surface to receive paint or enamel where such is used. This construction is particularly useful where strength obtained with little metal to reduce weight is the desideratum, and for which

reason the tubing thus produced is very well adapted for use in connection with bicycle-frames.

Having described my invention, I claim as new—

1. A sheet or blank of metal for the construction of tubing, the sheet to be wrapped to double thickness, said sheet having lugs at each edge formed by cutting and bending the metal to project from such edges, those at one edge projecting oppositely to those at the other edge, and slots 13 cut in the sheet between the edges thereof and in a position to receive the aforesaid lugs when the sheet is bent to form a tube.

2. A blank or sheet of metal for the construction of tubing, provided with openings or slots 13 between its sides 11 and 12 and cuts or slits 14 and 15 at its edges, to permit the formation of suitable lugs or projections adapted to enter openings 13 when said sheet is bent into the form described, the length of slits 15 being not more than half of slots 13, to permit two of the lugs to occupy slots 13, slits 14 being of a length to cause the lugs to protrude at the other side of openings 13 after having entered them, substantially as shown and described.

3. A tube of double thickness consisting of a single sheet, said sheet having lugs projecting in opposite directions from the edges which form its longitudinal seam and having an opening 17 between each pair of lugs, said sheet also having slots 13 along the longitudinal seam of the tube, each slot having two lugs inserted therein, one from each edge, which enter slots 13 in opposite directions, the oppositely-protruding lugs being flattened down, those from one edge at the outside and those from the other edge at the inside of the tube, the lugs of each pair being bent toward each other and crowded into the spaces 17, preventing an increase of thickness of the metal at the seam.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

WILL T. CRESSLER.

Witnesses:

ARTHUR KLINE,
C. SPENGEL.