(No Model.)

F. A. WILMOT.

SHEET METAL TUBE.

No. 578,801. Patented Mar. 16, 1897.

Fig. 1.

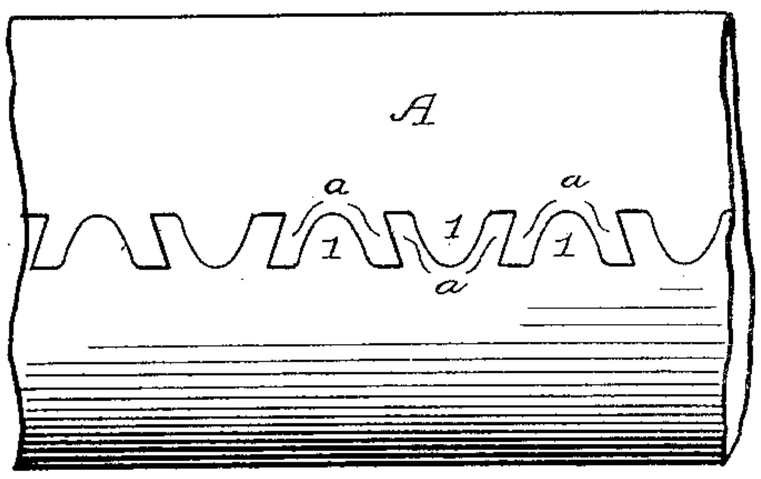


Fig. 2.

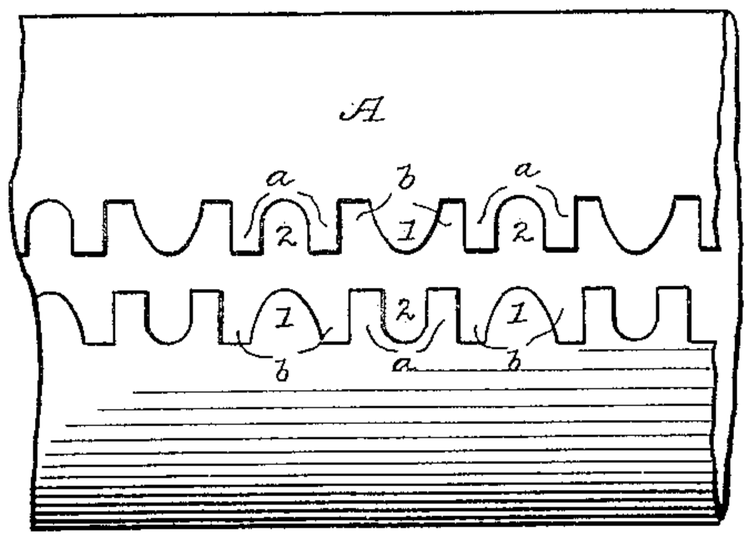


Fig. 3.

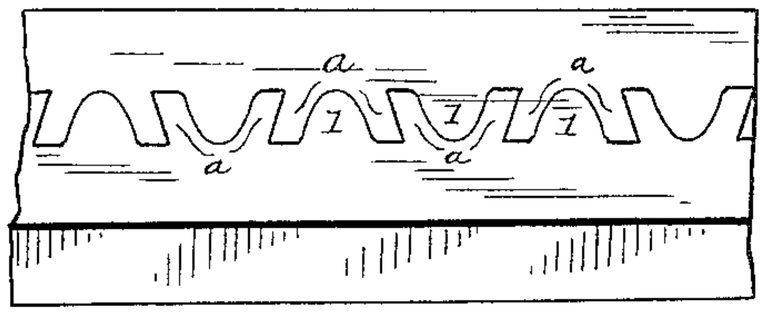
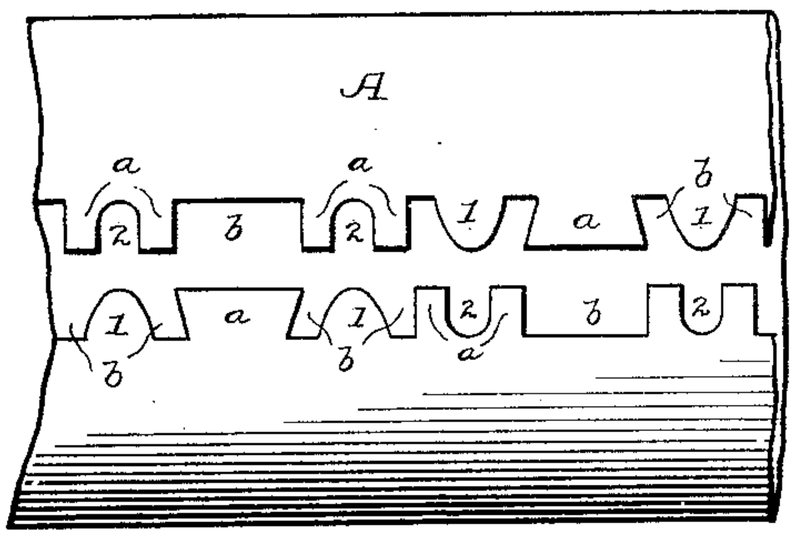


Fig. 4.

Fig. 5.



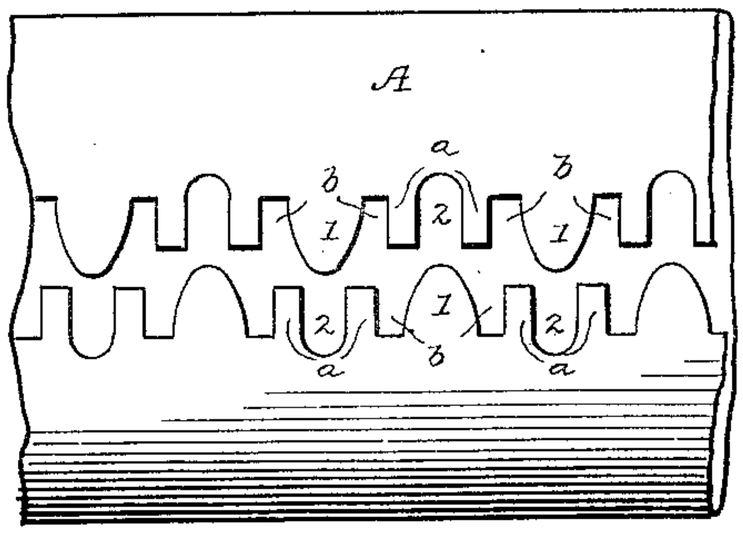
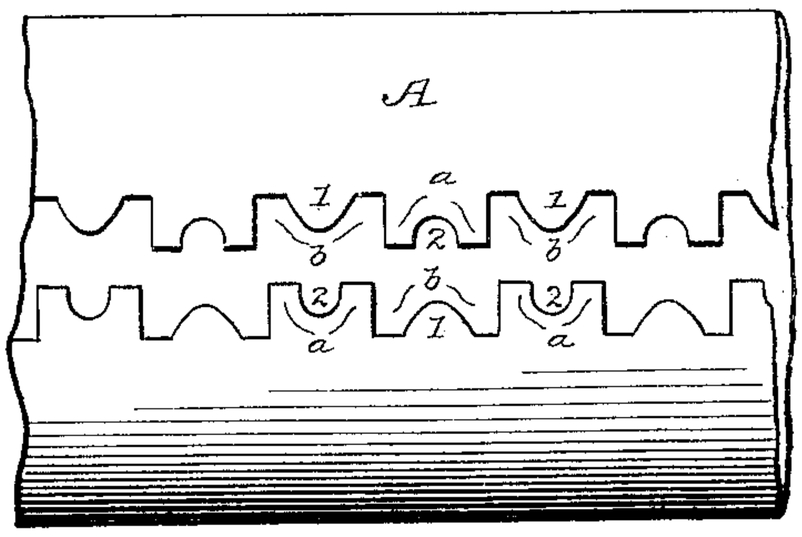


Fig. 6.



WITNESSES

H. A. Lamb.

Susan V. Haley.

INVENTOR

Frank A. Wilmot

By A. M. Wooster

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK A. WILMOT, OF BRIDGEPORT, CONNECTICUT.

SHEET-METAL TUBE.

SPECIFICATION forming part of Letters Patent No. 578,801, dated March 16, 1897.

Application filed September 29, 1896. Serial No. 607,350. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. WILMOT, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Sheet-Metal Tubes; and I do hereby declare the following to be a full, clear, 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.

This invention relates to the method of uniting sheet-metal edges and to the articles of manufacture produced by such method, and has particular reference to the production of metal tubing which may be made of clock-spring steel, although the method may be employed in connection with the production of other articles than tubes and from other metal than steel.

The object of my invention is to produce a joint in which interlocking projections and recesses are so brought together under edgewise compression as to cause parts or molecules of the metal to change their relative positions laterally, and thus become immovably interlocked without appreciably changing the thickness of the sheet metal at the seam or joint.

With these ends in view I have invented the novel method and the product thereof which I will now proceed to describe, and then point out in the claims.

In the accompanying drawings, Figure 1 represents a completed tube produced according to my method. Fig. 2 represents the tube having its edges formed with alternate projections and recesses and adapted to be brought together and compressed edgewise to form the completed tube shown in Fig. 1. Fig. 3 represents two flat strips of metal having their edges united according to my invention, the particular shape of the interlocked projections and recesses being similar to the illustration in Fig. 1. Figs. 4, 5, and 6 are views similar to Fig. 2, but illustrating different shapes which the edges may have prior to the final edgewise interlocking and compression.

Similar reference-characters are employed to designate similar parts throughout the several views.

Referring first to Fig. 2, A designates a blank adapted to be formed into a tube, the edges of which blank are provided with alternate projections *a* and recesses *b*, which may be termed the "main" projections and recesses, these being subdivided, as by a smaller projection or lug 1 at the center of each recess *b* and by a smaller recess or notch 2 at the center of each projection *a*.

For convenience in describing my invention I hereinafter mainly use such terms as above; but of course another way to describe the shape of the edges of the blanks would be to refer to the parts 1 and the small parts on each side of a notch 2 as "projections," and to apply the term "recesses" to the spaces or notches 2 and the spaces each side of a part 1. I prefer, however, to distinguish the main projections *a* and main recesses *b* from the smaller ones which subdivide them for the reason that in the forms which I have here chosen to illustrate my invention the main projections and recesses are substantially rectangular in outline, while the smaller or intermediate ones (termed "lugs" and "notches") have portions which are more or less curved or inclined.

To permanently unite the two edges of the blank shown in Fig. 2, the said edges are closed together about a mandrel or drawn through a die, or passed through rolls with or without a mandrel to cause the projections to pass directly into the recesses as the edges are brought together, and in this direction of movement a circumferential or edgewise compression is given to the blank, so as to cause the side walls of the lugs 1 to laterally displace the portions of the projections *a* which lie each side of the notches 2, thus causing some of the molecules of metal forming the projections to change their relative positions to some extent, the projections finally becoming clenched together, as indicated in Fig. 1, without appreciable alteration in thickness.

Owing to the sides of the lugs 1 being inclined in opposite directions the forcing of the parts together causes the two prongs of

the projections *a* to move laterally in alternate opposite directions, the shapes of the recesses adjacent to said prongs on both pieces or edges of metal being correspondingly altered.

I may employ a small amount of solder at places or throughout the length of the irregular line of the joint, but I do not limit myself thereto.

In the case of uniting the edges of two flat strips or sheets of metal, as indicated in Fig. 3, the procedure is the same as above described, except that here there would be no circumferential compression—merely an edgewise compression.

As indicated in Fig. 4, the lugs 1 and notches 2 may be omitted from some of the main recesses and projections, and, as indicated in Fig. 5, the lugs 1 may be of greater length than the two prongs of the projections *a*, and the notches 2 may be of greater depth than the recesses *b*, or, as shown in Fig. 6, the lugs and notches may be, respectively, of less length and depth than the main projections and recesses.

Having now described how my invention may be carried into effect, although without attempting to set forth all of the modifications of which it is capable, I declare that what I claim is—

1. The method of uniting two edges of sheet metal which consists in forming said edges with interlocking projections and recesses, some of the projections having sides which are inclined in opposite directions, and then forcing the projections and recesses together edgewise and thereby alternately displacing portions of the metal laterally and in opposite directions to alter the shape of the said projections and recesses, whereby the parts will be firmly clenched together.

2. The method of making sheet-metal tubing which consists in first forming the edges of the blank with interlocking projections and recesses, some of the projections of one edge differing in outline from the opposite recesses of the other edge, and then forcing the projections and recesses together edgewise and thereby laterally displacing portions of the metal to alter the shape of the said projections and recesses, whereby the parts will be firmly clenched together.

3. A tube formed from a blank of sheet metal having upon its edges a continuous series of interlocking projections and recesses portions of which have oppositely-inclined sides to form cam-surfaces so that, when a circumferential compression is given to the blank, metal is displaced in alternate opposite directions and locks the said edges against separation.

4. A tube formed from a blank of sheet metal having its edges provided with interlocking projections and recesses, the ends of some of said projections or recesses differing in outline from the ends of the corresponding parts so that, when the blank is compressed circumferentially, metal is displaced sidewise and clenches the edges firmly together.

5. A tube formed from a blank of sheet metal having upon its edges interlocking alternate projections *a* and recesses *b* subdivided by the notches 2 in the projections *a* and the cam-shaped lugs 1 in the recesses *b*, the said lugs 1 being wider than the notches 2, whereby, when the blank is compressed circumferentially, the portions of the metal each side of the notches 2 are displaced sidewise and interlocked.

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

FRANK A. WILMOT.

Witnesses:
A. M. WOOSTER,
SUSAN V. HELEY.