

(No Model.)

F. A. WILMOT.
SHEET METAL TUBE.

No. 578,799.

Patented Mar. 16, 1897.

Fig. 1.

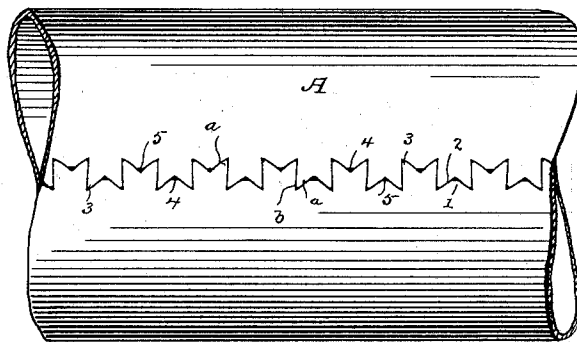
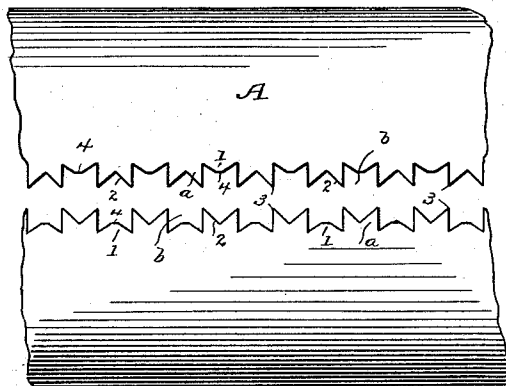


Fig. 2.



WITNESSES

H. A. Lamb
S. V. Richardson

INVENTOR

Frank A. Wilmot
By *A. M. Wooster*
Atty.

UNITED STATES PATENT OFFICE.

FRANK A. WILMOT, OF BRIDGEPORT, CONNECTICUT.

SHEET-METAL TUBE.

SPECIFICATION forming part of Letters Patent No. 578,799, dated March 16, 1897.

Application filed March 13, 1896. Serial No. 583,061. (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.

My invention relates to the class of metal tubes which are formed by curving a blank of sheet metal the meeting edges of which are provided with interlocking projections and recesses; and the object of my invention is to produce a tube of this character which may be made, if required, of clock-spring metal, is so constructed that the cost of production shall be reduced to the minimum, the projections and depressions being so shaped as to produce the least possible wear upon the dies and punches, and in which the projections and depressions will interlock readily and when once interlocked and the final compression has been given to the tube will not unlock under any circumstances whatever, the tube being equally as strong at the joint as at any portion.

With these ends in view I have devised the novel tube of which the following description, in connection with the accompanying drawings, is a specification, letters and numbers being used to designate the several parts.

Figure 1 is a view illustrating the completed tube, the projections and depressions having been interlocked and clenched; and Fig. 2 is a view showing the edges of the blank curved toward each other and in position to be interlocked.

It is of course well understood that in making this class of tubes the blanks are made of slightly-greater width than is necessary to encircle the mandrel, that in all diework, especially in cutting steel, it is desirable that the lines of the punches be right lines, and, furthermore, that it is desirable that the projections and recesses shall be so shaped that the projections will pass directly into the recesses without the necessity of placing the projections over the recesses and then forcing them down into the recesses.

The objection heretofore found in making tubes from blanks the edges of which were provided with straight-sided projections which were forced into straight-sided recesses has been that the resiliency of the metal frequently causes the edges of the blank to separate more or less at the joint. This is especially true when metal of the character known as "clock-spring" steel is used, this grade of metal being especially adapted for use in the manufacture of bicycle-frames, where great strength and stiffness is required with the least possible weight, it being impossible, moreover, to form from the edges of a tube-blank made from this metal the usual lock-joint, as the metal will break when bent at a sharp angle. In my novel tubes the usual lock-joint is dispensed with, and I wholly overcome the objection of separation at the joint by so shaping the projections and recesses that when the final compression is given to the blank about the mandrel the projections will be clenched in the recesses in such a manner as to leave a perfectly-tight joint, if required, and under all circumstances to prevent the edges of the blank from separating. This feature is especially valuable when the tubes are used in the manufacture of bicycle-frames, as it enables me to use light stiff metal and to lock the edges of the blank by means of straight-sided interlocking projections and recesses. This I have found to be impracticable without my novel improvement for the reason that the heat necessarily applied in brazing the tubes to the connections is liable to melt the solder in the joints, and then the resiliency of the metal opens the joints.

A denotes a blank the edges of which are provided with alternate projections *a* and depressions *b*. The novel feature of my invention is that I provide at the base of a portion or all of these depressions lugs 1, which engage the walls 2 at the ends of the corresponding projections. The walls are provided with angular recesses, as shown in the drawings, leaving points 3 at the edges of the projections. When the edges of the blank are closed together, the projections are forced into the corresponding recesses, and when the final compression is given to the blank about the mandrel the lugs 1 will engage the walls 2 at

the ends of the projections and will force the side walls of the projections outward, causing them to engage the side walls of the depressions, thereby firmly clenching and locking the projections in the depressions, so that the tube is made as strong at the joint as at any other place.

In Fig. 2 I have shown the sides of the recesses in walls 2 as lying at more acute angles to the line of the joint than the sides of lugs 1, and have also shown the tips of lugs 1 as flattened, as at 4. The effect of this special construction is to spread the points 3 in opposite directions and interlock them and also to leave slight openings entirely through the completed tube, as indicated at 5 in Fig. 1. The purpose in leaving these openings is to permit solder to flow freely through the joint at these points, thereby assisting to make a perfectly homogeneous joint. I wish it distinctly understood, however, that my invention is not limited to this feature of construction, but consists, broadly, in the use of the lugs 1 at the bases of a portion or all of the depressions, which engage the ends of the projections and cause the side walls of said projections to move laterally and rigidly engage and enter into the side walls of the depressions.

Having thus described my invention, I claim—

1. A tube formed from a blank of sheet metal having upon its edges a continuous se-

ries of interlocking projections and depressions, said depressions having angular lugs at their bases and said projections having angular recesses at their ends leaving points 3 at the edges thereof, so that when the final compression is given to the blank said lugs will engage the recesses in the corresponding projections and will force the side walls of the projections outward into engagement with the side walls of the corresponding depressions, thereby clenching the edges of the blank in the interlocked positions.

2. A tube formed from a blank of sheet metal having upon its edges interlocking projections and depressions, said depressions being provided at their bases with lugs having flattened tips and the front walls of the corresponding projections being recessed as shown so that when the final compression is given to the blank the lugs will force the side walls of the projections outward into engagement with the side walls of the depressions and the edges of the blank will be clenched in the interlocked position leaving openings through the joint between the tips of the lugs and the bases of the recesses as and for the purpose set forth.

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

FRANK A. WILMOT.

Witnesses:

A. M. WOOSTER,
S. V. RICHARDSON.