D. A. RITCHIE.

Manufacture of Sheet-Metal Tubing.

No. 224,228. Patented Feb. 3, 1880.

Fig. 1.

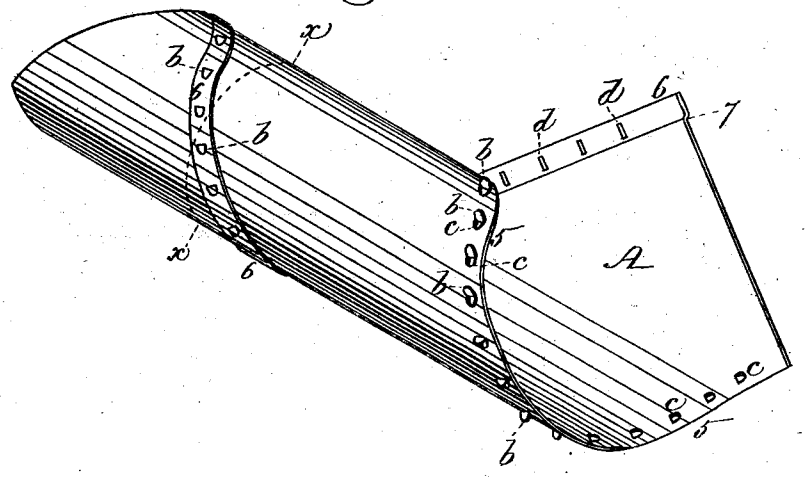


Fig. 2.

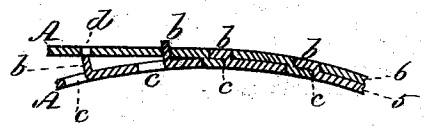
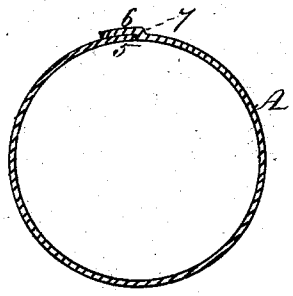


Fig. 3



Witnesses,
W. J. Cambridge
W. S. Spring.

Inventor,
David A. Ritchie
per R. E. Heckemacher
Atty

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DAVID A. RITCHIE, OF CHELSEA, MASSACHUSETTS.

MANUFACTURE OF SHEET-METAL TUBING.

SPECIFICATION forming part of Letters Patent No. 224,228, dated February 3, 1880.

Application filed June 6, 1879.

To all whom it may concern:

Be it known that I, DAVID A. RITCHIE, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Sheet-Metal Tubing, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view representing a piece of my improved sheet-metal tubing in the process of construction. Fig. 2 is a section taken on the line of the seam, enlarged. Fig. 3 is a transverse section on the line *x x* of Fig. 1.

My invention relates to that class of sheet-metal tubing formed by winding a strip spirally around a mandrel; and it consists in a spirally-wound sheet-metal tube in which one edge of the strip is provided with tongues or projections formed by punching and striking up the metal at suitable intervals, the other edge of the strip having slits or apertures through which the tongues pass as one edge of the strip overlaps the other in the operation of winding it spirally around the mandrel, the tongues or projections being afterward clinched or flattened down on the outside of the seam in such a manner as to hold the edges of the strip firmly together and prevent any liability of their separation, thus insuring a tight joint.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents a strip of sheet metal of the required width, which, as it is fed through a machine adapted for the purpose, is wound spirally around a mandrel or former. One edge, 5, of the strip A, as it passes through the machine, and before it is wound on the mandrel, is punched by suitable mechanism in such a manner as to strike up tongues or projections *b* at short distances apart, these tongues being left at right angles with the surface of the strip, the holes *c* from which the metal is punched necessarily corresponding in size and shape to the tongues. In the opposite edge *b* of the strip A are punched, at the same distance apart as the tongues *b*, a series of narrow slits or apertures, *d*, of such size and shape and in such a position as to allow the tongues *b* to pass up through them as the edge *b* is brought down onto and overlaps the edge 5 (see Fig. 1) in the operation of winding the strip A on the mandrel. A pressure-roll or other suitable device now passes over the seam and clinches or flattens down the tongues *b* onto the outside of the edge *b*, as seen in Fig. 1, which completes the operation, the two edges of the strip being held firmly and immovably together by the clinched tongues or projections, which thus form a cheap, simple, and effective fastening, the several operations of winding the strip, striking up the tongues, forming the apertures for their reception, and clinching them down being all performed during a single passage of the strip through a machine, many advantages being thus presented over the ordinary method of uniting the edges of a strip of metal by means of separate rivets, which are more costly and involve the expenditure of additional time and labor in their application, besides leaving heads or projections on the inside of the pipe, which, if of small diameter, is liable to be obstructed by the accumulation of dirt on these projections.

The edge *b* of the strip A is provided, as usual, with an offset, 7, which causes the joint to be flush on the inside of the pipe, so as to offer no obstruction.

In practice I prefer to exert a very heavy pressure in clinching down the tongues *b*, so as to embed or force them into the surface of the metal on which they are laid, which causes the under surface of the overlapping edge *b* of the strip to be pressed out, as seen in Fig. 2, into the apertures *c*, which lie directly beneath, and which are thus filled up flush, causing the under surface of the edge 5 to present a perfectly smooth and even surface, while the joint is rendered additionally secure.

I do not confine myself to the form or size of the tongues, as they may be of any suitable shape and size.

Sheet-metal tubing constructed as above described is well adapted for water and hot-air conductors, stove-pipes, speaking-tubes, and various other purposes, and may be galvanized or tinned, if desired, to render the seam or joint perfectly tight.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A spirally-wound sheet-metal tube in which one edge of the strip A is provided with tongues or projections *b*, punched or struck up therefrom, and the other edge with corresponding slits or apertures *d*, through which the tongues pass as one edge of the strip overlaps and is laid down upon the other in the operation of winding, the tongues being afterward clinched or flattened down to secure the overlapping edges of the strip together and form the joint, substantially as described.

2. In a joint for sheet-metal tubing made as described, the tongues *b*, pressed into or embedded in the outer surface of the metal, so as to force the corresponding portion of its under surface into the apertures *c* in the piece of metal beneath, from which the tongues are punched, substantially as and for the purpose described.

Witness my hand this 4th day of June, A. D. 1879.

DAVID A. RITCHIE.

In presence of—
P. E. TESCHEMACHER,
W. J. CAMBRIDGE.