(No Model.)

A. H. LIMONT.

PROCESS OF MAKING DUPLEX TUBING.

No. 408,729. Patented Aug. 13, 1889.

Fig. 2.

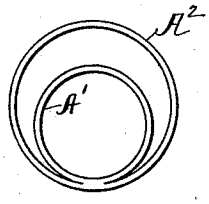


Fig 1.

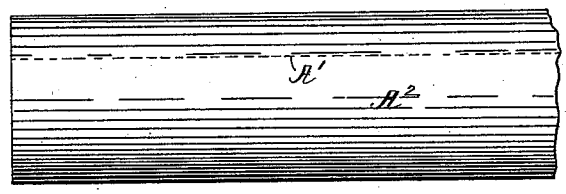


Fig 3.

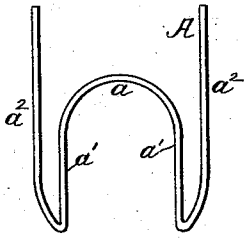


Fig 4.

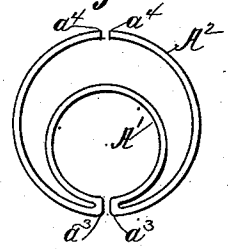


Fig 5

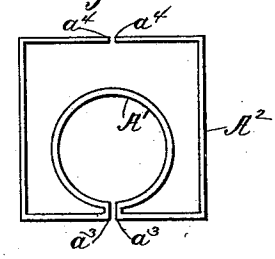


Fig 9.

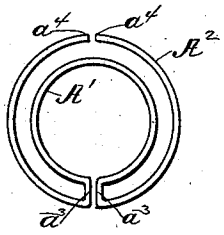


Fig 8.

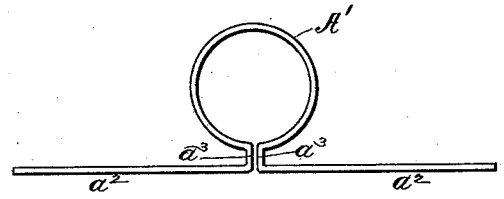


Fig 7.

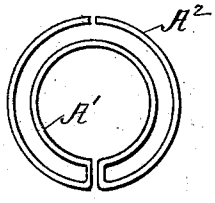
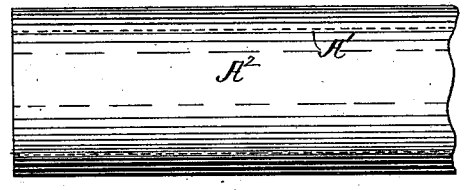


Fig 6



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PROCESS OF MAKING DUPLEX TUBING.

SPECIFICATION forming part of Letters Patent No. 408,729, dated August 13, 1889.

Application filed March 30, 1889. Serial No. 305,380. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER H. LIMONT, of Waterbury, in the county of New Haven and State of Connecticut, have invented a certain new and useful Improvement in the Process of Making Duplex Tubing, of which the following is a specification.

My improvement relates to the process of making duplex tubing of that kind which has its two ducts arranged one within the other and made of a single strip of metal.

The improvement consists in the process of making duplex tubing, consisting in taking a strip of metal, bending it about midway between the side edges, and also bending it at two points intermediate of the middle portion of the side edges back upon itself.

I will describe a process of making duplex tubing and then point out the novel features in claims.

Figure 1 is a side view of tubing embodying my improvement. Fig. 2 is an end view thereof. Fig. 3 is an end view of a sheet or strip of metal such as is used for manufacturing tubing of the kind shown in Figs. 1 and 2, and representing said sheet or strip as it appears at one stage in the manufacture of this tubing. Figure 4 is an end view of this sheet or strip of metal bent to complete the tubing. The edges are not, however, represented as united in this figure, Fig. 2 being a corresponding view illustrating the tubing as completed. Fig. 5 is a view corresponding to Fig. 4. In this view the outer duct is, however, made rectangular in the cross-section instead of circular in the cross-section, as it is represented in Fig. 4. Fig. 6 is a side view of tubing of a slightly-modified form embodying my present improvement. Fig. 7 is an end view thereof. Fig. 8 is an end view of the sheet or strip of metal as it appears at one stage in the manufacture of this form of tubing. Fig. 9 is an end view of the sheet or strip as finally bent into shape.

Similar letters of reference designate corresponding parts in all the figures.

Considering first the example of tubing illustrated by Figs. 1, 2, 3, 4, and 5, A designates a sheet or strip of metal which has parallel sides. It is first so bent that its middle portion a will assume the form of a semicircle, so that the immediately-adjacent portions a' will be tangential to the semicircular portion and parallel with each other, and so that the edge portions a^2 will extend on curves outwardly and then parallel with the portions a', as may be readily understood by reference to Fig. 3. Subsequently the straight portions a' will be bent to complete the circle of which the portion a forms part, and the straight portions a^2 will be bent to form a larger circle. These two circles may be seen completed in Fig. 4. The inner one A′ is, it will be seen, eccentric to the larger and outer one A^2. It will be observed that in this example of my improvement the inner circle or duct A′ is at one portion close to the inner surface of the larger and outer one A^2.

The bending may be done by any suitable tools or machinery. As these form no part of my improvement, I will not make further allusion to them. The opposite edges a^3 of the two ducts, where these ducts are contiguous, are united and the side edges a^4 of the sheet or strip are united. This may be done by brazing or soldering. The tubing provided with the two ducts A′ A^2 will then be completed in the form illustrated by Fig. 2.

In Fig. 5 I have shown a form of tubing in which the sheet or strip has the parallel portion a' bent to complete the circle of which the portion a is a part, and afterward has the side portion a^2 bent into the form of a rectangular tube. After this bending the opposite edges a^4 will be united, as before explained in connection with Fig. 4.

Obviously the inner duct A′ may, if desired, be made of angular form in carrying out my improvement.

Turning now to Figs. 6, 7, 8, and 9, it will be seen that the sheet or strip is at the middle bent to form a circle or duct A′. This may be best understood by reference to Fig. 8. Then the portions a^3 of the sheet or strip immediately adjacent to the meeting edges of this circle or duct A′ are extended parallel to each other and radially to the said circle or duct a short distance. The side portions a^2 of the sheet or strip are then bent into circular form and form the outer duct A^2, as may

be understood by reference to Fig. 9. In this example it will be seen that the two ducts are concentric. The portions of the sheet or strip extending radially from the inner duct A′ are united, and the side edges a^4 are united by brazing or soldering. The appearance of the finished tubing may best be understood by reference to Fig. 7.

Tubing embodying my improvement has two distinct and separate ducts. Each may be used for a different purpose. For example, electric-light wires may be passed through one and gas through the other.

The manner of making the joints, whether by soldering, brazing, or otherwise, is an immaterial feature.

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

1. The process of making duplex tubing, consisting in taking a strip of metal, bending it at about midway between the side edges, and also bending it at two points intermediate of the middle portion of the side edges back upon itself, substantially as specified.

2. The process of making duplex tubing, consisting in taking a strip of metal, bending it at the middle longitudinal portion into the form of a semicircle, with tangential portions extending from said semicircle, then bending the tangential portions into a continuation of the curve of the semicircle, so as to complete the circle, and subsequently bending the edge portions of the strip back to form a larger circle surrounding the circle or duct first completed, substantially as specified.

3. The process of making tubing, consisting in forming two ducts, one within the other, the outer being extended from and formed around the inner, substantially as specified.

4. The process of making tubing, consisting in forming two ducts, the inner being made by bending the middle portion of a sheet or strip of metal into form, and the outer being made by bending the side portions of the metal outwardly in opposite directions around the inner duct until the edges meet, substantially as specified.

ALEXANDER H. LIMONT.

Witnesses:
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