(No Model.)

G. H. EVERSON.

MODE OF MAKING COMPOUND METAL TUBES.

No. 438,072. Patented Oct. 7, 1890.

Fig. 1.

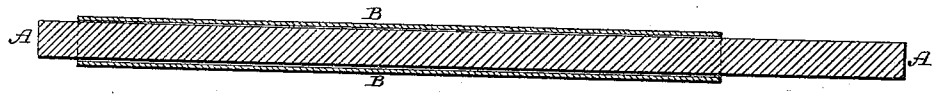


Fig. 2

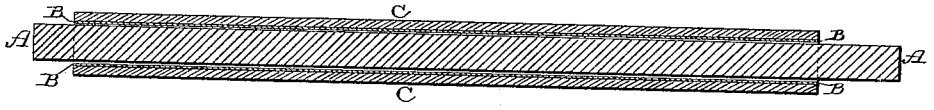


Fig. 3.

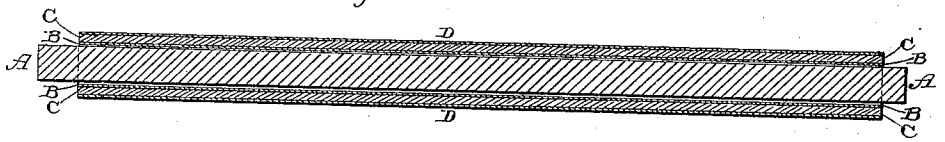
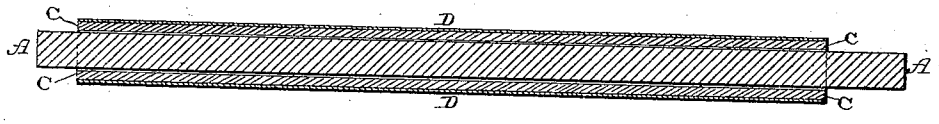


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE H. EVERSON, OF PITTSBURG, PENNSYLVANIA.

MODE OF MAKING COMPOUND METAL TUBES.

SPECIFICATION forming part of Letters Patent No. 438,072, dated October 7, 1890.

Application filed January 31, 1890. Serial No. 338,740. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE H. EVERSON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Process for Lining and Covering Tubes and Pipes; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improved process for lining and covering hard metallic tubes or pipes with softer metals; and it consists in, first, placing the lining upon a hard mandrel which has been suitably lubricated, and then rolling the lining upon the mandrel until it has the desired size and thickness, passing the tube which is to be lined over the lining on the mandrel, and then rolling the tube and the lining upon the mandrel until the tube or pipe is rolled tightly upon the lining, and, second, placing the tube which is to be covered upon a hard mandrel, covering it with the material which is to be used as a covering, and then passing the tube and covering while upon the mandrel through suitable rolls until the covering is rolled tightly upon the tube and the covering is reduced to the required thickness, as will be more fully described hereinafter.

The object of my invention is to cover iron, steel, or other hard metallic tubes or pipes, either inside or out, or both, with softer metals—such as lead, copper, zinc, tin, &c.—and thus produce highly-finished tubes or pipes made of iron or steel, and which are so covered with other metals as to produce practically pipes of that metal or metals, and which have not only a much greater strength and resistance, but which can be produced at a much lower price.

Figure 1 is a vertical section of a hard mandrel having a lining or covering placed upon it and ready to be rolled. Fig. 2 is a similar view showing a pipe placed upon the lining after the pipe and lining have been rolled. Fig. 3 is a similar view showing the covering applied to a lined pipe. Fig. 4 is a similar view showing the covering applied to the pipe without a lining.

I first take a hard smooth mandrel A of the exact diameter desired for the inside of the lining of the tube and somewhat longer than the tube that is to be lined and covered. This mandrel is then thoroughly lubricated over its entire surface with oil and graphite or other suitable lubricant, and this mandrel is placed inside of the tubular lining which is to be placed inside of the tube or pipe. This lining B must be thicker than it is intended to be when finished, so as to allow for the rolling which it is to receive. The mandrel A and the lining B placed upon it are then passed a suitable number of times through suitable grooves in suitable rolls until the lining material is rolled tightly upon the mandrel A and the desired thickness of the lining material is obtained. The tube or pipe C to be lined is then slipped over the lining B into position. The tube, lining, and mandrel are then passed through suitable grooves in suitable rolls until the tube or pipe is rolled tightly upon the lining and the two are made practically one. If it is desired to cover the tube or pipe either with the same or a different material from the lining, the covering D is then placed around the outside of the tube or pipe and the whole is passed through suitable grooves in suitable rolls until the covering is rolled tightly upon the tube and the covering is reduced to the required thickness. Then by suitable appliances the hard mandrel, which has been prevented from sticking to the lining by the lubricating material, is removed from the inside of the lining of the tube, after which the ends of the lining, tube, and covering are to be trimmed off evenly. Where a lining alone is required the covering is dispensed with, and if a covering alone is required the pipe is placed directly upon the lubricated mandrel, rolled to the required thickness, and then the covering is applied, as above described. Either the lining and covering may be of the same material or of different materials, as may be desired. By this construction very superior tubes for steam-boilers, underground-wire conduits, and many other purposes can be produced. Pipes lined and covered with brass or copper

are substantially the same as pipes made wholly of brass or copper, possess a much greater strength, and can be produced much more cheaply.

Having thus described my invention, I claim—

1. The process described of lining pipes, consisting in placing the metal which is to form the lining upon a hard mandrel, rolling this lining until it has the desired thickness, then placing the pipe which is to be lined upon the lining, and rolling both the pipe and the lining upon the mandrel to any desired degree, substantially as shown.

2. The process of covering pipes or tubes, consisting in placing the pipe upon a lubricated mandrel, rolling the pipe to the desired thickness, placing the covering material around the pipe upon the mandrel, and then rolling both the covering material and the pipe to any desired degree, substantially as set forth.

3. The process herein described of both lining and covering pipes of hard material with other metals, consisting in placing the lining upon a hard lubricated mandrel, rolling the lining until it fits tightly upon the mandrel and is reduced to the required thickness, placing the tube upon the lining and rolling both the tube and the lining, placing the covering upon the tube thus rolled, and then rolling the covering, the tube, and the lining, substantially as specified.

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

GEORGE H. EVERSON.

Witnesses:
JOHN Q. EVERSON,
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