W. GRIFFITH.

ART OF PRODUCING HOLLOW ARTICLES OF METAL.

APPLICATION FILED MAR. 20, 1909.

959,518.

Patented May 31, 1910.

Fig. 1.

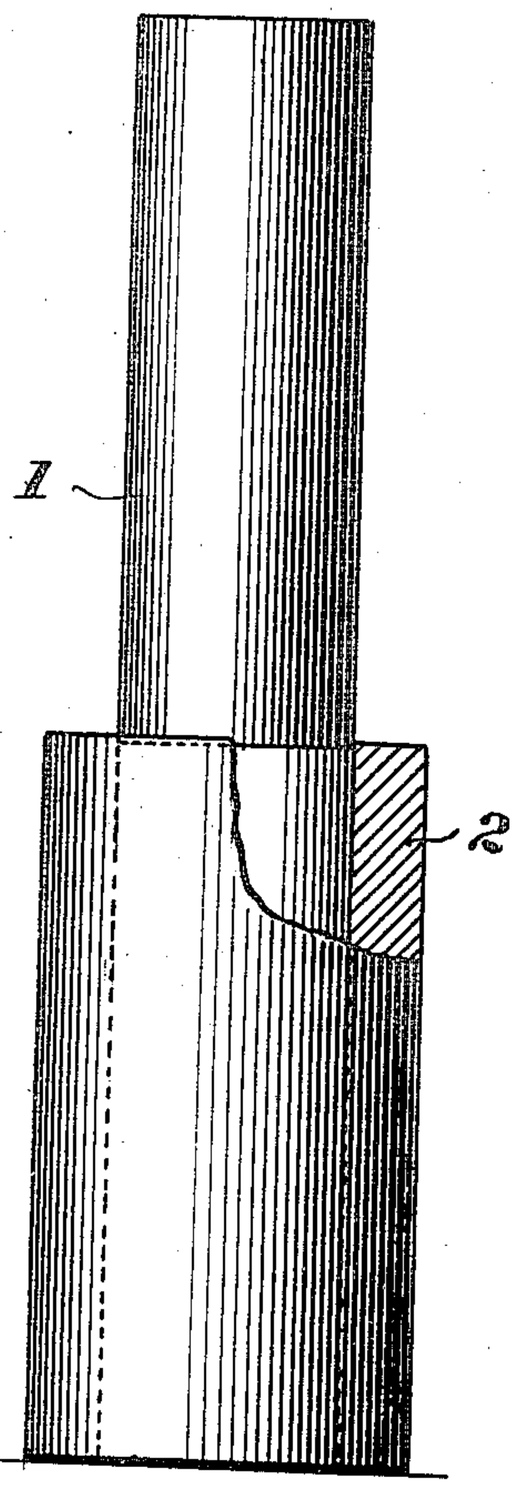


Fig. 2.

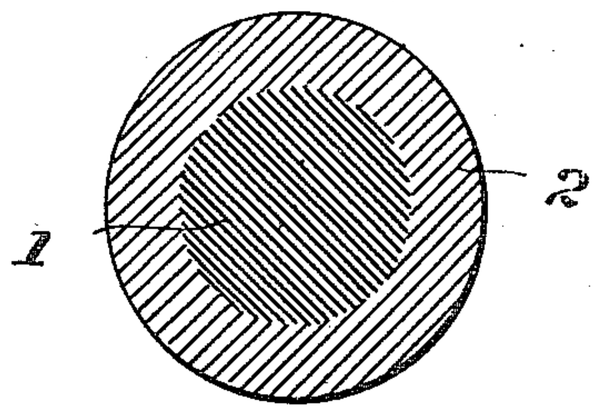
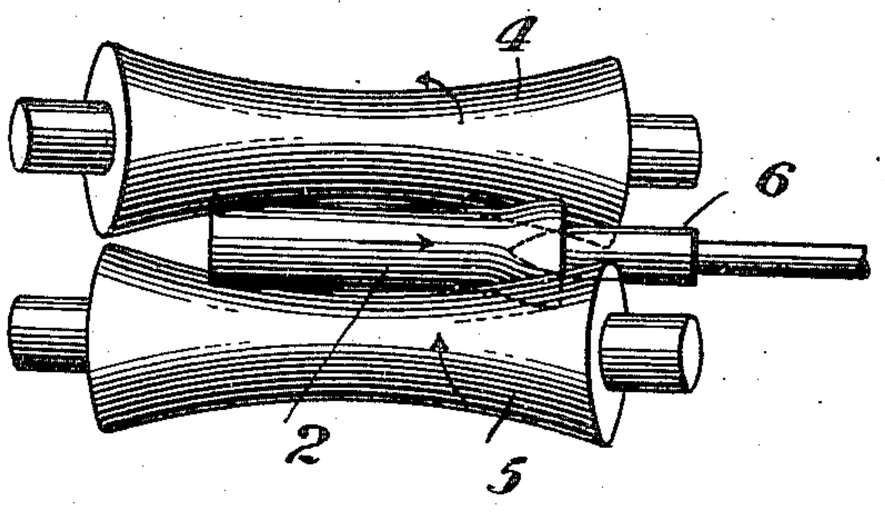


Fig. 3.



WITNESSES

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ART OF PRODUCING HOLLOW ARTICLES OF METAL.

959,518. Specification of Letters Patent. Patented May 31, 1910.

Application filed March 20, 1909. Serial No. 484,776.

To all whom it may concern:

Be it known that I, WILLIAM GRIFFITH, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in the Art of Producing Hollow Articles of Metal, of which the following is a full, clear, and exact description.

In carrying out my invention, I take a hollow article of iron or steel and subject it to a cleaning operation, such as pickling, then, if desired, the article is immersed in an alkaline solution to prevent further oxidation of the metal. The article then receives a metallic deposition by being subjected to a solution of metallic salt after which treatment the article receives a core of copper or other metal either by pouring or insertion. An outside coating of sheet copper or other metal may then, if desired, be given the article. The product thus produced is placed in a heating furnace and heated to a point slightly below the melting temperature of the interior metal. It is then withdrawn from the furnace and passed through rolls or pressure device until the metals are welded to each other. If the metals have, during the preceding operations, been chilled the article to be treated is again placed in a reheating furnace and reheated, after which, and after it has been removed from the reheating furnace, it is pierced through the interior core of copper or other softer metal by a piercer of somewhat smaller diameter than the diameter of the copper or other metal core. This piercing may be done in the manner ordinarily practiced in the manufacture of seamless tubing.

For purposes of illustration reference is made to the accompanying conventional drawings in which—

Figure 1, is an elevation, partly in section, showing the softer metal core in position to be inserted into a hollow iron or steel article; Fig. 2, illustrates a cross-section through the welded ingot; and Fig. 3, is a diagrammatic illustration of one manner of piercing the ingot.

The ingot may be formed as illustrated in Fig. 1, by inserting a softer metal core 1, into the cavity of a hollow harder metal article 2. The resulting composite body or billet is then heated in a furnace to a degree slightly below the melting temperature of the interior metal core, after which it is passed through pressure rolls which weld the softer metal perfectly to the body of the harder metal, as illustrated in Fig. 2. If this welding operation has chilled the article, it is reheated in a furnace and may then be pierced, as in the manner shown in Fig. 3, by passing the billet through feeding rolls 4, 5, and forcing the same over a suitable mandrel 6, thereby piercing the soft metal core. The effect of piercing is to leave a cavity in the center of the ingot, billet, bar or tube which is lined with copper or metal other than the exterior portion of iron or steel and while the metal is hot a mandrel is inserted and the article, while in this heated condition, is rolled into a seamless tube. The effect of this operation is to produce a seamless tubing having an interior lining of softer metal and, when it is desired, an exterior coating of softer metal.

The advantages of my invention will be appreciated by those skilled in the art.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

The method of forming a body consisting of welding iron or steel to an inner core of softer metal, and piercing the softer metal, thus leaving a coating of softer metal adhering to the iron or steel.

In testimony whereof, I have hereunto set my hand.

WILLIAM GRIFFITH.

Witnesses:
M. ARTHUR KELLER,
M. A. BARTH.