Aug. 14, 1923. 1,465,073

L. D. DAVIS

PROCESS OF PRODUCING SEAMLESS INTERNALLY RIBBED TUBES

Filed Oct. 30, 1919

Fig. 1.

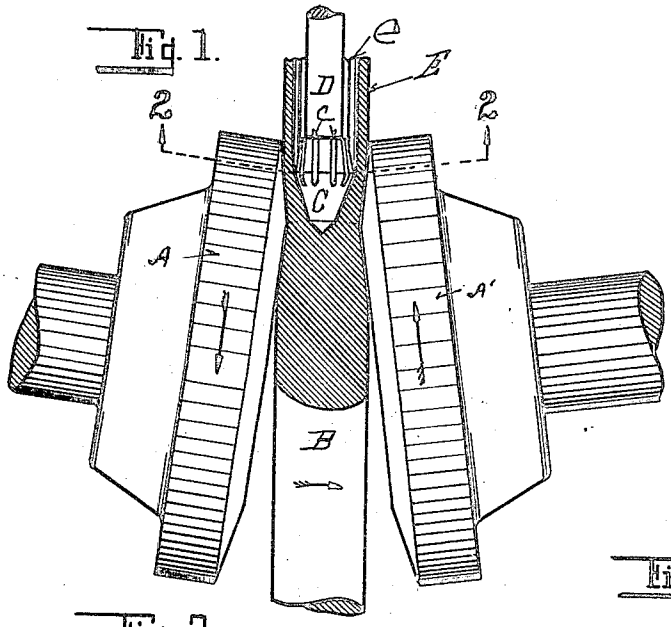


Fig. 3.

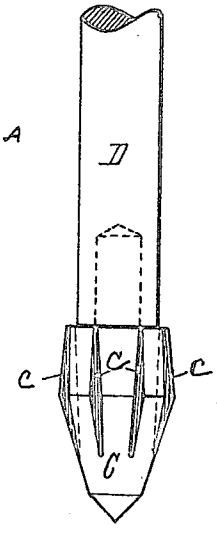


Fig. 2

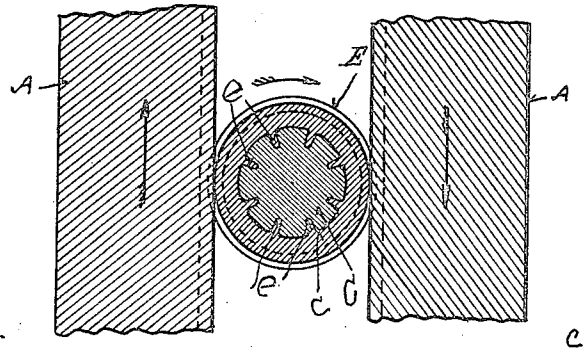
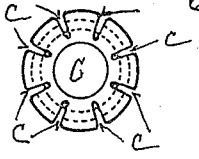


Fig. 4.



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UNITED STATES PATENT OFFICE.

LEONARD D. DAVIS, OF ERIE, PENNSYLVANIA.

PROCESS OF PRODUCING SEAMLESS INTERNALLY-RIBBED TUBES.

Application filed October 30, 1919. Serial No. 334,522.

To all whom it may concern:

Be it known that I, LEONARD D. DAVIS, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Processes of Producing Seamless Internally-Ribbed 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to the method of producing internally ribbed seamless tubes, and particularly to the method of making such seamless tubes for boilers; and has for its object the production from a solid billet of steel or other suitable metal, of a seamless tube having internal ribs or projections and thereby increasing the heating surface and effectiveness of the heat applied to the tubes in the generation of steam.

I am aware that lap-weld tubes having internal ribs therein have heretofore been made, but so far as I am aware, no one has, heretofore, produced a seamless tube with its well known advantages in boiler construction with internal ribs therein.

This I accomplish by piercing a billet in a billet piercing mill, preferably by means of a grooved piercing plug, so as to form from such billet a tube with internal ribs or projections on its inner surface; after which the walls of the tube coming from the piercing mill may be reduced and drawn out to any desirable thickness by means of the usual methods therefor; and while I prefer to make the seamless internally ribbed tube in the manner above described, I can produce it by piercing the billet with a plain piercing plug and then drawing out and reducing the tube formed from a pierced billet over a peripherally grooved mandril, thus forming the internal ribs in the finished tube.

The features of my invention are hereinafter fully set forth and described, and the accompanying drawings diagrammatically illustrate means for the production of my invention, in which drawings,

Figure 1, illustrates a section of a billet piercing mill, with a billet being pierced.

Figure 2, illustrates an enlarged cross section of the same on the line 2—2 in Fig. 1.

Figure 3, is an enlarged view in elevation of my improved piercing plug and its supporting mandril.

Figure 4, is an end view in elevation of the same.

In these drawings A A′ indicates a pair of billet piercing mill discs; B indicates a billet being pierced; C indicates a grooved piercing plug, and D its supporting mandril. The piercing plug C is provided with longitudinal grooves *c*, and is mounted on the mandril D so they will rotate in unison with the billet B being pierced; during this operation the billet B is rotated by the discs A A′, which discs are so located with relation to each other that they feed the billet B forward against the piercing plug C, and form said billet into a tube E with internal ribs *e* therein, and the tube thus formed is a complete internally ribbed seamless tube.

In case, however, it is desired to thin the walls of the tube so made, it can be readily done by drawing the same out over a grooved mandril by any of the ordinary methods of reducing seamless tubes now commonly practiced.

In the manner above described I produce a seamless internally ribbed tube, which in boiler practice greatly increases the heating surface thereof and the effectiveness of the heat applied thereto in the generation of steam.

Having thus described my invention so as to enable others to utilize and practice the same, what I claim as new and desire to secure by Letters Patent is:—

1. The process of making internally ribbed tubes from steel billets, consisting substantially in rolling a billet in a piercing mill and forcing a piercing plug having longitudinal slots in its periphery therethrough during the rolling process.

2. The process of making internally ribbed tubes from steel billets, consisting

substantially in forming internally projecting ribs on the inner surface of the tube during, and as a part of the piercing process.

3. The process of making internally ribbed tubes from steel billets, consisting substantially in causing a billet to be axially pierced by means of a piercing plug having longitudinal slots in its periphery whereby internally projecting ribs are formed on the inner wall of the tube during the piercing process.

In testimony whereof I affix my signature.

LEONARD D. DAVIS.