UNITED STATES PATENT OFFICE.

HENRY J. NEWTON, OF NEW YORK, N. Y.

IMPROVEMENT IN COPPER-COATED IRON PIPES FOR STEAM-BOILERS, &c.

Specification forming part of Letters Patent No. **132,485**, dated October 22, 1872.

To all whom it may concern:

Be it known that I, HENRY J. NEWTON, of the city, county, and State of New York, have invented a new and useful Improvement in Tubes and Pipes for Steam-Boilers, Superheaters, and other structures in which tubes or pipes are exposed to oxidation, of which the following is a specification:

In the use of tubular superheaters for superheating steam, the rapid oxidation of the tubes or pipes is a source of great inconvenience, especially when the tubes or pipes are of wrought-iron, which is, in other respects, the most suitable material. The object of this invention has been to obtain tubes or pipes which would stand the effect of the heat, more particularly the effect of oxidizing flames, for a longer time, and which at the same time would not be objectionably expensive or liable to other serious objections. I have found that iron pipes coated with copper serve an excellent purpose; and my invention consists in copper-coated iron pipe, which I believe to be an entirely new article of manufacture.

In carrying out my invention, I take ordinary wrought-iron tubes or cast-iron pipes, and, after subjecting them to a suitable pickling process in acids, immerse them in a bath of a solution of copper in connection with a galvanic-battery, and electroplate them with copper. I prefer, generally, to obtain on the iron pipes or tubes both an external coating and an internal lining of copper, such coating or lining to be of a thickness sufficient to insure protection; but in some cases it may be necessary to have only an external coating, and in others only an internal lining of copper, and in such cases when cheapness is a consideration, either the lining or the external coating may be omitted.

In the process of electroplating I prefer to place the pipe or tube in the bath in an upright position. To provide for plating the interior of the tube, I arrange centrally within and parallel with the tube, but out of contact therewith, a copper anode, consisting of a piece of copper-wire, with one end of which the positive pole of the battery is connected, and I connect the tube itself with the negative pole of the battery, so that it constitutes a cathode. To provide for properly plating the exterior of the pipe or tube one or more anodes, consisting of strips of sheet-copper connected each at one end with the positive pole of the battery are arranged in the bath outside of and parallel with the tubes.

The coating or lining, or both, of copper obtained by the electro-deposit is so pure that the iron pipes or tubes coated in this way are superior, so far as liability to oxidation by the action of flame or heated gas is considered, to copper pipes or tubes.

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

Copper-coated iron pipe or tubing, substantially such as is herein described.

HENRY J. NEWTON.

Witnesses:

HENRY T. BROWN,

MICHAEL RYAN.