No. 781,230. PATENTED JAN. 31, 1905.

H. RODMAN.

METHOD OF COATING METALS.

APPLICATION FILED DEC. 3, 1904.

Fig. 1.

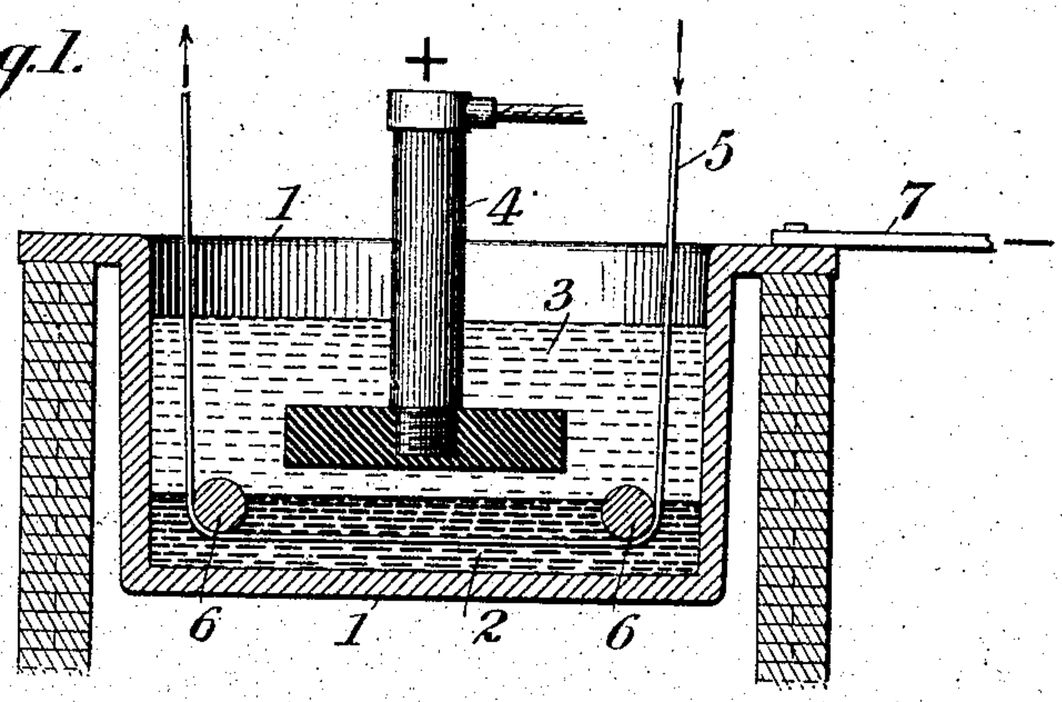


Fig. 2.

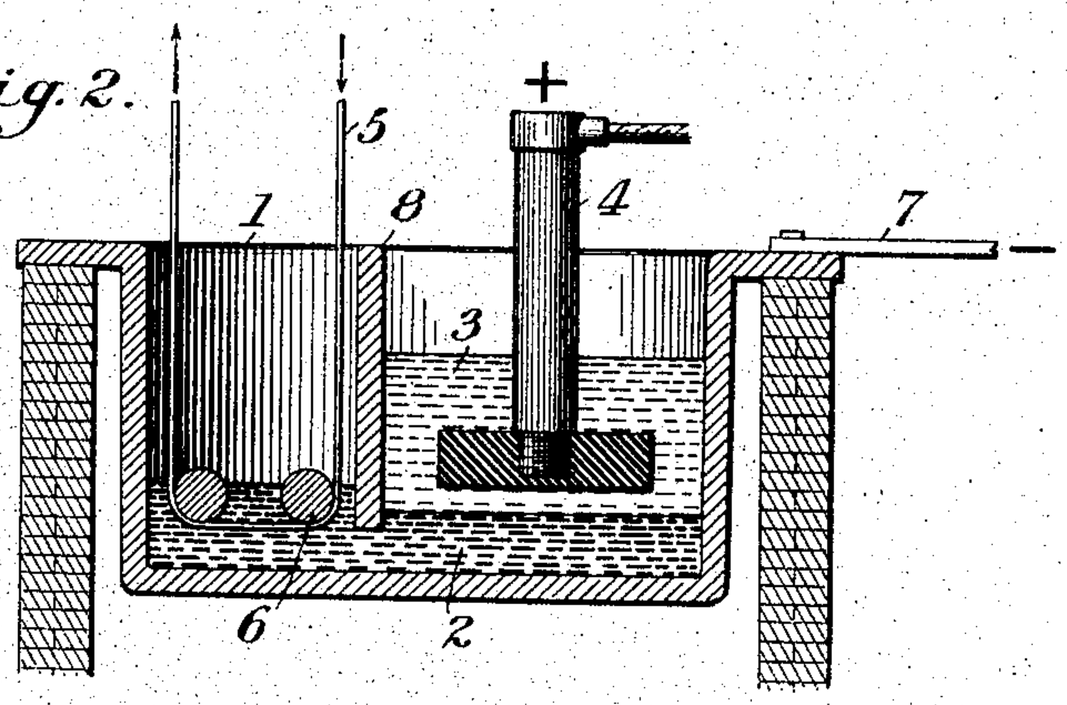
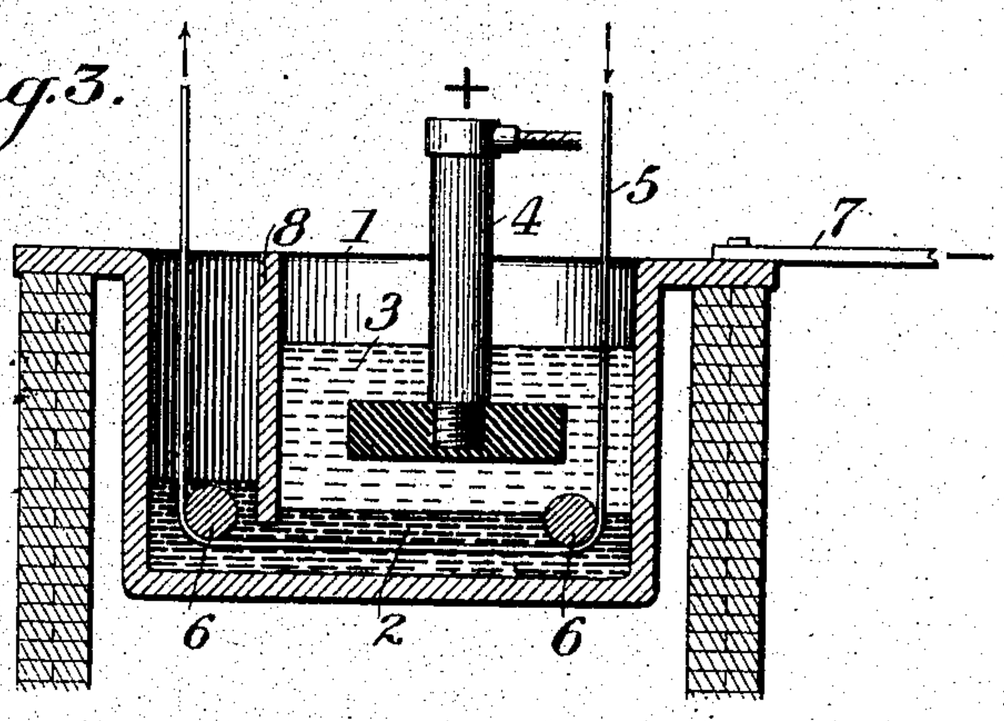


Fig. 3.



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No. 781,230. Patented January 31, 1905.

UNITED STATES PATENT OFFICE.

HUGH RODMAN, OF CLEVELAND, OHIO.

METHOD OF COATING METALS.

SPECIFICATION forming part of Letters Patent No. 781,230, dated January 31, 1905.

Application filed December 3, 1904. Serial No. 235,324.

To all whom it may concern:

Be it known that I, HUGH RODMAN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Methods of Coating Metals, of which the following is a specification.

This invention is a method of securing upon a metal, as iron or copper, an adherent coating of a fusible metal, as lead, tin, or zinc.

According to my invention the coating is effected in a bath of the fusible metal in which is maintained during the coating operation a suitable proportion of a highly-electropositive metal, such as potassium or sodium. Preferably the metal to be coated is preliminarily subjected to the action of such electropositive metal and is thereby cleaned and prepared for the reception of the adherent coating.

For a full understanding of my invention reference is made to the accompanying drawings, wherein—

Figure 1 is a vertical section of an arrangement of apparatus for carrying out my method. Figs. 2 and 3 are similar views of modified arrangements.

Referring to Fig. 1, 1 is a cast-iron vessel for containing the fusible metal 2 and a supernatent body 3, which may consist of the molten hydroxid of an alkali metal. 4 is an anode dipping into the molten hydroxid into proximity to the surface of the fusible metal 2. For use in a bath of hydroxid the anode may conveniently be of iron. 5 represents a wire of iron, copper, or other metal to be coated, which is directed by suitably-placed rollers or guides 6 6 through the molten hydroxid and the body of fusible metal underlying it, the wire being moved through the bath by any desired means. 7 indicates the cathode connection.

According to the above arrangement the cathode comprises the pot 1 and the molten metal 2 and wire 5, which are in metallic connection therewith. The electropositive element, as potassium or sodium, will therefore be deposited both upon the surface of the fusible metal 2 and upon the wire 5. The alkali metal rapidly diffuses through and dissolves in the fusible metal, such diffusion and solution being aided by the stirring action of the moving wire and serves to secure a closely-adherent and uniform deposit of the coating metal. That portion of the alkali metal which is deposited upon the wire 5 effectively cleans it by the reduction of any coating of oxid, thereby avoiding the necessity for any extensive preliminary pickling or cleaning. I may increase the path of travel of the wire through the electrolyte to an extent sufficient to insure a thorough cleansing.

According to the arrangement illustrated in Fig. 2 a partition 8 depends into the fusible metal 2, dividing the pot into two compartments, sealed by the fusible metal. One of these compartments contains the anode and electrolyte and the other the guides 6 6 for the wire. This arrangement is less desirable, however, than that shown in Fig. 1 or Fig. 3, because the metal to be coated is not preliminarily cleaned by the cathode reaction.

Fig. 3 illustrates a similar compartmental cell having the guides 6 6 so placed that the wire is carried to the molten bath through the electrolyte, but is withdrawn from the molten bath at a point where the latter is not covered by the electrolyte. This arrangement is advantageous for the reason that no alkali metal is electrodeposited on the wire after the application of the coating. The apparatus may be otherwise modified without departing from my invention.

I do not limit myself to the treatment of wire, which is described by way of illustration only, but may coat metal in any desired form; nor do I limit myself to a continuous process, it being essential merely that a due proportion of the electropositive metal be maintained in the bath throughout the coating operation. If desired, I may deposit the alkali metal upon the wire only, some alkali metal being transferred by the movement of the wire to the molten coating metal and securing an adherent coating thereof.

I claim—

1. The method of coating a metal which consists in subjecting it to the action of a molten coating metal, and maintaining in said

coating metal a suitable proportion of an alkali metal, substantially as described.

2. The method of coating a metal which consists in cleaning it by the action of an alkali metal, and thereafter coating it in a molten bath, substantially as described.

3. The method of coating a metal which consists in cleaning it by the action of an alkali metal, and thereafter coating it in a molten bath containing an alkali metal, substantially as described.

4. The method of coating a metal which consists in maintaining in a molten body of the coating metal a suitable proportion of an alkali metal, and subjecting the metal to be coated to the action of said body, substantially as described.

5. The method of coating a metal which consists in maintaining in a molten body of the coating metal a suitable proportion of an alkali metal, and moving the metal to be coated through said body, substantially as described.

6. The method of coating a metal which consists in electrodepositing an alkali metal on the metal to be coated, and thereafter subjecting said metal to the action of a coating metal, substantially as described.

7. The method of coating a metal which consists in electrodepositing an alkali metal on the metal to be coated, and thereafter subjecting said metal to the action of a coating metal and an alkali metal, substantially as described.

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

HUGH RODMAN.

Witnesses:
THEODORE A. WILLARD,
R. G. SMITH.