L. POTTHOFF.

ELECTROPLATING APPARATUS.

APPLICATION FILED FEB. 11, 1916.

1,243,098. Patented Oct. 16, 1917.

Fig. 1

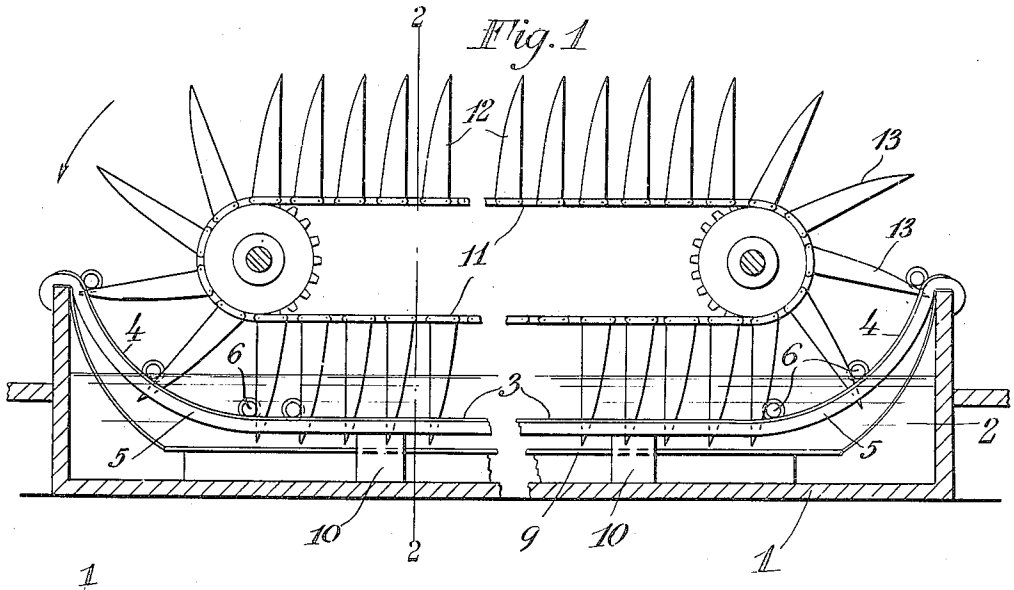
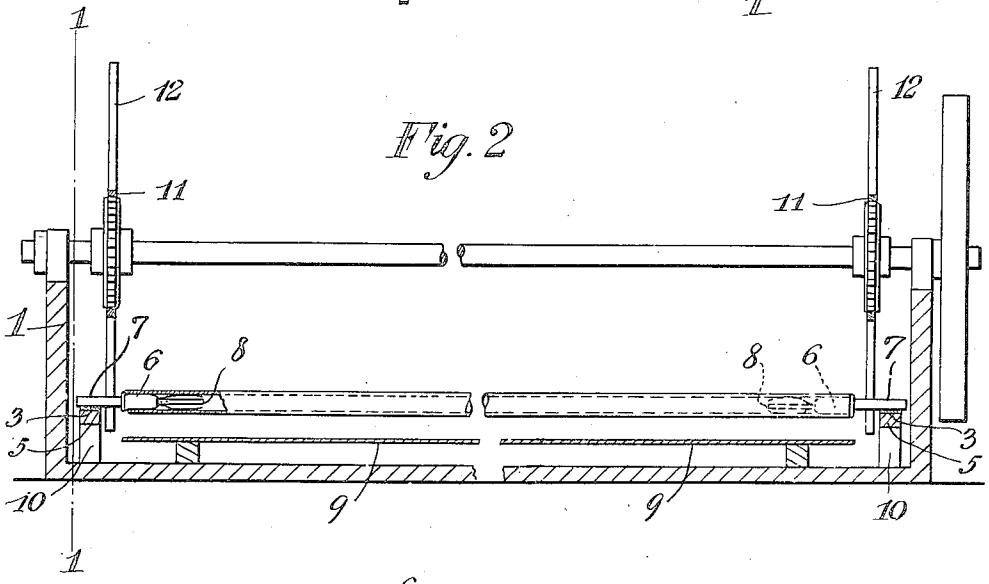


Fig. 2



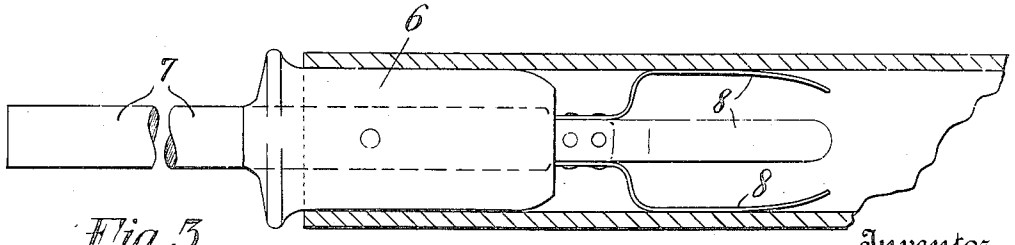


Fig. 3

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ELECTROPLATING APPARATUS.

1,243,098. Specification of Letters Patent. Patented Oct. 16, 1917.

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To all whom it may concern:

Be it known that I, LOUIS POTTHOFF, a citizen of the United States, residing at Flushing, in the county of Queens and State of New York, have invented certain new and useful Improvements in Electroplating Apparatus, of which the following is a full, clear, and exact specification.

This invention relates to electroplating apparatus, and particularly to the external electroplating of pipes or tubes with zinc or other suitable metal.

The object of the invention is to provide apparatus to carry a continuous succession of tubes through an electrolyte and so support them that the negative electrode terminal is not in moving contact with the surfaces being plated.

Hitherto it has been the practice to move the tubes on cathode rails which also support the weight of the tubes, but the contact of the cathode rail with the tube may interfere with the proper plating of the surface of the tube resting on it. The irregular character of the tube surface may produce irregular contact with the cathode rails, so that the resistance is increased, thereby causing an irregular or burned coating to be formed. To avoid these difficulties, I provide means for supplying current to the tubes through conductors contacting with surfaces which are not being plated.

In carrying out the invention, cathode plugs are inserted in the ends of the tubes having laterally extending pins which are in moving contact with cathode rails located outside the ends of the tubes. These plugs carry the current from the tubes to the rails, which are connected to the negative line in the usual manner. The plugs are preferably made to tightly fit the pipes, so that the electrolyte will not have access to the interior of the pipes. This avoids loss of electrolyte, and also the necessity of getting the electrolyte out of the pipes before they go into the washing tank. The invention also includes means for moving the tubes in continuous succession through the electrolyte, so that the surfaces of the tubes are in free contact with the electrolyte, and a good electrical connection between the pipe and the negative side of the line at all times obtained.

In the accompanying drawings,

Figure 1 is a longitudinal section of an electroplating tank embodying my invention taken on line 1—1 of Fig. 2;

Fig. 2 is a transverse section taken on line 2—2 of Fig. 1, and

Fig. 3 is a partial section view of a tube provided with a plug according to my invention.

1 is a tank containing the electrolyte 2 through which extend the cathode rails 3 of conducting material, connected to the negative side of the line, and curved upwardly at each end, as at 4, to guide the tubes into the electrolyte at one end, and out at the other. The rails 3 are fastened to supporting strips 5 of non-conducting material provided at intervals with legs 10.

The rails 3 are spaced apart a distance greater than the length of the tubes to be plated. The tubes passing through the electrolyte between the rails 3 have plugs 6 inserted in their ends and pins 7 projecting therefrom in moving contact with the rails 3. These plugs serve to carry the current to the cathode rails 3 from the tubes, and they are preferably made to fit tightly into the ends of the tubes so as to exclude the electrolyte. In the preferred form shown, the plug is formed of a central core 7 having spring contact prongs 8 at its inner end for engagement with the inside of the tube. The bushing 6 may be tapered to fit snugly into the end of the tube in a fluid-tight manner, and is preferably of non-conducting material, so as not to take any deposit.

In practice, the tubes are supplied with plugs at each end and are fed to the left end of the machine with the projecting contact pins 7 resting on the rails 3. Conveyer chains 11 carrying traveling pins 12 are provided at each side of the machine as shown in my prior Patent No. 786,776 to space the tubes and move them through the electrolyte. At the right hand or discharge end of the machine, the tubes roll down the inclines 13 of the pins 12 and out of the machine. The rails and conveyers are made adjustable to accommodate different lengths of tubes. Near the bottom of the tank are provided anodes 9, 9, of zinc or other suitable metal connected to the positive side of the line in the usual manner.

In this apparatus the end plugs close the tubes and convey the current therefrom, so that the tubes do not have to be tipped to

remove the solution and the plating is confined to the exterior surfaces of the tubes while the cathode contact is made through the interior. The plugs may also serve to support the tubes and convey them through the solution, so that the exterior surfaces are entirely free from any contact which might mar them or interfere with the plating action.

It is evident that the plugs 6 need not necessarily support the weight of the tubes, but that other means may be provided, or the traveling conveyer may be adapted for this purpose. The pins 7 between the rails 3 and the plugs 6 may be protected by insulating material where they are in contact with the pins of the conveyer or these pins may engage the pipes directly. I do not wish to confine my invention to the specific embodiment above described and illustrated, but intend to include such modifications thereof as fall within the scope of the appended claims.

Having thus described my invention, I declare that what I claim as new and desire to secure by Letters Patent, is:—

1. In an apparatus for electroplating tubular articles, the combination with a tank for the electrolyte, of cathode rails, plugs of conducting material supporting the tubes on said rails, and means for moving said tubes in succession along said rails.

2. In an electroplating apparatus, a tank having a cathode rail therein, means conveying current from said rail to said tube comprising a plug fitted in the end of said tube and in moving contact with said rail, and means for moving said tube through said tank.

3. In an apparatus for electroplating tubular articles, the combination with a tank containing the electrolyte, cathode rails spaced apart a distance greater than the length of the tubes to be plated, of means for supplying current to said tubes from said rails comprising plugs closing the ends of the tubes and in moving contact with the rails, and means for conveying a succession of tubes through said electrolyte.

4. In an apparatus for electroplating tubes, the combination with a tank containing the electrolyte, of supporting means sustaining the tubes horizontally in the electrolyte comprising means for conducting current from said tube, and conveying means for moving a succession of tubes through said tank, said supporting, current conducting and conveying means being always out of contact with the surfaces to be plated.

5. The combination with means for supporting pipes in parallel relation in an electroplating solution, of a projecting contact plug in each end of said pipes, and means connected with said contact plugs for moving the pipes in continuous succession through the solution and for conducting the current therefrom.

6. The combination with a tank for the electroplating solution, of means for supporting and conveying a succession of tubes through said solution comprising plugs inserted into the ends of the tubes to support said tubes freely in the solution and conduct the current therefrom.

7. In apparatus for electroplating hollow articles, the combination with a supporting plug sealing the inside of the article against the electrolyte and comprising a conductor in contact with said article, of means for supporting said plug and conveying current to said conductor to plate the surface of said article while freely immersed in the electrolyte.

8. In an apparatus for electroplating hollow articles, the combination with a supporting plug sealing the inside of the article against the electrolyte and comprising a conductor in contact with said article, of means for supporting said plug and conveying current to said conductor to plate the surface of said article while freely immersed in the electrolyte, and means for moving the articles in continuous succession through the electrolyte.

9. In electroplating apparatus, a current conducting device for the article being plated comprising a plug of non-conducting material inserted in a recess in the article to seal the same, and a conductor passing through said plug and adapted to convey current to said article.

10. In electroplating apparatus, a current conducting device for the article being plated comprising a plug of non-conducting material inserted in a recess in the article to seal the same, a conductor passing through said plug and adapted to convey current to said article, and means whereby said device will support said article within the electroplating solution.

In testimony whereof I affix my signature.

LOUIS POTTHOFF.