No. 866,959. PATENTED SEPT. 24, 1907.

L. POTTHOFF.

ELECTROPLATING APPARATUS.

APPLICATION FILED MAY 1, 1906.

2 SHEETS—SHEET 1.

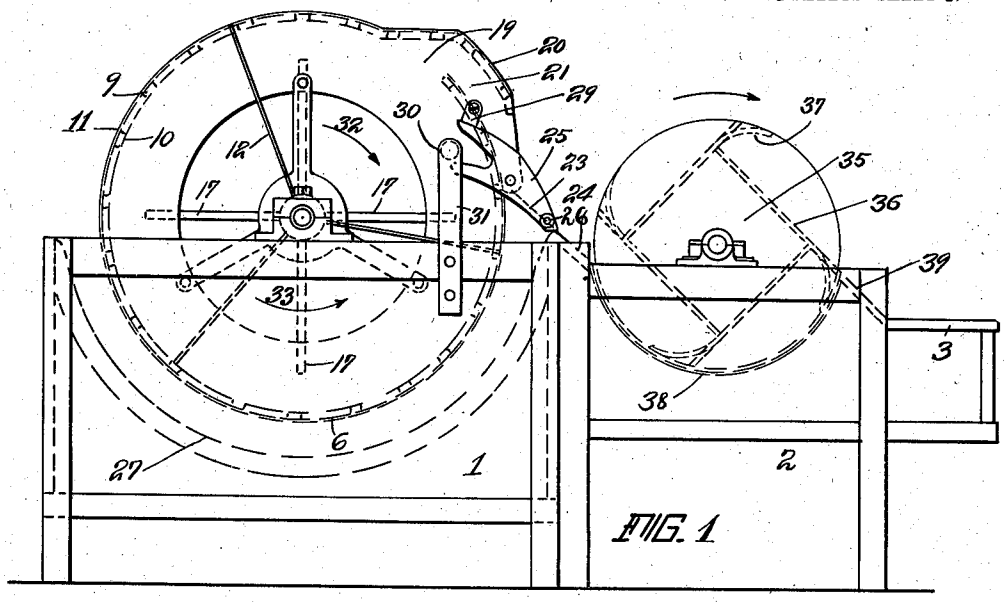

FIG. 1

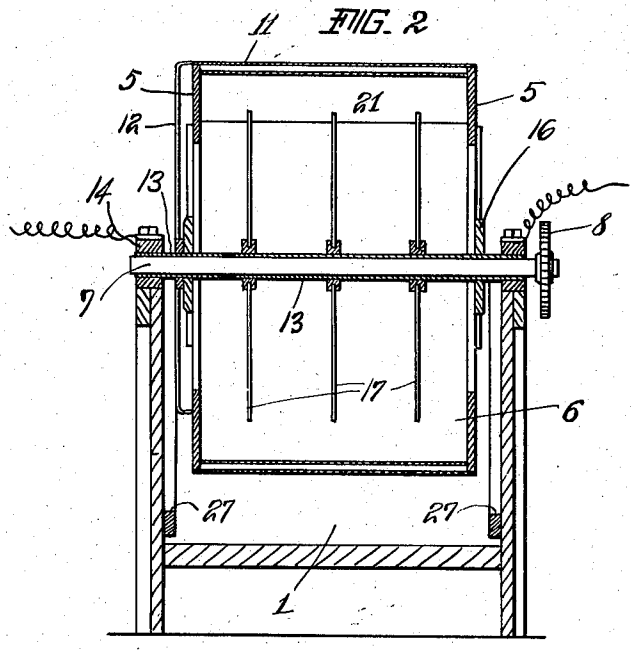

FIG. 2

Witnesses
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Geo. A. Hoffmann.

Louis Potthoff Inventor
By his Attorney
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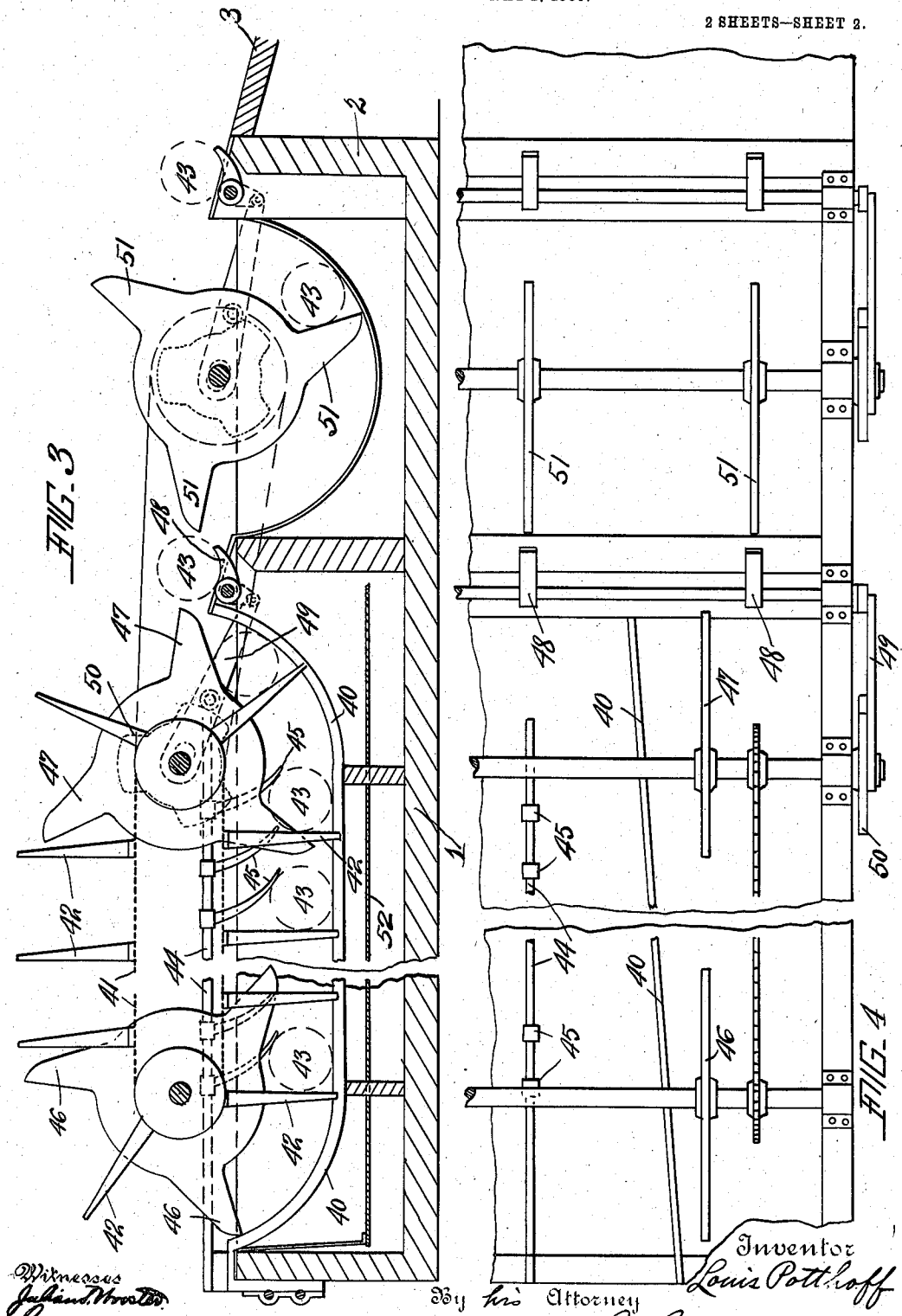

FIG. 3

FIG. 4

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UNITED STATES PATENT OFFICE.

LOUIS POTTHOFF, OF FLUSHING, NEW YORK.

ELECTROPLATING APPARATUS.

No. 866,959. Specification of Letters Patent. Patented Sept. 24, 1907.

Application filed May 1, 1906. Serial No. 314,649.

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 more particularly has for its object the production of an apparatus wherein the entire handling of the material shall be accomplished mechanically, in transferring it from one tank to another.

The invention is shown herein in two forms, one adapted for the automatic handling of small articles such as nails, etc., and the other for elongated material such as rods, pipes, etc., but both embodying the same general principles of operation.

A further object is to improve upon apparatus heretofore devised by me for handling small articles by the provision of means whereby the material can be automatically discharged outside the tank, and to provide improved and simplified circuit connections.

In the accompanying drawings, Figure 1 shows an apparatus for handling small articles; Fig. 2 is a detail view showing the electrical arrangements; Fig. 3 shows an apparatus for handling elongated material, and Fig. 4 is a plan view.

Referring first to Figs. 1 and 2, 1 represents a tank for the galvanizing solution, of usual construction and lined with acid proof material. 2 is a similar tank containing a washing solution of hot water into which the articles are automatically discharged from the galvanizing tank, and thence automatically discharged onto a table or other receptacle 3. The apparatus for small articles comprises a rotatable barrel conveyer 4 composed of heads 5, 5, a side 6, and is mounted on a shaft 7, which is driven by a sprocket 8. The side 6 is composed of a number of slats 9, within which is a porous lining or support 10, for the material, composed of burlap, cane matting or similar material. Outside of the slats is an anode 11 of sheet zinc, and the latter is connected by wires 12 to a copper bushing carried by the shaft 7 and turning in copper bearings 14 connected to the positive terminal of the current supply. The negative current connection is from the opposite bearing 15 to a copper bushing 16 and thence to arms or stirrers 17 which rotate with the drum and stir up the material which rests on the porous support 10.

In order to automatically discharge the material, the barrel is provided with a longitudinal opening 19, and over this is a shield 20, forming a chamber 21, which prevents escape of the material except when the barrel is rotated counter clockwise in Fig. 1. When rotating clockwise, the material falls over the opening 19 without escaping, but when the barrel rotates in the other direction a quantity of the material passes through the opening 19 into the chamber 21 and thence falls outside the barrel when it reaches the position shown in Fig. 1.

In order to guide the discharged material into the washing tank 2, a pivoted door 23 is provided, which automatically falls open so as to form a chute, down which the material from chamber 21 slides onto a chute 24 leading to washing tank 2.

25 is a cam shaped forked lever carried at one end of the door, and 26 is a roller thereon which rides on a track 27 to hold the door closed and prevent the escape of material before the door has reached its highest elevation and is about to descend, whereupon the weight of the material trapped in chamber 21 will open door and slide down into washing tank 2.

29 is a stop which lever 25 engages and 30 is a pin mounted on an upright 31 carried by the frame for closing the door automatically by engaging the lever 25.

In Fig. 1, arrow 32 indicates the direction of rotation when galvanizing, and the material falls across opening 19 without being trapped in chamber 21. When the material is to be discharged, the barrel is rotated in the direction of arrow 33, thus trapping material in chamber 21, which cannot escape until the roller 26 rides off the right end of track 27, thereby enabling the material to fall out on the door 23 and chute 24. Further rotation of the barrel in this direction, automatically closes the door by the engagement of lever 25 with pin 31, and while the door remains closed, the lever clears pin 31, so that in the ordinary rotation while galvanizing, no interference between the door and the pin occurs. Sufficient material is supplied to contact with the arms or stirrers 17, and the current passes from the anode, through the solution and the porous support 10 to the material and thence out through the arms 17.

In the water tank 2 is mounted a rotary conveyer 35, formed of a plurality of baskets or buckets having straight sides 36 and curved sides 37, and rotating in a porous circular basket 38, which forms a continuation of the chute 24. At the opposite side is a chute 39 leading to table 3, and positioned so as to form a continuation of the straight sides 36 of the buckets. As will be seen from Fig. 1, the material falls from the barrel down chute 24 into one of the buckets and is carried up through the water and automatically discharged onto table 3. The conveyer 35 will be driven synchronously with the drum in any suitable manner. The porous basket 38 permits circulation of water but prevents escape of material.

Because of the difference in the character of the material, the apparatus for long material, such as pipes, bars, channels, &c., is somewhat different in appearance.

1 is the tank, 2 the washing tank, as before. The

tank 1 is somewhat longer, and contains a pair of fixed cathode rails 40 inclined to the direction of travel, which support the material at the same time changing the point of contact therewith.

41 is a conveyer having wooden pins 42 for moving the bars or pipes 43, one being provided for each side.

44 is a conductor carrying brushes 45 which bear on the material 43 as it is moved along to help take out the current, as the contact with the rails 40 is not always sufficient to prevent burning.

46, 47, are rotary arms which take the weight of the material at each end in order to prevent breaking the pins 42, and the arms 47 are curved in such manner that after lifting the material out it can roll down on to an oscillatory latch 48, which is operated by a lever 49 and cam 50 to periodically discharge the material into tank 2, through which it is moved and washed by arms 51 and discharged onto table 3 by a mechanism similar to that between tanks 1 and 2.

52 is an anode of sheet zinc and is connected with a source of current in the usual manner, and the cathodes 40 and 44 are connected to the other side of the current supply as will be well understood. The shafts for the conveyer and the other parts will be suitably driven as before described.

If hollow articles are to be galvanized on both sides, it is desirable to provide within the pipes inside anodes consisting of bars of zinc wrapped with porous material and connected to the current source in any suitable manner, these inside anodes dissolving away to produce the inside coating as described in my Patent No. 786,776, dated April 4, 1905.

From the foregoing description it will be seen that I have provided an electroplating apparatus which will, as long as it is supplied with material, perform automatically the operations of galvanizing and washing, obviating entirely the necessity of handling the material by hand. It has been found that with my improvements, one man can attend to a number of machines, and consequently largely reduce the expense. At the same time the contact of the material and the support will be automatically changed during the plating operation, so that an even coating will be secured on all parts of the material.

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

1. In an electroplating apparatus, the combination with a galvanizing tank, and a washing tank, of a single means for moving material through the galvanizing tank to be galvanized and mechanically discharging the material into the washing tank from the galvanizing tank, substantially as described.

2. In an electroplating apparatus, the combination with a galvanizing tank, and a washing tank, of a single means for moving material through the galvanizing tank to be galvanized and mechanically discharging the material into the washing tank from the galvanizing tank, and means for automatically discharging the material from the washing tank, substantially as described.

3. In an electroplating apparatus, the combination with a galvanizing tank, and a washing tank, of means for moving material through the galvanizing tank to be galvanized while automatically changing the points of contact between the material and its support, and mechanically discharging the material into the washing tank, substantially as described.

4. In an electroplating apparatus, the combination with a galvanizing tank, of a single means for moving material through the galvanizing tank to be galvanized while automatically changing the points of contact between the material and its support while being moved, and mechanically discharging the material into the washing tank, and means for automatically discharging the material from the washing tank, substantially as described.

5. In an electroplating apparatus, the combination with a galvanizing tank, of a tumbling barrel therein for shaking material while being galvanized, a washing tank, said tumbling barrel mechanically discharging material directly into the washing tank, substantially as described.

6. In an electroplating apparatus, the combination with a galvanizing tank, of a tumbling barrel therein for shaking material while being galvanized, a washing tank, said tumbling barrel mechanically discharging material directly into the washing tank, and means for automatically discharging material from the washing tank, substantially as described.

7. The combination with a tumbling barrel adapted to contain material to be treated, and a tank, of means whereby the material can be discharged by the tumbling barrel outside the tank without removing the barrel from the solution, substantially as described.

8. The combination with a tumbling barrel adapted to contain material to be treated, and a tank, of means whereby the material is retained in the barrel when rotated in one direction and discharged by the barrel directly outside the tank when rotated in the opposite direction, substantially as described.

9. The combination with a tumbling barrel adapted to contain material to be treated, and a tank, of means whereby the material is retained in the barrel when rotated in one direction and discharged therefrom down an inclined surface directly outside the tank when rotated in the opposite direction, substantially as described.

10. In a tumbling barrel apparatus, the combination with a galvanizing tank, and a washing tank, of a tumbling barrel therein adapted to retain material when rotated in one direction and to discharge material when rotated in the other, a washing tank, and means whereby the discharged material is discharged by the barrel into the washing tank, substantially as described.

11. In a tumbling barrel apparatus, the combination with a galvanizing tank, and a washing tank, of a tumbling barrel therein adapted to retain material when rotated in one direction and to discharge material into the washing tank when rotated in the other, and means for discharging the material from the washing tank, substantially as described.

12. In a galvanizing apparatus, the combination with a galvanizing tank, of means for moving material through a galvanizing solution therein comprising a tumbling barrel having a door, means whereby said door acts as a chute, means for discharging material from the barrel, and a washing tank for receiving the discharged material, substantially as described.

13. In a tumbling barrel apparatus, the combination with a tumbling barrel, having a door, of means for positioning said door to act as a chute, means for discharging material carried by the barrel onto said door when so positioned, a washing tank to receive the discharged material, and a conveyer in said tank for discharging the material therefrom, substantially as described.

14. The combination with a tank, of a tumbling barrel therein, and the barrel having means for automatically discharging material outside the tank through the side of the barrel, substantially as described.

15. The combination with a tank, of a tumbling barrel partially immersed therein, and means for preventing the discharge of material from the barrel until the material is carried out of the solution, substantially as described.

16. The combination with a tank, of a tumbling barrel partially immersed therein, means for confining the material, and means whereby the material can be carried out of the solution by the barrel and be discharged from the tank, substantially as described.

17. In a tumbling barrel apparatus, the combination with a tumbling barrel, the barrel having means for automatically discharging material through the side of the barrel, a conveyer for receiving the discharged material,

and means for automatically discharging the material from the conveyer, substantially as described.

18. In a tumbling barrel apparatus, the combination with a closure for the side of the tumbling barrel, of means for automatically opening said closure to permit discharge of the material, substantially as described.

19. In a tumbling barrel apparatus, the combination with a closure for the side of a tumbling barrel, of means for automatically opening said closure upon reversal of the direction of movement to discharge the material, substantially as described.

20. In a tumbling barrel apparatus, the combination with a barrel having an opening in the side, of a pivoted door for closing said opening, and means for positively preventing the opening of said door during a portion of the revolution of said drum, substantially as described.

21. In a tumbling barrel apparatus, the combination with a barrel having an opening in the side, of a movable door for closing said opening, and a shield for keeping material away from the door, substantially as described.

22. In a tumbling barrel apparatus, the combination with a barrel having a longitudinal opening in the side, of a pivoted door for closing said opening, and a shield within the barrel and preventing the access of material to said door except when the barrel is rotated in one direction, substantially as described.

23. In a tumbling barrel apparatus, the combination with a barrel rotatably mounted on a shaft, of rotatable cathode terminals mounted to rotate with said barrel, said cathode terminals being within the barrel, an anode carried by the barrel, and electrical connections for said anode and cathode passing through the shaft bearings, substantially as described.

24. In a tumbling barrel apparatus, the combination with a barrel having a pivoted closing door, of means whereby the door opens when a certain point is reached, and means for automatically closing the door upon further movement in the same direction, substantially as described.

25. The combination with a tank, of a tumbling barrel therein provided with means for mechanically discharging the material outside the tank without removing the barrel from the solution, substantially as described.

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

LOUIS POTTHOFF.

Witnesses:
JULIAN S. WOOSTER,
GEO. A. HOFFMAN.