

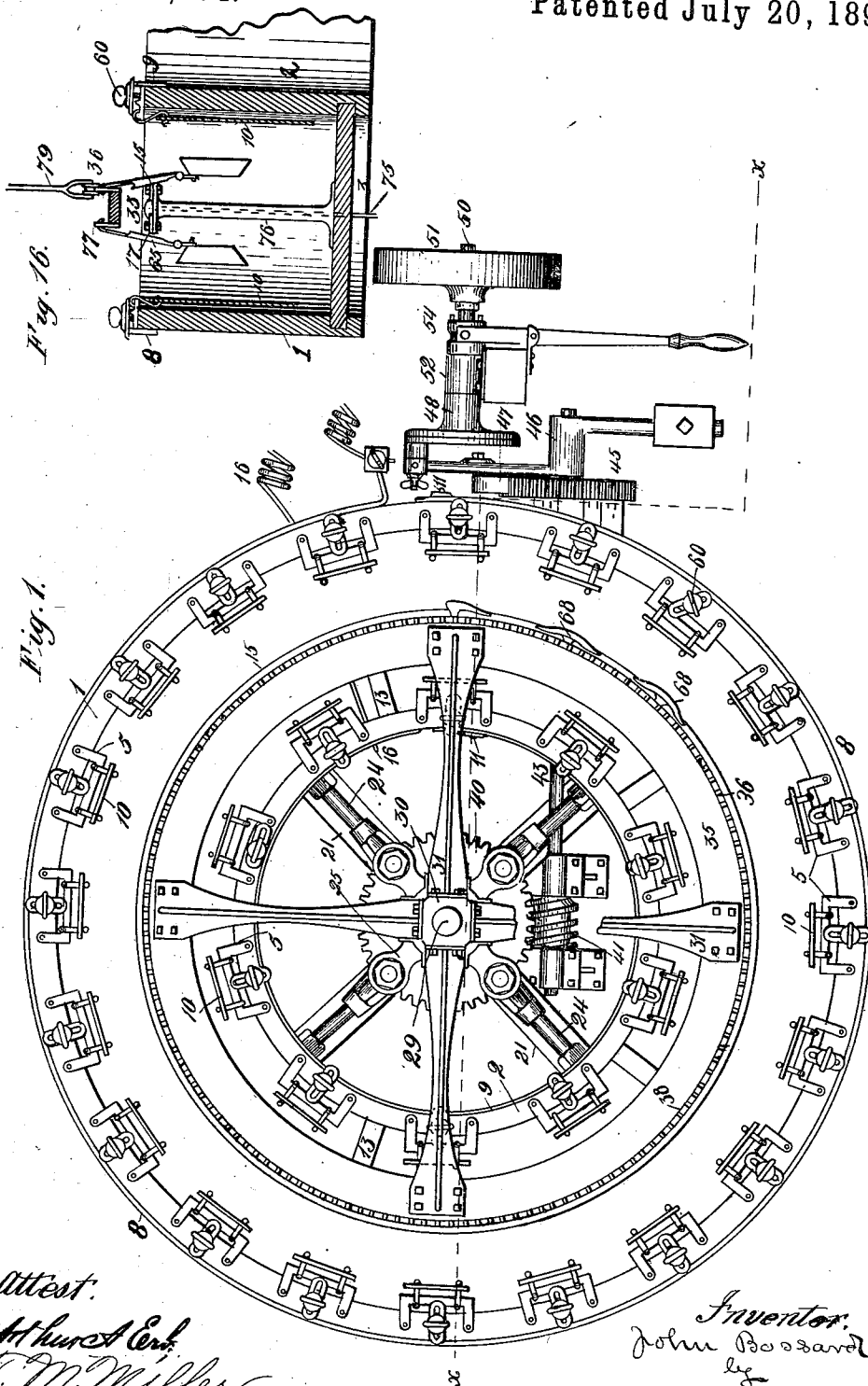
(No Model.)

4 Sheets—Sheet 1.

J. BOSSARD.
ELECTRODEPOSITING DEVICE.

No. 586,894.

Patented July 20, 1897.



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T. M. Miller

Inventor:
John Bossard
by
m. m. each his
attys.

(No Model.)

4 Sheets—Sheet 2.

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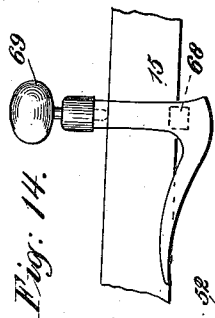


Fig. 9.

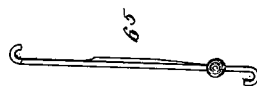


Fig. 8.



Fig. 10.

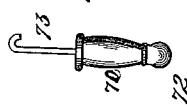


Fig. 2.

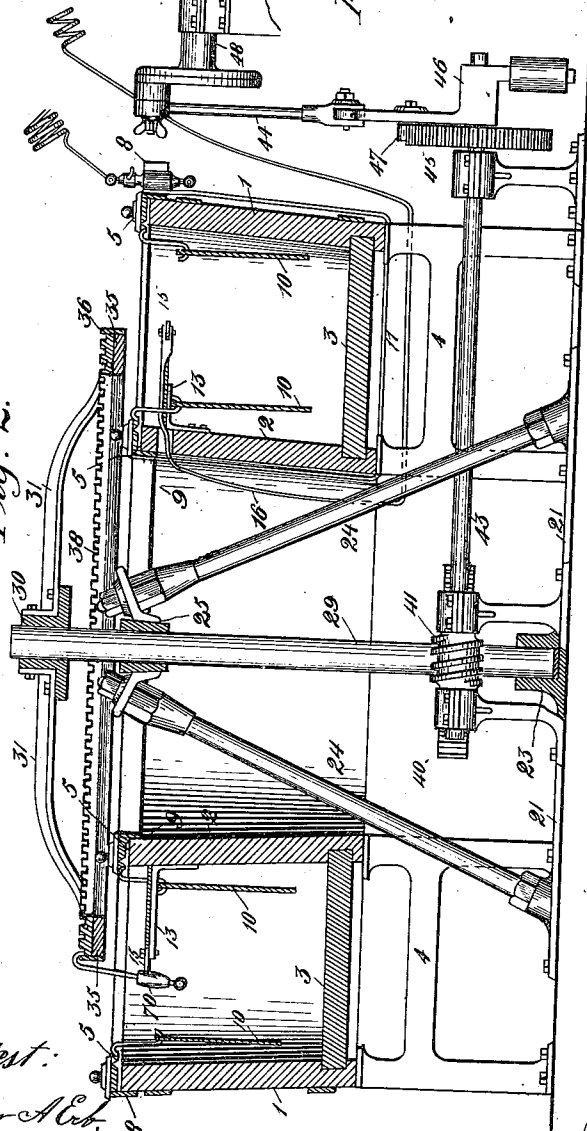


Fig. 4.

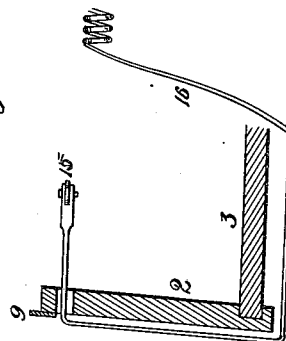
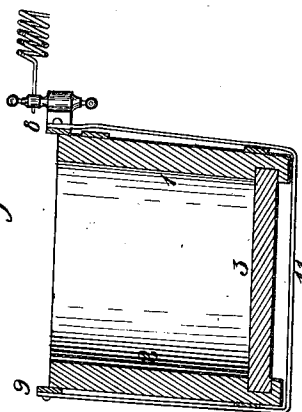


Fig. 5.



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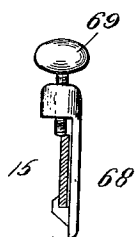
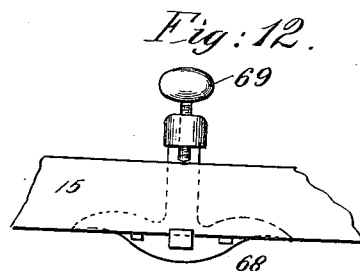
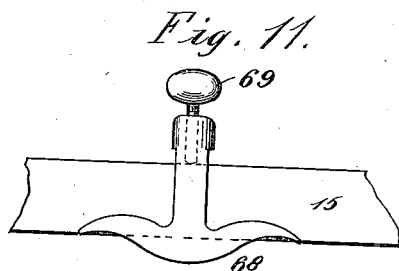
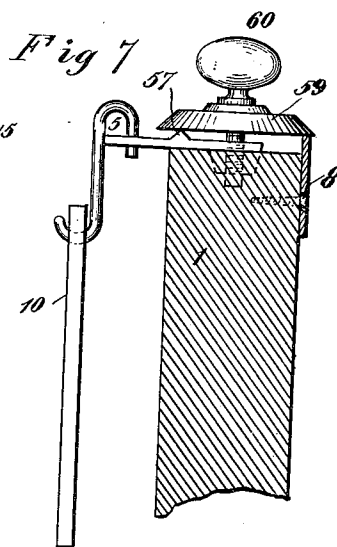
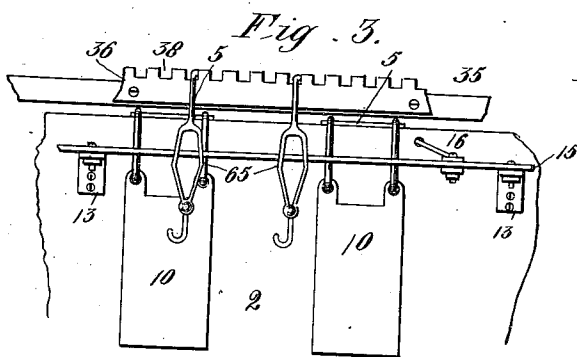
(No Model.)

4 Sheets—Sheet 3.

J. BOSSARD.
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No. 586,894.

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(No Model.)

4 Sheets—Sheet 4.

J. BOSSARD.
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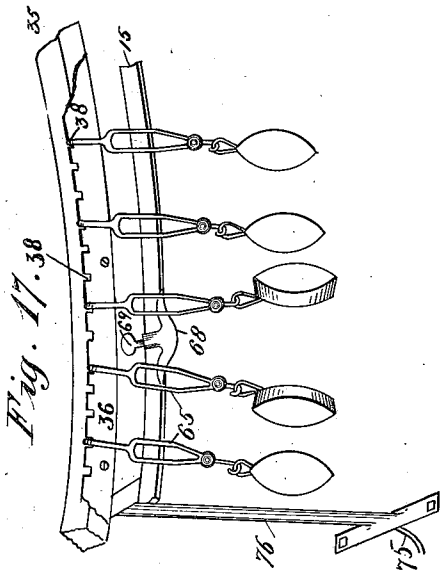


Fig. 17.38

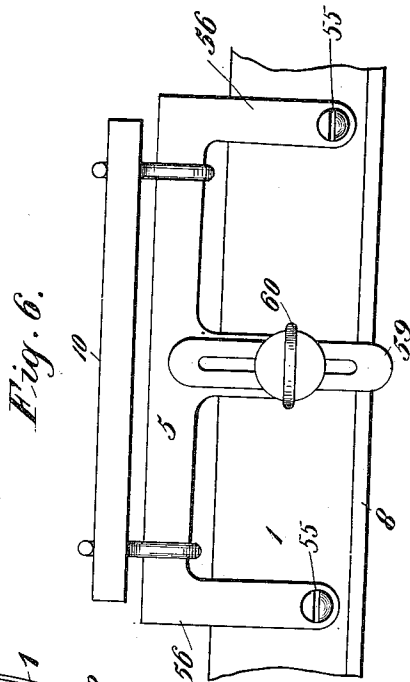


Fig. 6.

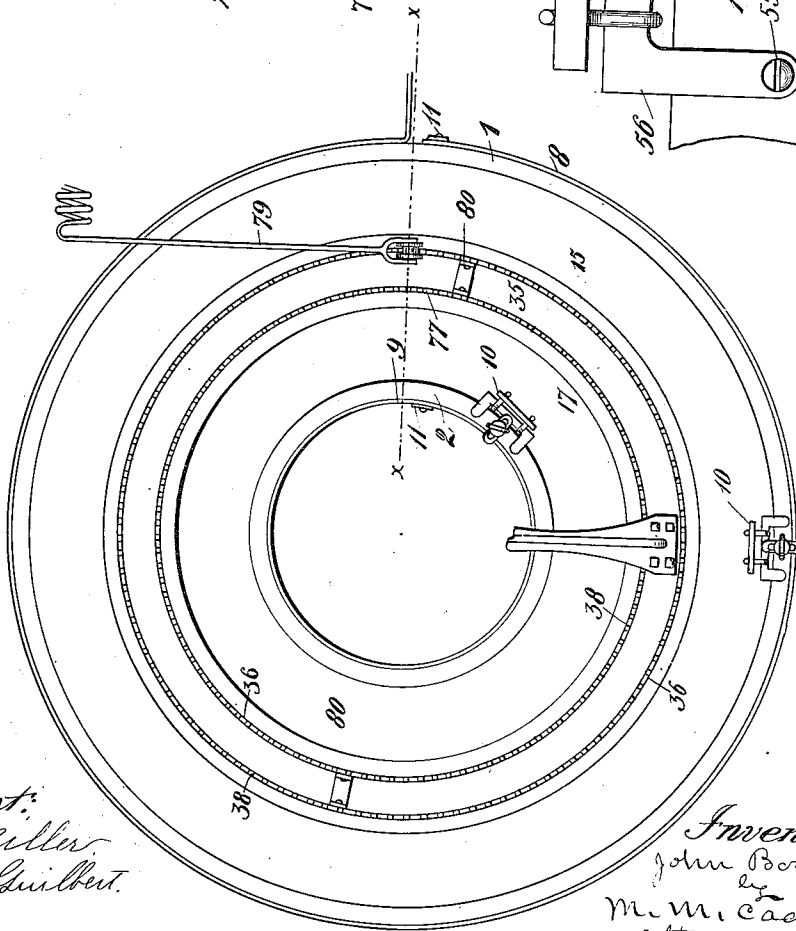


Fig. 15.

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UNITED STATES PATENT OFFICE.

JOHN BOSSARD, OF DUBUQUE, IOWA.

ELECTRODEPOSITING DEVICE.

SPECIFICATION forming part of Letters Patent No. 586,894, dated July 20, 1897.

Application filed May 31, 1895. Serial No. 551,149. (No model.)

To all whom it may concern:

Be it known that I, JOHN BOSSARD, a citizen of the United States, residing at Dubuque, in the county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Electrodepositing Devices; 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.

My invention relates to electrodepositing devices, and has for its leading object to provide means for causing the articles to be deposited upon to travel around in a circular manner and receive the deposit, and a single operator can both introduce and remove the articles from the bath while standing at a given place. This I accomplish by attaching the articles in the bath to a rigid carrier having cathode connection, which travels in a circle, carrying the articles past the anode-surfaces suspended in the bath.

Figure 1 shows a plan view of my device. Fig. 2 shows a vertical section taken on the line *x x* of Fig. 1 and side view of machinery for propelling same. Fig. 3 is a detailed side view of the relative position of the anode and cathode element as arranged in the bath. Fig. 4 shows the connection of the cathode element. Fig. 5 shows the connection of the anode element. Fig. 6 is a plan view of the anode-carrier. Fig. 7 is a side elevation of Fig. 6. Fig. 8 is a perspective of one of the hooks for suspending the articles in the bath. Fig. 9 is a side view of Fig. 8. Fig. 10 is an oiler for the cathode-bar. Fig. 11 is a plan view of a metal clamp for deflecting the travel of the articles. Fig. 12 is a rear view of Fig. 11. Fig. 13 is a part side elevation and part section of Figs. 11 and 12. Fig. 14 is a modified form of Fig. 11. Fig. 15 shows a plan view of a modified form of carrier in connection with two cathode-rings and cathode connection. Fig. 16 is a vertical section on line *X X* of Fig. 15. Fig. 17 illustrates position of articles while traveling over clamps shown in Figs. 11, 12, and 13.

Like figures of reference denote corresponding parts in all of the drawings.

1 is the outer and 2 the inner wall of a circular tank having a water-tight bottom 3 and

leaving a space surrounded by the inner wall 2. Between these two walls is a depositing-bath. By this mode of construction of the tank there is provided a convenient space for the operating machinery presently to be described, and also there is secured the greatest electrodepositing capacity with the least possible amount of depositing-bath. The tank thus constructed is set upon trestles 4 4, bolted to the floor or other solid foundation and extending across the bottom of the tank, as shown more particularly in Fig. 2. The tank shown is of a circular form, but tanks of other form may be used with equally good results. Upon the upper edge of the walls 1 and 2 of the tank are fastened the anode-carriers 5 5, (shown in detail in Figs. 1, 2, 3, 6, and 7,) from which are suspended in the bath the anodes 10 10.

Around the outer side of wall 1 and the inner side of wall 2 of the tank and projecting slightly above the upper edge of the walls on their outside are secured metal bands 8 8 and 9, preferably of copper, through which the electrical current is transmitted to the anode-plate 10 10. The two bands 8 and 9 are connected together by a metal strap 11, running from band 8 down the outer side of wall 1 and under the tank up along the inner wall 2, as shown in Figs. 2 and 5. Against the inner upper edge of wall 2 are fastened brackets 13 13, projecting inwardly and over the bath, to the outer ends of which is riveted the circular cathode-ring 15. This ring 15 is connected with the cathode element of the dynamo by a wire 16 running through the wall 2, down said wall, and underneath tank to dynamo. To the floor of the building in the space surrounded by the inner wall 2 of the tank is bolted a base having feet 21 21 projecting at right angles to each other and forming a foot-box 23 at the intersection of the feet. In the outer end of the feet 21 21 are secured the braces 24 24, fastened together at their top in a journal-plate 25. In the foot-box 23 is a shaft 29, projecting up through the journal-plate 25, to the top of which shaft is rigidly fastened a spider 30, having the curved arms 31 31. At the end of the arms 31 is fastened a rigid carrier 35, of a circular shape, having a metal band 36 secured to the outer side of the carrier 35. This band 36 is

set with its upper edge above the carrier 35 and is formed at its upper edge into notches 38, the object of which will presently appear.

Near the base of the shaft 29 is a wheel 40, which meshes into a worm 41, and by means of the worm-gear the shaft 29 is revolved. A shaft 43, which carries the worm 41, has set upon its outer end a ratchet-wheel 45, and also upon said shaft 43 is pivoted a counter-poised rocker-arm 46, carrying a pawl 47. To the outer end of 46 is pivoted a pitman 44, which is adjustably united to a crank 48. The crank 48 is rigidly fixed to a shaft 50, the outer end of which carries a pulley to which power for operating the machinery is applied. Upon this shaft 50, between the pulley 51 and the journal 52, is a clutch 54 for connecting and disconnecting the power. It is evident that this machinery might be secured above or overhanging the tank, but I prefer the mode shown.

The anode-carrier (shown in Figs. 6 and 7) is attached to the upper edge of the walls 1 and 2 of the tank by screws 55 55 through its arms 56. Upon the longitudinal center 5 and integral therewith is a contact-point 57. Spanning this point 57 and the band 8 is a link 59, adjustably and movably held in position by a thumb-screw and washer 60, for the purpose of connecting the anode element to the anode-plate 10. When it is desired to disconnect the current from the plate, the screw is loosened and the link 59 is turned away from connection with the band 8. The anode-carriers attached to the upper edge of the wall 2 are connected to the band 9 in the same manner as those upon the wall 1 to the band 8.

Figs. 8 and 9 show different views of hooks 65 for suspending the articles to be deposited upon in the bath. The hook consists of a curve or other convenient construction—as, for instance, a T or ball at the upper end to engage with the notches 38, a body which is broadened so as to make increased contact against the metal bar 15 and terminating in any convenient means like a hook or loop for holding the articles in the bath. These hooks are suspended from the rigid carrier 35 and held in place in the notches 38 of the band 36 and bear against the cathode-bar 15. Against the outer edge of the cathode-ring 15 is removably secured at convenient distances apart clamps 68 (shown in Figs. 11, 12, and 13) by thumb-screws 69. Fig. 14 shows a modified form of this clamp. The object of the clamp will presently appear.

In Fig. 10 is shown an oiler 70, which consists of a roller upon which is placed a small quantity of oil. A slight weight 72 is attached to its lower end to hold it steady as it travels along. The upper end terminates in a hook 73, by which it is suspended from the band 36, the object of which is to slightly oil the outer edge of the cathode-ring 15, so that the hooks 65 will smoothly travel along the edge of the ring 15 with the least possible friction.

In Fig. 16 I have two cathode-rings 15 and 17, one on each side of the carrier 35, and the cathode connection with rings 15 and 17 is made by a wire 75, running up through a hollow standard 76, set in the tank, and when two cathode-rings are used there is added to the inner side of the carrier 35 another band 77, having the notches 38, and in all respects like the band 36, to which articles to be plated may be hung thereon the same as to the band 36. When it is not desired to make connection through the hollow standard 76, the connection with the cathode element may be made by a trolley 79 on the top of the metal band 36 and metal straps 80, connecting band 36 with band 77. By this arrangement the cathode-ring as such might be dispensed with or only be used as convenient bars for attaching the clamps 68 for deflecting the articles in the bath.

The mode of operating my device is as follows: The desired depositing-bath is placed in the tank between the walls 1 and 2. The anodes are then suspended in the bath from the anode-carriers 5 5, fastened to the top of the walls 1 and 2. The required time necessary for making the deposit upon the articles is determined and the carrier is set to make one revolution in such time by adjusting the pitmen 44 and the slide-crank 48, so that the pawl 47 will compass the required number of notches or cogs on the ratchet-wheel 45 at each revolution of the pulley 51. Power is then applied to the pulley 51 and by its motion is transmitted to the carrier 35, as before fully described, and the electrical current is turned on, but at this time each individual anode is disconnected from the anode element except one. The articles to be deposited upon are then attached to the hooks 65 and hung in the bath from the band 36 in the notches 38, the body of the hooks bearing against the cathode-ring 15 and thus making the cathode connection with the bath. A second link 59 is then turned crosswise to the wall 1 or 2, thus making a connection with another of the anode-plates 10 in the bath, and these anode connections are made as often as the cathode-surface increases by the addition of more articles to the bath.

It will be seen that the anode-surface can be increased or decreased at will and at any point along the line of the travel of the article.

In "crowding the bath," whereby the greatest amount of deposition is attempted with the least loss of space, there appears the well-known detriment of "shading" such parts of the articles which are contiguous to each other. To avoid this, clamps 68 are introduced at convenient points upon the outer edge of the cathode-rings 15 and 17, which cause the articles in the bath to be deflected from their line of travel, thereby exposing hitherto shaded portions to electric sight of anode-surfaces.

As the articles travel up and down the incline of the clamp they will take the position

shown in Fig. 17, partly on account of the broadened bearing-surface of the body of the hook 65, thereby exposing the side of the articles more fully to the anode influences, and by this movement the bath will be further stirred as well as the articles given a different position, especially when the clamp is introduced, as shown in Fig. 14.

It will be seen that a single operator can stand at a given place and put the articles in the bath and start them on their circuit and when they return to him can remove them therefrom.

It will also be seen that for articles which require a large amount of deposit, like type, the carrier can be filled and set in motion and travel for hours without the assistance of an operator, and the bath will be continually stirred and always active.

The construction in detail of my device may be changed in many ways without departing from the spirit of my invention. For instance, the shape of the tank may be other than circular.

Having now described my invention and explained its mode of operation, what I desire to secure by Letters Patent is—

1. An electrodepositing device, consisting of a tank, with anode connection, a circular carrier having cathode connections from which a number of articles to be deposited upon are suspended within the bath and means for causing the carrier to rotate in a horizontal plane, carrying the articles to be deposited upon around in the bath, for the purposes shown.

2. An electrodepositing device, consisting of a tank containing a depositing-bath, one or more anodes suspended in the bath, with anode connections, a number of articles within the bath, cathode connection with the articles in the bath, a circular carrier adapted to revolve in a horizontal plane above the bath from which the articles to be deposited upon are suspended and means for revolving the said carrier, whereby the articles are carried around in the bath, for the purposes shown.

3. An electrodepositing device, consisting of a tank, one or more anodes, each suspended in the bath from an individual carrier and each provided with an individual switch with the anode element, a rigid carrier adapted to revolve by which the articles to be deposited upon are carried around in the bath, a shaft for sustaining and revolving said carrier, means for revolving said shaft and connection between the cathode element and the articles in the bath, substantially as described and shown.

4. An electrodepositing device, consisting of a tank containing a depositing-bath, one or more anode-plates suspended within said tank, one or more cathode-rings secured above the bath, electrical connection with said ring, a rigid carrier arranged to revolve above the bath; and hooks for suspending the articles within the bath, adapted to engage with the

carrier and bearing against a cathode-ring, all combined to operate for the purposes shown.

5. An electrodepositing device, consisting of a rigid carrier, adapted to travel above the bath, hooks removably attached to the carrier for suspending the articles in the bath and connected with the cathode element, one or more rings beneath said carrier having one or more clamps adjustably secured to the edge or edges of said rings and means for revolving said carrier, whereby the articles to be deposited upon are carried around in the bath with the hooks from which they are suspended, bearing against the ring, and deflected by engaging with said clamps out of their line of travel, as and for the purposes shown.

6. In an electrodepositing device of the character described, a tank containing a bath, a revoluble carrier above the bath, hooks depending from the carrier, articles to be deposited upon carried by the hooks, and a ring between the bath and carrier and carrying adjustable cams adapted to engage with the hooks and deflect them out of the line of travel, substantially as set forth.

7. In an electrodepositing device, a tank for holding the depositing-bath, consisting of a base, outer and inner walls, said inner wall surrounding an open-bottomed well, and a carrier adapted to revolve, by which the articles to be deposited upon are advanced in a horizontal plane within the bath, a revolving shaft for sustaining and revolving said carrier set within the well surrounded by the said inner wall, and means for revolving said shaft located beneath the tank as and for the purposes shown.

8. An electrodepositing device, consisting of a tank having a base, an outer and inner wall, said inner wall encompassing a space, one or more anodes each suspended from an individual carrier and each having an individual switch with the anode element, a rigid carrier adapted to revolve by which the articles to be deposited upon, removably attached thereto, are carried around in the bath, a shaft for sustaining and revolving said carrier, set in the space encompassed by said inner wall, means for revolving said shaft and connection from the cathode element to the articles in the bath, as and for the purposes shown.

9. In an electrodepositing device a revoluble carrier from which the articles to be deposited upon are suspended, a ring beneath the carrier, hooks for suspending the articles in the bath from the carrier and bearing against the said ring and an oiler adapted to come in contact with said ring, whereby the passage-way of the body of the hooks along said ring is oiled, substantially as described and shown.

10. An electrodepositing device consisting of a tank containing a depositing-bath, one or more anode-plates suspended in said bath, a rigid carrier adapted to travel in a circular

manner above the bath, one or more cathode-conductors secured to said carrier, having cathode connections and hooks by which the articles to be deposited upon are suspended in the bath, engaging said carrier, substantially as set forth.

11. In an electrodepositing device, a tank containing a bath and having anode connections, a rigid carrier having cathode connections and adapted to travel in a circular manner above the bath, a metallic band secured to said carrier and having notches therein, and hooks for suspending the articles to be deposited upon in the bath, adapted to engage within said notches upon the band, substantially as set forth.

12. In an electrodepositing device, a tank containing a bath and having anode connections, a rigid carrier having cathode connections and adapted to travel in a circular manner above the bath, a metallic strip secured to said carrier, hooks for suspending the articles within the bath and adapted to engage with said metallic strip, and means for retaining the hooks on the carrier at a given distance apart, substantially as set forth.

13. An electrodepositing device consisting of a tank containing a depositing-bath and having one or more tubes running through said tank and bath, one or more anode-plates suspended in said bath, a rigid carrier adapted to travel in a circular manner above the bath, hooks for suspending the articles to be deposited upon in the bath and engaging said carrier, and electric connections with the articles in the bath through said tubes, substantially as set forth.

14. In an electrodepositing device, a tank containing a depositing-bath, one or more

cathode-rings above the bath, and a tube through said bath through which electric connection is made to the articles in the bath, substantially as set forth.

15. In an electrodepositing device, a circular tank containing a depositing-bath, having anode connections, a ring above the bath having cathode connections, one or more clamps secured to the outer edge of said ring, a rigid carrier adapted to travel in a circular manner above the bath, in combination with one or more hooks for suspending the articles in the bath, consisting of a hooked upper portion for engaging with the carrier, broadened middle portion for engagement with the clamps, for deflecting the articles out of the line of travel, and with the ring for making cathode connections with the articles in the bath, and means for attaching the lower portion of said hooks to the articles in the bath, all combined and arranged substantially as described.

16. An electrodepositing device, consisting of a circular tank, containing a depositing-bath and having one or more anodes suspended in said bath, a circular carrier adapted to travel in a horizontal plane above the bath, hooks for suspending the articles to be deposited upon in the bath and engaging said carrier and cathode connections with the articles in the bath, and means for revolving said carrier at an intermittent rate of speed, substantially as set forth.

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

JOHN BOSSARD.

Witnesses:

M. M. CADY,
J. E. ROSSER.