June 30, 1925. 1,544,188

J. W. SLATTERY

PLATING BARREL

Filed Oct. 29, 1923 3 Sheets-Sheet 1

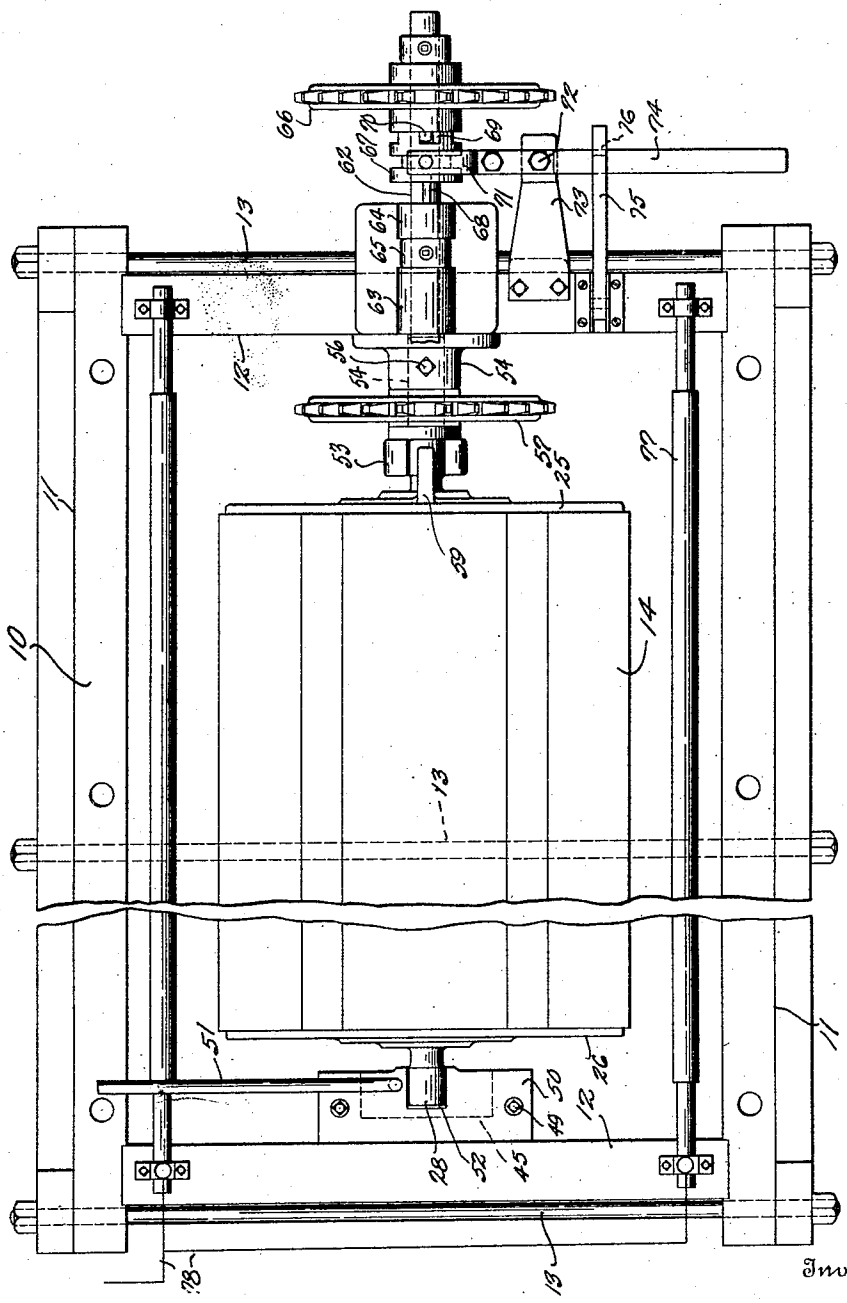


Fig. 1.

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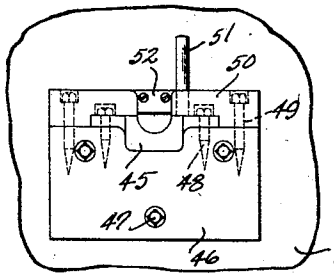


Fig. 3.

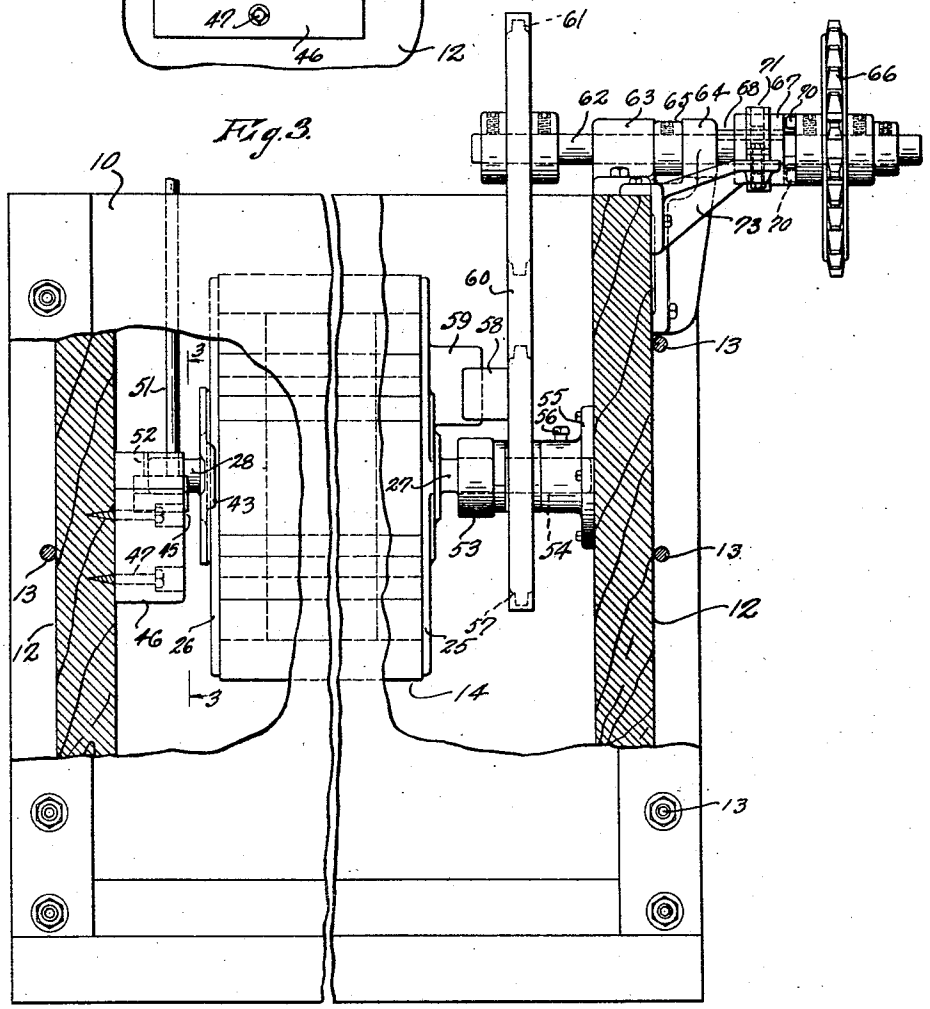


Fig. 2.

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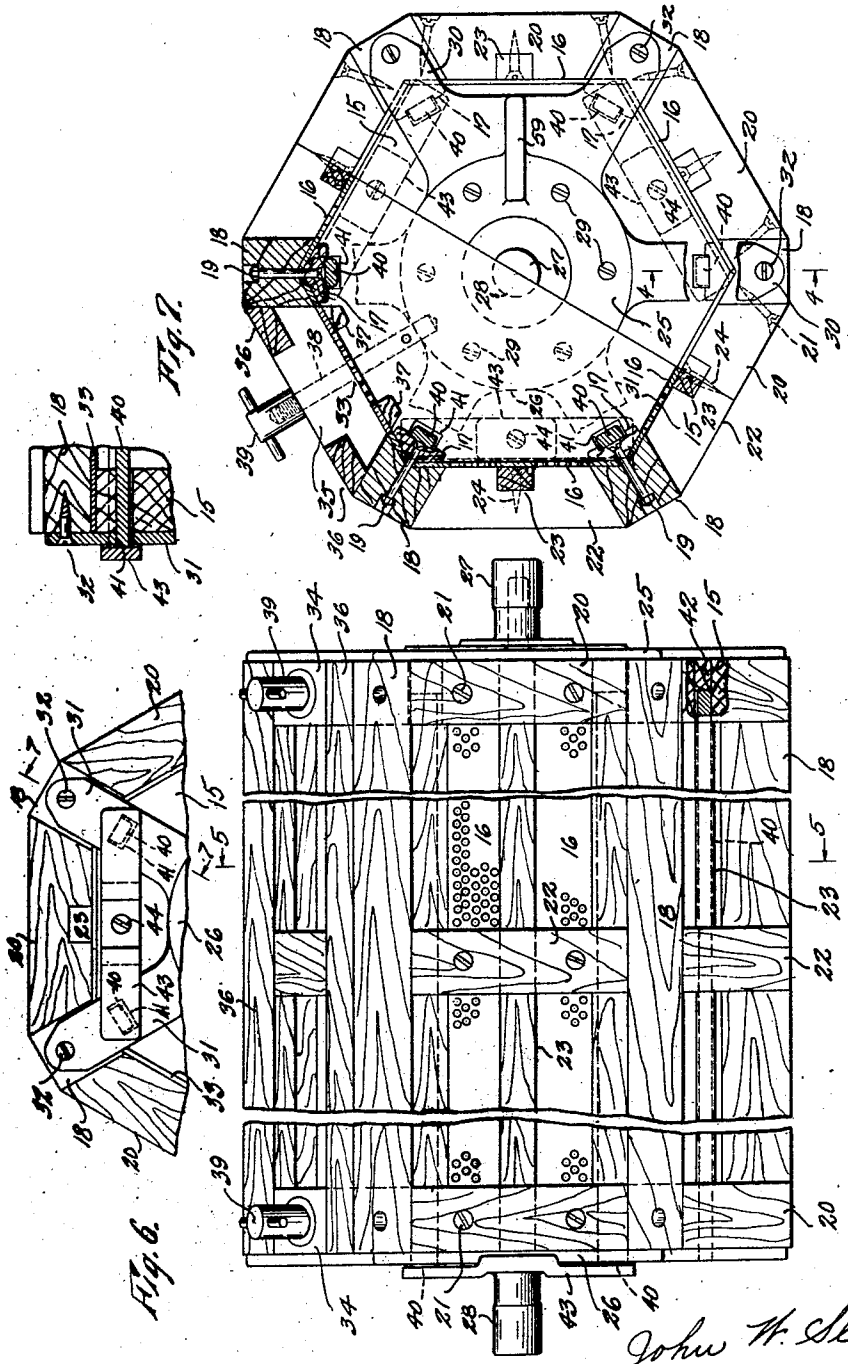


Fig. 4.

Fig. 6.

Fig. 5.

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN W. SLATTERY, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE CORNWALL & PATTERSON MANUFACTURING COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

PLATING BARREL.

Application filed October 29, 1923. Serial No. 671,410.

To all whom it may concern:

Be it known that I, JOHN W. SLATTERY, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Plating Barrel, of which the following is a specification.

This invention relates to plating barrels, such as are used for electro plating of relatively small articles, and has for an object to provide an improved barrel for this purpose which will transmit a larger current than that which can be used in the barrels of substantially the same size now generally employed, which will give better contact with the articles to be plated and so will give a quicker deposit producing a better finish which does not have to be tumbled after removal from the barrel, and to produce a barrel which will have a much greater capacity than similar sized barrels of the old types.

With these and other objects in view, I have devised the construction illustrated in the accompanying drawings, forming a part of this specification, similar reference characters being employed throughout the various views to designate corresponding elements. In these drawings,

Fig. 1 is a top plan view of the barrel complete.

Fig. 2 is a side elevation of the same, portions of the walls being broken away to more clearly show the construction.

Fig. 3 is a side elevation of the bearing at the live end of the rotatable container, the view being substantially on line 3—3 of Fig. 2.

Fig. 4 is a side elevation of the rotatable container.

Fig. 5 is a partial end view and partial transverse section thereof, the end view being taken from the right of Fig. 4 and the section being substantially on line 5—5 of Fig. 4.

Fig. 6 is an elevation of a portion of the other end of the container, and

Fig. 7 is a detailed section substantially on line 7—7 of Fig. 6.

The device comprises a tank or receptacle 10 for the electrolyte. This tank may be of various constructions but is preferably made of wood, and comprises side members 11 having vertical grooves adjacent their ends to receive the side edges of the end members 12, and these members are clamped together by suitable tie-bolts 13. Mounted in this tank or receptacle is the rotatable container 14 for the articles to be plated. In the drawings this container is shown as being polygonal in cross section, this particular container being hexagonal, but it may, of course, have other shapes if desired. The opposite ends of this element comprise hexagonal wooden blocks 15 which are connected by the side walls of the container. These side walls comprise flat perforated plates 16 of suitable non-conducting material, such as celluloid. Seated in notches in the corners of the end blocks 15 are wooden strips 17 substantially V-shaped on their outer sides, as shown in Fig. 5, against which the side edges of the plates 16 rest and to which they are clamped by longitudinally extending wooden bars 18 which have a V-shaped groove on their inner edges to receive the abutting edges of the plates 16, and extending through the strips 17 and the bars 18 are suitable screw bolts 19 for clamping these elements on the opposite sides of the abutting plates 16, as shown in Fig. 5. At their opposite ends over the blocks 15 the bars 18 are connected by suitable transverse wooden blocks 20 secured to the bars 18 by suitable screws 21. If the rotatable container is of sufficient length similar blocks 22 are provided at the center of the container. To prevent the plates 16 buckling or yielding outwardly under the weight of the articles in the container longitudinal wooden bars 23 are provided against the outer walls of these plates and forming a backing therefor, these bars being seated in suitable recesses in the blocks 20 and 22, and secured in position by suitable screws 24.

Secured to the outer walls of the blocks 15 are a pair of trunnion supports, in the present instance comprising spiders 25 and 26, these spiders being preferably made of brass and carry the trunnions 27 and 28. These spiders are secured to the blocks by suitable screws 29. Each spider has a plurality of radially extending arms, in the present instance six, corresponding to the number of bars 18, the arms on the spider 25 being shown at 30 and those on spider 26 at 31, and these arms are each secured

to the end of a wooden bar 18 by suitable screws 32. These spiders rigidly secure the sides of the container to the end blocks 15 and also form rigid supports for the trunnions on which the container rotates.

Means must be provided to allow for placing the articles to be plated within the container and to allow removal of the same therefrom when the plating operation is completed. For this purpose one of the side panels is made removable. This panel is indicated at 33 and comprises a perforated celluloid plate the same as plates 16, but it is not clamped at its opposite sides between the strips 17 and bars 18. As shown in Fig. 5 it is of a width equal to the distance between two bars 18 and is mounted on the inner edges of the transverse wooden blocks 34 and 35, these blocks being secured together by longitudinal wooden strips 36 seated in notches in the top edges thereof. For the purpose of protection the side edges of the plate 33 and to also help secure this plate in position, a pair of longitudinally extending wooden strips 37 are provided. This door or removable panel is adapted to seat between two bars 18, and for the purpose of removably securing it in position a pair of threaded rods 38 extend radially outward from the blocks 15 and pass through openings in the end blocks 34. Nuts 39 are threaded on these rods outside the blocks and serve to clamp the panel in position. By merely removing the nuts 39 the panel may be lifted out of position providing a large opening for insertion and removal of the articles to be plated. By merely placing the panel in position again and applying the nuts 39 it is securely fastened.

For the purpose of conducting the electric current from the articles in the container a plurality of conductor bars 40 are provided extending longitudinally of the container adjacent the inner walls thereof, and they are also preferably mounted in the corners formed by the side panels, as shown in Fig. 5. These bars may be of different shapes but are preferably rounded on their inner sides to give a large contact surface and to prevent injury to the articles to be plated. These bars extend throughout the length of the container and through openings in the block 15 at the live end of the container and through openings 41 in the arms 31 of the spider 26 where they form electrical contact with these arms of the spider. At their opposite ends they extend only part way through the block 15, the remainder of the openings being closed by wooden plugs 42, as shown in Fig. 4, so that these bars are insulated from the dead end spider 25. For the purpose of clamping these bars in position and also insuring proper contact for passage of the current, metal strips 43 are provided which are secured to the live end block 15 by suitable screws 44 and are clamped thereby against the ends of two adjacent coductor bars 40 bridging these two bars, as shown in Figs. 4 and 6, that is one of these bridge members for each pair of conductor bars.

At the live end of the container the trunnion 28 rests in the metal bearing 45 which is open at its upper side to allow for easy insertion and removal of the trunnion. This trunnion is carried by a suitable wooden block 46 secured to an end wall 12 of the tank 10 by suitable lag screws 47 and is secured on the block by suitable screws 48. Extending over this bearing and secured in position by suitable screws 49 is a protecting wooden block 50, and extending through this block and having electrical contact with the bearing 45 is a conductor 51, preferably a brass tube, to which is connected one of the lead wires from the source of the current supply. A plate 52 of metal, such as aluminium, is mounted at the end of the trunnion to take any lateral thrust.

At the opposite end of the container the spider 25, which is insulated from the conductor bars 40, carries the other trunnion 27 which seats in a bearing 53. This bearing is also open at its upper side to allow for easy insertion and removal of the trunnion and is mounted on a stud 54 extending into a bracket 55 to which it is secured to by a suitable set screw 56. Mounted to rotate on this stud between the bracket and the bearing is a sprocket 57 carrying on the inner side thereof a pair of spaced lugs 58 adapted to extend on opposite sides of a lug 59 carried by the spider 25. Thus there is a driving connection between the sprocket 57 and the container which however will not interfere with the easy insertion and removal of the container into and from the tank. A chain 60 leads from the sprocket 57 to a sprocket 61 mounted on a shaft 62 on the top of the tank. This shaft is mounted to rotate in bearings on suitable brackets 63 and 64 mounted on the tank, a collar 65 being secured to this shaft between these brackets to hold it in position. Loosely mounted on the shaft is another sprocket 66 connected by a suitable chain drive, not shown, to a source of power. For connecting this sprocket in driving relation with the shaft 52 a clutch 67 is provided slidable longitudinally on the shaft but mounted to rotate therewith by means of a suitable feather 68, and this clutch is provided with suitable notches 69 adapted to receive projections 70 carried by the sprocket 66 so that when these projections are seated in the notches the sprocket is in driving relation with the shaft. The clutch may be shifted to and from driving connection with the sprocket by a fork 71 pivoted at 72 on a

bracket 73 and operated by means of a lever 74. For the purpose of holding this clutch engaged, a pivoted lever 75 is provided having a hook 76 adapted to engage the lever 74.

For carrying the anodes a pair of suitable supporting bars 77 are mounted on the top of the tank on opposite sides of the rotatable container which are connected by lead wires 78 to the other pole of current supply. The blocks of nickel or whatever metal is being used for plating is suspended in the electrolyte from these bars and have electrical connection with these bars through their supports.

In operation the tank is filled to the proper height with the electrolyte required, and the articles to be plated are placed within the rotatable container which when closed is immersed in the electrolyte. As the container rotates the articles will come successively into contact with the conductor bars 40, and the current passing from the anodes to these articles, which form the cathode, through the electrolyte will deposit the plating metal on the surfaces of the articles. It will be apparent that the conductor bars 40 will give a large contact surface for engagement with the articles to be plated so that there may be a large current passed through the device. As these conductor bars are located adjacent the inner walls of the container they run under the articles so that a much better contact is secured therewith. This feature is also increased by having the conductor bars in the corners formed by the side panels on the container. As a number of these bars may be provided and thus an extended contact may be secured with the articles to be plated, it will be apparent that a large current may be passed through the device, and therefore, I secure a fast quick deposit of the plating metal and one that is much faster than is possible in the old types of barrels. For this reason the surface of the plate is much smoother. In fact, in actual practice it has been found that articles plated in this barrel have such a smooth finish that the later tumbling operation in sawdust and meal is not required. Where in the old types of barrels only fifty or sixty amperes can be passed through the apparatus I can get one hundred and sixty-five amperes through this device, and therefore, while in the old types of barrels I could only plate two hundred pounds per hour, in this barrel I can plate five hundred pounds per hour, thus more than doubling the capacity.

Having thus set forth the nature of my invention, what I claim is:

1. In a plating barrel, a rotatable container for the articles to be plated, said container comprising insulating walls having openings therein, a plurality of separate, spaced, bare conductors extending longitudinally of the container adjacent the inside walls thereof, means for conducting electric current to said conductors, a support, a stationary stud carried by the support having an open topped bearing, a trunnion on one end of the container seated in said bearing, a sprocket mounted to rotate on the stud, coacting lugs carried by the sprocket and container for rotating the latter, and means for driving the sprocket.

2. In a plating barrel, a container rotatable about a horizontal axis and comprising perforated insulating walls, a plurality of spaced conductor bars extending longitudinally of the container adjacent the inner walls thereof and projecting through one end of the container, a spider at one end of the container having arms provided with openings to receive said projecting ends of the bars for conducting electric current to said bars, and means for rotating the container.

3. In a plating barrel, a container rotatable about a horizontal axis and having insulating walls provided with openings therethrough, a plurality of spaced conductor bars extending longitudinally of the container adjacent the inner walls thereof, a metal support secured to one end of the container and having electrical connection with said bars, a trunnion carried by said support, an open topped bearing for said trunnion, a wooden protecting block extending over the bearing, a metal plate carried by the block forming a bearing for the end of the trunnion, means for conducting electric current to said bearing, and means for rotating the container.

4. In a plating barrel, a container substantially polygonal in cross-section and rotatable about a horizontal axis, said container comprising insulating walls having openings therethrough, a plurality of spaced conductor bars extending longitudinally of the container and located adjacent the corners formed by the adjacent sides of the container and extending through one end of the container, a spider at one end of the container connected having radial arms provided with openings to receive a source of current supply and to said conductors and form electrical contact therewith, means for conducting electric current to the spider, and means for rotating the container.

5. In a plating barrel, a container rotatable about a horizontal axis and comprising insulating walls having openings therethrough, a plurality of spaced conductor bars extending longitudinally of the container adjacent the inner walls thereof, a trunnion carried by the container at one end thereof, a support for the trunnion connected to the container and having radially extending arms in contact with said bars to conduct electric current from the trunnion

to the bars, a bearing for the trunnion, an electrical conductor connected to said bearing, and means for rotating the container.

6. In a plating barrel, a receptacle for electrolyte, bearings mounted in said receptacle, a container having trunnions at its opposite ends mounted in said bearings, said container having walls of insulating material with openings therethrough, a plurality of spaced conductor bars extending longitudinally of the container adjacent the inner walls thereof and also extending through one end of the container, a support for one of the trunnions secured to the end of the container and having openings into which the ends of the bars project, said support adapted to conduct electric current from the trunnion to said bars, an electric conductor leading to the bearing for said trunnion, and means at the opposite end of the container for rotating the container.

7. In a plating barrel, a receptacle for electrolyte, bearings mounted in said receptacle, a container having trunnions at its opposite ends mounted in said bearings, said container having walls of insulating material with openings therethrough, a plurality of spaced conductor bars extending longitudinally of the container adjacent the inner walls thereof, a spider secured to an end of the container and carrying one of the trunnions, said spider having arms provided with openings through which the conductor bars extend, strips of conducting material secured to the end of the container and each engaging the ends of two of the conductor bars, a conductor leading to the bearing for said trunnion, and means for rotating the container.

8. In a plating barrel, a receptacle for electrolyte, bearings mounted in said receptacle, a container substantially polygonal in cross-section and comprising walls of insulating material having openings therethrough, a plurality of spaced conductor bars extending longitudinally of the container on the inside thereof and located adjacent the corners formed by the sides of the container, trunnions secured to the ends of the container and seated in said bearings, a metal support for the trunnion at one end having openings through which the conductor bars extend, a conductor leading to the bearing for said trunnion, bars of conducting material secured to said end of the container and each engaging the ends of two conductor bars, and means at the other end of the container for rotating the container.

9. In a plating barrel, a rotatable container comprising polygonal end blocks having recesses at the corners thereof, longitudinal strips seated in said recesses with the outer walls thereof at an acute angle, longitudinal bars outside said strips and having a V-shaped groove on their inner walls corresponding to said strips, panels of perforated non-conducting material mounted with their edges between the bars and strips, trunnion supports secured to the blocks at the outer ends thereof and to the ends of said bars, trunnions carried by said supports, bearings for said trunnions, longitudinally extending conductor bars in said container and electrically connected with a source of current supply, and means for rotating said container.

10. In a plating barrel a container having perforated walls of insulating material and mounted to rotate about a horizontal axis, trunnions carried at the opposite ends of said container, bearings for said trunnions open at the top thereof, an electrical conductor leading from one of said bearings to a source of current supply, a plurality of longitudinally extending conductor bars in said container and electrically connected with said bearing, the other bearing being mounted on a stationary stud, a sprocket mounted to rotate on said stud, a driving connection between the sprocket and the container including a pair of spaced lugs on one of the members and a lug on the other member extending between the first lugs, and means for rotating said sprocket.

In testimony whereof I affix my signature.

JOHN W. SLATTERY.