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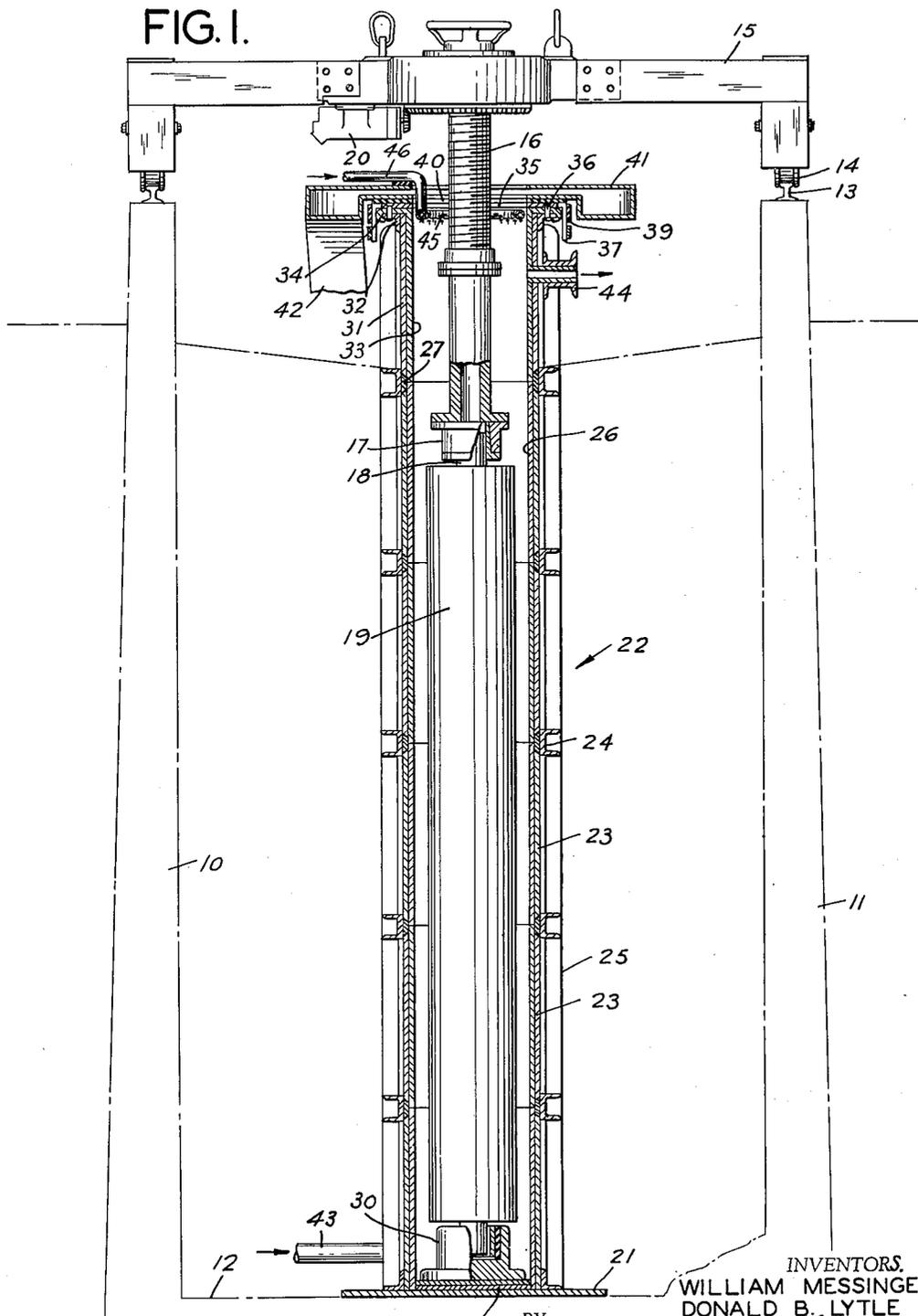
2,634,878

PLATING TANK STRUCTURE

Filed March 31, 1948

2 SHEETS—SHEET 1

FIG. I.



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2 SHEETS—SHEET 2

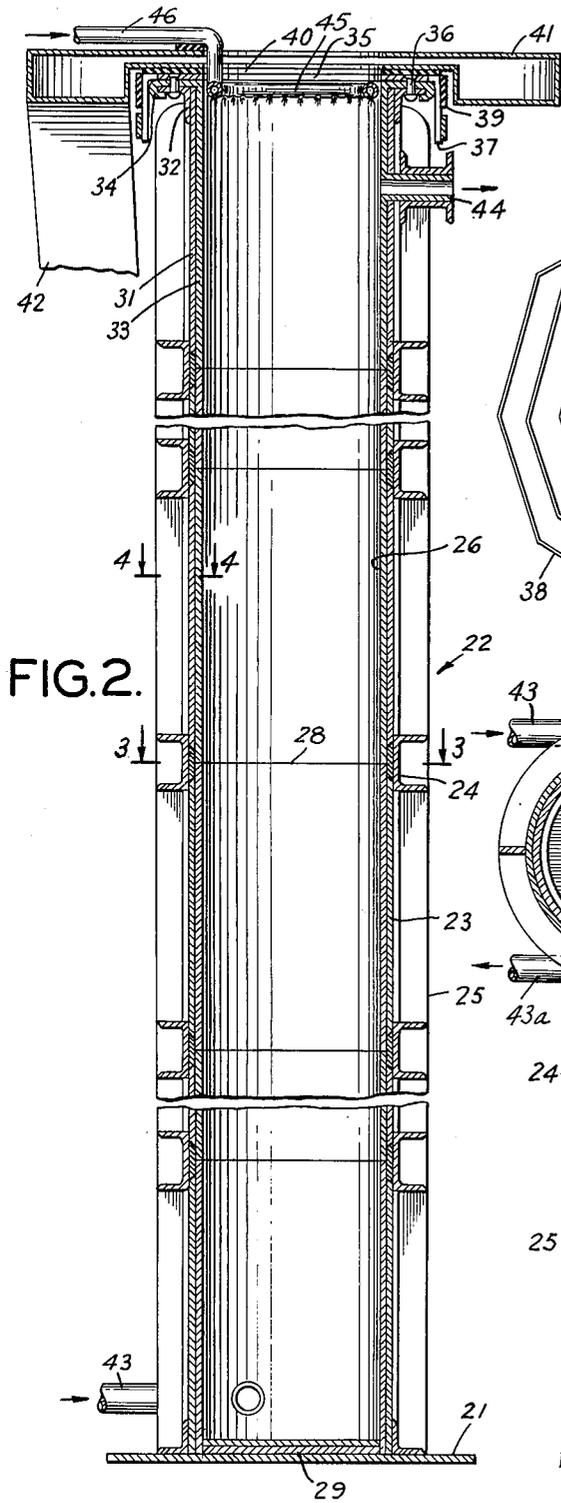


FIG. 2.

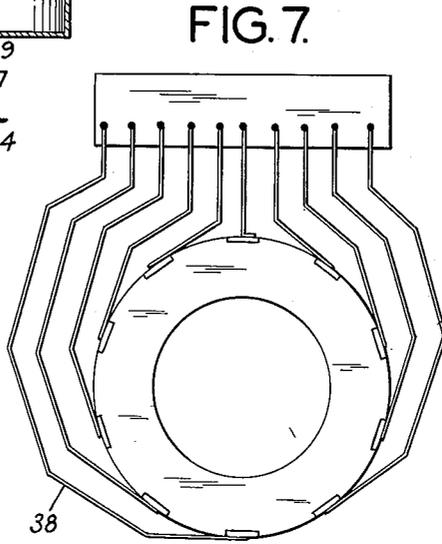


FIG. 7.

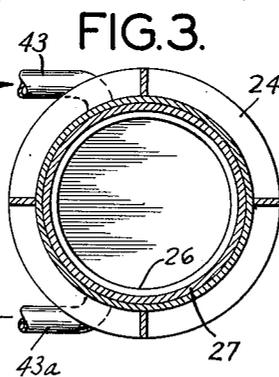


FIG. 3.

FIG. 4.

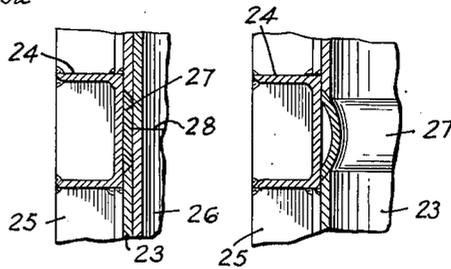
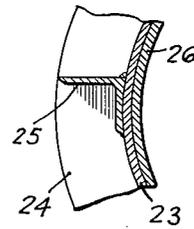


FIG. 5.

FIG. 6.

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PLATING TANK STRUCTURE

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4 Claims. (Cl. 220—5)

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The present invention relates to plating tanks in which electroplating operations are accomplished and relates, more specifically, to an improved plating tank structure in which long objects may be plated effectively.

More particularly, the invention embodies an improved plating tank structure wherein long objects may be plated while being supported in a vertical position also, preferably rotated while in such position.

In plating long objects, such as the surface of cylinders and the like, particularly in the plating of chromium, it has been found that a uniform plate is difficult to obtain in plating operations wherein the cylinder or other object is supported with its axis in a horizontal position and partially immersed in the plating medium in such position. To accomplish a uniform and proper plating of long objects, such as cylinders and the like, the present invention proposes to provide a plating tank which is capable of receiving the objects to be plated and supporting them in a vertical position. While in such position, the objects are subjected to a uniform plating action by an electroplating operation in which the desired current density is employed that is uniform and controllable.

To accomplish this object, the present invention provides an improved plating tank structure which is of adequate strength to withstand the structural stresses to which it is subjected, the tank being provided with a liner that is inert to the plating solution and supported effectively within the tank so that there will be no sagging or other variations from the desired structural relationship that is established when the tank is fabricated.

An object of the invention, accordingly, is to provide a plating tank structure capable of being mounted in a vertical position and, in such position, providing a desired depth of tank, the interior of the tank being provided with an inert liner that is effectively secured in aligned position and maintained in such position throughout the life of the tank.

A further object of the invention is to provide a tank structure of the above character wherein the liner may be assembled and secured in a normal position within the tank, being effectively secured in its normal position and maintained as an effective seal between the plating solution and the outer tank structure.

Further objects of the invention will be apparent as it is described in greater detail in connection with the accompanying drawings, wherein

Figure 1 is a view in vertical section, taken through a plating tank constructed in accordance with the present invention and showing a

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cylinder supported in such tank in position for the plating operation;

Figure 2 is an enlarged view of the tank structure shown in Figure 1 and taken in the same plane as the sectional view of Figure 1;

Figure 3 is a view in horizontal cross-section, taken on the plane 3—3 of Figure 2, and looking in the direction of the arrows;

Figure 4 is a partial view in section, taken on line 4—4 of Figure 2, and looking in the direction of the arrows;

Figure 5 is an enlarged partial view in section, taken on the plane of Figures 1 and 2, and showing the connection of the tank section and liners at the adjacent ends thereof;

Figure 6 is a view similar to Figure 5 showing the manner in which the sealing connection between the ends of the tank sections and the liner is mounted in its assembled position, the view illustrating the formation of the sealing section prior to the peening operation by which the sealing section is deformed and secured in its final sealing position; and

Figure 7 is a plan view in somewhat schematic form of one way of supplying electricity to the plating tank structure in order that the electroplating operation may be carried out.

Referring to the above drawings, the plating structure is illustrated schematically as being mounted within a pit formed by foundation walls 10 and 11 and a bottom foundation member 12. The walls 10 and 11 may be formed with track members 13 upon which flanged wheels 14 rest, the wheels serving to support a traveling carriage 15 on the tracks 13.

Carriage 15 is provided with a support member 16 having a chuck 17 which is adapted to secure the shaft 18 of a cylinder 19 or other article to be plated. A motor 20 is provided to rotate the support 16 and cylinder 19 in a manner which will be readily apparent.

A bottom plate 21 is provided on the base or foundation 12 of the pit and is adapted to support the tank structure indicated generally at 22 and formed of component parts now to be described.

The tank structure is formed of a plurality of cylindrical tank sections 23 supported in an aligned position with their ends suitably spaced. The tank sections 23 are welded, as illustrated in Figure 5, to annular U-shaped channel sections 24 so that when they are welded together, they form a continuous tank of desired length and diameter. These elements provide the desired structural strength for the plating tank, and the strength and rigidity of the tank may be reinforced by providing angle irons 25 extending lengthwise of the tank and in suitable number

circumferentially. In the form shown in the drawings, four angle irons 25 are indicated around the circumference of the tank and extending lengthwise thereof.

Inasmuch as the plating solutions, particularly in chromium plating operations, are corrosive to metals, such as steel, which are desirably used in the formation of the tank sections and members above described, it is necessary to provide a suitable inert liner to protect the tank sections and seal them from the plating solution. To accomplish this, the tank is lined with lead, the lining structure being formed with a plurality of cylindrical liner sections 26, formed of lead, and mounted in abutting end to end relationship, as illustrated in Figure 1. Prior to inserting the liner sections 26, the space between the ends of the tank sections 23 are filled and sealed by means of lead sealing bands 27. In order that the tank sections may be effectively sealed from the plating solution, the sealing sections 27 are preferably forced into the normal position illustrated in Figure 5 by means of a peening operation well known and understood in the art. For example, the sealing sections 27 are formed in inwardly convex formation, as illustrated in Figure 6, the ends of the section being secured under angularly formed adjacent ends of the tank sections 23, as illustrated in Figure 6. The sections 27 are quite naturally mounted in the position illustrated in Figure 6. During assembly, tank sections 23 and channels 24, or the sealing sections 27, may be of sectional formation and peened into position after the tank sections are assembled, the elements of the sealing members 27 being burned into a continuous sealing member so that an effective seal and connection are provided between the adjacent ends of the tank sections 23.

After the sealing sections 27 are peened into the position illustrated in Figure 5, the lead liners 26 are then inserted in the position, also illustrated in Figure 5, and are burned together and to the sealing sections 27 at the meeting line indicated at 28, in Figure 5. The burning of the liner sections 26 to the sealing sections 27 has the important advantage of providing support for the liner sections at intervals along the length of the tank section and thus of preventing sagging of the liner sections due to their own weight.

The bottom of the tank is provided with lead bottom plates 29 which are burned at their peripheries into the bottom liner 26, thus completing a fluid-tight tank structure and one in which the structure is effectively sealed from the plating solution carried within it. On the lead bottom plates 29, a guide bearing 30 is provided, the purpose of the guide bearing being to locate properly the cylinder 19 within the tank 22.

In order that suitable electrical connections may be provided by means of which electroplating operations may be carried out, the top of the plating tank is formed by providing the uppermost tank section 31 with an L-shaped top flange 32 and forming the uppermost lead liner 33 with a top flange 34 that overlies the angle member 32. An annular conducting ring 35 formed, for example, of copper, is riveted to the flange 34 and angle 32 by means of rivets 36 and is provided with depending flange members 37 spaced circumferentially around the periphery of the ring. Bus bars 38 are connected to the flanges 37 and insulating plates 39 are provided on the sides of each of the flanges 37. An insulating ring 40 rests upon the top of the annular ring 35 and supports a ventilating hood 41, which is connected to a suitable

duct 42 for providing a desired suction at the top of the tank to remove fumes escaping by means of the plating operation. The hood 41 is effectively insulated from the electrical conducting elements by means of ring 40 and plates 39.

In order that a plating solution may be introduced into the tank and circulated, inlet and outlet pipes 43 and 43a are provided at the bottom of the tank. An overflow outlet 44 is provided adjacent the top of the tank and additional plating solution is introduced into the tank at the top thereof through an annular perforated tube 45 having a supply pipe 45 connected thereto.

From the foregoing, it will be seen that a plating tank structure has been provided with an inert liner that is continuous and provides a complete seal between the plating solution and the tank structure. The manner of mounting the liner is such as to hold it effectively against sagging and maintain it in a desired assembled position.

While the invention has been described with specific reference to the structure shown in the accompanying drawings, it is not to be limited save as defined in the appended claims.

We claim:

1. A plating tank comprising a plurality of tank sections, means supporting the tank sections in spaced, axial alignment with one another, the adjacent spaced ends of the tank sections being undercut when viewed from the interior of the tank, a liner in each tank section, the liners being of a deformable material inert to plating solutions and being mounted in abutting end to end relationship, and band sealing means peened between the spaced undercut ends of the tank sections and overlapping the abutting ends of the liners, the sealing means being of the same inert material as the liners, in locking engagement with the spaced undercut ends of the tank sections and fused to the abutting ends of the liners.

2. A plating tank as defined in claim 1 wherein the sealing means lie against the support means.

3. A plating tank as defined in claim 1 wherein the tank sections, liners and sealing means are cylindrical in cross section.

4. A plating tank as defined in claim 1 wherein the liners and sealing means are of lead.

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