Oct. 3, 1967 C. W. JENKS 3,345,282

PORTABLE BARREL PLATING UNIT

Filed Aug. 10, 1964 2 Sheets-Sheet 1

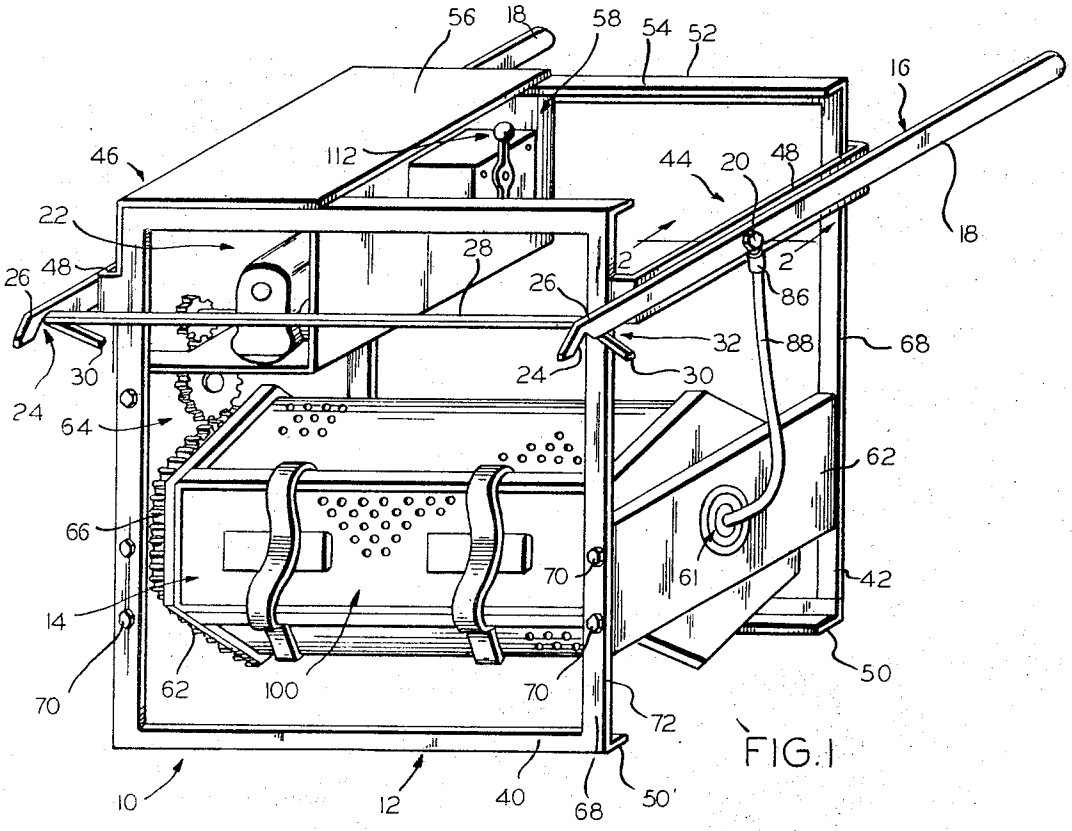


FIG. 1

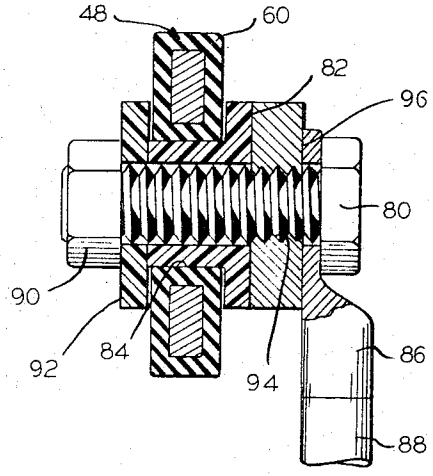


FIG. 2

INVENTOR
CARL W. JENKS

BY
Mann, Brown & McWilliams
ATTORNEYS

Oct. 3, 1967 C. W. JENKS 3,345,282

PORTABLE BARREL PLATING UNIT

Filed Aug. 10, 1964 2 Sheets-Sheet 2

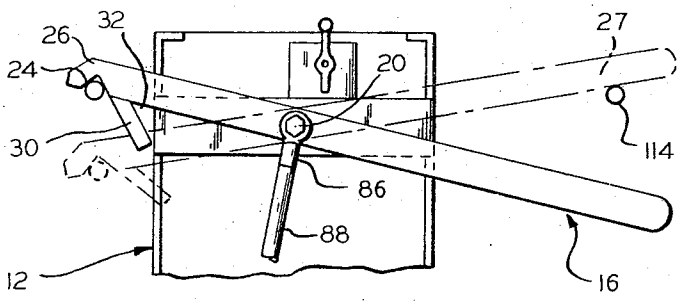


FIG.3

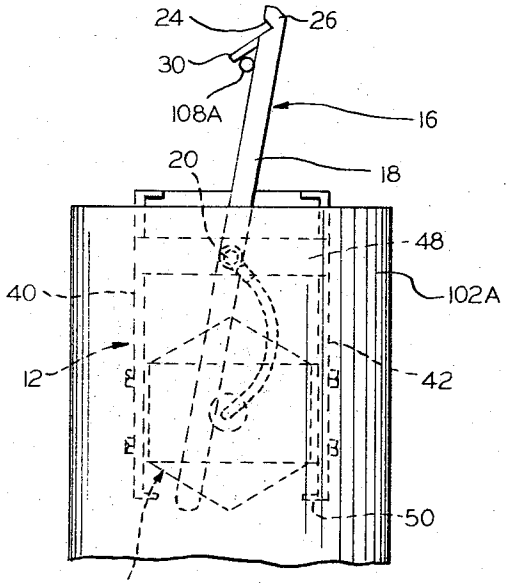


FIG.5

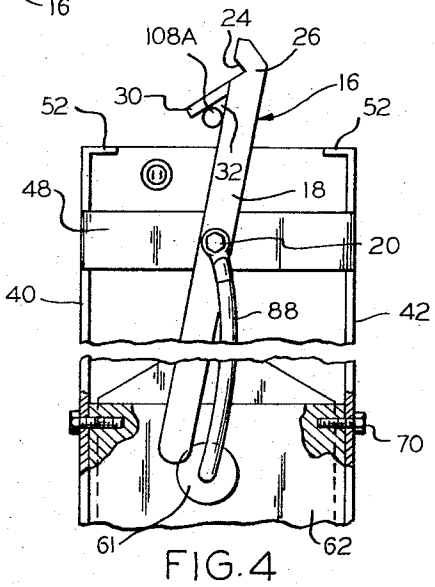


FIG.4

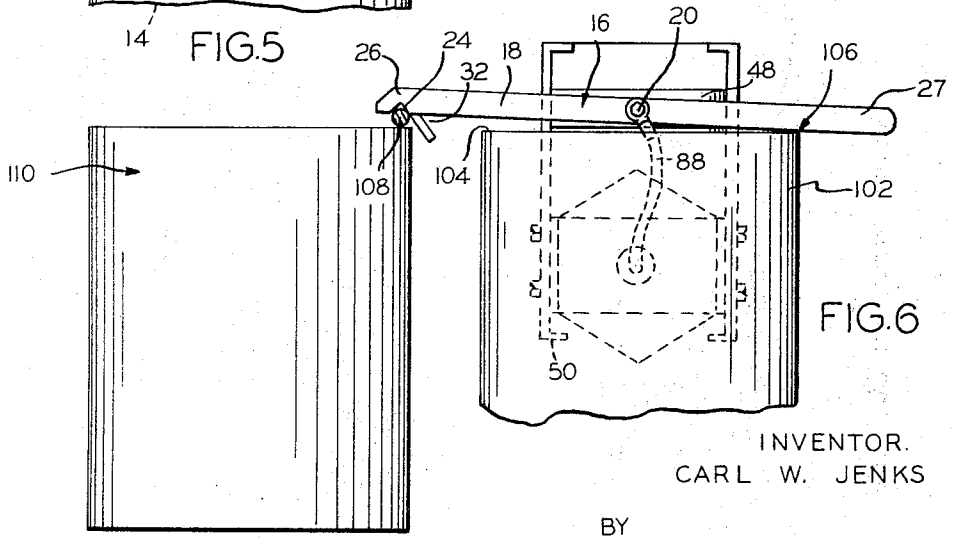


FIG.6

INVENTOR.
CARL W. JENKS

BY
Mann, Brown & McWilliams
ATTORNEYS

United States Patent Office 3,345,282
Patented Oct. 3, 1967

3,345,282

PORTABLE BARREL PLATING UNIT

Carl W. Jenks, 1131 Ostrander,
La Grange Park, Ill. 60525

Filed Aug. 10, 1964, Ser. No. 388,432
10 Claims. (Cl. 204—213)

My invention relates to a portable barrel platting unit, and more particularly, to an electroplating barrel unit that comprises a self-contained portable electroplating barrel or cylinder device which may be utilized in connection with standard barrel plating equipment.

Barrel plating units of the type to which the invention relates generally comprise a frame in which the plating barrel or cylinder is rotatably mounted, with the unit as a whole, when in use, being suspended within a plating tank so as to dispose the barrel in a submerged position in the plating liquid.

These units have conventionally included several contact arms that are fixed to the frame for contact with a cathode bar disposed at one side of the tank.

It frequently happens that one or the other of these contact arms does not make good contact with the cathode bar, and also, cathode bars may be at different elevations with respect to the tank rim in different installations in which the portable barrel units may be used, with the result that the barrel unit frame may be cocked off its desired vertically disposed operating position with accompanying adverse results.

A principal object of my invention is to provide a portable barrel plating arrangement in which the desired vertically disposed operating position and desired contact of both contact arms are assured in spite of the varied cathode bar positions that may be encountered in practice.

Another principal object of the invention is to provide a contact arm arrangement for portable barrel plating units that permits the same unit to be used for both forward and center or overhead contact arrangements.

Still other objects of the invention are to provide a simplified unitary frame arrangement for portable barrel plating units, to provide a unique barrel journalling arrangement for portable barrel unit frames that permits the barrel to be readily removed from the unit, and to provide a portable barrel plating unit that is economical of manufacture, convenient and efficient in use, and readily adapted for application to existing plating installations.

Other objects, uses and advantages will be obvious or become apparent from a consideration of the following detailed description and the application drawings.

In the drawings:

FIGURE 1 is a diagrammatic perspective view of a specific embodiment of the portable barrel plating unit comprising my invention;

FIGURE 2 is a fragmental cross-sectional view taken along line 2—2 of FIGURE 1;

FIGURE 3 is a fragmental side elevational view of the unit shown in FIGURE 1, taken from the right hand side of FIGURE 1, and showing diagrammatically how the unit may be applied to cathode bars of different heights;

FIGURE 4 is a view similar to that of FIGURE 3, but showing the unit employed in a center or overhead contact arrangement;

FIGURE 5 is similar to FIGURE 4, but shows the unit of FIGURE 4 suspended within a conventional plating liquid tank; and

FIGURE 6 is a view similar to FIGURE 3, but shows the unit applied to a conventional plating tank in connection with a forward contact arrangement.

However, it is to be understood that the specific drawing illustrations provided are supplied primarily to comply with the requirements of 35 U.S.C. 112, and that the invention may take other specific embodiments.

Reference numeral **10** of FIGURE 1 generally indicates a specific embodiment of my portable barrel plating unit invention, which comprises a frame **12** journaling a plating barrel or cylinder **14** for rotation about a substantially horizontal axis, a contact assembly **16** comprising a pair of contact bars **18** pivoted to frame **12** as by pins **20**, and a suitable drive arrangement generally indicated at **22** for rotating the plating barrel or cylinder **14**.

In accordance with this invention, the contact bars **18** are pivoted as at **20** to the frame **12**, and are provided with contact notches or areas **24** at like ends **26** to provide electrical contact in the forward contact position shown in FIGURES 3 and 6.

Also, contact bars **18** are joined together at their contact forming ends **26** by resiliently flexible cross bar member **28** which is in the form of a U-shaped member defining depending ends **30** that are applied to the ends **26** of the cross bars **18** to extend outwardly of the respective cross bars in the manner shown in FIGURES 1 and 3–6.

The ends **30** and the cross bar ends **26** define contact notches or areas **32** that in accordance with my invention adapt my unit for the central or overhead contact arrangement shown in FIGURE 4, this being done by merely pivoting the contact assembly **16** to the position of FIGURE 3 and hooking the ends **26** over the cathode bar.

Frame **12** generally comprises a pair of spaced side frames **40** and **42** of rectangular configuration joined together at the ends **44** and **46** of the unit by cross tie members or bars **48**.

The lower ends of the side frames **40** may be flanged as at **50** to provide adequate floor bearing surface when the frame **12** is resting on the floor or the like, and the upper ends **52** may be flanged as at **54** to serve as a support for a cover **56** (see FIGURE 1) of a suitable motor housing **58** that is built into frame **12** between the side frames **40** and **42** to support and house motor device **22**.

The side frames **40** and **42** and cross tie members **48** are preferably fabricated from steel bars or the like to define an integrally united framework that is provided with a suitable coating **60** (see FIGURE 2) that is electrically insulating and plating liquid-resisting in characteristics.

The plating barrel or cylinder **14** is conventional in construction and is journalled in any appropriate manner, as by conventional tubular bearing devices **61**, in end panels **62** for rotation under the driving action of motor device **22**, which drives same through appropriate gearing of a conventional type that is generally indicated at **64**. Gearing **64** meshes with a gear **66** that is fixed to one end of the barrel or cylinder **14**.

As indicated in the drawings, end panels **62** are preferably secured to the vertical bar members **68** of the respective side frames **40** and **42** by suitable bolts **70** which extend into the end panels from the outwardly facing surfaces **72** of the side frame vertical bars **68**. This permits the entire barrel unit including the end panels **62** to be removed from frame **12** by merely detaching the bolts **70** of both of the end panels **62**.

The respective contact bars **18** are pivotally secured to the respective cross tie members **48** of frame **12** (see FIGURE 2) by journalling them on a threaded stud **80** (see FIGURE 2) that forms pin **20** and is received through an electrically insulating sleeve or bushing **82** mounted in an appropriate opening **84** formed in the respective cross tie members **48**.

Also received over each stud **80** is an electrical contact dangler lug **86** of cable **88** that leads the respective bearing devices **61** to the respective electrodes within the barrel or cylinder **14**.

A nut **90** turned up against insulating washer **92** completes the pivot assembly for the respective contact arms or bars **18**.

The insulating sleeve or bushing **82** and washer **92** may be formed from any suitable electrical insulating material.

Bars or arms **18** are formed from a good electrical conductive material such as copper or the like and preferably have substantially the shape indicated in the drawings to define the notches **24**, **32** and perforation **94** through which the threaded stud **80** passes.

The cross bar **28** is likewise formed from copper and is fixed to the respective contact bar ends **26** in any suitable manner, as by welding.

The contact assembly **16** comprising the contact bars or arms **18** and the cross bar **28** is preferably covered with a suitable electrical insulating coating, such as polyvinyl chloride, except in the areas of notches **24** and **32** and at the contact positions **96** where lugs **86** make contact with the respective contact bars or arms **18**. These latter positions are left bare for good electrical contact purposes.

It may be added that the pivotal connection arrangement shown in FIGURE 2 is identical at the left hand side of the unit as shown in FIGURE 1.

As indicated, the cross bar member **28** of the contact assembly **16** is applied to the ends **26** of contact bars or arms **18** at an angle on the order of 45 degrees with respect to the plane of the bars **18** to define the contact area **32**.

In operation, if the unit **12** is to be applied to the forward contact position of FIGURE 6, after the barrel or cylinder is appropriately filled and closed, through the usual door **100**, the unit is picked up and lowered over a plating liquid tank **102** (see FIGURE 6) so that the frame **12** enters the liquid and the contact arms or bars **18** extend more or less horizontally over the edges **104** and **106** of the tank, with the contact area or notch **24** substantially aligned with the cathode bar **108** of a suitable apparatus that is indicated in blocked diagram form as a whole at **110**.

The unit is then lowered until the ends **27** of the contact bars **18** rest on the tank edge **106** and the notches **24** of ends **26** rest on the cathode bar.

After the anode device is appropriately applied to tank **102**, the plating unit may be operated in the usual conventional manner, rotation of the barrel or cylinder **14** being achieved by using appropriate switch arm **112** to actuate motor device (after the latter has been connected to a suitable source of power).

The resiliently flexible nature of cross bar **28** permits the weight of the unit **10** to firmly seat both contact areas or notches **24** of contact bars or arms **18** against the cathode bar.

Furthermore, the pivotal connection between the contact bars or arms and the unit frame **12** insures that the frame **12** will be disposed in its desired vertical position even though the cathode bar might be at different heights with respect to the upper edge of the plating liquid tank, as depicted in FIGURE 3. In the broken line position of FIGURE 3 it is assumed that the contact bars or arms at their ends **27** are held by a suitable supplementary support **114**, but in any event it will be noted that the frame **12** will have its desired vertically disposed position in either position of the contact assembly **18**.

In the event that the device **10** is to be applied to a center contact situation in which the cathode bar **108A** (see FIGURES 4 and 5) is positioned over the plating tank **102A**, it is only necessary to pivot the contact assembly to substantially the vertical position of FIGURES 4 and 5 and then hook the contact assembly over the cathode bar **108A** to suspend the entire unit within tank **102A** with the barrel immersed in the liquid. The plating operation may then proceed in the usual and customary manner.

It will therefore be seen that I have provided a novel portable barrel plating unit incorporating a contact assembly that is readily adapted to both center and forward contact situations, and that insures that good contact with the cathode bar will be made by both contact arms and that the barrel frame will be in its proper vertically disposed operating position.

The unitized frame is of simplified and efficient design and permits ready application thereto of the end panels in which the plating barrel or cylinder is journalled. And, as already indicated, the plating barrel is readily removed as a unit from the frame by merely detaching the end panels from the unit side frame members.

The foregoing description and the drawings are given merely to explain and illustrate my invention and the invention is not to be limited thereto, except insofar as the appended claims are so limited, since those skilled in the art who have my disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

I claim:

1. An electroplating barrel unit comprising:
an electroplating barrel,
frame means for journalling said barrel for rotation about a substantially horizontal axis,
and a contact assembly secured to said frame means,
said contact assembly comprising:
a pair of contact arms pivotally secured to said frame intermediate their respective ends on either side of said frame means for pivotal movement about a substantially horizontal axis,
said arms each having a forward electrical contact area formed thereon at like ends of each,
and a flexible member connecting said ends of said arms together.

2. In an electroplating barrel unit of the type including a barrel journalled in a frame for rotational movement about a substantially horizontal axis, which barrel in its operative position is suspended in the plating solution, the improvement wherein:
said unit includes a contact assembly secured thereto for pivotal movement about a substantially horizontal axis,
said contact assembly comprising:
a pair of contact arms pivotally secured to said frame on either side of said frame for pivotal movement about the last mentioned horizontal axis,
said arms being secured to said frame intermediate their respective ends,
said arms having a sufficient length so that when horizontally disposed, both ends of each project outwardly of said frame,
said arms each having a forward electrical contact area formed at like ends of each arm for contact with a cathode bar,
and a flexible tie member connecting said ends of said arms together,
whereby said barrel may be suspended in a container of plating liquid by resting said contact arm contact areas on a cathode bar at one side of the container and resting the other ends of the bars on the other end of the container.

3. The improvement set forth in claim **2** wherein:
said contact arms at said like ends thereof are formed with hook means defining electrical contact areas for contact with a cathode bar positioned above the container,
whereby said unit may be suspended in the liquid by hanging same from the last mentioned cathode bar.

4. In an electroplating barrel unit of the type including a barrel journalled in a frame for rotational movement about a substantially horizontal axis, which barrel

in its operative position is suspended in the plating solution, the improvement wherein:

said frame comprises a pair of spaced side frames joined together at each end of the frame by a cross tie member,

an end frame member extending across each end of the frame below the respective cross tie members,

said end frame members being secured to the respectibe side frames at each end of the frame,

said barrel being journalled in said end frames for rotation about said axis,

a pair of contact arms each pivotally secured to the respective cross tie members for pivotal movement about an axis paralleling said horizontal axis,

said arms being secured for said pivotal movement intermediate their respective ends,

said arms each having a length such that when they are aligned with said cross ties, both ends of each project outwardly of said side frames,

said arms each having a forward electrical contact area formed at like ends of each for contact with a cathode bar,

and a flexible tie member connecting said ends of said arms together,

whereby said barrel may be suspended in a container of plating liquid by resting said contact arm contact areas on a cathode bar at one side of the container and resting the other ends of the bars on the other end of the container.

5. The improvement set forth in claim **4** wherein:

said contact arms at said like ends thereof are formed with hook means defining electrical contact areas for contact with a cathode bar positioned above the container,

whereby said unit may be suspended in the liquid by hanging same from the last mentioned cathode bar,

6. The improvement set forth in claim **4** wherein:

means for detachably securing said end frame members to said side frames whereby said end frames and barrel may be removed from said frame as a unit.

7. The improvement set forth in claim **4** wherein:

said side frames and said cross tie members are integrally united together.

8. The improvement set forth in claim **5** wherein:

said flexible tie member comprises:

a U-shaped member formed from a resiliently flexible material,

with the legs of said U-shaped member being secured to the respective contact arm ends to define said hook means.

9. The improvement set forth in claim **7** wherein:

said side frame members and said cross tie members having a coating of electrically insulating material covering same except at said contact areas.

10. The improvement set forth in claim **4** wherein:

said contact arms are pivotally mounted on said cross ties by electrically insulating bushings.

References Cited

UNITED STATES PATENTS

70,667	11/1867	Witsil	259—89 X
888,068	5/1908	Daniels	204—213
1,030,053	6/1912	Catlin	204—213
1,254,046	1/1918	King	204—213

FOREIGN PATENTS

564,075	10/1957	Italy.
942,733	11/1963	Great Britain.

JOHN H. MACK, *Primary Examiner.*

W. VAN SISE, *Assistant Examiner.*