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D. E. SAFFEL
ANODIZING RACK

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2 Sheets-Sheet 1

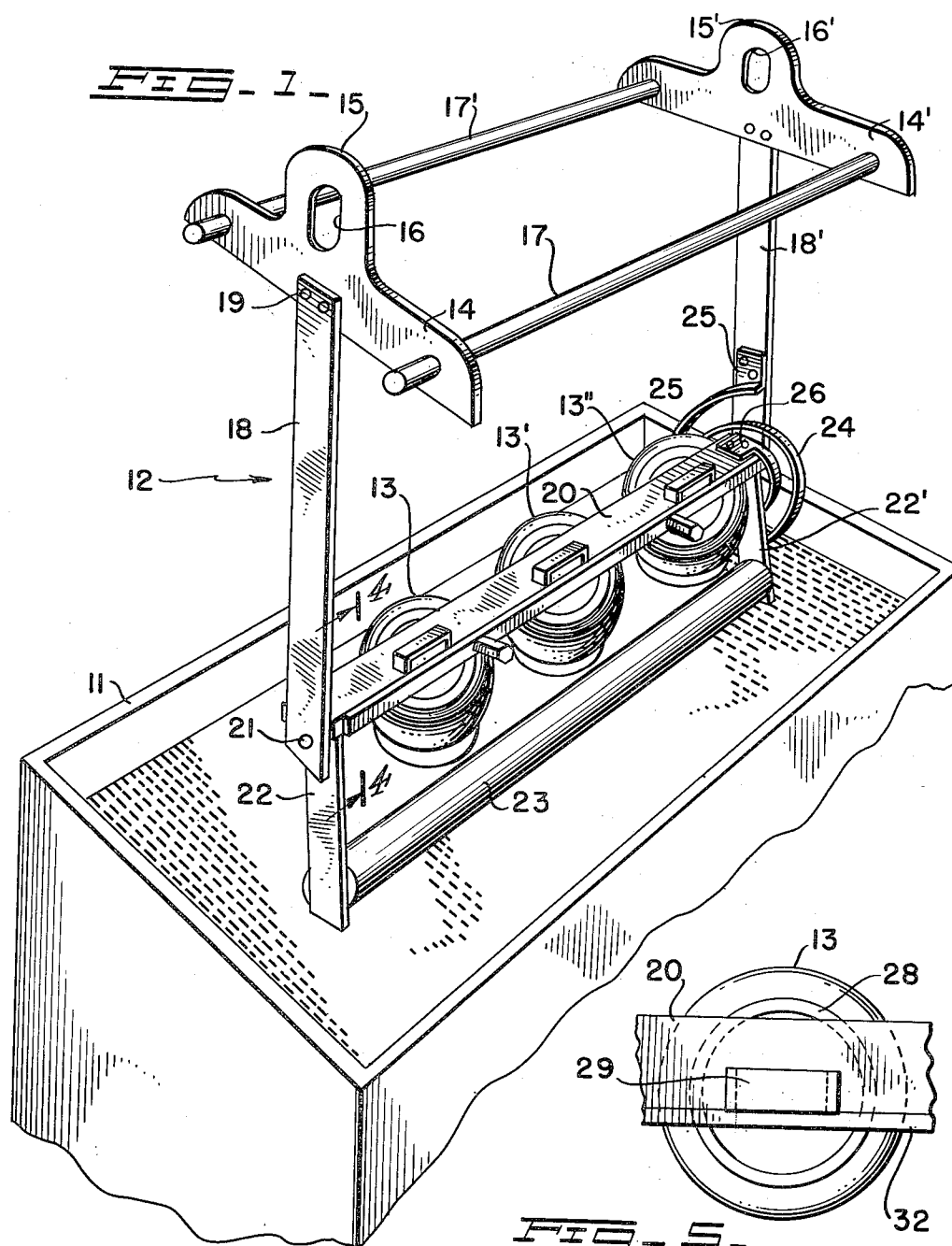


FIG. 5.
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FIG. 2-

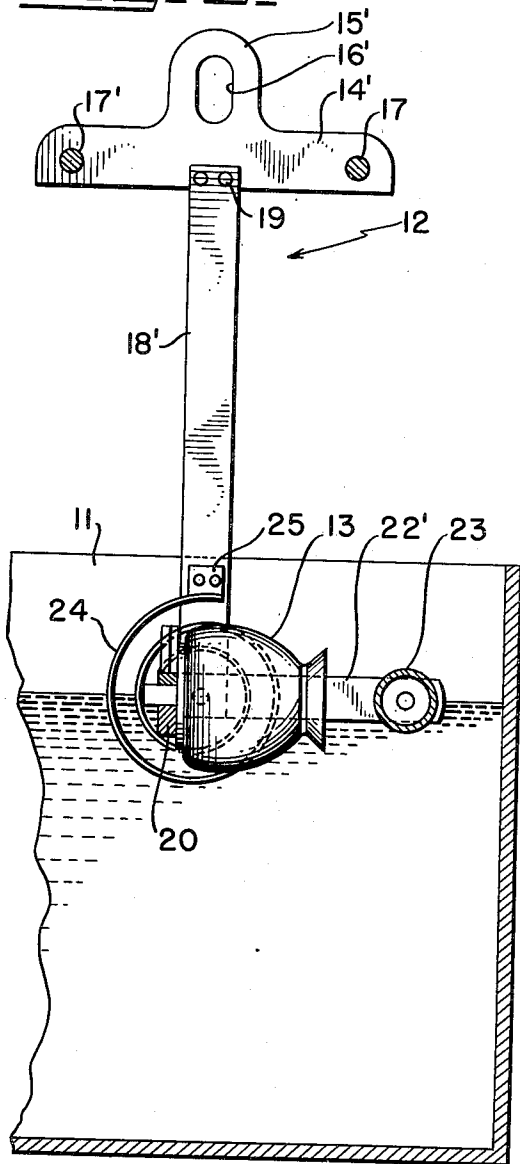


FIG. 3-

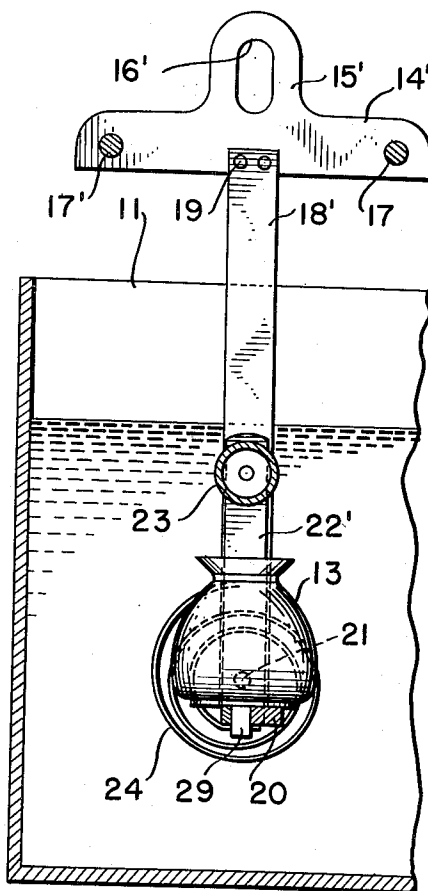
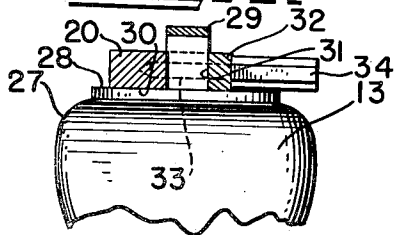


FIG. 4-



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ANODIZING RACK

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1 Claim. (Cl. 204—297)

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This invention relates to an apparatus for immersing articles to be treated in a bath, and more particularly in the specific embodiment of the invention disclosed, to an apparatus for anodizing vessels having one closed end.

In the art of anodizing closed vessels, that is, vessels having a closed end and an open end, it has heretofore been the practice to immerse the vessels in an anodizing solution. However, if the vessels are rigidly secured to a frame and plunged straight down into the bath with a rectilinear motion, several disadvantageous results are thereby produced. The turbulent flow of the anodizing solution into the vessels results in the entrapment of gas within the vessels and the consequent production of "gas marks" on their interior surfaces. Furthermore, if the vessels are immovably secured with respect to the frame, emptying the solution from the vessels is difficult upon removal of the latter from the various immersion baths.

It is therefore a primary object of the present invention to provide an apparatus for immersing closed vessels into a bath in such a manner that at the initial contact of the vessels with the bath the vessels will be aligned in an approximately horizontal position. This allows the solution to flow without turbulence through the lower portions of the horizontally projecting open ends, thereby allowing air and other gases to escape from the interiors of the vessels through the upper portions of the open ends as the interiors become filled with the solution.

Another object is to provide that the horizontally positioned vessels be gradually rotated toward an upright position as the immersion continues so that the vessels, after full immersion, are upright, uniformly filled with solution, and devoid of entrapped gases.

A further object is to provide that the vessels, upon removal from the bath, be gradually rotated back to the horizontal position and then downwardly to an inverted position so as to facilitate the emptying of the solution from within the vessels.

Another object of the present invention is to provide, in an apparatus having a frame for supporting the vessels and adapted to be rectilinearly lowered into a bath, the above-noted angular movements of the vessels, said movements occurring automatically in response to the position of the frame with respect to the surface of the bath.

A further object is to provide a simple, effective float-operated means for automatically controlling said angular positioning of the vessels.

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Another important object of the invention is to provide a novel conducting means for supplying electric current to the vessels during the anodizing operation, said conducting means being unaffected by the angular movements of the vessels or the insulating effect of the anodizing solution.

Other objects and advantages will appear as the description proceeds or are inherent in the structure disclosed in the specification and the drawing wherein:

Fig. 1 is a perspective view of the apparatus before immersion has commenced and showing the vessels inverted;

Fig. 2 is a transverse vertical sectional view showing the horizontal position of the vessels at the beginning of the immersion;

Fig. 3 is a transverse vertical sectional view showing the vessels in upright position and fully immersed in the bath;

Fig. 4 is a sectional detail view taken substantially on the line 4—4 in Fig. 1 and showing the means for securing the lower closed ends of the vessels to a rack; and

Fig. 5 is a top plan detail view of the rack and vessel securing means as seen when looking downwardly in Fig. 4.

Referring now to the drawing, the reference numeral 11 indicates a tank containing a bath or anodizing solution. A frame, indicated generally at 12, is adapted to carry a plurality of vessels 13, 13', 13'' and immerse the latter in the tank 11.

In more detail, the frame 12 comprises a pair of horizontally-spaced end members 14, 14' each provided with an upwardly-extending integral flange portion 15, 15' respectively. The portions 15, 15' are provided with slots or openings 16, 16' which are adapted to coact with any suitable well-known mechanism (not shown) for conveying the apparatus 12. A pair of brace rods 17, 17' are rigidly secured at their opposite ends to the end members 14, 14'. A pair of downwardly-depending supporting members 18, 18' are secured at their upper ends to the end members 14, 14' respectively by means of rivets or other conventional securing means indicated at 19.

Extending between the lower ends of the supporting members 18, 18' is a horizontal rack 20 adapted to support the vessels 13, 13', 13''. The opposite ends of the rack 20 are pivotally mounted on the supporting members 18, 18' by means of pins 21 secured to the rack 20 and rotatably mounted within bearings or openings in the supporting members 18, 18'. It will thus be seen that the rack 20 is freely rotatable about a horizontal

axis. Rigidly secured at opposite ends of the rack 20 are bracket members 22, 22' which project radially outwardly from the axis of rotation of the rack 20. A longitudinal tubular float 23 extends between and is secured to the outermost ends of the bracket members 22, 22'.

Since in the specific embodiment of the invention disclosed in the drawing and specification, the apparatus is employed for anodizing, the frame 12 comprising end members 14, 14', rods 17, 17' and supporting members 18, 18', and also the rack 20 are formed of a suitable metallic current-conductive material. Although some current will pass from the frame 12 to the rack 20 through the bearing contact surfaces at 21, this will be small due to the insulating characteristic of the anodizing solution which surrounds said bearing surfaces. To assure the maintenance of a direct positive electrical contact between the frame 12 and rack 20, there is provided a conductive metallic coil spring 24. One end of the spring 24 is provided with a flat flange 25 contacting and secured to the supporting member 18', whereas the other end is provided with a similar flange 26 secured to and in contact with the rack 20. As best seen in Figs. 2 to 4, the axis of the coil spring 24 is approximately coincident with the axis of rotation of the rack 20.

The vessels 13, 13', 13'' are illustrative of one of the many types which may be utilized with the present invention and in the specific disclosed embodiment are in the form of lower sections of coffee making utensils. The vessels 13, 13', 13'' are each provided with a lower closed end 27 having a flat annular lower surface 28, as best seen in Figs. 4 and 5 wherein the vessel 13 is shown inverted. U-shaped bracket 29 is secured to the lower surface 28 and projects downwardly therefrom. The rack 20 is provided with a flat upper surface 30 adapted to abut against the lower surface 28 of the vessel 13.

The rack 20 is further provided with several open sided U-shaped slots 31, one pair of slots for each of the brackets 29. The latter project into the slots 31 and are clamped securely therein by means of a lock bar 32 extending longitudinally of the rack 20. The lock bar 32 is held in place by means of studs 33 fixed at one end to the rack 20 and projecting through the lock bar 32 so as to receive the nuts 34. It is to be understood that other types of vessels and other means for securing them to the rack 20 may be employed.

The operation of the apparatus will now be described. Before immersion, the weight of the float 23 and the torsion effect of the coil spring 24 combine to maintain the rack 20 in the inverted position shown in Fig. 1. The vessels 13, 13', 13'' are mounted in inverted position on the rack 20 by inserting the brackets 29 into the open sided slots 31 disposed in a longitudinal side of said rack and then rotating the peg nuts 34 so as to cause the lock bar 32 to securely clamp the brackets 29.

The frame 12 is then moved downwardly toward the bath or anodizing solution in the tank 11. The float 23 will contact the bath and the buoyancy of the float 23 will cause it to remain at the surface of the bath as the frame 12 is lowered, thereby rotating the float 23, the bracket

members 22, 22', the rack 20, and hence also the vessels 13, 13', 13'' upwardly toward the horizontal position shown in Fig. 2. During this tilting movement of the vessels 13, 13', 13'' the solution flows smoothly into their interiors without turbulence and the gases displaced by the solution and are permitted to escape. As the frame 12 continues to be lowered the vessels 13, 13', 13'' continue to pivot upwardly about the horizontal axis of rotation of the rack 20 until the upright position shown in Fig. 3 is obtained.

As the frame 12 is removed from the bath, the weight of the float 23 and the torsion effect of the spring 24 tend to maintain the float 23 at the surface of the bath, thereby causing the vessels 13, 13', 13'' to tilt downwardly toward the horizontal position shown in Fig. 2. As the frame 12 is raised further above the bath, the vessels 13, 13', 13'' will continue to tilt downwardly so as to finally assume the inverted position shown in Fig. 1, thereby completing the emptying of the vessels.

It is to be understood that the specific embodiment of the invention disclosed in the drawing and specification is merely illustrative of one of the many forms which the invention may take in practice; the scope of the invention being delineated in the appended claim.

Having described my invention, what I claim and desire to secure by Letters Patent is as follows:

A plating device for immersing container vessels into an anodizing bath consisting of a frame having a pair of flat parallel spaced-apart vertical metal frame members and a pair of substantially T-shaped inverted apertured end members secured to the tops of said vertical members and further having a pair of spaced-apart rods secured to the ends of the T-shaped end members, a flat longitudinal rack rotatably mounted between the lower ends of the vertical frame members, a plurality of U-shaped vessel holding brackets disposed in open sided slots positioned at one edge of said rack, a longitudinal lock bar having a plurality of apertures therein for removably securing said U-shaped brackets to said rack, a plurality of locked peg-nuts disposed in said apertures of said lock bar for locking said bar to said rack, a longitudinal float secured to the ends of said rack in spaced relation thereto, and a flat metal coil spring of several turns wound axially about one end of said rack and secured to the flat bottom thereof and secured at the other end to the flat inner face of one of said flat parallel vertical members for conducting an electrical current from said vertical members to said rack, whereby a plurality of container vessels secured to said racks at their vessel bottoms are gradually uniformly filled with anodizing solution upon lowering said vertical spaced-apart members into said anodizing bath.

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