

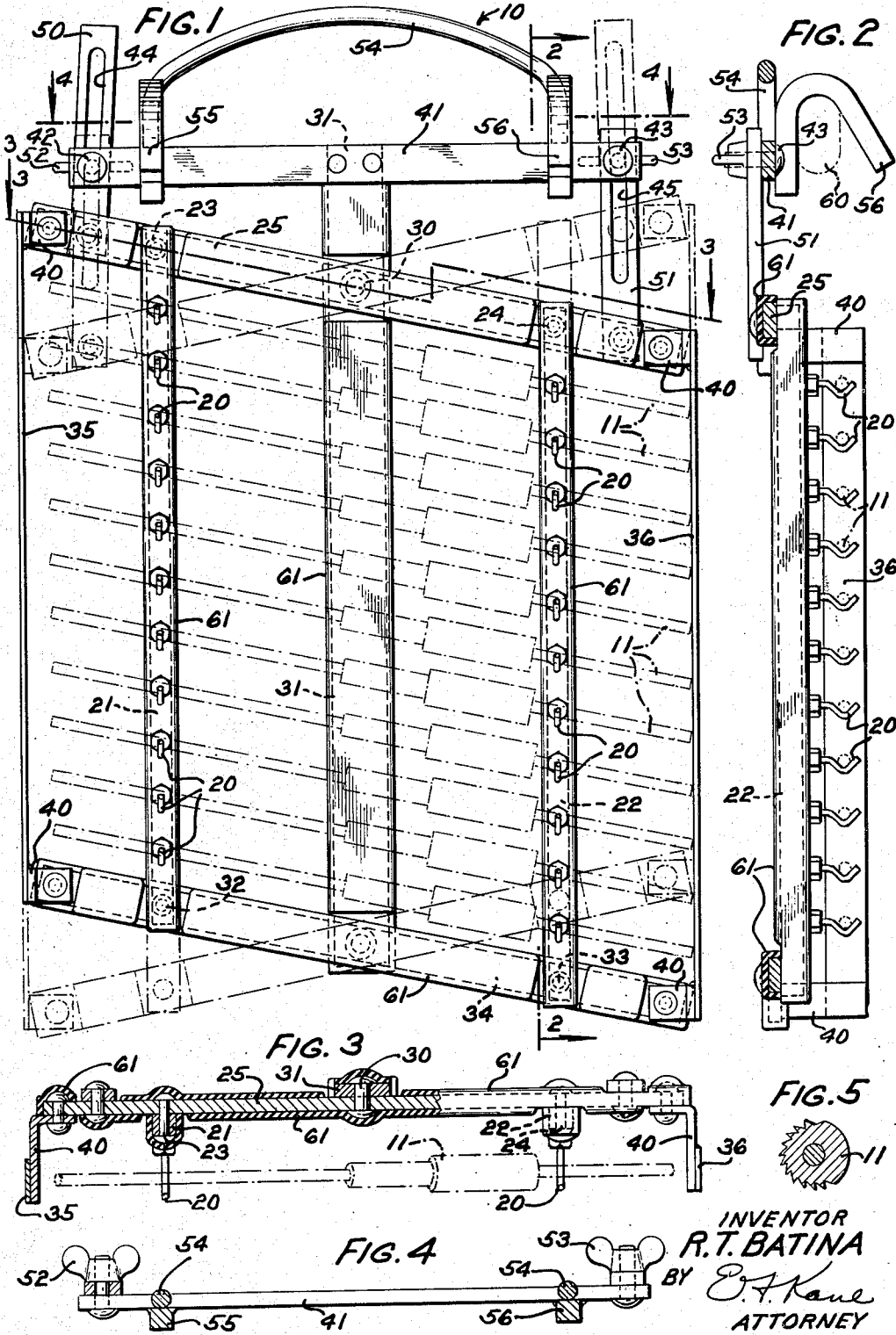
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PLATING RACK

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PLATING RACK

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This invention relates to plating racks and more particularly to racks for supporting irregular shaped articles during the electroplating thereof.

In the ordinary methods of electroplating articles the article to be plated is immersed in a plating bath and the article is connected as the cathode in a circuit wherein the anode is a bar of the plating metal also immersed in the plating bath. During the plating process, gas is given off at the anode and at the cathode due to electrolysis. Normally, the gas given off at the anode is oxygen and that given off at the cathode is hydrogen. The gases form bubbles in the plating solution which will rise to the surface if unimpeded. It has been found when plating irregular shaped objects that gas bubbles formed at the bottom of the article being plated may be imprisoned by the irregular contours of the article and will insulate portions of the article from the plating solution thereby impeding the plating process at those portions. When the plating cycle is finished it has been found that due to these imprisoned gas bubbles portions of the article will be unplated necessitating additional plating to cover up the exposed unplated areas.

An object of this invention is to provide a new and efficient plating rack, especially for articles of irregular contour.

In accordance with one embodiment of this invention, a plating rack for simultaneously supporting in a plating bath a plurality of irregular shaped shafts is provided with two parallel rows of shaft-supporting hooks mounted on two vertical parallel bars pivoted to a frame in such a manner that the parallel bars may be moved vertically relative to one another and in opposite directions to each other. Shafts to be plated are supported in a substantially horizontal position by corresponding hooks on both parallel bars which may be moved vertically in opposite directions during the plating process to first tilt the shafts in one direction and then in the opposite direction to free any gas bubbles that may have been imprisoned by the irregular contours of the shafts being plated.

A complete understanding of the invention may be had by referring to the following detailed description taken in conjunction with the accompanying drawings, wherein

Figure 1 is a front elevation of a specific embodiment of the invention showing one position in full lines and an oppositely tilted position in dot and dash lines;

Fig. 2 is a side sectional view of the apparatus shown in Fig. 1 and taken on the line 2—2 of that figure;

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Fig. 3 is a plan sectional view of the apparatus shown in Fig. 1 and taken on the line 3—3 of that figure;

Fig. 4 is a plan sectional view of part of the apparatus shown in Fig. 1 and taken on the line 4—4 of that figure to show more clearly the clamping mechanism, and

Fig. 5 is a cross-sectional view of one of the shafts to be supported by the apparatus in a plating bath.

As shown in the drawings a plating rack 10 may be used for supporting, in a plating bath, irregular shaped shafts 11, for example, the type shown in cross section in Fig. 5 which has a plurality of milled surfaces that result in the formation of shoulders and other angularities along the shaft which might imprison gas bubbles and insulate areas of the shaft from the electrolyte.

The shafts 11 are supported by a plurality of cathode hooks 20 secured to a pair of vertical parallel bars 21 and 22 properly spaced apart to accommodate the shafts and pivotally supported at their upper ends by pivot pins 23 and 24 secured in opposite halves of a yoke 25 which is oscillatably mounted at its center on a pivot pin 30 fastened to a central frame member 31 near its upper end. The lower ends of the bars 21 and 22 are pivotally connected to pivot pins 32 and 33 fastened in the opposite halves of a lower yoke 34 whose center is pivoted at the lower end of the central frame member 31. The relation between the pivotal connections should be such as to maintain a parallel relation between the bars 21 and 22 and the central frame member 31.

To prevent the shafts 11 from sliding too far along the hooks 20 when they are tilted in either direction, a pair of guards 35 and 36 are pivotally connected to the opposite ends of the yokes 25 and 34. When the yokes are tilted in either direction the guard members together with the bars 21 and 22 remain parallel with the central frame member 31. In order to hold the flat side of the guard members toward the shafts the pivotal connections to the ends of the yokes are made through right angular elbows 40 secured to the ends of the guard members.

Rigidly secured to the upper end of the central frame member 31 is a cross bar 41 having a pair of bolts 42 and 43 fixed to the ends thereof which bolts slidably engage the sides of slots 44 and 45 formed in link members 50 and 51 whose lower ends are pivoted to the upper yoke 25 at points intermediate the vertical bars 21 and 22 and their adjacent guard members. It will be apparent that as the yokes are tilted in either direction the link members will move correspondingly but will always be in engagement with the bolts

42 and 43. A pair of thumb nuts 52 and 53 are provided on the bolts 42 and 43 to secure the link members against movement relative to the cross bar thereby maintaining the yokes at any desired angle with respect to the central frame member 31.

For convenience in handling the apparatus a handle 54 is secured to the cross bar 41. Also secured to the cross bar 41 at points adjacent to the bolts 42 and 43 are a pair of heavy hooks 55 and 56 by which the rack may be suspended on a cathode feed bus bar 60. The hooks provide both the mechanical support for the rack while suspended in a plating bath and the electrical connection to the cathode feed line.

All the parts of the rack except the handle should be made of electrically conducting material, and to prevent the parts of the rack which are immersed in the plating bath from being plated it is advisable to cover all such parts with a coating 81 of insulating material, for example rubber. The pivotal connections, especially, should be covered to prevent freezing of the joints with plating material. In practice a soft rubber of tacky quality is applied over these joints but for the sake of clarity of illustration these covers are not shown on all the joints.

In the operation of the apparatus the shafts to be plated may be supported in a plating bath at an angle as shown in Fig. 1 during half the plating cycle, and then during the second half of the plating cycle the shafts may be tilted in the opposite direction by loosening the thumb nuts 52 and 53 and rocking the yokes 25 and 34 to the desired angle, as shown in dot and dash lines in Fig. 1, after which the thumb nuts may be tightened to hold the apparatus rigid. Tilting of the shafts will free any gas bubbles that may have been imprisoned by the irregular surfaces on the shafts thus permitting the gas bubbles to escape to the surface of the plating solution.

As will be readily apparent the movement of the shafts 11 when the bars 21 and 22 are moved from one extreme position to the other will also expose the part of the shaft which had been engaging the hooks 20 to the action of the plating solution.

What is claimed is:

1. An article plating rack comprising an upper framework having a centrally depending member, a framework oscillatably mounted on said depending member comprising a pair of yokes pivoted one above the other on said depending member, a pair of spaced apart bars linked between said yokes, said bars having article supporting members for supporting an article in a position across a supporting member on each bar, means for limiting the sliding of articles being held by said supporting members, link members pivoted to the upper framework, and means carried on said upper framework and engageable with said link members for rigidly holding said oscillatable framework in any one of a plurality of positions with respect to said upper framework.

2. A plating rack for supporting irregular shaped shafts in a plating bath comprising a substantially T-shaped frame having an upper cross bar and a centrally depending member rigidly fixed to said cross bar, a pair of cross arms each centrally pivoted one above the other on said depending member, a pair of vertical bars pivotally connected between said cross arms and operable on tilting of said cross arms to move in substantially vertical paths but in opposite directions to each other, article supporting hooks

secured to said vertical bars for supporting an article in a position extending across a hook on each bar, retaining members to prevent the articles from sliding off the article supporting members, a pair of links having their lower ends pivoted to opposite halves of the first said cross arm, and clamping means secured to said cross bar for selectively clamping the upper ends of said links in any predetermined position.

3. An article plating rack comprising a frame having an upper cross bar and a centrally disposed depending member rigidly fixed to said cross bar, a cross arm centrally pivoted on said depending member below said cross bar, a second cross arm centrally pivoted on said depending member below said first cross arm, a pair of substantially parallel bars linked to said cross arms, one of said parallel bars being linked between said cross arms on one side of said depending member and the other parallel bar being linked between said cross arms on the opposite side of said depending member, thereby to effect upon tilting of said cross arms a relative parallel movement of said parallel bars in opposite directions to each other, hooks secured to said parallel bars for supporting articles between them, retainers associated with said parallel bars to prevent articles from sliding off the hooks when they are in a tilted position, and means for rigidly fixing said parallel bars in any selected position comprising a link member pivoted to the first said cross arm and adapted to be clamped to said first cross bar in any selected position.

4. An article plating rack comprising a frame having an upper cross bar and a centrally disposed depending member rigidly fixed to said cross bar, a cross arm centrally pivoted on said depending member below said cross bar, a second cross arm centrally pivoted on said depending member below said cross arm, a pair of substantially parallel bars linked to said cross arms, one of said parallel bars being linked between said cross arms on one side of said depending member and the other parallel bar being linked between said cross arms on the opposite side of said depending member thereby to effect upon tilting of said cross arms a relative parallel movement of said parallel bars in opposite directions to each other, hooks secured to said parallel bars for supporting articles between them, retainers associated with said parallel bars to prevent articles from sliding off the hooks when they are in a tilted position, means connected to said frame for suspending said apparatus on an electrical feed line, and means for rigidly fixing said parallel bars in any selected position comprising a link member pivoted to the first said cross arm and adapted to be clamped to said first cross bar in any selected position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,010,647	Leffel	Dec. 5, 1911
1,165,917	Tegoli	Dec. 28, 1915
1,427,875	Weeks	Sept. 5, 1922
1,747,165	Eaton	Feb. 18, 1930

FOREIGN PATENTS

Number	Country	Date
152,724	Germany	June 24, 1904