Nov. 22, 1938. A. M. WAGNER 2,137,819

PLATING APPARATUS

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FIG. 2

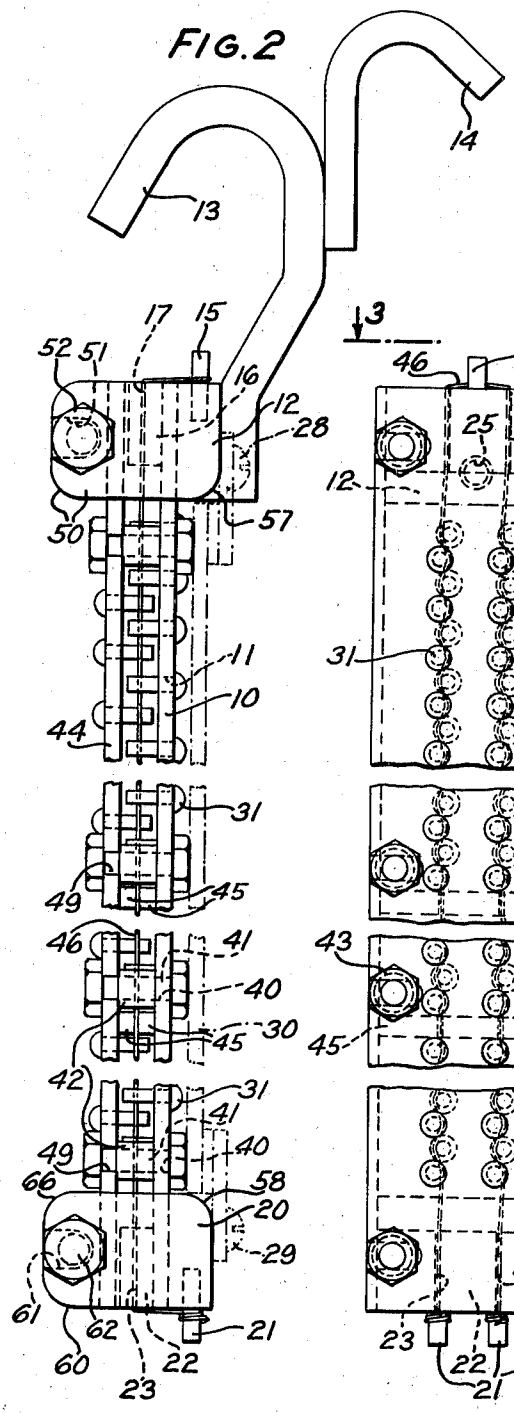
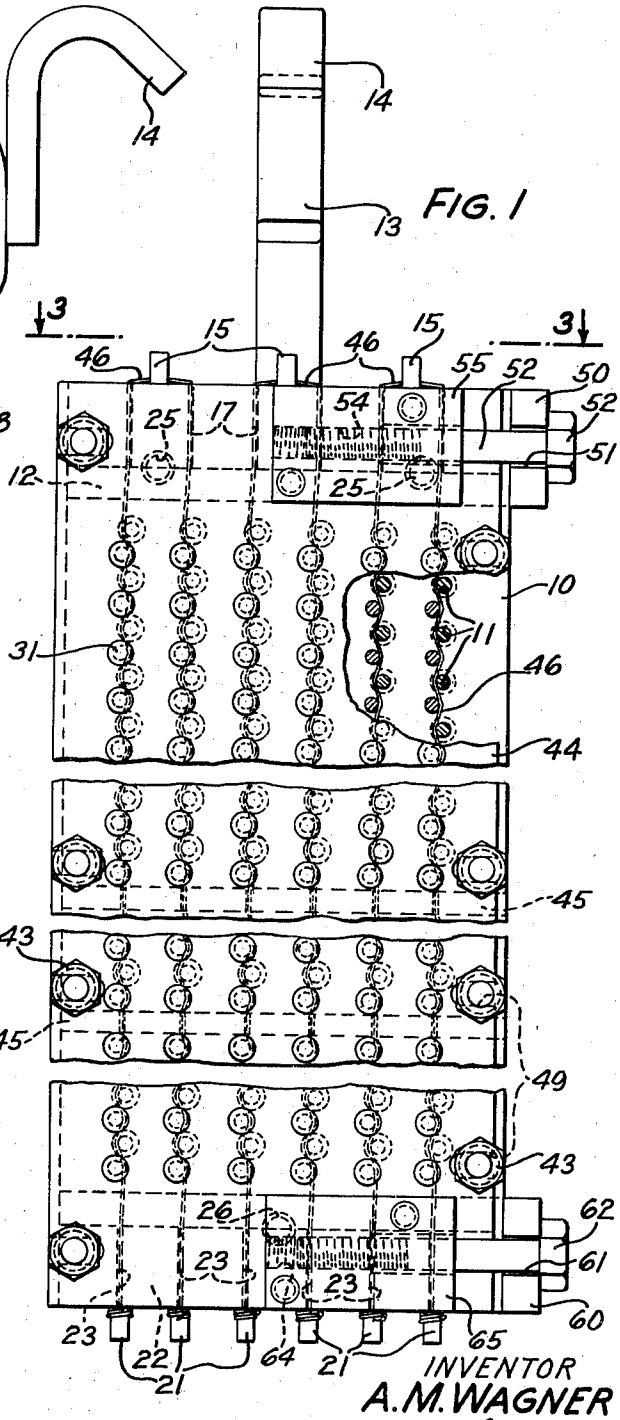


FIG. 1



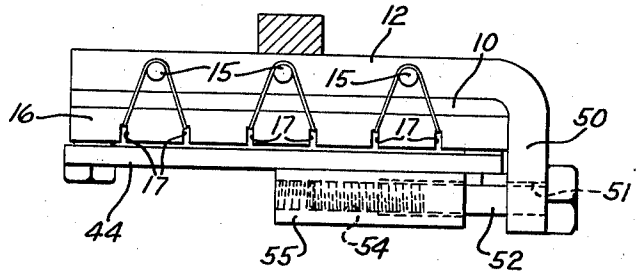
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FIG. 3



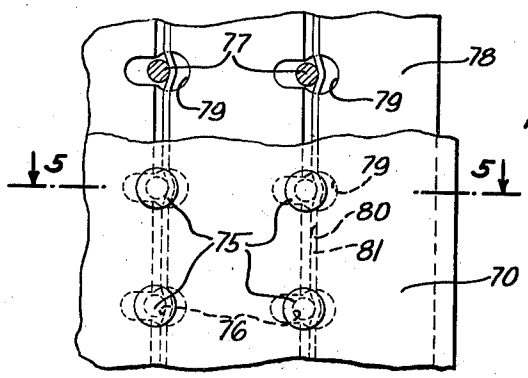


FIG. 4

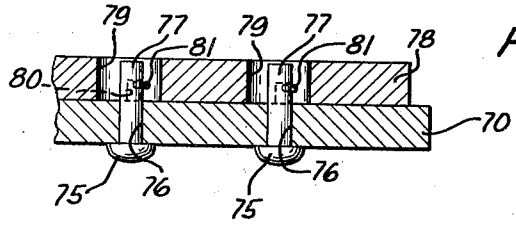


FIG. 5

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Patented Nov. 22, 1938 2,137,819

UNITED STATES PATENT OFFICE

2,137,819

PLATING APPARATUS

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Application October 30, 1935, Serial No. 47,348

12 Claims. (Cl. 204—5)

This invention relates to plating apparatus, and more particularly to a device for holding small headed articles during electro-deposition of a coating thereon.

It is an object of the present invention to facilitate the handling of small parts during the plating thereof.

In accordance with one embodiment of the invention, two spaced parallel plates are provided, each having a plurality of rows of apertures therein for receiving headed articles, the heads of which are to be plated. One of the plates carries a series of wires corresponding in number to the number of rows of apertures and is shiftable laterally with respect to the other plate so that the wires will engage the shanks of the articles in opposite plates to exert a clamping action to hold the articles in good frictional engagement with the plates and in good conducting engagement with the wires.

In another embodiment of the invention, two plates are provided, one of which, i. e., the back plate, has apertures larger than the shanks of the articles to be plated and has wires extending across these apertures to clamp articles positioned in apertures in the other plate, i. e., the front plate, against the edges of the apertures in the front plate.

A better understanding of the invention will be had by reference to the accompanying drawings, wherein—

Fig. 1 is a front elevational view of a rack constructed in accordance with one embodiment of the invention and having articles the heads of which are to be plated supported thereby, parts being broken away to simplify the drawing;

Fig. 2 is a side elevational view of the rack shown in Fig. 1;

Fig. 3 is a view taken along the line 3—3 of Fig. 1 in the direction of the arrows;

Fig. 4 is a fragmentary front elevational view of the second mentioned embodiment of the invention, and

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4 looking in the direction of the arrows.

Referring now to the drawings wherein like reference characters indicate the same parts throughout the several views, particular reference being had to Figs. 1, 2 and 3, a plate 10 is provided having a large number of apertures 11 formed therein arranged in rows from the top of the plate to the bottom (Figs. 1 and 2).

In the embodiment of the invention now being described, there are provided six rows containing a large number of apertures 11 arranged in straight rows from the top of the plate to the bottom, the plate 10 has secured to it at its upper end (Figs. 1 and 2) a cross member 12 to which is secured the usual type of U-shaped hook 13 for supporting the rack in a plating bath, a second hook 14 being secured to the hook 13 for the purpose of providing a handle for the rack. Fixedly mounted in the cross member 12 are a series of pins 15, there being three pins 15 provided in the embodiment of the invention disclosed herein. The cross member 12 is secured to the right side (Fig. 2) of the upper end of the plate 10, and on the left side of the plate 10 a second cross member 16 is fixed. The cross member 16 has a series of six slots 17 cut therein in substantially direct alignment with the rows of perforations 11. The lower end of the plate 10 has a cross member 20 secured to the right side thereof (Fig. 2) which is similar to the cross member 12 differing therefrom in that it has six pins 21, similar to the pins 15, mounted therein. The surface of the plate 10, opposite to that upon which the cross member 20 is mounted, has a slotted bar 22, similar to the cross member 16, mounted thereon in which are provided six slots or grooves 23.

The cross member 12 is provided with a pair of threaded apertures 25 and the cross member 20 is provided with a single threaded aperture 26 for receiving screws 28 and 29 whereby a back plate 30 shown in dot and dash lines in Fig. 2 may be temporarily secured adjacent to the right hand side (Fig. 2) of the plate 10 for holding a series of rivets or bolts 31 in the plate 10 during the assembly of the device.

The plate 10 is provided with four apertures 40 at its right hand side (Fig. 1) and four apertures 40 adjacent its left hand side, in which assembly bolts 41 may be secured. The bolts 41 have associated therewith tubular spacers 42 whereby a second apertured plate 44 may be mounted in spaced relation to the apertured plate 10. A plurality of slots 49 are formed in the edges of the plate 44 into which the bolts 41 will extend when the plates 10 and 44 are assembled. When the plates are assembled they are clamped together by threading nuts 43 on the bolts 41 whereby the plates will be held in spaced relation parallel to each other.

Guide members 45 are secured as by welding or riveting to plates 10 and 44 at spaced intervals for holding wires 46, attached to pins 21 and stretched around pins 15, midway between the two plates when the plates are assembled.

The right hand end of the cross members 12 and 20 (Figs. 1 and 3) are bent at right angles

to the rest of the cross member to provide portions 50 and 60 which extend out beyond the plate 44 and are slotted at 51 and 61 to receive the shanks of bolts 52 and 62. The threaded portion of the bolts 52 and 62 are threaded into apertures 54 and 64 formed in blocks 55 and 65 secured to the plate 44. It will be noted that the edges of the blocks 55 and 65 and the cross members 12 and 20 are rounded off as shown at 56, 66, 57 and 58, respectively, to permit the insertion of members to be plated in the two plates 10 and 44 at points closely adjacent the blocks 55 and 65 and cross members 12 and 20 without interfering with the plating of the parts.

In using the improved form of plating rack disclosed hereinbefore, a number of headed members such as the rivets or bolts 31 the heads of which are to be plated, are inserted in the plate 10 with the heads of the members to be plated extending toward that surface of the plate 10 on which the cross members 12 and 20 are secured whereupon the back plate 30 is secured temporarily to the cross members 12 and 20 to hold the headed members in place on the plate 10 during the further assembly operations of the rack.

The plate 10 may then be turned over without dropping the members to be plated out of the plate 10. After the headed members have been thus assembled in the plate 10, one of the wires 46 is attached to the right hand pin 21 and extended upwardly (Fig. 1) through the slot 23 at the left hand side (Fig. 1) of the right hand row of rivets or bolts 31, thence through the right hand slot 17 and over the right hand pin 15 back through the second slot 17 from the right and second slot 23 from the right to the second pin 21 from the right where it is secured. Wires 46 are similarly stretched from the other pins 21 around the remaining pins 15 so that a wire will be closely adjacent the left hand side (Fig. 1) of the stud of each rivet or bolt 31 mounted in the plate 10. All of the apertures in the plate 44 are then filled with rivets or bolts 31, the heads extending to the left (Fig. 2). The plate 44 is then placed in position upon the members 16 and 22, and the shanks of the rivets or bolts 31 mounted in the plate 44 will be to the left of the wires 46. After the plate 44 has been thus placed in position, the nuts 43 may be tightened somewhat to hold the plate 44 against movement away from the plate 10 whereupon the bolts 52 and 62 are tightened to draw the plate 44 to the right to make all of the studs of the rivets or bolts 31 mounted therein force the wires 46 against the studs of the rivets or bolts 31 mounted in the plate 10, thereby to place all of the studs mounted in both plates under sufficient tension to hold them in the rack. The rack may then be inserted in a plating tank to plate the heads of the headed members and if desired, the heads may be buffed or polished without removing them from the rack.

By rounding off the corners of those parts of the rack adjacent the heads to be plated, substantially the entire surface of both plates may be utilized for supporting parts to be plated without the plating current being taken up by sharp edges which would otherwise prevent the heads of the members adjacent the parts 55, 65, 12 and 20 from receiving an even coat of plating material. The wires 46 which are preferably copper wires, serve to establish contact with the articles to be plated, thereby to make certain that the plating current is conducted through each article. The plates 10 and 44 may be of metal or insulating material. In some instances, particularly if a costly plating material is being used, these plates if made of metal may be protected with a protective coating such as a cellulose derivative lacquer or other organic, resistant coating.

In the form of the invention just described, it will be noted that the plates 10 and 44 serve as shields preventing any substantial amount of plating on the shanks of the rivets, since the anodes (not shown) are suspended facing the heads of the rivets.

In accordance with another embodiment of the invention, particularly adapted to parts having a short shank and whose heads are to be plated, an arrangement somewhat similar to that heretofore described is utilized. A plate 70 has a series of apertures 76 formed therein in which parts 75 having relatively short shanks 77 may be inserted with the heads of the parts 75 engaging the lower surface (Fig. 5) of the plate 70. A second plate 78 is provided having pear shaped apertures 79 and having a plurality of slots 80 formed therein extending between apertures 79 in each row and being positioned so that a wire 81 passed over pins similar to the pins 15 and 21 will be in a position where the shanks of the members 75 will, upon assembly of the two plates 70 and 78, pass into the smaller semi-circular portion of the pear shaped apertures 79 and the wire 81 will be to the right of the shanks (Figs. 4 and 5). The plates 70 and 78 are assembled with the lower surface of one plate engaging the upper surface of the other and, therefore, no spacers 42 are used in this embodiment of the invention. Bolt assemblies similar to the assembly bolts 52 and 62 and cooperating parts are provided for causing a transverse movement of the plates 70 and 78 after they are assembled so that the shank of each member 75 will deform the wire 81 and through the contact of the members 75 therewith the members will be held in position on a plating rack which has all the other structural features of the previously described rack with the exception that the parts will be mounted only in one plate due to the fact that the shanks of the parts are of insufficient length to permit supporting them in the manner previously described.

In using either of the plating racks disclosed hereinbefore, the removal of parts from the racks is accomplished by simply loosening the bolts 52 and 62 which will permit the plated articles to fall out of the plates.

What is claimed is:

1. A plating rack comprising a plate apertured to receive extending portions of articles to be plated, a second plate similarly apertured and slidable with respect to said first mentioned plate and spaced from the first plate to form a free space between said plates, a clamping element secured to one of said plates and extending in said space to hold the articles in response to movement of said plate, and guides on said plate and in engagement with the clamping element for spacing said clamping element from the plates.

2. A plating rack comprising two spaced parallel plates each having rows of apertures therein for receiving extending portions of articles to be plated, a series of wires extending into said space and having their ends secured to one of said plates and corresponding in number to the number of rows of apertures in each plate, and

means for moving the plates laterally with respect to each other to engage the wires with the extending portions of the articles to clamp the articles in position in the plates.

3. A plating rack including a plate apertured to receive extending portions of articles to be plated, a second plate also apertured to receive said extending portions of the articles, and a clamping element secured to said second plate and extending across the apertures therein to clamp the articles against the first mentioned plate.

4. A plating rack including a member having a plurality of apertures conforming to the shape of extending portions of articles to be plated, a member having a plurality of apertures therein of a different shape, and clamping means extending across the apertures in said second member for exerting a clamping action on articles inserted in the first mentioned plate.

5. A plating rack comprising a member having a plurality of apertures conforming to the shape of extending portions of articles to be plated, a member having a plurality of apertures therein of a shape not conforming to the shape of said extending portions, clamping means extending across the apertures in said second member, and means for shifting the members transversely with respect to each other to cause said clamping means to force the extending portions of said articles against the sides of said apertures to clamp the parts in the rack.

6. A plating rack for holding headed parts during the plating of the heads thereof comprising a pair of plates each having a plurality of rows of apertures in which the shanks of a plurality of parts may be inserted, means for assembling the plates back to back and in spaced relation whereby said shanks extend into the space between the plates, clamping means supported by one of the plates, and means for shifting the plates laterally to cause the shanks of the parts in one of the plates to render the clamping means effective to clamp the parts in both plates.

7. A plating rack comprising a pair of apertured plates for receiving the shanks of articles the heads of which are to be plated, means for holding one of said plates in a plane parallel to the other of said plates in spaced back to back relation so that the shanks extend into the space between the plates, means for moving one of said plates laterally of the other while they are parallel to each other, and a clamping means secured to one of said plates for exerting a clamping action on articles in both plates when the plates are moved transversely with respect to each other.

8. A plating rack comprising a pair of apertured plates for receiving the shanks of articles the heads of which are to be plated, means for holding one of said plates in a plane parallel to the other of said plates in spaced back to back relation so that the shanks extend into the space between the plates, means for moving one of said plates laterally of the other while they are parallel to each other, and a clamping means secured to one of said plates for clamping the articles in opposite plates against opposite sides of the apertures therein.

9. A plating rack comprising a pair of apertured plates for receiving the shanks of articles the heads of which are to be plated, means for holding one of said plates in a plane parallel to the other of said plates in spaced back to back relation so that the shanks extend into the space between the plates, means for moving one of said plates laterally of the other while they are parallel to each other, and wires secured to one of said plates in a position to be clamped between the shanks of articles in the plates to hold said articles in the apertures in the plates when the plates are moved laterally with respect to each other.

10. A plating rack comprising a pair of plates, a plurality of passages arranged in rows in said plates through which the shanks of articles, the heads of which are to be plated, may be passed, a plurality of wires secured to the opposite ends of one of said plates, guide members for positioning one of said wires closely adjacent each row of passages in said plate to which the wires are secured, means for holding said plates in parallel planes, and means for moving one of said plates with respect to the other to cause the wire secured to one plate to be clamped between the protruding shanks of the articles in the plates thereby to hold the articles in the plates.

11. In a plating rack, a member having a row of openings to receive articles to be plated, a plate having a row of openings similar to the openings in said member, a wire fixed at its ends and strung substantially parallel to the row of openings in the plate and the row of openings in the member, means for supporting said wire in position parallel to said rows of openings, and means for causing said wire to be pressed laterally against the articles.

12. An article supporting rack comprising a pair of apertured plates for receiving the shanks of articles to be supported, means for holding one of said plates in a plane parallel to the other of said plates in spaced back to back relation so that the shanks extend into said space, means for moving one of said plates laterally of the other while they are parallel to each other, and a clamping means secured to one of said plates for exerting a clamping action on the articles in the plates when the plates are moved transversely with respect to each other.

ARTHUR M. WAGNER.