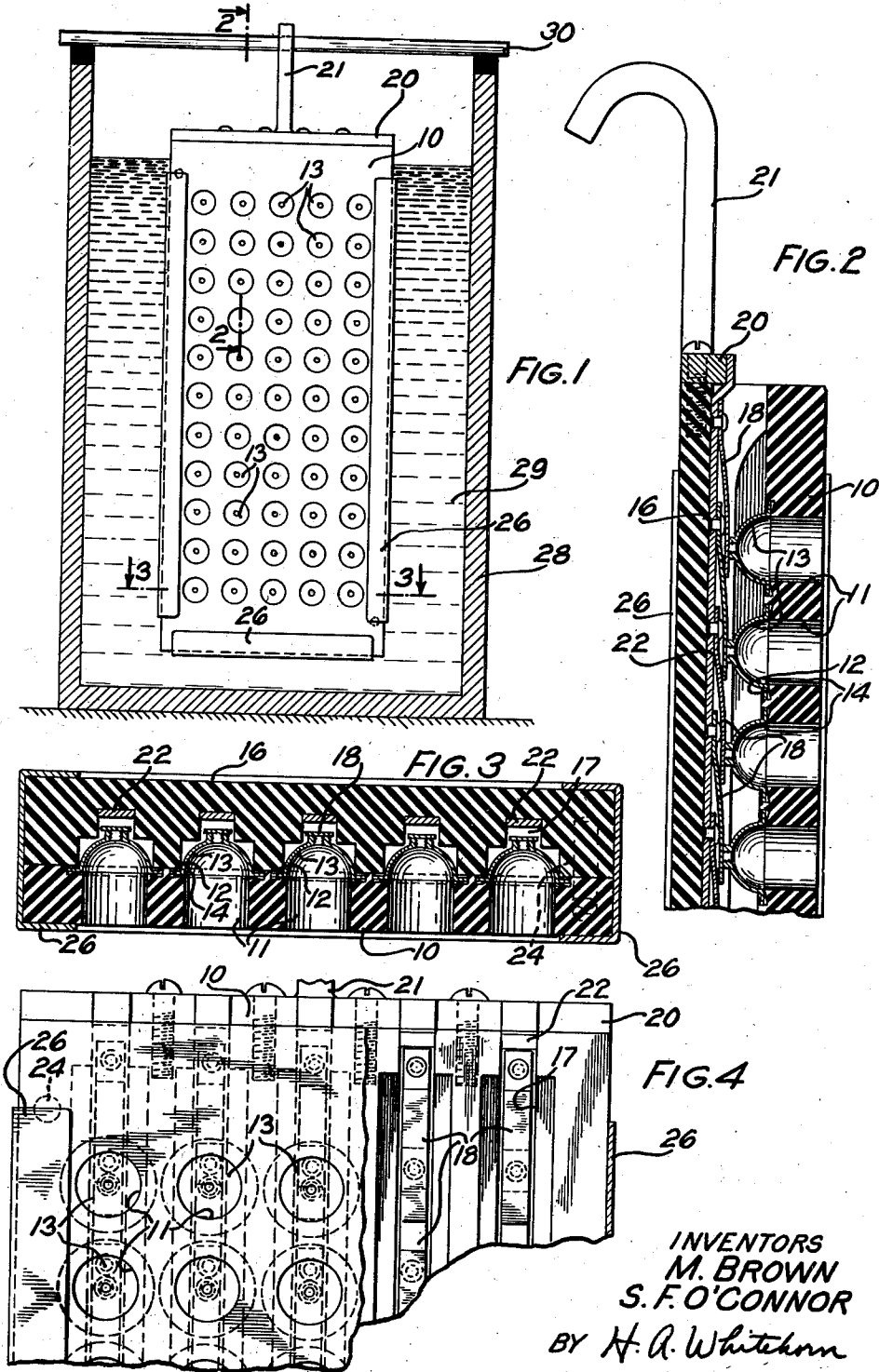


March 16, 1937.

M. BROWN ET AL
ELECTROPLATING APPARATUS

2,073,679

Filed Feb. 5, 1935



INVENTORS
M. BROWN
S. F. O'CONNOR
BY H. A. Whitehorn
ATTORNEY

UNITED STATES PATENT OFFICE

2,073,679

ELECTROPLATING APPARATUS

Morris Brown, La Grange, Ill., and Stephen F. O'Connor, Lakeview, Mont., assignors to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application February 5, 1935, Serial No. 5,008

6 Claims. (Cl. 204—5)

This invention relates to electroplating apparatus and more particularly to racks for holding articles to be electroplated.

An object of the invention is to provide a simple, efficient and practical rack for holding articles during electroplating processes so that predetermined surfaces of the articles may be electroplated.

In accordance with the object, one embodiment of the invention contemplates a rack having an apertured portion for receiving articles to be electroplated, a solid back portion, means for securing the portions together, and resilient elements carried by the back portion and positioned to engage the articles for holding the articles in close engagement with the apertured portion and for forming electrical contacts with the articles to complete circuits therethrough.

Other objects and advantages will be apparent from the following detailed description taken in conjunction with the accompanying drawing, wherein

Fig. 1 is a front elevational view of the rack mounted in an electroplating tank;

Fig. 2 is a fragmentary vertical sectional view of the rack on an enlarged scale taken along line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view on an enlarged scale taken along the line 3—3 of Fig. 1; and

Fig. 4 is a fragmentary front elevational view of the upper part of this rack, with portions of the structure shown broken away.

Referring now to the drawing, wherein like reference numerals designate similar parts throughout the various views, numeral 10 designates an apertured portion of the rack, this portion being in the form of a plate having a plurality of apertures 11 therein. Annular grooves or rabbets 12 are disposed concentric with the apertures 11 for receiving flanges of articles 13 to be plated. In the present embodiment of the invention the articles 13 consist of cup-shaped electrode members for carbon transmitters, the inner surfaces of which are to be gold-plated. To avoid wasting the plating material by plating surfaces of the article which are not necessary to be plated, the bottom walls of the annular grooves 12 are tapered inwardly to form a sealing edge 14 into engagement with which the cups are held, as hereinafter described.

A second plate-shaped portion 16 of the rack has grooves 17 extending longitudinally therein. Each of these grooves has a wide article receiving portion adjacent to the surface and a narrower

terminal receiving portion extending deeper into the plate 16. Resilient terminals or retaining springs 18 are disposed in these grooves where they have their upper ends rigidly secured to conductive strips 22 mounted in the narrow portions of the grooves and extend outwardly and downwardly away from the strips 22 so that their ends will engage the cups or articles 13 and hold them in close engagement with the sealing edges 14. The strips 22 are all electrically connected to a metallic cross member 20, which extends across the top of the rack portion 16 where it is secured to the rack, the metallic member having a metallic supporting hook 21 secured thereto by any suitable means, such as welding. The means for electrically connecting the resilient terminals 18 to the metallic member 20 consists of strips of conductive material 22 placed in the grooves 17 and in electrical engagement with which each of the terminals of each group are disposed.

The portions 10 and 16 of the rack are removably secured to each other by channel members 26 formed of suitable resilient sheet material which are placed over the sides and lower ends of the rack portions for securing the rack portions together and for substantially preventing the flow of plating solution into the cavities within the rack. Locking pins 24 may be used to hold the rack portions 10 and 16 in alignment.

A plurality of racks of this type may be disposed in a tank 28 containing a plating solution 29 and having supporting conducting bars 30 over which the supporting hooks 21 may be disposed. For a specific example, the inner surfaces of the cups or articles 13 may be given a coating of gold and the coating solution may contain sodium gold cyanide. It will be understood that suitable anodes (not shown) are provided, preferably suspended in the solution adjacent to the perforated faces of the racks. Any suitable or usual means may be used for supplying the plating current.

In assembling the rack to coat the articles 13, the apertured portion 10 may be placed upon a table with the annular grooves 12 positioned upwardly and each groove provided with an article 13 to be coated. When the articles have been disposed in the grooves, the portion 16 of the rack is placed upon the portion 10 and in so doing, each of the terminals 18 engages one of the articles, forcing the articles in close engagement with the sealing edges 14 and forming electrical contacts with the articles. The portions 10 and 16 are held in proper relative positions by means of the pins 24; and as soon as the channel mem-

bers 26 are disposed in place, the rack is in readiness for the plating operation. Portions 10 and 16 of the rack are formed of any suitable material as, for example, hard rubber so that they will not be affected by the plating solution and as soon as the circuits are completed through the plating solution and the articles, the inner surfaces of the articles will be plated as they are the only surfaces effectively exposed to the plating solution. It will be understood that the sealing joints of the rack are not necessarily liquid tight and that the solution penetrates into the interior thereof. The space around the articles, however, is so restricted and the quantity of liquid surrounding the protected portions is so small that the amount of plating on these portions will be negligible if any. The sealed joints should be sufficiently tight to prevent any substantial circulation of solution into the interior of the rack during the plating operation.

Although the invention has been disclosed and described as applied to an apparatus for electroplating a specific form of article, it is clear that the apparatus has a more general application and that the apparatus may be used for other plating or coating processes without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In a rack for supporting articles while being coated, a member having apertures and recesses adjacent the apertures for receiving articles to be coated, a sealing member for sealing the surfaces of the articles except those communicating with the apertures, and means for securing said members together, said means sealing connecting edges of said members against the entrance of coating solution between said members.

2. In a rack for supporting an article while being coated, a member having an aperture and a recess adjacent the aperture for receiving an article to be coated, a sealing member for sealing the surfaces of the article except those communicating with the aperture, and means disposed in said sealing member for holding the

article in close engagement with the surfaces of the recess to form a seal.

3. A rack for supporting articles during electroplating comprising a portion having a plurality of plating apertures for exposing the portion of the surfaces to be plated, a second portion cooperating with the first portion for enclosing the portions of the articles not to be plated, and means for resiliently positioning the articles, said means also serving as current leads to the articles.

4. A rack for supporting articles during electroplating comprising a portion having a plurality of plating apertures for exposing the portion of the surfaces to be plated, a second portion cooperating with the first for enclosing the portions of the articles not to be plated, said second portion having grooves therein into which the articles extend, and resilient contact members in said grooves for positioning the articles and conducting current thereto.

5. A rack for supporting articles during electroplating comprising a member with a plurality of recessed apertures arranged in rows to receive the articles, a second member cooperating therewith and having a groove for each row of said apertures, and a plurality of resilient contact members in each groove to retain the articles in position and conduct plating current to the articles.

6. In a rack for supporting articles during electroplating, a base having recessed apertures for receiving the articles and exposing the surfaces to be plated, a cooperating grooved plate devised to enclose the articles and seal the surfaces not to be plated, a plurality of resilient contact members in the groove in said plate for retaining the articles in position and conducting plating current to the articles, and a plurality of channel members for joining said base and plate and sealing the joint between them against the circulation of plating solution.

STEPHEN F. O'CONNOR.
MORRIS BROWN.