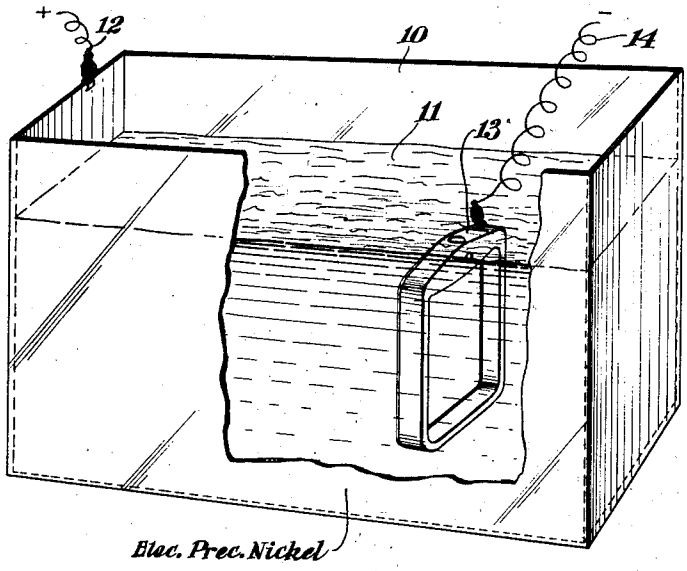
Dec. 22, 1931. B. BART 1,837,193

METHOD OF ELECTRODEPOSITING PRECIOUS METALS AND APPARATUS FOR PRACTICING THE SAME

Filed June 8, 1928



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Patented Dec. 22, 1931 1,837,193

UNITED STATES PATENT OFFICE

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METHOD OF ELECTRODEPOSITING PRECIOUS METALS AND APPARATUS FOR PRACTICING THE SAME

Application filed June 8, 1928. Serial No. 283,997.

The invention relates in general to an improved method for the electrodeposition of precious metals and in an apparatus for commercial practice of the same.

In the art of electroplating articles with the so-called precious metals, it is the usual practice to contain the precious metal in a solution in the electrolyte and subject relatively small articles as cathodes to the action of an electrolytic bath following conventional practices in this respect. In this prior art it is known to use platinum as the anode as such metal is insoluble in the electrolyte but economy necessitated the use of a small size anode when such as expensive metal was used. No attempt has been made heretofore insofar as is known to electroplate large surfaced articles with precious metals and certainly no attempt has been made to so electroplate large articles on any commercial scale due to the prohibitive cost of providing an anode sufficiently large to supply the requisite area of contact with the electrolyte. The anode surface in electroplating with platinum and like metals should at all times be considerably larger than the cathode surface. An anode surface of the area requisite to plate large size articles is prohibitive.

One of the primary objects of this invention is to provide for an economic deposition of a layer of precious metal on a cathode surface of relative large area.

In this specification and in the claim, the term "precious metal" is sufficiently generic to include any one of the following metals: ruthenium, rhodium, palladium, osmium, iridium, chromium, platinum and gold.

Broadly, the invention is attained by containing the precious metal as a solution in the electrolyte periodically replenishing the metal to maintain the requisite percentage of metal in solution; but practicing the electrolytic deposition on a relatively large area cathode, in the presence of an anode formed of a non-precious metal which is insoluble in the electrolyte and which presents to the electrolyte the requisite large area of contact.

Referring to the apparatus aspect of the disclosure, an object of the invention is to provide an electrolytic bath which will function economically in coating large size objects with any one of the precious metals and by means of which the method may be practiced commercially and efficiently when practiced on a large scale.

Various other objects and advantages of the invention will be in part obvious from a consideration of the method features of the disclosure and from an inspection of the accompanying drawing and in part will be more fully set forth in the following particular description of one method of practicing the invention, and the invention also consists in certain new and novel modifications of the preferred method and other features of construction and combinations of parts hereinafter set forth and claimed.

In the accompanying drawing, the figure illustrates an electrolytic bath by means of which the method herein featured may be practiced, and which illustrates a preferred embodiment of the physical aspect of this disclosure.

In the drawing, there is shown a tank 10 constituting the anode and which forms or outlines a receptacle for containing the electrolyte 11. Conventional means are provided for connecting the positive lead 12 from a suitable source of electric energy. Positioned in the tank is a cathode 13 and the showing is intended to represent some large area article to be coated such as an automobile radiator frame. The negative lead 14 is conventionally connected physically and electrically to the large size cathode.

The electrolyte 11 contains a solution of the precious metal which is to coat the cathode 13. In the instant case, it may be assumed that the electrolyte contains a phosphate of platinum employed in the case where it is desired to coat a radiator frame with a thin layer of electrolytically deposited platinum.

It is a feature of this disclosure that the anode, in this case the tank itself, or a glass tank lined with electrolytic nickel, be insoluble in the electrolyte. The only metal known at present which will meet these requirements is electrolytically deposited nickel. It is believed that electrolytically deposited cobalt and perhaps electrolytically

deposited chromium may eventually be utilized to form the tank or at least to constitute a lining for the tank. It is not known at this time whether the use of cobalt or chromium is commercially practicable.

It is noted that other metals usually used for the purpose of forming anodes, even rolled nickel, are unsuited for use as anodes in practicing the method herein featured. Nickel of the electrolytically deposited form is the only substance now used with entire satisfaction.

Another feature which is believed to contribute to the success of the method of coating large objects as herein outlined is that the area of anode exposed to the electrolyte is relatively large. Apparently the greater the exposure of area of anode the more efficient is the operation. In the illustrated case, where the anode forming tank has the cathode positioned therein, the area of anode exposed to the electrolyte is, of course, many times the area of cathode surface exposed to the electrolyte. It is within the scope of this disclosure to form the tank of some suitable material such as glass, porcelain or celluloid and the like and position the anode in the form of plates of electrolytically deposited nickel in such non-metal tanks.

As the amount of precious metal deposited on the cathode is extremely thin, it has been found that by following the method herein featured the coating of large objects at a cost which is not prohibitive for commercial practice is possible and as a matter of fact is only slightly more expensive than the coating of similar objects with certain of the non-precious metals such as silver. The large area of cathode in contact with the electrolyte permits of a rapid deposition with resulting economy in the time necessary to effect the deposition and economy in current consumption over known methods.

I claim:

An electrolytic bath including an electrolyte containing a solution of one of the precious metals, and an anode of electrolytically deposited nickel insoluble in the electrolyte.

Signed at Newark in the county of Essex and State of New Jersey this 31st day of May A. D. 1928.

BLASIUS BART.