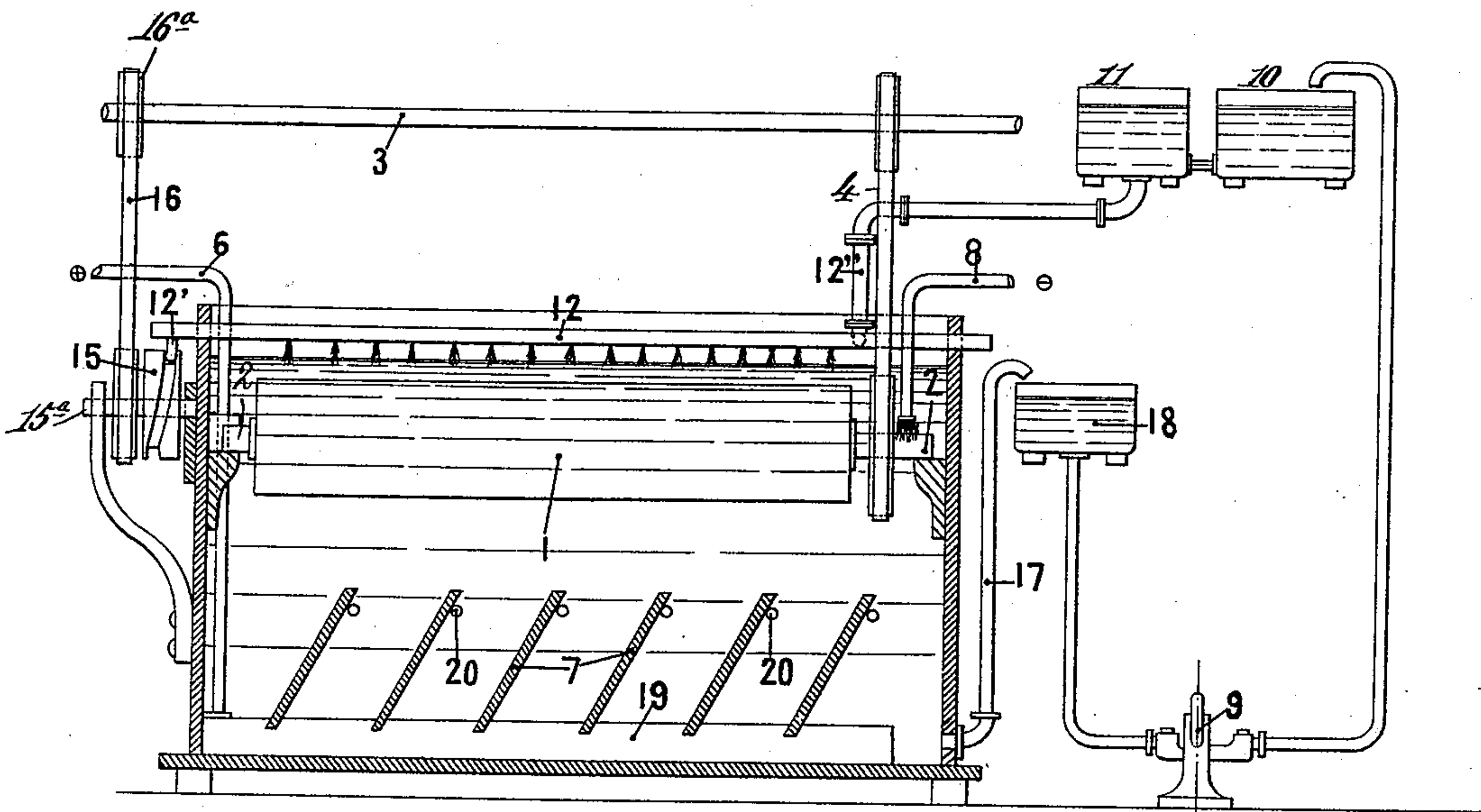


(No Model.)

H. THOFEHRN.
ELECTRODEPOSITION OF METALS.

No. 519,595.

Patented May 8, 1894.



Witnesses

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UNITED STATES PATENT OFFICE.

HERMANN THOFEHRN, OF PARIS, FRANCE.

ELECTRODEPOSITION OF METALS.

SPECIFICATION forming part of Letters Patent No. 519,595, dated May 8, 1894.

Application filed June 20, 1893. Serial No. 478,248. (No model.)

To all whom it may concern:

Be it known that I, HERMANN THOFEHRN, a subject of the Emperor of Germany, and a resident of Paris, France, have invented certain new and useful Improvements in Electroplating; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has for its object to provide a new and improved apparatus whereby electrolytic depositions of copper or other metal can be obtained, in such manner that the metal deposited possesses great fineness and perfect homogeneity.

To accomplish this object my invention consists essentially in the combination of an electrolytic bath, of an anode and cathode, and a reciprocating spraying pipe for showering the electrolyte upon the cathode.

The invention also consists of other features which will be hereinafter described and claimed, reference being made to the accompanying drawing, in which the figure is a vertical sectional view of an electrolytic bath embodying my invention.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawing, where I have illustrated the working of the apparatus in connection with a cylinder which is to be plated with electrolytic metal. The cylinder is mounted on gudgeons 2 and is rotated by any suitable mechanism, such for example as a belt connection 4 with a shaft 3 rotated by any suitable motor. The anodes 7 are arranged in an inclined position near the bottom of the tank in which the cylinder is mounted to rotate, and these anodes are coupled up and traverse the bath so as to deposit the metal upon the cathode 1 and leave at the point 8 to return to its source. The current enters at 6. The electrolyte is kept in constant circulation by a pump 9, as will hereinafter appear, so as to force the liquid received from the tank into a reservoir 10, placed at a higher level, wherein the liquid is purified, that is to say, freed from matters which are injurious to the quality of the deposit. From the reservoir 10 the liquid passes into a neighboring reservoir 11, wherein it is

restored to its standard strength, and from which it falls so as to shower the cathode, under a pressure regulated according to the elevation of the feed tank 11. The showering is produced by a spraying pipe 12, receiving a reciprocating movement longitudinally so that all parts of the cathode will be equally showered. In the case of cylinders the discharge pipe is straight, but in the case of revolving surfaces the pipe may conform to such surfaces. The discharge pipe 12 is perforated with small holes arranged very close together, so that all parts of the metallic deposit will be acted upon by the liquid jets falling under a pressure which may be easily regulated. A longitudinal slot extending all along the discharge pipe would answer the purpose equally well.

By the means described I obtain a perfectly homogeneous metallic deposit on the surface of the cathode, giving to the metal the qualities required by the trade.

The electrolyte is maintained at a uniform level, and above the point of submergence of the cathode, by means of the supply pipe 12'', the level of the fluid being preserved by means of the overflow pipe 17, which discharges into the tank 18, the latter being connected by a suitable pipe with the pump 9 and the pump being connected with the tank 10.

The to-and-fro movement of the spray-pipe 12 is effected in the following manner: The ends of said pipe are prolonged sufficiently to enable them to be carried through the sides or walls of the tank, which thus furnish a bearing, or support for the same. The supply-pipe 12'' is connected to the spray-pipe 12 by means of a flexible section of pipe. Upon one of the outwardly projecting ends of the spray-pipe 12 is mounted a finger 12', which lies in a cam-race formed in a disk 15, which is carried by a shaft 15^a, driven by a belt 16, from a driving-pulley 16^a carried by the power-shaft 3. It is evident that a number of spraying-pipes 12 may be simultaneously operated by the means described.

As here illustrated, the anodes 7 are arranged above the conductor, and consist of a strip or plate 19 which is protected from the corrosion of the fluid, save at points of contact for the anodes, by an insulated coating of caoutchouc or gutta-percha. The rods 20,

justably fulcrumed in said support, a conical frustum operating said levers, a cam-shaft driven from the power-shaft, and cams simultaneously operated by said cam-shaft to raise 5 the can-support and depress the conical frustum, substantially as specified.

4. In a mechanism for seaming sheet metal cans, the combination of a seaming head arranged to be held stationary in use with a series of seaming dies borne on adjusting levers provided with adjustable fulcrums, and wedge mechanism to move them when in use. 10

5. The combination of the seaming head 29, arranged to be held stationary in use with a

series of seaming dies 28, borne on adjusting levers 24, provided with alternative bearings, 49, adapted to act as fulcrums for adjustment to cans of different sizes, and wedge mechanism formed of the conical frustum 23 having vertical motion to move the levers and dies in use. 15 20

In testimony whereof I affix my signature in presence of two witnesses.

JOHN A. STEWARD.

Witnesses:

ELLA M. BALLOU,
ELBRIDGE M. BUCK.