Aug. 31, 1943. E. J. MERCIL 2,328,162

PLATING TANK

Filed March 4, 1940

Fig. 1.

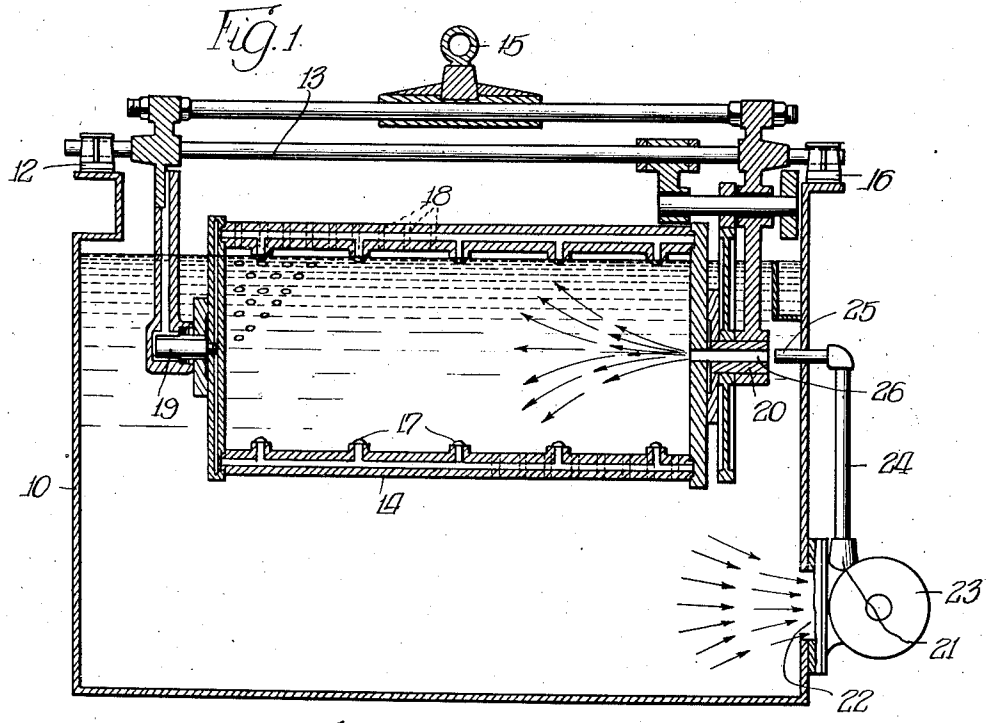
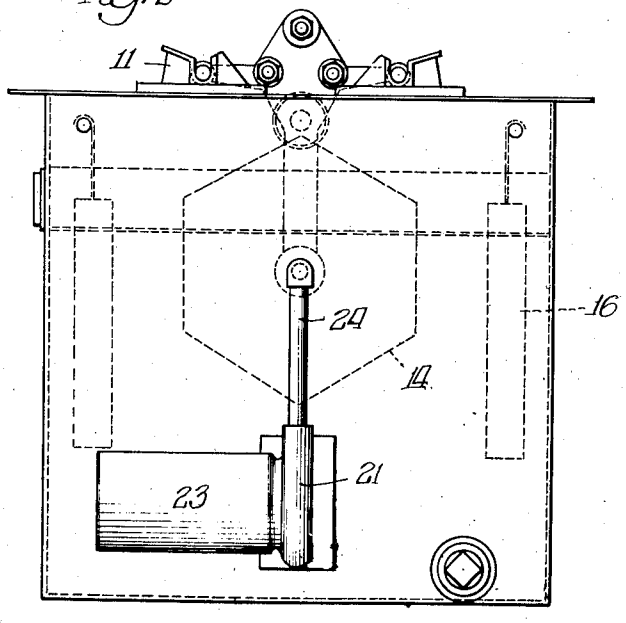


Fig. 2



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UNITED STATES PATENT OFFICE

2,328,162

PLATING TANK

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Application March 4, 1940, Serial No. 322,077

2 Claims. (Cl. 204—212)

My invention relates to plating, and particularly to novel means for lowering the time required for plating, due to more rapid circulation of the electrolyte.

In plating by the use of mechanism of the barrel type, it is customary to employ a rotatable cylinder immersed within the liquid, the materials to be plated being confined within the cylinder or barrel. In order to bring about the transfer of the metal in the solution to the articles to be plated, the barrel is provided with a multiude of small perforations.

However, in the course of operations, the perforations become obstructed and circulation of the liquid is comparatively slow with the result that the liquid within the barrel is spent and the plating process is delayed.

An object of my inventiion is to provide means for enforcing circulation of the liquid and at the same time to avoid interference with the removal and replacement of the cylinder, which is necessary when the articles are to be placed in and removed from the barrel. To that end I provide a motor and pump unit, preferably located exteriorly of the tank, the intake of the pump being open to the lower portion of the tank while the outlet is in the form of a pipe, so arranged that the open end of the pipe is in register with an axial opening in the barrel trunnion without actually entering the trunnion and preventing easy removal of the cylinder from the tank.

The invention will be more readily understood by reference to the accommpanying drawing; in which,

Fig. 1 is a longitudinal sectional view through plating equipment arranged as described; and,

Fig. 2 is an end view of the tank.

In the drawing I have illustrated a conventional tank 10, open at the top, the flanged upper edges provided with brackets 11—12 for the support of the frame, indicated generally by the numeral 13, on which the barrel 14 is supported. Gear means are provided on the frame for rotation of the tank in the usual manner, it being intended that the frame and barrel may be lifted by engagement of a hoist with the ring 15. The barrel, as shown, is hexagonal in cross section, one of the panels being removable to permit the insertion and removal of the articles to be plated. The anodes are indicated at 16 in Fig. 2, the cathodes being in the form of contacts 17 within the walls of the tank.

As indicated, the barrel is provided with a multitude of small openings 18 in the side walls thereof through which the plating liquid passes. The barrel 14 revolves on trunnions 19—20 in the usual manner.

The apparatus so far described is well-known and the operation thereof is generally understood. However, as before described, the plating time is lengthened, due to the difficulty of maintaining adequate circulation of the electrolyte through the small openings in the barrel, this difficulty in circulation being pronounced when a heavy liquid is required or when the openings become clogged after extended use. In order to avoid this difficulty and maintain rapid circulation, I provide a pump 21 mounted exteriorly of the tank, the inlet 22 from the pump being open to the lower portion of the tank. An electric motor 23 may be used for operating the pump. The outlet from the pump is connected to a pipe 24, a nipple or short length of pipe 25 projecting through a wall of the tank below the normal or operating level of electrolyte within the tank and terminating at a point opposite the axis of rotation of the barrel and in register with an opening 26 through the trunnion 20. While the pipe does not engage or fit within the axial opening 26, the velocity head created by the pump is sufficient to force the liquid through the trunnion and into the cylinder, the excess liquid being forced out of the many small openings in the cylinder. Thus the circulation system does not interfere in any way with the normal operation of the tank, the cylinder being readily removed and replaced without interruption of the circulation pump.

As shown in Fig. 1, the barrel 14 is normally submerged or partly submerged in the electrolyte, thus requiring that if the circulation injector 25 be caused to register with the axis of the barrel, it must be at a point below the level of liquid within the tank. Thus the nozzle or pipe 25 will normally be below the level of the electrolyte and the injector action or increased velocity head at the outlet from the nozzle will have the effect of carrying into the axial opening 26 some of the liquid at the upper part of the tank along with the liquid drawn by the pump from the lower part of the tank. This serves to prevent stratification of the electrolyte.

Obviously the construction is capable of considerable modification of its details and I do not wish to be limited except as indicated in the appended claims.

I claim:

1. Electroplating apparatus comprising in com-

bination, a tank for electrolyte, a rotatable cylinder removably mounted therein for receiving articles to be plated, said cylinder having perforated walls through which the electrolyte is adapted to circulate and provided with an opening at its axis of rotation, a circulation pipe, the open end of which is located below the operating level of electrolyte within the tank and registers with but does not enter the axial opening in the cylinder, and a pump connected to said circulation pipe and adapted to withdraw electrolyte from the tank and force it into the said cylinder through said axial opening.

2. In plating apparatus in combination, an open top tank for plating solution, a frame structure superposed on said tank and carrying a cylinder and means for rotating the cylinder, said cylinder being adapted to receive articles to be plated and having a multitude of small perforations in its walls through which the plating solution is adapted to circulate, the cylinder being provided with trunnions at its axis of rotation, one of said trunnions having an axial opening, a pump and driving means mounted exteriorly of the tank, the intake of the pump being open to the lower portion of the tank and a discharge pipe connected to the outlet from the pump and fixedly projecting through a wall of the tank below the normal level of plating solution therein and registering with but spaced from the opening in the cylinder trunnion, whereby the plating solution in the tank and cylinder may be circulated and whereby the frame and cylinder may be removed and replaced without interference by the said discharge pipe.

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