No. 887,539. PATENTED MAY 12, 1908.

G. P. STEVENS.

MOVABLE PLATING APPARATUS.

APPLICATION FILED AUG. 27, 1907.

Fig. 1.

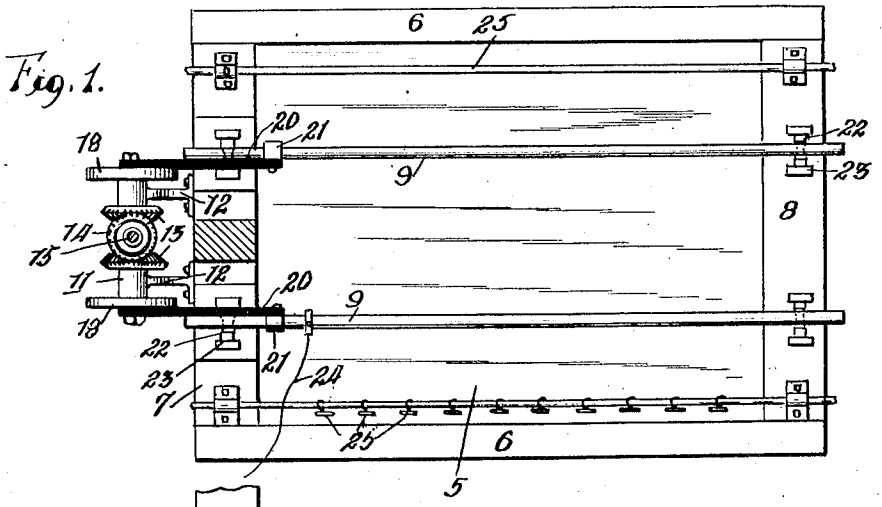


Fig. 2.

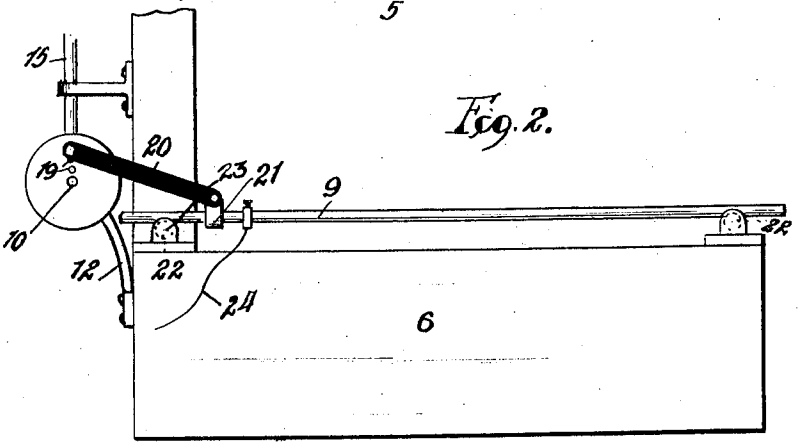


Fig. 3.

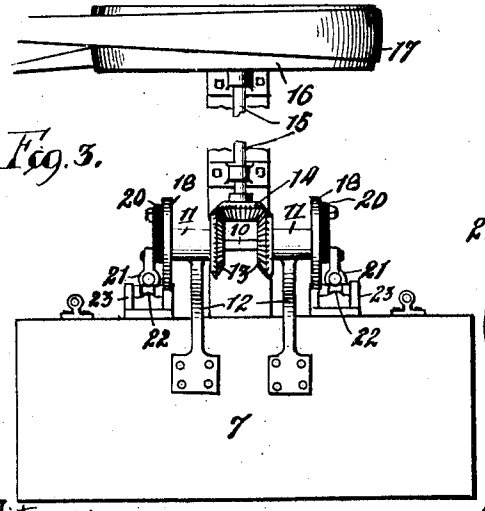
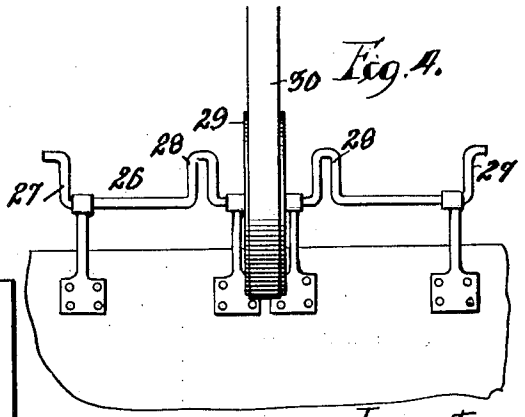


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MOVABLE PLATING APPARATUS.

No. 887,539. Specification of Letters Patent. Patented May 12, 1908.

Application filed August 27, 1907. Serial No. 390,328.

To all whom it may concern:

Be it known that I, GEORGE P. STEVENS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Movable Plating Apparatus, of which the following is a specification.

In the art of electro-plating, especially nickel-plating, it is generally understood that the rapidity of the deposit of nickel will depend upon the strength of the electric current and the richness of the plating solution, but it has also been found that, under ordinary conditions, the work can be successfully performed only by means of a current of moderate strength and a solution of predetermined richness, since any increase in the strength of current or in the richness of the solution will tend to burn or blacken the work and thereby destroy its value.

The object of the present invention is to enable the plating operation to be performed by a current of much greater intensity and in a stronger solution, which proportionately increases the rapidity with which the plating can be done and correspondingly increases the capacity of the plating tank.

By employing the method of the present invention it has been found, from actual test, that the work can be accomplished in substantially one-third the time ordinarily employed. It has, furthermore, been shown that the work plated by the apparatus of the present invention is brighter and more satisfactory in character than that produced by the ordinary methods.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a top or plan view of a plating tank provided with the reciprocating supporting rods of the present invention; Fig. 2 a side elevation of the same; Fig. 3 an end elevation of the same; and Fig. 4 a slightly modified form of actuating mechanism.

The device of the present invention is employed in connection with a tank 5 of the usual construction, comprising side walls 6 and end walls 7 and 8. The tank has extending from end to end thereof one or more supporting rods 9, two being shown in the present embodiment of the invention. The supporting rods usually employed in connection with plating tanks are stationary, but the gist of the present invention resides in providing means for reciprocating said rods, which serve to support the work to be plated within the solution in the tank. By moving the work within the solution it is possible to employ a much stronger current and thereby proportionately facilitate the plating operation without burning or blackening the work which would invariably result if a current of like strength were utilized in plating stationary objects within the tank.

A reciprocating motion can be imparted to the supporting rods in any one of several ways, but the mechanism shown in Figs. 1, 2 and 3 is of highly satisfactory character by reason of its simplicity, although other equivalent mechanical means might be employed without departing from the spirit of the invention. The mechanism thus illustrated consists essentially of a shaft 10, which is journaled within a pair of sleeves 11, supported upon brackets 12, which are secured to the front end of the tank and extend upwardly therefrom. The shaft 10 has mounted thereon, near its center, a pair of inwardly facing bevel pinions 13, which mesh with a central bevel pinion 14 carried by a vertical shaft 15, which carries a pulley 16, adapted to be actuated by a belt 17, connected with any suitable source of power. The shaft has, on its opposite ends, a pair of crank wheels 18, each provided with a plurality of holes 19, radially arranged, which holes permit of the adjustment of a driving arm 20 of insulating material, which arm is pivoted, at its inner end, to a collar 21, rigidly secured to the reciprocating supporting rod near the forward end thereof. Each rod is supported upon a pair of rollers 22, which are journaled within bracket plates 23 at the ends of the tank. The supporting rod has connected therewith a flexible wire connection 24, which leads to a dynamo or other source of electrical power. The supporting rod is adapted to have the work suspended therefrom by hangers or wires in the usual manner, and such rod forms a cathode, which is intended to cooperate with nickel plates 25, which comprise the anodes, and which are arranged and connected in the usual manner.

It will be understood that the manner of applying the current and arranging the work within the tank differ not at all from that ordinarily employed in the art of metal plating.

In the embodiment of the invention shown in Fig. 4, in place of the gear mechanism

heretofore described, a crank shaft 26, having at its ends a pair of end crank arms 27, and intermediate cranks 28, is employed, which has mounted thereon, at its center, a pulley 29, which carries the belt 30. The driving arms 20 are pivoted to the cranks and actuate the supporting rods in precisely the same manner as that hitherto described. It is further apparent that other mechanical means for moving the support for the work might be provided without changing the plating operation herein described in any manner.

In use, the work is suspended from the rods into a suitable solution within the tank and the electric current turned on in suitable volume, and thereafter the mechanism started, which smoothly and evenly reciprocates the supporting rods and carries the work back and forth within the solution without agitating or disturbing it to any pronounced degree. The rods are preferably reciprocated at a slow enough rate to permit the work to hang substantially vertical without being swung or violently agitated within the tank. This ease of movement is desirable, since agitation of the liquid will tend to stir up a sediment, which ordinarily falls to the bottom of the tank and which, if brought in contact with the work, would tend to impair its brightness. The current can be turned on to substantially three times or more the volume ordinarily applied, which enables the work to receive its coating of nickel or similar metal in substantially one-third of the time ordinarily employed, which of course trebles the capacity of the tank without increasing its size or otherwise altering its construction.

What I regard as new and desire to secure by Letters Patent is:

1. A plating apparatus comprising a tank, a support for the work elevated above the intended level for the solution in the tank, and means for moving the support in opposite directions, as and for the purpose set forth.

2. A plating apparatus comprising a tank, a support for the work elevated above the intended level for the solution in the tank, and means for reciprocating the support, as and for the purpose set forth.

3. In a plating apparatus, the combination of a tank, a longitudinally extending supporting rod slidably mounted with respect to the tank, and mechanism for reciprocating the rod, substantially as described.

4. In a plating apparatus, the combination of a tank, a longitudinally extending supporting rod slidably mounted with respect to the tank, a driving arm of insulating material connected with the rod, and mechanism for actuating the driving arm, substantially as described.

5. In a plating apparatus, the combination of a tank, a longitudinally extending supporting rod slidably mounted with respect to the tank, a driving arm of insulating material connected with the rod, a shaft provided with a crank member to which the driving arm is pivoted, and means for constantly revolving the shaft, substantially as described.

6. In a plating apparatus, the combination of a tank, a supporting rod slidably mounted on the tank, a shaft journaled at the end of the tank, a crank member on the shaft, a driving arm of insulating material connected with the supporting rod, a bevel pinion on the shaft, a bevel pinion meshing therewith, a power transmission shaft upon which the last named bevel pinion is mounted, and means for rotating the power transmission shaft, substantially as described.

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