

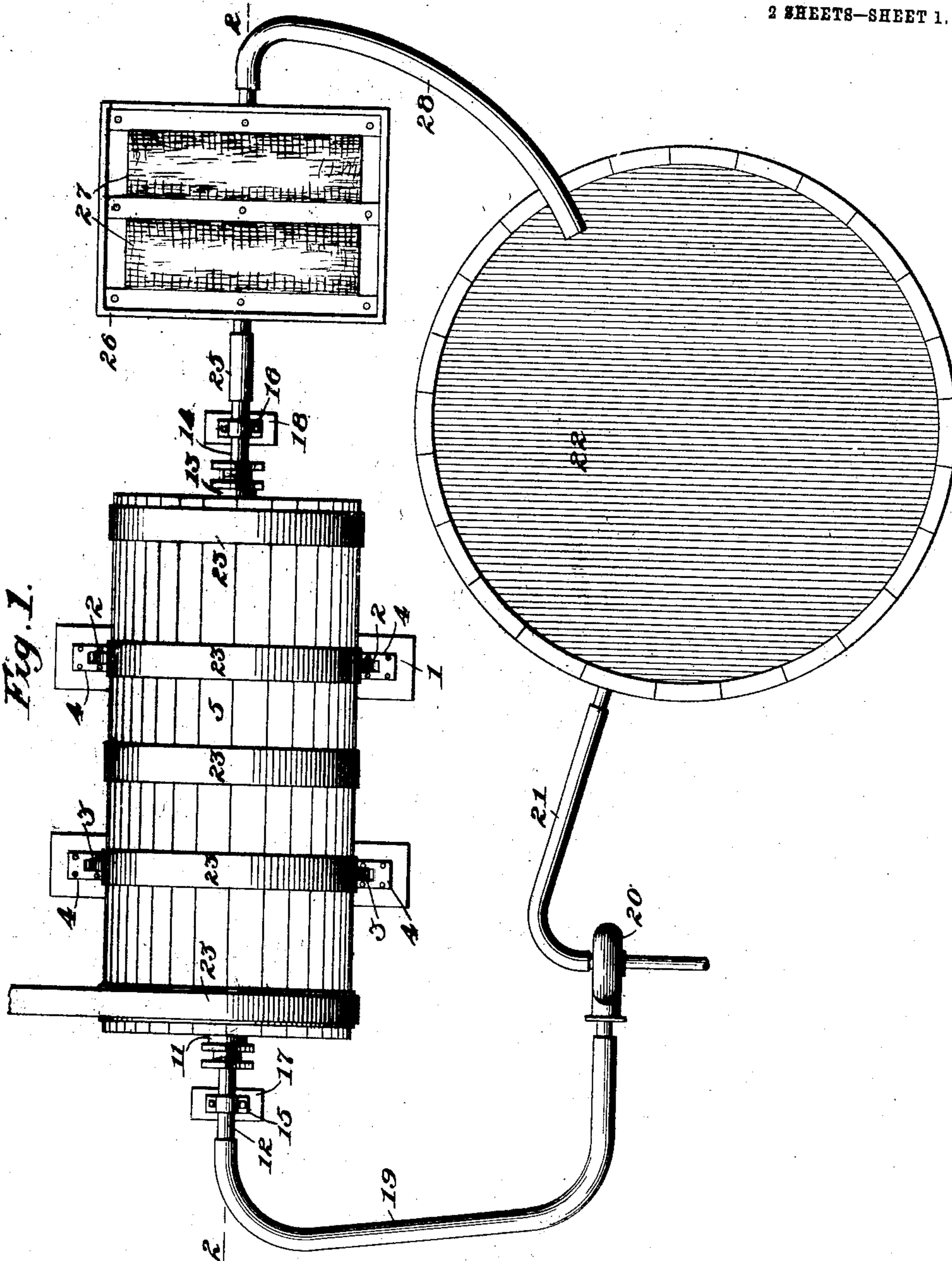
No. 837,832.

PATENTED DEC. 4, 1906.

W. A. HENDRYX.  
METAL DEPOSITING APPARATUS.

APPLICATION FILED MAY 18, 1906.

2 SHEETS—SHEET 1.



Witnesses:  
Charles Davies  
Theodore Hill

Inventor:  
Wilbur A. Hendryx  
By Leo D. Bishop  
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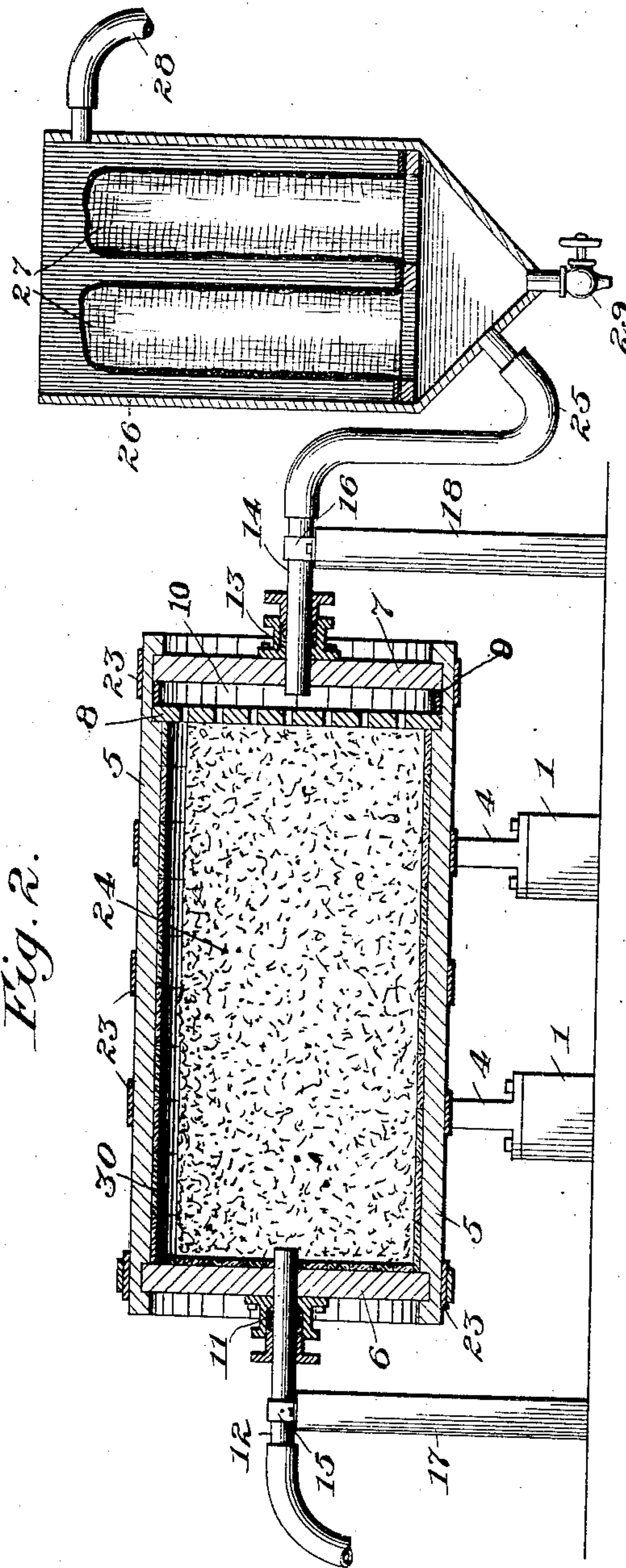


Fig. 2.

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# UNITED STATES PATENT OFFICE.

WILBUR ALSON HENDRYX, OF DENVER, COLORADO.

## METAL-DEPOSITING APPARATUS.

No. 837,832.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed May 18, 1906. Serial No. 317,600.

*To all whom it may concern:*

Be it known that I, WILBUR ALSON HENDRYX, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Metal-Depositing Apparatus, of which the following is a specification.

The object of this invention is to provide a simple and effective device for the separation and recovery of gold, silver, copper, or other metallic values from solutions containing the same.

For a full understanding of the invention reference is made to the accompanying drawings, wherein—

Figure 1 is a plan view of a preferred form of apparatus. Fig. 2 is a vertical central section of the same on line II II of Fig. 1.

Similar numerals of reference indicate similar parts throughout both views.

The numeral 1 designates supporting-timbers upon which are mounted four rollers 2 3, journaled upon supporting-castings 4 and so spaced as to rotatably support a cylindrical drum 5, which carries at its inlet end a removable head 6 and at its outlet end a removable head 7 and a removable perforated sheet or screen 8. Between the outlet-head 7 and the screen 8 is a rim 9, preferably of wood, spacing said head and screen and providing a cylindrical space 10. Centrally secured to the inlet-head 7 is a stuffing-box 11, through which passes an inlet solution-pipe 12. Similarly secured to the head 7 is a stuffing-box 13, carrying the outlet solution-pipe 14. These pipes are rigidly secured by clamps 15 16 to timbers 17 18. A pump 20 is shown connected on its discharge side with inlet-pipe 12 by means of a rubber hose 19 and on its suction side by hose 21 with a solution-supply tank 22. The tank 22 may be merely a reservoir for the metal-bearing solution, or it may be a leaching-tank of any suitable character.

The drum 5 is illustrated as constructed of wooden staves secured by hoops or bands 23. As clearly shown in Fig. 2, the heads 6 7 and the screen 8 are preferably set in grooves in the inner face of the drum in such manner as to be readily removable. The material of the screen 8 and of the pipes and other accessories should in all cases be so chosen as to resist substantial corrosion by the solutions used. For alkaline solutions the screen 8 may conveniently be of iron, while for acid

solutions a hardened alloy of lead may be used.

For cyanid or other, alkaline solutions I prefer to employ an iron or steel drum, and in this case no lining is required. For solutions having a substantial corrosive effect upon iron the drum is preferably lined, as indicated at 30, with a suitable material capable of withstanding the corrosive effect of the solutions and the mechanical abrasion due to the precipitating agent. For instance, for acid solutions, such as sulfuric or hydrochloric acids, I preferably use a lining composed of tiling set in cement.

Within the drum 5 is placed a divided or granular precipitating agent 24 in sufficient quantity so that the solution traversing the drum will be completely subjected to its action. This precipitating agent is chosen with reference to the particular metal or metals to be deposited. In depositing copper from its chlorid or sulfate I preferably use metallic iron or steel scraps or shavings or other suitable forms offering a very extended depositing-surface. For cyanid solutions of gold and silver I may use metallic zinc or an alloy or mechanical mixture containing the same in shot or pulverulent form. The precipitating agent in these and equivalent forms is hereinafter referred to as "granular."

The apertures in the plate or screen 8 should be of such size as to retain the granular depositing material 24, while permitting the free passage of the solutions carrying the precipitated metallic values in suspension. The outlet 14 is preferably connected, as by a rubber hose 25, with the lower end of a receptacle 26, containing one or more filters 27 of suitable material and shown as of the inverted-bag type, so arranged that the precipitated values are collected in the lower portion of the tank 26, to be withdrawn through outlet 29, as desired. The clear solutions overflow by pipe 28 and are preferably returned to supply-tank 22 to be again utilized. The clear solutions, however, may be otherwise disposed of as desired.

While I have shown a filter for collecting the metal values, it will be understood that these values may be permitted to settle and the clear solution decanted therefrom or that they may be otherwise recovered.

The operation of the apparatus is as follows: The solutions are conveyed either continuously or intermittently from the leaching or supply tank 22 through the precipitating-



drum 25 and filter or other separating device 26, the clear solutions being preferably returned to the tank 22, as stated. In the drum 5 the metal values are precipitated, but are not retained, the abrasion due to the agitation of the precipitating agent separating them from the surfaces upon which they are deposited and the current of solution conveying them to the collecting vessel 26.

While I have described a revoluble drum as the preferred means for maintaining such agitation of the precipitating agent as will suffice to detach the deposited values therefrom, I may substitute such other means as will accomplish this result. For instance, it is obvious that the same result may be effected by agitating the precipitating agent within a stationary vessel by any suitable means or by imparting a jiggling or reciprocatory motion to the vessel containing the same.

I claim—

1. Apparatus for depositing metals comprising a receptacle, a solution inlet and outlet therefor, a granular precipitating agent therein, means for agitating said precipitating agent, means for retaining said precipitating agent in said receptacle and a collecting device for the precipitate connected with said outlet, substantially as described.

2. Apparatus for depositing metals comprising a receptacle, a solution inlet and outlet therefor, a granular precipitating agent therein, means for agitating said precipitating agent, means for retaining said precipitating agent in said receptacle and a filter connected with said outlet, substantially as described.

3. Apparatus for depositing metals comprising a substantially closed receptacle, a solution inlet and outlet therefor, a precipitating agent in said receptacle, means for re-

taining said precipitating agent in said receptacle and means for agitating said precipitating agent, substantially as described.

4. Apparatus for depositing metals comprising a substantially closed receptacle, a solution inlet and outlet therefor, a precipitating agent in said receptacle, means for agitating said precipitating agent means for retaining said precipitating agent in said receptacle and a collecting device for the precipitate connected with said outlet, substantially as described.

5. Apparatus for depositing metals comprising a revoluble receptacle, a solution inlet and outlet therefor, a granular precipitating agent therein, means for agitating said precipitating agent, and a collecting device connected with said outlet, substantially as described.

6. Apparatus for depositing metals comprising a substantially closed revoluble receptacle, a solution inlet and outlet therefor, a precipitating agent in said receptacle, means for agitating said precipitating agent, and a collecting device for the precipitate connected with said outlet substantially as described.

7. Apparatus for depositing metals comprising a leaching-tank, a receptacle containing a precipitating agent, means for agitating said precipitating agent, a collecting device, and means for conveying the solution successively through said leaching-tank, receptacle and collecting device, substantially as described.

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

WILBUR ALSON HENDRYX.

Witnesses:

CHAS. R. DAVIES,  
THEODORA WELLS.