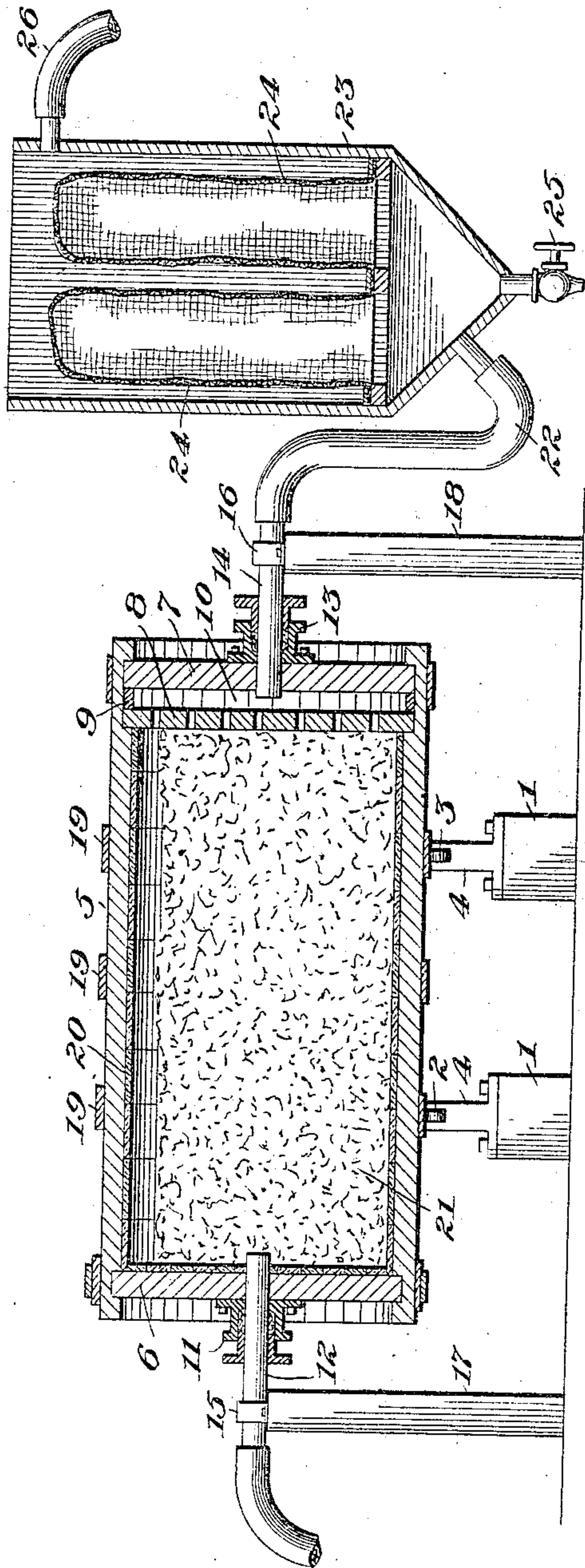


No. 860,661.

PATENTED JULY 23, 1907.

W. A. HENDRYX.  
METHOD OF DEPOSITING AND RECOVERING METALS.  
APPLICATION FILED NOV. 21, 1906.



Witnesses:

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*Leodora Wells*

Inventor:

*Wilbur Alson Hendryx*  
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*Att'y*



# UNITED STATES PATENT OFFICE.

WILBUR ALSON HENDRYX, OF DENVER, COLORADO

## METHOD OF DEPOSITING AND RECOVERING METALS.

No. 860,661.

Specification of Letters Patent.

Patented July 23, 1907.

Application filed November 21, 1906. Serial No. 344,473.

*To all whom it may concern:*

Be it known that I, WILBUR ALSON HENDRYX, a citizen of the United States, residing at Hotel Metropole, in the city of Denver, in the county of Denver and State of Colorado, have invented new and useful Improvements in Methods of Depositing and Recovering Metals, of which the following is a specification.

The object of this invention is to provide a method of depositing and recovering metals, the method being particularly applicable to the recovery of gold, silver, copper and other metallic values from solutions containing the same.

For a full understanding of the invention reference is made to the accompanying drawing, wherein the figure is a central vertical section through a preferred form of depositing and collecting means.

The numeral 1 designates supporting timbers upon which are mounted 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. A similar perforated sheet or screen may be arranged adjacent the inlet end if desired. 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. Inlet pipe 12 is connected with a source of supply of the metal-bearing solution, such source of supply being usually a leaching tank or a storage receptacle.

The drum 5 is illustrated as constructed of wooden staves secured by hoops or bands 19. As clearly shown in the figure 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, and of the pipes and their 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 hard 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 20 with a suitable material capable of withstanding the corrosive effect of the solutions and the 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 granular pre-

cipitating agent 21 in sufficient quantity so that the solution traversing the drum will be completely subjected to its action; the drum should not however be completely filled, in order that the surfaces of the precipitating agent may be effectively abraded as hereinafter described. 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 precipitating agent 21 while permitting the free passage of the solution carrying the precipitated metallic values in suspension. The outlet 14 is preferably connected, as by a rubber hose 22, with the lower end of a receptacle 23 containing one or more filters 24 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 23 to be withdrawn through outlet 25 as desired. The clear solution overflows by pipe 26 and is usually again utilized for extracting metals.

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.

In carrying my method into effect I proceed as follows: The solutions are conveyed either continuously or intermittently from the leaching or supply tank through the precipitating drum 5 and the filter or other separating device 24. 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 for the greater part from the surfaces upon which they have been deposited, and the current of solution conveying them to the collecting vessel 23.

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. The method of depositing and recovering metals, which consists in passing a stream of metal-bearing solu-

tion through a granular precipitating agent, agitating said precipitating agent and thereby separating the metallic deposit and providing clean surfaces for further deposition, transporting the separated deposit by said stream, and collecting the deposit.

5 2. The method of depositing and recovering metals, which consists in passing a stream of metal-bearing solution through a granular precipitating agent, agitating said precipitating agent by a movement of rotation and thereby

separating the metallic deposit and providing clean sur- 10  
faces for further deposition, transporting the separated deposit by said stream, and collecting the deposit.

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

WILBUR ALSON HENDRYX.

Witnesses:

THEODORA WELLS,  
CHAS. R. DAVIES.