

V. A. BREWER.
 APPARATUS FOR EXTRACTING COPPER.
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994,301.

Patented June 6, 1911.

Fig. 1.

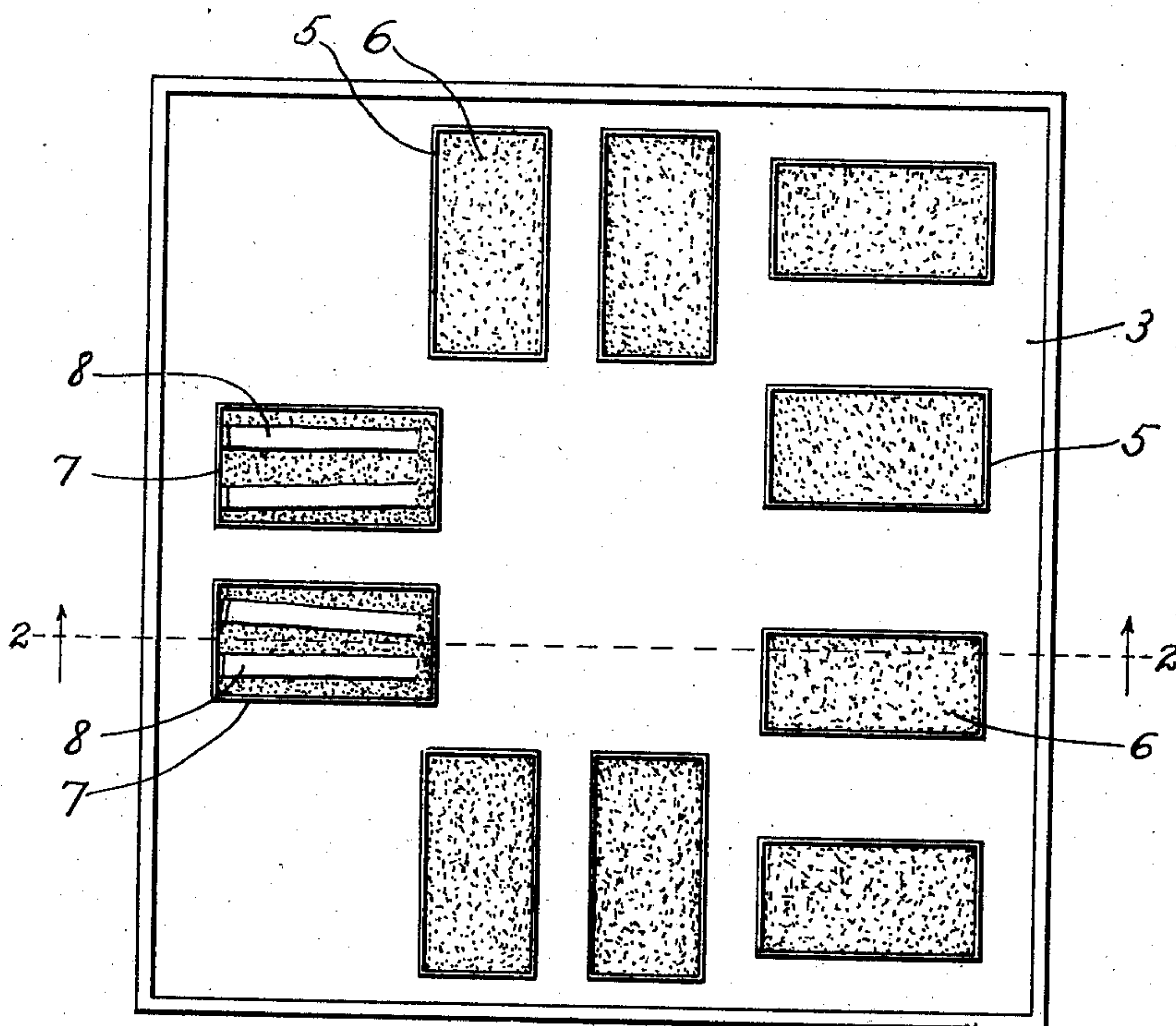
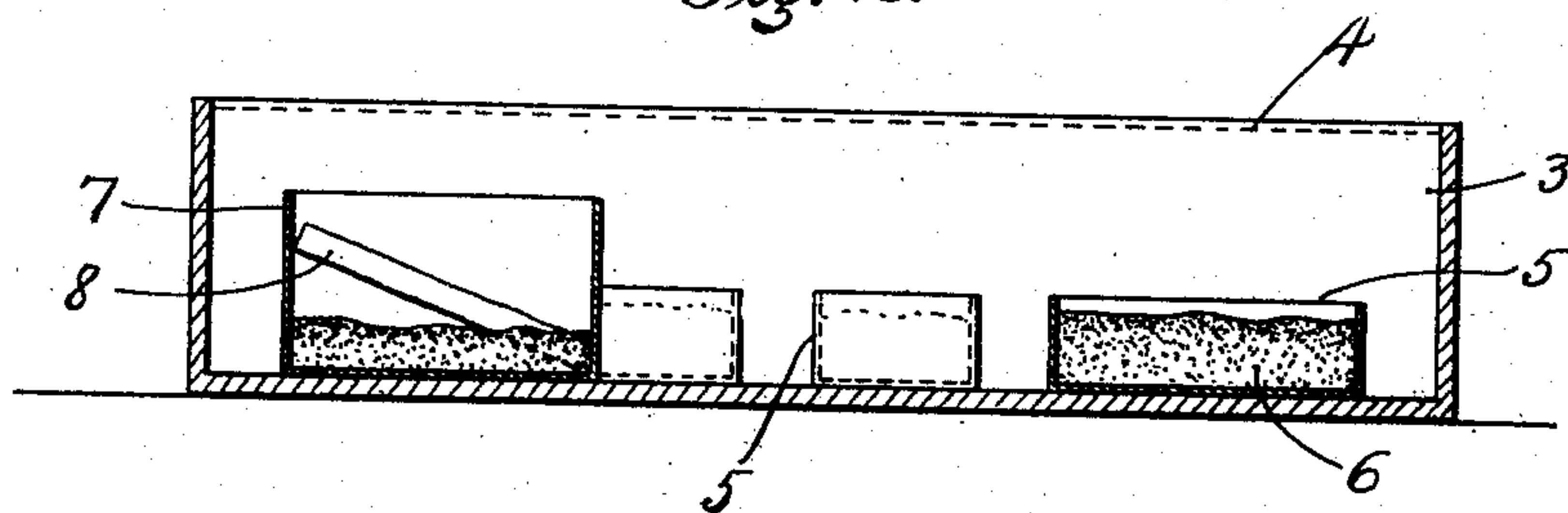


Fig. 2.



Witnesses.

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APPARATUS FOR EXTRACTING COPPER.

994,301.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, VERA AMY BREWER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Apparatus for Extracting Copper, of which the following is a specification.

This invention relates to the extraction of copper from its ores, and especially to such processes which employ a solvent for the copper whereby a solution of copper is provided from which the copper is then obtained.

More particularly the invention concerns itself with a process of this kind in which the copper is removed from the solution by the medium of iron bars upon which the metallic copper precipitates.

The object of this invention is to provide a process and apparatus by means of which the process may be carried on continuously and without the loss of any part of the solution containing copper.

The invention consists in the process and apparatus to be more fully described hereinafter and particularly set forth in the claim.

In the annexed drawing which fully illustrates my invention Figure 1 is a plan of my apparatus by means of which I carry out my process. Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Referring more particularly to the parts, the apparatus comprises a large tank or vat 3 in which I place a liquid solvent, the level of which may be located at about the line 4, as indicated in Fig. 2. This solvent is made as follows: two parts of hydrochloric acid HCL; two parts of sulfuric acid H_2SO_4 ; 1/16 part of any salt, such as common table salt. These substances having been mixed together form a concentrate, and this concentrate should be diluted in the proportion of one gallon to three hundred gallons of water. This produces a bath for the tank or vat 3, which will give good results. In order to protect this tank from the action of the acid I employ a tank of steel which is thoroughly coated on the interior with cyanid paint which is burned in.

Within the vat 3 and immersed in the bath I provide a plurality of ore holders 5, which

are in the form of shallow boxes of steel painted inside and out with cyanid paint. These boxes are removable and simply lie in the vat, as will be readily understood. In each ore holder I provide a quantity of crushed copper ore 6, and I prefer to crush this ore so that it will pass through a screen of one-eighth inch mesh. The acid bath attacks the copper and the copper goes into solution in the bath. I provide two precipitating tanks 7 which also simply lie in the vat, being immersed in the fluid, and in these precipitating tanks I place iron bars 8 which are disposed in an inclined position, as shown in Fig. 2. The copper which is in solution in the acid bath deposits in a finely divided metallic form as "cement copper" on the iron bars, and accumulates within the precipitating tanks. In other words, the presence of the iron precipitates the copper which clings to the iron. On account of the inclination of the bars, the copper will gravitate and fall from the bars so as to accumulate in beds in the bottoms of the precipitating tanks. In this way the precipitation may be carried on continuously until the iron bars are substantially covered by the bed of "cement copper" in the precipitating tanks. I find that better results are obtained by having the ore holders 5 of small height, for instance, if the depth of the solution is about three feet, the height of the tanks 5 may be about two feet and the precipitating tanks 7 are approximately the same height, and I find that the operation is very efficient if the upper edge of the precipitating tank is a foot below the level of the liquid. The precipitating tanks 7 should be coated inside and out with the cyanid paint in the same manner as the copper holders. By crushing the ore to about the grade of one-eighth inch mesh no agitation is necessary in carrying out the process. When the copper in the ore of any one of the ore holders 5 has substantially all passed into solution the ore holder may be removed and the liquid permitted to drain back into the vat and the gangue or dross may be thrown out. The tank may then be refilled with fresh ore and returned to the vat. In this way the process may be carried on continuously and the liquid within the

vat can be kept charged with copper which is constantly precipitating on the bars 8.

What I claim is:—

In apparatus of the class described, a tank having a plurality of removable ore holders disposed therein and adapted to be immersed in the bath contained by said tank and a removable precipitating tank adapted also to be immersed in the bath held within

said first tank and in which the metallic 10 copper may precipitate.

In witness that I claim the foregoing I have hereunto subscribed my name this 12th day of July, 1910.

V. A. BREWER.

Witnesses:

F. D. AMMEN,
EDMUND A. STRAUSE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
