UNITED STATES PATENT OFFICE.

FRANK GRUESSNER, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-FOURTH TO FRANCIS B. BADT, OF SAME PLACE.

PROCESS OF REGENERATING SOLUTIONS.

SPECIFICATION forming part of Letters Patent No. 489,632, dated January 10, 1893.

Application filed August 15, 1892. Serial No. 443,166. (No specimens.)

To all whom it may concern:

Be it known that I, FRANK GRUESSNER, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented a new and useful Improvement in Processes of Regenerating Solutions, of which the following is a specification.

My invention relates to a process of regenerating or restoring or cleaning electrolytic solutions, particularly such as are employed in connection with refining processes. I will describe its use and operation by reference to the process of refining copper, especially where such refining takes place for the purpose of recovering the precious metals. In such cases the impure copper in any suitable condition is immersed in an electrolytic solution as for example, one containing sulphate of copper and free sulphuric acid and serves as the anode of the battery. A proper cathode is provided, as for example, a suitable plate of pure copper, and the current is applied. The process of decomposition then begins, the impure copper of the anode being dissolved. The pure copper particles are carried over and deposited on the cathode, where they build up a plate or mass of pure copper. The precious metals, like silver and gold, are precipitated to the bottom. Arsenic, antimony, bismuth and the like are dissolved and incorporated in the solution. This process continues satisfactorily, the pure copper being gathered in a pure mass at the cathode, while the precious metals are precipitated until the solution becomes charged with impure matter, such as arsenic antimony, bismuth, and the like, to such a degree that the deposit of pure copper is prevented and a certain amount of such foreign substances is incorporated with the copper as it is deposited at the cathode. It is desirable now to revive, restore, or regenerate, the electrolyte; or, in other words, to remove the impure substances from it, and particularly arsenic. This is accomplished in various ways at the present time, but most of these methods embrace and require tedious, expensive and difficult processes. I have discovered that suitable quantities of metastannic acid, if boiled with the impure electrolyte, will combine with arsenic to form a salt, which being insoluble in the solution, is precipitated, freeing the solution from the arsenic and perhaps from some of the other foreign substances. This action will continue under varying conditions as to time and degree of heat and quantity of acid until the desired result is obtained.

I claim:

1. The method of regenerating or cleaning electrolytic solutions which consists in mixing with them suitable quantities of metastannic acid and applying heat to the mixture.

2. The method of regenerating electrolytes containing arsenic used for refining purposes, which consists in extracting the arsenic, and the like, therefrom, by mixing suitable quantities of metastannic acid with such electrolyte and then applying heat until a salt is formed by the combination of the metastannic acid with arsenic, and the like and precipitated.

FRANK GRUESSNER.

Witnesses:
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