

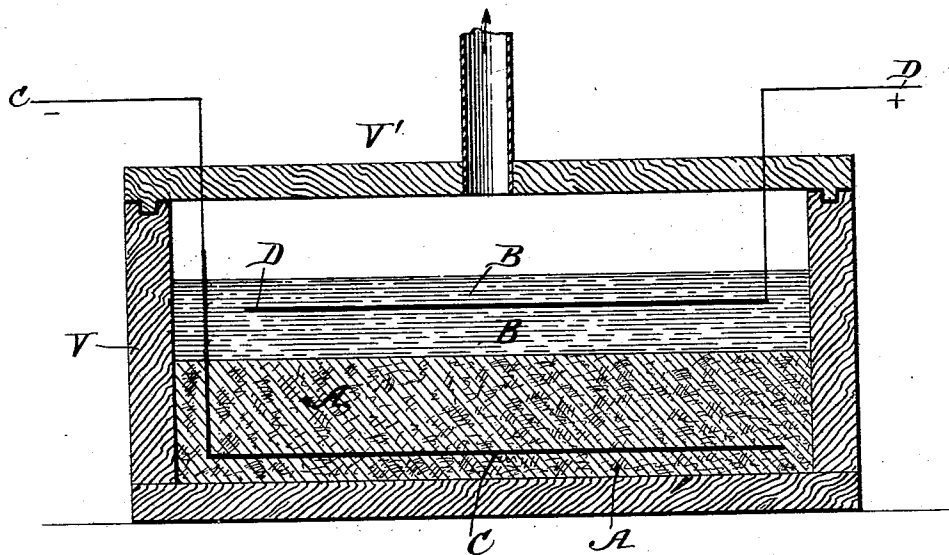
(No Model.)

J. DOUGLAS.

PROCESS OF EXTRACTING COPPER FROM ORES.

No. 563,144.

Patented June 30, 1896.



WITNESSES:

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JAMES DOUGLAS, OF NEW YORK, N. Y.

PROCESS OF EXTRACTING COPPER FROM ORES.

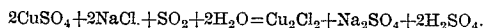
SPECIFICATION forming part of Letters Patent No. 563,144, dated June 30, 1896.

Application filed January 8, 1896. Serial No. 574,716. (No specimens.)

To all whom it may concern:

Be it known that I, JAMES DOUGLAS, of New York, in the county of New York and State of New York, have invented a new and useful Process of Extracting Copper from Ores, of which the following is a specification.

This invention relates generally to the extraction of copper, and particularly to the extraction of copper from the solid cuprous chlorid by means of electrolysis; and this invention relates also in particular to the process described and claimed in my application, Serial No. 545,389, filed April 11, 1895, the copper being reduced to the cuprous chlorid from the sulfate by means of a chlorin salt and sulfurous-acid gas, the reaction being as follows:



In the application above referred to I obtain copper by inserting both the cathode and anode into a solid cuprous chlorid slightly moistened, but I have also found that copper can be extracted equally as well by burying the cathode in the solid cuprous chlorid, and introducing the anode into an electrolyte in which the solid cuprous chlorid is suspended, and this constitutes the essential feature of my present invention.

The process also includes certain steps hereinafter fully described, and pointed out in the claims.

In the drawing hereto annexed, and forming a part of this specification, I have diagrammatically illustrated my process.

The cuprous chlorid is preferably obtained in the same manner as in my former application, although other processes could be employed to produce the solid cuprous chlorid, inasmuch as this is not the essential feature of my invention.

In order to extract the copper from the solid cuprous chlorid, I preferably suspend the solid cuprous chlorid A in water B, preferably slightly acidulated, for the purpose of increasing the conductivity of the electrolyte, said cuprous chlorid and electrolyte being contained in a vessel V, having a cover V'. A cathode C is inserted into the solid cuprous chlorid A, and the insoluble anode B, preferably of platinum or some cheaper metal plated

with platinum, is immersed in the electrolyte B, but does not touch the solid cuprous chlorid A. The anode D is preferably constructed of platinum or platinum-plated material, inasmuch as the chlorin and its compounds which are generated attack ordinary carbon and most metals which have commonly been used as anodes in electrolysis. When the electric current is sent through the cathode and anode, the copper is deposited on said cathode and more or less through the whole mass of the cuprous chlorid. As the deposition proceeds chlorin and chlorid compounds are evolved. If a weak current is used, a reguline deposit adheres to the cathode. If, on the other hand, a strong current is used, the cuprous chlorid is converted into a crystalline spongy mass of metallic copper. Part of the chlorin evolved remains in the electrolyte apparently as hydrochloric acid, rendering it very acid. Part, however, of the chlorin passes off as such, and probably hypochlorous acid. If desired, the chlorin and its compounds can be collected and used for subsequent operations.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The process herein described of extracting copper from the solid cuprous chlorid of copper, which consists in suspending said solid cuprous chlorid in an electrolyte, inserting the cathode into the said solid cuprous chlorid, and the anode into the electrolyte, and passing a current therethrough, substantially as shown and described.

2. The process herein described of extracting copper from the solid cuprous chlorid, which consists in suspending the said solid cuprous chlorid in an acidulated electrolyte, inserting the cathode of an electric circuit into the solid cuprous chlorid, and the anode into the electrolyte, and passing an electric current therethrough, substantially as shown and described.

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

JAMES DOUGLAS.

Witnesses:

GEORGE NOTMAN,
CHAS. A. AUSTIN.