

UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF PHILADELPHIA, PENNSYLVANIA.

PROCESS OF EXTRACTING PRECIOUS METALS FROM ORES.

936,545.

Specification of Letters Patent.

Patented Oct. 12, 1909.

No Drawing.

Application filed January 29, 1909. Serial No. 475,065.

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Processes of Extracting Precious Metals from Ores, of which the following is a specification.

My invention relates to an improvement in the process of extracting precious metals from ores.

I have discovered that if the concentrate of an ore carrying precious metal, even if such metal is combined with, what is technically called, a "sulfid", the precious metal can be dissolved in a solution carrying free chlorine and a solution carrying an oxid of nitrogen. I have found that the solution carrying free chlorine is advantageously made by electrolyzing a chlorid compound, such for instance as a chlorid of sodium, in an electrolytic apparatus with two compartments. The chlorine is evolved in the positive compartment and the anolyte of this apparatus may then be used for the purpose aforesaid. As to the oxid of nitrogen, I have found that instead of using the anolyte of an electrolytic apparatus, the product of the electric arc—with the aid of which the nitrogen of the air is oxidized—can be substituted in such cases where large currents are attainable.

In the course of my experiments, I have found that the oxid of nitrogen, produced with the aid of the electric arc, is very unstable, and in analyzing the product, it was found that the resultant gas contains a rather appreciable amount of active oxygen or ozone, and when this gas was carried into a liquid containing the concentrate of an ore carrying precious or other metals, the concentrate is more rapidly attacked than if nitric acid *per se* would be substituted. The gas is so rapidly absorbed by the liquid that the same is heated to a large degree. This again accelerates the dissolving action.

In using this improved process, I found

that it is best to first place the concentrate in contact with the chlorinated water, that is, the anolyte of the apparatus in which a chlorid compound was electrolyzed, and then carrying the gas as it comes from the arc and before it has time to decompose and also before it has undergone the refrigerating process to make it stable, in contact with the chlorinated water, which greedily absorbs it. I also found that it is best to agitate the concentrate. After a lapse of a few hours—depending on the strength of the solution and nature of the ore—the liquid is drawn off and it will be found that the precious metal, formerly contained in the concentrate, is now dissolved in the liquid.

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

1. The process of extracting metal from its ore, which consists in first subjecting the concentrate of said metal to a solution containing free chlorine and then subjecting the solution to the nitrous product of the electric arc.

2. The process of extracting metal from its ore, consisting in subjecting the ore to the dissolving action of a chlorinated water and a gaseous product of the electric arc.

3. The process of extracting precious metal from its ore, consisting in subjecting said ore to the dissolving action of the anolytic product of a chlorid compound and a gaseous compound of nitrogen produced with the aid of the electric arc.

4. In the process of extracting precious metals from their ores, the improvement, which consists in surcharging the solution adapted to dissolve said metal with the gaseous product of an electric arc, said product containing an oxid of nitrogen in unstable condition.

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

ISIDOR KITSEE.

Witnesses:

EDW. R. STILLEY,
MARY C. SMITH.