UNITED STATES PATENT OFFICE.

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TREATMENT OF ORES BEARING PRECIOUS METALS.

955,319. Specification of Letters Patent. Patented Apr. 19, 1910.

No Drawing. Application filed February 2, 1909. Serial No. 475,663.

To all whom it may concern:

Be it known that I, JOHN COLLINS CLANCY, a subject of the King of Great Britain, having declared my intention of becoming a citizen of the United States, at present residing at New York city, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in the Treatment of Ores Bearing Precious Metals, of which the following is a specification.

My invention relates to a novel method of treating ores bearing the precious metals, which method is particularly described and pointed out in the following specification and claims.

I have discovered that the precious metals may be advantageously recovered from ores containing them, whether such ores be rebellious or non-rebellious, by the use of a cyanid solution containing a soluble iodid and a soluble persulfate. In the case of rebellious ores—those containing, for example, reducing agents, or tellurium, or both—no preliminary treatment, such as roasting, is required.

In carrying my invention into practice, whether reducing agents and tellurium be or be not present, I treat the pulverized ores simultaneously with a cyanid solution—such, for example, as potassium cyanid—a soluble persulfate—such, for example, as the sodium or ammonium persulfate—and iodin or a soluble iodid—such, for example, as potassium iodid. The desired result is prevented if the solution be substantially acid, although it will take place if the solution be neutral or alkaline or only slightly acid. Such a solution I call a substantially non-acid solution. The strength of the solution is, to some extent, dependent upon the character of the ore to be treated, and it must, therefore, be ascertained by preliminary tests; but in practice with certain ores such as I have treated, I have found the following proportions to answer well the purposes of the process: a solution containing one pound potassium cyanid, one-half pound potassium iodid, three pounds sodium persulfate and one-half pound of lime or soda dissolved in two thousand pounds of water in the proportion of two parts of the above named solution to one part of ore. The same solution can be used again and again by keeping up the requisite strength in cyanid and sodium persulfate, but no further addition of potassium iodid is necessary, except to compensate for mechanical losses, as the persulfate regenerates the iodin to begin its work over again. Between each operation it is desirable to pass the liquor through zinc shavings in the ordinary way to extract the values which it contains.

As I have said, it is not necessary in practicing the above process with rebellious ores—those containing, for example, reducing agents (sulfids of iron, etc.), or tellurium, or both—to roast the ore, since the sulfids do not act on the solution to decompose it, and the tellurium is dissolved simultaneously with the precious metal.

Instead of applying the soluble persulfate to the solution in the presence of the ore being treated, it might be, although less advantageously, applied to the solution after it has been separated from the ore, or between successive treatments of ore since it acts to regenerate the iodin and this function might be performed after one batch of ore has been treated and before the next batch of ore is subjected to treatment by the solution.

The cost of iodin in a commercial process would be prohibitive were it not for the fact that in the processes above described the iodin is repeatedly regenerated and does the same work over and over again. Its action may be likened to that of a vehicle or carrier and hence it is not substantially consumed.

It will be understood that various modifications and changes in the described process may be made without departing from the spirit of my invention and without exceeding the scope of my claim.

In a pending application Serial No. 475,662 I have described the above process as an example, among others, of a generic invention, but I have not claimed it therein specifically. I do not claim in this patent the said generic invention, but

What I claim specifically herein is:—

1. The process of treating pulverized ore containing precious metals which consists in subjecting the ore to the action of a cyanid solution, a soluble iodid and a soluble persulfate.

2. The process of treating pulverized ore containing precious metals which consists in subjecting the ore to the action of a cyanid

solution a soluble iodid, and persulfate of sodium.

3. The method of treating ores containing tellurides of gold, which consists in applying thereto a cyanid solution, a soluble iodid and a soluble persulfate.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN COLLINS CLANCY.

Witnesses:
WM. GOLDBURG,
WM. H. HARDING, Jr.