

UNITED STATES PATENT OFFICE.

HENRY RENNER CASSEL, OF NEW YORK, N. Y.

PROCESS OF CHLORIDIZING ORES BY ELECTROLYSIS.

SPECIFICATION forming part of Letters Patent No. 300,951, dated June 24, 1884.

Application filed January 2, 1884. (No specimens.) Patented in England October 13, 1883, No. 4,879.

To all whom it may concern:

Be it known that I, HENRY RENNER CASSEL, a citizen of the United States, a resident of New York, in the county and State of New York, temporarily residing in the city of London, in the United Kingdom of Great Britain, have invented a Process for Chloridizing Ores and other Substances by Electrolysis, (for which I have applied for Letters Patent in England, No. 4,879, dated October 13, 1883;) and I do hereby declare the following to be a full, clear, and exact description of the same.

When treating free-gold ores by electrolysis in a solution of chloride of sodium, the solution is decomposed and the nascent chlorine thus generated rapidly combines with the gold, forming chloride of gold. When, however, rebellious or refractory gold ores and concentrates—such as pyrites, for instance—are treated, a secondary action takes place, and prevents the extraction of gold contained in the ore. Hydrochloric and hypochlorous acids are formed, which attack any compound of iron in the ore and change it into a protosalt, and this protosalt immediately precipitates the chloride of gold as fast as it is formed. The presence of free acids is further objectionable, as they also attack any antimony, arsenic, or other rebellious elements that may be contained in the ore. The object of my invention is to prevent this, and for this purpose I add to the ore or to the solution a substance—such as lime, for instance—which neutralizes the hydrochloric acid as soon as it is formed, and which does not precipitate the gold. Since no free acid can exist in presence of sufficient lime to neutralize it, the compounds of iron will not be attacked, and the protosalt cannot therefore be formed. Consequently the gold in solution will not be precipitated, and can easily be separated from the ores. Further,

the other refractory elements in the ore will also remain unaffected, so that it will be unnecessary to first furnace or roast the ore for the purpose of eliminating the rebellious or refractory elements.

Instead of lime, any suitable alkaline earth may be employed, or any other chemical compound or element for which the acids have a stronger affinity than for the compounds of iron in the ore; or a solution may be employed which will itself, by electrolytical decomposition, yield a base capable, when free, of neutralizing the acids.

The apparatus employed for carrying out my improved process may be of any suitable construction.

I am aware that it is old to mix ore and lime in water, and subject them to the action of chlorine gas under pressure; and that it is old to subject silver ores containing lime to a boiling bath containing salt and hydrochloric acid; but in neither of these cases is there any electrolytic action. In my invention the use of lime in the electrolytic process obviates certain defects of said process, as hereinbefore explained.

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

In the process of extracting gold from rebellious or refractory gold ores, the steps which consist in subjecting the ore to the action of a solution yielding nascent chlorine under electrolytic decomposition, and adding lime or its equivalent, whereby acids formed by secondary action during said decomposition are neutralized, substantially as and for the purpose set forth.

HENRY RENNER CASSEL.

Witnesses:

CHARLES ARTHUR ALLISON,
HARRY ARCHIBALD McLELLAN.