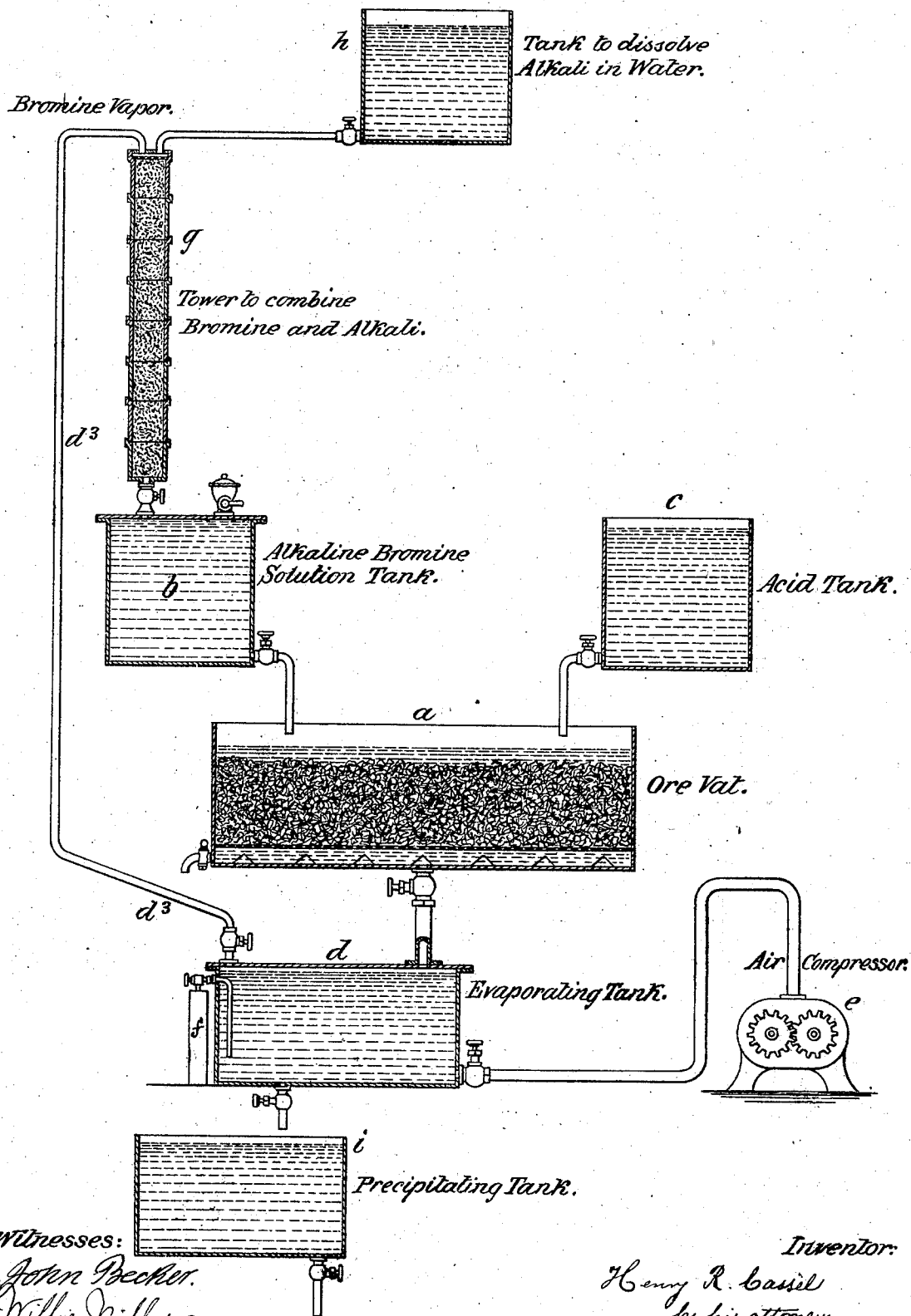


(No Model.)

H. R. CASSEL.
PROCESS OF EXTRACTING GOLD FROM ORES.

No. 578,721.

Patented Mar. 16, 1897.



Witnesses:

John Becker.
Willie Miller.

Inventor:

Henry R. Cassel
by his attorneys
Boeder & Bismund

UNITED STATES PATENT OFFICE.

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

PROCESS OF EXTRACTING GOLD FROM ORES.

SPECIFICATION forming part of Letters Patent No. 578,721, dated March 16, 1897.

Original application filed September 10, 1896, Serial No. 605,345. Divided and this application filed November 24, 1896. Serial No. 613,340. (No specimens.)

To all whom it may concern:

Be it known that I, HENRY R. CASSEL, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Processes of Extracting Gold from Ores; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to a division of application filed by me September 10, 1896, under Serial No. 605,345. In that application I describe a process of subjecting acidified auriferous ore to the action of a solution of a bromin compound of an alkaline base, so as to produce active bromin in intimate contact with the ore, which will rapidly dissolve the gold.

The present invention relates to a reversal of the said steps in the above process.

Instead of treating the acidified ore by a solution of a bromin compound of an alkaline base I first impregnate the ore with such bromin solution and then add the acid to liberate the bromin.

The accompanying drawing represents a sectional elevation of one form of an apparatus for carrying my invention into effect.

The apparatus is fully described in the application above referred to, to which reference is hereby made.

Briefly stated, *a* is the open ore-vat; *b*, the tank containing the bromin solution; *c*, the acid-tank; *d*, the evaporating-tank; *e*, the air-compressor; *f*, the chlorin-cylinder; *g*, the tower; *h*, the tank for the alkaline solution, and *i* the precipitating-tank.

The vat *a* is charged with pulverized ore, which is before or after introduction impregnated with a solution of a bromin compound of an alkaline base admitted from tank *b*. This bromin solution is made as follows: I mix a solution of an alkali, such as sodium or potassium hydroxid or its equivalent, with

bromin. If caustic soda is used, I take about one pound of this hydroxid dissolved in water for two pounds of bromin; but the strength of the solution may of course be regulated.

After thoroughly impregnating the ore with the above solution and while the ore is in a quiescent state I admit gradually from tank *c* diluted acid of sufficient strength to combine with the alkali and set free the bromin in the nascent or active state or in the form of oxyacids. This bromin being in intimate contact with the ore exerts a powerful dissolving action upon the gold.

To prevent the escape of bromin fumes from the ore, sufficient acid solution should be added to keep the ore submerged.

From tank *a* the gold and bromin solution is run into tank *d*, where the bromids formed during the operation are set free by chlorin from cylinder *f* or by other suitable reagent. The bromin being now free is vaporized by air-compressor *e* or in similar manner and driven through pipe *d'* into the tower *g*, containing plates, pebbles, or other obstructive bodies.

Within the tower *g* the subdivided bromin combines with an alkaline solution admitted from tank *h* to form a fresh bromin solution of an alkaline base, which flows into tank *b* for continuous use upon a fresh body of ore.

The gold solution is drawn from tank *d* into the precipitating-tank *i*, where the gold is precipitated by hydrogen sulfid or in any other manner.

What I claim is—

The method of extracting gold from ores which consists in gradually percolating an acid solution through a body of ore impregnated with a solution of a bromin compound of an alkaline base, the ore being maintained in a quiescent state during percolation, substantially as specified.

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

HENRY R. CASSEL.

Witnesses:

F. V. BRIESEN,
WILLIAM SCHULZ.