

UNITED STATES PATENT OFFICE.

WILHELM MAJERT, OF FALKENBERG, GERMANY.

PROCESS OF EXTRACTING GOLD FROM GOLD ORES.

SPECIFICATION forming part of Letters Patent No. 587,079, dated July 27, 1897.

Application filed September 30, 1895. Serial No. 564,209. (No specimens.)

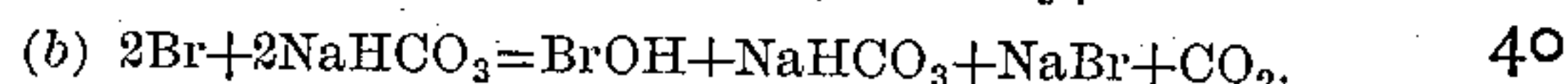
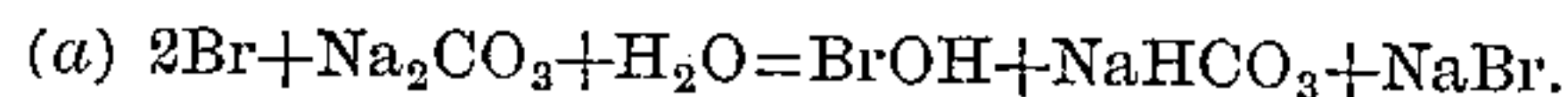
To all whom it may concern:

Be it known that I, WILHELM MAJERT, a subject of the Emperor of Germany, residing at Falkenberg, near Grunau, Prussia, German Empire, have invented certain new and useful Improvements in the Extraction of Gold from its Ores; and I do hereby 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.

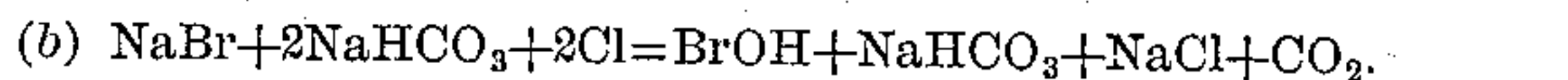
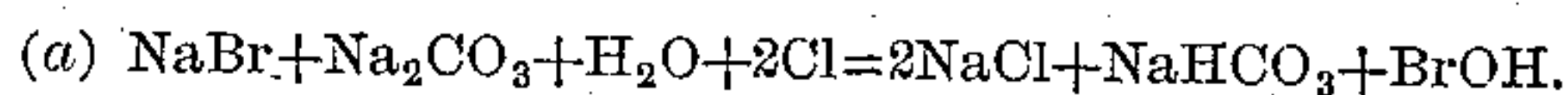
It has been heretofore proposed to extract gold from gold-containing ores by treating the finely-ground ore with an alkaline solution of a hypobromite of an alkali metal. This solution, however, does not dissolve gold at all readily. I have found that much better results are obtained by employing an aqueous solution of free hypobromous acid and at least as much carbonate, bicarbonate, borate, or baborate of an alkali metal as is equivalent to the hypobromous acid. In other words, I employ such a proportion of the alkaline salt as contains just a sufficient quantity of alkali metal to combine with all the free acid present. This produces a solution of the gold which is more perfect than that obtained even by a solution of cyanid of potassium and has the additional advantages

of being cheaper and of being readily and completely regenerated. This solution may be obtained in several ways, of which the following are examples:

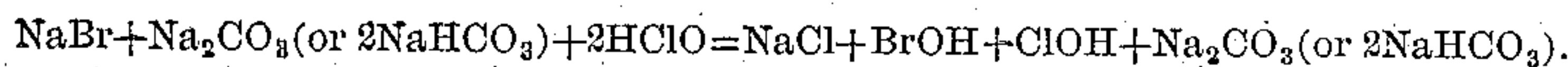
First. Dissolve one hundred and sixty parts of bromin in an aqueous solution of at least one hundred and six parts of carbonate of sodium, (or at least one hundred and sixty-six parts of bicarbonate of sodium.)



Second. Introduce seventy parts of chlorin into an aqueous solution of one hundred and three parts of bromid of sodium and at least one hundred and six parts of carbonate of sodium, (or if bicarbonate of sodium is used at least one hundred and sixty-six parts.)

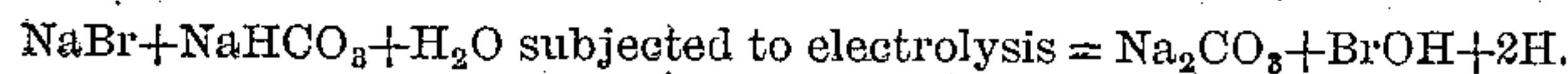


Third. Prepare an aqueous solution of one hundred and three parts of bromid of sodium and at least one hundred and six parts of carbonate of sodium, (or at least one hundred and sixty-six parts of bicarbonate of sodium) mixed with an aqueous solution of hypochlorous acid which contains seventy parts of active chlorin.

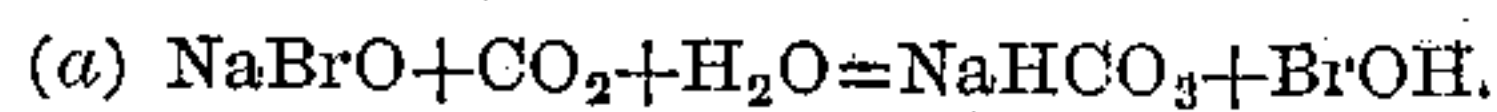


Fourth. Subject an aqueous solution of one hundred and three parts of bromid of sodium and at least one hundred and sixty-six parts of bicarbonate of sodium (which may yet contain more or less chlorid of sodium in so-

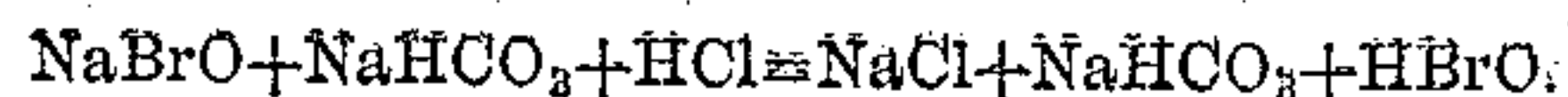
lution) to the process of electrolysis until the bromid of sodium under the evaporation of carbonic-acid gas is changed entirely or partially into free hypobromous acid and carbonate of sodium.



Fifth. By setting free the hypobromous acid in a solution of hypobromite of sodium by the introduction of carbonic-acid gas or by the addition of bicarbonate of soda.



Sixth. By setting free the hypobromous acid in a solution of hypobromite and carbonate of sodium by the addition of so much of some mineral acid that the amount of alkaline salt used shall contain just sufficient alkaline metal to combine with all the free acid present.



In all cases the sodium may be substituted

by potassium and the carbonic acid by boric acid.

In the same manner a larger proportion of chlorid of alkali metals is by no means harmful, and the quantitative proportions of the several component parts may vary to a great extent. It is only essential that free hypobromous acid shall be present along with such an amount of carbonate, bicarbonate, borate, or baborate of an alkali as will contain sufficient alkaline metal to combine with all of the free acid present.

The finely-ground or pulverized ore is covered with the extracting fluid and left in contact for a time longer or shorter, according

as the gold is in coarse or finely-divided condition. The solution is drawn off after the gold is dissolved and the gold is precipitated by iron. The fluid is then filtered to remove
5 the precipitated gold and ferric oxid, and the filtrate is regenerated by treating it with a quantity of chlorin or hypochlorous acid proportionate to the amount of bromid of sodium contained therein or by subjecting the filtrate
10 to electrolysis.

In all cases care must be taken that a quantity of a carbonate, a bicarbonate, a borate, or a biborate of an alkali metal proportionate to the free hypobromous acid be present, since
15 in the absence of one of these salts the oxids of other metals besides gold will be dissolved.

What I claim, and desire to secure by Letters Patent, is—

1. The process of extracting gold from its
20 ores which consists in treating the ore in a finely-divided condition with a solution con-

taining free hypobromous acid, in the presence of such a quantity of an alkaline salt of an alkali metal as contains a sufficient amount of alkaline metal to combine with all of the
25 free acid present, and precipitating the gold from the solution, substantially as described.

2. The process of extracting gold from its ores which consists in treating the ore in a
30 finely-divided condition, with a solution containing free hypobromous acid, in the presence of a carbonate of an alkali metal precipitating the gold from the solution and regenerating the filtrate by adding chlorin,
35 substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WILHELM MAJERT.

Witnesses:

MAX SCHÜTZE,

WILHELM SCHWIETHAL.