

# UNITED STATES PATENT OFFICE.

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## IMPROVED PROCESS FOR DISSOLVING GOLD.

Specification forming part of Letters Patent No. 8,729, dated February 10, 1852; antedated August 10, 1851.

*To all whom it may concern:*

Be it known that I, CHARLES F. SPIEKER, of the city and State of New York, have invented a new and improved method of extracting gold from the ore and sand in which it is found; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists in subjecting the fine particles of native gold which are contained in the ore or sand to the action of chlorine gas, when this is absorbed by water or by an alkali in the fluid state, or by another chlorine metal—for instance, chloride of iron—and thus form a solution of the chloride of gold, either for itself alone or in combination with a chloride of an alkaline nature, (or electro-positive nature,) and by this way separate the gold from the sand or mixture in which it was contained.

To enable others skilled in the arts and sciences to make use of my invention, I will proceed to describe its operations and execution.

I take any vessel of convenient size—say, barrels of forty or sixty gallons, which can be so well closed as to prevent the escape of the chlorine gas—to which I put such a mechanical fixture that its contents can be violently shaken or moved. Having such barrels in slings from a horizontal beam will be found to answer perfectly well. To these barrels I attach a flexible tube, made of india-rubber or gutta-percha, through which the chlorine gas from the apparatus where it is being manufactured is conducted into the barrels, while those are kept at the same time in a state of constant motion. In those barrels had previously a quantity of sand or ore containing gold been put, together with a quantity of water sufficient to fill the barrels half-full. The chlorine gas now entering the barrels is being absorbed by the water and brought in contact with the gold, which it dissolves, forming a solution of the chloride of gold, which may be easily separated from the sand by filtering or tapping the liquid off the sand when it has settled to the bottom of the sand. If the gold from one quantity of sand or ore has been extracted and the liquid contains

yet a quantity of free chlorine gas, it is poured upon a new quantity of sand or ore and the process repeated. The water used for leaching the first quantity of sand must contain free chlorine. The gold is then separated from the solution in the usual way, either evaporated to dryness and residuum heated to red heat, or it is precipitated by protosulphate of iron, hydrogen, metallic iron, &c.

This process of extracting the gold is materially improved and facilitated by bringing the chloride of gold in the moment that it is being formed in combination with a chloride of an electro-positive nature, such as an alkaline chloride or chloride of iron. The chloride of gold receives more permanency in this way, which is of considerable importance for the success of the operation. For this purpose I dissolve a quantity of common salt (the chloride of sodium) in the water previously, into which the chlorine gas is being conducted; or I put into it a quantity of the chloride of soda or potash, which forms then a double salt with the chloride of gold. Other metals contained in a native state in the sand or ore—such as copper or quicksilver (mercury)—are likewise dissolved by this process by means of the chlorine gas, and may be separated from the sand in the same way, and precipitated, either alone or with the gold, by precipitating the gold first with copperas, or by precipitating with metallic iron and separating them afterward. To avoid the inconvenience of manufacturing chlorine gas in a mining district, it may be made easily from chloride of lime and sulphuric acid in the same barrel in which the sand or ore with the particles of gold is contained, and while this barrel is manipulated upon, by putting a solution of the chloride of lime or the chloride of soda or potash in the barrel with the water and sand and adding from time to time small quantities of sulphuric acid. If an excess of chloride of soda or potash is left to remain in the barrels, or if common salt is added to the water, the double salt of chloride of gold and chloride of sodium or potassium will likewise be formed. The separation of the sand from the solution of gold as well

as other metals is the same, as likewise the precipitating of the gold or mercury or copper from the solution.

What I claim now as my invention, and desire to secure by Letters Patent, is—

The separating of gold from its ores, sands, or mixtures in suitable apparatus by the use of free chlorine gas, when absorbed by water

alone, or by water in combination with an alkali or an alkaline, earthy, or metallic chloride containing an excess of chlorine, as set forth in the specification.

CHARLES F. SPIEKER.

Witnesses:

H. MALESANDER,  
J. H. CUMMINS.