

"As soon as the gold is dissolved the circulation is stopped, the pinchcock *h* closed, and the pinchcock *g* opened; fresh water being run into the vessel *B* from *G*, and forced through the ore-vat for the purpose of washing out the auriferous solution into the tank *C*, from whence it is allowed to flow directly through the precipitators H^1 , H^2 , and H^3 , where a reaction takes place, resulting in the deposition of the gold in a metallic state, the precipitant—a complex sulphide—being recovered as to certain portions of its metallic constituents in the vessel *J*.

"In Fig. 4 the precipitator is shown in detail on an enlarged scale. It is so arranged that the vessels 1, 2, and 3, which have perforated bottoms and are filled with precipitant, may be so forced together by the screw *h* as to make good joints with the rubber-rings *i*, the solution rising through the vessels and overflowing at *j*. By means of the hinged pieces *k* attached to the movable top, the vessels 2 and 3 may be raised from off the vessel 1, so that it may be removed when fully charged; after being refilled with precipitant it is placed topmost of the series. By this means the lowermost filter is always worked out, and very little washing of the recovered gold is necessary before melting. The ore-vessel is discharged by unbolting the bottom A^1 , which may be opened or closed by means of the worm A^3 working in the worm wheel quadrant A^4 .

"The most argillaceous ores or slimes may be easily treated by this method; large quantities may be dealt with at a time; very little handling of the ore is necessary, and no noxious fumes escape to injure the workmen. Great advantages are found to accrue from maintaining the chlorine in solution under pressure. By means of the new precipitant rapid and complete precipitation of the gold is obtained."

The following are the specifications on which Mr. Bohm holds his patent rights, which will show more clearly what he claims. The plans referred to in the specifications are not annexed, as the other plan referred to in the foregoing specification will be sufficient to give an idea of the principle on which the extraction of gold and silver is effected:—

"SPECIFICATION.—LEACHING PLANT.

"Improvements in and Apparatus for the Separation of Gold and Silver, or either of them, from Ores or Materials containing them."

"I, William Dunsmore Bohm, of 5, Cumberland Villa, Chiswick, in the County of Middlesex, England, metallurgical chemist and engineer, do hereby declare the nature of my invention for 'Improvements in and Apparatus for the Separation of Gold and Silver, or either of them, from Ores or Materials containing them,' and in what manner the same is to be performed, to be particularly described in and by the following statement:—

"My invention has for its object to provide means, as hereinafter described, whereby gold and silver, or either of them, can be obtained very economically, conveniently, and efficiently from ores or materials containing them.

"In the process according to my invention, the ore or material to be treated (which need not be previously roasted, although it may be roasted if desired) is placed in a vat, and the leaching-solution is forced upwards through the ore or material (I will refer to it as ore), and through a filter at the upper part of the vat. In order to keep the filter of the leaching-vat clear without interrupting working to cleanse it, I, according to my present invention, provide a reversible vat with a filter at each end, the said vat being mounted so that it can be reversed to alternately reverse the positions of the filters as hereinafter more fully explained. In this reversible vat I may use any preferred leaching-solution, but I prefer one consisting of a solution in water of cyanide of potassium and carbonate of sodium or chloride of sodium, or both. Suitable proportions are one part of cyanide of potassium, containing 30 per cent. of cyanogen, to one-eighth of one part of carbonate or chloride of sodium (or both) to one hundred parts of water, but such proportions may vary with the value of the ore under treatment. The precipitating agent I prefer to employ for treating the solution after it leaves the vat is an alloy of zinc with an electro-positive metal, such as metallic sodium or potassium.

"I will particularly describe my invention with reference to the accompanying drawing, Figure 1 of which represents in plan an arrangement of apparatus suitable for use in carrying my said invention into effect. Figure 2 is an elevation partly in section of the same. Figure 3 shows two leaching-vats arranged side by side, one of the said vats being shown in section and of different proportions to the other vat; and Figure 4 is a longitudinal section of one of the trunnions of the leaching-vats drawn to an enlarged scale, showing passages for the ingress and egress of the liquor. I do not, however, limit myself to the precise form or details of apparatus shown, nor do I limit myself to the use of two vats, as one, two, or more may be used as desired, nor do I limit myself to the use of my improved apparatus with the particular chemical agents specified.

"When more than one leaching-vat is employed they may be all worked simultaneously if desired, or they may be worked alternately; so that, while one vat or several vats is or are being discharged and recharged with ore, the other vat or other vats may be in operation, whereby the process may be carried on continuously. I will describe my process with reference to one of the vats, it being understood that the like process is carried on with reference to the other vat or vats.

"Each vat AA^2 is provided at each of its opposite ends with a filter BB^2 , which may consist of any suitable material, such as iron-wire netting, or of teak wood having grooves *a* in its inner face, and perforated with holes *b* situated in the grooves, and covered with filter-cloth b^2 . These discs are secured by screws or other convenient means to the covers CC^2 , there being spaces d^1d^5 between the disc and the covers, with which spaces the pipes ee^2 communicate. Through these pipes the leaching liquor passes to and from the vat. The outlets from these pipes into the said spaces are covered by perforated plates or roses ff^2 , to cause the inflowing solution to spread evenly throughout the spaces d^1d^5 . The said pipes ee^2 are fixed to the covers CC^2 , so that they can be removed with the covers when detached for the purpose of charging the vats with the ore to be treated. The said covers may be secured to the body of the vat by bolts and nuts, secured in notches formed in flanges