

is accounted for by the well-known fact that a rising column of water has a tendency to leave behind or settle all suspended matter. Moreover, the pressure exerted by the superincumbent water in the vat also tends to rapidly settle the slimes. The precipitation of the particles is accelerated by the employment of the inverted funnel X as already described, against which the incoming flow of slimes is projected.

The slimes or tailings as they are precipitated pass through the outlet F into the mixing-chamber G, where the cyanide solution is introduced through H and compressed air admitted through K K. The employment of compressed air is solely for the purpose of thoroughly agitating the mixture of slimes or tailings and cyanide solution, and in nowise for the purpose of providing additional oxygen, the application of which I am well aware to be old.

The mixture of slimes and cyanide solution passes from the mixing-chamber G through pipes D¹ into the vat A¹, where the same operation is automatically performed as in the first tank A, with the difference, however, that, whereas in the former case water overflows by the launder C, in the latter cyanide solution escapes and is conveyed to the extractor-boxes, where the gold in solution is recovered.

The precipitated slimes are then drawn off into any convenient sump, where they may be again washed with water, or, if desired, into a third separation-vat for the purpose of waterwashing to recover any cyanide solution which may be remaining therein.

The special and economical features of the hereinbefore described apparatus are that—(1) The whole treatment, from the time the slimes are taken over by the slimes-treatment apparatus until finally discharged into the sumps, is entirely automatic and continuous; (2) the cyanide solution is thoroughly incorporated with the slimes without any stirring or mixing other than that automatically effected by the compressed air; (3) the whole apparatus needs no attention when once the various cocks have been properly regulated.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is,—

1. In apparatus for the treatment of slimes and tailings to extract the precious metals therefrom, a precipitating-vat with the supply-pipe so arranged that its delivery is in an upward direction beneath the surface of the water or liquids, so as to cause the mixture to assume a gentle rising motion in its passage through the vat and out at the overflow, substantially as hereinbefore described and illustrated on the accompanying drawings.

2. In apparatus for the treatment of slimes and tailings to extract the precious metals therefrom, a precipitating-vat A in combination with the inflow-pipe D provided with the bell-shaped mouth E, the inverted funnel X having the hollow stem or tube J, the bottom discharged with the outflow-cock F and the overflow-launder C, substantially as hereinbefore described and illustrated on the accompanying drawings.

3. In apparatus for the treatment of slimes and tailings to extract the precious metals therefrom, a vessel or chamber G, into which the slimes or tailings are introduced through the opening G¹ and the pipes H and K, for the admission respectively of cyanide solution and compressed air, substantially as hereinbefore described and illustrated on the accompanying drawings.

4. In apparatus for the treatment of slimes and tailings to extract the precious metals therefrom, the combination of a precipitating-vat as referred to in claims 1 and 2 with the mixing vessel or chamber referred to in claim 3, substantially as hereinbefore described and illustrated on the accompanying drawings.

5. An apparatus for the treatment of slimes and tailings to extract the precious metals therefrom arranged substantially as hereinbefore described and illustrated on the accompanying drawings.

W. E. HUGHES,

Agent for the Applicant.

Dated this 14th day of April, 1898.

IMPROVEMENTS IN OR RELATING TO THE TREATMENT OF ORES AND IN APPARATUS THEREFOR.

I, Elizabeth Barnston Parnell, of Gillmon House, West Street, Carshalton, Surrey, England, do hereby declare the nature of my invention for improvements in or relating to the treatment of ores and in an apparatus therefor, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the treatment of ores, its object being to extract the base metals from auriferous or argentiferous ores, leaving the gold and silver clean and free in the gangue, from which they can be recovered by any of the well-known solvents.

In carrying out my process the ore under treatment should first be crushed and concentrated by any of the well-known means, or preferably by means of the improved concentrator according to this invention. This improved concentrator comprises one or more wells in the surface of an oscillating table, with a slightly sloping surface, upon which the crushed ore is delivered, and over which a stream of water flows.

The water in the well or wells is kept in a state of perturbation or agitation by means of a "douche," which consists of streams of water or air delivered from suitable nozzles into the water. The nozzles preferably dip below the surface of the water to be agitated, as their action is then found to be greatly improved. The table should also preferably carry at its higher end an amalgamated plate, and a quicksilver well placed at the lower end of the amalgamated plate. A second plate may advantageously be added below the quicksilver well just referred to. When several water wells with "douches" are employed the crushed ore is by their action automatically "classified" in order of coarseness, the particles retained in the first well being the coarsest. Together with the hereinbefore-mentioned amalgamated plate and quicksilver well, the apparatus thus constructed acts at the same time as an amalgamator, concentrator, and "classifier."

The concentrated ore is next subjected to the oxidizing action of ozone, nascent oxygen, or other powerful oxidizing agent, which may be produced chemically or electrically, but I have found