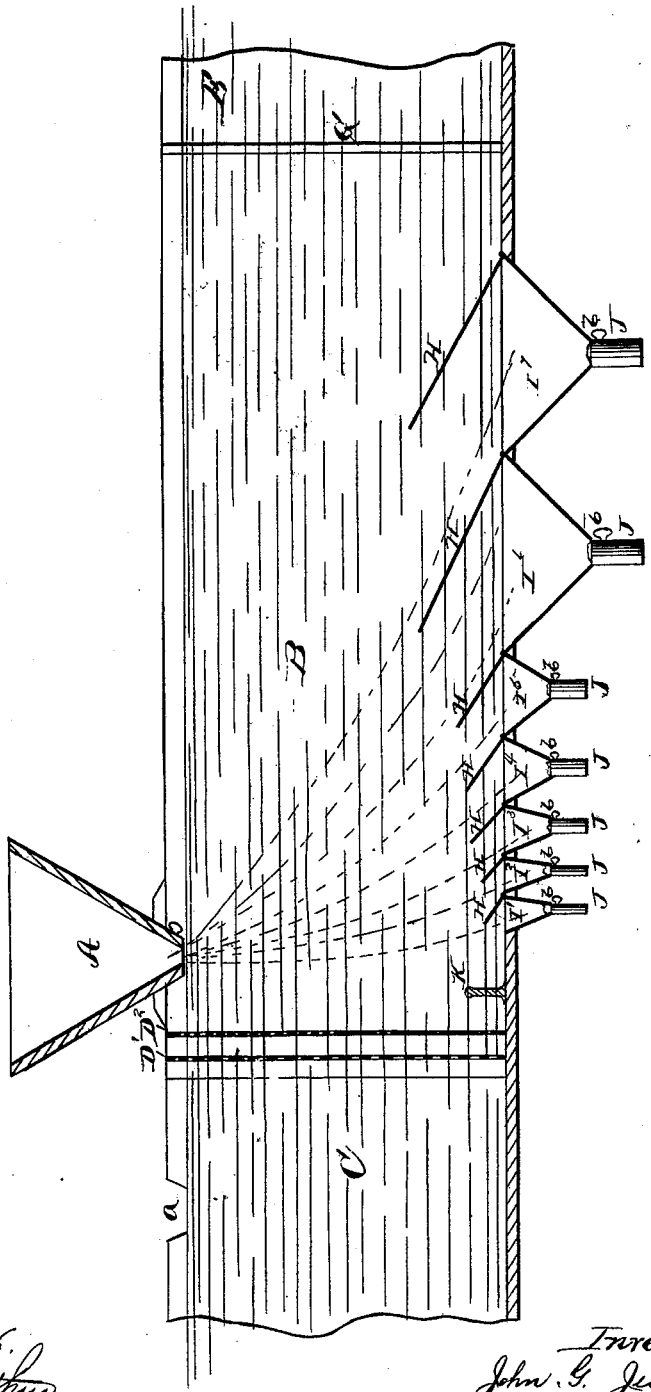
J. G. JEBB.

Ore-Separator.

No. 206,115. Patented July 16, 1878.



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UNITED STATES PATENT OFFICE.

JOHN G. JEBB, OF HALL VALLEY, COLORADO.

IMPROVEMENT IN ORE-SEPARATORS.

Specification forming part of Letters Patent No. **206,115**, dated July 16, 1878; application filed January 2, 1878.

To all whom it may concern:

Be it known that I, JOHN G. JEBB, of Hall Valley, in the State of Colorado, have invented certain new and useful Improvements in Ore-Separators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention is intended more especially for the treatment of low-grade ores and tailings hitherto considered of too little value to bear the expense of transportation or treatment by any of the older methods. It is, however, applicable to the treatment of any kind of ore or combination of ores, separating them effectually from each other and from the gangue-rock at a trifling cost, the invention requiring no skilled labor, and, in fact, but little attention, when in full work, and the plant required being of an inexpensive nature and not liable to wear out readily.

The two forces relied upon to effect the separation required are, first, that of the varying specific gravity of the different minerals under treatment, and, secondly, the propulsive force of a steady and deep current of water, the separation being further aided and secured by a system of ore-traps provided with lids adjustable to any required angle, the size of the mouths of these traps being proportionate to the depth of the current or to the specific gravity of the ore under treatment.

The annexed drawing represents a longitudinal section of my separator.

The ore having been thoroughly sized, so that there is as nearly as possible a uniformity between the particles of ore and rock, the product is fed direct from the screens or sieves into the hopper A, and through it into the separating-tank B. The delivery from the hopper is to be regulated by a set-screw or other means, so as to deliver the ore in a thin sheet across and at right angles to the current.

The water is supplied to the separating-tank from a large reservoir, C, which has an overflow at *a*. The current is further steadied by one or more gates, D^1 D^2, which are perforated, the first having fewer and larger holes than the second, and so on. The water then entering the tank B has a uniformly steady current, or enters the tank evenly from top to bottom. The current is now governed by a flood-gate, G, at the other end of the separating-tank, which gate is made either on the pattern of Venetian blinds or revolving slats, or in any other way, so that the water may be drawn off evenly from top to bottom as rapidly or as slowly as may be required, and passes through the gate G into the waste E. The water is used again in a similar tank for a different size of mineral.

The ore having been delivered onto the surface of the current in a broad thin sheet, as above stated, the whole charge at once begins to sink; but the heavier particles, such as galena, make the most direct course to the traps I^1 I^2, being a shorter time under the influence of the current than the lighter particles of say, copper, which latter are therefore deposited in a trap farther down the settling-floor, and the rock or gangue, being still lighter, is carried still farther and deposited in one or more of the end traps, which then receive nothing but tailings.

The traps I^1 I^2 I^3, &c., are in receiving capacity proportioned to both the depth of the current, (which is usually from four to five feet,) and the specific gravity of the various ores under treatment. A lid, H, which can be elevated or depressed at will, is fitted to each trap, so that should it be found that too much copper, say, is settling into the trap I^5, the lid of the trap I^4 is raised a trifle and the receiving capacity increased, whereas that of the trap I^5 is proportionally reduced. Once settled in the various traps, the clean ores are run off through pipes J to their respective receptacles, the tailings in the same manner being worked away through a trough. The ore-traps form, in fact, a false bottom to the separating-tank B, forming a series of flattened cones, and extending to some depth beneath the tank, ending in the pipes J, which are fitted with valves *b*, by which the flow of ore and water may be regulated.

K is a low division to prevent mud, &c., from reaching the traps.

In size, the separating-tank is found to work well ten feet long by five feet deep and twelve to fifteen inches broad. The sides must be

smooth, and metal is preferred for the material, though, of course, wood can be used. The traps vary in breadth from two inches or so, where the ore is expected to settle, to two feet, where the tailings are drawn off.

By hermetically sealing the top of the separating-tank and substituting air for water as the separating medium, the finest sizes of mineral and rock can be successfully separated. By considerably increasing the depth of the tank and arranging the sizing-machine in the head of it, several sizes can be treated in the same tank.

I am aware that it is not new to discharge the ore in a thin broad sheet into a current of air admitted at one end of a tank, which tank increases in depth from the end where such air is admitted to the end where the air escapes, and I do not therefore claim such as my invention. This is found objectionable because, from the construction of the tank used, the air will form eddies near the outlet end, which greatly retards the operation and prevents the proper separation. In my invention the tank used has its top and bottom parallel, and the current of water is of the same depth from one end of the tank to the other, and no eddies can possibly be formed in the separating-tank.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The process of separating ore by discharging the ore in a broad thin sheet into a current of water of uniform depth, whereby the varying specific gravity of the different minerals under treatment and the propulsive force of the water are utilized to effect the separation, substantially as set forth.

2. An ore-separating tank having its top and bottom parallel on the inside, and the bottom provided with a series of graduated traps or traps of varying sizes, a hopper on top arranged to discharge the ore in a broad thin sheet, and suitable inlet and outlet for a steady stream of water of uniform depth, for the purposes herein set forth.

3. The combination of the separating-tank B and the gates D^1 D^2, &c., provided with graduated openings and arranged at the inlet to the tank, for the purposes set forth.

4. The lids or valves H, in combination with the traps, for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN GLADWYN JEBB.

Witnesses:

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