

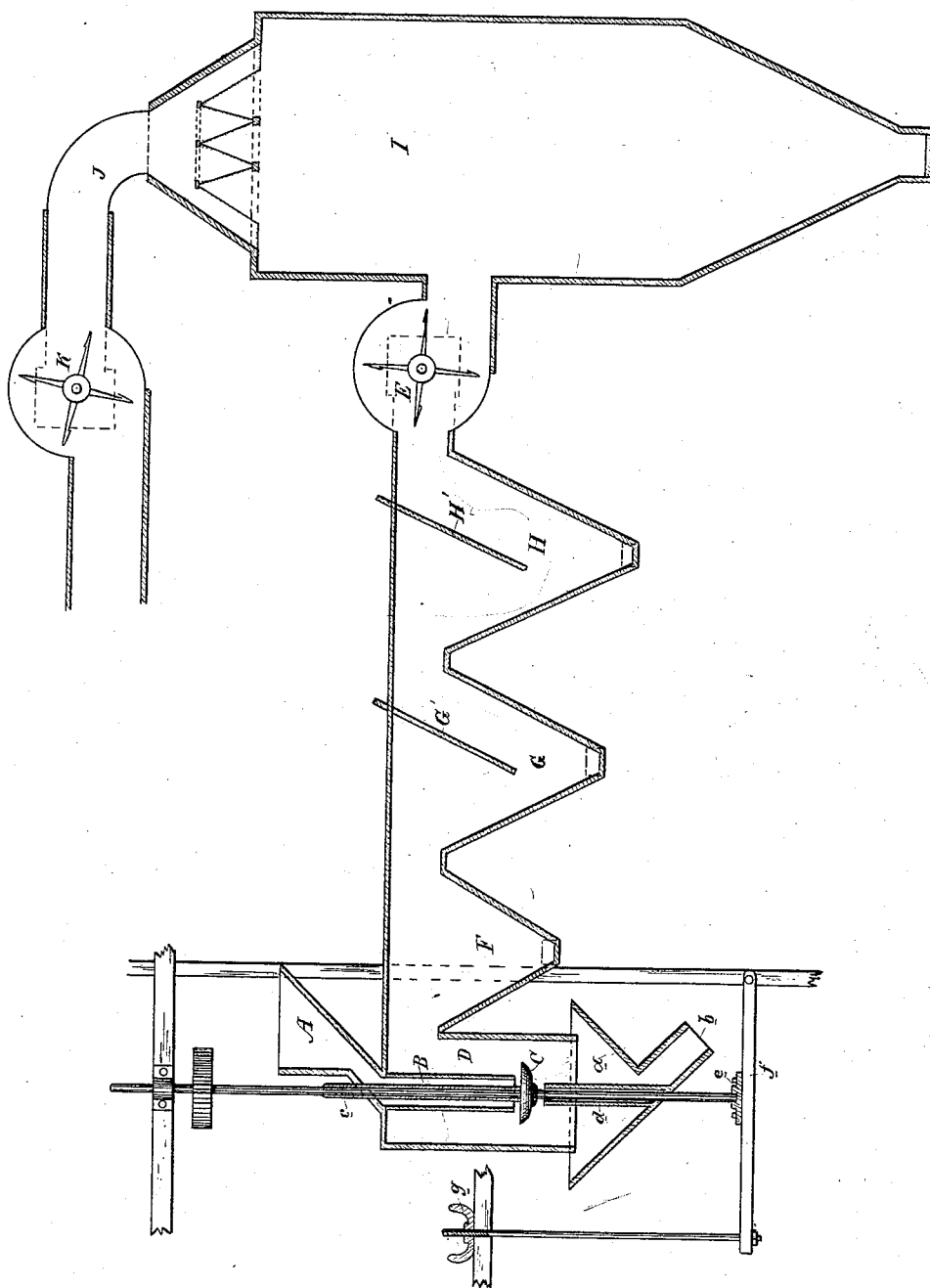
(No Model.)

J. BEHM.

ORE SEPARATOR AND CONCENTRATOR.

No. 320,998.

Patented June 30, 1885.



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UNITED STATES PATENT OFFICE.

JOSEPH BEHM, OF SAN JOSÉ, CALIFORNIA.

ORE SEPARATOR AND CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 320,998, dated June 30, 1885.

Application filed January 24, 1885. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BEHM, of the city of San José, Santa Clara county, State of California, have invented Improvements in Ore Separators and Concentrators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which is especially adapted for the separation of the more valuable portion of ores or minerals from their gangue after they have been pulverized, and in the concentration of the material, as will be more fully described, claimed, and explained by reference to the accompanying drawing, in which the figure represents a longitudinal vertical section of my apparatus.

A is a hopper, into which the ore is first received after having been pulverized to a sufficient degree of fineness. From this hopper it passes downward through an inclined passage and is discharged into a vertical cylindrical chamber, B, through which a vertical shaft extends, having a step and journal-box at bottom and top, respectively, and a suitable driving-gear, as shown. Upon this shaft is fixed a disk, C, just below the open end of the cylinder B. The rapid revolution of this shaft and disk C causes the pulverized material to be thrown outward within the larger inclosing-cylinder D, the finest portion of the dust being drawn upward and over the upper end of the cylinder D by a suction-fan, as will be hereinafter described, while the heavier portions will fall into a hopper, *a*, beneath the open bottom of the cylinder D, and may discharge outward by a spout, *b*, in its lower end. The disk C has an inclosing-sleeve, *c*, where it passes up through the cylinder B, and this protects the shaft from the wear and attrition of the material, which is fed into the cylinder around it. A second sleeve, *d*, also surrounds the shaft where it passes through the hopper *a*, this sleeve being secured to the hopper, as shown. The step *e*, within which the vertical shaft is supported, is fixed to a lever-arm, *f*, and this may be raised or depressed by a screw, *g*, or by other suitable device, so as to regulate the distance between the disk C and the bottom of the cylinder B, and thus control the discharge of the material from this cylinder.

The fine dust is drawn upward over the top of the cylinder D by a suction-fan, E, which is situated at the end of a passage which has a series of hoppers or chambers formed in it at F, G, and H. These passages may also be provided with inclined diaphragms G' H', which serve to prevent the air and dust from passing in a direct line to the fan. The diaphragms divert the current downward, so that any material which is heavy enough will be retained in the chambers. These chambers are graduated in size, those nearest the inlet being made smaller than those which are more distant, in order to produce a stronger current through them at this point. This is necessary by reason of the greater specific gravity of the ore which is deposited in the first chambers, and the strength of the air-draft lessens toward the outlet as the chamber increases in size, the deposited material being lighter.

The material which is deposited in the different chambers may escape automatically through doors or valves at the bottoms, which may be kept closed by springs or weights until the weight of the material within overcomes the springs, when it discharges, after which the doors are again closed.

The finest portion of the dust is carried through the fan-case E and is discharged into a large dust-chamber, I, from which it may also be withdrawn through suitable openings at the bottom. From the top of this dust-chamber a pipe or passage, J, connects with another suction-fan, K. This passage is in the form of an inverted cone or pyramid having its base connecting with the top of the chamber I, and the opening is covered with a fabric of some fibrous material, which, while allowing the air to escape, will arrest any dust which may be drawn upward by the action of the fan K. The material thus arrested in the chambers F, G, and H may be further concentrated by being discharged from these chambers into a second apparatus, which operates in the same manner as the one here described.

By this construction I am enabled to graduate the ore in fineness and separate it into as many grades as may be desired, all that is too coarse for further operations being again returned to a pulverizer.

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

1. An ore-concentrator comprising an inner vertical open-ended cylinder, a shaft extending through it, a distributing-disk upon said shaft, a protecting-sleeve upon the disk, an outer concentric cylinder with open ends to admit of a current of air passing through it, a hopper beneath said cylinder into which the coarser material may fall, and a sleeve on the hopper for protecting the shaft, substantially as herein described.

2. The herein-described separator and concentrator, comprising the concentric vertical

open-ended cylinders, rotating distributing-disk, and successive chambers or receptacles with their diaphragms, the fan by which the draft through the chambers is produced, a dust-chamber into which said fan discharges having a discharge-opening from its upper side, a second suction-fan, and a covering of fibrous material placed over said discharge-opening, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOSEPH BEHM.

Witnesses:

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H. C. LEE.