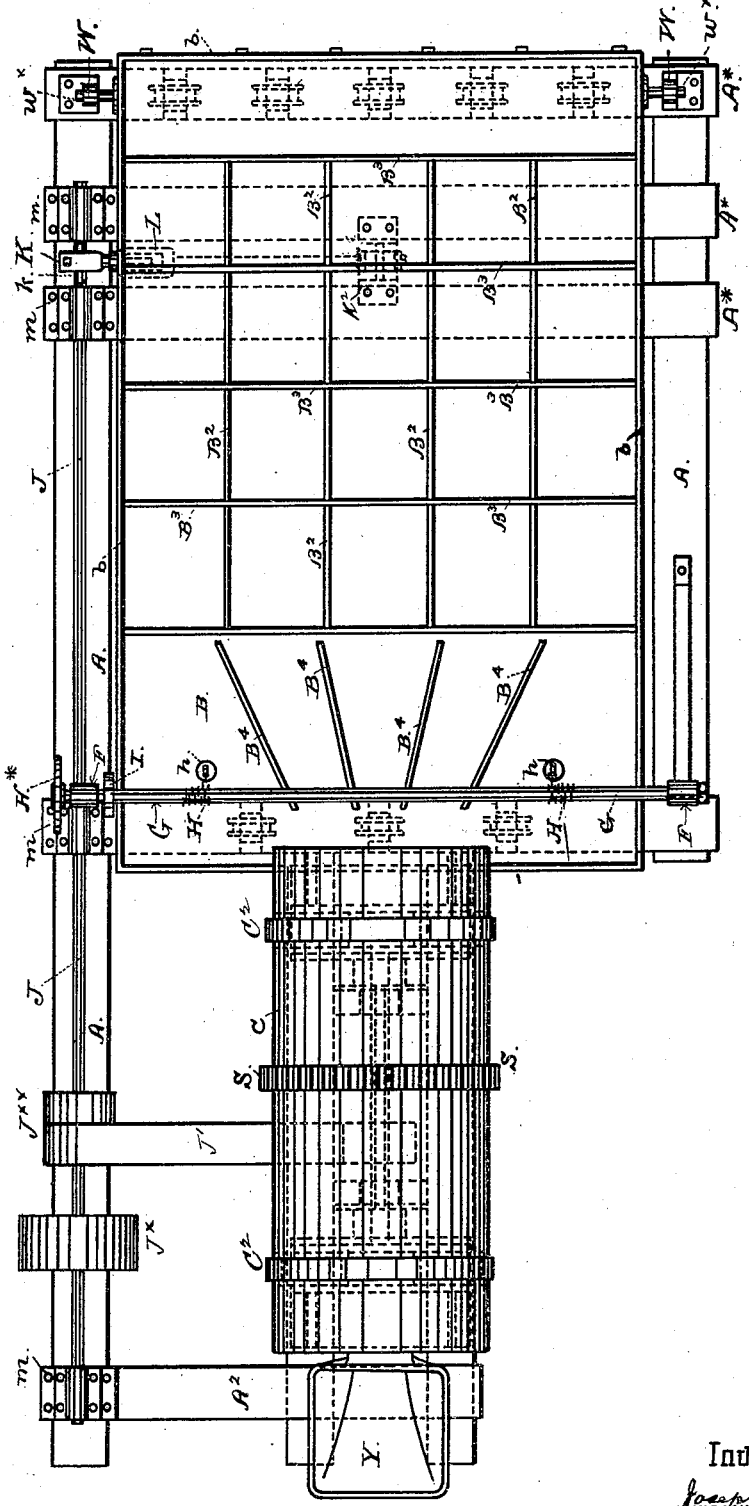
(No Model.) 3 Sheets—Sheet 1.

J. HUBERT.

WET ORE CONCENTRATOR.

No. 343,241. Patented June 8, 1886.

Fig. 1.



Witnesses:
Wm Mayer
John L. Taggard

Inventor:
Joseph Hubert
By his Atty., Wm. Bowen

(No Model.) 3 Sheets—Sheet 2.

J. HUBERT.

WET ORE CONCENTRATOR.

No. 343,241. Patented June 8, 1886.

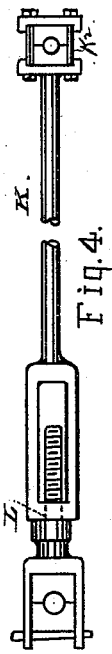


Fig. 4.

Fig. 3.

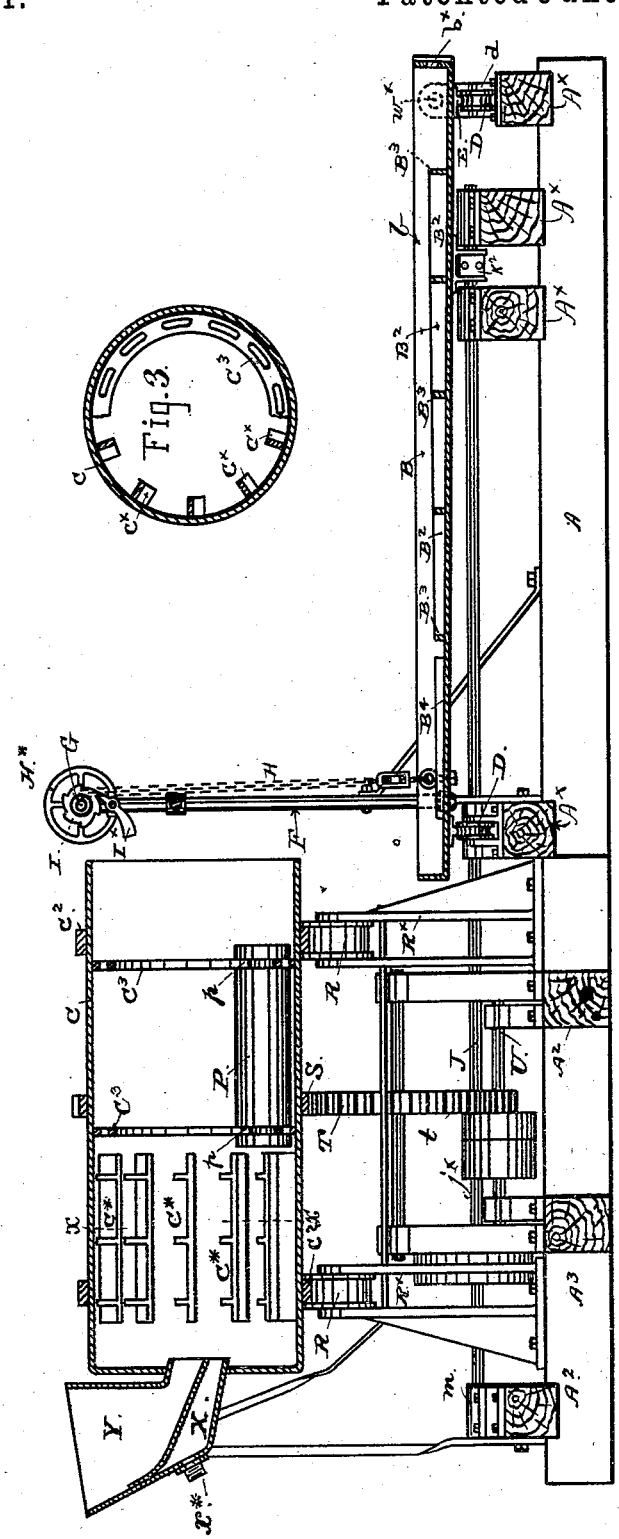


Fig. 2.

Witnesses:
Wm Mayer
John T. Taggard

Inventor:
Joseph Hubert
By his Atty Wm Mayer

(No Model.) 3 Sheets—Sheet 3.

J. HUBERT.

WET ORE CONCENTRATOR.

No. 343,241. Patented June 8, 1886.

Fig. 5.

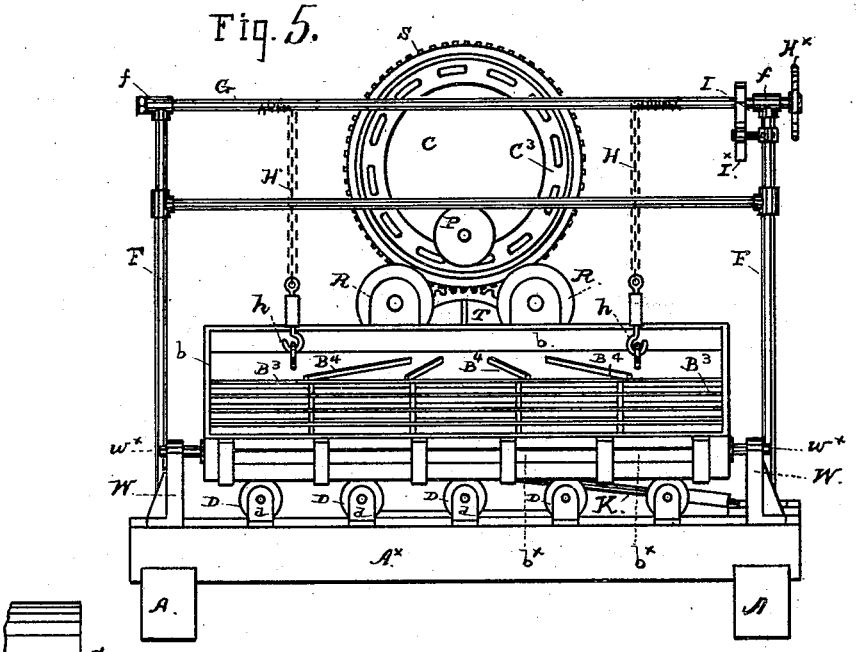


Fig. 6.

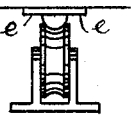
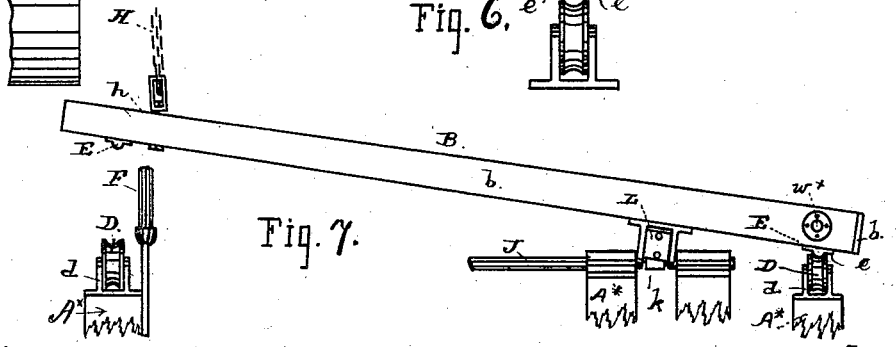


Fig. 7.



Witnesses:

Wm. Mayer

John C. Taggard

Inventor:

Joseph Hubert

By his Atty., [illegible]

UNITED STATES PATENT OFFICE.

JOSEPH HUBERT, OF SAN FRANCISCO, CALIFORNIA.

WET-ORE CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 343,241, dated June 8, 1886.

Application filed October 19, 1885. Serial No. 180,255. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HUBERT, a citizen of the United States, residing in the city and county of San Francisco, in the State of California, have invented certain new and useful Improvements in Wet-Ore Concentrators; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying and forming part of this specification.

My invention relates to improvements in ore separators and concentrators of the kind in which the material is subjected to the joint action of a stream or flow of water and a vibratory motion upon a flat concentrating table or surface.

The arrangements and combinations of the parts or mechanism are such as to produce an improved machine having great capacity and efficiency, and particularly adapted for working over the tailings from mills and other apparatus.

Referring to the accompanying drawings, in three sheets, Figure 1 is a plan or top view of my device. Fig. 2 is an elevation in section of same. Fig. 3 is a cross-section on *x x*, Fig. 2, through the barrel. Fig. 4 is a detail view of the pitman. Fig. 5 is an end view taken from the right-hand end of Fig. 2, and Figs. 6 and 7 show the construction of the table-carrying track and wheels.

A A* represent timbers forming a stout solid frame to bear the vibrating table B, and A^2 A^3 are other timbers that support the barrel C and its driving mechanism. On the cross-sills A* are set flanged wheels D D, having concave grooved rims and mounted in axle-boxes *d d*. Two sets of these wheels are used—one under the front end and the other set under the rear end of the table—and rails E E, corresponding in shape in cross-section to the form of the wheel-grooves, are secured on the bottom of the table. These rails are made of half-round bars with flanges *e e*, to bolt them in place. They are set back from the ends of the table to keep out the sand and matter from the wheels and bearings. Over the front end of the table or that end where the material is introduced a winding-shaft, G, is set in upright posts F F in sockets *f f*, so as to turn readily, and a hand-wheel, $H^\times$, and the pawl-and-ratchet wheel I $I^\times$ are provided as a means for rotating the shaft to wind and unwind the chains H H and hold them at any point. The ends of the chains are attached by hooks *h h* to eyes on the top of the table. The purpose of this winding mechanism is to raise and support the front end of the table at different inclinations greater than the angle or position it takes when it is supported by and is traveling on the track at that end, as in operating upon material of different or varying grades or characters of composition and richness it will sometimes be required to accelerate the discharge of the upper portion of the current of water and the suspended matter. This is accomplished by turning the shaft G until the desired pitch of the table is obtained, or for reducing the pitch by raising the pawl and unwinding the chains. In lifting the front end of the table from the wheels D the weight is sustained by the chains, but the rear end remains upon the rear set of wheels and rides back and forth under the movement applied to the table by the shaft J. The construction of the rails and carrying-wheels permits this adjustment of pitch in the table without disturbing its position with relation to the rear set of wheels, and without throwing any irregular strain or pressure on the wheel-axles. This will be understood by referring to Figs. 2 and 7.

On the sides of the table at the rear end are projecting guide-rods $w^\times$, set in line with the rail D and working through guides W on the frame-timbers, as seen in Figs. 1 and 2. The table, having free lateral movement upon the wheels between these guides, also swings on the centers $w^\times$ as the higher end is raised and lowered.

The table has a flat surface and a rim, *b*, around the sides, the height of which increases from the front to the rear end, so that at the rear the depth of the concentrating-surface is greatest. At this end are discharge slots or apertures $b^\times$ $b^\times$. The surface is divided into compartments by partitions B^2 B^3, running both longitudinally and transversely, and of regularly-increasing height from the front toward the rear end, as shown in Fig. 2 of the drawings.

At the higher or receiving end the table has a number of partitions, B^4 B^4, set in a divergent manner from that portion of the table-

surface directly under the end of the barrel, and running outwardly to the first transverse partition. These partitions serve to distribute the matter over the table-surface, and also to form pockets or obstructions, in the usual manner, to catch the metallic particles as they are separated under the influence of gravity and the action of the current and the movement of the table.

The shaft J carries a short crank, *k*, and a pitman, K, is attached to the bottom of the table at k^2 by a suitable connection. The outer end of the pitman is connected with its crank by a swivel-joint, L, (shown in Figs. 1 and 4,) for the purpose of permitting the table to be raised or lowered from the front or upper end without affecting the movements of the pitman or straining the crank and shaft. The shaft J is set in boxes *m m* on the bed-timbers, and is furnished with a pulley, $J^{\times}$, for an engine-belt. The main driving-shaft J is also provided with a fast and a loose pulley, as shown at $J^{\times\times}$, from which a belt, J', extends to the fast and the loose pulley $j^{\times}$ on the counter-shaft U.

The barrel C is a cylinder with one end open and the other end closed by a head, in which is a circular opening at the axis, for the end of a supply-hopper, Y, and in this opening provision is made for delivering a stream of water with the ore matter into the barrel by having an inlet, X, with a coupling, $x^{\times}$, for a water-pipe. The barrel is mounted in substantially a horizontal position in the frame A^2 A^3, and is driven by suitable gearing from a counter-shaft, U, to which motion is given by a belt, J', from the principal shaft J. Rotation is given to the barrel by the gears S T *t*, the first one being a toothed ring on the barrel, engaging with the gear T, and the last one a pinion on the counter-shaft U. These gears bring down the motion of the barrel to a considerably less rate of speed than that of the table. In the present construction the proportions of the gears T *t* are as six to one, and the table moves about eight times as fast as the cylinder. One part or section of the inner surface of the barrel is furnished with flanges C*, for lifting and dropping the material. They are set longitudinally at regular distance apart, and are confined to the front end, or that portion of the barrel where the material is received. In the space in rear of these flanges are two circular guide-ribs, C^3, (seen in Figs. 2 and 3,) which form a track for a grinding and scouring roller, P. This roller is set loosely in the barrel, but is kept in position by grooves *p*, near either end, into which the tracks C^3 fit. The material under treatment thus receives, first, the action of the flanges, and becomes thoroughly broken up and mixed with the stream of water, and afterward is acted on by the revolving roller in passing outward to the concentrating-table. The barrel is carried in the usual manner by flanged rollers R R and tracks C^2.

In the operation of this machine, the material, being introduced into the barrel with the stream of water, is brought into such condition before reaching the table that the separation and concentration will be effective and complete. In the case of some qualities or conditions of tailings it insures the recovery of many particles that are liable to be floated and carried off by the constantly-flowing stream of water.

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

1. The herein-described wet-ore concentrator, comprising the following mechanism: the revolving barrel C, having the feed-hopper and an inlet for water, the internal flanges, C* C*, and roller P, the inclined vibrating table B, having riffles and distributing partitions B^2 B^3 B^4 and discharge-apertures $b^{\times}$, the principal shaft J, for operating both the barrel and the table, the crank *k* on shaft J, and the pitman connecting it with the table at one end, a counter-shaft, U, near the other end of shaft J, and gears by which rotation of the barrel is produced, as set forth.

2. The herein-described wet-ore concentrator, comprising the barrel C, having a supply-hopper and an inlet for water, flanges C* C*, and roller P, and the inclined concentrating-table B, wheels D D, shaft G, chains H, and a hand-wheel and locking device for suspending and adjusting one end of the table, a rotating driving-shaft, J, and suitable gearing for connecting and operating said barrel and table.

3. A wet-ore concentrator comprising the inclined concentrating-table B, the grooved wheels D D, on which said table is mounted, the shaft G, and chains H, for suspending the table at the front end, means for adjusting its inclination, the shaft J, having crank *k*, the pitman K, and the swivel-joint L, substantially as and for the purpose set forth.

4. A wet-ore concentrator comprising the inclined concentrating-table B, grooved wheels D D, the crank-shaft J *k*, pitman K, swivel-joint L, the shaft G, chains H, hand-wheel, and locking pawl-and-ratchet device, substantially as described.

JOSEPH HUBERT. [L. S.]

Witnesses:
JNO. L. TAGGARD,
EDWARD E. OSBORN.