

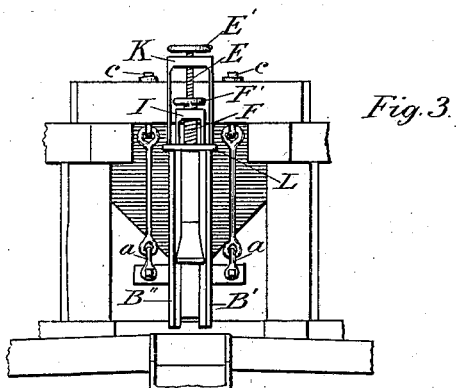
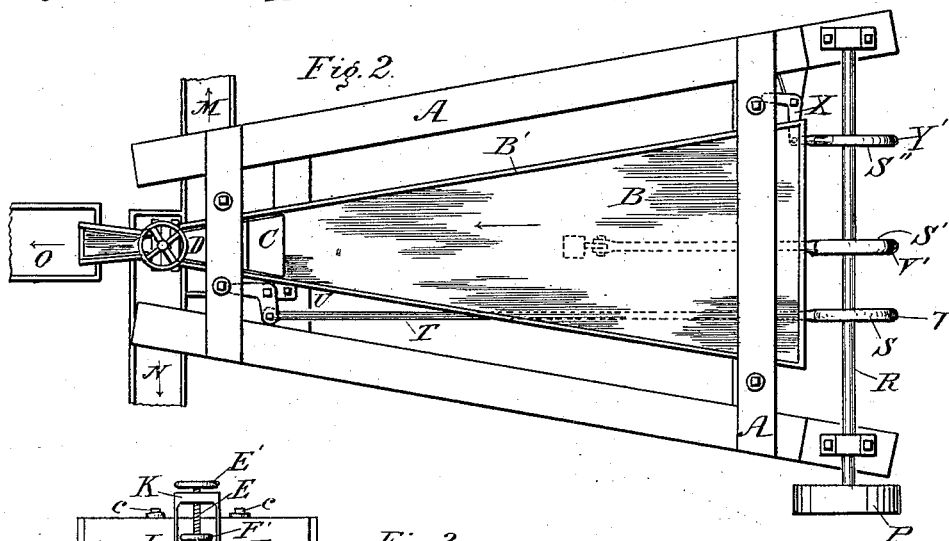
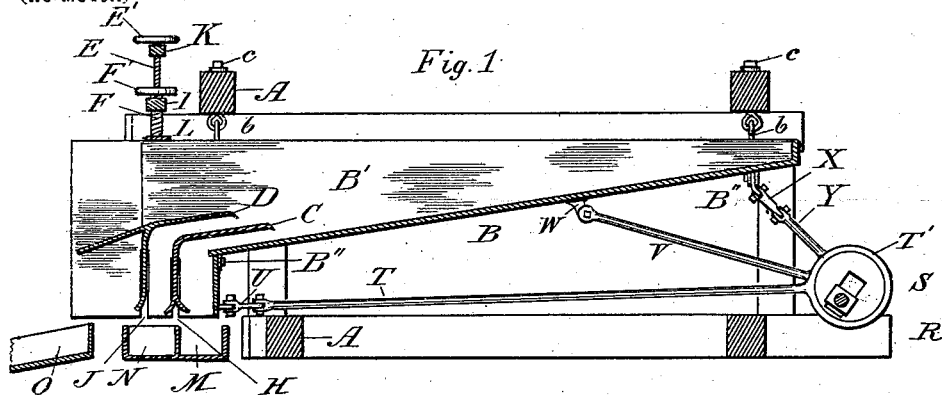
No. 650,138.

Patented May 22, 1900.

C. A. SMITH.
CONCENTRATOR.

(Application filed Apr. 24, 1899.)

(No Model.)



WITNESSES.

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UNITED STATES PATENT OFFICE.

CHARLES A. SMITH, OF LOS ANGELES, CALIFORNIA.

CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 650,138, dated May 22, 1900.

Application filed April 24, 1899. Serial No. 714,330. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. SMITH, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Concentrators, of which the following is a specification.

My invention relates to improvements in concentrators specially designed for treating pulp and placer material containing the precious metals in a free state.

The object of my invention is to provide a machine which will embody simple means to separate the ore or precious metals from the gangue. I accomplish this object by the mechanism described herein and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my concentrator with the side timbers of the front side of the frame and front side of the concentrating-trough removed for clearness of illustration. Fig. 2 is a plan of the same. Fig. 3 is an end view of the lower or discharge end of the concentrator.

A is the frame, in which is mounted the swinging concentrating-trough B. This trough is widest at the upper end or head and gradually decreases in width to the discharge end or tail. The sides B' should be of sufficient height to carry the pulp to the discharge. The water passing through the trough gradually increases in depth, thereby facilitating the separation of the heavier portions from the lighter. The bottom of the trough rests on cross-bars B'', (one at the head and one at the tail,) which strengthen the trough and provide means for attaching the trough to the frame by means of the clevises a, eye-rods b, and bolts c. This connection of the trough to the frame permits the trough to swing both longitudinally and laterally at the same time. For an ordinary medium-sized machine for working pulp the concentrating-trough should preferably have the following dimensions: length, sixteen feet; width at the head, two feet; at the tail, three inches; height of sides at the head, two inches; at the point where the concentrates are discharged, thirteen inches. These dimensions may be varied without departing from the spirit of my invention, which consists in a concentrating-trough gradually contracting in

width from the head to the point of discharge of the concentrates and having sides of sufficient height to retain therein from the head to the tail the material passing therethrough, provided with the novel means shown of separating such material into pure concentrates, semiconcentrates, and pure gangue, (a classification which I have given to these substances for convenience of description.) The sides B' extend beyond and below the bottom of the trough from the point where the concentrates are discharged to provide suitable means for attaching the separating-plates C and D, which are adjustably mounted therein. The edges of the horizontal part engage the sides of the trough B. The dividing-plate C separates the pure concentrates from the semiconcentrates, and the dividing-plate D separates the semiconcentrates from the pure gangue. These plates may be adjusted independently of each other by means of the screws E and F, having hand-wheels E' and F'. The lower or vertical part of the plate C projects through slots H in the sides B' of the trough. To these projecting edges is attached a yoke I, which passes over the top of the trough B. In the top of the yoke I is a screw-threaded hole, through which passes the screw F, having a working fit therein. The screw F has a screw-threaded hole extending longitudinally therethrough. The lower or vertical part of the plate D projects through slots J. To these projecting edges is attached a yoke K, which passes over the top of the trough B. The yoke K is rotatively attached to the screw E just below the hand-wheel E'. The screw E works in the threaded hole in the screw F. The screw E rests upon a cross-bar L, which passes across and is attached to the trough B. This separate adjustment of the plates C and D is particularly desirable in a concentrating-machine, as the quantity of concentrates varies with the different ores. By having two plates in the tail of the trough B the lower plate C may be set so that nothing but pure concentrates will pass thereunder, and the plate D may be set so that pure gangue only will pass over the same, while between the plates C and D will pass material composed partly of concentrates and partly of gangue, which I have termed "semiconcentrates."

The object in separating the material into

three parts is that by so doing it is not necessary to be so careful in separating the gangue from the concentrates, as the semiconcentrates may be run through the machine a second time, while to run the whole body of gangue and semiconcentrates a second or third time is often impracticable. In my machine almost all the worthless gangue is gotten rid of at the first handling and only that part which is in the semiconcentrates needs to be rehandled.

Mounted on shaft R are three eccentrically-adjustable disks S S' S''. These disks have an eccentric adjustment on the shaft R, where by the motion of the trough B may be changed at will and a different rate of lateral motion given to the tail from that given to the head, if desired. The disk S is connected to the rod T by strap T'. Rod T is pivotally connected to one end of the bell-crank lever U, which is pivotally attached to the frame A. The other end of the lever U is attached to the trough B near the tail thereof in order that the trough may have both longitudinal and lateral movement at the same time. Disk S' is connected to the rod V by strap V'. Rod V is pivotally connected to lug W, which is affixed to the bottom of trough B near the center thereof. Disk S'' is connected to rod Y by strap Y'. Rod Y is pivotally connected to one end of the bell-crank lever X, which is pivotally attached to the frame A. The other end of the lever X is pivotally attached to the trough B near the head thereof in order that the trough may have both longitudinal and lateral movement at the same time.

My machine is operated as follows: Motion is imparted to the shaft R through the main pulley P, and the material to be operated upon is fed into the head of the trough B in any suitable manner and in such quantities as the nature of the material requires. The trough B is given such a pitch from the head to the tail as may be found desirable with the particular material being treated by raising or lowering either end of the frame, (preferably the tail end is raised or lowered,) experience showing that no two materials require the

same pitch of the concentrating-trough. I preferably give the tail end of the trough B a greater lateral motion than the head, as the settling of the concentrates upon the bottom of the trough is facilitated thereby. This is done by adjusting the disk S on the shaft R, so that it has a longer stroke than the disk S''. As the material passes through the trough it increases in depth. At the tail it is separated by the plates C and D into pure concentrates, semiconcentrates, and pure gangue, which are carried away from the machine by the chutes M, N, and O.

The motion imparted to the trough by the eccentrics and bell-cranks is similar to that of hand-panning and greatly facilitates the settling of the concentrates or precious metals to the bottom of the trough along which they pass to the tail.

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

The herein-described concentrator comprising trough B gradually decreasing in width from the head to the tail, having sides B' gradually increasing in width from the head to the tail; adjustable separating-plate C for separating the concentrates from the semiconcentrates; adjustable separating-plate D for separating the gangue from the semiconcentrates; yoke Y attached to plate C and having threaded socket for the reception and working of screw F; screw F adapted to work in screw-threaded socket in yoke I and having hand-wheel F'; yoke K attached to plate D; screw E rotatively attached to yoke K and adapted to work in the screw-threaded opening in screw F and having hand-wheel E'; and chutes M, N and O for carrying away respectively the concentrates, semiconcentrates and gangue.

In witness that I claim the foregoing I have hereunto subscribed my name, this 13th day of April, 1899, at Los Angeles, California.

CHARLES A. SMITH.

Witnesses:

G. E. HARPHAM,
HENRY T. HAZARD.