No. 769,211. PATENTED SEPT. 6, 1904.

C. F. DU BOIS.

DRIP CONCENTRATOR.

APPLICATION FILED MAY 13, 1902. RENEWED FEB. 8, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

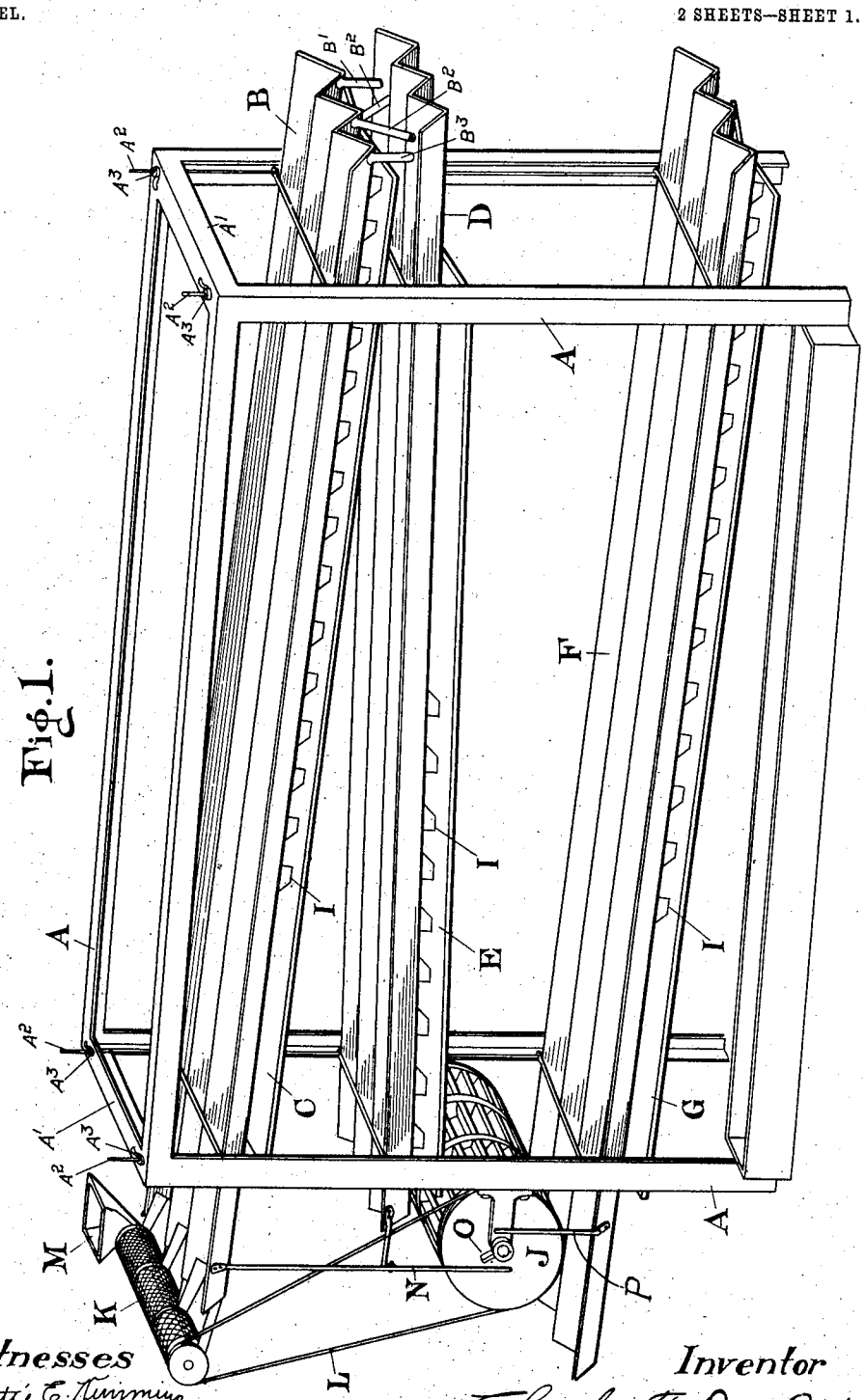


Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

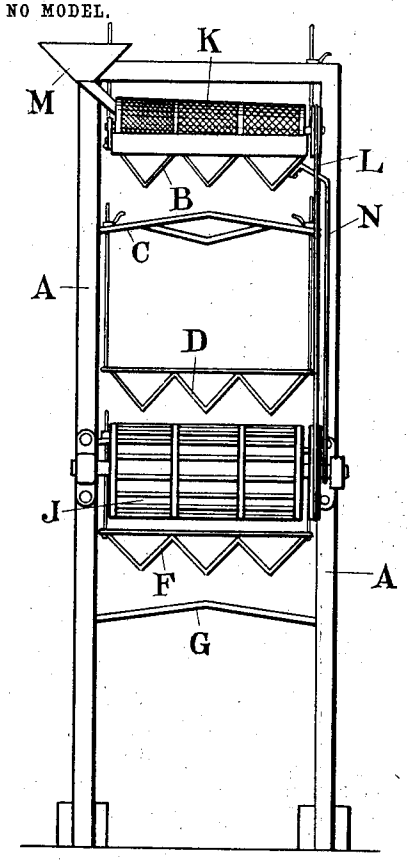


Fig. 3.

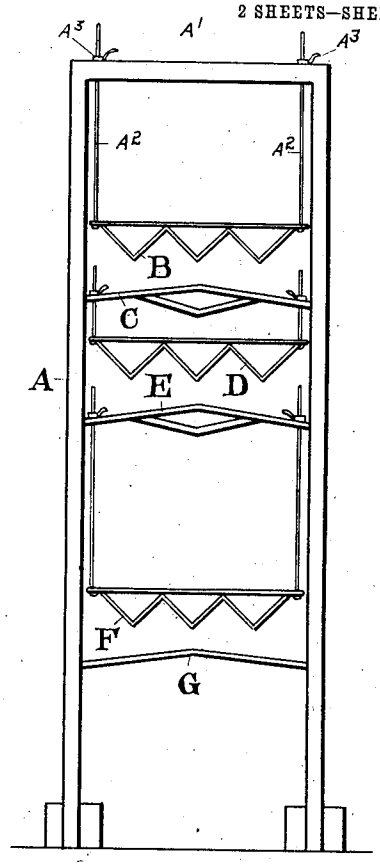


Fig. 2.

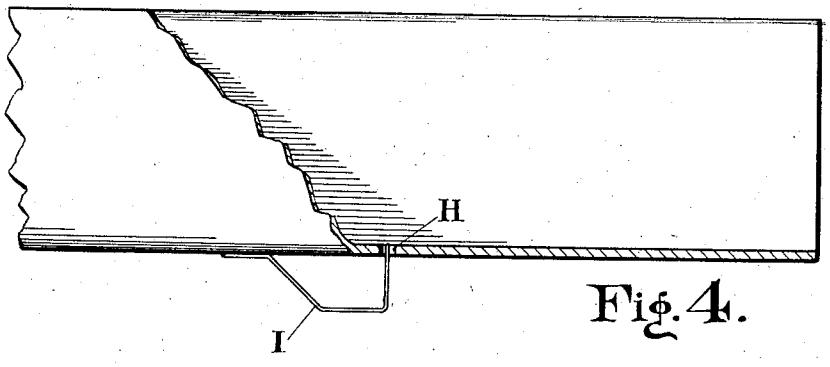


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES F. DU BOIS, OF DENVER, COLORADO, ASSIGNOR OF ONE-FOURTH TO ISAAC SUTTON, OF DENVER, COLORADO.

DRIP-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 769,211, dated September 6, 1904.

Application filed May 13, 1902. Renewed February 8, 1904. Serial No. 192,717. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. DU BOIS, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Drip-Concentrators; and I do declare the following to be a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

My invention relates to a drip-concentrator adapted to provide a new and efficient means of saving mineral values contained in pulverized rock, sand, and substances of any kind.

The objects of my invention are to provide a drip-concentrator adapted to be used below stamp-mills and other concentrating tables, one which will effectively treat the tailings of other machines and also wet crushed ore, and one which can be utilized as a dry process by a very simple modification of the machinery, consisting of increasing the incline of the troughs used.

The drawings illustrate my new device, in which—

Figure 1 is a perspective elevation of my invention. Fig. 2 is a front end view of same. Fig. 3 is a rear end view. Fig 4 is a fragmental view of the bottom of one of the troughs, showing the perforations or apertures.

Further reference is made to the drawings in explaining the detailed construction and operation of my new concentrator.

A represents the frame or supporting parts of the device.

A′ represents cross-bars placed between the supporting-frame or posts, (indicated by A.) Through these cross-bars are inserted rods, (indicated by A^2.) These rods extend downward and form means for supporting a series of troughs, (indicated by B.) The rods, which are provided with external threads at the upper ends, on which are placed thumb-screws, (indicated by A^3,) provide means for raising and lowering the said series of troughs.

C represents a platform inclined toward the middle. This platform is secured to the main frame, (indicated by A.) Rods similar to those indicated by A^2 are passed through this platform and form means for supporting another series of troughs, (indicated by D.) Below this series of troughs D is another platform, (indicated by E,) which is similarly attached to the inclination of the one represented by C. Another set of rods, similar to the ones hereinbefore referred to, are passed through apertures provided in the platform E and form means for supporting a third series of troughs, (indicated by F.) Another platform, (indicated by G) is provided beneath the series of troughs indicated by F and inclined in a corresponding manner with the platform hereinbefore referred to. The troughs are constructed of any suitable material, and their walls are inclined, forming a right-angled turn at the point of the trough. Numerous perforations or apertures (indicated by H) are provided in the bottom or right-angled point of the said troughs. A series of needles (indicated by I) are provided, which have points protruding into the said apertures H. The utility of these needles will be hereinafter fully referred to.

J represents a bucket water-wheel which is secured to the main frame A in a suitable manner. The water escaping over the ends of the series of troughs provides power for revolving this water-wheel J, which is connected with a revolving screen K by means of a belt or cable L, operating over suitable sheaves or pulleys provided on the ends of the drum J and the revolving screen K. The screen K is divided into three sections, each section being of a different mesh, the mesh increasing from the end where the hopper M is provided into which the pulp or substances to be treated is fed. An arm (indicated by N) is connected to the series of troughs above the drum and extends downward in close prox-

imity to the axle or shaft of the water-wheel. A cam-arm O is secured to the shaft of the water-wheel, adapted to strike the arm N and also the arm P, secured to the lower series of troughs, by means of which a slight jarring movement is imparted to said troughs, facilitating the passage of the material to be treated through the troughs and also greatly facilitating the separation of the mineral values from the refuse. The revolving screen also acts as an equalizer for the distribution of the water, as well as sizing the material to be treated. The oscillating or jarring movement imparted by the motion of the cam-arm is of material value in settling and saving the slimes of minerals.

The needles (indicated by I) are constructed in the form of a square loop, one end of which is secured to the bottom of the trough, and the other operates loosely within the aperture provided in the bottom of the trough. The vibrating movement of the said troughs causes these needles to move within said apertures and to prevent them from becoming clogged or filled with the mineral substance passing through them.

Any suitable contrivance can be utilized for a receptacle to receive the drippings containing the mineral, which flows from each side of the machine from the platforms indicated by C, E, and G.

The successful operation of my new drip-concentrator is as follows: The pulp or material, together with a sufficient quantity of water, is fed into the funnel M and is sized by the different screens provided on the revolving screen indicated by K. Each sized screen is provided with an outlet-spout leading into one of the troughs. The pulp is then carried downward through the trough, which receives the jarring motion, and the mineral values settled to the bottom escape outward onto the platform C through the apertures H. When the pulp reaches the ends of the first series of troughs, it is conveyed to the second series of troughs by means of suitable spouts. (Indicated by B', B^2, and B^3 in Fig. 1 of the drawings.) It then passes through the incline of the second series and over the water-wheel J, imparting a revolving movement to said water-wheel, and as the said water-wheel is constructed in three different sections or in as many sections as there are troughs in each series each trough empties its contents into the section of cups provided on the said water-wheel immediately beneath the trough, and the pulp is therefore conveyed by means of said cups to the troughs beneath, forming the lower series, (represented by F.) Provision is made in all the troughs for the escapement of the metal values through the apertures, facilitated by the movement of the needles hereinbefore referred to. When the pulp reaches the outer end of the third series of troughs, (indicated by F,) it is discharged and conveyed by any suitable means from the vicinity of the machine.

Of course I do not confine myself to any particular number of troughs nor to the construction illustrated, but desire to cover by Letters Patent the principle involved, embodying the jarring movement, the provision of the needles and apertures in the troughs, and construct the machine in any suitable manner found most practical without materially deviating from the principle illustrated and claimed.

After thus describing my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A drip-concentrator, consisting of series of troughs having perforations or apertures provided in the bottoms thereof, the said series of troughs inclined in opposite directions suitably suspended within a frame, each series of troughs except the lowest discharging into a lower one, a series of platforms secured within said frame upwardly inclined toward the middle, one of said platforms placed beneath each series of troughs, movable needles, the points of which are adapted to operate within said apertures being secured to the bottom of said troughs, the drum water-wheel placed beneath the lower end of one of the series of troughs, the revolving screen secured to the frame at the upper end of the top series of troughs, the said water-wheel adapted to impart a revolving movement to the said revolving screen by means of a suitable belt or cable operating around sheaves, substantially as specified.

2. In a drip-concentrator, series of troughs inclined in opposite directions, each series consisting of one or more troughs constructed V-shaped and laid parallel with each other having perforations provided in the bottom points thereof, said series of troughs except the lowest adapted to discharge into the next lower series, a looped needle secured to the bottom of said troughs having one end adapted to operate loosely within said perforations, a platform inclined toward the middle secured to the said frame beneath each series of troughs adapted to convey the mineral away from the machine after it has passed through the apertures in the bottom of the troughs, a water-wheel constructed in sections placed beneath the lower ends of the troughs over which the water and pulp flows revolving the said water-wheel and imparting a jarring motion to the troughs by means of a cam-arm adapted to be secured to the shaft of the said water-wheel, and to strike the arm attached to the said troughs, the revolving screen placed at the upper end of the top troughs adapted to revolve, the belt or cable adapted to operate

around a suitable pulley or sheave provided on the water-wheel and a pulley or sheave secured to the axle of the screen by means of which it is revolved, the said troughs being suspended upon suitable rods adapted to facilitate the vibration thereof, substantially as specified.

In testimony that I claim the foregoing as my own I hereunto subscribe my name in the presence of two witnesses.

CHARLES F. DU BOIS.

Witnesses:

MARTIN L. OCHS,

MATTIE E. KIMMINS.