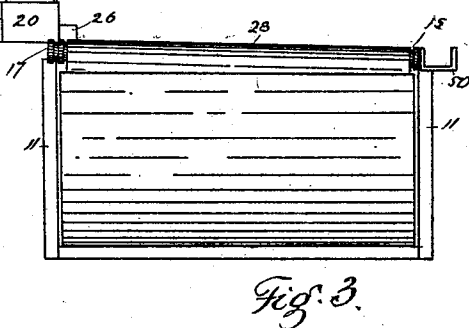
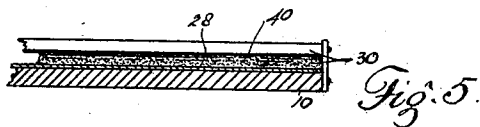
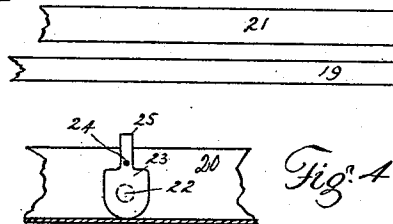
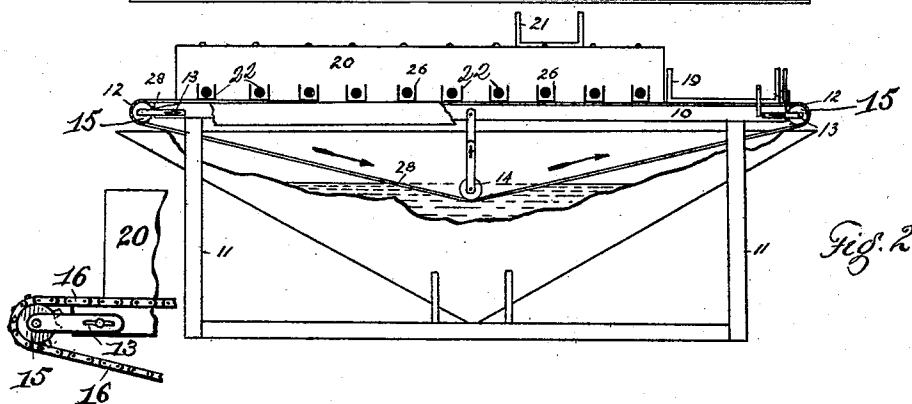
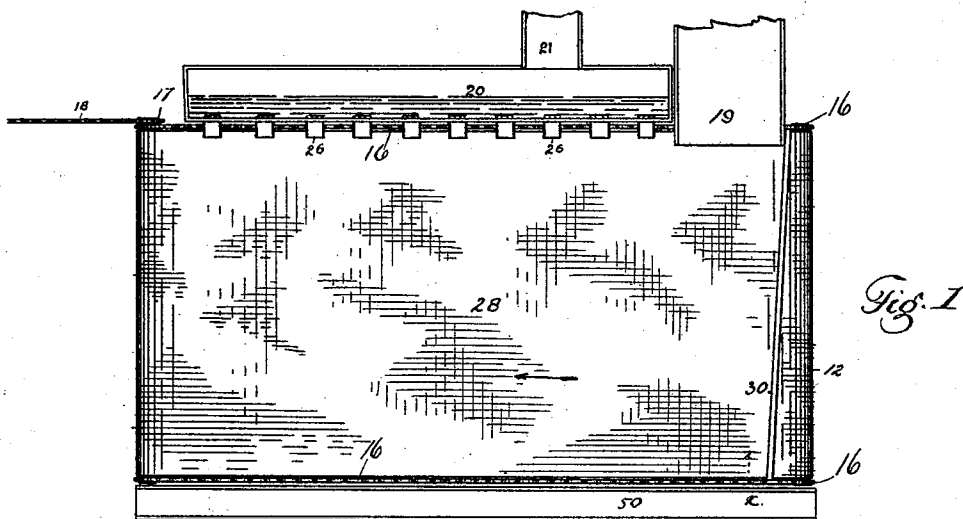


W. P. OGDEN.
CONCENTRATOR.

Patented Dec. 20, 1892.



WITNESSES:

WITNESSES:
G. J. Rolland
Wm. M. Connell

INVENTOR

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UNITED STATES PATENT OFFICE.

WILLIAM P. OGDEN, OF DENVER, COLORADO.

CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 488,528, dated December 20, 1892.

Application filed January 5, 1891. Serial No. 376,796. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. OGDEN, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Concentrators; and I do declare the following to be a full, clear, and exact description of the 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, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in ore concentrators of the class having a stationary table and an endless movable apron passing around the table from end to end and a water tank located beneath the table and adapted to receive the concentrates as they leave the apron; and it consists in the construction, combination and arrangement of the several parts of which it is composed, as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings in which corresponding parts are designated by similar numerals:—Figure 1 is a top or plan view of my improved concentrator; Fig. 2 is a side elevation of the same. Fig. 3 is an end view. Fig. 4 is an enlarged view in detail of one of the valves for regulating the supply of pure water during the operation of the machine. Fig. 5 is a section taken on the line $x-x$, Fig. 1.

In these views wherein similar reference characters indicate corresponding parts of the mechanism let the numeral 10 designate a stationary table supported upon four legs 11, 11, &c. This table is provided at each end with a roller 12 suitably journaled in slotted projections 13 extending from each side thereof. The rollers are adjustably supported by the slotted projections 13. This table is preferably rectangular in shape having its greatest extension between the two rollers. It is inclined transversely, but has no longitudinal inclination. In other words a line lying within the table parallel with its sides and connecting its ends lies in a horizontal plane, while a line connecting the two sides of the table is inclined to the horizontal.

Passing over the rollers 12 and engaging the upper surface of the table is the endless apron 28 which passes under the table and beneath a tension roller 14 adjustable vertically within its bearings. This apron is formed of some fibrous or textile material adapted to collect the mineral in its meshes while the gangue is carried therefrom by the water permitted to flow upon the apron above the table. The apron may be formed of napier or jute material, a piece of ordinary floor carpet, or a woolen blanket. The rollers are provided at one or both ends with sprocket wheels 15 which are connected by chains 16. It is thought best to employ but one chain 16, to-wit that connecting the two upper ends of the rollers, though two chains are shown in the drawings and may be used if desirable.

In adjusting the rollers to give the proper tension to the apron to cause it to run in a line parallel with the sides of the table, it may be found necessary to place the lower ends of the rollers farther apart than their opposite or more elevated extremities. In any event if one chain can be dispensed with it saves the trouble of adjusting a chain every time the lower ends of the rollers are regulated. The upper end of one roller is provided with an extra sprocket wheel or pulley 17 for the motor chain or belt 18.

The material to be treated together with a quantity of water sufficient to give it the necessary mobility is carried to the table by a trough 19 and discharged therefrom upon the upper right hand corner of the apron, the movement of the apron being from right to left on the horizontal portion of its travel, and from left to right through the remaining or inclining portions of its travel within the tank.

Along the upper side of the table and in close proximity thereto is a water trough or tank 20 which is supplied with pure water by an inlet spout 21. Trough 20 is provided with openings 22 on the side next to the table, these openings being closed by valves 23 pivoted at a point 24 above the opening and provided with handles 25 projecting above the top of the trough and by means of which the valves are adjusted, according to the quantity of pure water needed in separating or concentrating the material discharged upon the apron the said valves being held in the posi-

tion to which they may be adjusted by friction. As shown in the drawings when the valve handles are in a vertical position the openings 22 are closed, while by moving these handles to one side or the other, these openings may be wholly or partially uncovered, permitting water to pass to the apron.

The trough 20 is provided with a small chute or spout 26 leading downward from each opening 22 and adapted to conduct the water therefrom to the apron. The lower side of the table is provided with a tailings trough 50 extending the entire length of the table and adapted to receive the gangue which is separated from the mineral by the pure water from trough 20 and carried downward in a direction transverse to the movement of the apron and discharged into said trough 50 while the mineral settles into the meshes of the apron and is carried therewith to the tank underneath, where the mineral is washed off and left in the tank, the apron being clean when it again reaches the upper surface of the table.

It will be observed that trough 19 discharges the material upon the apron close to the end of the table. This is desirable in order to utilize the entire length of the apron in the treatment of the ore. In order to prevent the possibility of any of this material working over the adjacent extremity of the table a strip 30 of wood or other suitable material is secured across the end of the table between the end of trough 19 and the roller 12 and above the apron. This strip 30 is provided with a strip 40 of rubber, or other suitable yielding material which projects below the wood and engages the apron. By means of this device the material is effectually prevented from working over the end of the table while the apron is at the same time permitted to move freely thereunder.

From the foregoing description the operation of the device will be readily understood. The power for operating the machine is transmitted from any suitable motor through the medium of a belt or chain 18 passing over a wheel or pulley on the end of one of the rollers 12. The movement of the apron depends upon the material treated, but in any event it is quite slow since the separation of the mineral from the gangue must take place while the ore is passing on the apron from one end of the table to the other. Ordinarily the movement of the apron is about one foot per minute, but it may be slower or more rapid as the conditions vary. The apron being in motion, as soon as the ore is dis-

charged thereon one or more of the valves 23 are opened and pure water allowed to flow upon the apron. It will be observed that the valve nearest trough 19 is opened first while the others are opened in regular order from the first toward the opposite end of trough 20. Ordinarily it will not be necessary to open all the valves, but the number necessary to be opened can be readily determined by the operator, the object being to subject the material to the action of enough water to carry the gangue across the apron to the tailings trough, the mineral being at the same time allowed to settle into the meshes of the apron. This mineral is washed from the apron as it passes through the water in the tank underneath as before stated.

I am aware that prior to my invention inclined aprons have been used in concentrators the "gangue" being removed from the said aprons by suitable devices, and I do not therefore broadly claim such a construction, but

What I claim is:—

In an ore-concentrator the combination with a stationary table inclined transversely, lying in a horizontal plane longitudinally and having end-rollers adjustably supported by slotted projections 13, and an adjustable tension-roller 14, supported transversely beneath the stationary table, of a vessel adapted to contain water supported beneath said table and extending from end to end thereof, a textile apron provided with meshes for receiving and temporarily containing mineral therein, a trough 19 for delivering mobilized material to the upper right-hand corner of the apron, a water-trough or tank 20, provided with an inlet spout 21, and openings 22 provided with pivot-valves 23 having handles 25 projecting above the top of the trough 20, for adjusting said valves to regulate the supply of pure water, the chutes or troughs 26, leading from the opening 22, and adapted to conduct the water therefrom to the apron, the tailings-trough 50, at the lower side of the table, the transverse strip 30 having a strip 40 of yielding material secured to the strip 30, and projecting below the same to engage the horizontal portion of the movable apron, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM P. OGDEN.

Witnesses:

WM. MCCONNELL,
FRED. W. FELDWISCH.