

(No Model.)

2 Sheets—Sheet 1.

T. J. HATCH.
CONCENTRATOR.

No. 544,254.

Patented Aug. 6, 1895.

FIG. 8.

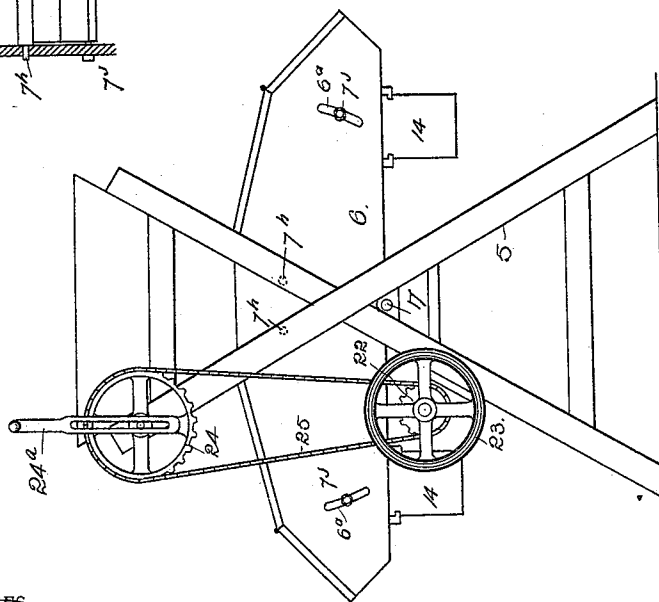
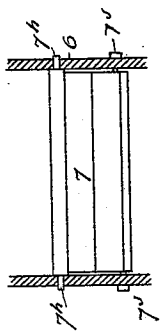


FIG. 1.

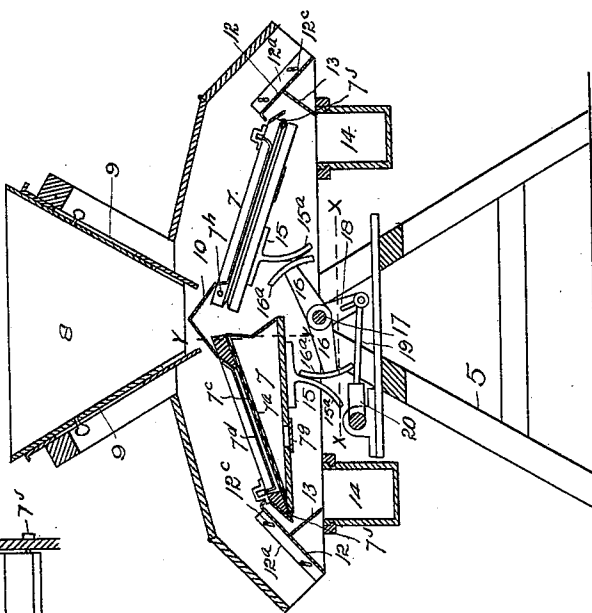


FIG. 2.

WITNESSES

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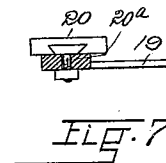
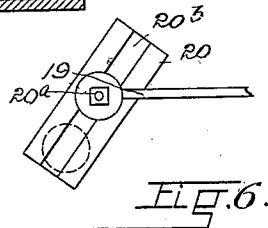
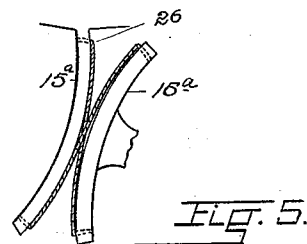
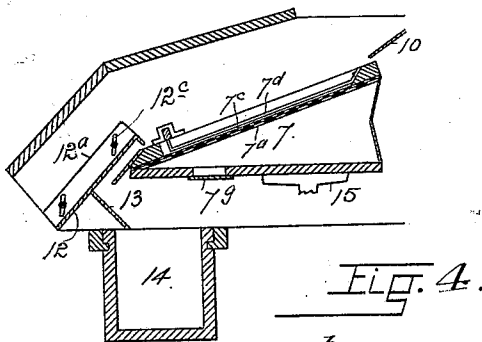
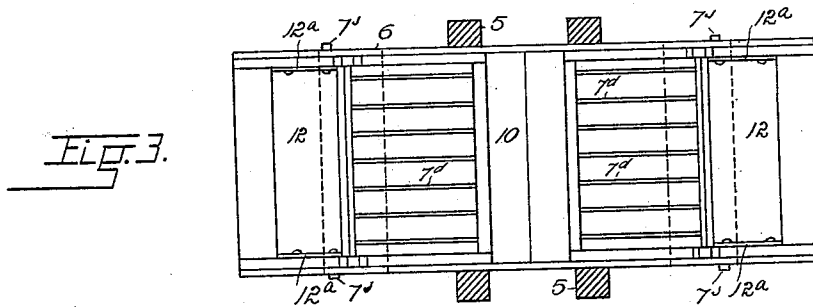
(No Model.)

2 Sheets—Sheet 2.

T. J. HATCH.
CONCENTRATOR.

No. 544,254.

Patented Aug. 6, 1895.



WITNESSES:
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UNITED STATES PATENT OFFICE.

THOMAS J. HATCH, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO
ELISHA J. NOLDS, OF SAME PLACE.

CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 544,254, dated August 6, 1895.

Application filed September 22, 1894. Serial No. 523,805. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. HATCH, 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 dry placer machines or concentrators; and it consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a vertical section of the same. Fig. 3 is a top or plan view with the hopper removed. Fig. 4 is a fragmentary section showing the parts on a larger scale. Fig. 5 is a fragmentary detail view illustrating the manner of connecting the arms on the rock-shaft with the bellows. Fig. 6 is an enlarged side view illustrating the crank-arm on the main shaft and the adjustable wrist-pin carried by said arm and connected with the pitman. Fig. 7 is an end view of the same. Fig. 8 is a section taken through the casing on the line *y y*, Fig. 2.

Similar reference-characters indicating corresponding parts or elements in the views, let the numeral 5 designate the framework composed of two pairs of intersecting or crossed bars suitably separated and connected. Between the two pairs of bars 5, and supported therein, is the casing 6. Between the sides of this casing are located the bellows 7, their expanding ends being located toward each other and in suitable proximity. The upper or stationary face of each bellows is composed of an inner screen 7^a, forming the support for a cloth covering 7^b, outside of which is located a coarse screen 7^c, adapted to maintain the cloth in place and prevent its swelling upward under the influence of the air-current

from beneath. The lower or movable face or part of each bellows is formed with a suitable valve 7^d, adapted to allow the air to enter during the expansion of the bellows and prevent it from escaping during the contraction thereof. These bellows are so constructed that the only escape from their air-chambers is through their upper screen-faces.

Attached to the framework above the bellows and adapted to discharge into the casing is the hopper 8, to whose sides are attached the adjustable plates 9, whose function is to regulate the opening at the bottom of the hopper and control the feed therefrom. Directly beneath the opening in the hopper is located a deflector 10, bridging the space between the two bellows, and having oppositely-inclined sides which divide the material fed from the hopper and direct or distribute it in approximately equal quantities upon the screen-faces of the bellows.

At the lower extremity of each bellows and adjustably supported between the two sides of the casing is located an apron or plate 12, having flanges 12^a, provided with inclined slots 12^b, through which are passed set-screws which enter the sides of the casing. The space between the upper end of this apron or plate and the lower extremity of the upper face of the bellows is regulated by the adjustment of this plate, which is accomplished by loosening the set-screws and sliding the plate upward or downward, as may be desired. The function of the apron is to separate the gangue which is uppermost on the screen-face of the apron from the mineral below, whereby the latter passes beneath the apron, while the former passes thereover and is thus discharged from the machine. To the bottom of the apron is attached a depending plate 13, which the mineral engages as it leaves the bellows. By means of this plate the mineral is directed or guided into a box 14 below, slidably attached to the casing, where by it may be removed at pleasure. To the bottom of the lower side of each bellows is attached a plate 15, having a segmental projection 15^a, adapted to engage a corresponding segment 16^a, made fast to the extremity of an arm 16 on the rock-shaft 17, to which is also made fast a crank-arm 18, connected with one

extremity of a pitman 19, the opposite extremity of which is attached to a wrist-pin 20, adjustable within a dovetailed groove 20^b of the crank-arm, made fast to the main shaft 21, journaled in the framework and carrying a sprocket-wheel 22 and a fly-wheel 23. The sprocket 22 is connected with a crank-sprocket 24 by means of a chain 25.

The segments 15^a and 16^a may be connected in operative relation by any suitable means. As shown in the drawings, this connection is made by short wire cords or cables 26. One extremity of each cable is connected with one end of the segment 16^a and the other end of the cable with the more remote end of the segment 15^a. The two cables thus cross each other in forming the connection between the two segmental faces. As the two segments 15^a and 16^a are located on opposite sides of the rock-shaft, when one bellows is closed or contracted the other is opened or expanded, and vice versa.

From the foregoing description the operation of the mechanism will be readily understood. By turning the crank 24^a on the sprocket-wheel 24 motion is transmitted through the medium of chain 25 to the shaft 21, and thence through the medium of the crank-arm, the pitman 19, and the crank-arm 18 to the rock-shaft 17, and thence through the medium of the arms 16, the segment 16^a, and the segment 15^a to the two bellows 7, which are operated by virtue of the connection between the adjacent faces hereinbefore described. During this movement of the bellows the material to be treated is fed into the hopper and passes therefrom to the deflector 10, and thence to the inclined screen-faces of the two bellows 7. As soon as the material reaches the bellows it is subjected to the action of the air, which is forced through the screen of the bellows by the oscillating movement of their lower parts or faces. These air-currents serve to separate and disintegrate and agitate the dry pulverized or placer material, and at the same time cause it to move downward and outward toward the lower extremities of the bellows. During this action of the material the mineral particles, which are of greater specific gravity than the gangue, seek and occupy the lowest possible position on the bellows-faces, while the gangue assumes a position on top thereof. Hence when the material leaves the lower extremity of the bellows the mineral passes beneath the apron-plates and thence into the boxes, drawers, or receptacles 14 beneath, while the gangue passes over the tops of the aprons, since the space between the aprons and the lower extremities of the bellows must not be large enough to allow the gangue to pass under the apron. The upper extremity of the plate 12 is curved downwardly, forming a sort of riffle over which the gangue passes.

The inclination of the upper surface of each bellows is regulated according to the quality or condition of the material under treatment.

To this end the upper extremity of each bellows is pivoted in the casing by means of spindles 7^h, formed on the bellows and entering suitable apertures in the casing, while the lower or hinged extremity of each bellows is provided with spindles 7^j, which may be a continuation of the hinge-pin connecting the upper and lower parts of the bellows. The spindles 7^j project through curved slots 6^a formed in the casing, and are threaded to receive nuts which engage the casing. By loosening these nuts the lower extremities of the bellows may be raised or lowered at pleasure, while by retightening the nuts each bellows may be secured in the adjusted position.

Having thus described my invention, what I claim is—

1. In a concentrator, the combination of the framework, an inclined bellows mounted thereon, its upper side being composed of screen, a rock shaft having an arm provided with a segment, a counterpart segment attached to the bottom of the bellows, cords for connecting the segmental faces in operative relation, and suitable means for operating the rock shaft, substantially as described.

2. In a concentrator, the combination with the framework, of the bellows having its upper side covered with screen, a rock shaft carrying a segment attached to a suitable arm, another corresponding segment attached to the bottom of the bellows, suitable cords or cables connecting the segmental faces in operative relation, another shaft journaled in the frame, and a pitman connecting the last named shaft with the rock shaft, substantially as described.

3. In a concentrator, the combination with the framework, of a casing supported thereon, a bellows located between the two sides of the casing and having an upper screen face, a plate located at the lower extremity of the bellows and so located as to divide the mineral from the gangue, and suitable means connected with the lower side of the bellows for oscillating the same, said means consisting of a rock shaft carrying a segmental plate, a similar plate attached to the bellows, and cords connecting the adjacent faces of these plates in operative relation substantially as described.

4. In a concentrator, the combination with the framework, of a pair of bellows supported thereon in suitable proximity, and provided with screen faces, a plate located at the lower extremity of each bellows and adapted to divide the mineral from the gangue, a rock shaft having two arms provided with segmental faces, corresponding segmental faces or plates attached to the bottom of each bellows, means for connecting the segmental faces in operative relation a main shaft, and a pitman for connecting the last named shaft with the rock shaft, substantially as described.

5. In a concentrator, the combination of the framework, a plural number of inclined bellows supported thereon and having screen-

sides or faces, means located at the lower extremity of each bellows for dividing the mineral from the gangue, a rock shaft journaled in the framework and carrying segmental plates, other similar plates attached to the bellows, cords connecting the adjacent faces of these plates, and suitable means for operating the rock shaft, substantially as described.

6. In a concentrator, the combination with the framework, of a plural number of bellows supported thereon and having the upper sides composed of screen adapted to receive the material to be treated, each bellows being provided with a segmental plate attached to its lower or oscillating side, a rock shaft journaled in the frame and provided with arms terminating in segmental plates cords connecting said plates in operative relation with the similar plates attached to the bellows, a main shaft also journaled in the frame, and a pitman connecting the last named shaft in operative relation with the rock shaft, substantially as described.

7. In a concentrator, the combination with the framework, of a plural number of bellows supported thereon, their upper sides or

faces being composed of screen, and the lower faces adapted to oscillate, a main shaft and an intermediate rock shaft, a pitman connecting the two shafts, and suitable means for connecting the rock shaft with the oscillating sides of the bellows whereby the bellows are operated by the rotation of the main shaft, said means consisting of segmental plates and cords connecting the adjacent faces of the plates substantially as described.

8. In a concentrator, the combination with the framework, of the bellows having a screen upper face, a rock shaft carrying a segmental plate, other similar plates attached to the bellows, cords connecting the adjacent faces of the segmental plates, a main shaft provided with a crank arm having an adjustable wrist pin, and a pitman connecting said wrist pin with a suitable crank arm on the rock shaft, substantially as described.

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

THOMAS J. HATCH.

Witnesses:

G. J. ROLLANDET,
E. J. NOLDS.