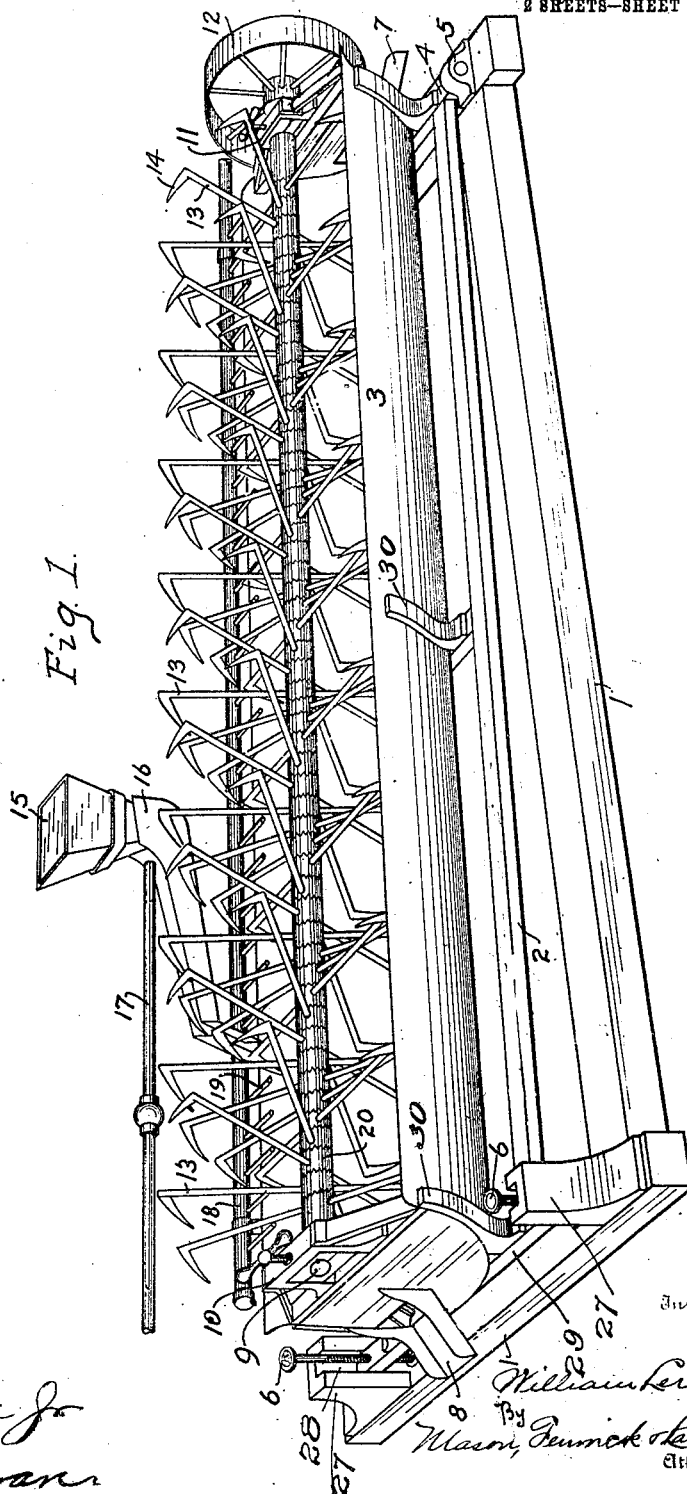


No. 837,082.

PATENTED NOV. 27, 1906.

W. LERCHEN.  
ORE CONCENTRATOR.  
APPLICATION FILED SEPT. 5, 1905.

2 SHEETS—SHEET 1.



Witness  
J. M. Fowlie, Jr.  
E. C. Crooman

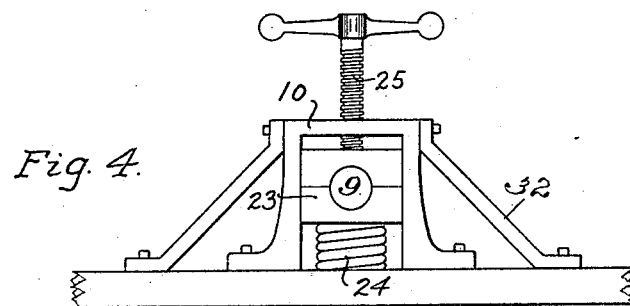
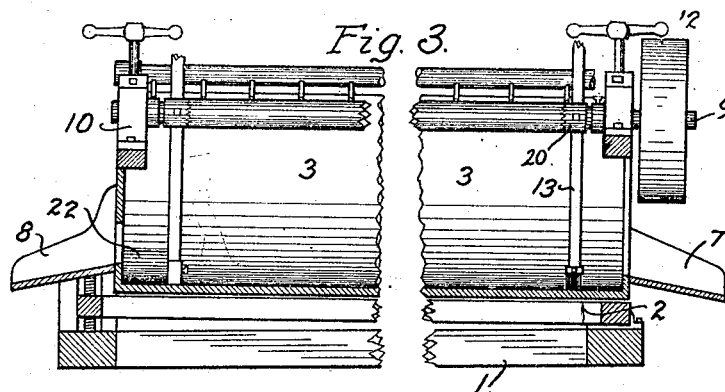
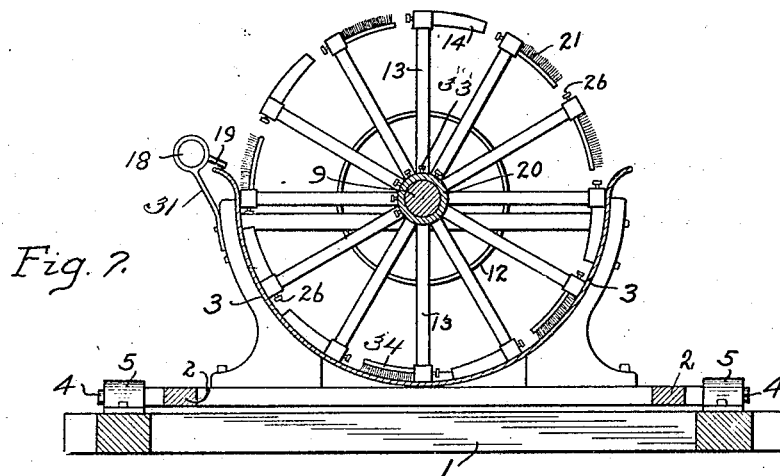
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

WILLIAM LERCHEN, OF DENVER, COLORADO, ASSIGNOR OF ONE-THIRD  
TO WILLIAM BEMROSE, OF ALMA, COLORADO

## ORE-CONCENTRATOR.

No. 837,082.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed September 5, 1905. Serial No. 277,030.

*To all whom it may concern:*

Be it known that I, WILLIAM LERCHEN, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Ore-Concentrators; and I do hereby 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.

This invention relates to improvements in ore-concentrators.

The object of the invention is the provision of means for facilitating the separation of precious metals from ores.

With this and other objects in view the invention consists in certain other novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a mechanism constructed in accordance with the present invention. Fig. 2 is a transverse sectional view of the mechanism depicted in Fig. 1. Fig. 3 is a longitudinal sectional view of the mechanism illustrated in Fig. 1, the agitating members being removed from the horizontal revoluble shaft. Fig. 4 is a fragmentary end view of the mechanism, showing the adjusting means for the ends of the agitating-member-carrying shaft.

Referring to the drawings, 1 designates a platform of any preferred structure, which is provided at its front or forward end with bearing-blocks 5 5. The platform 1 at its rear end is provided with parallel standards 27. Each of the standards 27 is provided with a groove 28 formed upon its inner face, within which is positioned one end of the horizontal beam 29. The parallel beams 2 are connected at one end to the horizontal beam 29 and at their forward ends are secured to a horizontal beam or support 4. The beam 4 is provided with trunnions at each end, which are journaled in the bearing-blocks 5. The beams 2 and 29 constitute a frame upon which are secured curved standards 30. These standards 30 are preferably secured to the vertically-movable frame in parallel positions.

A semicylindrical shell or casing 3, consti-

tuting a trough, is positioned between the curved standards 30. At the lower or front end of the semicylindrical casing there is secured a spout 7, which is employed for discharging the liquid and tailings from the casing. Upon the upper end of the casing there is secured a spout 8, similarly constructed to spout 7.

It will be obvious that the frame is pivotally mounted at the front of the platform, and to facilitate the vertical adjustment of said frame I employ vertical screws 6 6, which when rotary movement is imparted thereto will raise or lower the rear end of the frame, and consequently the casing. Thus the adjustment of the frame and casing is accomplished by reason of the fact that the screws 6 engage the horizontal beam 29, Fig. 1. By adjusting the rear end of the frame the desired slant or inclination of the casing 3 may be obtained for causing successful separation of the metals from the tailings.

The casing 3 is preferably provided with flanged horizontal edges for facilitating the discharge of liquid into said casing. Brackets 31 are secured to upper ends of the curve standards 30 and are arranged to support the horizontal inlet-pipe 18. The liquid-supply pipe 18 is provided with a plurality of laterally-extending discharge-nozzles 19 for spraying the liquid over the agitating device and into the casing 3. The liquid-pipe 18 is arranged at one end for connecting with any suitable reservoir.

The tailings or crushed ore may be fed to the casing 3 through hopper 15 and spout 16. If it is desired, liquid may be discharged into spout 16 through pipe 17, thereby assisting in discharging said tailings or crushed ore into said casing 3.

The agitating device comprises an approximately horizontal shaft 9, which is journaled in adjustable boxes vertically movable in the guides 10 and 11, the said boxes having means for controlling the position of the shaft with relation to the casing 3. The box in the guide 11 is constructed in a similar manner to the box in the guide 10, which is illustrated in detail in Fig. 4.

Referring to Fig. 4, it will be seen that the box 23 is positioned within the guide 10, which is preferably rectangular in shape. The guide 10 is provided at each side with a brace 32. Interposed between the box 23

and the upper edge of the end of the casing 23 is a cushioning member, preferably a spring 24. A screw 25 is carried by the guide or frame 10 and is adapted to move the box 23 downward, and consequently compress the spring 24. Upon rotating the bolt or adjusting device 25 for feeding the same upward the spring 24 will lift the box 23 and the end of the shaft 9. Upon the front or lower end of the shaft 9 there is fixedly secured a drive-belt wheel 12. A plurality of collars 20 are carried by the shaft 9. Each collar is preferably provided with a pair of opposite and diametrical extending arms 13. Each collar 20 is adjustably secured in position on the shaft 9 by a set screw or bolt 33. Each of the collars 20 is provided, as just intimated, with a plurality of arms 13, and some of said arms are provided with removable adjustable blades 14, while other arms are provided with removable and adjustable brushes 34. Each blade 14, as well as the back of each brush 34, is preferably curved, so as to make it segmental in shape and enable it to conform to the inner surface of the cylindrical casing 3. Of course it will be obvious that if it is desired only the outer edge of the blades 14 need be curved, as the inner edge may be straight. The blades 14 and the brushes 34 are secured in a fixed position upon the arms 13 by means of thumb-screws 26. The brushes 34, as well as the blades 14, are preferably positioned upon the arms 13, so as to place their outer ends nearer to the upper end of the casing 3 than the end which is secured to the arm. Each collar 20 is provided with a recessed or notched portion on one end and with a tooth upon its opposite end. By reason of this notch-and-tooth structure of the collars they are adapted to interlock for fixedly securing the same upon the shaft, and thereby prevent independent rotary movement. This structure of the collars also makes it possible to alter the radial relation of the arms with respect to each other by changing the relation of each collar with respect to its adjacent collars.

In the drawings I have preferably shown the collars provided at each edge with a plurality of recesses producing tooth projections which engage similar projections and recesses on the adjoining or abutting collar. Owing to the peculiar positioning of the agitating members upon the shaft, a spiral structure is produced which will, through the medium of the blades and brushes, constituting fingers or plows, feed the precious metal from the lower portion of the casing to the upper end thereof. The tailings being lighter than the metals will be discharged through the lower opening of the casing with the liquid; but the metals, owing to their weight, will drop to the bottom of the concentrator and will be fed toward the upper end of the casing 3 and subsequently pass

from said casing through the upper aperture and the spout 8.

By reason of the spiral structure of the agitating device the crushed ore which is deposited in the casing is continually agitated when the mechanism is in operation. By reason of the peculiar structure of the blades and brushes the brush will positively remove any tailings or crushed ore from the sides and bottom of the casing 3, and owing to the positioning of said brushes, as well as the blades upon the arms, the plow action will be obtained for shoveling or throwing the ores toward the upper end of the concentrator.

The collars 20, which are carried by the shaft 9, constitute an outer or sectional shaft surrounding the primary shaft 9; and the outer or auxiliary shaft carries agitating members which are arranged spirally thereon.

A shovel-like blade, as 22, is provided and preferably arranged near one end of the casing 3, the blade being so positioned as to facilitate the scraping up of the metal from the bottom of the casing and the delivering thereof to the opening which leads to the spout 8.

What I claim is—

1. In a mechanism of the class described, the combination with a support, of a semicylindrical casing carried by said support, a horizontal shaft carried by said casing, interlocking collars carried by said shaft, a blade and brush carried by each of said collars and separate discharges for ore and gangue.

2. In a mechanism of the class described, the combination with a support, of an angularly-adjustable casing carried by said support, a vertically-adjustable shaft carried by said casing, a collar carried by said shaft, an adjustable brush and blade carried by said collar and separate discharges for the ore and gangue.

3. In a mechanism of the class described, the combination with a support, of a semicylindrical casing carried by said support and vertically adjustable at one end, a revoluble shaft journaled upon said casing, removable interlocking collars carried by said shaft, an arm carried by each of said collars, a removable and adjustable member carried by the said arm and separate discharges for the ore and gangue.

4. In a mechanism of the class described, the combination with a support, of a pivotally-mounted frame carried by said support, a semicylindrical casing provided with longitudinal flanged edges carried by said frame, a vertically-adjustable shaft journaled upon said casing, interlocking collars carried by said shaft, and spirally-arranged agitating members secured to said collars and discharges for the ore and gangue located at opposite ends of the casing.

5. In a mechanism of the class described, the combination with a casing, of an adjustable revoluble shaft carried by said casing,

interlocking collars carried by said shaft and constituting an outer shaft, an adjustable blade and brush carried by each of said collars and discharges for the ore and gangue located at different points in said casing.

6. In a mechanism of the class described, the combination with a support, of an angularly-adjustable casing carried by said support, a vertically-adjustable shaft carried by said casing, mutually-interlocking collars carried by said vertically-adjustable shaft, spirally-arranged agitating members carried by said collars and discharges for the ore and gangue.

7. In a mechanism of the class described, the combination with a support, of a vertically-adjustable semicylindrical casing carried by said support, said casing provided with longitudinal flanged edges, a spout secured to each end of said casing, a vertically-adjustable, revoluble shaft journaled upon other ends of said casing, revoluble collars carried by said shaft, means connecting said collars for preventing independent movement thereof, and spirally-arranged agitating members carried by said collars.

8. In a mechanism of the class described, the combination with a support, of a casing carried by said support, means to move one end of the casing relative to the opposite end as a pivot, a revoluble shaft carried by said casing, means for adjusting one end of said shaft vertically relative to the casing, removable collars carried by said shaft, fastening means formed upon and engaging the edges of said collars for securing the same against independent movement, and an agitating member carried by one of said collars.

9. In a mechanism of the class described, the combination with a casing provided with ore and gangue discharge spouts at opposite ends, of a shaft carried by said casing, an arm carried by said shaft, and a removable segmental brush carried by said arm arranged for operative contact with the inner surface of the casing.

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

WILLIAM LERCHEN.

Witnesses:

CARLE WHITEHEAD,  
WILLIAM B. STEARNS.