(No Model.)

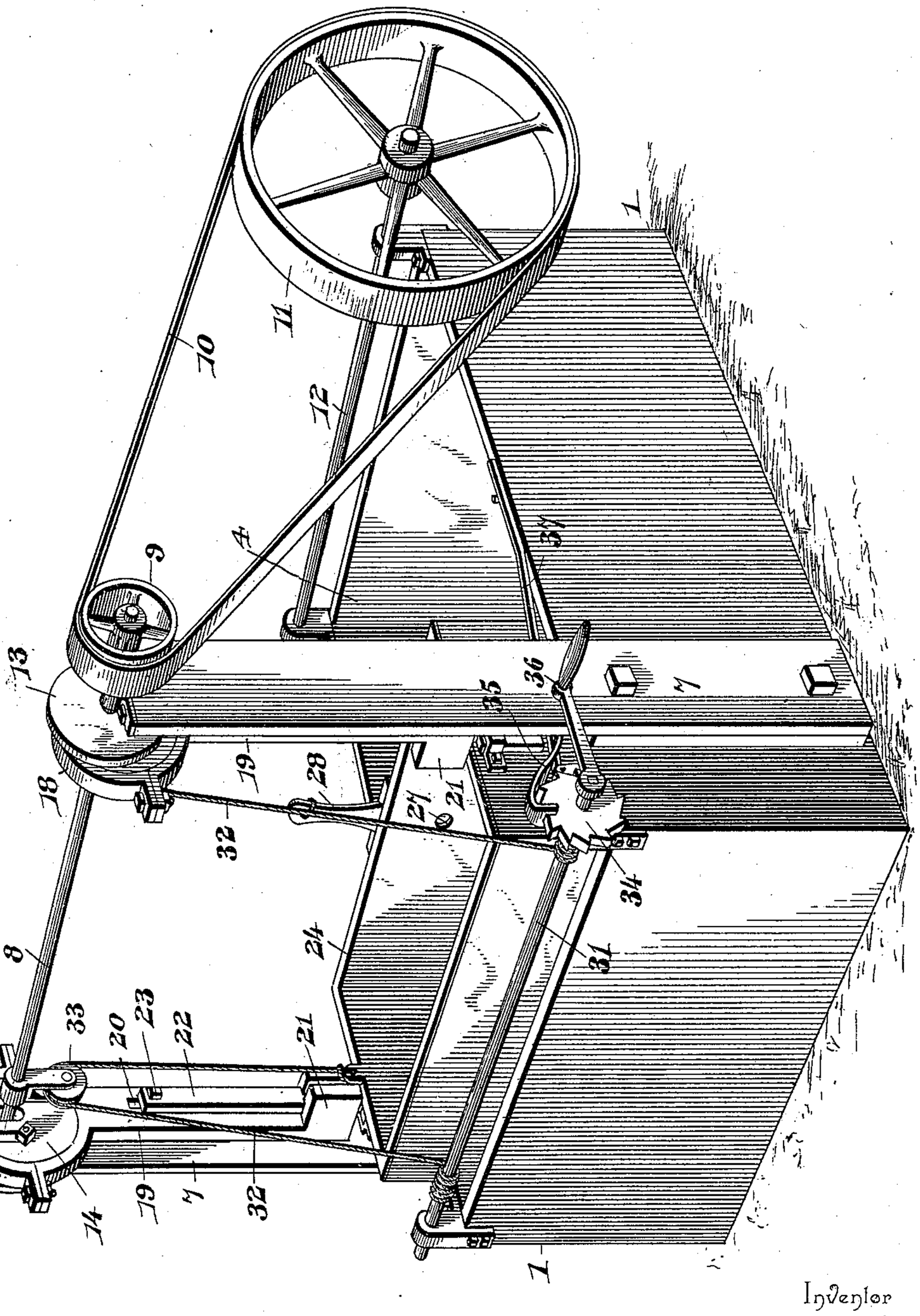
3 Sheets—Sheet 1.

A. W. PATTERSON.

ORE SEPARATOR.

No. 601,815. Patented Apr. 5, 1898.

Fig. 1.



Witnesses

Jas. K. McCathran

C. B. Hillyard.

Inventor

Andrew W. Patterson

By his Attorneys,

C. A. Snow & Co.

(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

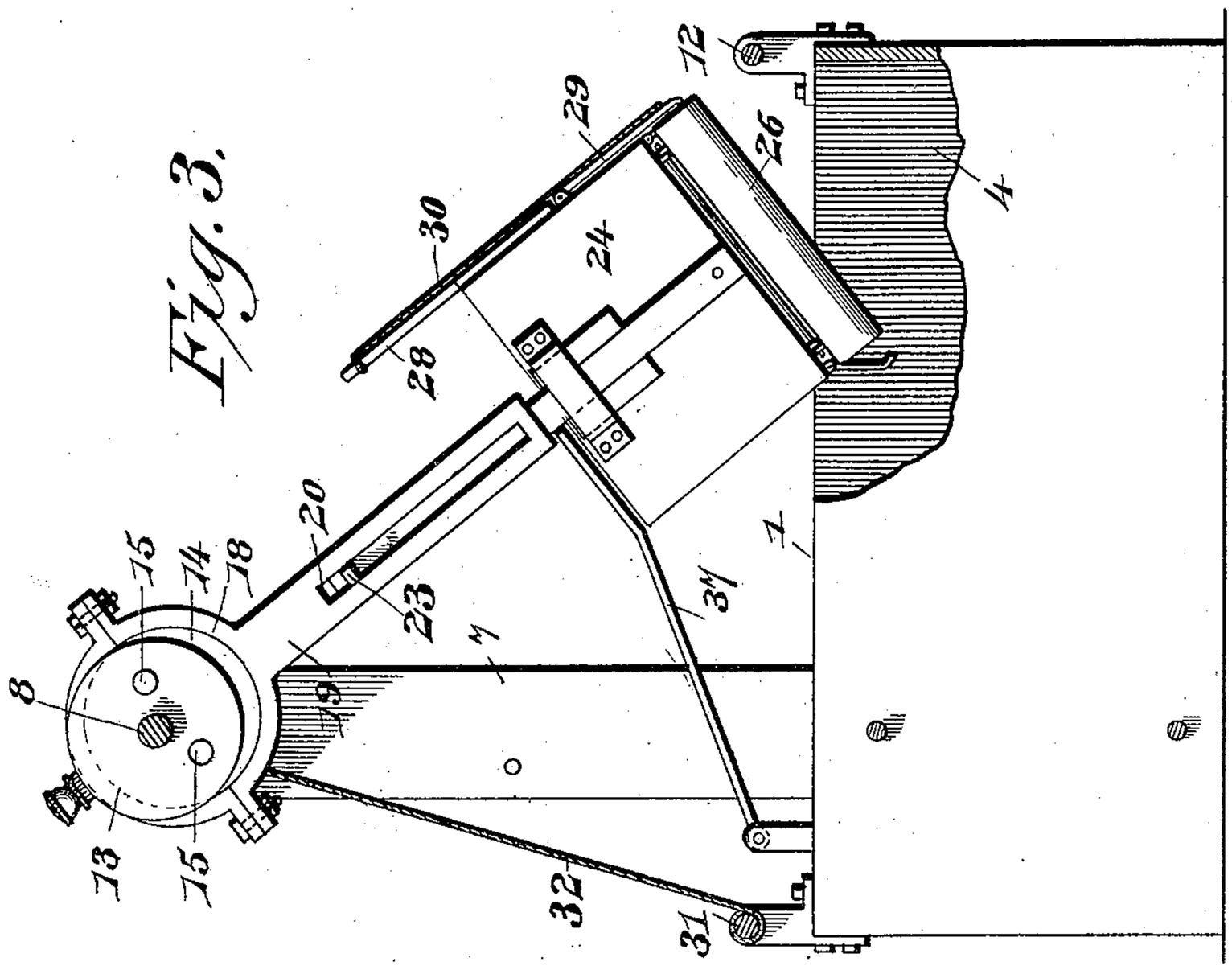
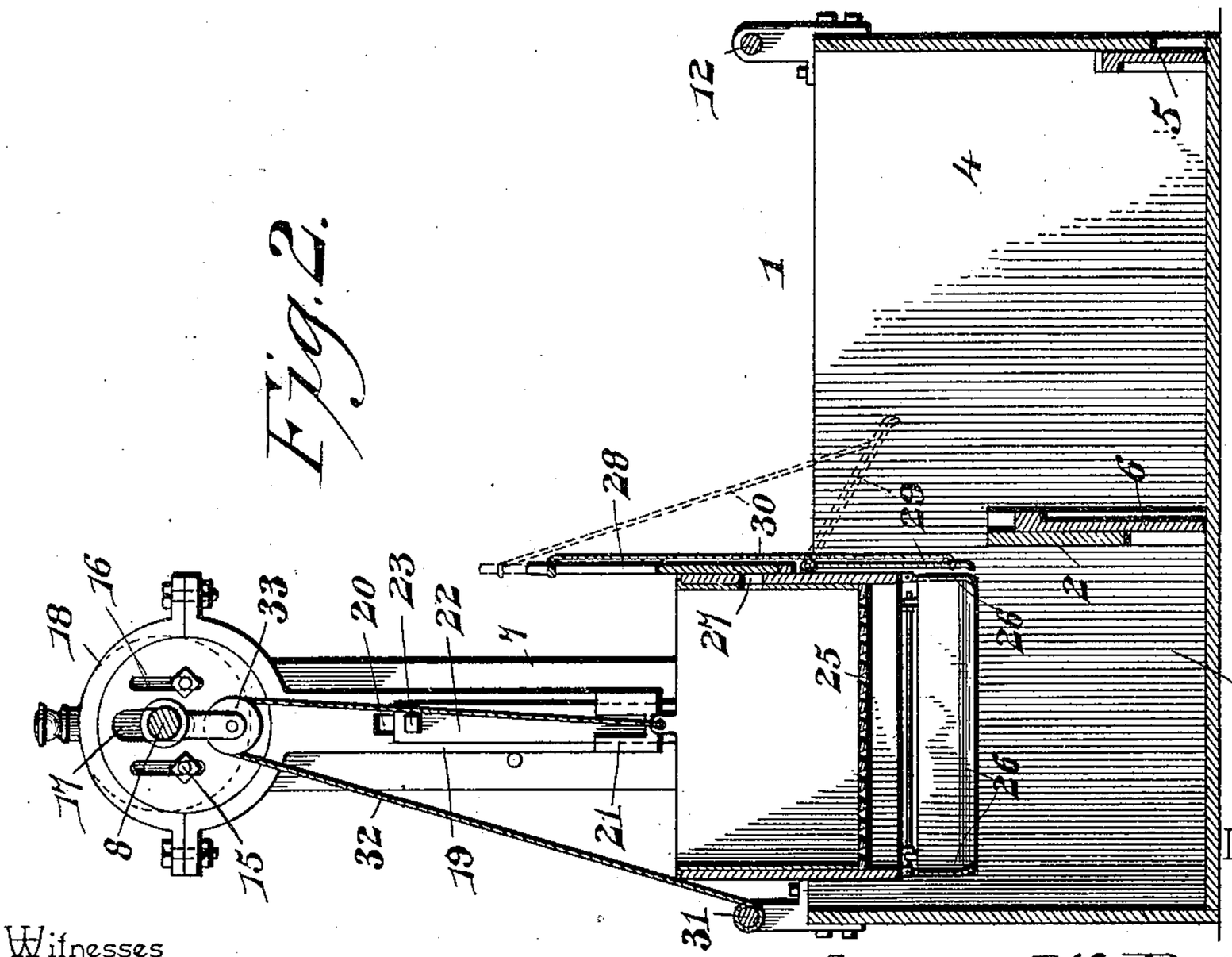


Fig. 2.



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Jas. K. McCathran
C. B. Hillyard.

Inventor
By his Attorneys,
Andrew W. Patterson
C. A. Snow & Co.

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Fig. 4.

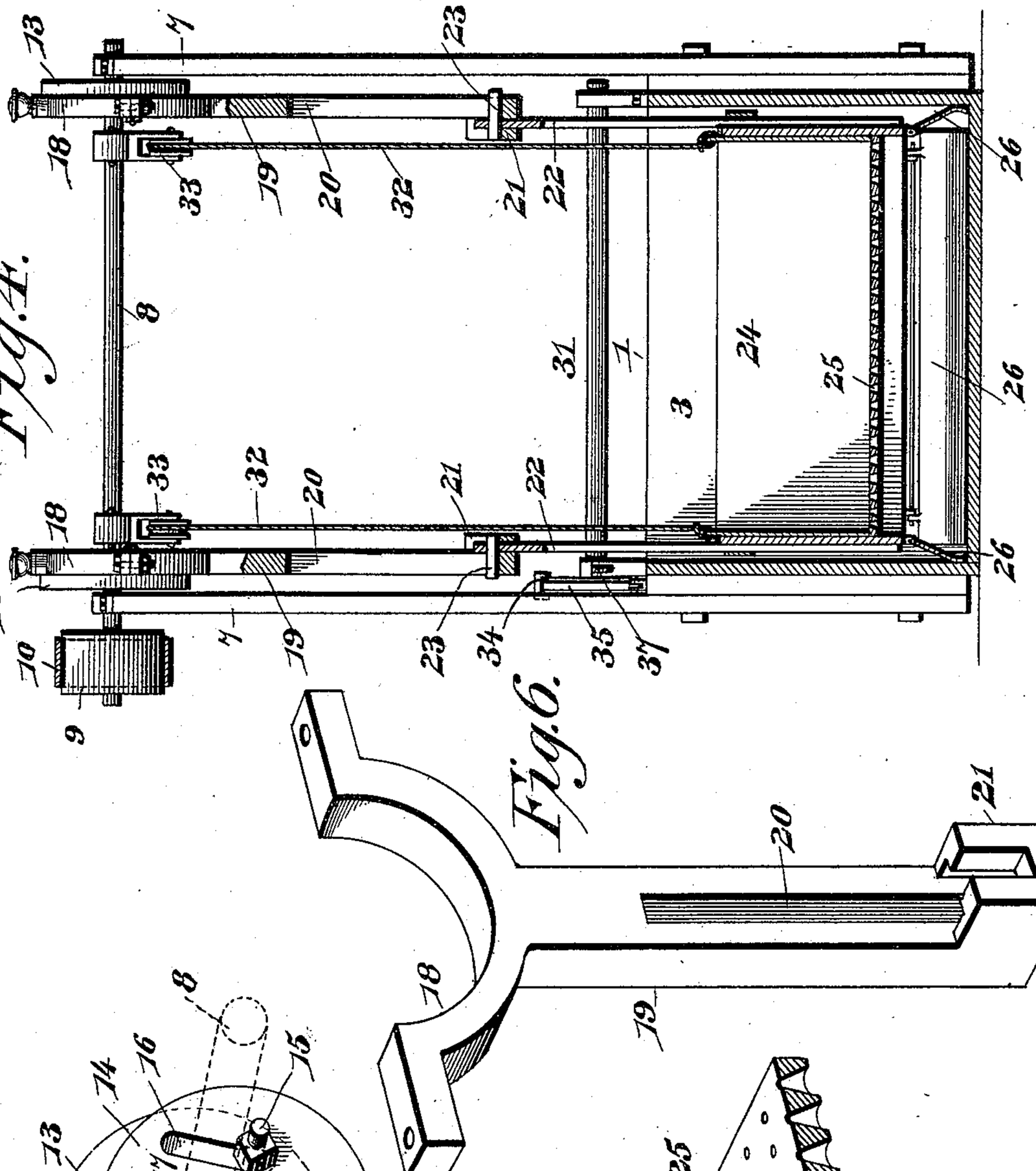


Fig. 6.

Fig. 5.

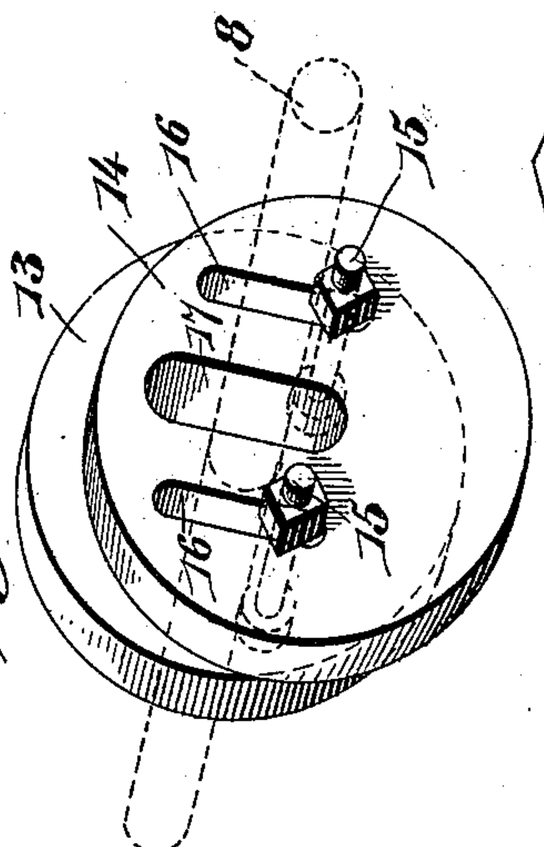
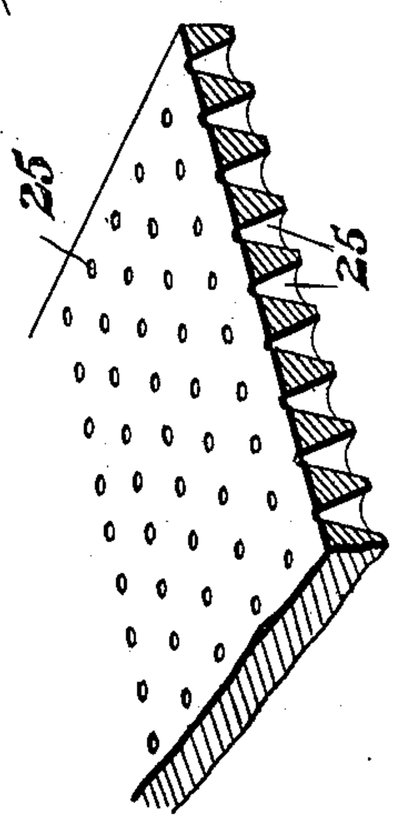


Fig. 7.



Witnesses
Jas. K. McCathran
C. B. Hillyard.

Inventor
By his Attorneys,
Andrew W. Patterson
Church & Co.

UNITED STATES PATENT OFFICE.

ANDREW W. PATTERSON, OF AURORA, MISSOURI.

ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 601,815, dated April 5, 1898.

Application filed May 26, 1897. Serial No. 638,288. (No model.)

To all whom it may concern:

Be it known that I, ANDREW W. PATTERSON, a citizen of the United States, residing at Aurora, in the county of Lawrence and State of Missouri, have invented a new and useful Ore-Separator, of which the following is a specification.

This invention relates to ore-separating apparatus of the class embodying a jig-box, in which the mineral is placed and immersed in a tank containing water, the sand, mud, and light matter being separated from the mineral by the combined action of the water and the reciprocating movement of the jig-box.

A principal object of the invention is to obviate the use of a pole for reciprocating the jig-box and saving the operator the time and effort required to travel from the box to the end of the pole after each operation and replenishing of the box.

A further advantage is to have the parts disposed in as small a space as possible, so that in inclement weather the operator is protected and a minimum amount of covering required for housing the apparatus and the attendant.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of an ore-separator constructed in accordance with this invention. Fig. 2 is a longitudinal section thereof. Fig. 3 is a side elevation having the near side of the tank broken away and showing the sieve or jig-box held from over the vat to permit of access thereto. Fig. 4 is a transverse section. Fig. 5 is a detail view of an adjustable eccentric for varying the movement of the jig-box. Fig. 6 is a detail view in perspective of the guide-bar having the lower portion of the eccentric-yoke applied thereto. Fig. 7 is a detail view of the perforate bottom or sieve closing the lower end of the jig-box.

Corresponding and like parts are referred to in the following description and indicated in the several views of the accompanying drawings by the same reference characters.

The tank or body 1 of the apparatus may be of desired form and, as shown, is of rectangular outline and is subdivided by a transverse partition 2, forming a vat 3 and a sludge-box 4, which are in communication above the partition, as the latter extends a short distance above the middle of the tank or body. The walls of the vat are vertical, which is essential, as will appear presently, to insure a practically close fit between the said walls and the jig-box to insure a thorough and rapid separation of the mineral. A gate 5 closes an opening in the lower end of the rear wall of the tank, and a similar gate 6 closes an opening in the lower portion of the partition 2, and both gates operate in suitable guides, which direct them in their movements and retain them in place.

Uprights 7 are secured to the sides of the tank near its front end and are provided at their upper ends with bearings in which is journaled a shaft 8, provided at one end with a band-pulley 9 and driven by means of a belt 10 from a band-wheel 11 on the end of a shaft 12, journaled in bearings at the rear end of the tank, said shaft 12 being driven by hand or in any way desired. Plates or disks 13 are secured to the end portions of the shaft 8 and have disks 14 adjustably connected therewith and forming the eccentrics by means of which the jig-box is actuated. The disks or eccentrics 14 are secured to the inner faces of the plates or disks 13 in such a manner as to admit of their adjustment to vary the movement of the jig-box within certain limits and are held in place by bolts or similar fastenings 15, passing through the plates or disks 13 and operating in slots 16 of the eccentrics 14, said slots 16 being disposed in parallel relation and upon opposite sides of an intermediate slot 17, which affords clearance for the shaft 8, so as to admit of the eccentrics being shifted to the desired position when required. Yokes 18 coöperate with the eccentrics 14 to transmit a reciprocating motion to the jig-box. The guide-bars 19 have connection with the yokes and have the lower portion thereof formed therewith and are provided with longitudinal slots 20 and a lateral

cuff 21 at their lower ends, through which bars 22, secured to the jig-box, are adapted to operate. The bars 22 are secured at their lower ends to the ends of the jig-box and have pins 23 at their upper ends to operate in the longitudinal slots 20, whereby the jig-box is caused to move vertically without causing any binding between the bars 22 and the cuffs 21 when the box is raised and lowered with reference to the vat 3.

The jig-box 24 may be of any desired shape and is oblong and of rectangular form, and is of such relative dimensions as to fit easily within the vat 3, so as to move therein when reciprocated. This box is preferably metal-lined in order to render it more durable, and the body is composed of wood for the sake of lightness. The bottom of the jig-box is closed by a screen or plate, the latter formed with a series of perforations 25, which are contracted at their upper ends and flare outwardly and downwardly to prevent the lodging and wedging of any substance therein, as any matter which will readily pass through the contracted end of the openings will not bind because of the flare given to the walls of the openings. Plates 26 are hinged or loosely connected at their upper edges to the sides of the jig-box and have their lower edges bent inward, made rounding, or otherwise constructed so as not to engage with the sides of the vat to check the descent of the jig-box therein. These plates are intended to swing outward at their lower edges and ride upon the inner walls of the vat, so as to secure a practically close fit between the jig-box and vat, whereby the water is compelled to pass through the perforate bottom of the jig-box when the latter is reciprocated and lowered therein, whereby the light matter—such as earth, sand, and sludge—is carried off. An opening 27 is formed in the rear side of the jig-box and is closed by a gate 28, which operates in suitable guides, and this opening when uncovered admits of the water and fine sand in the upper portion of the jig-box escaping into the sludge-box just prior to removing the mineral from the jig-box. A plate 29 is hinged at its upper edge to the rear side of the jig-box, at a point below the opening 27, and normally occupies a pendent position and has connection with the gate 28 by means of a cord or chain 30, and when elevating the gate 28 to disclose the opening 27 the plate 29 is brought from a pendent to an inclined position, whereby the water and sand are directed into the sludge-box and prevented from entering the vat.

The jig-box, in addition to its reciprocating movement in the vat, is adapted to be raised and lowered to admit of the separated ore being removed therefrom and the ore to be separated or treated supplied thereto, and to attain this end the jig-box has connection with a windlass 31 at the front end of the tank by means of cords or chains 32, the latter being connected at their lower extremities with the ends of the jig-box and passing over sheave-pulleys 33, loosely mounted upon the shaft 8, the opposite ends of the cords or chains being connected with the windlass to be wound thereon for raising and lowering the jig-box, as may be required. A ratchet-wheel 34 is secured to one end of the windlass and its teeth are engaged by a pawl 35, whereby the jig-box is held in an adjusted position. A crank 36 is applied to the windlass and enables the latter to be turned for regulating the height of the jig-box with reference to the tank or vat. By having the sheave-pulleys 33 loosely mounted upon the shaft 8 the latter is enabled to turn without changing the relation of the pulleys, the frames or blocks of the said pulleys being provided at their upper ends with bearing-sleeves, through which the said shaft 8 passes.

The ore to be separated after being crushed or otherwise suitably reduced is supplied to the jig-box, the latter being elevated for this purpose, and when sufficiently loaded the jig-box is lowered into the vat by means of the windlass, and the shaft 12 being rotated either by hand or other suitable power the jig-box by reason of the eccentrics 14 and intermediate connections has imparted thereto a reciprocating motion which settles the mineral and loosens the slime, sand, &c., which latter may be drawn off through the opening 27 or flow over the sides of the jig-box, as required. The fine ore or mineral will pass through the perforate bottom or sieve of the jig-box into the vat and may be collected, when required, by elevating the jig-box and pushing it to one side and holding it in this position by means of a brace 37, as indicated in Fig. 3. The sludge-box is cleared of the slime by opening the gate 5, and the vat 3 is subsequently cleared by opening the gate 6, as will be readily understood.

When the jig-box is lowered into the vat to the limit of its movement, the pins 23 engage with the lower closed ends of the slots 20 and support the jig-box, and the cords or similar connections 32 are slackened to permit of the jigging motion of the box upon operating the shaft 8 in the manner set forth.

Having thus described the invention, what is claimed as new is—

1. In apparatus for separating ore, the combination of a tank, a jig-box, a shaft having an eccentric portion, connections between the jig-box and eccentric portion of the shaft and comprising parts slidably related and having a limited movement, and means independent of the suspending and jigging mechanism for raising and lowering the jig-box and moving the parts comprising the slidable connections, substantially as set forth.

2. In apparatus for separating ore, the combination of a tank, a jig-box, a shaft having an eccentric portion, bars secured at their outer ends to the jig-box and eccentric portion of the shaft and having their inner ends slidably connected, and limited in their outward movement, a windlass, and a cord or

flexible connection between the jig-box and windlass for raising and lowering the jig-box and moving the parts comprising the slidable connection, substantially as set forth.

3. In combination, a tank, a jig-box, a shaft, an eccentric adjustably connected with the shaft, bars slidably related and connecting the adjustable eccentric with the jig-box, and limited in their outward movement, and means independent of the jigging mechanism for raising and lowering the jig-box and moving the slidably-related bars relatively to each other, substantially in the manner set forth for the purpose described.

4. In apparatus for separating ore, a jig-box provided with an opening in its side, a pendent plate having loose connection at its upper end with the box at a point below the said opening, a gate normally closing the opening, and a connection between the pendent plate and gate for raising the lower end of the plate when elevating the gate, substantially as set forth for the purpose described.

5. An apparatus for separating ore comprising in its construction a tank subdivided by a vertical partition, forming a vat and sludge-box, the rear end of the vat and the partition being provided with sluice-gates, a jig-box operating in the vat and having a gate-controlled opening in its rear side, plates having loose connection with the sides of the jig-box, a shaft, eccentrics adjustably connected with the shaft, bars slidably connected and interposed between the jig-box and eccentrics, sheave-pulleys loosely mounted upon the said shaft, a windlass, and connections between the windlass and jig-box for raising and lowering the latter, substantially in the manner set forth for the purpose specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ANDREW W. PATTERSON.

Witnesses:

S. C. STEWART,

J. S. MUSGROVE.