E. B. HOOVER.

CONTINUOUS OPERATING ORE SEPARATOR.

APPLICATION FILED SEPT. 15, 1921.

1,438,708. Patented Dec. 12, 1922.

4 SHEETS—SHEET 1.

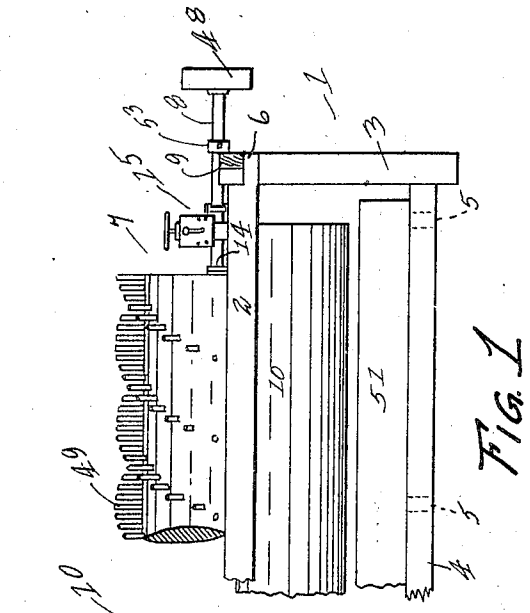


FIG. 1

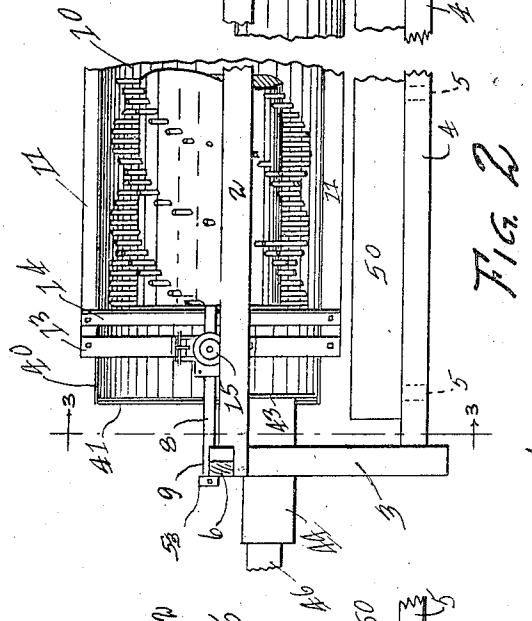


FIG. 2

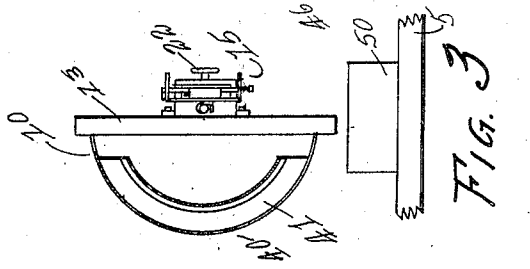


FIG. 3

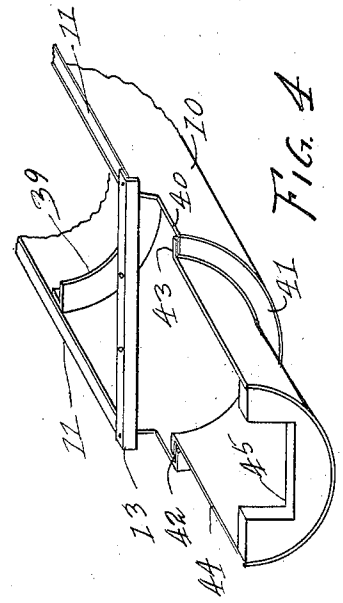


FIG. 4

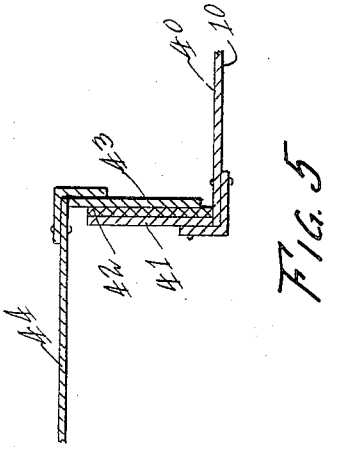


FIG. 5

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4 SHEETS—SHEET 2.

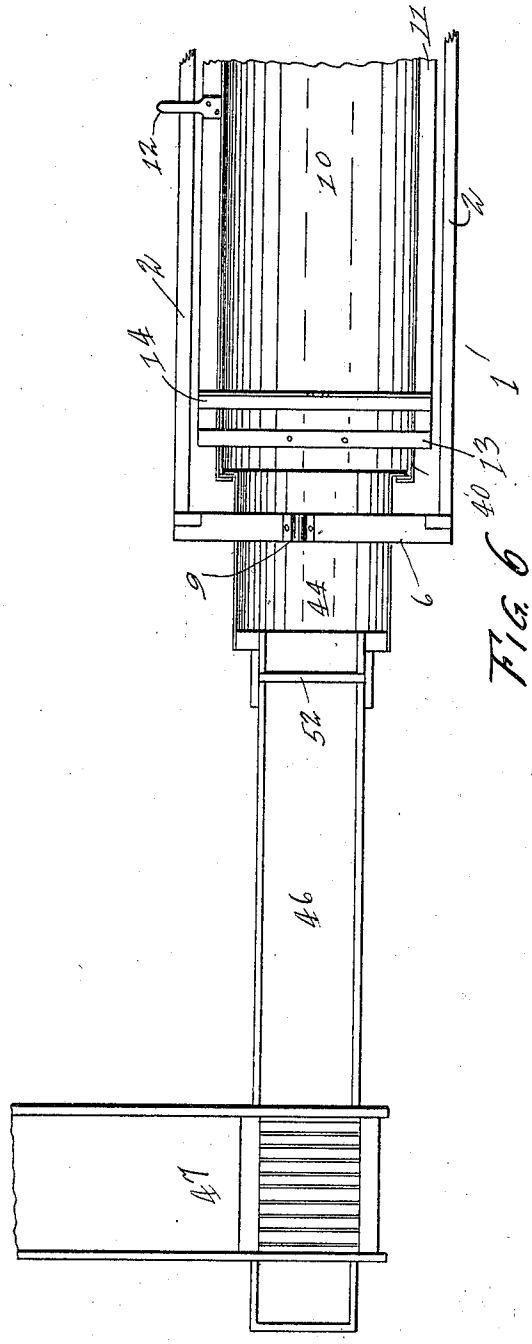


FIG. 6

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CONTINUOUS OPERATING ORE SEPARATOR.

APPLICATION FILED SEPT. 15, 1921.

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4 SHEETS—SHEET 3.

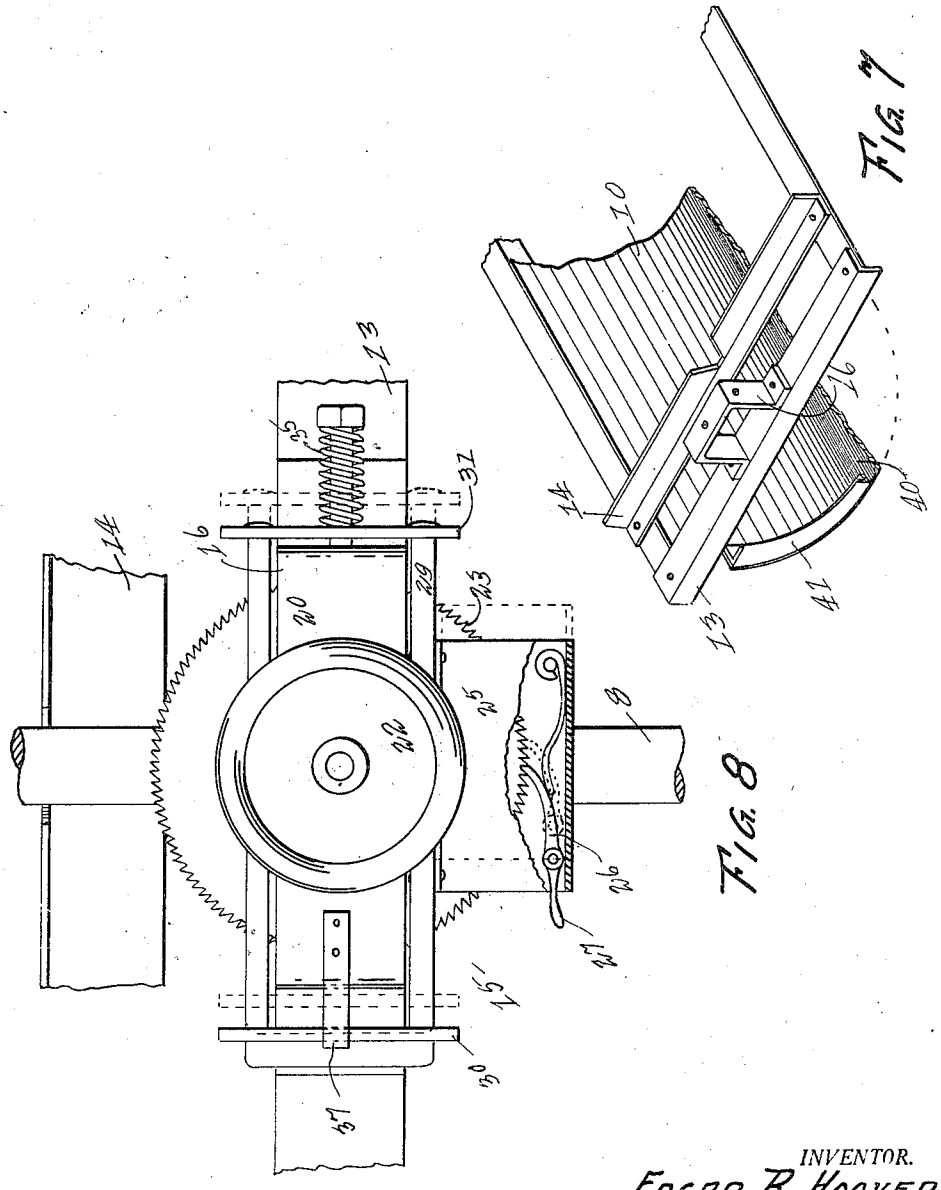


FIG. 7

FIG. 8

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CONTINUOUS OPERATING ORE SEPARATOR.

APPLICATION FILED SEPT. 15, 1921.

1,438,708.

Patented Dec. 12, 1922.

4 SHEETS—SHEET 4.

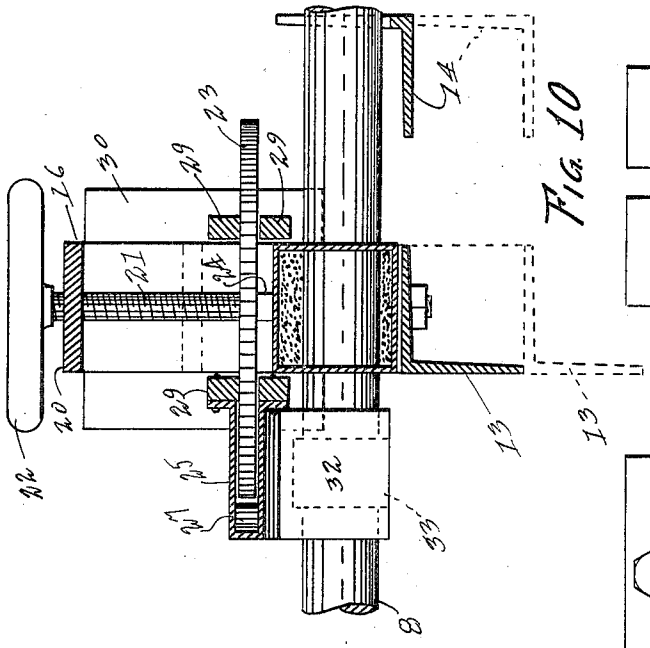


FIG. 10

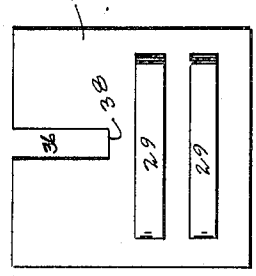


FIG. 13

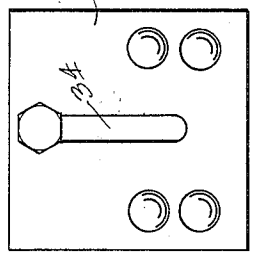


FIG. 12

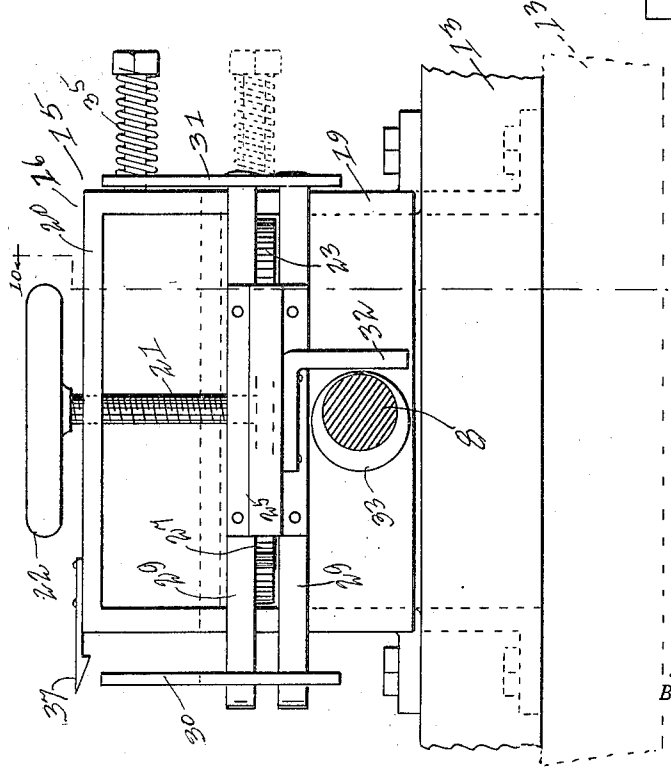


FIG. 9

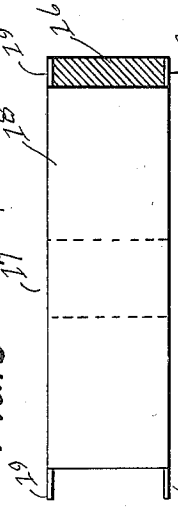


FIG. 11

INVENTOR.

EDGAR B HOOVER

BY E E Sause

ATTORNEYS.

Patented Dec. 12, 1922. 1,438,708

UNITED STATES PATENT OFFICE.

EDGAR B. HOOVER, OF WALLA WALLA, WASHINGTON, ASSIGNOR OF ONE-THIRD TO J. W. IMLAY, OF WALLA WALLA, WASHINGTON.

CONTINUOUS-OPERATING ORE SEPARATOR.

Application filed September 15, 1921. Serial No. 500,740.

To all whom it may concern:

Be it known that I, EDGAR B. HOOVER, a citizen of the United States, residing at Walla Walla, in the county of Walla Walla and State of Washington, have invented certain new and useful Improvements in Continuous-Operating Ore Separators, of which the following is a specification.

This invention relates to ore separators and means to change an otherwise intermittently operating machine into a continuous operating machine.

One object of the invention is to provide a means for increasing the capacity of the machine by making it continuous.

A further object of the invention is to provide a means whereby the machine is made continuous.

A further object of the invention is to provide a means for dumping the machine that will not effect its continuous operation.

With these and other objects in view reference is had to the accompanying drawings in which—

Fig. 1 is a side elevation of part of the machine in its operative position;

Fig. 2 is a side elevation of part of the machine with the sluice box in the dumping position;

Fig. 3 is an end elevation on the line 3—3 of Fig. 2, of the sluice box in the dumping position;

Fig. 4 is a perspective view of the receiving end of the sluice box;

Fig. 5 is a section of the joint between the receiver and the sluice box;

Fig. 6 is a plan view of the sluice box and receiver showing one form of feeding means;

Fig. 7 is a perspective view of part of sluice box showing constructional details;

Fig. 8 is a plan view of lowering mechanism;

Fig. 9 is an end elevation of lowering mechanism;

Fig. 10 is an end elevation, on the line 9—9 of Fig. 9, of the lowering mechanism, in section;

Fig. 11 is a plan view of the sliding box;

Fig. 12 is an end elevation of tension plate; and

Fig. 13 is an end elevation of the latching plate.

Having reference to the drawings like numerals refer to like parts throughout the several views and the numeral 1 refers to the frame of the machine, and consists of side rails 2, legs 3, braces 4, crossties 5 and end pieces 6.

The end pieces bear the weight of the revolving griddle 7 which is supported thereon by the shaft 8 which in turn is maintained in place by journals 9 placed therein for the purpose. The journals may be of the usual type or may be half bearings as shown.

Suspended beneath the revolving griddle is a curved sluice box 10 which is substantially braced by the side rails 11, one of which carries a handle stop 12 attached thereto, and a thrust piece 14.

The curved sluice box 10 is suspended on the shaft 8 by means of the lowering mechanism 15 which consists of a yoke 16 substantially attached to the end piece 13 by any suitable means. A journal 17 is slidably mounted in the yoke so that the yoke may move in a vertical plane while the journal remains stationary on the shaft 8. The journal is of the nature of a box having walls 18 and in the box Babbitt or other anti-frictional metal is poured to surround the shaft, and the walls are extended on the sides to form guides 19 wherewith to slidably engage the yoke.

Through the top 20 of the yoke and in threaded engagement therewith is a pedestal bolt 21 provided on its upper end with a hand wheel 22 and connected rigidly at its lower end with a ratchet wheel 23 through which it extends to form a bearing point 24, the bearing point resting on the journal 17 and thus supporting the load of the curved sluice box which is attached to the yoke.

A guard 25 covers the outer exposed portion of the ratchet wheel and contains a suitably positioned dog 26, having an exposed trigger 27, and the customary spring 28, wherewith to operate the ratchet wheel.

The guard is rigidly attached to sliding members 29 which in turn are rigidly attached at one end to a latch plate 30 and at the other end to a tension plate 31 in a manner to provide ample room for longitudinal movement of the sliding members, this movement being required to operate the ratchet wheel.

The guard has attached thereto a cam plate 32 which is positioned to register with and be operated by a cam 33 attached to the shaft 8 of the griddle.

It is now obvious that each revolution of

the shaft will impart a longitudinal movement to the guard 25, and with it the sliding members 29 and the latch and tension plates, 30 and 31 respectively, and the dog 26 operating with the movement of the guard against the ratchet wheel causes it to rotate a very short distance, depending on the movement of the guard.

The tension plate 31 is provided with a slot 34 through which a bolt is passed to attach to the yoke and to carry a tension spring 35 which bears against the tension plate, by which means the dog is returned to its initial position preparatory to again rotating the ratchet wheel.

Each movement of the ratchet wheel imparts a corresponding rotating movement to the pedestal bolt 21 and thus lowers the yoke and increases the distance between the sluice box 10 and the revolving griddle 7.

The latch member 30 is notched at 36, see Fig. 13, to engage the latch 37 attached to the top 20 of the yoke 16 for the purpose, the notch being designed to straddle the latch and to engage it when it has lowered sufficient to register with the bottom edge 38 thereof.

By this means the operation of the lowering mechanism ceases as soon as the yoke has lowered the required distance which depends on the height of the riffles 39, shown in Fig. 4, or as soon as it has reached a point where obvious damage might occur to the mechanism if the lowering operation was continued.

One end of the curved sluice box is provided with an extended portion 40 which terminates in a flange 41 having a packing strip 42 attached thereto, and this flange and packing strip seats against a corresponding flange 43 attached to the receiver 44 in a manner to permit oscillation of the curved sluice box without interfering with the receiver which is stationary, being rigidly attached to the machine in any suitable manner.

The material to be separated may be fed directly into the receiver or a recess 45 may be provided in its outer end to receive an auxiliary sluice box 46 into which the material may be deposited, being screened when necessary by a screen 47 placed in a convenient position with respect to the auxiliary sluice box.

Collars 53 are attached to the shaft 8 to prevent horizontal movement thereof, and the thrust piece 14 which is a part of the curved sluice box, maintains the sluice box in proper relation with the griddle and receiver.

In operation the material to be separated is deposited either in the receiver or the auxiliary sluice box, as before mentioned, running water is then directed into the material and the combined mass flows into the sluice box. The revolving griddle is then set in motion by means of any prime mover acting through the wheel 48 which is rigidly attached to the shaft 8, and now stirs and combs the material with sufficient manipulation to cause the baser parts to pass through the machine and out at its other end.

The finer parts consisting of gold, or ore and black sand, fall to the bottom of the sluice box to be obstructed in their passage by the riffles 39, which extends perpendicular to the sluice box, in the usual manner of riffles.

Now as the operation is continued the valuable parts accumulate in the bottom of the sluice box, which is gradually receding from the griddle with the movement of the lowering mechanism until a distance is reached where the teeth 49 are out of operable register with the riffles, then the boxes 50 and 51 respectively are placed beneath the curved sluice box which is dumped by means of the handle stop 12. The contents now fall by gravity into the boxes and it has been found in operation that the values remain in the first half of the sluice box, therefore after dumping, the material in the box 51 is returned to the receiver, and that in the box 50 removed for final separation in any approved manner.

Where an auxiliary sluice box is used a head gate 52 may be placed therein during the dumping operation, to stop the flow of the material temporarily.

As soon as the sluice box is dumped and oscillated back to its normal position, it is raised to its initial position with respect to the griddle, by the hand wheel 22 which is manually operated. During this operation obviously the ratchet wheel must be released from the dog, hence by pressing the trigger 27 the dog is withdrawn from the ratchet wheel which may then be rotated backward to its initial position.

As the dumping operation requires only a moment's time and as the material may continue to pass through the machine during the manual manipulation of the lowering mechanism it is obvious that the continuous operation of the griddle will be unaffected and that its functioning will only be delayed momentarily during the time necessary to rotate the curved sluice box.

Having thus described my invention, I claim—

1. In a continuous operating ore separator, having a rotating griddle mounted on a shaft, a sluice box oscillatably mounted on said shaft, automatic means for lowering said sluice box away from said griddle during the operation thereof, and a stationary receiver attached to said separator in slidable contact with the sluice box.

2. In a continuous operating ore separa-

tor, having a rotating griddle mounted on a shaft, a sluice box suspended from and oscillatably mounted on said shaft, ratchet means operable with said griddle for lowering said sluice box, means to restore said sluice box to its normal position, and a stationary receiver attached to said sluice box.

3. In a continuous operating ore separator, having a griddle rotatably mounted on a shaft, a sluice box oscillatably mounted on said shaft, means for oscillating said sluice box, ratchet means for lowering said sluice box with respect to said griddle, a cam attached to said shaft, in operable register with said ratchet means, means for returning said sluice box to its normal position, and a stationary receiver slidably attached to said sluice box.

4. In a continuous operating ore separator, in combination with an ore separator having a revolving griddle, a sluice box oscillatably mounted on the shaft of said griddle, means to prevent the rotation of said sluice box, and means for uniformly increasing the distance between the sluice box and said griddle.

5. In a continuous operating ore separator, the combination of an ore separator comprised of a frame, a revolving griddle, and a curved sluice box, means for lowering said curved sluice box synchronously with the rotation of said griddle, and means for dumping said curved sluice box without effecting the continuous rotation of said griddle.

In testimony whereof I affix my signature.

EDGAR B. HOOVER.