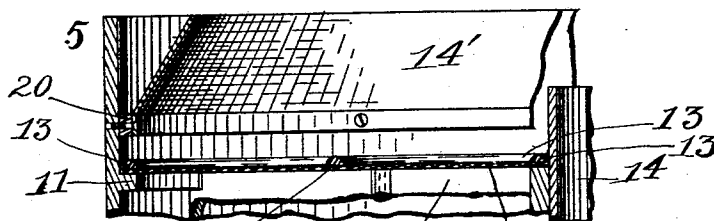
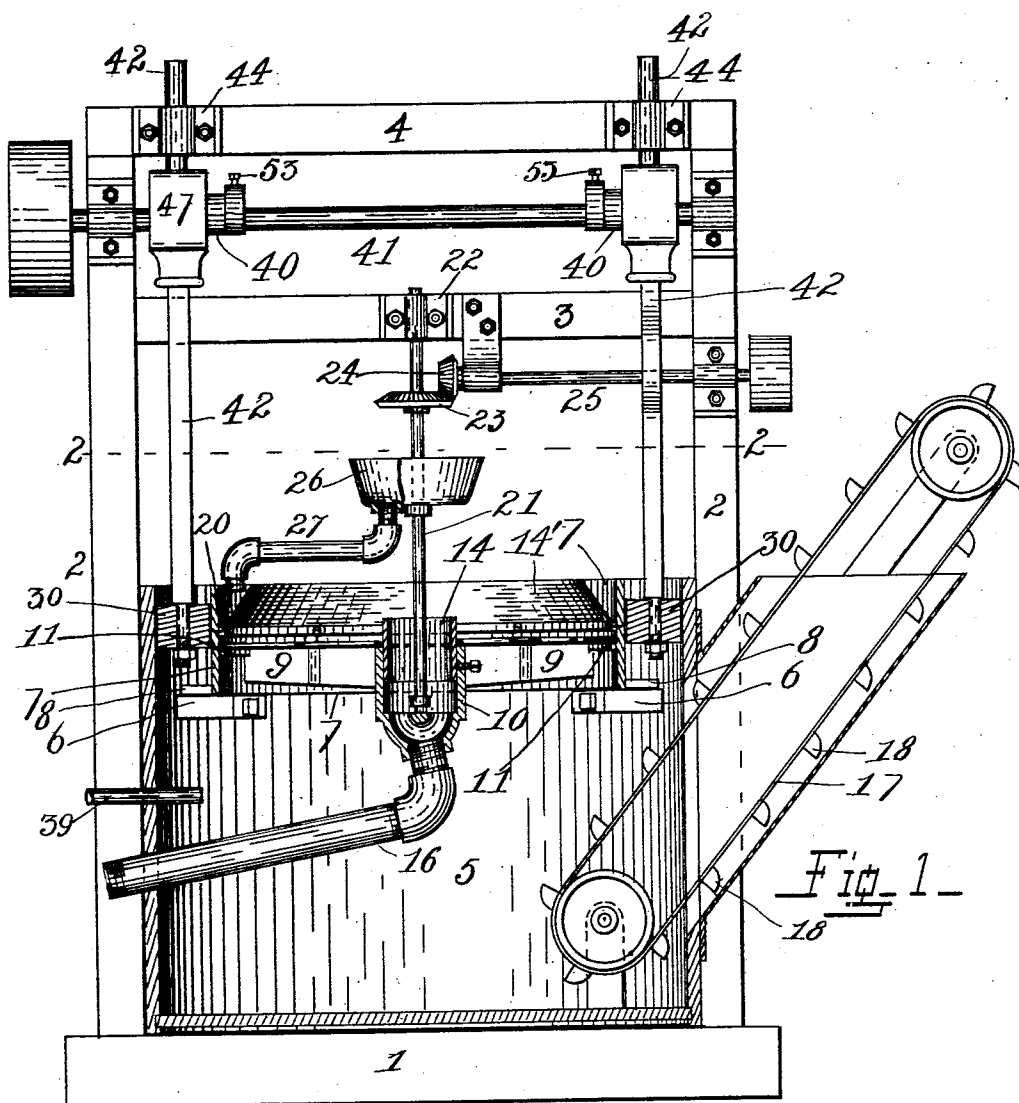


2 Sheets—Sheet 1.

No. 573,594.

Patented Dec. 22, 1896.



Witnesses

S. M. Wood

H. L. Keith

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WILLIAM HOOPER

By A. A. Woodson atty.

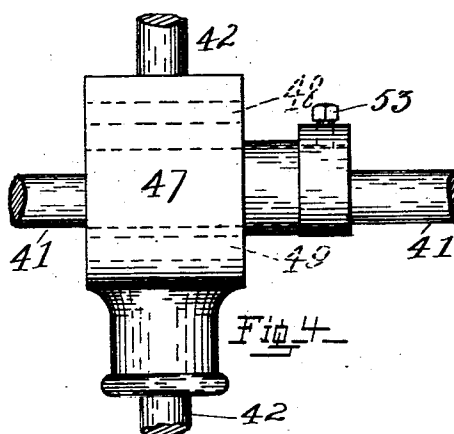
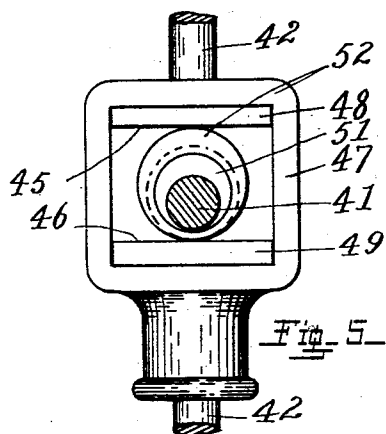
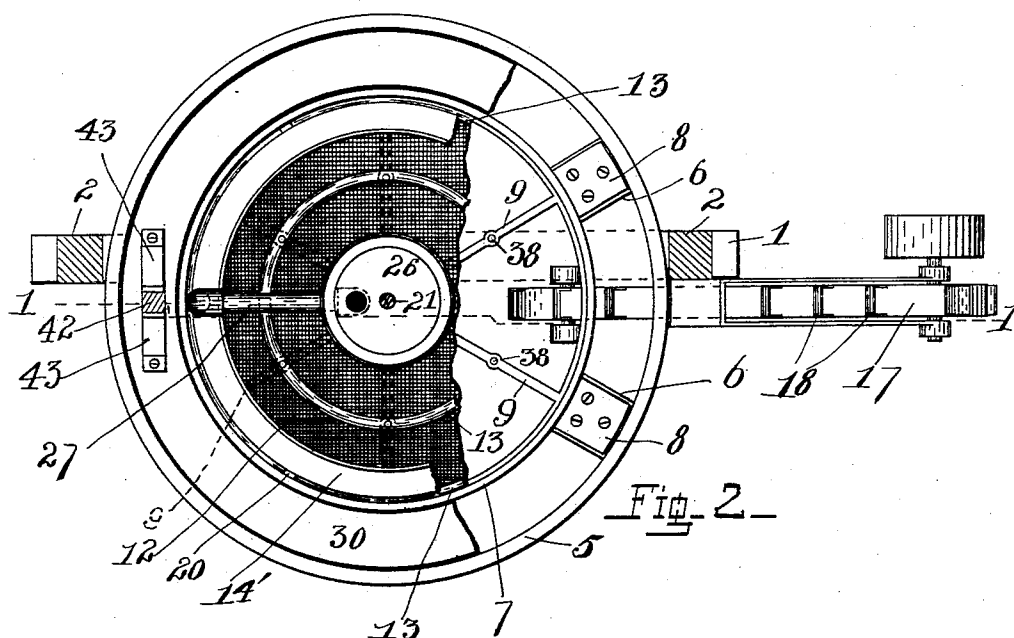
(No Model.)

2 Sheets—Sheet 2.

W. HOOPER.
MACHINE FOR JIGGING ORES.

No. 573,594.

Patented Dec. 22, 1896.



Witnesses—
J. M. Wood
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UNITED STATES PATENT OFFICE.

WILLIAM HOOPER, OF TICONDEROGA, NEW YORK.

MACHINE FOR JIGGING ORE.

SPECIFICATION forming part of Letters Patent No. 573,594, dated December 22, 1896.

Application filed September 14, 1895. Serial No. 562,549. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HOOPER, a citizen of the United States of America, and a resident of Ticonderoga, in the county of Essex and State of New York, have invented a certain new and useful Machine for Jigging Ores; 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 said device, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

The object of this invention is the improvement of machines for jigging ores or separating, by means of agitation in water, the metallic or valuable part of the ore from the gangue, the agitation being in a sieve and for the purpose of keeping the particles suspended for a short time in water, so as to give the heavier portions a chance, by rapid subsidence, to arrange themselves as the lower stratum on a woven-wire cloth or perforated bottom of the sieve, to the end that such heavier portions may be discharged through said bottom and the lighter portions be floated off at the top by the force of and with a current of water flowing upwardly through a sieve.

In the drawings, Figure 1 is a side view, in vertical section, on the line 1 1, Fig. 2, showing most of the parts. Fig. 2 is a top view showing a section on the line 2 2, Fig. 1. Fig. 3 is an enlarged view of a portion of the screen. Fig. 4 is an enlarged front view of one of the adjustable eccentrics and other details directly connected therewith. Fig. 5 shows one end of the eccentric and connected parts.

In the drawings like reference-marks are uniformly used on the same parts in all the views.

The machine being supported by a proper foundation, its operative parts are carried on a frame that consists principally of the sill 1, the posts 2, and the cross-pieces 3 and 4, that are preferably arranged substantially as shown in Fig. 1. A hutch or tub 5 rests on the sill 1 and is attached to the portion of the frame described in any convenient and

proper way. On the inner side of this tub, which for obvious reasons should be round, are bolted or otherwise fastened blocks 6, as shown in Figs. 1 and 2. Resting on these blocks is a ring 7, having outwardly-projecting feet 8, that are screwed or bolted to the blocks 6 for the purpose of holding the ring 7 rigidly in position concentric to the tub 5. This ring should be of about the vertical depth and leave an annular space between it and the tub of about the horizontal width, in proportion to the other parts, that is shown in Figs. 1 and 2. On the inner side of this ring are arms 9, that attach to the central cup-shaped part 10, these three parts being cast integral.

On the inner side of the ring 7, between the arms 9, are inwardly-projecting flanges 11, that make a continuous ledge on which rests the outer edge of a circular disk of wire-cloth or perforated metal 12, that forms a screen to discharge the heavier part, as will be described, of the material operated upon. This screen 12 also rests on the arms 9, and having an opening in the center to correspond with the opening in the top of the cup-shaped part 10 its inner edge rests on said cup-shaped part, thus giving it a bearing-surface that covers but a small portion of its area, but is so distributed as to enable it to sustain the superincumbent load. It is also necessary to secure this screen against displacement by an upward pressure of water that will be hereinafter described. Therefore rings 13 are fastened on the top of the screen by screws or rivets passing through them and the screen into holes 38 in the arms 9. It being impracticable to show the rings 13 with sufficient distinctness in Fig. 1, a portion of the sieve is shown enlarged in Fig. 2, and the reference-mark 13 is applied thereon instead of on Fig. 1.

The ring 7, the screen bottom 12, and a ring 14, adjustable as to height, form the sieve into which the material to be separated is deposited, as will be hereinafter described. The ring 14 fits into the cup-shaped part 10 and is fastened at any desired height by a set-screw 15 in order to cause the sieve to fill to the desired depth before overflowing into the cup-shaped part 10, the part 10 forming the sluice

through which the overflow may pass, as shown in Fig. 1, out of the sieve and thence through the pipe 16, that carries the overflow outside the hutch. The heavy material that percolates through the screen 12 is carried away by means of a belt 17, having the usual form of elevator-buckets 18 and being suitably mounted on driving and carrying pulleys.

On the inner side of the ring 7, with its lower edge slightly above the sieve-bottom, is a conical ring 14', having a portion of its lower edge of cylindrical form for the purpose of being conveniently bolted to the ring 7. Blocks 20 are interposed between the two rings for the purpose of forming a substantially continuous annular opening between them. It will be observed that the annular opening just described is directly over the flange 11 and a ring 13, the advantage of which will appear in the description of the operation of the device.

The mechanism by which the ore and water is fed into the sieve consists of a vertical shaft 21, having a lower end bearing on the bottom of the cup-shaped part 10 and an upper bearing in the bearing-box 22 on the cross-piece 3. The shaft 21 should be driven at a moderate speed by a pair of bevel-gears 23 and 24 and a horizontal shaft 25 or by some other approved means. On the vertical shaft 21 is a feed-tub or hopper 26, that should be attached to the said shaft rigidly. Connected to the hopper 26 is an open pipe 27, that extends outwardly and downwardly, as shown in Figs. 1 and 2, to a point directly over or in the opening between the rings 7 and 14' to convey the ore and water that may be put into the tub and discharge it into the sieve.

In the space or opening between the hutch and the sieve, and nearly filling said opening, is a plunger 30. This plunger conforms to the width of said opening, but it is not found to be practicable nor desirable to make such a fit as would be required in a pump-piston or plunger working against a high pressure, the only requisite being that its vertical reciprocating movement shall cause accession and recession of the water through the bottom of the sieve, the hutch being filled for that purpose to the point of overflowing into the outlet through the ring 14. Whenever, as is usually the case, the material to be separated has a high specific gravity, it is advantageous to supply a flow of water under the screen, as by a pipe 39, the excess of the upward flow in such a case helping to overcome the excess of gravity, and it will assist the inflow into the sieve caused by the plunger to slightly raise the material and also to prevent a violent recession of the water from the sieve. The total quantity of water to be used, as well as the proportion to be fed in with the ore and that to be fed through the pipe 39, must be governed by the nature and peculiarities of the ores to be separated.

The plunger 30 is actuated by eccentrics

40 on the shaft 41, being connected to the plunger by the rods 42, that are bolted to the plunger, as shown, and preferably supported by braces 43. The upper ends of the rods 42 slide through guide-boxes 44, by reason of which all parts of the plunger will have a uniform movement. The eccentrics engage upper and lower horizontal surfaces 45 and 46 in rectangular openings in the heads 47 on the rods 42, as shown in Fig. 5. These horizontal surfaces, being subject to wear, should be on removable blocks 48 and 49, that may also be made adjustable. The eccentrics are made adjustable, in order that the stroke of the plunger may be regulated to suit the kind and quantity of material to be operated upon, by making them in two parts—namely, the part 51, that may be made integral with its shaft, and the part 52, that fits and revolves thereon, being set at the desired point by the set-screws 53. It will be observed by reference to Fig. 5 that these parts are eccentric. The degree of eccentricity should be governed by the requirements; but it is believed to be best to put about one-half the "throw" in each, by reason of which the throw may be reduced to the point of obliteration by turning the part 52 so that its eccentricity will counteract that of part 51, thus giving the greatest possible range of eccentricity.

The operation of the device is as follows: The hutch being filled with water, as above indicated, the ore is fed into the hopper 26 with sufficient water to cause it to flow through the pipe 27, by which it is discharged into the conical hopper in the sieve. The hopper 26 and the pipe 27, being caused to revolve, will trail the water and ore into said conical hopper, and thus distribute it evenly against the outer ring of the sieve and over a ring 13. It would be obviously disadvantageous to allow the incoming ore and water to impinge on the sieve-bottom at any point where the screen would be directly exposed to its action, as the bed of ore in the process of separation would be disturbed thereby.

An accumulation of ore at the inner side of the outer wall of the sieve will be prevented by the flow of water to the discharge-opening in the center, the ore being rendered more susceptible to the action of the flowing water by the fluctuation of the water through the screen and bed of ore already described, the said fluctuation of water causing a rapid subsidence of the heavier part and its discharge through the screen and into the bottom part of the hutch, whence it is removed by the usual form of elevator, as heretofore described. The lighter part of the ore being kept, by the means described, at the top of the ore-bed in the sieve will be discharged with the water overflowing into the sluice at the center of the sieve and out through the pipe 16. The speed and "stroke" of the plunger and the quantity of water fed in at

each of the two sources of supply should be regulated according to the peculiarities of the ore to cause a proper separation.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for jigging ores, a hutch, a sieve consisting of a ring set in said hutch near the top thereof with a space intervening between said ring and hutch and a screen in said ring, means for feeding ore and water to said sieve, an outlet therefrom for the lighter part of the ore, an imperforate annular plunger situated in the space around the ring, and means for vertically reciprocating said plunger for the purpose specified.

2. In a machine for jigging ores, a hutch, a sieve mounted therein near the top, the screen-bottom of the sieve being imperforate for a short space around its outer edge, an outlet in the center of the sieve for the lighter part of the ore, means for agitating the contents, a conical ring seated in said sieve leaving an opening around its periphery between it and the sieve-frame directly over the imperforate portion of the screen, and a feed-

pipe traversing the space between said conical ring and the sieve-frame, for the purpose specified.

3. In a machine for jigging ores, a hutch, a sieve, of smaller diameter than the hutch, supported centrally therein near the top, an annular plunger in the space between said hutch and sieve, a shaft mounted thereover, an eccentric near each end of said shaft, an eccentrically-bored ring mounted on each of the aforesaid eccentrics and means for holding it in any set position thereon, and a cross-head on each eccentric-pitman connecting same to the corresponding side of the annular plunger, a central outlet communicating exteriorly of the hutch and a cuff set in the inner opening of said outlet and adjustable vertically above said sieve, for the purpose specified.

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

WILLIAM HOOPER.

Witnesses:

D. C. BASCOM,

HERBERT WHEELER.