

No. 676,534.

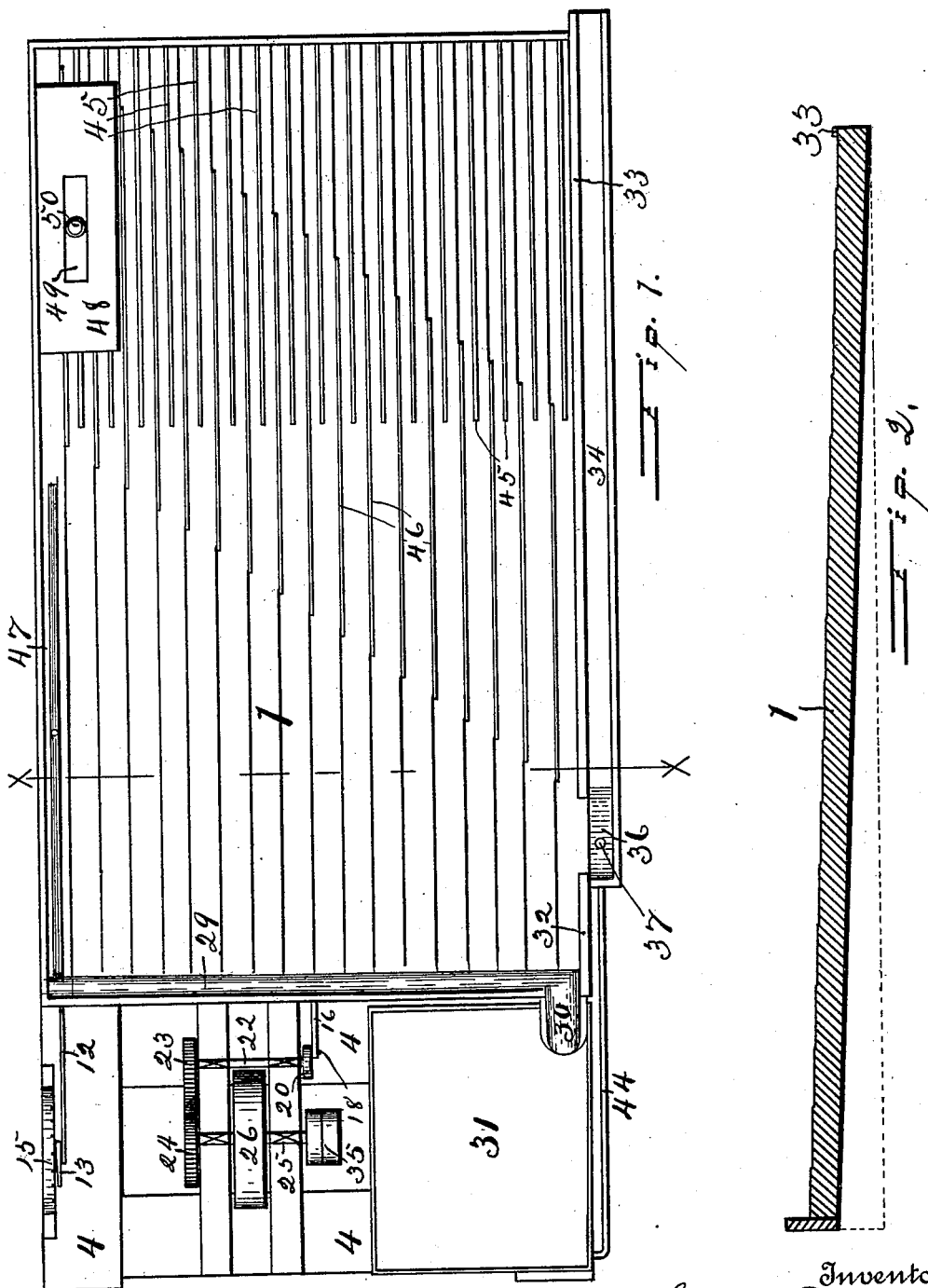
Patented June 18, 1901.

T. DYNAN.
ORE CONCENTRATOR.

(Application filed Dec. 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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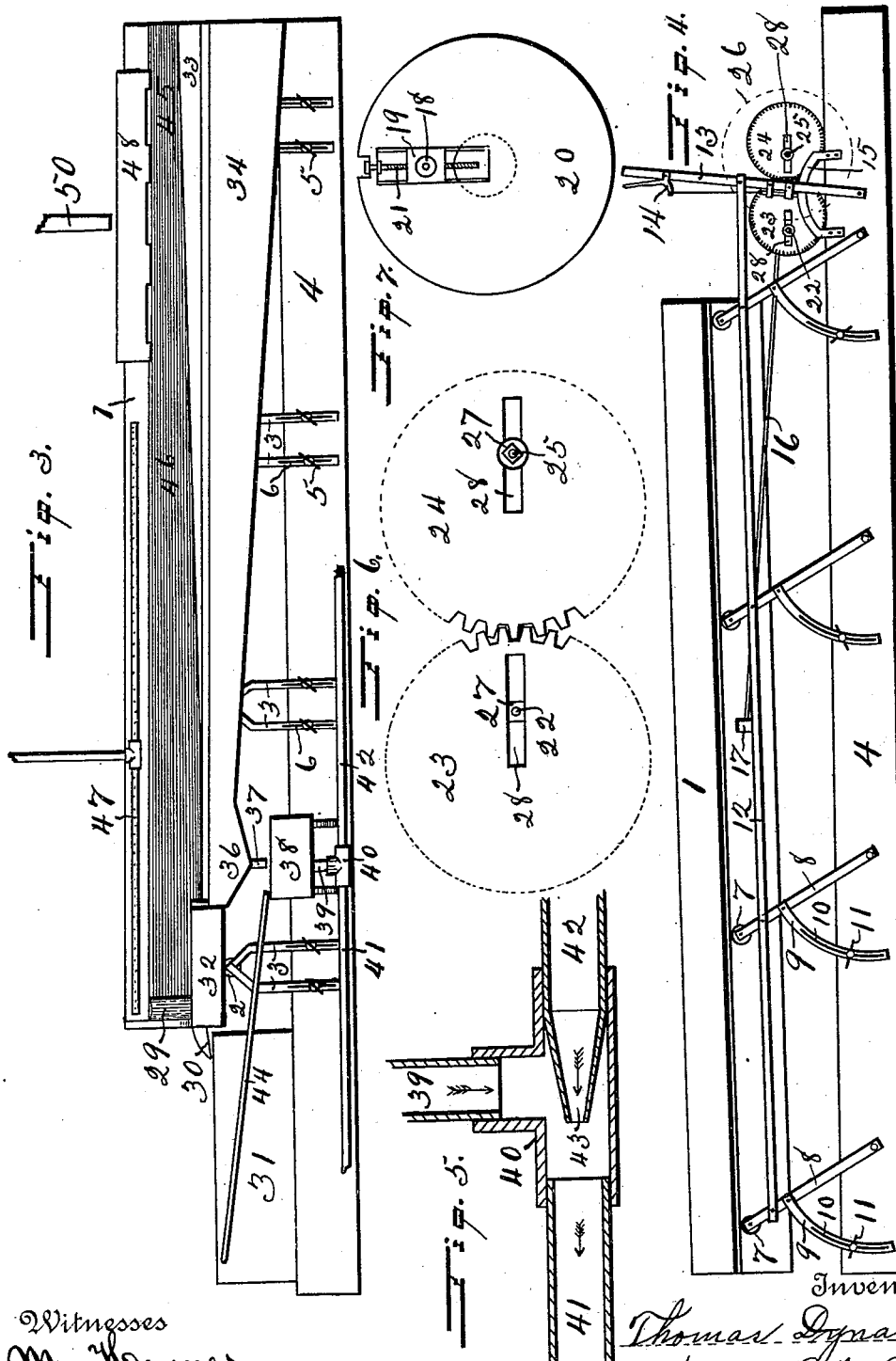
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UNITED STATES PATENT OFFICE.

THOMAS DYNAN, OF AMADOR CITY, CALIFORNIA.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 676,534, dated June 18, 1901.

Application filed December 24, 1900. Serial No. 40,885. (No model.)

To all whom it may concern:

Be it known that I, THOMAS DYNAN, a citizen of the United States, residing at Amador City, in the county of Amador and State of California, have invented certain new and useful Improvements in Ore-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 ore-concentrators, and more particularly to that class known as "table-concentrators," over which crushed ore is introduced and the precious metal separated therefrom.

My object is to furnish an ore-concentrator with which the fine sulfurets may be thoroughly and effectively separated from the residue and saved, together with the coarser sulfurets. This I accomplish by the use of the peculiar construction, novel combination, and adaptation of parts hereinafter set forth, and particularly pointed out in the claims hereunto annexed, reference being had to the accompanying drawings for a better comprehension hereof, in which—

Figure 1 is a top view of my improved ore-concentrator. Fig. 2 is a detached sectional view through line X X, Fig. 1. Fig. 3 is a front side elevation of the concentrator. Fig. 4 is a rear elevation of the same, showing the adjustable roller-bearings. Fig. 5 is a detail sectional view of the injector-elevator. Fig. 6 is a detail view of the cam-gears, showing the adjusting-slot therein. Fig. 7 is a detail view of the crank, showing the adjustable crank-pin.

Similar figures of reference indicate corresponding parts in the several views.

I employ a table 1, which has its front side mounted on rollers 2, journaled in trusses 3, which are adjustably secured to the side of the bed-timbers 4 by thumb-nuts 5, said trusses 3 being adjustable by reason of slots 6, arranged therein.

The rear side of the table 1 is supported on rollers 7, which are journaled in arms 8, piv-

otally secured to the bed-timbers 4, said arms 8 each having a curved arm 9, provided with a slot 10 therein, secured thereto and adapted to be each engaged by a thumb-nut 11. The table 1 may be given the proper slant forward by the last-named arms 8 and 9, which said arms 8 are connected near the rollers 7 by a bar 12, which is pivotally secured to each and has one end attached to a lever 13, which has its lower end pivoted to the side of the bed-timbers 4 and is provided with the usual spring-fastener 14 and segment-rack 15, which is also attached to the bed-timbers 4.

The table 1 is oscillated by means of a rod 16, suitably attached at one end to a lug 17, which is rigidly attached at a suitable location beneath the table, preferably near the center thereof, and the other end of said rod 16 is journaled to a wrist-pin 18, which is rigidly attached to a base 19, adapted to be adjusted in a slot arranged radially in the crank-wheel 20. The base 19 and pin 18 are adjusted by means of a screw 21, operated from the periphery of the crank-wheel, with which screw the base 19 engages. The crank-wheel 20 is rigidly attached to one end of a shaft 22, which is suitably journaled on the bed-timbers and has a gear-wheel 23 attached eccentrically to its other end. A similar gear-wheel 24 is similarly attached to a shaft 25, which is journaled on the bed-timbers, said wheel 24 being adapted to engage the wheel 23 for the purpose as will be presently shown. The shaft 25 is provided with a suitable balance-wheel 26 and the usual power-pulleys 35.

As shown in Fig. 6, the eccentric gear-wheels 23 and 24 are each provided with a slot 28, arranged radially therein for the reception of the shafts 22 and 25, respectively, which are inserted therein and maintained rigidly in position by means of nuts 27. The slots 28 are provided for the purpose of giving the uneven oscillatory end motion to the table so much desired in machines of this class.

The top surface of the table is arranged in steps or terraces, as shown in Fig. 2, which extend from end to end of said table, said steps being preferably four inches wide and

one-sixteenth of an inch drop from one step to the next step below. The table is given a slant, as shown in Fig. 2.

The table 1 has a groove 29 in its left-hand end, which terminates in a spout 30, which empties into a tank 31, which rests on the bed-timbers. On the lower edge of the table, near the left-hand end, a strip 32 is secured in position to confine the sulfurets and water and conduct the same into the tank 31. On the remainder of the lower edge of the table a tapering strip 33 is secured, as shown in Fig. 3, which extends from the lower right-hand corner to within a short distance of the end of the strip 32.

A sluice-box 34 is attached to the lower side of the table 1, so as to catch and carry away the residue that is separated from the sulfurets and carried over the strip 33. The strip 33 is preferably about one and one-half inches high at the extreme right-hand end and tapers to a point within about a foot of the strip 32, thus leaving a small space for unseparated quartz to pass from the table into the upper end of the sluice-box 34, which has a depression in the bottom thereof to prevent any sulfurets that may not be separated from passing away with the tailings, thereby forming a receptacle 36, which has an opening in the bottom thereof provided with a pipe 37 to conduct the contents into a box or vat 38, which is rigidly secured to the side of the bed-timbers 4. The overflow from the sulfurets-tank 31 is also conducted into this box or vat 38 by means of a pipe 44. As fast as the material enters the box 38 the same is carried back to the battery (not shown) by an injector-elevator (shown in Fig. 5) composed of the pipe 39, which is connected to the bottom of the box 38 and conducts its contents into a T-pipe connection 40, from which a pipe 41 extends to the battery, (not shown,) whither the contents of said pipes are impelled by water under proper pressure passing through a pipe 42, connected to the opposite end of the T 40 in line with the pipe 41, which pipe 42 is provided with a nozzle 43. As will be seen, a great saving of water is effected by reason of the double use of a greater part thereof.

I arrange a series of strips 45 across the right-hand end of the table, each being located, preferably, near the center of each step or terrace, said strip being preferably three-eighths of an inch thick and one-half inch high at the extreme end of the table, tapering to one-fourth inch at the other end. I also arrange another series of strips 46 diagonally on said table, said strips being placed parallel with the table and alternately between the strips 45, as shown in Fig. 1. These strips are three-eighths of an inch wide by one-fourth of an inch high to within a short distance (preferably one foot) of one end, whereupon said strips taper to a feather-edge, said ends being placed toward the groove 29.

A pipe 47 is arranged as shown in Figs. 1 and 3 for the purpose of supplying and distributing clear water on the forward end of the table.

A pulp distributor or spreader 48 is arranged rigidly on the upper side of the table near the right-hand end for the purpose of delivering the crushed ore evenly on the table. Said spreader 48 has a slot 49 arranged longitudinally in the top side for the reception and to allow the free action of a pipe 50, which conducts the pulp or crushed ore from the stamps or battery to the table.

The mode of operating my improved ore-concentrator is as follows: The bed-timbers 4 having been placed in position, the table 1, supported on the rollers 2 and 7, and the machinery for imparting motion to the table having been properly adjusted on the frame, the table 1 is given the desired slant forward to suit the quality of ore being worked by means of the rollers 7 and arms 8 and 9, which are operated by the lever 13, after which the thumb-nuts 11 are tightened to maintain the said arms more securely in position. The gear-wheels 23 and 24 are adjusted on the shafts 22 and 25 to give the proper uneven or jerky motion. By adjusting the shafts nearer the center of the wheels 23 and 24 the motion is lessened, and vice versa. The crank-pin 18 19 is adjusted in the crank-wheel 20, so as to give the desired length of end motion for the table. The pulp or crushed ore is introduced through the pipe 50 into the spreader 48, from whence it passes over the table. The sulfurets are caught by the strips 45 and 46 and carried forward by the uneven oscillatory end motion of the table, which has the right-hand end preferably about one inch lower than the other end for the purpose of preventing the refuse from running forward into the groove 29, and thence into the sulfurets-tank 31. As the sulfurets are carried forward on the table the water from the pipe 47 carries away all mud from the same, rendering said sulfurets free from mud or other impurities when they are deposited into the groove 29 and conducted into the tank 31. Any extremely fine sulfurets that are carried over the strips 45 are given a chance to settle in the lower right-hand corner by reason of an eddy formed by the strip 33, which prevents the water from flowing over the same at the extreme outer end, whereupon after said sulfurets have settled the same are carried forward by the oscillatory motion, as before described, until the end of the strip 33 is reached, at which point the said sulfurets, together with other unseparated quartz, are deposited into the receptacle 36 and from there into the box 38. From the box 38 said unseparated quartz is forced back to the battery by the injector-elevator (shown in Figs. 3 and 5) to be worked over and returned to the table.

I am well aware that ore-concentrators have been made which have corrugated surfaces; but these are defective.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an ore-concentrator of the class described the combination with a suitable table 5 and its connections of the adjustable rollers 2 arranged under the front side of said table and journaled in trusses 3, said trusses 3 adjustably attached to suitable bed-timbers, by thumb-nuts, the rollers 7 arranged beneath 10 the rear side of said table and journaled in arms 8, said arms 8 pivoted to bed-timbers and having the supporting-arms 9 attached thereto, said arms 9 each provided with a slot 10 and thumb-nut 11, the rod 12 attached to 15 the arms 8 and to the lever 13, and said lever 13 provided with its spring-stop 14, all arranged and operating substantially as shown and described and for the purposes set forth herein.

2. In an ore-concentrator, the combination 20 with a suitable foundation 4 of the table 1 with its surface composed of steps and provided with the strips 45 and 46 arranged as described, said table being mounted on suitable rollers which are mounted on and journaled in the said foundation, the spreader 48 25 suitably arranged on said table, the strips 33 and 32 arranged on the lower edge of the table, the groove 29 in the front end of the table, the tank 31 resting on the bed-timbers, the sluice-box 34 attached to the lower edge 30 of the table and having the receptacle 36 at its upper end, the box 38, the injector-elevator connected to said box 38, the rod 16 suitably attached at one end to the table and its other end journaled to the wrist-pin 18, said wrist-pin adjustably attached to the crank-wheel 20, said crank-wheel 20 rigidly attached to a suitable shaft 22, the shafts 25 and 22 journaled on the bed-timbers, said shaft 25 having suitable balance-wheels and pulleys attached thereto, the eccentric gear-wheels 23

and 24 adjustably attached to one end of the shafts 22 and 25 respectively, and the water-pipe 47, all arranged and operating substantially as shown and described and for the purposes set forth herein. 45

3. In an ore-concentrator the combination with a table suitably mounted on roller-bearings, of the terraced surface of said table provided with the strips 45 and 46 arranged as described, the ore-spreader 48, the water-pipe 47, the strips 32 and 33 arranged on the lower side of said table, the sluice-box 34 having the receptacle 36 arranged at its top end, the box 38 arranged below the receptacle 36, the injector-elevator arranged below the said box 38, the force-pipe 42 and the discharge-pipe 41 suitably attached thereto and suitable machinery arranged to impart motion to the table, all arranged and operating substantially as shown and described and for the purposes set forth herein. 50 55 60

4. In an ore-concentrator, the combination of an inclined table having a trough at one end, means for supplying pulp to the table, means for actuating the table, a sluice-box arranged at the lower edge of the table and having a depression at its receiving end, a tank arranged to receive from the trough of the table, a receptacle arranged to receive from the depression of the sluice-box, means for conveying sulfurets from the tank to said receptacle, a water-supply pipe, and an injector-elevator interposed between and connected to the said receptacle and the water-supply pipe. 65 70 75

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

THOMAS DYNAN.

Witnesses:

RICHARD VANCE,
HENRY ALLAN.