

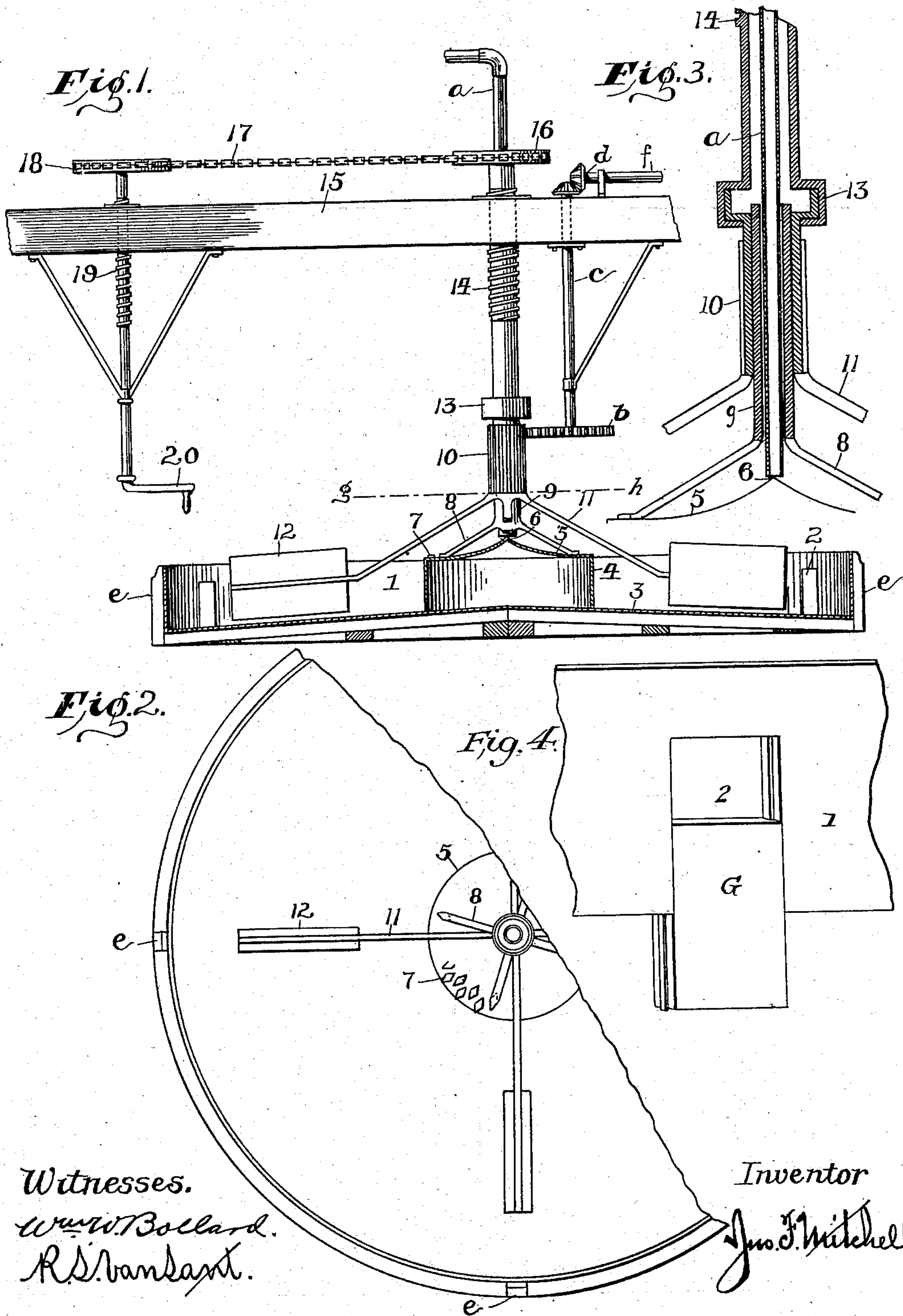
No. 654,662.

Patented July 31, 1900.

J. F. MITCHELL.
ORE SEPARATING MACHINE.

(Application filed Oct. 30, 1899.)

(No Model.)



Witnesses.
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UNITED STATES PATENT OFFICE,

JOHN F. MITCHELL, OF TOPEKA, KANSAS.

ORE-SEPARATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 654,662, dated July 31, 1900.

Application filed October 30, 1899. Serial No. 735,222. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. MITCHELL, a citizen of the United States, residing at 1130 Western avenue, city of Topeka, in the county of Shawnee and State of Kansas, have invented new and useful Improvements in Ore-Separating Machines, of which the following is a specification.

My invention relates to apparatus for separating precious metals and other ores from earth, pulverized rock, sand, &c., whereby a complete separation takes place, with an economical use of water. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the entire machine; Fig. 2, a top view of the machine on the line *g h*, with part of it broken away; Fig. 3, a vertical section of that portion of the machine above the line *g h*, Fig. 1. Fig. 4 is an elevation of a fragment of the side 1 of the tank, showing one of the gates *G*, which are operated as vertically-adjustable closures for discharge-openings 2.

Similar numerals and letters refer to similar parts throughout the several views.

The sides 1 of the tank are provided with discharge-openings 2, which are open when the operation begins, but are gradually closed by gates *G*, which operate as vertically-adjustable closures by being pushed upward as the tank fills with ore.

The central cylinder 4, crowning the vertex of the tank's bottom 3, is provided with a cone-shaped top 5, which is surrounded on its outer edge with spreaders 7 or diamond-shaped cleats, the purpose of which is to insure the equal distribution of the mingled water, ore, rock, and earth to all parts of the tank. The ore, rock, and earth after being crushed and screened in the usual manner, being mixed with water enough to carry them, are introduced into the tank through the feed-pipe *a*, and are discharged on the vertex 6 of the cone-shaped top 5 of the central cylinder 4, flowing thence downward over its sides to the bottom 3 of the tank. The ore being heavier than the rock and earth settles around and near the base of the cylinder 4 in the stronger current, while the rock and earth being lighter than the ore continue to respond to the force of the current, which

is being gradually diminished by radiation, and are carried to a point on the bottom 3 of the tank farther removed from the cylinder 4 than the point at which the ore has been deposited, a large proportion of the rock and earth being carried out of the tank through the discharge-openings 2. The water as it radiates from the central cylinder 4 and flows outward over the inclined bottom 3 of the tank gradually diminishes in depth and force and if undisturbed will break up into small streams or rivulets before reaching the sides 1 of the tank, the result being the cutting of channels in the surface of the ore-bed, which is formed on and parallel to the bottom 3 of the tank, and carrying the ore out through the discharge-openings 2 in the sides 1 of the tank. To prevent the water from breaking up into rivulets and carrying the ore out of the tank through the discharge-openings 2, and to preserve the sheet-like formation of the water for the greatest possible distance from the cylinder 4, fans 12, attached to, and near the outer extremity of arms 11, (radiating from the elongated cogged hub 10 and revolving on the axle 9, supported by braces 8, attached to and resting on the top 5 of the cylinder 4,) sweep near and parallel to the bottom 3 of the tank with a rotary motion.

The air being compressed in front of the rotating fans 12 escapes underneath their lower edges, exerting an influence on the surface of the water which deflects it, and by thus impeding its progress causes it to preserve its sheet-like formation as it flows outward from the central cylinder 4.

The elongated cogged hub 10 is connected at its upper end by a swivel 13 to a screw 14, passing through an overhead timber 15, having at its upper end a pulley-wheel 16, which is connected by an endless chain 17 or belt with a similar wheel 18, outside the circumference of the tank, having a screw 19 attached to its under side which passes downward through the timber 15 and terminates at its lower extremity in a crank 20 or handle that when turned raises or lowers the fans 12, as required, preventing them from coming in contact with the ore and water in the tank. The elongated cogs on the hub 10 permit it to be raised or lowered without stopping its

revolving motion, and it is connected with a cog-wheel *b*, suspended at the lower end of a perpendicular shaft *c*, extending upward through and supported by the overhead timber 15, and terminating at its upper end in a cog connection *d* with the horizontal shaft *f*, which imparts the power to revolve the fans 12.

In the accompanying drawings four radiating arms 11 and fans 12 are shown; but this number may be increased or diminished, their number and size being governed by the speed with which they are revolved.

The size of the machine will be governed by the volume of material it is desired to treat.

The fans, which are one of the most important features of the structure, can be made of any suitable material, such as light wood or sheet metal, and the velocity with which they are rotated and their distance above the surface of the water will be governed by the force of the current to be deflected.

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

1. An ore-separating machine comprising a circular tank with inclined bottom 3, a central cylinder 4, having a cone-shaped top 5 and an axle 9 resting on braces 8 attached to it, a feed-pipe *a*, an elongated cogged hub 10, turning on the axle 9, and having arms 11 attached to and radiating from near its base, fans 12 attached near the outer extremity of the arms 11, a screw 14 attached to the top of

the hub 10 by a swivel connection 13, a pulley-wheel 16 attached to the upper end of the screw 14, connected by an endless chain 17 or belt, to a pulley-wheel 18 supported by an upright screw 19, terminating, at its lower end, in the handle 20, or crank, substantially as shown, and for the purposes specified.

2. An ore-separating machine comprising a circular tank with vertical discharge-openings 2 in the sides 1, gates *G* which operate as vertically-adjustable closures for discharge-openings 2, an inclined bottom 3 to tank, a central cylinder 4, having a cone-shaped top 5, an axle 9 resting on braces 8 attached to it, a feed-pipe *a*, an elongated, cogged hub 10 turning on the axle 9, and having arms 11 attached to and radiating from near its base, fans 12 attached to the arms 11 near their outer extremities, a screw 14 attached to the top of the hub 10 by a swivel connection 13, a pulley-wheel 16 attached to the upper end of the screw 14, connected by an endless chain 17 or belt, to a pulley-wheel 18, supported by an upright screw 19, terminating, at its lower end, in the handle 20 or crank, a cog-wheel *b* connected with the hub 10 and attached to the lower end of the perpendicular shaft *c* which has a cog connection *d* with a horizontal shaft *f* supplying the power, all substantially as set forth.

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Witnesses:

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