

T. W. SCOTT.
ORE CONCENTRATING TABLE.
APPLICATION FILED SEPT. 30, 1908.

944,917.

Patented Dec. 28, 1909.
2 SHEETS—SHEET 1.

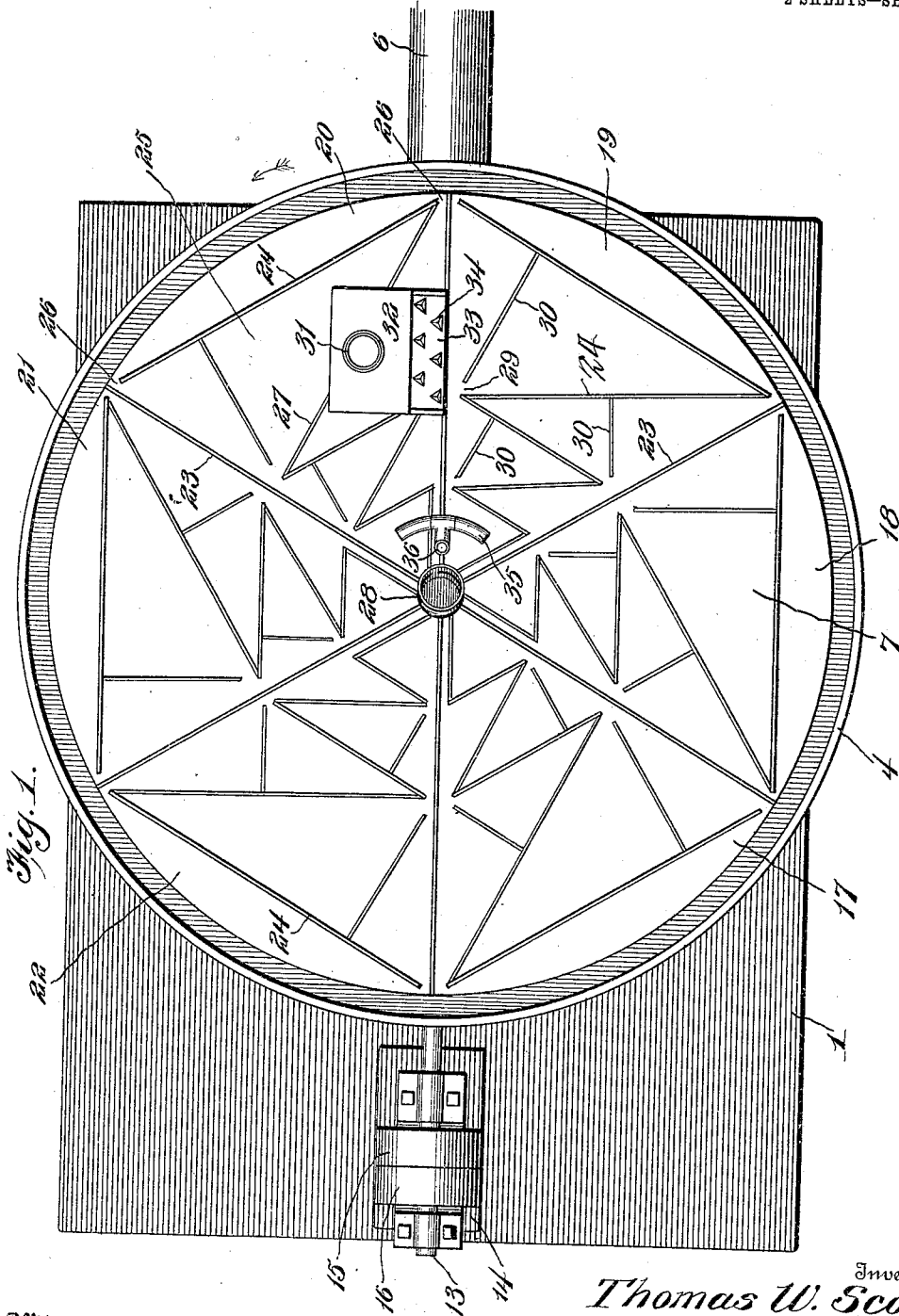


Fig. 1.

Witnesses

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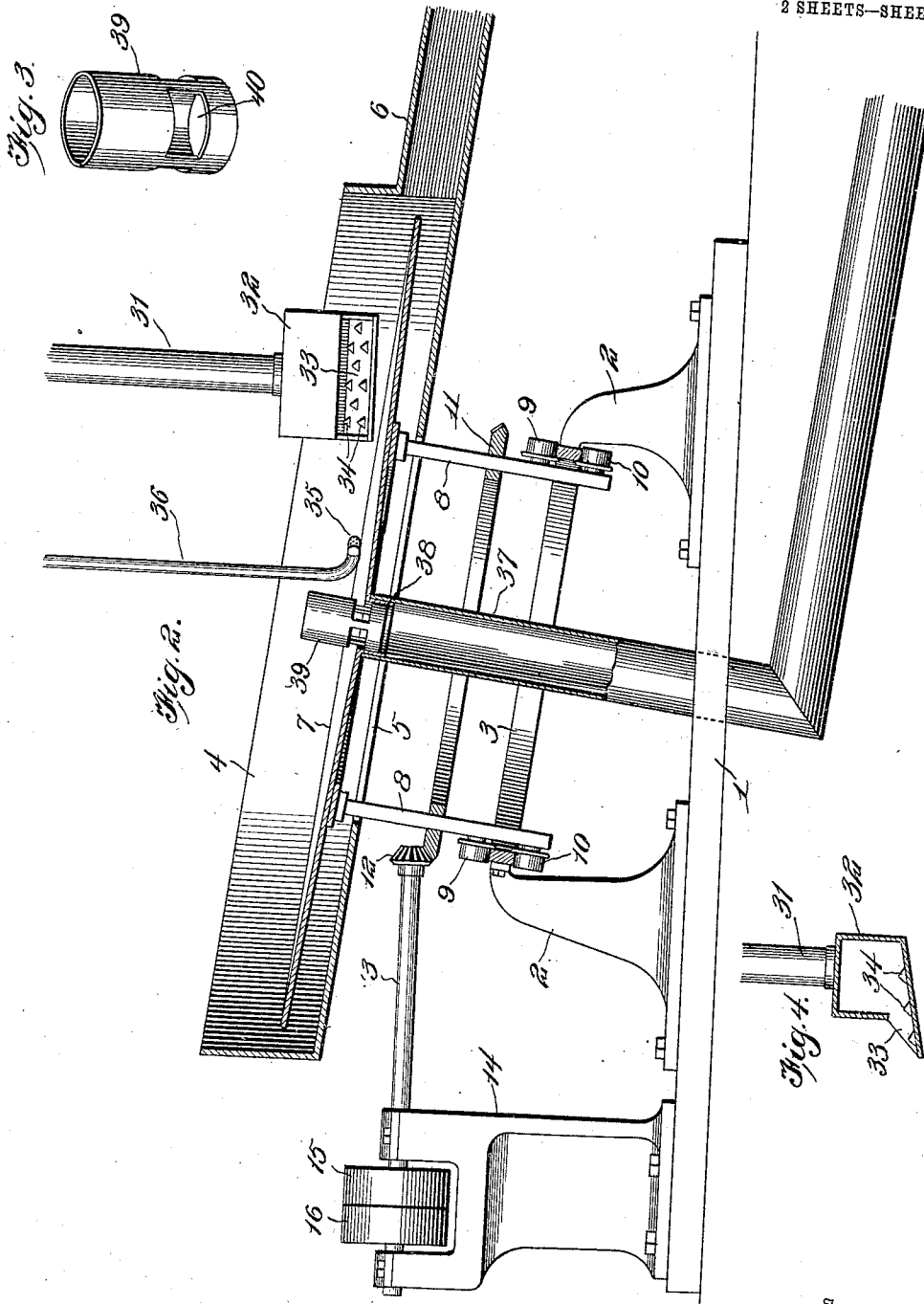
By Victor J. Evans
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UNITED STATES PATENT OFFICE.

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ORE-CONCENTRATING TABLE.

944,917.

Specification of Letters Patent.

Patented Dec. 28, 1909.

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To all whom it may concern:

Be it known that I, THOMAS W. SCOTT, a citizen of the United States, residing at Morenci, in the county of Graham and Territory of Arizona, have invented new and useful Improvements in Ore-Concentrating Tables, of which the following is a specification.

This invention relates to an ore concentrating table for concentrating ores and slimes, *i. e.*, separating the ore from the gangue, the object of the invention being to provide a rotary concentrating table of novel construction by which the material under treatment is shifted and kept in motion by centrifugal action and gravity in such a manner as to secure an effective separation of the ore from the gangue.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawing, in which:—

Figure 1 is a top plan view of an ore concentrator embodying my invention. Fig. 2 is a central vertical longitudinal section of the same. Fig. 3 is a perspective view of the valve tube. Fig. 4 is a sectional view of the feed box or spout.

Referring to the drawings, 1 designates a suitable base, floor or foundation, upon which are mounted and suitably secured brackets 2 carrying an annular inclined track 3. Arranged above the track and supported in any desired manner is a stationary launder or inclosing receptacle 4, provided in its bottom with a circular opening 5. This launder or receptacle is preferably of circular form, open at the top and arranged at the same angle of inclination as the track. At its lowermost portion the launder is provided with an outlet 6 for the discharge of the tailings.

Arranged to rotate within the launder or receptacle and disposed at a suitable elevation above the bottom thereof is a circular concentrating table 7 supported by a frame structure composed of a series of arms 8 which extend downward through the opening 5 and through and below the track 3 and carry at their lower ends upper and lower sets of wheels or rollers 9 and 10 to travel upon the upper and lower surfaces of the track, whereby the table is mounted to rotate in a fixed plane. Any suitable means for rotating the table may be employed. In

the present instance, an annular beveled gear 11 is shown fixed to the arms 8, and with this gear meshes a pinion 12 on one end of a drive shaft 13 journaled in bearings on a supporting standard 14 and carrying fast and loose pulleys 15 and 16 by which the shaft may be driven by a belt from a suitable source of power.

The table 7 is of concavo-convex or dish form in cross-section, its upper surface sloping or inclining at all points from the rim edge to the center of the table. In practice, the table is preferably constructed of a series of flat substantially triangular sectors 17, 18, 19, 20, 21 and 22, six in number, although any desired number may be employed, said sectors having their meeting edges united in any substantial manner and being inclined from their outer segmental basal edges at an angle of about nine degrees toward the point of connection of their vertices at the center of the table. These sectors or sections of the table are preferably made of seasoned wood, and the surface of the table given a coating of cement to render it durable and water-proof. The track, launder and table themselves are inclined at a corresponding angle to the horizontal, generally at an angle of about 7°, while the sloping faces of the table formed by the connected sectors or sections are inclined toward the center of the table at an angle, as stated, of about 9°, so as to secure an effective agitation and circulation of the ores and slime by centrifugal action and gravity, as hereinafter described. Between these sectors or sections of the table are arranged dividing radial grooves or riffles 23, and near the periphery of each section is formed or provided a transverse riffle 24 terminating at its end adjacent the outer ends of the adjoining riffles 23 and forming therewith a substantially triangular space or chamber 25 having plane surfaces or outlines 26 between the contiguous portions of the riffles 23 and 24. Within the space or chamber thus formed is a zigzag groove or riffle 27 of irregular form, the outer or longer limb of which extends from the rear end of the partition 24 in the direction of rotation of the table shown by the arrow in Fig. 1, while the inner or shorter limb thereof extends to an opening 28 at the center of the table. This arrangement of the grooves or riffles provides a series of angular spaces or pockets upon the surface of each table sec-

tion, which pockets are provided with contracted inlets and outlets 29 formed by baffle grooves or riffles 30 extending part way across the wider ends thereof, this arrangement of the grooves or riffles being adapted to secure an effective shifting motion of the material under treatment to separate the concentrates from the gangue.

The ores and slimes are conducted from a hopper or source of supply through a conducting pipe 31 to a feed box or spout 32 supported in any suitable manner above the center of the lower surface of the table or adjacent thereto. This box is provided with a discharge outlet 33 at the lower portion of its side facing reversely to the direction of rotation of the table and projecting outwardly therefrom by extension of the bottom of the box beyond such side. The bottom of the box is inclined outwardly and downwardly to cause the material to feed by gravity through the outlet and is provided with rows or series of staggered deflectors 34, preferably composed of triangular blocks of wood or metal, arranged to divide up and properly diffuse the stream of material to cause it to flow in an even stream through the outlet. Arranged between the feed box and the center of the table and concentric with the axis thereof is a segmental rose or sprinkler 35 mounted on the lower end of a water supply pipe 36 and arranged to discharge a spray of water upon the upper portion or portions of the lowermost inclined section or sections of the table as the latter revolves, the water being commingled with the material through the motion of the table and the action of gravity to place the same in proper condition for a more effective separation and to provide for the discharge of the lighter materials from the surface of the table after the separation. A pipe 37 extends downward from the center of the table and is in communication at its upper end with the opening 28. Through this pipe the concentrates are discharged into a suitable receptacle. The upper end of the pipe fits about a flange 38 depending from the wall of the opening 28, whereby it is centered in position, and this flange forms a guide and support for a controlling valve 39. This valve comprises a tube slidably mounted in the opening and provided near its lower end with an annular series of spaced slots 40, forming outlets for the discharge of the concentrates from the table, the size of which outlets may be regulated by adjusting the valve within the opening, as will be readily understood.

From the foregoing description, it will be apparent that the inclination of the table and its portions or sections causes the material deposited on the lower portion thereof and which is commingled with the water discharging from the rose to pass upwardly

with the ascending side of the table and to gradually shift inwardly toward the center of the table. As the table rotates, therefore, the concentrates will be carried around and on both the ascending and descending sides will shift downwardly and inwardly and be constantly stirred, agitated and turned over by the motion of the table, their gravital sliding action toward the center of the table and by the action of the riffles so as to thoroughly separate the heavier particles from the lighter particles. The concentrates will accordingly be retained on the surface of the table and worked toward the center thereof and discharged through the valved outlet 28, while the refuse or tailings will be washed and carried outward by the water which will be forced outwardly over the rim edge of the table under the centrifugal action produced by the rotation of the latter, whereby the tailings will be discharged into the launder or receptacle 4 and pass by gravity therefrom through the outlet 6. As a result, a large amount of material may be treated within a given period of time and in a simple manner owing to the number of forces exerted to effect the separating action, and a thorough and more effective separation of the ore from the gangue secured.

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

1. An ore concentrator comprising a base frame having an annular track, a launder disposed above said track and provided with an outlet at its lower portion and with an opening in its bottom above the track, a rotary table arranged within the launder, the track, launder and table being inclined at an angle to the horizontal, and said table embodying a series of segmental faces each provided with irregularly arranged riffles and being inclined between their outer and inner edges at an angle to the horizontal, a frame extending downward from said table through the opening in the launder and provided with wheels arranged to travel upon said track, gearing connected with the frame for rotating the table, means for discharging a stream of water upon the surface of the table adjacent to the concentrates outlet and on a radial line between the same and the tailings outlet, and means for feeding the material to be treated to the lowermost portion of the table below said water supplying means and on the radial line between the same and the tailings outlet.

2. An ore concentrator comprising a base frame having an annular track inclined to the horizontal, a launder arranged at a corresponding angle above the same and provided at its lowest portion with an outlet for the tailings and in its bottom with an opening arranged above the track, a dished concentrating table arranged to rotate within

the launder and inclined at a corresponding angle, said table having a series of sector-like surfaces inclined at an angle to its plane of rotation and provided with a central outlet for the concentrates, each of said surfaces being provided with irregularly arranged riffles, a frame depending from the table through the bottom opening in the launder and provided with wheels arranged to travel said track, gearing connected with said frame for rotating the table, means for discharging a stream of water upon the surface of the table adjacent to the concentrates outlet and on a radial line between the same and the tailings outlet, means for feeding the material to be treated to the lowermost portion of the table below the water supplying means and on the radial line between the same and the tailings outlet, a discharge pipe for the concentrates extending upward between the track and depending frame and communicating with the outlet in the table, and a valve controlling said outlet.

3. An ore concentrator embodying an inclined rotary table adapted for the peripheral discharge of the tailings and having a central discharge outlet for the concentrates, said table being of dished form and composed of a series of sector-like portions in-

clined at an angle to the plane of rotation of the table, each of said portions being provided with an outer transverse riffle, an inner zigzag riffle, and partitions between and subdividing the space between the riffles into a plurality of communicating divisions.

4. An ore concentrator embodying an inclined rotary table adapted for the peripheral discharge of the tailings and having a central discharge outlet for the concentrates, said table being of dished form and composed of a series of sector-like portions inclined at an angle to the plane of rotation of the table, each of said portions being provided near its periphery with a transverse riffle and a zig-zag groove or riffle, and dividing radial riffles between the said portions of the table, said riffles being arranged to provide each portion with a substantially triangular space or chamber divided by the zig-zag riffle and having discharge outlets between the ends of the transverse riffle and the adjacent radial riffles.

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

THOMAS W. SCOTT.

Witnesses:

ARTHUR R. BLAINE,
W. J. ARTHUR.