C. W. WRIGHT.

CONCENTRATING TABLE.

APPLICATION FILED AUG. 11, 1910.

1,051,049.

Patented Jan. 21, 1913.

2 SHEETS—SHEET 1.

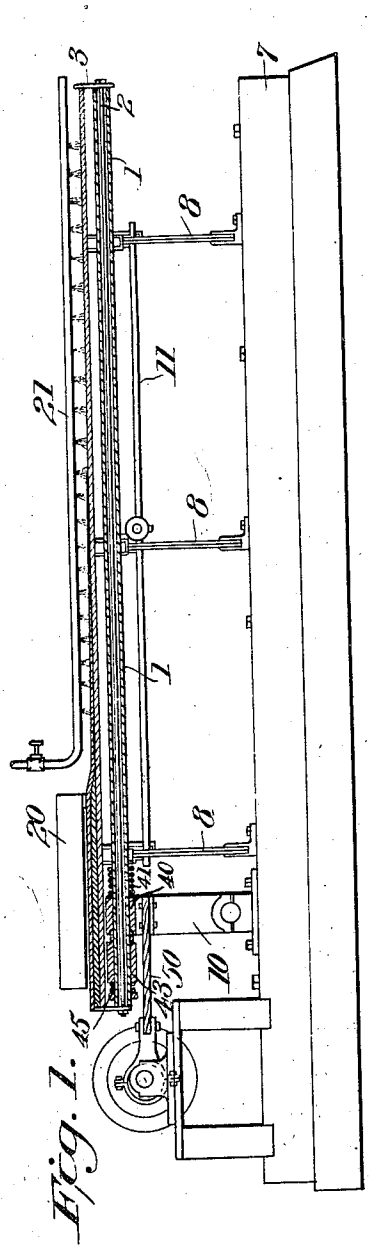

Fig. 1.

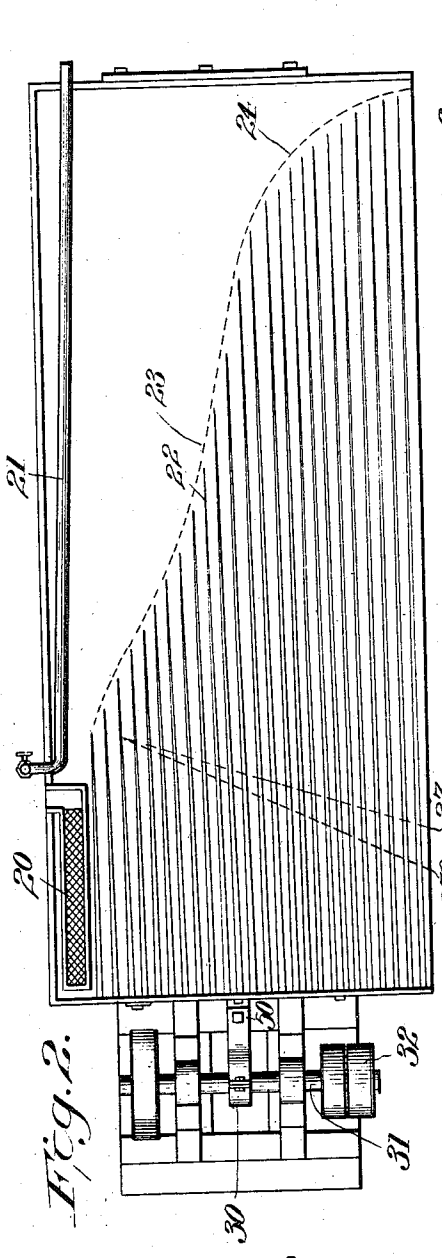

Fig. 2.

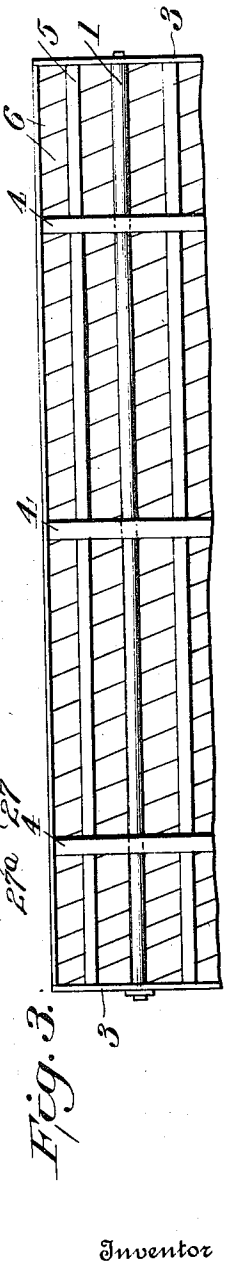

Fig. 3.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

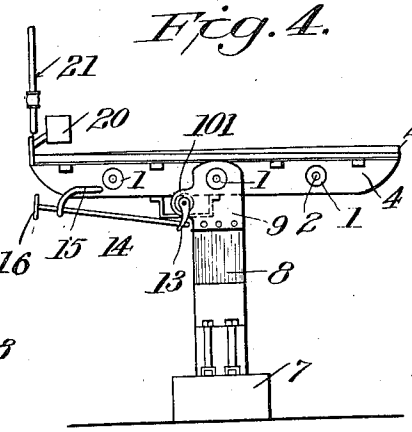

Fig. 8.

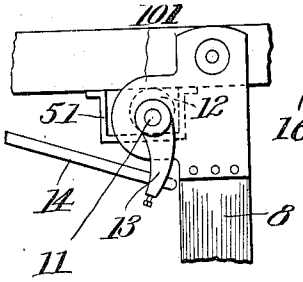

Fig. 9.

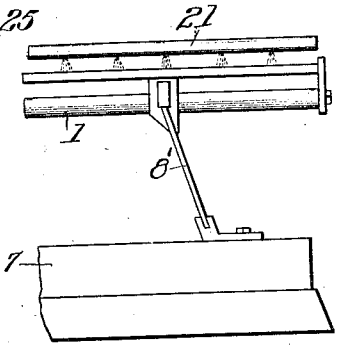

Fig. 5.

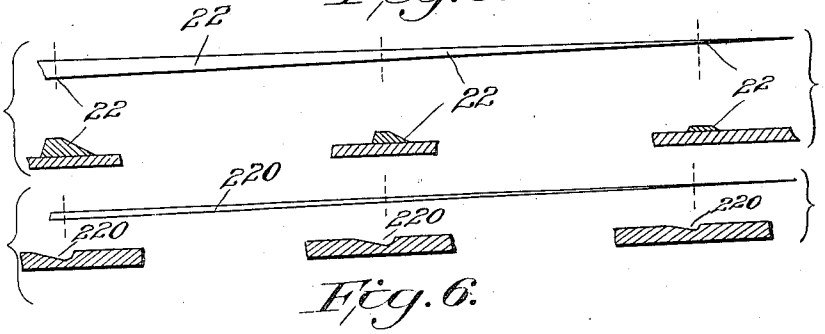

Fig. 6.

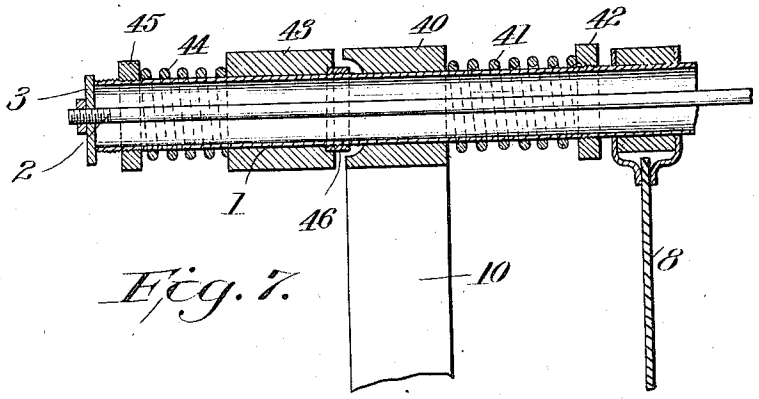

Fig. 7.

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UNITED STATES PATENT OFFICE.

CHARLES WILLIAM WRIGHT, OF WASHINGTON, DISTRICT OF COLUMBIA.

CONCENTRATING-TABLE.

1,051,049. Specification of Letters Patent. Patented Jan. 21, 1913.

Application filed August 11, 1910. Serial No. 576,679.

To all whom it may concern:

Be it known that I, CHARLES WILLIAM WRIGHT, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Concentrating-Tables, of which the following is a specification.

My invention relates to tables used for concentrating ores and is more particularly designed to provide a table adapted not only to separate the gangue from the metalliferous minerals, but also to separate such minerals from each other.

It also relates to certain structural features of such tables, whereby there is obtained simplicity and strength of construction, as well as a ready adaptability or adjustment to varying conditions and classes of materials to be treated.

In the accompanying drawings:—Figure 1 is an elevation partly in section; Fig. 2 is a plan view of the table; Fig. 3 is a plan view of a portion of the bottom of the table; Fig. 4 is an end elevation; Fig. 5 is a detail view of riffles on the table; Fig. 6 is a detail view of grooves in the table; Fig. 7 is a detail view of the bumping mechanism; Fig. 8 is a detail view of the means for adjusting the horizontal angular relation of the table; and Fig. 9 is a detail showing a modified form of support for the table.

The table is made up of a frame-work consisting of longitudinally extending iron pipes 1 having a length of about 3½ meters, and placed horizontally about ½ meter apart. Passing through the pipes are iron rods 2 of suitable diameter and secured at their ends to sheet metal plates 3 by nuts. By this arrangement the frame-work can be rigidly clamped together. Transverse beams 4, carried by the pipes and longitudinal strips 5, carried by the transverse beams, make up the frame-work. Diagonally laid boards 6 form the bottom of the table.

The table is supported on the foundation 7 by a series of resilient supports 8, 8, 8, which may be of wood or metal, and to which is secured in any suitable manner the central pipe-support 1. As shown in Fig. 4 iron plates 9 are secured to supports 8, the pipes 1 being carried in suitable openings in the plates 9. Journaled in ears 101 is a shaft 11, to which are secured eccentrics or cams 12, which engage the bottom of the table.

51 is a keeper surrounding the cam.

An arm 13 secured to the shaft is operated by means of a rod 14 having a screw-threaded engagement with a bracket 15 secured to the frame-work of the table.

16 is a hand-wheel for rotating the screw-rod, to vary the horizontal inclination of the table.

At the feed end of the table the surface is given a more gradual slope toward the lower edge, as shown at 25 in Fig. 4, the inner edge of this sloped portion being tapered, as shown at the left end of Fig. 1, the extent and limits of this sloped portion being indicated by the line 27. The portion of the table between lines 27 and 27ª is beveled off to form a gradual slope from the raised portion to the surface of the table.

The upper surface of the table is covered with linoleum on the surface of which parallel riffles 22 are attached. The riffles are made with a sharp bevel of 60°, for instance, toward the upper side of the table, and with a flat bevel of 30°, for instance, toward the lower side of the table, as shown in Fig. 5. The top edge of the riffles is planed off and it is found that this form of riffle causes the least amount of disturbance to the stratification of beds formed on the table during concentration.

The intervening flat spaces afford, in the treatment of finely crushed ores, an opportunity for the heavier ore particles or concentrates to separate out and settle to the bottom of the groove between the riffles. The sharp bevel of the next riffle prevents further movement of the heavier particles across the table, while the general flow of the pulp-carrying stream is not interrupted. The heavier particles are, so to speak, buried under a bed of lighter ores in this space, thus remaining separated from the lighter material and are gradually progressed by the reciprocating action of the table to the discharge end of the groove. There is thus little opportunity for loss of the heavier material by its being washed over the crest of the next succeeding riffle. The flat top of the riffles prevents the disturbance of the upper layers of the pulp stream, and assists further stratification with an easy descent of the concentrates into the succeeding channel.

The riffles are from 2 to 10 millimeters high at the feed end of the table and are planed down to zero toward the concentrate end of the table. However not all of them

are of the same length, but they terminate in a double curved line, as shown in Fig. 2. This is found to give the best results when concentrating compound ores. The arrangement of the set of riffles with their ends in the concave curve 23 gives a wider area on the table for the cleaning of the heavier minerals deposited in the upper riffles, which minerals discharge at the upper part of the concentrate end, while the riffles having their ends in the convex curve 24 carry the next heavier minerals farther forward toward the lower part of the concentrate end, thus preventing them from being washed off with the tailing or middling discharges.

20 is the usual feed-box and 21 a water-feed pipe adjustably arranged, so that the water may be delivered at various points on the table as desired.

The table is given a to-and-fro movement by an eccentric 30 carried on a shaft 31 and driven by a pulley 32. A rod which may be made of strong wood, so as to be slightly flexible, is connected to an upright 10, which carries at its upper end a sleeve 40, (see Fig. 1), surrounding the central supporting pipe 1. A strong spring 41 is located between the sleeve 40 and a tension-adjusting nut 42, screwed on the pipe. To the rear of the sleeve 40 and mounted on the pipe is a second sleeve 43 and a spring 44 and adjusting nut 45, also screwed onto the central pipe 1. Between the sleeves 40 and 43 is an adjusting ring 46, by means of which the distance between the sleeve can be regulated. In the operation of this portion of the device, as the support 10 moves forward, the spring 41 is compressed, owing to the inertia of the table. As the spring gradually asserts itself the table is pushed forward, and as the table is moving forward faster than the sleeve 40, the sleeve 43 is brought against the sleeve 40 and a slight bump is imparted through the spring 44 and nut 45 to the table, the adjustability of the springs enabling the force of this bump to be nicely regulated. The eccentric connection then pulls the table back for its next forward movement.

The riffles are shaped in cross-section as shown in Fig. 5. Instead of riffles grooves 220 may be used, in which case they are made of the shape shown in Fig. 6. The upper portions of these figures show in plan the tapering shape of the riffles, while the lower portions of the same figures show the shapes in cross-section at the planes indicated in dotted lines.

In the general operation of the table, the feed material is fed onto the feed end of the table, its tendency to flow rapidly across the table being checked by the less inclined outer portion 25, thus insuring the early precipitation of the slimes into the grooves between the riffles. By the repeated impulses given to the table the metalliferous material is gradually fed forward, the heavier portions, such as galena, arriving at the comparatively large unriffled portion of the table outside of the curve 23, where they can be subjected to the film of wash water from the pipe 21, while the lighter metalliferous portions of the ore, such as blende, are fed along the riffles and out onto the table opposite the curve 24. The tailings and middlings are delivered in the manner common to this class of concentrating table.

When coarser material is to be treated, the supports 8′ may be inclined as in Fig. 9, so that the movement of the table will give a slight upward throw to the material, the action being thus more of a "jigging" nature than when the movement of the table is in a substantially horizontal plane.

I claim:

1. The combination with a concentrating table of a reciprocating device moved positively in each direction, an adjustable resilient device interposed between the reciprocating device and the table, an adjustable abutment carried by the table and longitudinally movable relatively thereto, for bumping engagement with the reciprocating device.

2. The combination with a concentrating table of a reciprocating device moved positively in each direction, a resilient device interposed between the reciprocating device and the table, and an abutment carried by the table and longitudinally movable relative thereto for bumping engagement with the reciprocating device.

3. The combination with a concentrating table of a reciprocating device moved positively in each direction, an adjustable resilient device interposed between the reciprocating device and the table, and an abutment carried by the table and longitudinally movable relative thereto for bumping engagement with the reciprocating device.

4. The combination with a concentrating table of a reciprocating device moved positively in each direction, an adjustable resilient device interposed between the reciprocating device and the table, an adjustable abutment carried by the table and longitudinally movable relative thereto for bumping engagement with the reciprocating device, and a spring between said abutment and a fixed portion of said table.

5. A concentrating table comprising a central longitudinal member, supporting devices connected to said member, and means secured to and movable bodily with the table and supporting device for adjusting the angular position of the table.

6. A concentrating table comprising a central longitudinal member, resilient supporting devices on which said member is pivoted, a cam or cams carried on one or more

of said supporting devices and engaging directly with said table, and means carried by said table for rotating the cams.

7. A differentially reciprocating concentrating table having on its surface spaced riffles with intermediate plane surfaces, said riffles having a sharp inclination toward the feed side of the table and a less inclined bevel toward the other side of the table, the tops of said riffles being flat.

8. A differentially reciprocating concentrating table having on its surface longitudinally extending riffles of gradually increased length, the ends of one portion of the riffles being arranged in a curve concave with reference to the higher side of the table and extending from the feed end of the table toward the delivery end, and the ends of the other portion being arranged near the discharge end in a convex curve.

9. A differentially reciprocating concentrating table having a surface, the transverse inclination of the surface at the feed end of the table being less than the transverse inclination at the concentrate end, longitudinally extending riffles arranged on the surface of said table, the ends of the riffles at the upper portion of the table being arranged along a concave curve, and the ends of the riffles at the lower portion of the table being arranged in a convex curve.

10. A differentially reciprocating concentrating table having a continuous surface, the transverse inclination of the surface at the feed-end portion of the table being less than the transverse inclination at the concentrate-end portion, the two portions being connected by a beveled surface-portion extending angularly across the table as shown.

11. A concentrating table comprising a central longitudinal member, resilient supporting devices connected to said member, a reciprocating device moved positively in each direction, an adjustable resilient device interposed between one side of the reciprocating device and an abutment fixed to said member, an adjustable abutment carried by said member and longitudinally movable relative thereto for bumping engagement with the other side of said reciprocating device.

12. A concentrating table comprising a frame having a central longitudinal member, a central longitudinal series of resilient supports on which said member is pivoted, means connected to the frame and supports for adjusting the angular position of the frame and movable bodily with said frame, and means connected to said member for imparting a movement to said table.

13. A concentrating table comprising a frame, a central longitudinal member forming a rigid part of said frame, a central longitudinal series of resilient supports on which said member is pivoted, a shaft mounted in bearings on said supports, cams on said shaft engaging the table, and means for rotating said cam-shaft.

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

CHARLES WILLIAM WRIGHT.

Witnesses:

N. P. LEONARD,

J. H. BRICKENSTEIN.