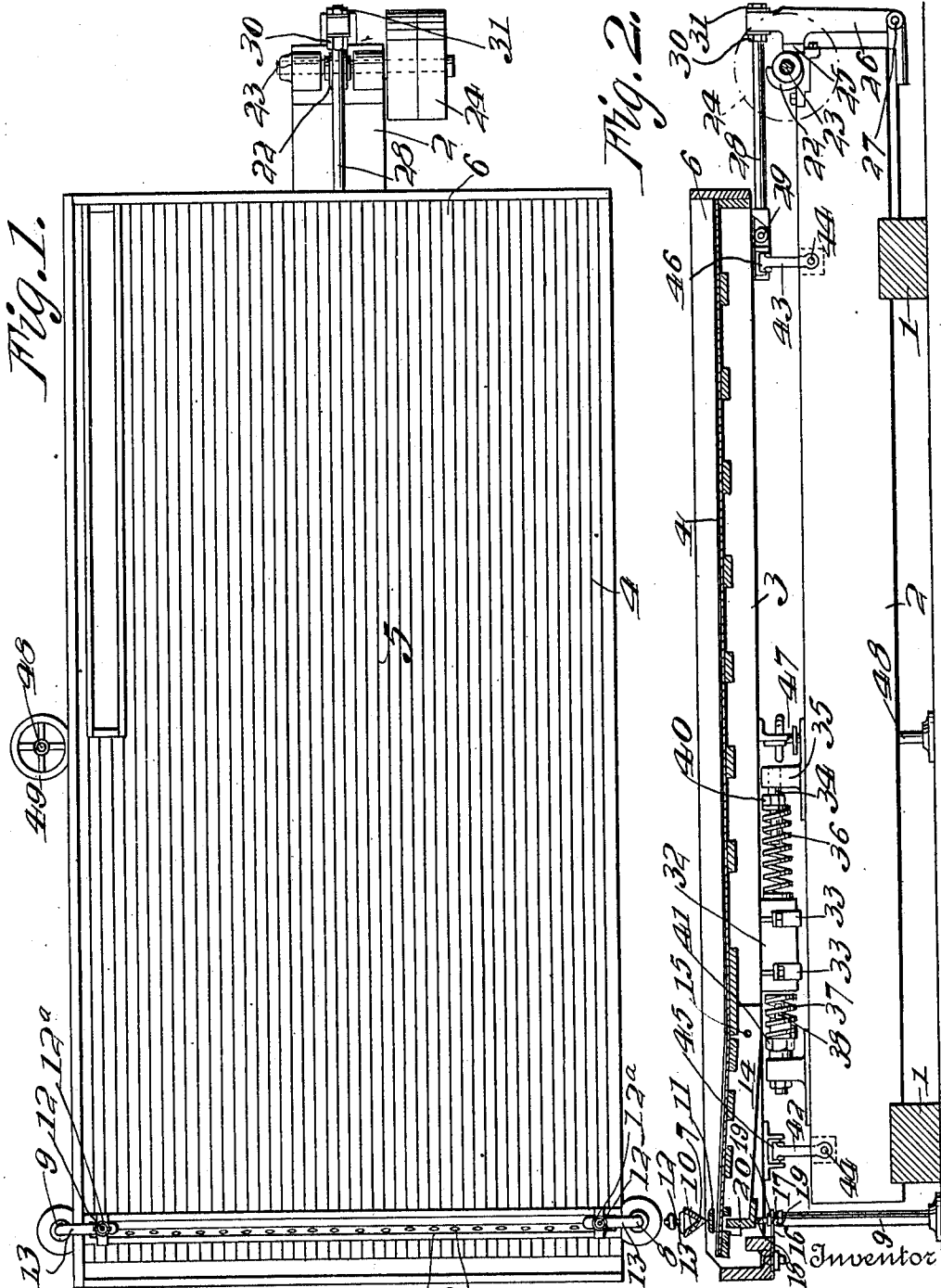


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ORE CONCENTRATOR AND SLIMING TABLE.
APPLICATION FILED JULY 7, 1909.

980,202.

Patented Jan. 3, 1911.

2 SHEETS—SHEET 1.



Witnesses

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Fig. 3.

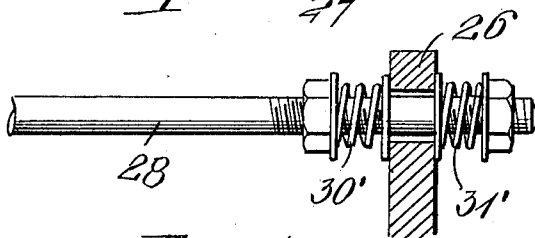
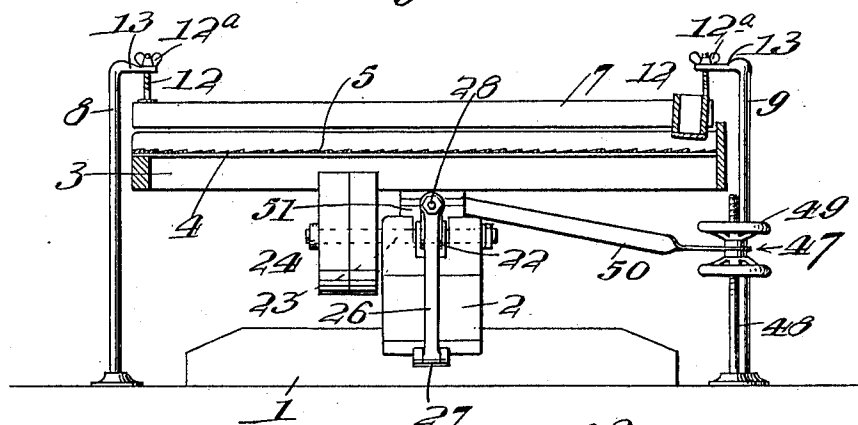
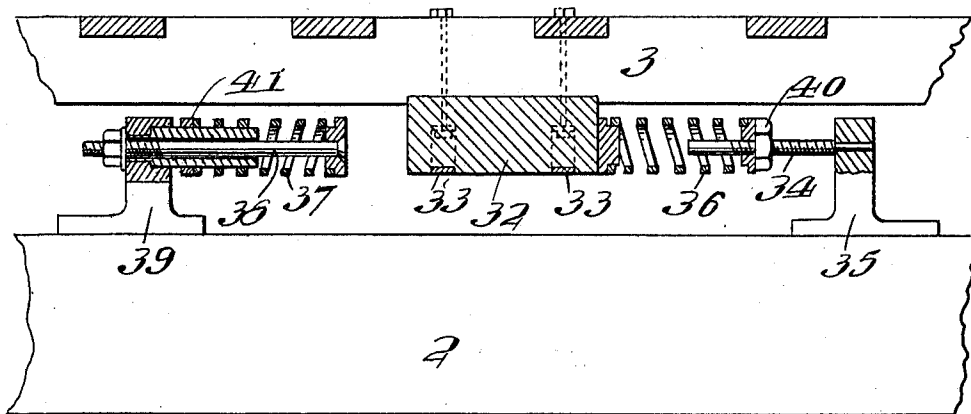


Fig. 5.

Fig. 4.



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UNITED STATES PATENT OFFICE.

CHRISTOFFER A. CHRISTENSEN, OF PORTLAND, OREGON.

ORE-CONCENTRATOR AND SLIMING-TABLE.

980,202.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed July 7, 1909. Serial No. 506,270.

To all whom it may concern:

Be it known that I, CHRISTOFFER A. CHRISTENSEN, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Ore-Concentrators and Sliming-Tables; 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.

This invention relates to an improved ore concentrator and sliming table.

One object of the invention is to provide a table of this class with means for separating minerals of different specific gravity and all of which may be thrown forward by the same movement of the table.

Another object of the invention is to provide means for gently and evenly distributing water into the riffles.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangements of parts, as will be more fully described and particularly pointed out in the appended claim.

In the accompanying drawings, Figure 1 represents a top plan view of a concentrating table constructed in accordance with this invention; Fig. 2 is a longitudinal vertical section thereof; Fig. 3 is an end view taken from the front of the table; and Fig. 4 is a detail vertical transverse sectional view showing the bumper and adjacent parts. Fig. 5 is a detail side elevation of the upper end of the lever and the connecting rod showing a slightly different form of connection.

In the operation of ore concentrating plants the crushed ore is delivered upon a table to which a reciprocatory movement is imparted and upon which is delivered wash water, the longitudinal reciprocations imparted to said table serving to effect the advancement of the particles of rock and mineral along said table and the mineral which is heaviest gravitates to the bottom of the mass and is deposited upon the table and progresses along said table while the rock, dirt and the like are gradually washed away from the mineral portion and are discharged with the wash water over one edge of the table, hereinafter designated as the "tailings-discharge" edge. The mineral

portion is advanced or progressed over the end of the table.

In order to prevent the mineral from being washed off with the wash water it is usual to provide riffles upon the surface of the table, the purpose and function of which is to form stops to catch and hold the mineral particles while permitting the lighter rock and dirt to wash over the upper or top edges of the riffles.

This invention relates particularly to the construction and arrangement of the riffles whereby a complete separation of the minerals is effected without the danger of losing any.

Referring more particularly to the drawings, 1 denotes the supporting frame having arranged thereon a centrally disposed longitudinally arranged supporting bar or beam, 2. The top, 3, of the table is preferably constructed of suitably supported 1/2 inch lumber arranged lengthwise and covered with linoleum, 4, or any other suitable material. Over this linoleum is arranged other 1/2 inch lumber disposed lengthwise of the table and having V-shaped grooves or riffles, 5, arranged therein and extending lengthwise of the table, each riffle being of the same depth and width throughout the entire length of the table. These riffles are made narrow and shallow at the upper or feed side, 6, of the table and are gradually widened and deepened toward the lower side thereof. These riffles are made of varying widths and depths to provide for the concentrating of fine slime which frequently contains lead, iron and zinc and if the riffles be made of the same width and depth the agitation necessary to move the lead which will settle in the first riffles at the upper end of the table will be too great to permit the lighter minerals to settle in the lower riffles, but by having the riffles deeper and wider on the lower or discharge side of the table, a greater body of the lighter minerals will settle in them. This permits the table to throw them forward with the same movement which is necessary to move the heavier minerals in the shallow riffles.

A V-shaped trough, 7, for supplying water to the end of the riffles is suspended on two iron standards, 8 and 9, preferably bolted to the floor. This trough, 7, is open at its upper end and is provided in one of its side walls with a plurality of apertures as 10, which permit the water to discharge there-

through and flow to the bottom edge of the trough and drop onto a narrow board, 11, fastened to the top of the table and which distributes the water gently and evenly into the riffles. This trough may be raised or lowered by means of thumb screws as 12, secured to opposite ends of the trough and extending through independently projecting lateral arms, as 13, formed on the upper ends of the standards, 8 and 9. These screws are preferably made as shown in Fig. 3, being provided with winged nuts as 12^a.

The inner ends of the riffles are secured to the main frame of the table while the outer ends of the riffles are secured to short supporting bars as 14, arranged at the outer end of the table, said bars being pivotally mounted at their inner ends upon a transversely disposed rod, 15, whereby said bars may be raised or lowered. Secured to the under side of the front end of the frame is a transversely disposed plate, 16, having a series of recesses, 17, formed in the inner edge thereof, and in each of which is arranged an adjusting screw, 18. These screws are preferably provided with fixed collars as 19, adapted to engage opposite sides of the plate, 16, to hold the screws in place on said plate and permit them to be turned in the recesses, 18. The upper threaded ends of the screw, 17, are adapted to work in threaded apertures formed in the lower face of iron bands, 20, which are arranged on the outer end of each of the short bars, 14, as shown clearly in Fig. 2. By connecting the outer ends of the bars, 14, with the adjusting screws, 18, said outer ends may be raised or lowered on the rod, 15, to any desired extent, thereby raising the riffles at this end of the table. The driving gear or table reciprocating mechanism consists of a cam, 22, fixed to a driving shaft, 23, having drive pulleys, 24, mounted thereon by means of which power may be applied to the shaft to turn the same and the cam, 22, fixed thereto. This cam, 22, is designed to engage a wooden block, 25, secured to a lever, 26, hinged at its lower end at 27, to the supporting frame. A connecting rod, 28, passes through the upper end of the lever, 26, and engages a hinged casting, 29, fastened to the front of the table preferably at the under side thereof. This produces a simple and substantial movement and permits the length of the stroke to be changed by turning the two nuts, 30 and 31, on the connecting rod 28, arranged on opposite sides of the lever 26. Coiled springs 30' and 31' are preferably arranged on the rod 28 on opposite sides of the lever 26 between it and the nuts 30 and 31 as shown in Fig. 5 to deaden the noise of the cam 22 when it strikes the lever 26. A bumper 32 is secured to the lower face of the table preferably by means of straps as 33 and is prefer-

ably constructed of wood or other suitable material. A horizontally disposed rod 34 is mounted at one end in a bracket 35 secured to the supporting frame and a coiled driving spring 36, is arranged on the rod 34, between the bumper 32 and the bracket 35, and exerts its tension to throw the table backward after it has been moved forwardly by the cam 22. A coiled buffer or stop spring 37 is mounted on a rod 38 between the other end of the bumper 32, and a bracket 39, in which said rod 38 is mounted. This spring 37 is designed to receive the thrust of the member 32, when the spring 36 forces said table backward and thus minimizes the shock and muffles the sound of the blow. The tension of these springs 36 and 37 is regulated by nuts 40 and 41, mounted on the outer ends of the rods 35 and 38 inside the supporting brackets 35 and 39. The spring 37 is so short as to stop the table in its return stroke, imparted by the spring 36 with sufficient abruptness to make it the equivalent of the well known bump to cause forward travel of the concentrators.

The table is supported on the beam 2, by means of uprights 42 and 43, connected at their lower ends by a hinge joint as 44, with the beam 2, and hingedly connected at their upper ends with brackets 45 and 46, depending from the lower face of the table, the hinged connection of the members 42 and 43 being arranged to permit the table to be tilted sidewise for adjusting it in varying inclinations by means now to be described.

Arranged beneath one side of the table preferably midway between the ends thereof is a tilting device, 47, which is here shown as consisting of an upright, 48, secured at one end to the supporting structure and having its upper end screw threaded. An adjusting member, 49, is screwed on to the upper member, 48, and is preferably made in the form shown in Fig. 3. A bar, 50, is connected at one end to the member, 49, and at its other end to a bracket, 51, on the lower face of the table, preferably at a point about the center thereof. The raising or lowering of the member, 49, raises or lowers the table at the side to which it is connected and thus provides for the tilting of the table at one desired angle.

From the foregoing description, taken in connection with the accompanying drawings, the construction and combination of the invention will be readily understood without requiring a more extended explanation.

Having thus described my invention, what I claim is:

In combination with a transversely inclined, longitudinally riffled, differentially reciprocable concentrating table, having an upwardly inclined section at the concen-

trates discharge end, over which inclined
section the riffles extend to the discharge
end of the table, of means for supplying
water upon said inclined section, near the
5 discharge end thereof, and a transversely
extending distributing board intermediate
said water supply means and the riffles upon
said inclined section and in close proximity
to said riffles, said distributing board being

adapted to evenly distribute the water over 10
said riffles without substantial impact.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

CHRISTOFFER A. CHRISTENSEN.

Witnesses:

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I. J. MERRILL.