No. 713,436. Patented Nov. 11, 1902.

C. J. HODGE.

JIG FOR MINERAL OR ORE WASHING.

(Application filed Dec. 19, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

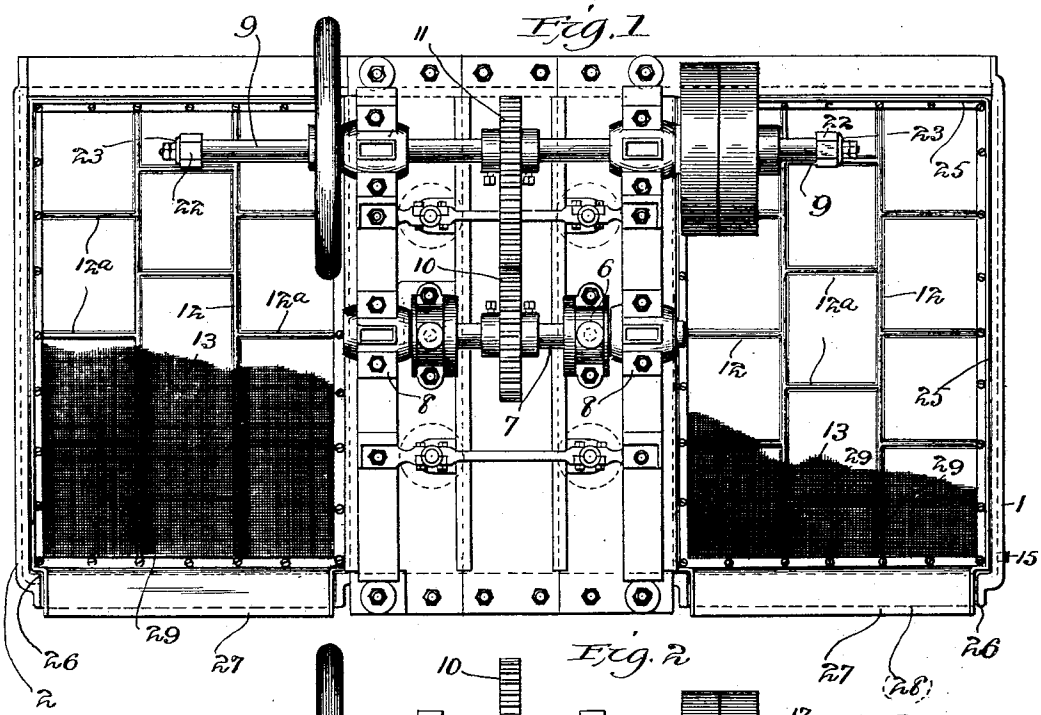
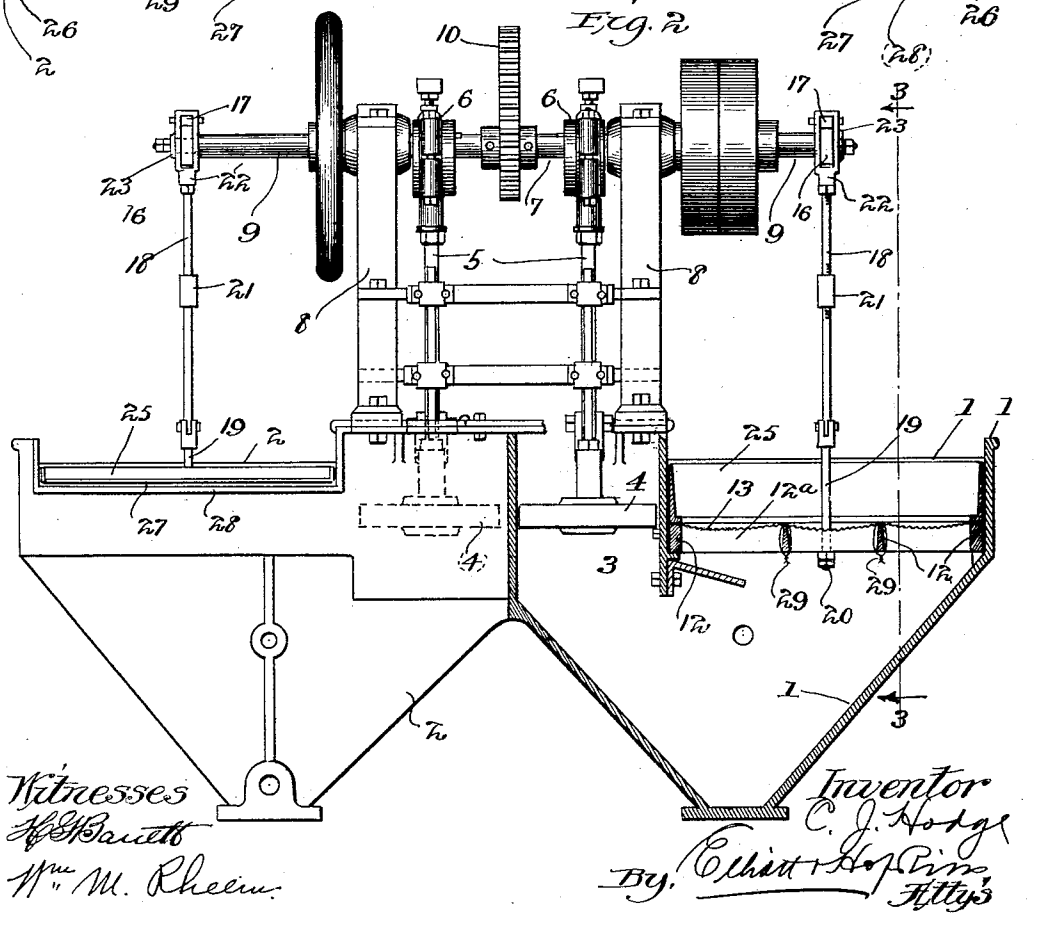


Fig. 2.



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Fig. 3

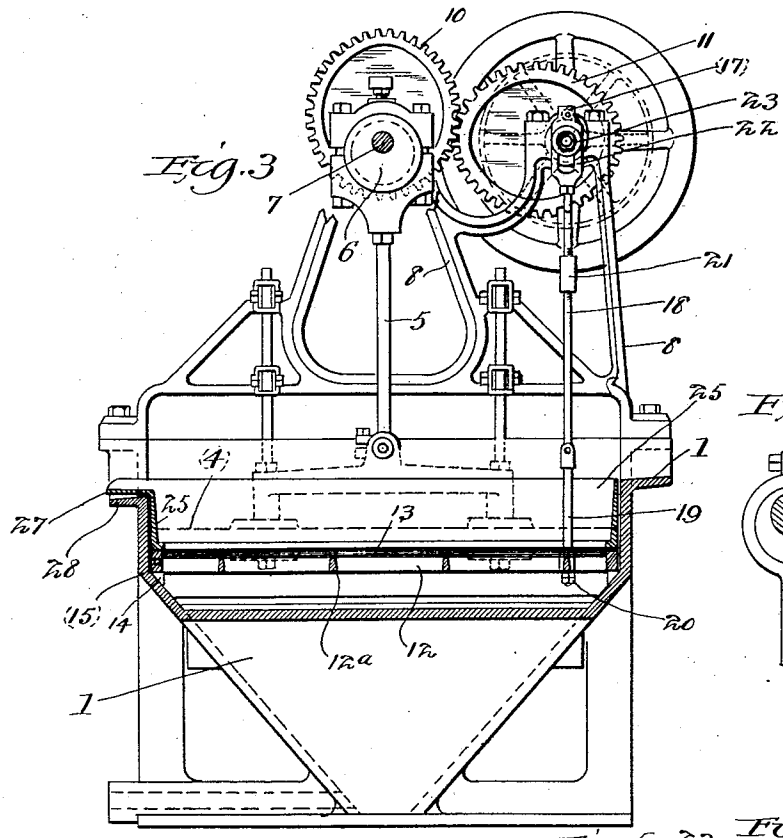


Fig. 8

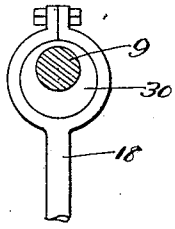


Fig. 4

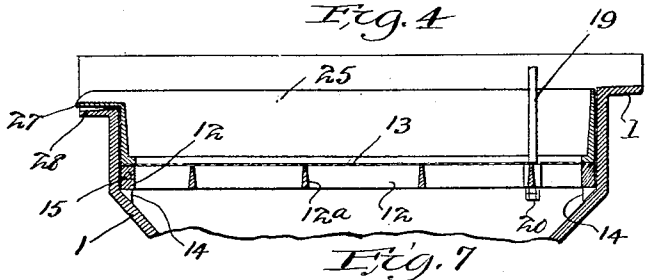


Fig. 5

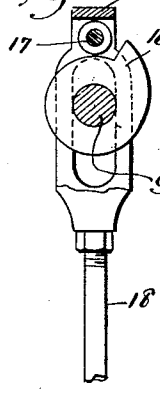


Fig. 6

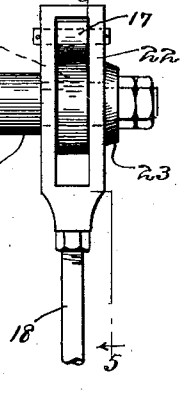
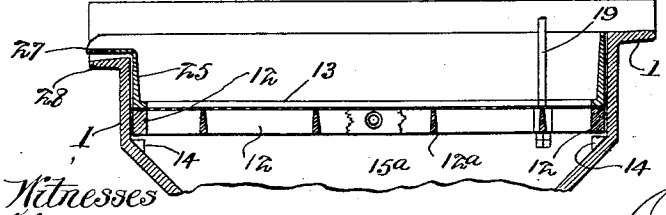


Fig. 7



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No. 713,436. Patented Nov. 11, 1902.

C. J. HODGE.

JIG FOR MINERAL OR ORE WASHING.

(Application filed Dec. 19, 1898.)

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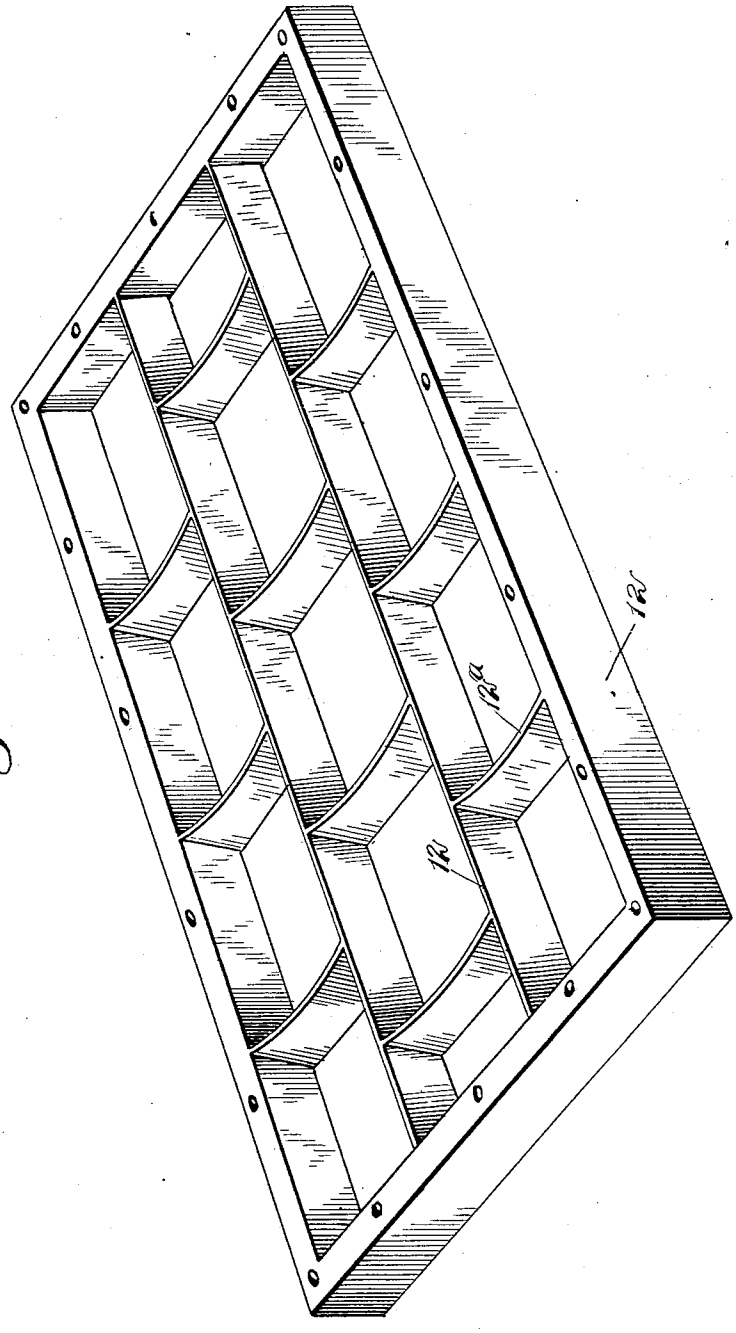


Fig. 9.

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UNITED STATES PATENT OFFICE.

CHARLES J. HODGE, OF HOUGHTON, MICHIGAN.

JIG FOR MINERAL OR ORE WASHING.

SPECIFICATION forming part of Letters Patent No. 713,436, dated November 11, 1902.

Application filed December 19, 1898. Serial No. 699,669. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. HODGE, a citizen of the United States, residing at Houghton, in the county of Houghton and State of Michigan, have invented certain new and useful Improvements in Jigs for Mineral or Ore Washing, of which the following is a full, clear, and exact specification.

My invention relates to jigs of the character described in my United States Patent No. 575,646, issued January 19, 1897.

One of the objects of my invention is to provide an improved and simple form of jig in which the material to be treated will be subjected to continuous agitation from the time it enters or is deposited upon the screen until it leaves the apparatus, and the screen will be moved downwardly while the plunger of the jig is also descending, thus causing the screen to also move against the force of the water. In jigs of this character it is necessary to employ a grate or screen supporting frame comprising a number of longitudinal and transverse bars for sustaining the fabric or screen against the downward pressure of the material resting thereon. It is desirable to have this screen as regular throughout its surface as possible, avoiding all cavities liable to catch and hold the drifting material; but the screen will sag between the bars however closely they may be arranged within practicable limits; but the sagging of the screen longitudinally of the tank or in the direction of the drift of the material is not objectionable, since it does not retard the movement of the material toward the outlet. Hence my invention has for another object to sag the screen longitudinally of the grate or lengthwise of the line of drift of the material, so that it cannot sag crosswise, and thus form ridges to retard the movement of the material.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a plan view of my improved jig with portions of the screen broken away. Fig. 2 is a side elevation thereof with the end of one of the tanks and screen-frames cut off. Fig. 3 is an end elevation, partly in section, on the line 3 3, Fig. 2. Fig. 4 is a vertical longitudinal sectional view of the screen, its supporting-frame or grate, and a part of the tank. Fig. 5 is an enlarged detail sectional view taken on the line 5 5, Fig. 6. Fig. 6 is an edge view thereof. Fig. 7 is a view similar to Fig. 4, illustrating a modification in the manner of pivoting the grate hereinafter described. Fig. 8 is a view of the eccentric for agitating said modified form of grate, and Fig. 9 is a perspective view of the grate.

I have shown my invention in connection with a pair of connected tanks 1 2, this being the usual but not the essential arrangement, for it is obvious that a single tank might be employed. These tanks 1 2 are each provided with the usual plunger-chamber 3, in which operates a plunger 4, having a connection 5 with an eccentric 6 on a shaft 7. The shaft 7 is mounted in suitable frames or standards 8, and it derives motion from a driving-shaft 9 through the intermediary of a pair of gears 10 11, mounted upon the countershaft 7 and driving-shaft 9, respectively, the latter shaft being also mounted in the frames 8. These gears 10 11 are of elliptical form and they are pierced by their shafts at remote points from their centers, so that each will possess both the maximum and minimum leverage. They are so arranged with reference to each other that the maximum leverage of the gear 11 will be in engagement with the minor diameter or minimum leverage of the gear 10 when the plungers are descending, so as to give to the plungers a rapid downstroke; but when the plungers are ascending the minimum leverage of the gear 11 is in engagement with the maximum leverage of the gear 10, and consequently imparting to the plungers a slower movement on their upstroke.

Arranged in each of the tanks 1 2 in the usual manner is a grate or frame 12 for supporting the screen or sieve 13, arranged thereover. This grate or frame 12, however, instead of being fixed, as heretofore, rests freely

upon its supporting-legs 14, and, if desired, may be hinged or pivoted at one end by means of bolts or pins 15 passing through the tank and engaging therein, thus leaving the other or opposite end of the frame or grate free to rise and fall or vibrate. Vibratory movement may be imparted to the grate, and consequently to the screen or sieve, by any suitable connection with the operating mechanism. As a preferred arrangement I have provided each end of the driving-shaft 9 with a scroll-cam 16, with which engages an anti-friction stud or roller 17, connected with a rod 18, whose lower end is connected with the free end of the grate 12. One end of the grate 12 is pierced by an eyebolt 19, which is secured thereto by nuts 20, and has its upper end pivoted to the lower end of the rod 18, which is made in sections and coupled together by a turnbuckle 21, so that the length of the rod may be readily adjusted. The upper end of the rod 18 is secured to a yoke 22, which straddles the shaft 9 and also embraces the cam 16, the stud 17 being secured to the upper end of the yoke 22 and the cam being held in place by a cap 23 on the outer end of the shaft. Thus it will be seen that as the shaft rotates the stud 17 will be gradually raised, lifting the grate 12 until the plungers are about to descend, and when the stud 17 reaches the abrupt end of the cam 16 it will suddenly drop and agitate the grate and screen.

The screen or sieve 13 is held in place on the grate 12 by means of a marginal frame 24, secured to the grate 12 by screws or other suitable devices, and this frame 24 has a standing flange or wall 25, which rises from all sides of the grate to a point above the water-line in the tank, excepting at the end of the tank, where its overflow or outlet 26 is formed, and here the wall or flange is provided with a lip 27, which is formed at a lower level than the upper edges of the wall and overhangs the usual lip 28 at the outlet end of the tank, so that the water and material discharging through the outlet will not be afforded any opportunity to run down between the tank and the wall 25. The lip 27 is formed slightly above the lip 28, so as to provide clearance for the oscillation of the wall 25 with the screen and grate, and the other end of the wall 25 and of the grate are of course also provided with sufficient clearance to permit of the desired vibration.

The grate 12 is formed with longitudinal bars, which extend lengthwise of the tank or in the direction of the drift of the material on the screen, and these bars are connected by short cross-bars 12^a, preferably arranged to break joint with each other, so as to avoid, as far as possible, bringing the ends of the bars together, and thereby decreasing the effective area of the screen. These cross-bars 12^a are sagged or curved downwardly at their upper edges in a direction transversely of the line of drift of the material, so that the screen 13 will be compelled to sag or bend from end to end, and thus form troughs extending lengthwise of the drift of the material, whose bottoms will be free from ridges because of the difficulty of bending the screen on two contrary curves at once. The screen may be bound to the bars of the grate by wires 29 or otherwise.

In Fig. 7 I have shown the screen supported at its mid-length on pivots 15^a instead of being hinged at one end, so that it may receive a teetering movement. The pivots 15^a, however, will form the support for the grate when in a horizontal position, and the lugs 14 will be located a sufficient distance below it to allow for vibration. When this manner of pivoting the screen is adopted, it is preferable to vibrate it by means of an eccentric 30 (shown in Fig. 8) or by any other regular movement.

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

1. A jig for mineral or ore washing, comprising in combination a tank, one end wall of which is lower than its other walls and provided with an outwardly-projecting lip, a screen-frame supported in said tank, means for vibrating the said screen-frame, one end wall of which screen-frame is in a plane below its other walls, but in a plane above the lower end wall of the tank, and is provided with an overflow-lip projecting from the tank-lip in a plane differing therefrom in pitch, whereby a clearance is provided for the oscillation of the screen-frame end walls, the screen and the screen-supporting frame, and the contents of the screen-frame is prevented from overflowing its sides and one end, substantially as set forth.

2. A jig for mineral or ore washing having in combination a tank having an overflow, a screen in said tank, a grate for supporting said screen having grate-bars extending transversely thereof and at an angle to the floor toward the overflow, said bars being sagged at their upper edges so as to permit the screen to bend downwardly and form a trough leading toward the overflow, substantially as set forth.

3. A jig for mineral or ore washing having in combination a tank provided with an overflow, a screen in said tank, a grate for supporting said screen having grate-bars extending toward said overflow and cross grate-bars having their upper edges sagged transversely of said first bars, and said screen being pressed down to conform to said bars and to thereby form longitudinal troughs extending from the inlet to the overflow, substantially as set forth.

4. A jig for mineral or ore washing having in combination a tank provided at one end with an overflow arranged on a lower level than the remainder of the walls of the tank,

a screen-frame supported in said tank, a screen supported on said frame and having continuous troughs or channels extending toward the overflow, a flange extending entirely around and supported on said screen-frame and having a laterally-projecting lip over the edge of the tank at said overflow and being arranged at a lower level than the remainder of said flange, and means for tilting said screen and frame endwise of the said troughs, substantially as set forth.

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