

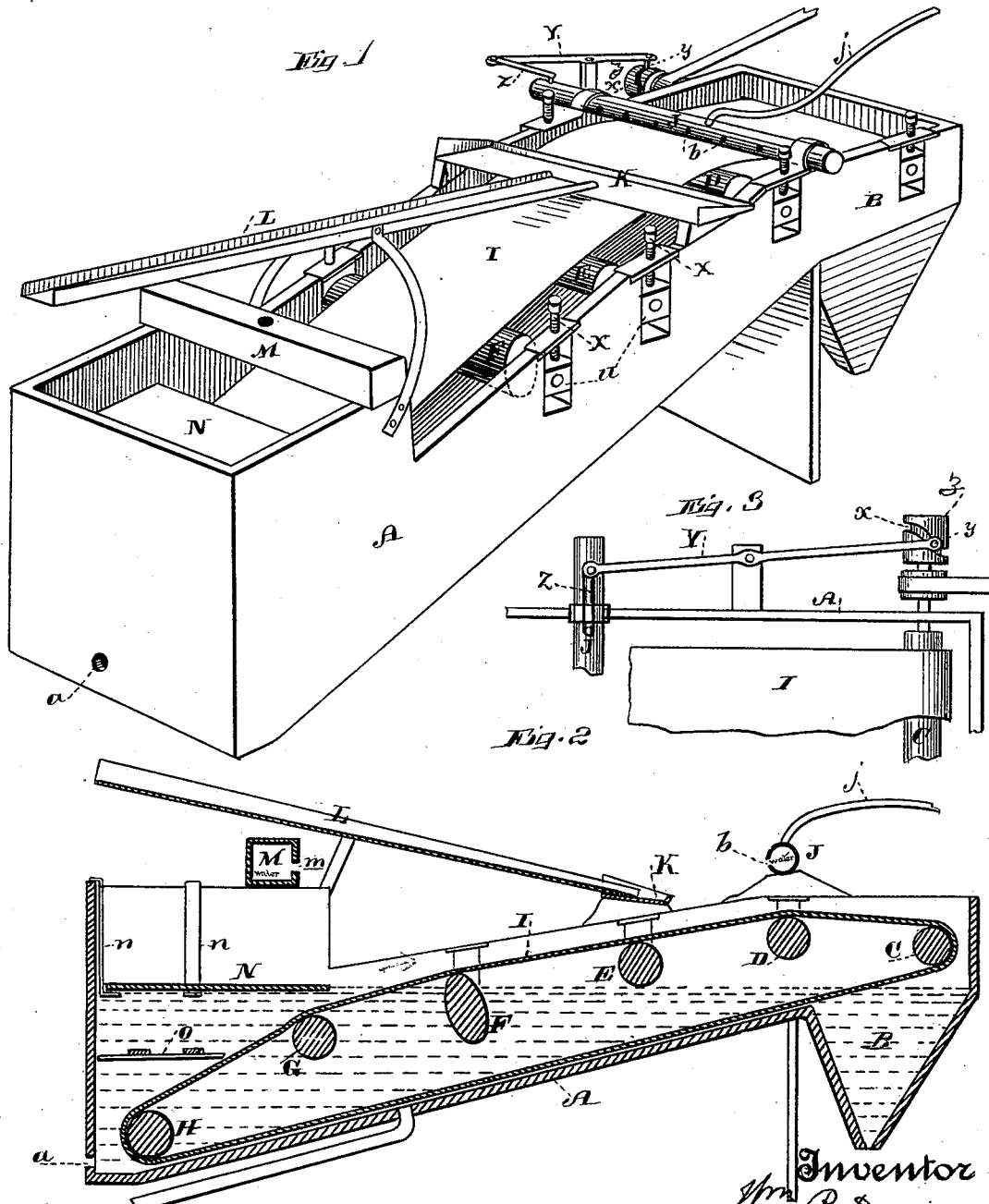
(No Model.)

W. P. DAVIS.

ORE CONCENTRATOR AND AMALGAMATOR.

No. 269,563.

Patented Dec. 26, 1882.



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UNITED STATES PATENT OFFICE.

WILLIAM P. DAVIS, OF SPRING CITY, NEVADA.

ORE CONCENTRATOR AND AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 269,563, dated December 26, 1882.

Application filed June 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. DAVIS, of Spring City, county of Humboldt, State of Nevada, have invented an Improved Ore Concentrator and Amalgamator; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in that class of ore-separating devices in which an endless belt travels upward against a stream of water and deposits its concentrations in a tank below.

These improvements consist in the general arrangement of the belt within the tanks, in means for changing the inclination or level of the belt at any suitable points, and in a means for imparting to it an undulatory motion; also, in means for discharging vibrating jets of water upon its surface near its upper end, in the provision of a series of streams near its lower end, in the employment of an inverted floating amalgam-plate, and amalgamating-grates through which the waste must pass to the discharge. These, together with minor details of construction, will hereinafter fully appear.

The object of my invention is to provide an effective means for concentrating and amalgamating ores.

Referring to the accompanying drawings, Figure 1 is a perspective view. Fig. 2 is a longitudinal vertical section. Fig. 3 is a detail of construction.

Let A represent a tank having an inclined bottom. At its upper end is a smaller tank, B, having a discharge from its bottom. This is the receiving-tank for the concentrations. The main tank A is supplied with water from a pipe underneath, and it has a discharge, *a*, in its end near its bottom.

In the receiving-tank B is journaled the driving-drum C, to which power may be applied in any suitable manner. At about the line of meeting of the tanks A and B, and a little higher up in the frame of the device than drum C, is a roller, D. Farther on, a little lower, is a roller, E, and still lower down is a cam-roller, F, while succeeding this are the rollers G and H, as shown, the latter being near the bottom of the box. Over these rollers is fitted an endless belt, I, of suitable construction. This passes over drum C, extends up to roller

E, thence down over eccentric roller F and rollers G and H, around the latter of which it passes underneath and up the inclined bottom of tank A to the drum C.

To the belt is given what is known as an "uphill travel"—that is, it travels up the incline to roller D and down around drum C, from which it derives its motion. All the rollers over which it passes, including drum C, are individually journaled in boxes *u*, provided with screws *x*, whereby each may be adjusted to vary the inclination or level of the belt at any desirable point, which is an advantage to the ore at different points upon the belt, as is found by experience. The cam-roller F gives to the belt a gentle undulatory motion, which is highly beneficial in settling the heavier particles.

The water in both tanks A and B is to be kept high enough to submerge the entire belt, with the exception of that portion of its top extending from the top of drum C to a point just before it reaches roller G.

Over the belt at its highest point, which is above the roller D, is a water-pipe, J, supplied by a flexible pipe, *j*, and provided with a number of small apertures, *b*, from which jets of clear water are directed upon and against the belt as it travels upward. The pipe J is loosely journaled in boxes to have a certain lateral movement or vibration, which may be accomplished in any suitable manner. I have here shown the following device: Upon the projecting end of the shaft of drum C is a driving-pulley, and a pulley, *z*, in which is made an eccentric groove, *x*.

Y is a centrally-pivoted lever, one end of which is provided with a stud, *y*, traveling in the groove *x*, and its other end is connected by a rod, Z, with the pipe J. Thus the water-pipe J is made to vibrate laterally to distribute its jets over the belt.

Above the belt, lower down than pipe J, is set across the frame the ore distributor or feed K, supplied from the sluice L. At the lower end of the tank A, about in a line above roller G, is a water-pipe, M, from which, through apertures *m* in its side, streams of water are directed down upon the belt at the edge of the water-line.

In the tank A, at its lower end, is a plate, N,

amalgamated on its lower surface, sustained upon the surface of the water by means of suitable hangers, *n*. This plate extends between the water-line upon the belt and the end of the tank. Under it, down in the water and just above the lower end of the belt I, is an amalgam-grate, O, which is secured to the frame, and through which the waste must pass in seeking discharge *a*.

The following is a description of the operation of the device:

The belt I travels upward by means of power applied to drum C. Its larger portion moves through the water with which tanks A and B are supplied, so that it moves noiselessly, and but little power is required to operate it.

The ore is fed to the belt from distributor K, and moving up meets the vibrating jets of water from pipe J. By these jets a separation occurs at this point. The heavier particles or concentrations resist the downward flow of the water, and are carried down into receiving-tank B, which contains clear water, and are washed off. From this they are continually discharged through its bottom. The lighter or waste particles flow down over the belt with the water. They contain a proportion of precious metal too light to resist the flow. The undulatory motion given by cam-roller F tends to settle them down upon the belt, and some are thus carried up and washed off in tank B. The rest continue down to the water's edge, where they are met by the downward jets of clear water from the pipe M, and more separation occurs. What is left descends into the muddy water, and the floating gold is caught under the inverted amalgam-plate N. Others pass down through the amalgam-grate O and are caught, while the purely waste matter finds a discharge through opening *a*. Thus during the entire operation the pulp is subjected to concentrating and amalgamating processes, and a larger proportion of precious material is saved, rendering the machine as a whole very effective.

I may use any construction of belt. Different material requires different surfaces of belt. A friction-surface, which I make by mixing fine sand with the paint applied to a heavy canvas belt, I have found to do excellent work upon some kinds of ore.

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

1. In a concentrating device, the water-tank A and receiving-tank B, filled with water, in combination with the endless upwardly-revolving belt I, passing through and above the water, and a water and ore distributor, arranged substantially as and for the purpose herein described.

2. In a concentrating device, the water-tanks A and B, arranged as shown, in combination

with the endless upwardly-revolving belt I, driving-drum C, rollers D E G H, and the cam-roller F, all arranged substantially as and for the purpose herein described.

3. In a concentrating device, the water-tanks A and B and the endless traveling belt I, arranged, as shown, in combination with the driving-drum C, rollers D E G H, and the cam-roller F, said drum, rollers, and eccentric having a vertical adjustment in their bearings by means of the boxes *u* and screws *x*, substantially as and for the purpose herein described.

4. In a concentrating device, the water-tanks A and B, with their discharges, and endless traveling belt I, in combination with the ore-distributor K, water-supply pipe J, with its apertures *b*, and means for laterally reciprocating the same, all arranged substantially as and for the purpose herein described.

5. In a concentrating device, the water-tanks A and B, with their discharges, and the endless traveling belt I, in combination with the ore-distributor K, water-pipe J, with its apertures *b*, and means for laterally reciprocating the same, and the water-supply pipe M, with its apertures *m*, discharging upon the belt at the water-line, arranged substantially as and for the purpose herein described.

6. In a concentrating and amalgamating device, the water-tanks A and B, with their discharges, endless traveling belt I, ore-distributor K, and water supply pipes J, with their apertures *b*, all arranged as shown, in combination with the plate N, amalgamated on its lower side and sustained by hangers *n n*, substantially as and for the purpose herein described.

7. In a concentrating and amalgamating device, the water-tank A, with its discharge *a*, water-tank B, with its discharge, endless revolving belt I, and a water and an ore distributor, all as shown, in combination with the plate N, amalgamated on its lower side and sustained by hangers *n n*, and the amalgam-grate O, arranged substantially as and for the purpose herein described.

8. In a concentrating and amalgamating device, the water-tank A, with its discharge *a*, water-tank B, with its discharge, endless revolving belt I, with its adjustable drum C, adjustable cam-roller F, water-pipe J, with its apertures *b*, and means for laterally vibrating the same, ore-distributor K, water-supply pipe M, with its aperture *m*, plate N, amalgamated on its lower side and sustained by hangers *n n*, and the amalgam-grate O, all arranged and operating together, substantially as and for the purpose herein described.

In witness whereof I hereto set my hand.
WILLIAM P. DAVIS.

Witnesses:

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