

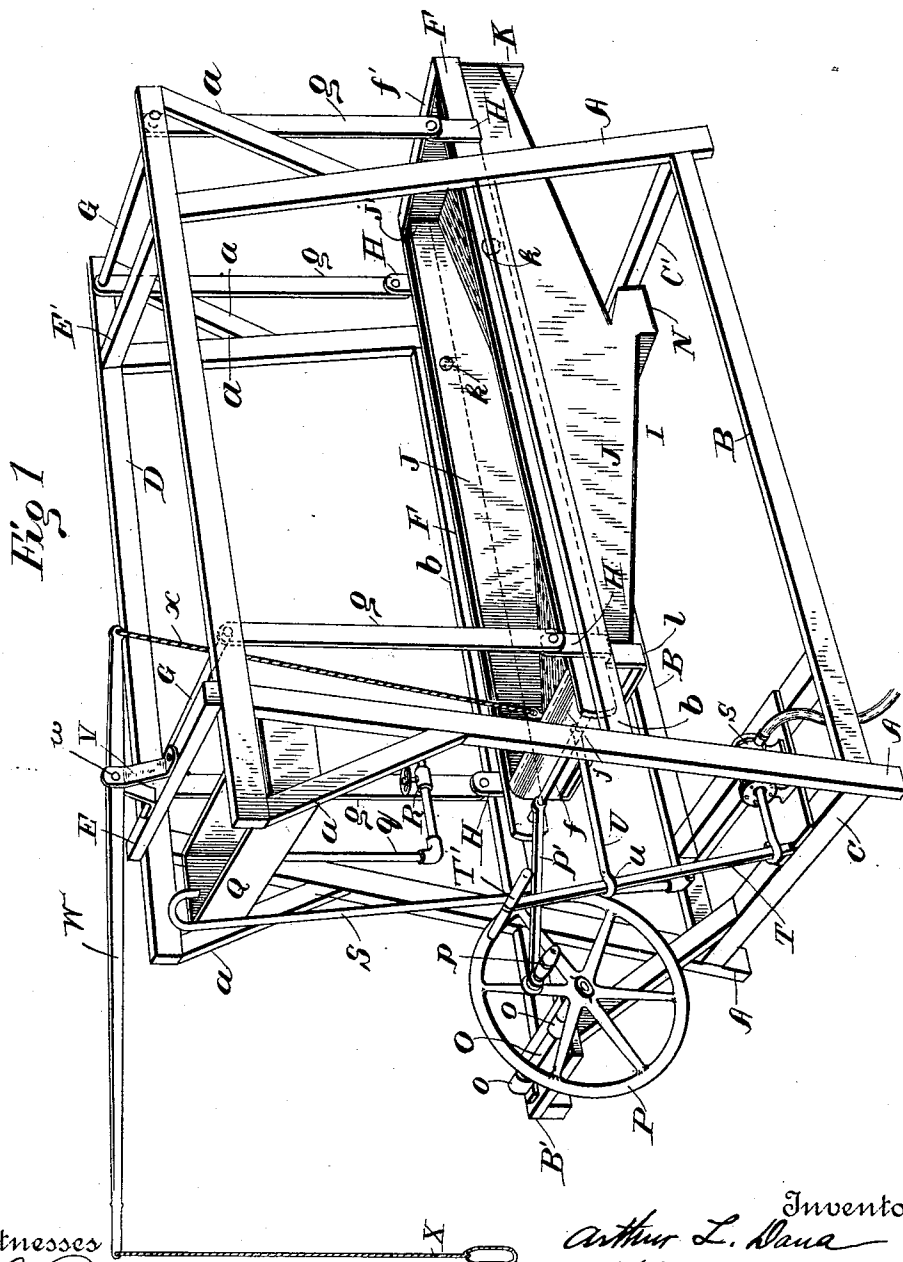
(No Model.)

2 Sheets—Sheet 1.

A. L. DANA.
ORE WASHER AND CONCENTRATOR.

No. 481,550.

Patented Aug. 30, 1892.



Witnesses
C. C. Burdine
E. C. Higdon

Inventor
Arthur L. Dana
by Higdon & Higdon
his Attorneys

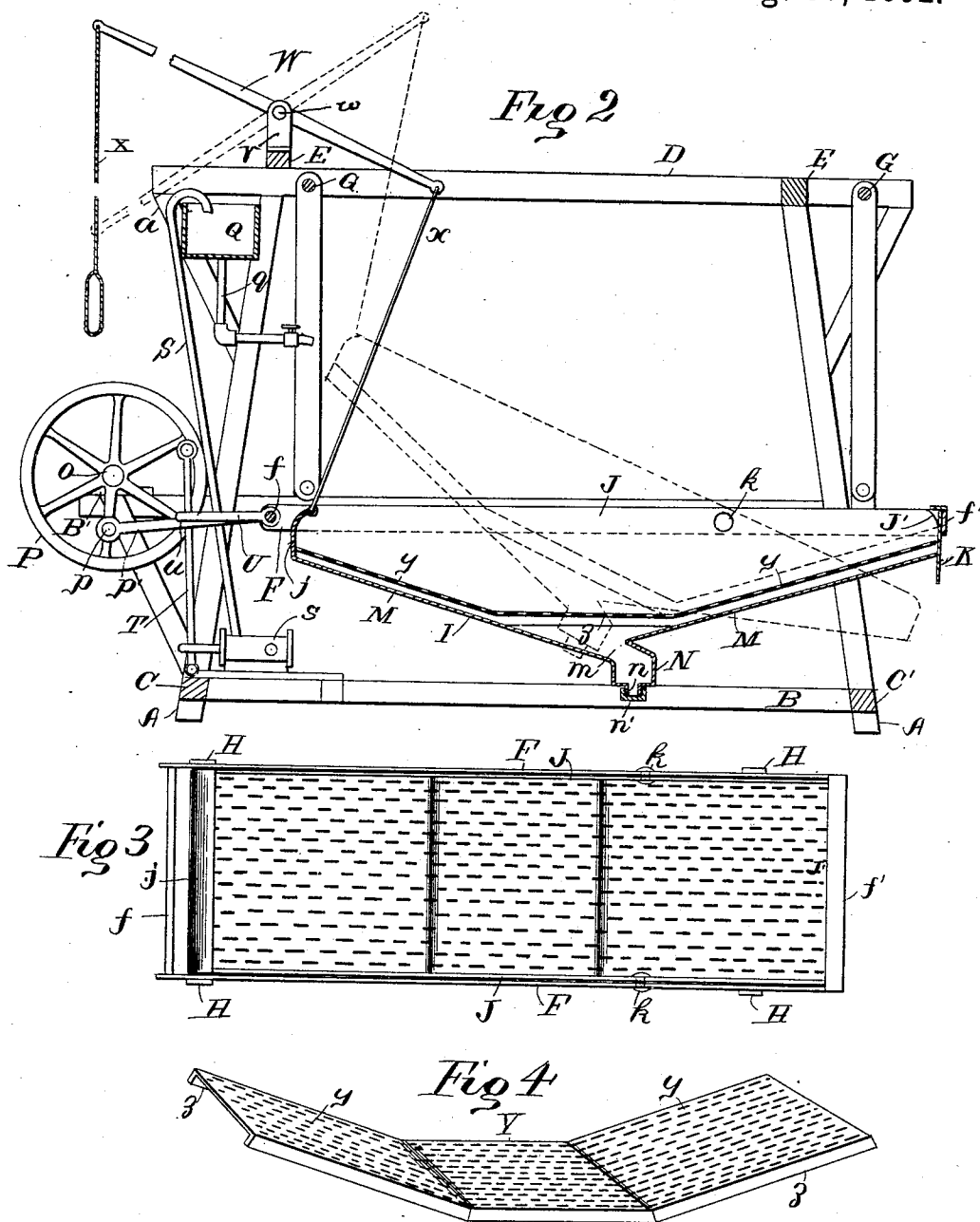
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His ATTORNEYS.

UNITED STATES PATENT OFFICE.

ARTHUR L. DANA, OF COLORADO SPRINGS, COLORADO.

ORE WASHER AND CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 481,550, dated August 30, 1892.

Application filed December 28, 1891. Serial No. 416,286. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR L. DANA, metallurgist and assayer, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented certain new and useful Improvements in Ore Washers and Concentrators; and I do hereby 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.

My invention relates to an ore-washer, its object being to wash the alluvial soil and rock in placer-mining, so as to catch the gold contained therein, and also for washing tailings from the stamp-mills. The apparatus is also used in dry-sand gold extraction.

To these ends my invention consists in certain features of construction and combinations of parts, to be hereinafter described, and then particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my apparatus. Fig. 2 is a vertical longitudinal section thereof, showing the shaking-shoe in dotted lines tilted. Fig. 3 is a plan view of the shaking-shoe and the oscillating frame in which it is pivoted. Fig. 4 is a perspective view of the perforated false bottom of the shaking-shoe.

Four uprights A, at opposite corners of the oblong framework, are connected by a pair of parallel side beams B and a pair of parallel cross-beams C C' at the bottom, and by a pair of parallel side beams D and a pair of parallel cross-beams E E' at the top. The uprights A incline inwardly, and the ends of the top side beams D are connected with the same by means of braces a. The uprights A are further connected at the sides by a pair of side beams b, located above the lower beams. These parts constitute the framework whereon the operative parts of the apparatus are supported, which I will now describe.

Hanging lengthwise of the framework of the apparatus and between the opposite sides thereof is an elongated oscillating frame consisting of parallel side bars F and parallel end bars f f'. At each end of the top of the framework is a cross-bar G, from each of which is pivotally suspended a pair of swing-

ing bars g, there being four of these bars g altogether, one near each corner of the framework. The lower ends of the swinging bars g are pivotally connected with lugs H, located one at each end of the side bars F, whereby the frame F f f' is supported so as to oscillate.

Within the oscillating frame the shaking-shoe I is located. This shaking-shoe is provided with sides J and with a front or feed end j. The rear end of the shaking-shoe is open to provide a discharge-mouth J', which when the shoe is in shaking position is closed by a depending cover-plate or flange K, projecting from the end bar f' of the oscillating frame.

Projecting inwardly from the side bars F of the oscillating frame are opposite pivots k, located nearer the rear or discharge end than the front or feed end of said frame, and on these pivots k, which pass through the sides J of the shaking-shoe to the rear of its mid-length, said shoe is pivoted, so that the front or feed end of the shoe will always be heavier than the rear or discharge end, and thus tend to seek a horizontal position. The front or feed end of the shaking-shoe is prevented from falling below the horizontal by means of a hanger l, which connects the side-bars F of the oscillating frame and passes under the shoe. In this manner the shaking-shoe is so supported in normal position that its upper edge will be substantially flush with the upper edges of the side bars F of the oscillating frame within which it is pivoted.

The shaking-shoe will now be described more in detail. The bottom of the shoe is composed of two inclines or plates M M', which respectively extend downwardly from each end of the shoe toward the center or more properly, toward each other. The front plate M has a greater slope than rear plate M', so that the lower end of the latter is somewhat higher than the lower end of the former. By reason of this relative position of the inner ends of the inclines or plates M M' a rearwardly-presented transverse opening m is formed, extending from side to side of the shaking-shoe. Communicating with the opening m is a pocket or trap N which extends rearwardly and downwardly and from side to side of the shaking-shoe, being thus located

at the lower ends of the inclines. At the bottom of the pocket or trap N is a screw-threaded nozzle *n*, that is closed by a screw-cap *n'*.

Y is a screen or perforated false bottom fitted removably in the shaking-shoe and provided with upwardly-inclined ends *y* and with downturned flanges *z* at each side, which rest upon the plates M M'. On an extension B' are affixed a pair of bearings *o*, in which a shaft O is journaled. At the inner end of said shaft is a hand-wheel P, provided with a hand-crank *p*. Connecting the hand-crank *p* and the front end bar *f* is a pitman *p'*. By means of this hand-wheel P the frame F *f f'* is oscillated, thus shaking the shoe I. The shaft O may be turned by any other motive power, instead of by hand.

Secured to the top of the framework between the front uprights A and the braces *a* is a tank Q, from which depends a discharge-pipe *q*, provided at its lower end with a faucet or nozzle R for discharging water into the shaking-shoe I. Running up on the top of the tank Q from the bottom of the framework is a supply-pipe S, which at its lower end communicates with a pump *s*. Pivoted on the cross-beam C, in front of the pump *s*, is an oscillating upright rod T, with which the piston-rod of the pump is loosely connected. Secured to the end bar *f* of the oscillating frame is a connecting-rod U, through an eye *u* of which the rod T passes. By means of these connections it will be observed that when the frame F *f f'* is oscillated the pump is simultaneously worked, so as to keep the tank constantly supplied with water. Instead of shaking the shoe by means of the hand-wheel the operator may work the rod T direct by taking hold of the handle T' thereof.

On the front cross-beam E of the framework is a bracket V, on which is fulcrumed at *w* a lever W, connected at its inner end with the front end of the shaking-shoe below by means of a rope or wire *x*. From the front end of the lever W a manipulating rope or wire X hangs within convenient reach.

From the foregoing description it will be apparent that the means for elevating the shoe and the feeding and oscillating mechanism are all located at the front or feed end of the shoe, whereby the entire apparatus is within the control of a single operator.

The *modus operandi* of this apparatus is as

follows: The dirt is placed in the shoe, upon the screen or false bottom Y, and then the water is let on to wash it. The shaking-shoe I is then put in operation so as to shake and sift the gold, which is the heaviest, through the screen, whence it falls onto the inclines M M' and, being assisted by the water, it is caused to fall into the pocket or trap N. The gold that falls onto the incline M' will slide therefrom onto the incline M and thence into the pocket or trap N. After the dirt has been thoroughly shaken the operator takes hold of the manipulating-rope X, pulling down the lever and turning the shoe I on its pivots, thus dumping the rocks and sand on the screen out of the shoe and leaving the gold collected in the pocket or trap N. The gold is removed from the pocket N through the nozzle *n* by removing the cap *n'*.

By means of this apparatus the gold is separated without the use of quicksilver. The apparatus is also useful in places where water is scarce.

Slight changes in my apparatus may be resorted to by any skilled mechanic without departing from the spirit and scope of my invention.

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

1. In an apparatus of the class described, the combination, with a swinging shoe having its bottom inclined from each end inwardly, but at different degrees of inclination, whereby a rearwardly-directed opening *m* is formed, of a trap N, encircling said opening, substantially as and for the purpose set forth.

2. In an apparatus of the class described, the combination, with an oscillating shoe having its bottom inclined from each end inwardly, but at different degrees of inclination, whereby a rearwardly-directed opening *m* is formed, of a trap N, inclosing said opening, and a false perforated bottom disposed in said shoe, substantially as and for the purpose set forth.

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

ARTHUR L. DANA.

Witnesses:

T. S. MARBLE,
J. ZYLEMU.