(No Model.)

J. M. WISHART.

GOLD SEPARATOR.

No. 597,450. Patented Jan. 18, 1898.

Fig. 1.

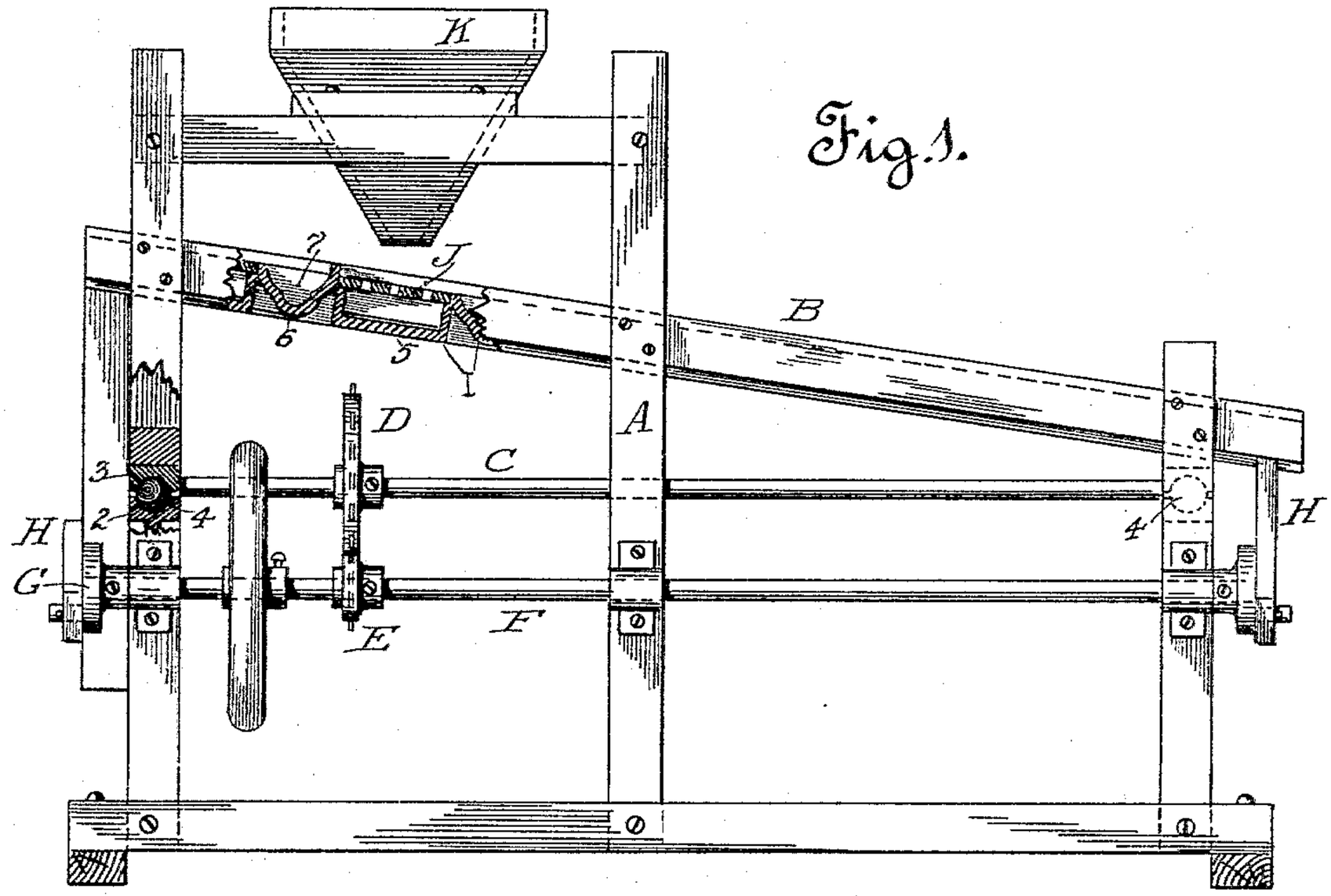


Fig. 2.

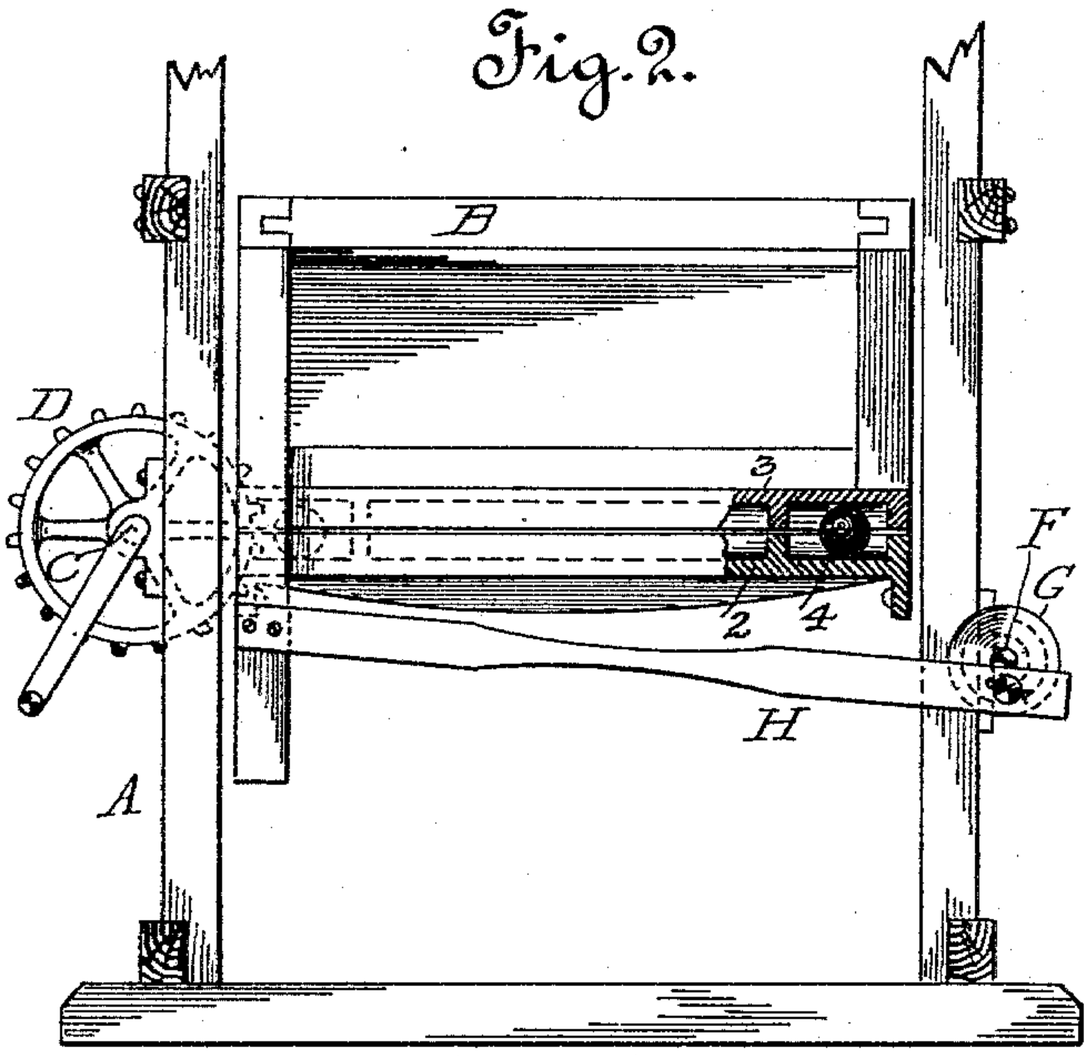
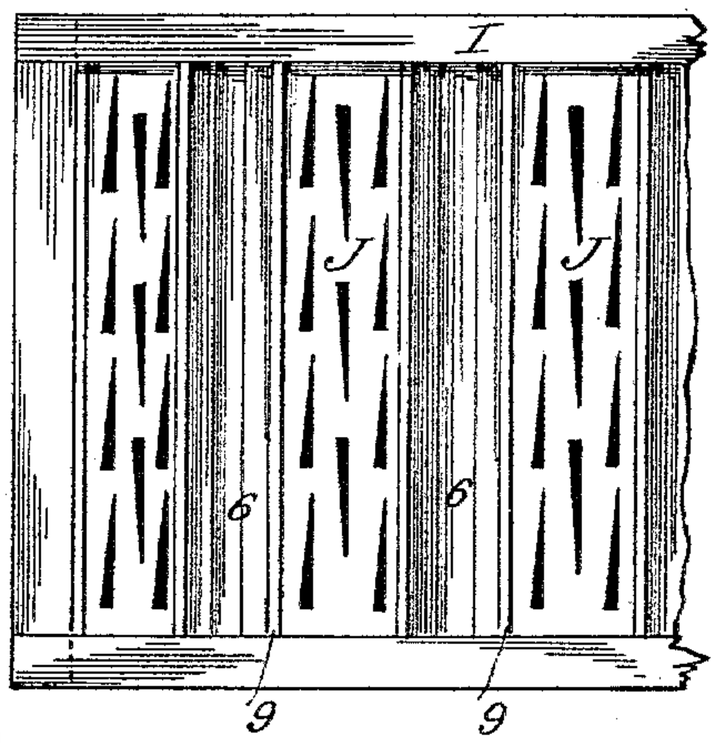


Fig. 3.



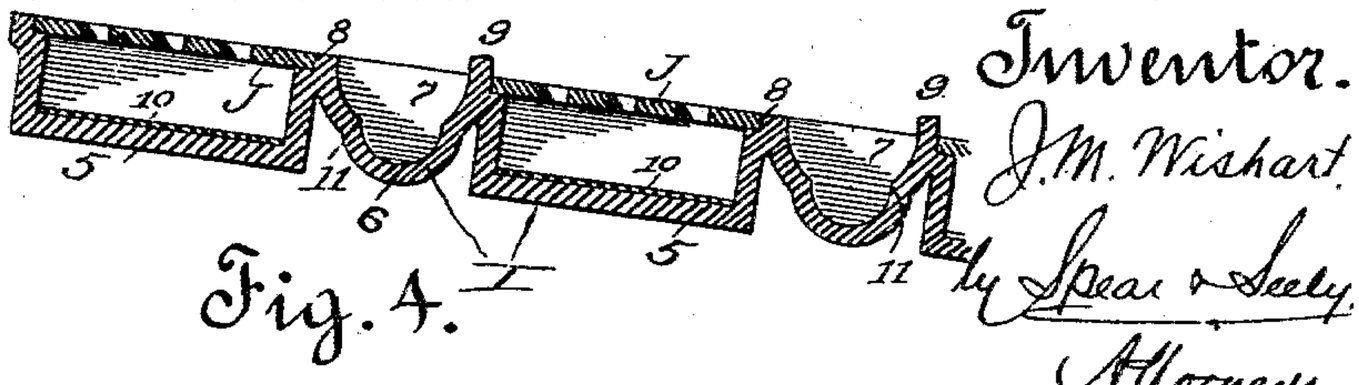


Fig. 4.

Witnesses.

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UNITED STATES PATENT OFFICE.

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GOLD-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 597,450, dated January 18, 1898.

Application filed June 15, 1896. Renewed December 13, 1897. Serial No. 661,759. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. WISHART, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Gold-Separators; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to ore-washers, and more particularly to apparatus for separating gold from sand, clay, gravel, and other material containing particles of free gold.

I have embodied my invention in an improved wet ore washer and amalgamator; and my improvements refer particularly to the construction of the working surface of the machine alone and in connection with improved amalgamating devices. They also refer, however, to special means for rendering the machine easy to work and also easy to clean up.

The various improvements which constitute my invention are fully described in this application and are shown in the accompanying drawings, in which—

Figure 1 is a side elevation of my machine, partly broken away to show the bearings for the shaking-surface and the construction of said surface in relation to the frame which supports it. Fig. 2 is an end elevation. Fig. 3 is a plan view of the working surface. Fig. 4 is a detail sectional view.

My machine is supported by a framework A, which may be made of wood in a cheap and simple way.

I intend my machine especially for use in rough and unsettled mining districts where there are few facilities for repairing machine-work, and hence I make my machine as simple and durable in construction as possible.

B represents the shaking or vibrating frame which holds the ore-working surface. This frame is rectangular in end elevation, but is inclined when looked at in side elevation, so as to give the proper downhill travel to the water and ore. The frame B is supported upon the main frame by antifriction ball-bearings 4. Two grooved or channeled boxes 2 and 3 are secured, respectively, to the main frame and the shaking-frame, so that they form a bearing for the balls 4, of which I prefer to use two at each end of the machine. This ball-bearing gives an exceedingly easy motion to the shaking-frame, which is of importance, as it will often be necessary to run the machine by hand.

On one side of the main frame is a shaft C, which carries a sprocket D. A chain from this sprocket is connected to another sprocket E on a shaft F on the other side of the main frame. On the ends of the shaft F are crank-disks G, to which are pivoted the flexible connecting-rods H, which extend across the machine to the shaking-frame.

The shaft C is provided with a hand-crank, power-pulley, or other device for applying power. Revolving this shaft will communicate a rapid and regular vibration or side shake to the frame B on its ball-bearings. The channels in which the balls are placed are natural oil-cups. The frame B can be lifted bodily off its bearings when the cotter-pin which holds the pitmen to their crank-disks has been removed and the pitmen slipped off the crank-pins.

The inclined shaking-frame B carries the ore washing and amalgamating devices, which are of peculiar construction.

I is a metallic plate or frame formed in one piece, or, in the case of a long machine, cast in two or more sections. This casting is a series of shallow boxes 5, alternating with transverse channels 6 of about the same depth, and both the channels and boxes extend entirely across the frame and are closed at the ends by the sides 7 of the latter. The upper edges of the boxes are slightly rabbeted, as shown at 8, forming ledges in which are set flat plates J, which lie flush with one wall of the channel; but the opposite wall of each channel is slightly prolonged upward, producing a series of lateral riffles 9 between each channel and the adjacent plate J. The bottom of each box is covered with an amalgamated plate 10, and the lower surface of each plate J may be, and is preferably, amalgamated also. Each plate J is perforated in the peculiar way shown in Fig. 3. These perforations are arranged in lateral rows and are of elongated triangular shape. Each perforation in each series overlaps or breaks joint with the two adjacent perforations in the next series, so that in the whole extent of the table there will be no continuous surface free from

perforations. The hopper K is a combined distributer for the auriferous material and for water, which are together fed down upon the shaking table as a pulp. The side shake spreads the pulp across the table, and it is washed downward by the water, aided by the natural inclination of the table. Large particles of free gold are caught by the channels, which are fluted, as shown at 11. The riffles 9 create an obstruction and an eddy in the current in each channel. As the material passes over the perforated plates more or less of it finds its way through the perforations and into the boxes, where there is a constant agitation of the current. Particles of gold are caught by the plates at the bottom of the boxes, while some of the flour-gold, being light, is caught by the amalgamated lower side of the perforated plate. The whole current is, however, washing in and out through the perforations, leaving more or less of its precious particles in the amalgam and carrying more or less into the next transverse channel, and so on through the series of channels and boxes.

I have found in practice that the machine is remarkably effective in separating the fine particles of gold found in some sea-sands on the Pacific coast and that such sands can be profitably worked by its use. Its effectiveness I believe to be principally due to the very thorough separation which takes place in the separate boxes covered by the perforated plates and amalgamated, especially when the machine is getting a side shake, which keeps the material in the boxes well agitated and constantly flowing into and out from the perforations.

In cleaning up the shaking frame can be lifted bodily, as before described, and tilted sidewise, so that the contents can be easily washed or swept out.

The simplicity of the construction makes it an exceedingly cheap machine to build, and hence it is particularly adapted to be used in small gravel-mines or on ocean-beaches with material containing only a small percentage of gold, which must be worked cheaply and will not pay for working with complicated, extensive, and expensive gold-separating plants.

Having described my invention, what I claim is—

1. In combination, in an ore-separator, a working surface composed of a series of rectangular boxes having flat bottoms and a series of narrow channels having rounded bottoms permanently secured between the boxes, the boxes and channels being of substantially the same depth, substantially as described.

2. In combination in an ore-separator, a working surface composed of a series of rectangular boxes, and narrow sunken channels between the same, the division-wall between said boxes and channel having corresponding rectangular recesses in each of their inner faces at their upper ends, and the perforated covers for said boxes adapted to be seated in said rabbeted portions and to rest parallel to the bottom of said boxes, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 6th day of June, 1896.

JAMES M. WISHART.

Witnesses:
L. W. SEELY,
GEO. T. KNOX.