(No Model.)

E. A. WALL.

ORE SEPARATOR.

No. 368,033. Patented Aug. 9, 1887.

Fig. 1.

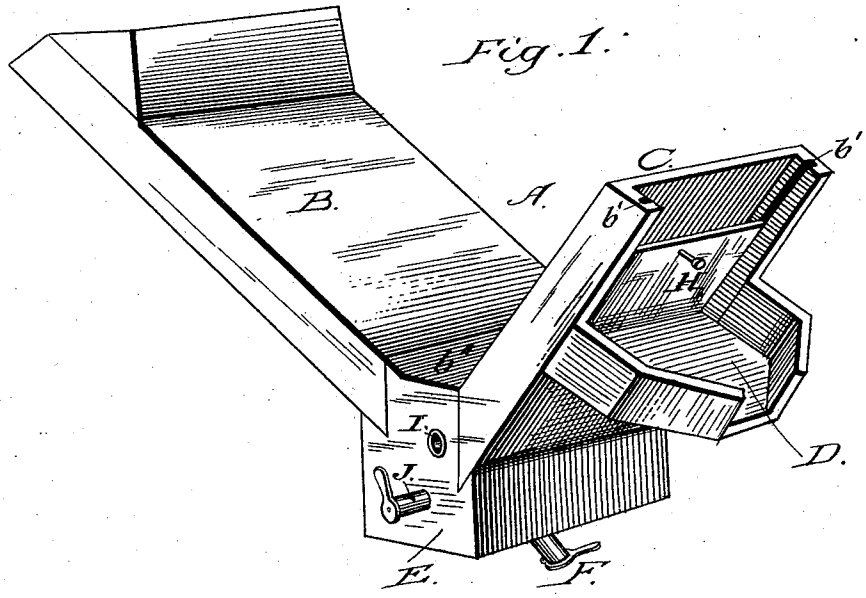
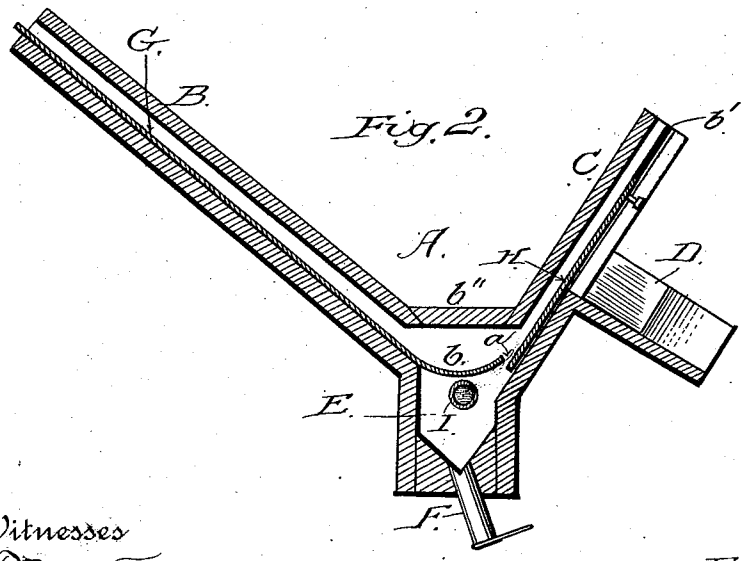


Fig. 2.



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SPECIFICATION forming part of Letters Patent No. 368,033, dated August 9, 1887.

Application filed January 6, 1887. Serial No. 223,527. (No model.)

To all whom it may concern:

Be it known that I, ENOS A. WALL, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and Territory of Utah, have invented certain new and useful Improvements in Ore-Separators, of which the following is a full and clear description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a perspective view of a separator embodying my improvements. Fig. 2 is a longitudinal vertical sectional view of the same.

My invention relates to hydraulic sluice separators; and it consists in the peculiar constructions and combinations of parts, which I shall hereinafter fully describe and claim.

To enable others skilled in the art to which my invention appertains to make and use the same, I will now describe its construction and indicate the manner in which the same is carried out.

The object of this invention is to treat the finer particles or slimes of ores containing valuable minerals resulting from the washings or separating of the coarser products, which are not as well adapted to treatment by a vaning-jig, such as is illustrated and described in my application, Serial No. 216,612, filed October 19, 1886.

In the said drawings, A represents an inclosed rectangular sluice-trough having the two upwardly-diverging conduits B and C, the former receiving the water containing the mineral slimes, and the latter having a discharge at D for the waste material.

At the juncture of the arms B and C is a receptacle, E, which extends transversely across the machine and has its upper portion in communication with the lower end of the arms B and C, as shown in Fig. 2. The bottom or floor of the reservoir E is grooved or V-shaped to receive the dressed mineral, which is afterward drawn from said bottom through a faucet-gate, such as F, let into the bottom of said receptacle.

In the bottom of the sluice or arm B is placed an adjustable wooden or metal plate, G, which closely fits the interior of said sluice or arm, extends downwardly into the upper portion of the receptacle, and has its end *b* curved or bent upwardly, as shown, so as to form a space between itself and the top of the receptacle, and closes the mouth of the same, with the exception of a narrow throat, *a*, formed between the end of said plate G and an adjacent plate, H, as shown in Fig. 2.

The size of the throat *a* may be increased or diminished by means of an adjustable plate, H, which is fitted in guides or grooves *b'* in the sides of the arm or sluice C. This plate or gate H also raises or lowers the point of overflow and controls the force of the current flowing through the machine.

Immediately beneath the plate G, and passing transversely through the receptacle E, is a small pipe, I, having in one side a narrow slotted opening extending the entire length of the throat and parallel therewith. This pipe I is located so as to throw a thin sheet or spray of water obliquely upward through the throat *a* and in the direction of the discharge at D, so that any particles of mineral passing through the machine must pass through this sheet of water before entering the receptacle E. The force of the water introduced through the pipe I being under full control by means of a common gage cock, it will be readily seen that particles of mineral of any given weight may be allowed to pass through the throat into the receptacle or be driven out through the waste-gate at D, as described. In the side of the receptacle and near the bottom is introduced a small pipe, J, for the introduction of a small stream of fresh water for the purpose of flushing accumulating mineral through the gate F and to compensate for the vacuum created by the discharge of water and minerals through said gate, it being essential that no flow of water be permitted from the volume introduced in the arm or sluice B to pass into the receptacle E.

The mode of operating the separator consists in introducing the water containing mineral slimes at the feed end of the sluice or arm B, the waste-gate being set high or low, according to the character of the material. If the mineral be of high specific gravity, the waste-gate is lowered, so as to increase the force of the current sufficiently to carry the waste matter up the inclined sluice and over the waste-gate; but if the mineral be relatively light the

gate and point of overflow must be raised, so as to reduce the force of the water-current and avoid carrying off valuable portions of the slimes.

The gate H must be closed sufficiently to cause the water in the sluice to back up and fill the space to the feed end of arm B, so as to form a solid column in the sluice from end to end, thereby avoiding any ripples in the flow and producing a steady-moving column through the machine. It will be found that in passing down the inclined sluice or arm all the heavier particles of minerals will be precipitated to the bottom of the sluice and will drop into the reservoir E after passing through the spray from the pipe I, which intervenes to prevent light and worthless material from passing into the receptacle and assists in raising such material up the inclined sluice and over the waste-gate D.

The breadth and depth of the opening or throat *a* must be governed by the quantity of water available and amount of mineral slimes contained, it being necessary in any case that the column of water shall be sufficient to fill the sluice with a strong current—*i. e.*, sufficient to force the waste material up the inclined sluice to the point of discharge. The covering *b''* of the sluice immediately over the throat should be horizontally placed, so as to give greater room for the water and permit the lighter particles of waste to be carried, with the assistance of the spray from pipe I, over the throat, while the heavier minerals, having settled to the bottom and traveled down upon the wooden or metal plate, are here left in an "eddy" to crowd themselves through the throat into the receptacle below, the spray driving back any particles of waste matter that may attempt to pass.

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

1. The receptacle F and inclined diverging conduits B and C, communicating at their lower ends, in combination with the adjustable plates G and H, arranged to leave between their edges the throat *a*, and the pipe I, having a slot in line with said throat, substantially as described.

2. The conduits B and C and the receptacle communicating therewith and having a V-shaped bottom, in combination with the adjustable plates G and H, the water-pipe I, and the discharge-faucet in the bottom of the receptacle, substantially as described.

3. The rectangular sluice having a feed and overflow, in combination with a receptacle extending transversely across said sluice and having a V-shaped bottom, a gate or faucet in said bottom, the adjustable plates G and H, forming between their adjacent ends the throat *a*, the slotted pipe I, and pipe J, substantially as specified.

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