(No Model.) 2 Sheets—Sheet 1.

O. MATZKE.

DRY ORE AMALGAMATOR AND SEPARATOR.

No. 349,442. Patented Sept. 21, 1886.

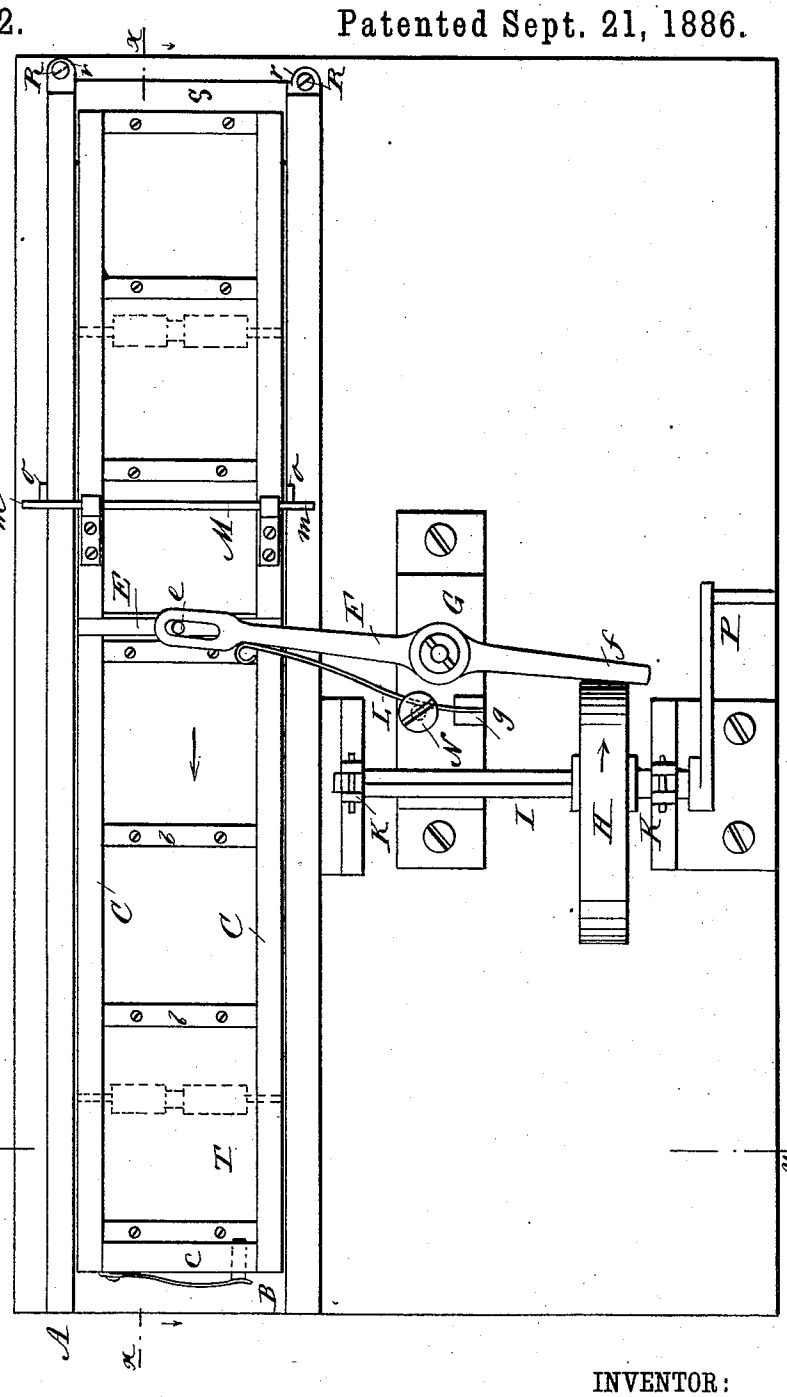

Fig. 1.

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Fig. 2.

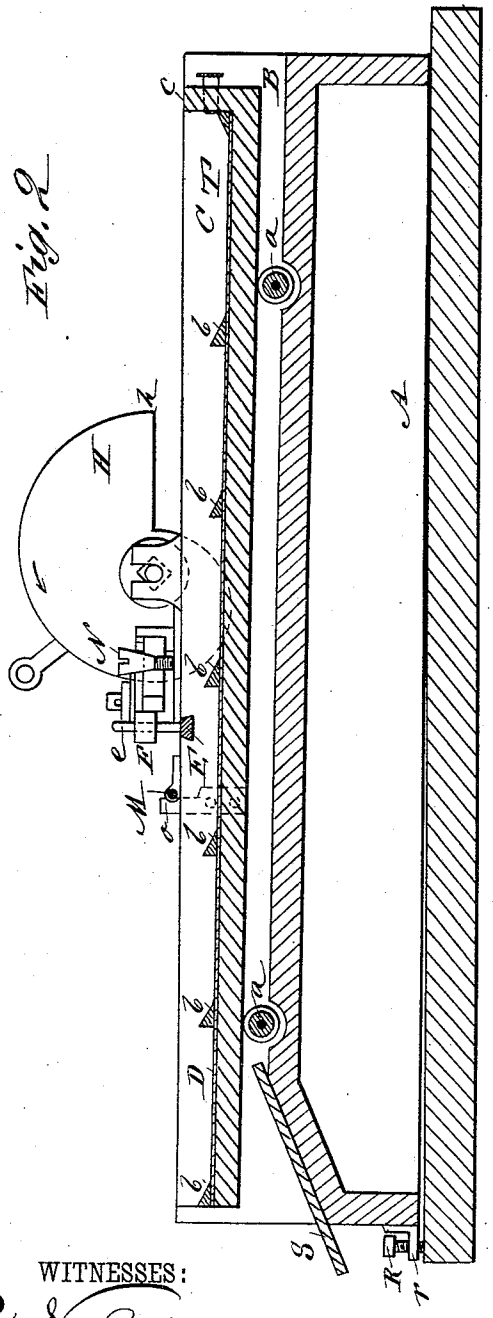
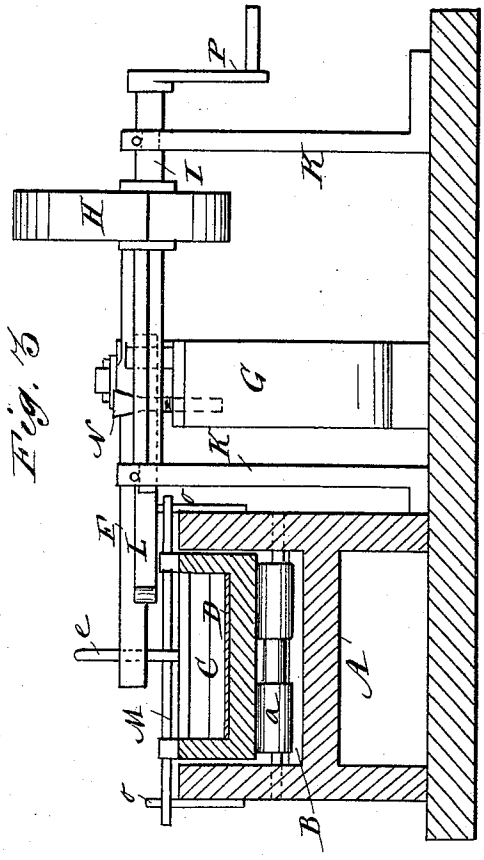


Fig. 1.



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UNITED STATES PATENT OFFICE.

OTTO MATZKE, OF GUNNISON, COLORADO.

DRY ORE AMALGAMATOR AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 349,442, dated September 21, 1886.

Application filed March 23, 1886. Serial No. 196,254. (No model.)

To all whom it may concern:

Be it known that I, OTTO MATZKE, of Gunnison, in the county of Gunnison and State of Colorado, have invented a new and Improved Dry Ore Amalgamator and Separator, of which the following is a full, clear, and exact description.

My invention relates to the construction of an amalgamator designed more particularly for use in connection with stamped or pulverized ore, but also applicable for use in connection with the product of placer-mines.

The invention consists in the construction and arrangement of parts, as will be hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my improved amalgamator. Fig. 2 is a longitudinal sectional elevation of the same taken on line *x x* of Fig. 1, and Fig. 3 is a cross-sectional view taken on line *y y* of Fig. 1.

In constructing such an apparatus as is illustrated in the drawings above referred to, I provide a main frame, A, constructed to form a box-like guideway, B, in which there are arranged rollers *a a*, and upon these rollers there is mounted the amalgating box or trough C, said trough being formed with an amalgamated copper bottom, D, and being divided into a series of compartments by cross dams or ridges *b b*. One end of the amalgamating-trough C is closed by a cross-wall, *c*, while the other end of the trough is open, and the dams or ridges *b* are formed with faces which incline toward the wall *c*, but the faces toward the open end are formed at right angles to the bottom of the trough C. A cross-bar, E, provided with a vertical pin, *e*, is secured in the position shown. This pin *e* is engaged by a lever, F, said lever being pivotally mounted upon a stationary block or standard, G, and being formed with a bifurcated or slotted end, in order that a proper engagement may be had with the pin *e*. The end *f* of the lever F extends within the path of a cam, H, which said cam is carried by a shaft, I, that is mounted in bearings formed in standards K K and arranged to be turned by a crank-arm, P. The parts described are normally held in the position shown best in Fig. 1 by a spring-strip, L, one end of which is secured in a slot formed in a vertical post, *g*, projecting upward from the face of the standard or block G, while the other end of the spring L bears against the operating-face of the lever F, as clearly indicated, the end of the spring being bent over, as shown. The tension upon the spring L is regulated by a screw, N, formed with a cone-shaped head, as best shown in Figs. 2 and 3. The trough C carries a cross-rod, M, preferably made of some springy metal, and provided with ends *m m*, which project beyond the side walls of the trough and strike upon stops *o o*, carried by the walls of the main guiding-trough B, from which construction it will be seen that as the cam H is revolved in the direction of the arrow the amalgamating-trough C will be moved in the direction of the arrow shown in Fig. 1, this motion being continued until the point *h* of the cam H passes from engagement with the end *f* of the lever F, after which the spring L will be free to throw the said end *f* back toward the axis of the cam, which movement will throw the amalgamating-trough in a direction opposite to that imparted to it by the cam; but this movement of the trough will be suddenly checked at the time when the bar M strikes against the stops *o*. The end of the main frame A is provided with adjusting-screws R R, which are held by the brackets *r r*, as best shown in Fig. 2, the idea being to slightly elevate the open end of the amalgamating-trough and to regulate such adjustment to meet the exigencies of the case in hand. Beneath the open end of the trough C there is arranged an inclined chute or way, S.

The operation is as follows: The mercury is placed above each of the dams *b* and the crushed ore delivered as desired to the lower chamber, T, of the trough C, after which the shaft carrying the cam H is rotated, in order that the cam in connection with the spring L may impart a jerky reciprocating motion to the amalgamating-trough, and as a result of this motion the crushed ore will be carried toward the open end of the trough C, thereby being caused to pass successively over the mercury contained in each one of the compartments of said trough, so that the metal

contained in the ore will be brought in contact with the said amalgamator, it being well understood that the metal will be heavier than the quartz, and will consequently work its way to the bottom of the mass. It will be noticed that the trough C is thrown with more suddenness by the spring than by the cam. The inclined sides of the ridges or dams *b* are toward the rear, while the vertical sides face the open end of the trough, so that when the spring throws the trough rearward the vertical sides of the dams will prevent the mercury from passing over the dams, but the inclined sides will allow the ore to pass toward the forward or open end of the trough when the trough is thrown by the cam. To further prevent the mercury from getting wasted, the trough has its open end slightly raised, and this also prevents the ore from passing too rapidly from the trough.

When the products of placer-mines are separated by such an amalgamator as has been described, the said products are first thoroughly dried and all larger stones, &c., removed therefrom.

I am aware that a machine for washing ores has been provided with a reciprocating trough having ridges provided with vertical forward edges and inclined rearwardly on their upper faces; also, that a longitudinally-reciprocating trough having a series of stepped pans has been moved forwardly by a cam and thrown in the opposite direction by a spring-rod, and I do not claim the same, broadly, as of my invention.

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

1. The combination, with the guideway of trough C, closed at its rear end and provided with dams *b*, having vertical forward sides and inclined rearward on their upper sides, of a lever, F, connected at its inner end with trough C, the cam H, acting on the lever F to move the trough forward, having an abrupt shoulder, as at *h*, and a spring acting to throw the trough suddenly rearward at the moment the shoulder *h* passes the lever, substantially as set forth.

2. The combination, with a main trough provided with rollers *a a*, of an amalgamating-trough divided into compartments by a series of ridges or dams, a pin, *e*, carried by said amalgamating-trough, a lever, F, slotted to engage with said pin, a cam, H, a spring, L, a spring-regulating screw, N, stops *o o*, and a bar, M, substantially as described.

3. The combination, with a main trough constituting a way and carrying rollers *a a*, of an amalgamating-trough formed with a series of ridges or dams and carrying a vertical pin, *e*, a lever, F, cam H, spring L, bar M, carried by the amalgamating-trough, and stops *o o*, substantially as described.

OTTO MATZKE.

Witnesses:
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LOUIS A. DUNHAM.