(No Model.)

W. A. FRANK & T. WICKS.

ORE CONCENTRATOR.

No. 388,659. Patented Aug. 28, 1888.

Fig 1.

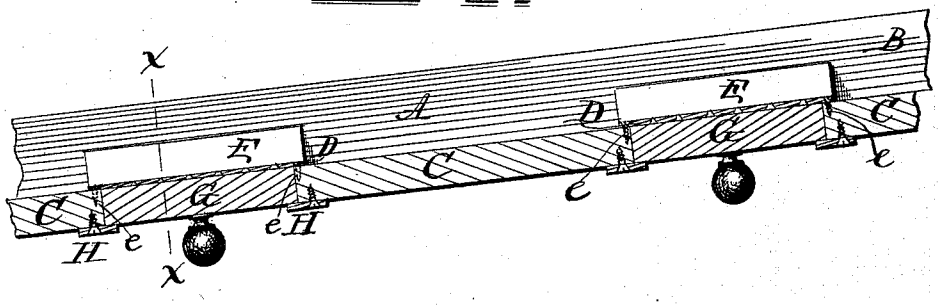


Fig 2.

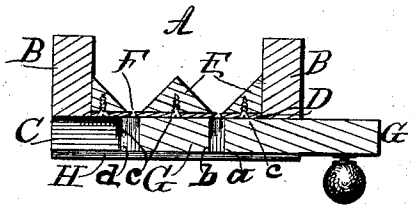


Fig 4.

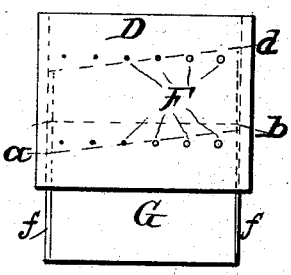


Fig 3.



Witnesses,
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UNITED STATES PATENT OFFICE.

WILLIAM A. FRANK AND THOMAS WICKS, OF PINAL, ARIZONA TERRITORY.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 388,659, dated August 28, 1888.

Application filed August 3, 1886. Renewed December 12, 1887. Serial No. 257,682. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. FRANK and THOMAS WICKS, citizens of the United States, residing at Pinal, in the county of Pinal and Territory of Arizona, have invented certain new and useful Improvements in Ore-Concentrators; and we 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.

This invention relates to improvements in the ore-concentrator for which W. A. Frank obtained Letters Patent No. 342,435, dated May 25, 1886.

By systematically experimenting with various styles of troughs we are led to conclude, first, that a continuously-grooved trough when set steep enough to permit the wash to run through it at the desired speed permits a current to form which carries along the precious metals which it is desired to remove from the wash by settling and screening; secondly, that gates sliding lengthwise of the trough are not easily fitted to work well, and that they are liable to be jarred down the incline, out of place.

The object of our present invention is to overcome these difficulties; and to that end the invention consists in the construction and combination of parts forming an ore concentrator, hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of a portion of an ore-concentrator trough, showing our invention. Fig. 2 is a transverse vertical section of the same at the line *x x* of Fig. 1. Fig. 3 is a longitudinal section of the sheet-metal bottom of the screen in the line of a groove, and Fig. 4 is a plan view of a screen bottom and a gate.

A represents a trough having a bottom partly grooved and partly plane.

The trough-body consists of the sides B, which are preferably vertical, and the bottom C, which is a plane or a series of planes parted by a series of openings, which extend through the said body-bottom. Across these openings are placed grooved screens, which constitute the grooved portions of the trough-bottom.

D represents the bottom of a screen, consisting of sheet metal.

E represents slanting-sided strips placed longitudinally of the trough upon the bottom D, and secured thereto by screws *e*, forming V-shaped grooves in the screen. These strips project upward within the trough above the general plane of its bottom, and serve to break the current of the wash as it runs along the trough into eddies at these screens, so that the ore may settle from the eddies and be discharged through the screen.

F represents holes or perforations through the bottom D. These perforations are located along the bottoms of the said grooves in the screen, and consequently they pass through portions of the bottom of the trough. The screens are secured to the body-bottom C by means of screws *e*, and are consequently removable.

G G represent gates fitted to slide upon cleats H H, across the trough, close up to the screen-bottom, to close the perforations F at pleasure.

The front edge of the gate is diagonal to the line of perforations, as shown by the dotted line *a*, Fig. 4, so that as the gate advances across the screen it closes but one hole at a time. The advance angle of the gate is usually made to begin closing the larger holes of the screen first, because, if the wash be poor the particles of metal are fine and do not require large holes for their escape. If there is more than one line of holes, F, the gate should be provided with a diagonal front-edged section to cover each line.

d represents the diagonal front edge, and *b* the back edge, of such a section. These sections may be of any suitable number joined together by side strips, *f*—such, for instance, as hoop-iron nailed along their edges. The perforations through the screen-bottom are made to gradually decrease in size from one end of a line of holes to the other to provide holes of different sizes for the escape of different-sized particles of ore, and each hole is conical, opening downward, in order that every particle of metal which enters the mouth

of a hole may readily pass through and fall below it. In operation, when the gate is pushed forward its acute angle advances over one hole, then the next, and so on until all the holes are closed.

The advantages of this ore-concentrator are its simplicity, ease of operation, good results, and cheapness.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, in an ore-concentrator, of a trough-body having a plane bottom with a series of openings through it, a series of screens secured upon the said bottom across the said openings, and perforated with fine holes located in lines along the trough, and provided with V-shaped strips rising abruptly above the plane of the trough-bottom and located beside the lines of holes, substantially as shown and described,

2. The combination of a trough-body having a plane bottom with a series of openings through it, a series of sheet-metal plates removably secured to the said body-bottom across the said openings and perforated with fine holes located in lines along the trough, and slanting-sided strips secured upon each of the said plates along beside the said holes, substantially as shown and described.

3. A trough having its bottom divided into a series of spaces alternately plane and grooved, and having fine perforations located in lines along the bottoms of the said grooves, the sides of the said grooves being slanted and rising abruptly above the plane portions of the bottom, substantially as shown and described.

4. The combination of a trough having fine perforations located in a longitudinal line in its bottom, and a gate fitted to slide across the trough close beneath the perforated portion, and having its front edge diagonal to the line of holes, substantially as shown and described.

5. The combination of a trough having fine perforations located in a line in its bottom, and a gate fitted to slide close beneath the perforated portion in a direction transverse to the said line and having its front edge diagonal to the said line.

6. The combination, in an ore-concentrator, of a sheet-metal bottom, D, having lines of upwardly-tapering perforations in it, and slanting-sided strips E, secured upon the said bottom beside the lines of perforations, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM A. FRANK.
THOMAS WICKS.

Witnesses:
THEO. D. REYMERT,
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