(No Model.) 2 Sheets—Sheet 1.

J. B. IRVIN.

ORE CONCENTRATOR.

No. 416,626. Patented Dec. 3, 1889.

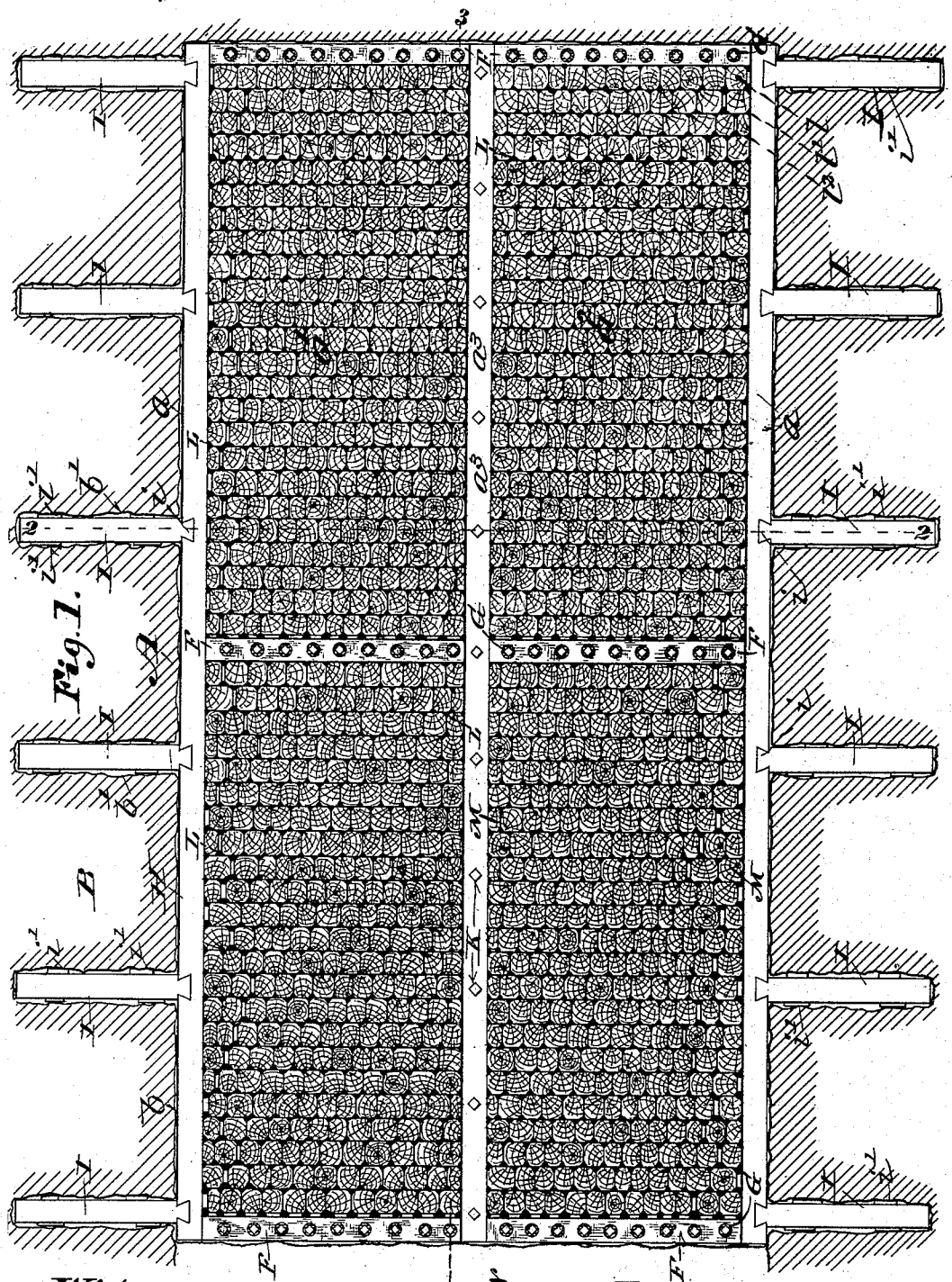


Fig. 1.

Witnesses:
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W. S. Anderson

Inventor:
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N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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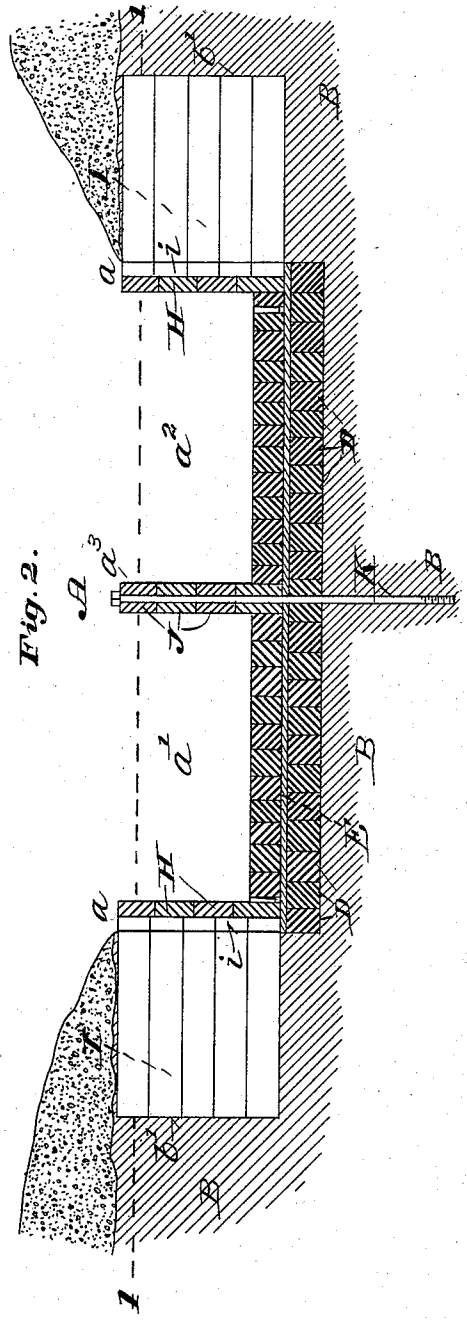


Fig. 2.

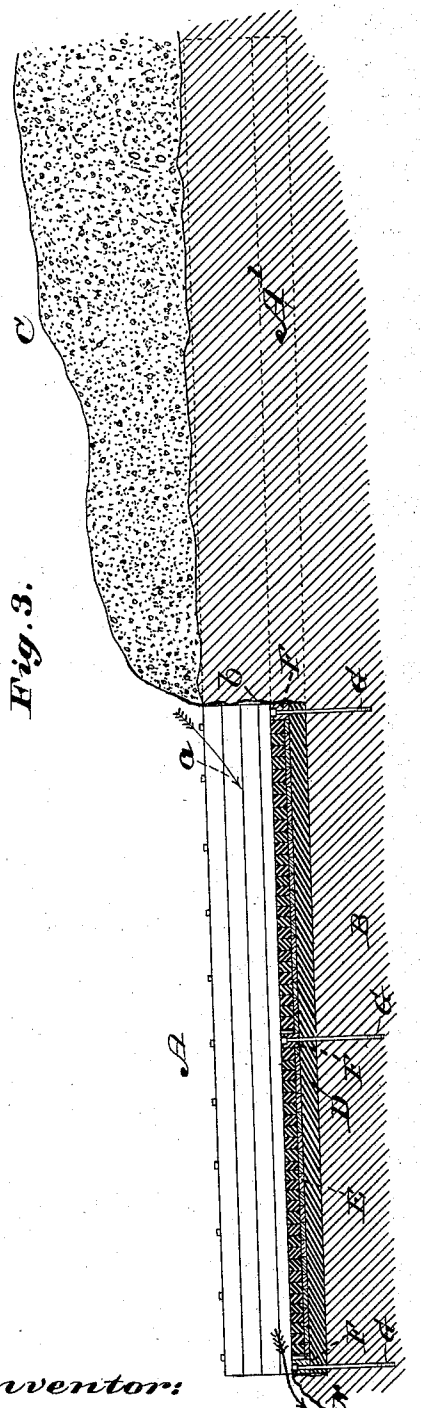


Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN B. IRVIN, OF SPARTA, OREGON, ASSIGNOR OF ONE-HALF TO LUTHER T. WOODS, OF ST. LOUIS, AND CHARLES D. MOODY, OF WEBSTER GROVES, MISSOURI.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 416,626, dated December 3, 1889.

Application filed August 9, 1887. Serial No. 246,501. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. IRVIN, of Sparta, Oregon, have made a new and useful Improvement in Ore-Concentrators, of which the following is a full, clear, and exact description.

This improved concentrator is adapted more especially for fine placer gold, such as is found in the beds of streams in gold-producing districts. Its construction, described generally, is as follows: An excavation is made in the bed-rock of the stream, and in the excavation a system of gold-saving cells or pockets is formed. The system is extended upward and downward and also across the stream, and it is preferably divided longitudinally into two or more parts, over either or all of which the stream may be turned, and thereby carry the gold-bearing earth over the cells or pockets, into which the particles of gold drop, while the earth is mainly borne along with the water and discharged beyond the concentrator. The current is diverted from any part of the cells whenever it is desired to recover the gold therefrom.

The most desirable mode of carrying out the improvement is exhibited in the annexed drawings, making part of this specification, in which—

Figure 1 is a horizontal section on the line 1 1 of Fig. 2, which in turn is a vertical transverse section on the line 2 2 of Fig. 1. Fig. 3 is a vertical longitudinal section on the line 3 3 of Fig. 1.

The same letters of reference denote the same parts.

A represents the concentrator. As it resembles a "flume," it may for convenience be so termed.

B represents the bed-rock, which is excavated at *b* to receive the flume.

C, Fig. 3, represents the gold-bearing earth above the bed-rock.

In initiating the construction the stream by any customary method is diverted from its bed and the earth immediately above the proposed excavation *b* removed. The rock is then removed to form the chamber to receive the flume A, which is constructed as follows: First a layer of timbers D is arranged longitudinally in the excavation *b*. Planks E are then laid crosswise upon the timbers. Cross-timbers F, Figs. 1 and 3, secured to the bed-rock by means of the bolts G, serve to fasten the timbers D in place. The planks E are held down upon the timbers by being confined by the sides and partition of the flume, as shown in Fig. 2. The sides *a a* of the flume are composed of timbers H, one above the other, as shown, and held in place by means of the ties I, Figs. 1 and 2, which at the inner end *i* are dovetailed or otherwise fastened to the timbers H, and thence extend into mortises *b'* in the bed-rock, and therein, by means of wedges *i'*, or other means, securely fastened. The flume is divided into compartments a' a^2 by means of the partition a^3, which is composed of timbers J, piled one above another, and held in place by means of the bolts K, which pass down through the timbers J, the planks E, the timbers D, and into the rock B, substantially as shown. The gold-saving cells F, Fig. 1, are then formed just above the planks E by means of the blocks M, which are laid upon the planks E, between the sides, respectively, and partition, and there wedged down upon the planks E, and also tightly laterally together, but so constructed and arranged as to form a series of cells L, extending throughout the length of the flume. Each row *l* of cells is practically separated from the next row *l'* of cells lower down in the flume, so that the gold dropping into the highest row *l* is not to any great extent carried thence downward into the next row *l'* of cells, and so on from row to row to the lower end of the flume.

The operation of the improvement is as follows: The flume being ready, the stream is turned into it, and the earth C carried with the stream into the flume, as indicated by the arrows *c*, Fig. 3. The gold at once drops into the cells L and onto the planks E. Mercury is usually introduced into the cells, and an amalgam in consequence forms upon the planks E. The earth is carried by the water through the flume, and after passing out of the flume is discharged into a depression N, Fig. 3, and thereby got out of the way. In starting the building of the flume the practice is to begin at the brink of a fall, and in this way a depression N is conveniently obtained. The object of the compart-

ments a' a^2 is to provide for a continuous use of the flume.

When it is desired to clean up, the current, by any suitable means—such as a gate (not shown)—is diverted from one of the compartments—say the compartment a'—and is directed entirely through the other compartment a^2. The blocks M are then taken up and the planks E thereby exposed in the compartment a', whereupon the gold in that compartment is readily recoverable. The current is then, after replacing the blocks M, and thereby re-forming the cells L in the compartment a', similarly diverted from the compartment a^2 and directed entirely through the compartment a'. The blocks M are then removed from the compartment a^2 and the gold that has been deposited therein is recovered, as in the compartment a'. The blocks M are then replaced and the cells L re-formed in the compartment a^2. The current can then be sent, as originally, through both compartments a' a^2, and after a suitable interval of time the operation of recovering the gold can be repeated.

After the earth C has been substantially washed away from the bed-rock for a distance equal, say, to the length of the flume A, the bed-rock can be excavated above the flume, and in such new excavation an extension of the flume can be formed, as indicated by the broken lines A′, Fig. 3, and so on, as the earth C continues to be washed away, the flume can be extended farther and farther up the course of the stream.

The form of ore-concentrator here described is desirable for several reasons. It is thoroughly anchored in the bed-rock, so as to effectually withstand the force of the current, however strong it at times may become. It offers no obstruction to any object, however large—such as a tree, which may be carried into it by the stream. It provides many receptacles for the gold, which receptacles are accessible at any time, and as the flume is extended the portion or portions previously built become an efficient means for carrying off the earth which passes through the upper end or portion of the flume.

The cells l l' l^2, &c., are formed by and between the beveled vertical edges of the blocks M.

I claim—

1. The flume made in the bed-rock of a stream and having secured to its bottom timbers the blocks M, set closely together and having beveled vertical edges which form transverse series or rows of metal-saving pockets, substantially as specified.

2. The flume made in the bed-rock of a stream and having secured to its bottom timbers the flooring E, and upon said flooring the blocks set closely together and having beveled vertical edges which form transverse rows of metal-saving pockets, substantially as specified.

3. The flume made in the bed-rock of a stream and having bolted to its floor longitudinal timbers D thereabove the transverse planking or flooring E, and upon said flooring the blocks M, set closely together and having beveled vertical edges which form the transverse series of pockets l l', &c., substantially as specified.

4. In the flume A, the combination of the sides composed of the longitudinal timbers H, the ties I, with their inner ends dovetailed and fitted in dovetailed recesses in the said timbers and extending thence outward in recesses in the bed-rock, in which recesses they are secured by wedges, and the blocks M, having beveled vertical edges and set closely together, substantially as specified.

5. In the flume A, the combination, with the flooring-timbers composed of the longitudinal beams D, the transverse planking E, and the blocks M, having beveled vertical edges to form the pockets l, of the sides a, composed of the longitudinal timbers H, the ties holding said sides to the bed-rock, and the central longitudinal partition a^3, composed of the timbers J, bolted through the blocks, planking, and timbers D to the bed-rock, substantially as specified.

Witness my hand this 6th day of April.

JOHN B. IRVIN.

Witnesses:
C. D. MOODY,
A. M. EVEREST.