(No Model.)

G. M. LEVETTE.

APPARATUS FOR EXTRACTING GOLD FROM PLACER MINES.

No. 324,856. Patented Aug. 25, 1885.

Fig. 1

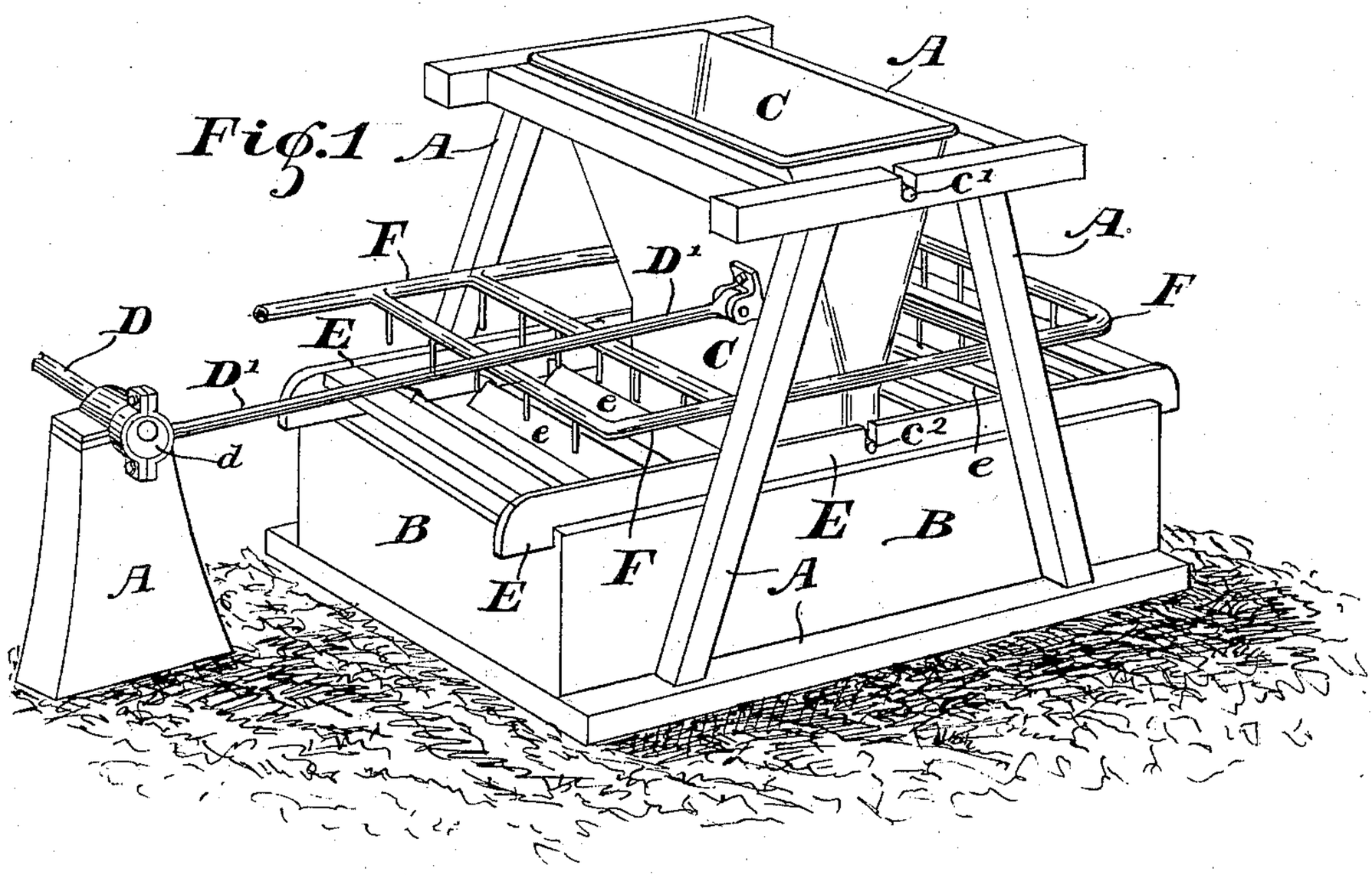
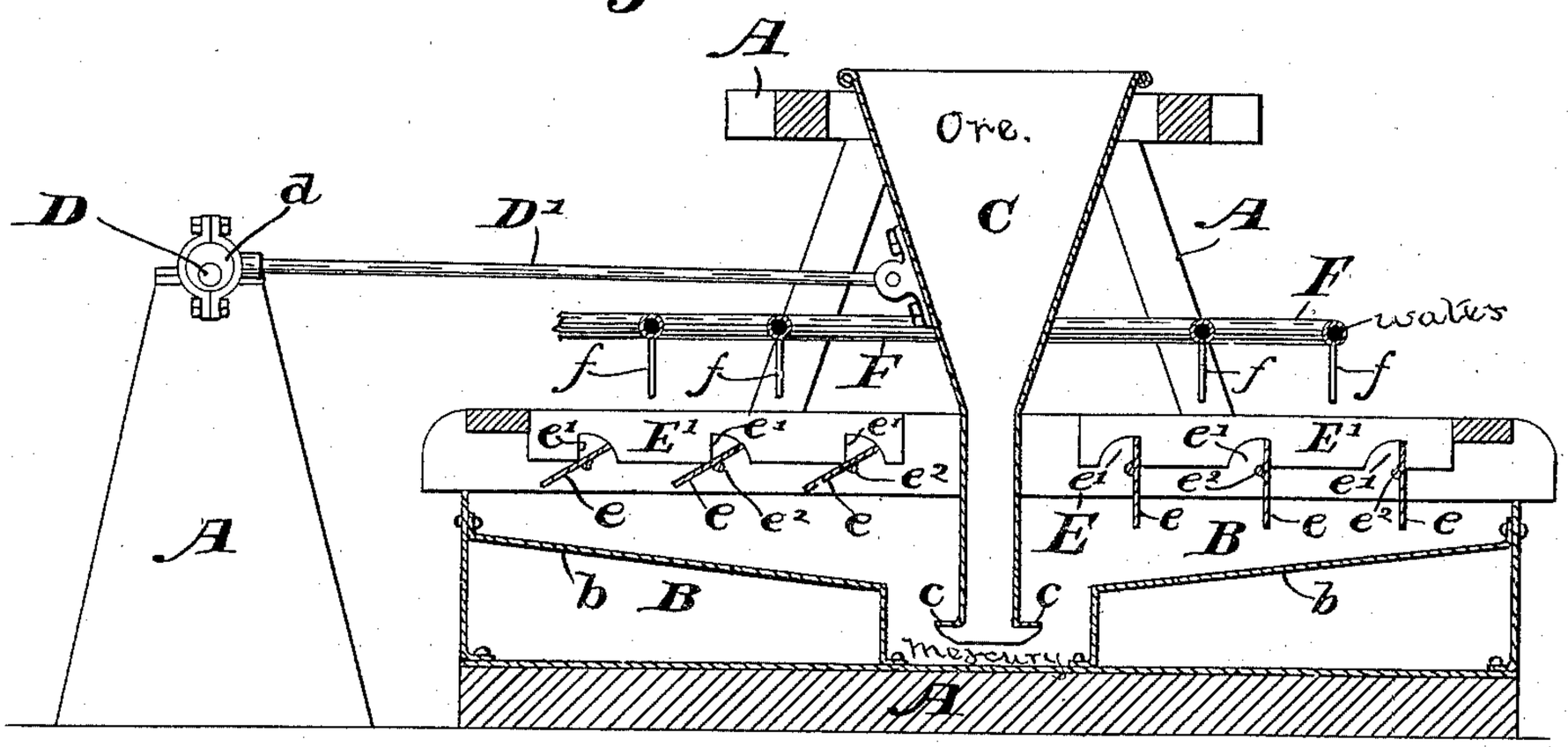


Fig. 2.



WITNESSES.

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APPARATUS FOR EXTRACTING GOLD FROM PLACER MINES.

SPECIFICATION forming part of Letters Patent No. 324,856, dated August 25, 1885.

Application filed June 16, 1885. (No model.)

To all whom it may concern:

Be it known that I, GILBERT M. LEVETTE, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Apparatus for Extracting Gold from Placer Mines, of which the following is a specification.

The ordinary operation of conducting what is known as "placer" mining is both laborious and wasteful, and except in localities where there is a large water-supply, which can be used under heavy pressure, is well nigh impracticable. The object of my present invention is to produce an apparatus whereby each particle of sand to be treated may be caused to come in contact with the mercury, and all the precious metal contained therein thus taken up, and whereby the sand can be thoroughly washed, and the mercury thus freed therefrom by a comparatively small quantity of water before it is discharged from the apparatus.

The theory of my invention is based on the well-known fact that the specific gravity of mercury is much greater than that of sand, and, therefore, when the sand is plunged beneath the mercury, it will immediately rise and float upon its top. It consists in a certain machine or apparatus, in the use of which the sand is first plunged beneath the mercury, then afterward allowed to rise through the mercury and float upon its top, and is then worked off over the top, being meantime thoroughly washed by jets of water directed thereon.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a perspective view of a machine embodying my said invention, and Fig. 2 is a central longitudinal section thereof.

In said drawings, the portions marked A represent the frame-work of the apparatus; B, the pan or trough which contains the mercury; C, a hopper suspended on the frame-work and leading down into the mercury-pan to near its bottom; D, a driving-shaft by which the same is operated; E, a scraper arranged to reciprocate over the mercury-pan and draw off the sand as it rises to the top, and F a series of water-pipes by which the necessary supply of water for washing the sand is directed thereon.

The frame-work A is or may be any suitable frame-work for supporting the pan, hopper, and pipes, and has suitable bearings in its upper timbers in which the gudgeons by which said hopper is suspended rest.

The mercury-pan B is constructed preferably of sheet metal, (generally boiler-iron,) of a size corresponding to the amount of work to be done. In order that the quantity of mercury to be used shall be the minimum to accomplish the work, I construct the pan of full depth only in the center, inserting in each end a false bottom, *b*, which commences near the top at the ends, and inclines downwardly gradually toward the center until it nearly reaches the path of the vibrating hopper, when it runs directly to the bottom, as shown in Fig. 2. By means of this construction less than one-half the quantity of mercury which would otherwise be required is necessary, and the cost of the apparatus is thereby materially decreased, mercury, as is well known, being expensive.

The hopper C is provided with gudgeons *c'*, which rest in bearings in the frame-work, and is suspended thereby, as shown. Its lower end is preferably straight up to a point above the top of the mercury-pan, and flaring from that point to the top. It is preferably provided on its lower end with flanges *c*, which keep the sand from coming in contact with its sides as said sand rises from the bottom to the top of the mercury. This hopper may be driven by any means, the means shown being the driving shaft D, with an eccentric, *d*, thereon, and a connecting-rod, D', connecting said eccentric to the side of the hopper.

The scraper E is a frame-work resting upon the mercury-pan B, and provided upon each side of the hopper with pivoted scraper-blades *e*, which are adapted to carry the sand from the center toward the ends, those upon one side being pivoted so as to rise up when the scraper as a whole is moving in one direction, and those on the other side being similarly arranged to rise when it is moving in the other direction, and each being provided with stops which hold them in vertical position while moving toward their own end of the mercury-

pan. The stops shown consist of bars E′, secured inside the edges of the frame, having notches e' cut therein, the vertical faces of which are toward the ends of the pans, the pivots e^2 of the scraper-blades being arranged just below and to the rear side of said vertical faces, as shown in Fig. 2.

The water-pipes F are arranged above the mercury-pan, and are provided with numerous orifices or nozzles, *f*, by which the water is discharged onto the sand resting on the top of the mercury, and said sand is thus thoroughly washed with a mere fraction of the water consumed in practicing the ordinary method.

The operation is as follows: The sand is thrown into the hopper, and that in the lower part, notwithstanding the greater specific gravity of the mercury, is, by the weight of that on top, forced down to the bottom of the mercury-pan. The hopper being continually vibrated, a small quantity of sand is liberated at each motion of the hopper and rises up through the mercury on either side of said hopper to the top of said mercury in the pan, each particle of sand being in this way brought into contact with the mercury, and the particles of gold or other precious metal adhering thereto, thus permitted to be taken up thereby. The sand upon rising to the top is thoroughly washed by the numerous streams of water coming thereon from the water-pipes through the orifices or nozzles, and any mercury that might otherwise adhere thereto and be carried off is washed back into the pan. The scraping device E, which is continually in motion, is preferably driven by projections c^2 on the sides of the hopper, and operates to carry off the washed sand in either direction, and discharge it over the ends of the mercury-pan.

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

1. The combination of a mercury-pan and a vibrating hopper extending from above said pan down into the same to near its bottom, whereby the sand is conducted beneath the mercury, and then by the vibrations of the hopper permitted to escape from beneath said hopper and rise to the top of said mercury.

2. The combination, in mining apparatus, of a frame-work, a vibrating hopper suspended upon said frame-work and extending down into and near the bottom of a mercury-pan, said mercury-pan having a deep central portion somewhat wider than the distance traveled by the vibrating hopper and shallow ends, and means for moving the treated sand in each direction from the center, and discharging it over the ends of the pan, substantially as set forth.

3. The combination of a mercury-pan, a vibrating hopper extending to beneath the surface of the mecury in the pan, and a reciprocating scraper moving over the pan, and adapted to scrape off the sand which rises to the top of the mercury.

4. The combination of a mercury-pan, a hopper leading beneath the surface of the mercury, and a scraper for removing the sand from off the mercury, said scraper consisting of a reciprocating frame-work having pivoted blades on each side of the center, the blades on each side being arranged to work toward their respective ends of the pan.

5. The combination of a mercury-pan, a hopper leading to near the bottom of said pan, scrapers arranged to reciprocate over the top of said pan, and a series of water-pipes arranged above said pan, and provided with orifices or nozzles to discharge the water onto the sand on the mercury in the pan.

6. The combination of a mercury-pan, a vibrating hopper leading to beneath the surface of the mercury, a scraper, and a series of water-pipes or jets.

7. The combination of a mercury-pan, a hopper leading to beneath the surface of the mercury therein, a scraper, and means for imparting a vibratory or reciprocal motion to said hopper and said scraper.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 11th day of June, A. D. 1885.

GILBERT M. LEVETTE. [L. S.]

In presence of—
C. BRADFORD,
CHARLES L. THURBER.