(No Model.)

F. M. ILER.

ORE CONCENTRATOR.

No. 473,506. Patented Apr. 26, 1892.

Fig. 1.

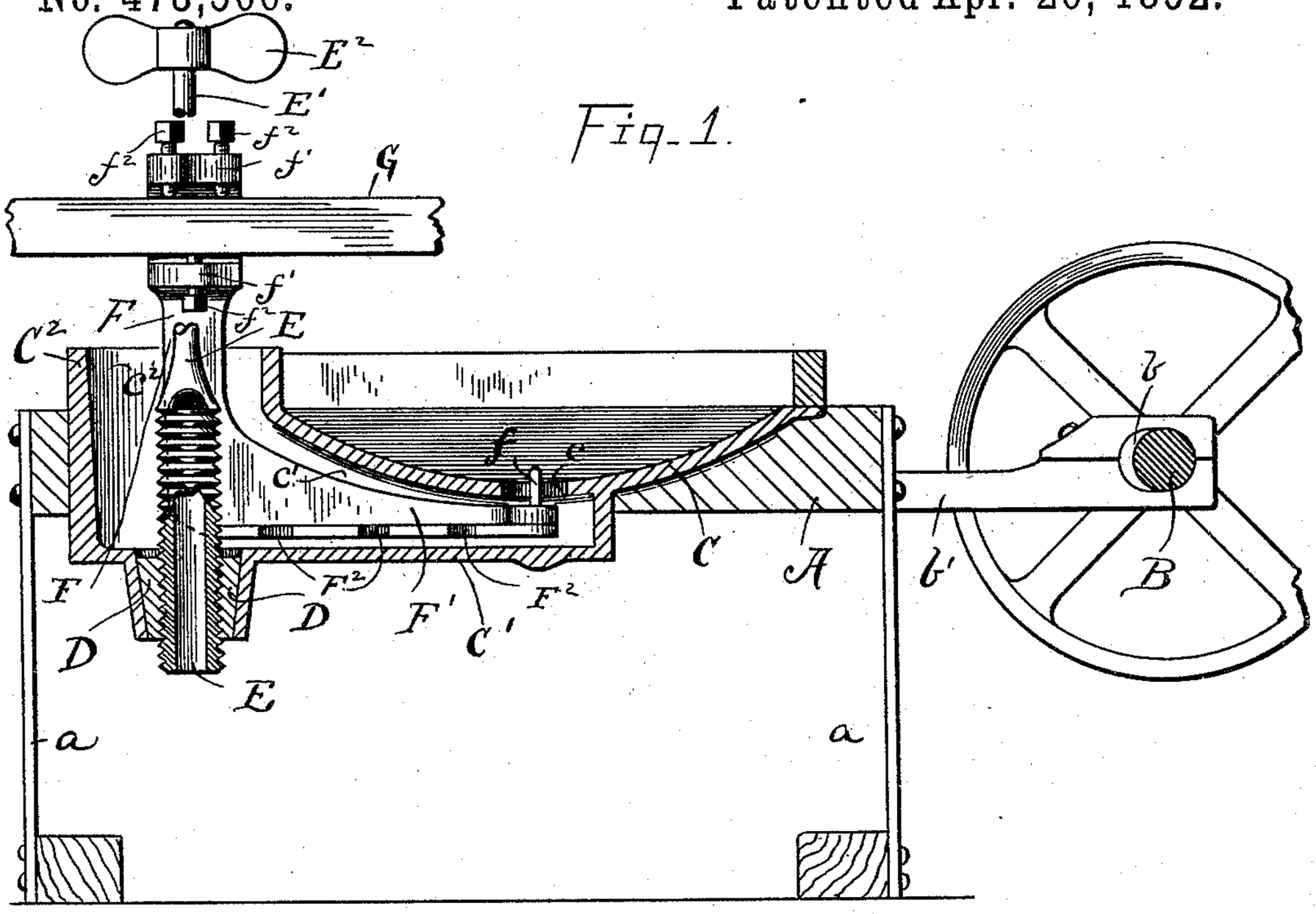


Fig. 2.

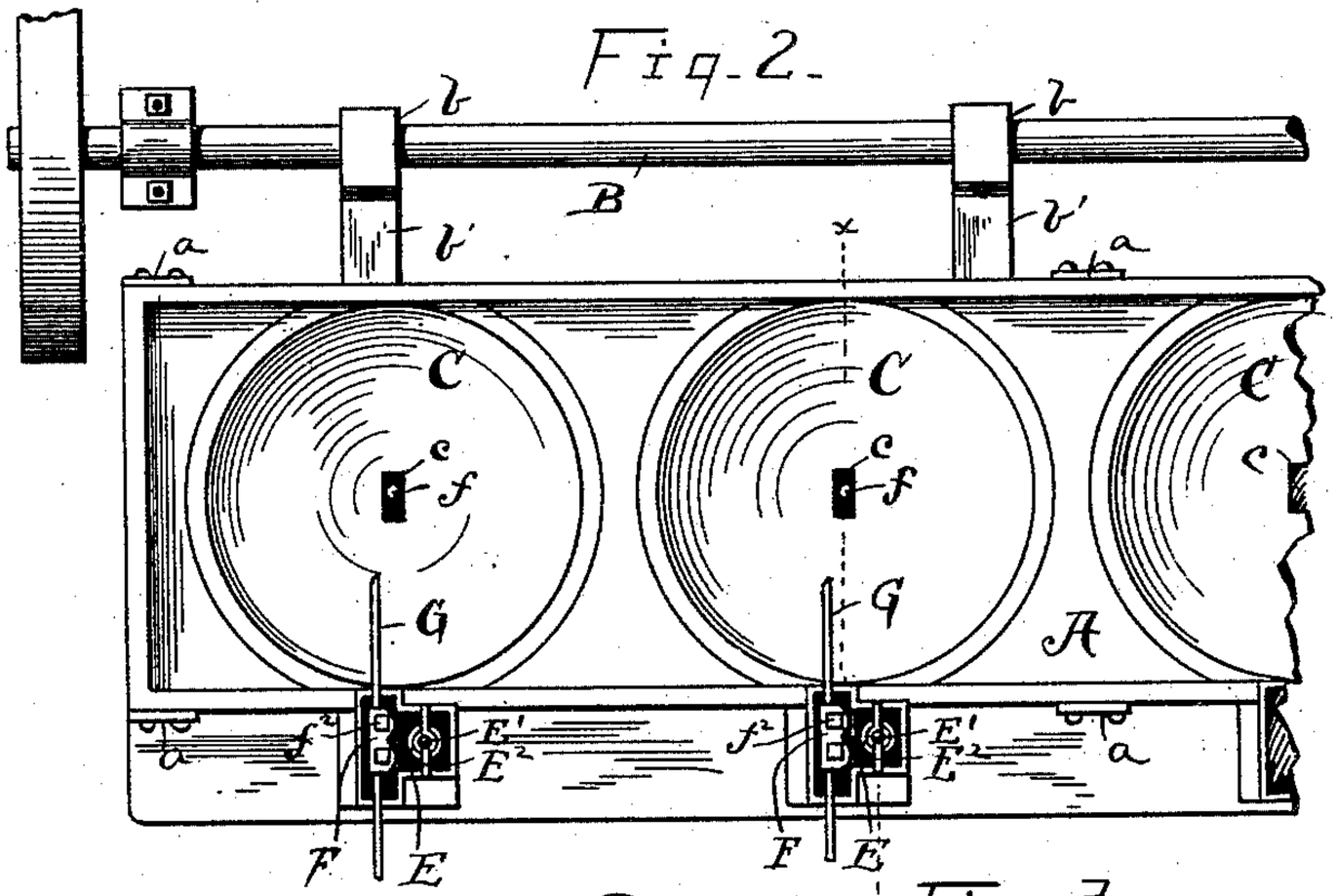
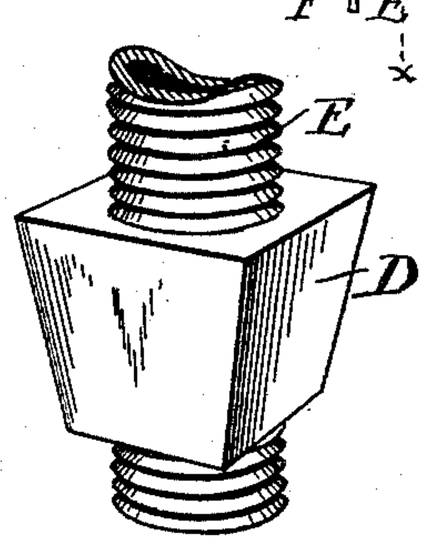


Fig. 3.



Witnesses.
E. Byron Gilchrist.
C. C. Wood.

Inventor.
Frank M. Iler
By Lyford & Lyford
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK M. ILER, OF MARION, OHIO.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 473,506, dated April 26, 1892.

Application filed April 20, 1891. Serial No. 389,649. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. ILER, of Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Ore-Concentrators; and I 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 pertains to make and use the same.

My invention relates to improvements in ore-concentrators; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

Heretofore ore-concentrators have usually been run or operated until a goodly quantity of the concentrated material had accumulated therein, whereupon the machine was stopped and a so-called "clean-up" was had—that is to say, the concentrated material was removed and everything was put in order for another run. The cleaning-up process usually required a good deal of time as compared with the length of the run, and hence the cleaning-up greatly reduced the amount of work that the concentrator could turn out. I have therefore devised means for a continuous discharge of concentrated material, whereby the device may be run continuously for a week or a month, or for any given length of time.

In the accompanying drawings, Figure 1 is an elevation in transverse section taken on line *x x*, Fig. 2. Fig. 2 is a plan of a portion of a concentrator embodying my invention. Fig. 3 is an enlarged view in perspective in detail of members D and E.

A represents a laterally vibrating or shaking table, constructed usually of wood and more or less inclined endwise, the table being usually mounted on legs *a*, that are usually thin flat springs, and a driving-shaft B extends lengthwise the table and is located just to the one side, this shaft having eccentrics, as at *b*, that are connected by pitmen *b'* with the table. These eccentrics have slight throw—say a sixteenth of an inch, more or less—and as the shaft runs at a comparatively high speed the table is vibrated or shaken laterally, so as to keep the material in a constant state of agitation.

C C are the concentrators proper, these being saucer-shaped dishes, constructed usually of cast-iron and set in flush with the surface of the table, members C being distributed at suitable intervals lengthwise the table. If a double table—that is, a table broad enough—be employed, two or more rows of concentrators C could extend lengthwise such table. Member C has a heavy rib C' on the under side extending from past the center to the outer edge of the dish, where it is integral with the vertical lug C^2, the rib and lug being cored to form intersecting chambers *c'* and c^2, the former connecting with a rectangular opening *c* in the bottom of the dish. The walls of the vertical chamber c^2 converge at the bottom, and a tapering rectangular plug D, usually of cast-iron, is adapted to close the chamber at the bottom, the plug in such case being inserted or removed from the top. Plug D has a central vertical screw-threaded hole for receiving valve E. This valve, as shown, is screw-threaded externally and is hollow and open top and bottom, but at the top end is provided with a long shank E' and handle E^2, by means of which the valve may be turned on its axis to screw the valve up or down. The material concentrated in dish C may be passed through opening *c* into chamber *c'*, and from thence may pass into chamber c^2, and from thence may pass through the cavity of the valve E and discharge by gravity, and of course the material will discharge more freely, according as the valve is screwed down lower. The valve having been adjusted vertically, as desired, to regulate the discharge, plug D and the valve may be lifted out by means of the valve-handle to drain the concentrator—for instance, over night in cold water—and this having been done the plug and valve may again be returned to their place without losing or disturbing the previous vertical adjustment of the valve. With such construction a continuous discharge can be had from each concentrator C. The tendency of the heavy concentrated material is to pack into chamber *c'* and clog it, notwithstanding the vibration of the table, and to prevent this I provide as follows: F is an arm of the bell-crank-lever variety adjustably secured to the stationary bar G. The vertical section F of this arm extends down into chamber c^2, and the lateral member F' operates in chamber *c'*. The free end of

member F′ is pierced vertically to receive a pin *f* loosely, so that this pin can be withdrawn when it is desired to remove the arm. This pin extends up loosely through opening *c*. The lateral arm F′ is provided with a series of holes, depressions, or projections—such, for instance, as notches F^2—to make the arm more effective in agitating the material. This stationary arm, operating in the chambers of the vibrating member C, agitates the material in these chambers and prevents it from clogging. The discharge, therefore, may be continuous from each agitator, and the device can be run continuously as long as desired without stopping to clean up. Member F is provided with ears *f*′, these ears being provided with set-screws f^2, as shown, for engaging the supporting-arm G, and by manipulating these set-screws arms F F′ may be adjusted centrally in the chambers *c*′ c^2, so as not to collide with the walls thereof. By loosening some of these set-screws and by removing pin *f* the arm can be removed from the chambers when necessary. My improved device has all the advantages of ordinary concentrators of this class, and has the further advantage of a continuous discharge, so that it can be run for any desired length of time without stopping to clean up.

What I claim is—

1. An ore-concentrator comprising a shaking table bearing one or more concave dishes, substantially as shown, each dish having a central opening connecting with a lateral chamber below, the latter connecting with a vertical chamber located outside the line of the dish, and a valve for controlling the discharge from the vertical chamber, substantially as set forth.

2. An ore-concentrator comprising a shaking table bearing one or more saucer-shaped dishes having connected lateral and vertical chambers, substantially as indicated, of a stationary arm operative within such chamber to serve as an agitator in co-operating with the vibrating member, substantially as set forth.

3. An ore-concentrator comprising a shaking table bearing concave dishes or concentrators proper, each dish having connected lateral and vertical discharging-chambers, the latter having a hollow valve adjustable vertically, such valve and the seat thereof being removable, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 28th day of March, 1891.

FRANK M. ILER.

Witnesses:
C. H. DORER,
WARD HOOVER.