

(No Model.)

G. M. ELDRIDGE.
ORE WASHER AND CONCENTRATOR.

No. 502,663.

Patented Aug. 1, 1893.

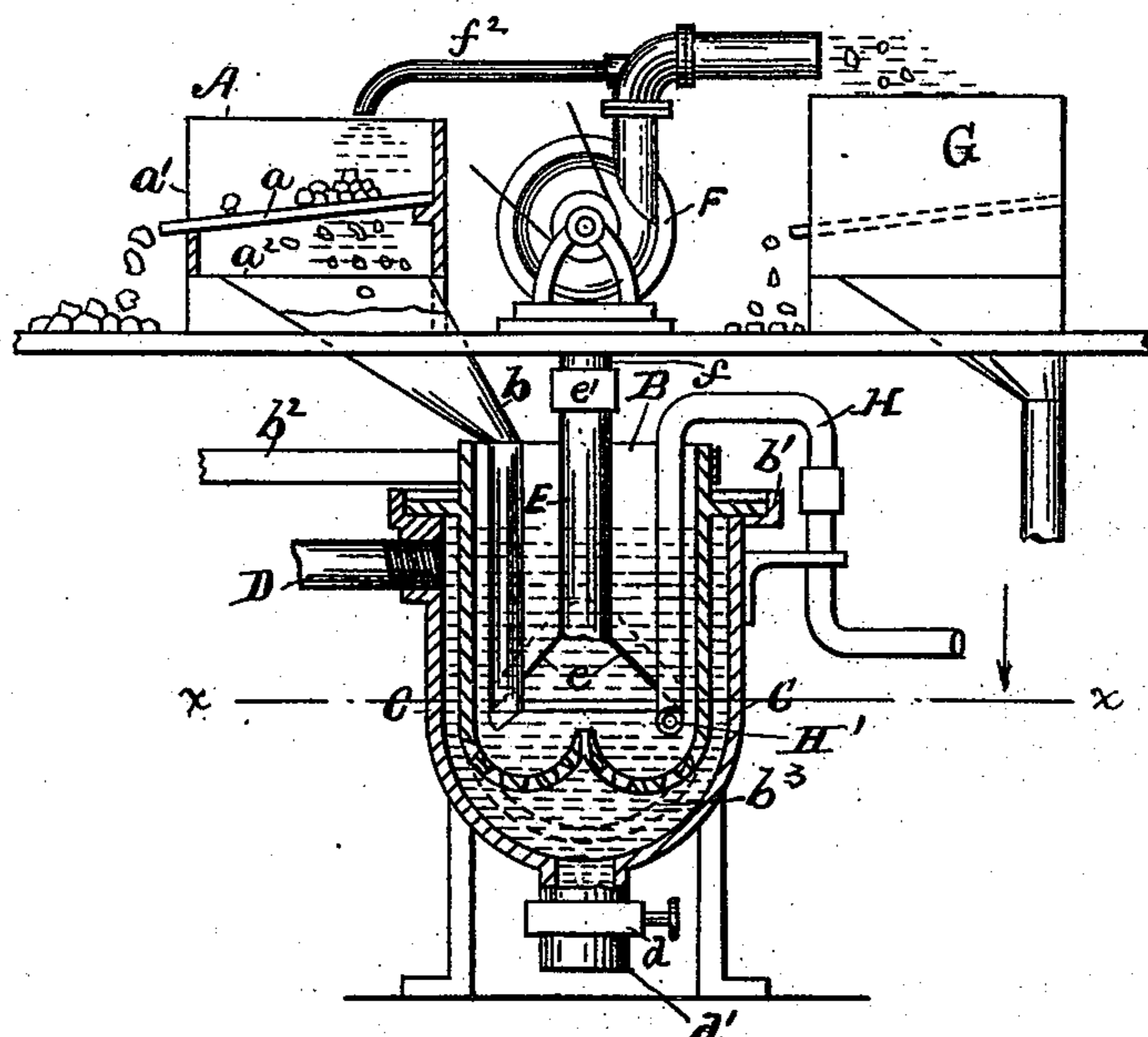


FIG. 1.

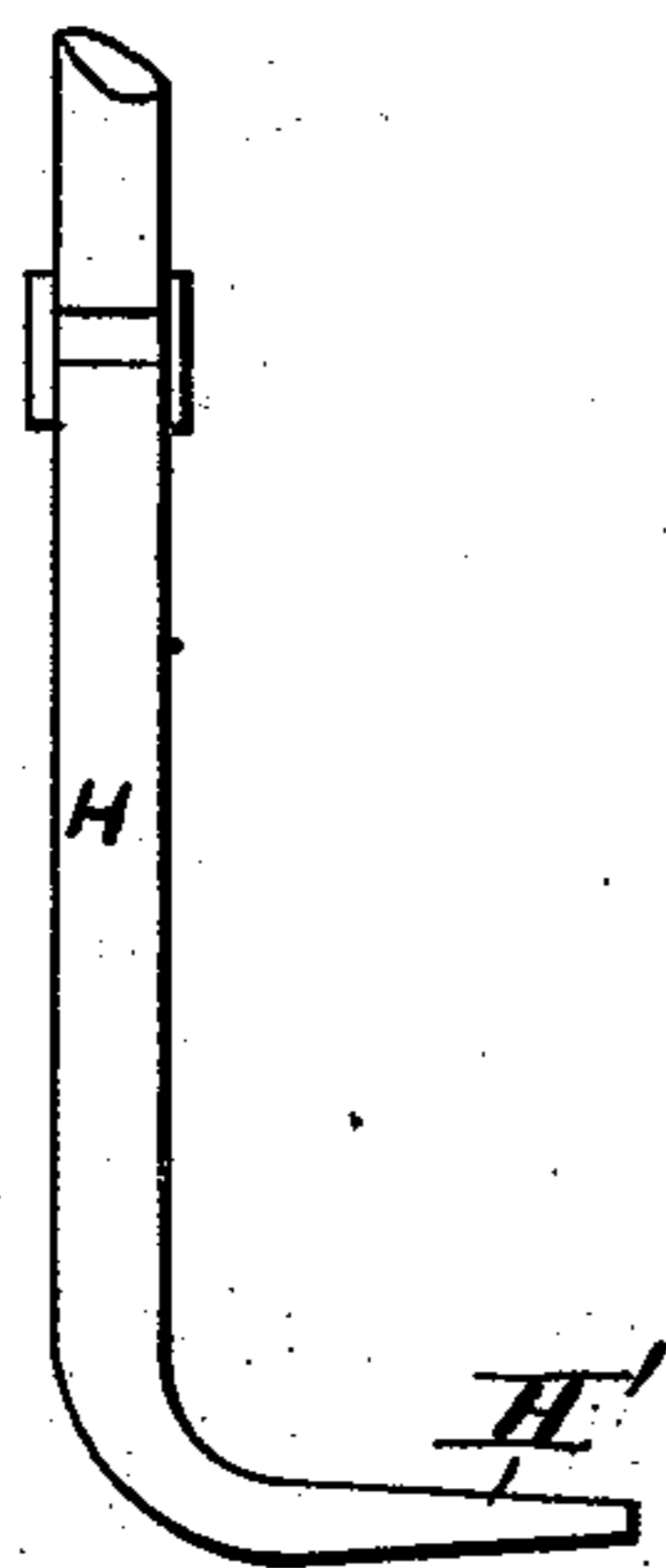


FIG. 2.

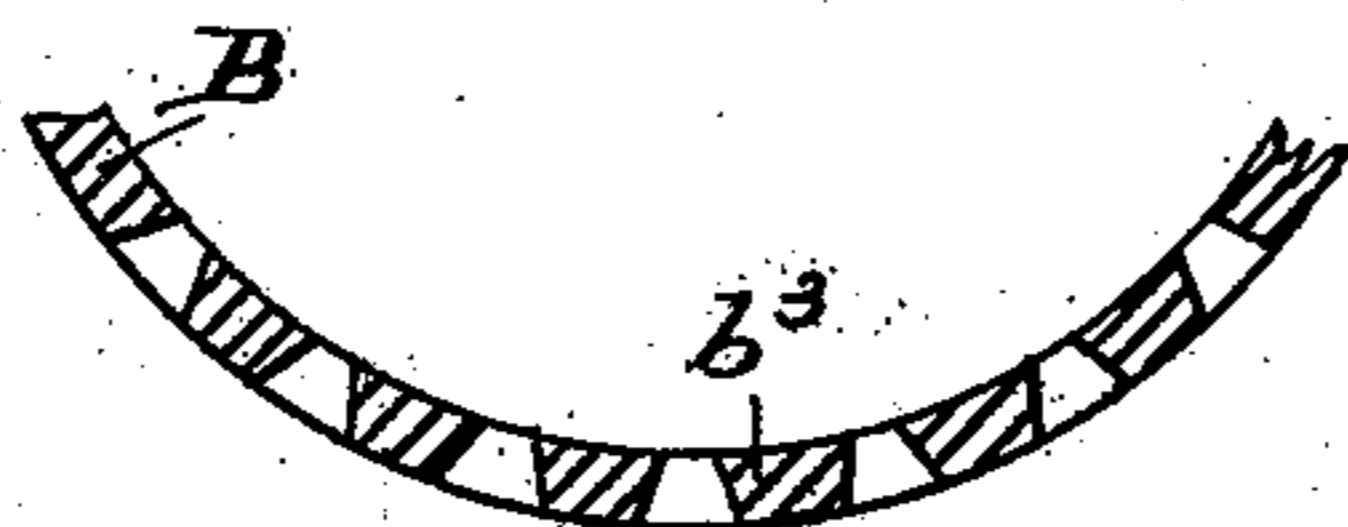


FIG. 4.

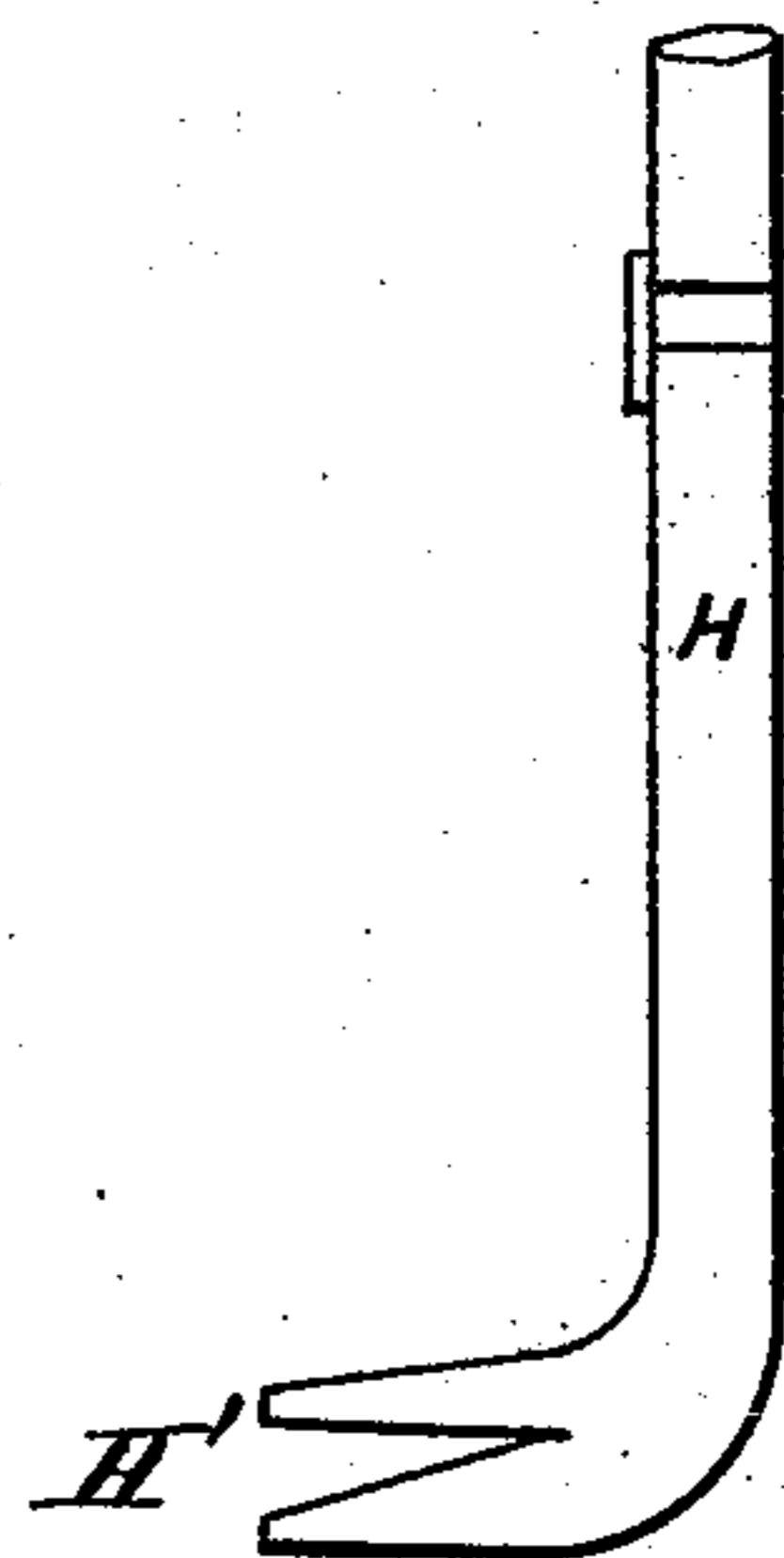


FIG. 3.

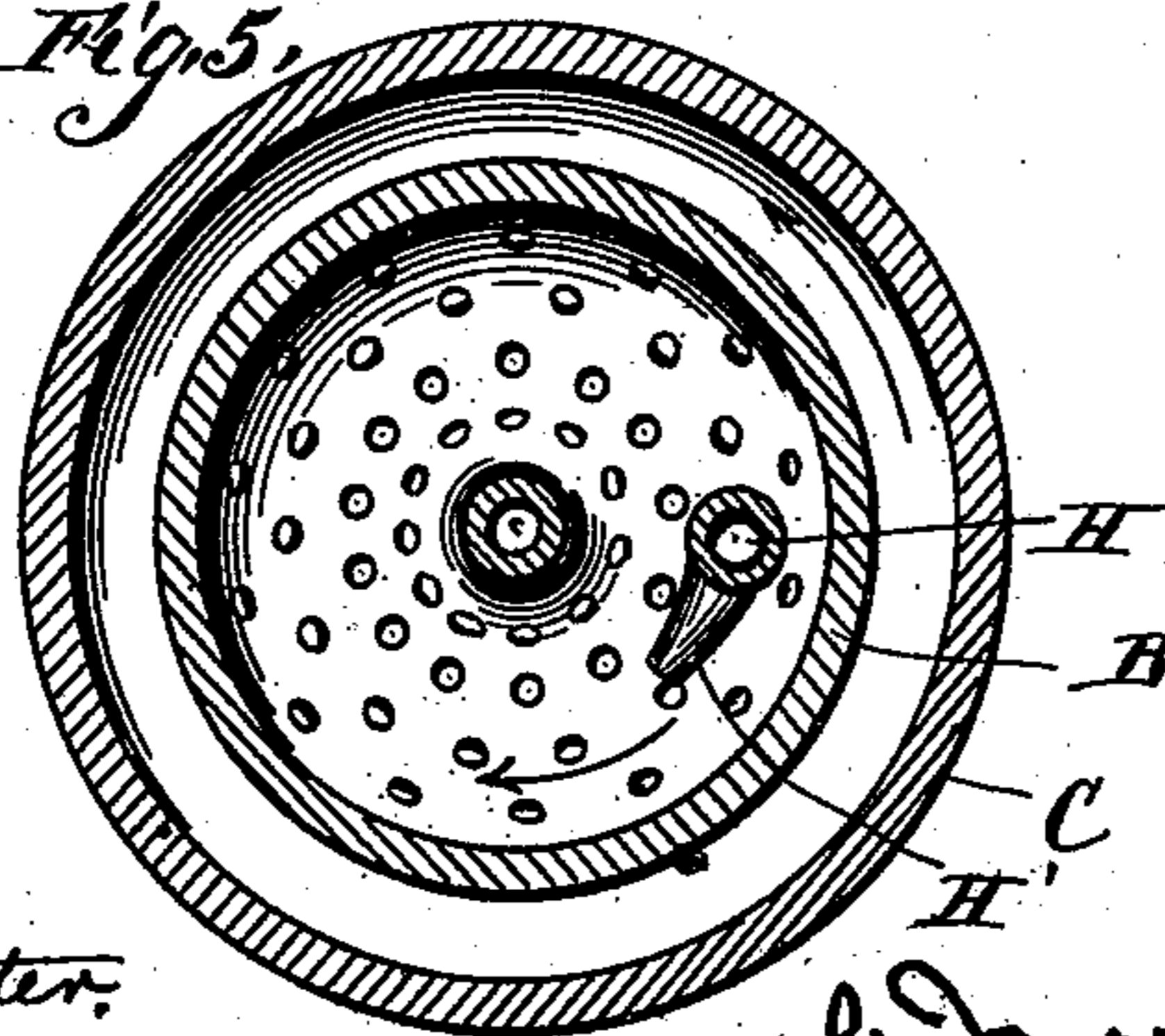


FIG. 5.

WITNESSES:

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GRIFFITH MORGAN ELDRIDGE, OF PHILADELPHIA, PENNSYLVANIA.

ORE WASHER AND CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 502,663, dated August 1, 1893.

Application filed April 14, 1893. Serial No. 470,275. (No model.)

To all whom it may concern:

Be it known that I, GRIFFITH MORGAN ELDRIDGE, a citizen of the United States of America, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ore Washers and Concentrators, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to an improvement upon an ore washer and concentrator patented to Charles F. Pike September 1, 1891, No. 458,837, and it consists in a device whereby a defect in that machine is obviated and the gangue is well agitated without interfering with its separation from the ore.

Referring to the accompanying drawings: Figure 1. is a sectional elevation of a washer or concentrator showing details of construction, as in the Pike machine, and also the improvement which I have made therein. Figs. 2. and 3. are details of a pipe for agitating the gangue, with single and double nozzle. Fig. 4. is a detail of the perforations in the bottom of the receiver. Fig. 5 is a sectional bottom plan view taken below the plane of dotted line $x-x$, Fig. 1.

A. represents a feed box having an inclined grating or analogous surface leading to a discharge end a' , said box having an open bottom a'' below the grating a . From the bottom a'' leads a chute pipe b , which enters and depends into near the bottom of a preferably open-top cylindrical receiver B, which is supported in any suitable manner, as indicated at b' , upon an outside jacket or chamber C, so as to admit of its being rotated by a band, chain or belt b'' suitably applied and driven, the actuating or power-transmitting device for said belt b'' not being shown in the drawings, as they are obvious.

At or near the top of the chamber C is a water supply pipe D. and at the bottom of said chamber is a valve d of any suitable or desired construction to admit of drawing off from time to time of any accumulations of ore in chamber C through outlet pipe d' .

The bottom of the receiver B may be constructed as shown in solid lines, or as in dotted lines b^3 or otherwise as desired. Depending into the receiver B is a pipe E, which

preferably has an outwardly-flaring or inverted-funnel-shaped lower end e for embracing the bottom b^3 of the receiver B. This pipe E connects, preferably by a slip-joint e' , with the inlet-pipe f of a suction or sand pump F of the kind which admits of the passage through it of a large bulk or volume of material, the same being a valveless or centrifugal pump, commercially termed a "coal-pump." It discharges onto G, which may be a waste-grating or sluice or may lead to another concentrator, as may be desired.

The operation is as follows: The gangue, with its boulders, stones or other bulky matter, as contradistinguished from prepared or pulverized gangue, is dumped or supplied to the grating a which separates from the gangue the boulders or other large waste material. Preferably a stream of water is supplied to the grating a in any suitable manner, as by an independent pipe or by a branch f'' from the discharge end f' of the pump. The screenings from the grating a are conveyed by the chute-pipe b into the bottom of the receiver B, where they are subjected to the upward flow or current of water from supply-pipe D. through chamber C, and up through the perforations in the bottom b^3 of the receiver B, and to other water current herein-after specified, whereby the ore is separated from the gangue and brought to the bottom of the receiver and whence it falls through the perforations in said bottom to the bottom of the jacket or chamber C, from which it may from time to time be drawn off by opening the valve in outlet-pipe d' .

The machine, as thus far described, is the Pike machine, in which the water supply enters only into the space between the receiver B and chamber C, (except that which comes through chute b ,) passing up through the perforations in the bottom of the receiver B, and thus agitating the gangue, while the ore passes, or should pass down through the same perforations against the current of water. The defect of this machine is that with such current of water passing up through these perforations as is necessary sufficiently to agitate the gangue the particles of ore which it is desired to have pass down through these perforations are held up by the current of water and will not so pass down; at least

to such of them as are of small size or irregular shape; and it is this defect which my invention is intended to remove. To this end I continue the connection of the pipe D
5 to the chamber C. but with only a light pressure of water; and I furnish the receiver B a further supply of water by a pipe H, which enters and depends into the receiver near to its bottom and terminates in one or more nozzles H', (shown in detail in Figs. 2 and 3,) preferably inclining horizontally or below the horizontal, and preferably directed against the direction of motion of the receiver. There may be as many of these pipes H as may be
15 desired.

The current of water projected from the nozzle of the pipe H is sharp and effectually stirs up the gangue, causing and allowing the larger and lighter portions of it to go to the top, and the smaller and heavier to the bottom, and keeping it in such loose condition as to be readily amenable to the action of the upward current of water in the pipe E while not interfering with the descent of the ore through the perforations in the bottom of the receiver. These perforations are tapering, larger at the bottom than at the top, so that no ore can lodge in them, as shown in Fig. 4. The pressure of water in the space
20 between receiver B and chamber C is only sufficient to prevent accumulation of gangue and ore at the tops of these perforations but not sufficient to make a current which will interfere with the free passage of the ore downward through them.
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I claim as my invention—

1. In an ore concentrator and washer having a receiving chamber with a perforated bottom or partition, a pipe connected with
40 said receiver and supplying water to the space between said bottom and partition, which water passes up through the latter and a pump with a suction-pipe projecting into said cham-

ber to a point immediately above the perforated bottom, the combination therewith of
45 a pipe adapted to receive a current of water and having a nozzle adapted to project a stream of water into said chamber above the perforated bottom.

2. In an ore concentrator and washer having a receiving chamber with a perforated bottom or partition and a pump with a suction-pipe projecting into said chamber to a point immediately above the perforated bottom the combination therewith of a pipe
50 55 adapted to receive a current of water and having a nozzle adapted to project a stream of water into said chamber above the perforated bottom.

3. In an ore washing or concentrating apparatus having a rotating perforated receiver and a pump having a suction-pipe projecting into said receiver the combination therewith of a pipe adapted to receive a current of water and having a nozzle adapted to project a
60 65 stream of water into said receiver in a direction opposite to the direction of motion of the receiver.

4. In an ore washer and concentrator having a rotating receiving chamber with a perforated bottom or partition and a pump with a suction pipe projecting into said chamber to a point above the perforated bottom, the combination of a pipe adapted to receive a current of water and having a nozzle adapted
70 75 to project a stream of water into said chamber above the perforated bottom in a direction opposed to the direction of rotation of the chamber and perforations in said bottom or partition tapering from the bottom to the top thereof.
80

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Witnesses:

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