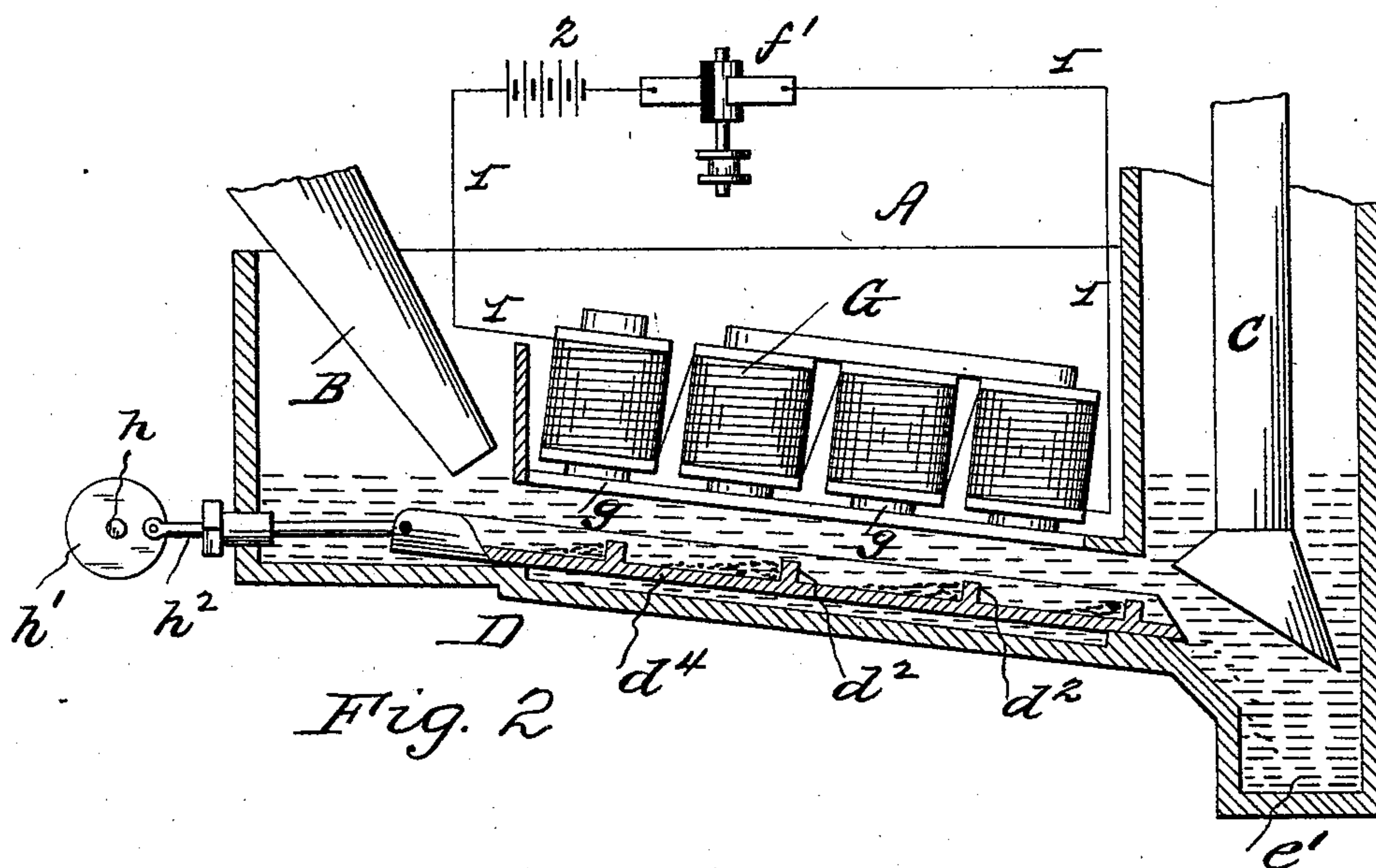
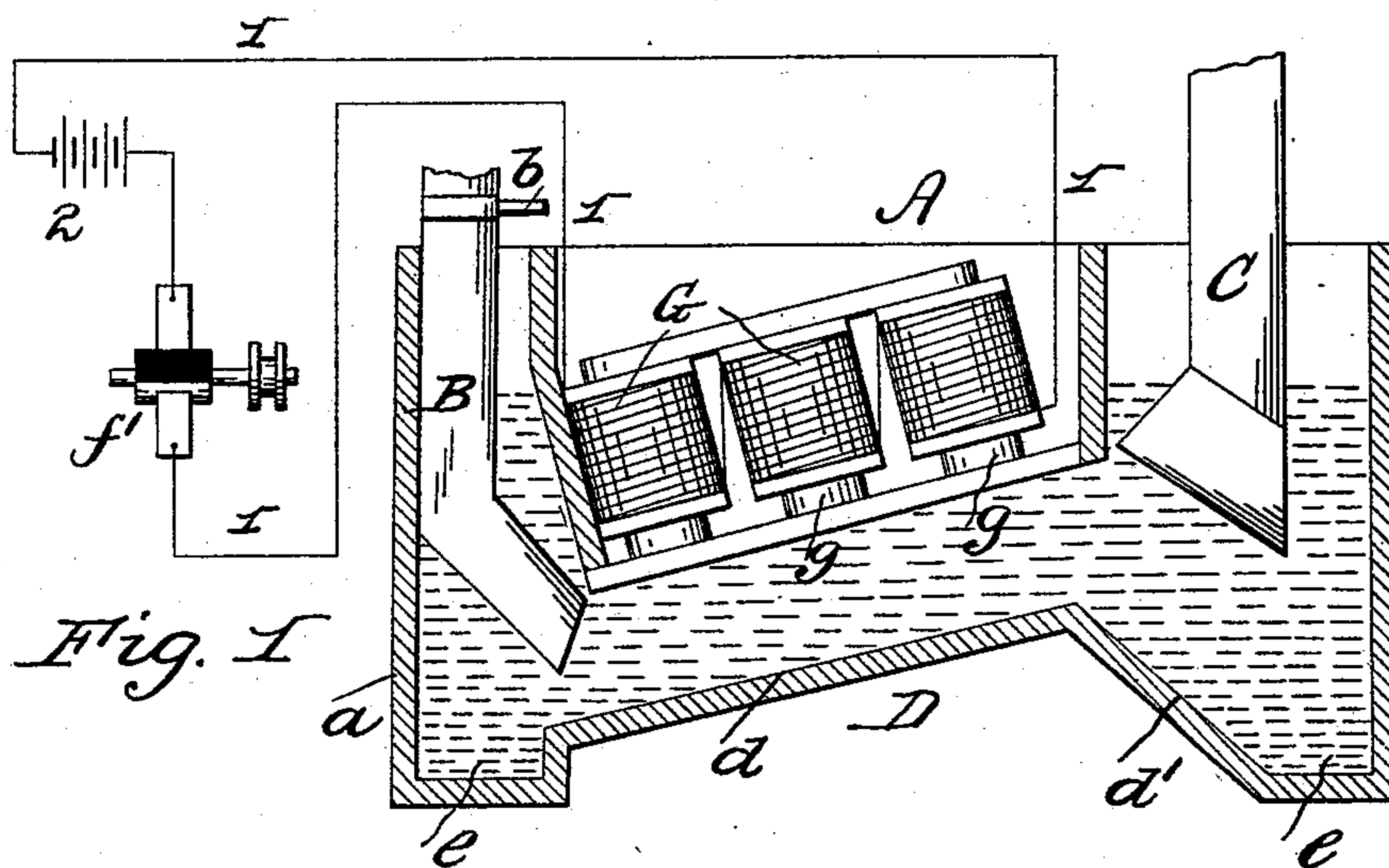


(No Model.)

C. F. PIKE.
ORE WASHER OR CONCENTRATOR.

No. 529,080.

Patented Nov. 13, 1894.



WITNESSES :

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CHARLES F. PIKE, OF PHILADELPHIA, PENNSYLVANIA.

ORE WASHER OR CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 529,080, dated November 13, 1894.

Application filed April 6, 1894. Serial No. 506,654. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. PIKE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ore Washers or 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 appertains to make and use the same.

My invention has relation to that form of ore-washers or concentrators in which the metal particles are recovered without the use of mercury or amalgam plates; and it has for its object a simple and efficient washer or concentrator which not only separates the metal particles from the waste-matter of the ore but also separately concentrates the black-sand from such waste-matter and metal-particles so that such sand may be saved for use.

My invention accordingly consists of the combinations, constructions and arrangements of parts as hereinafter more fully described in the specification and pointed out in the claims.

Reference is had to the accompanying drawings, wherein—

Figure 1, is a sectional elevation of a form of washer embodying my improvements, and Fig. 2, is a sectional elevation of another form of washer embodying my improvements.

A represents the washer which may be of any suitable form, as shown in the drawings. It is of an oblong form having a feeding device B at one end, and a suction-discharge C at its other end.

In Figs. 1 and 2 the washers or their receiving vessels *a* are shown with bottoms relatively reversely inclined. The incline *d* of bottom D in Fig. 1 rises from and adjacent to the feeding end of the washer and the incline *d'* descends toward the suction-discharge which is located above said incline *d*. At the lower ends of each incline *d* *d'* suitable receptacles *e* and *e'* respectively are located. The receptacle *e* is used for the accumulations of the concentrates of metal and receptacle *e'* for that of the black-sand. Adjacent to or above and parallel with the incline *d* between the feed-end and the discharge-end of the washer are located the poles *g* of a series of magnets

G. The magnets G are preferably alternately active and inactive. They may all be made active and inactive simultaneously or successively by means of a suitably constructed and actuated circuit breaker *f'* included in the electric circuit 1—1 for magnets G.

The feed device B may, if desired, be provided with an adjustable slide *b* for regulating the volume of ore fed therefrom.

As the ore from feed B passes into the washer A above the incline *d*, its contained black-sand particles are alternately attracted by the magnets G and fall away therefrom as they travel from the feed to the discharge end of the washer under the influence of the suction-discharge in pipe or device C. This alternate attraction of the black-sand particles imparts to them in their passage through the washer above the incline *d*, a rising and falling or a zizzag movement for maintaining them suspended in the washer above the incline *d* in a scattered or dispersed condition, to admit of any metal particles segregated with the black-sand particles separating therefrom and descending to the incline *d*, down which they move by gravity and accumulate in receptacle *e*.

If the suction or lifting force in device C is regulated so that it will not be strong enough to discharge the black-sand particles as they pass beyond apex of the incline *d* and out of the influence of the field of force of the magnets G, said sand-particles fall and separate from the waste-matters being discharged, and descend to the incline *d'* and pass along the same to receptacle *e'*. The black-sand, therefore, is also concentrated and saved in a vessel or chamber separate from the metal particles.

In Fig. 2, the bottom *d⁴* has but one incline and that a descending one, and such bottom is shown composed of a shaking or jigger plate having riffles *d²* thereon for catching the concentrates of metal. In this case the poles of the magnets G may align with the riffles *d²* so that the black-sand in or tending to fall into the riffles is subject to the electrical field of force as well as to the mechanical shaking of such jigger bottom *d⁴* for keeping it out of the riffles. In this case the metal-particles are collected in the riffles, while the black-sand particles fall off the incline *d⁴* and con-

tinue their descent to receptacle e' either uninfluenced or influenced by the suction-discharge as desired.

It is evident that the details of my invention will vary to meet the different requirements of service or forms of washers.

From the foregoing it will be noted that both the metal-particles and the black-sand are separated from the waste-matters of the ore and saved, and that this is done without the aid of mercury or amalgam-plates. If desired, however, the black-sand particles may be discharged through the device C when the requirements of service make it unnecessary to save the same.

The inlet end of the suction discharge may be adjustable to and from the field of force of the magnets G in any desired manner or such inlet-end and the tube for the suction discharge may be a hose or otherwise made flexible for effecting such adjustment.

1—1 shows the electric circuit including a source of electric supply 2 for the magnets G. The latter are included in said circuit in any suitable manner in accordance with the well known ways of circuiting magnets for rendering all of them simultaneously or successively alternately active and inactive. I prefer a form of mechanically actuated circuit breaker f' , as the same may be constructed and speeded to give any desired extent of duration of opening and closing of circuit 1—1 to suit the requirements of service.

h represents a shaft having a disk h' to which is eccentrically connected one end of a link h^2 , the other end of which is in engagement with bottom d^4 for jiggling or actuating the same, but, if desired, other well known forms of actuating mechanism may be substituted therefor.

The ore and water are fed into device B in any suitable manner or, if desired, the washer-vessel a may have a separate water supply.

From the foregoing, it will be noted, that the movement of the ore from the feed to the discharge is primarily controlled by the suction force of such discharge. Hence this ap-

plication is generic to another pending application filed by me of an even date herewith, Serial No. 506,651, in which such travel or movement of the ore is primarily caused by a jet or jets of water, rotating plate or other suitable positively actuated means, and is, therefore, subordinate to this application.

What I claim is—

1. In an ore washer or concentrator the combination of a receiving vessel, a feed device and a suction discharge device relatively distantly located in said vessel one or more magnets between said feed and discharge devices, and means for causing the material fed to the vessel to flow in a plane at an angle to a horizontal from said feed to said discharge in proximity to and below said magnets, and circuit connections including a source of electric supply for the magnets and a circuit changer substantially as and for the purposes set forth.

2. In an ore washer or concentrator the combination of a receiving vessel containing a body of water, a shaking or jigger bottom for or in said vessel, transverse riffles on said bottom, a feed inlet and a discharge outlet for the vessel, one or more magnets located above and adjacent to said bottom and circuit connections including a source of electric supply for the magnets substantially as set forth.

3. In an ore washer or amalgamator, the combination of a receiving vessel, a shaking or jigger bottom for or in said vessel, transverse riffles on said bottom, a feed device and a discharge device for said vessel, one or more magnets located between the feed and discharge devices and above and adjacent to said bottom, and circuit connections with a source of electrical supply for said magnets, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES F. PIKE.

Witnesses:

JOHN RODGERS,
S. J. VAN STAVOREN.