

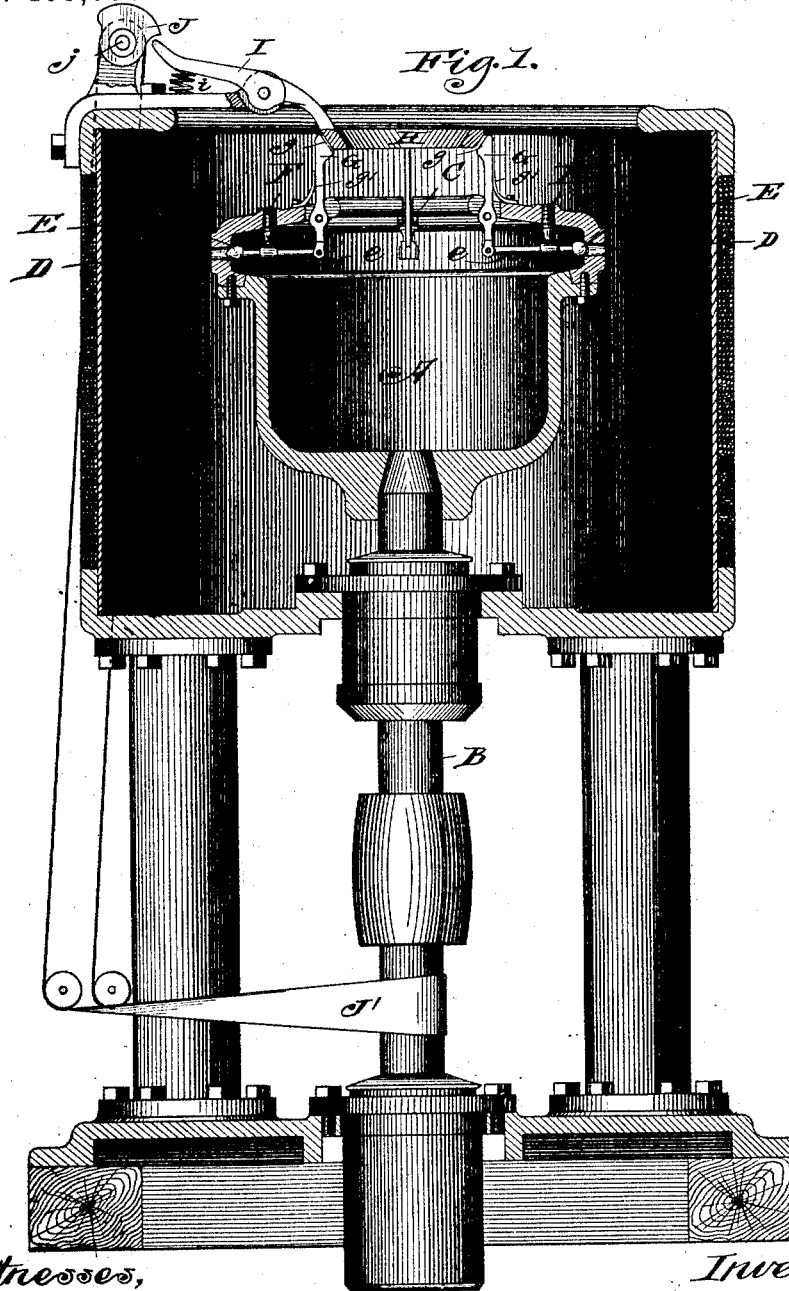
(No Model.)

3 Sheets—Sheet 1.

O. B. PECK.
CENTRIFUGAL ORE SEPARATOR.

No. 489,090.

Patented Jan. 3, 1893.



Witnesses,
J. J. Mann,
Clifford & White.

Inventor,
Orrin B. Peck,
By, Banning & Banning & Payson,
Attys.

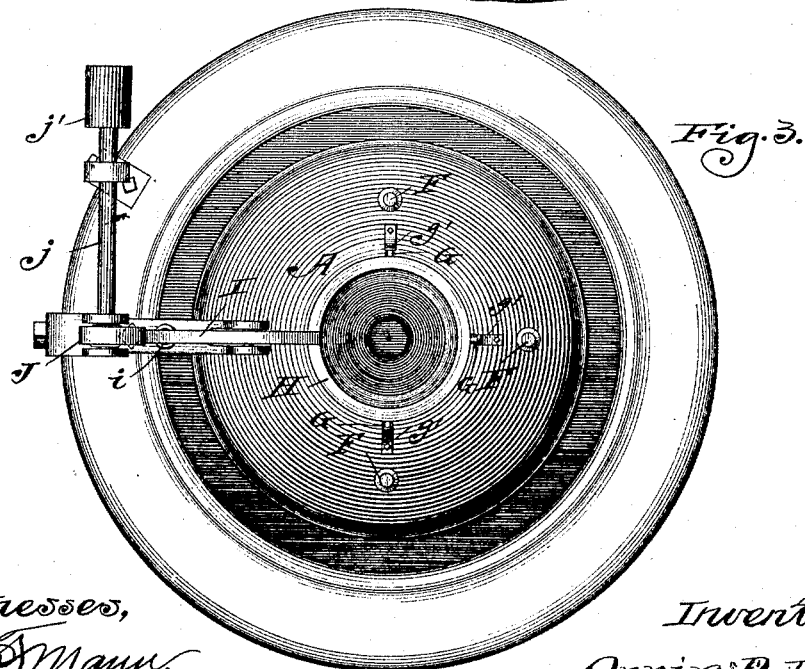
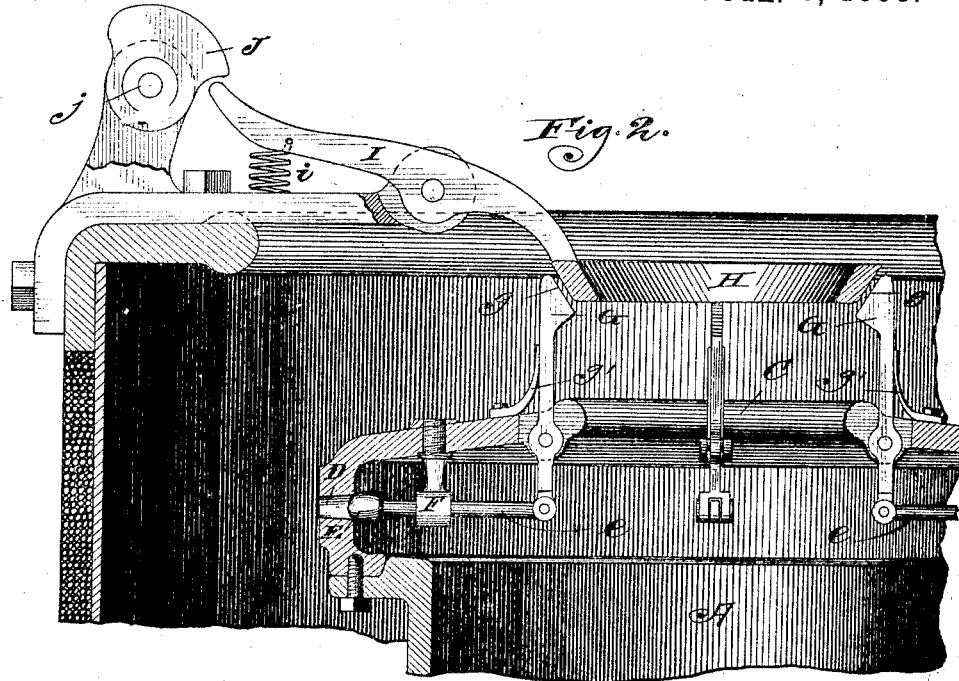
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3 Sheets—Sheet 2.

O. B. PECK.
CENTRIFUGAL ORE SEPARATOR.

No. 489,090.

Patented Jan. 3, 1893.



Witnesses,
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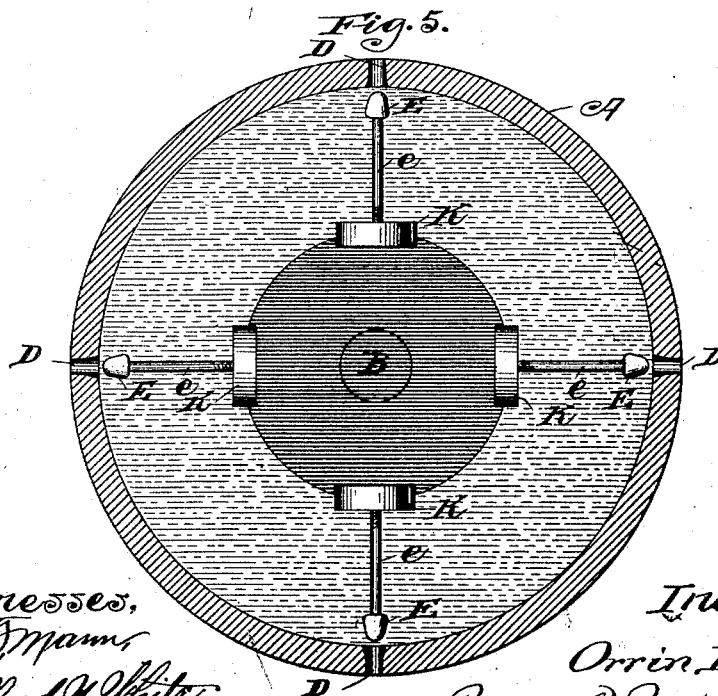
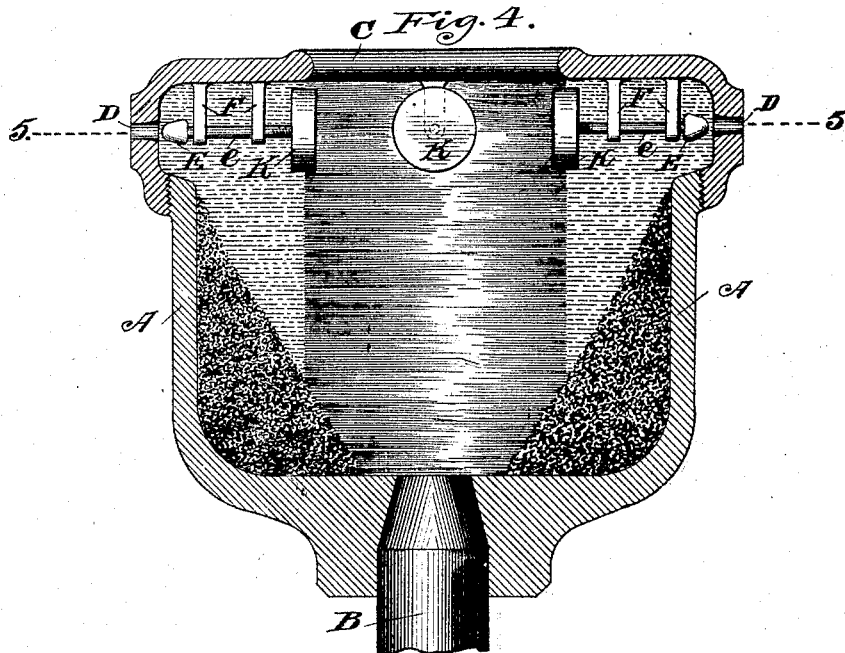
(No Model.)

3 Sheets—Sheet 3.

O. B. PECK.
CENTRIFUGAL ORE SEPARATOR.

No. 489,090.

Patented Jan. 3, 1893.



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UNITED STATES PATENT OFFICE.

ORRIN B. PECK, OF CHICAGO, ILLINOIS, ASSIGNOR TO MELINDA PECK, OF
SAME PLACE.

CENTRIFUGAL ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 489,090, dated January 3, 1893.

Application filed April 24, 1891. Serial No. 390,326. (No model.)

To all whom it may concern:

Be it known that I, ORRIN B. PECK, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Centrifugal Ore-Separators, of which the following is a specification.

In operating machinery of this class, I have found that it is desirable to keep the particles of material while being treated constantly submerged, and the object of my invention is to provide means for regulating the discharge of the liquid and material being treated in such manner as to maintain a constantly submerged state of such material, by the use of as small a quantity of water or other liquid as practicable, and my invention consists in the features and details of construction hereinafter described and claimed.

In the drawings, Figure 1 is a central vertical section of a machine provided with my improvements; Fig. 2 a similar section of a portion of the upper part of such machine, drawn on an enlarged scale; Fig. 3 a plan view of the machine shown in Fig. 1; Fig. 4 is a vertical central section of the vessel, showing a modified form of the apparatus; and Fig. 5 is a sectional view taken on line 5 5 of Fig. 4.

In treating powdered or finely divided material containing metallic or mineral-bearing substances by the action of centrifugal force in a revolving vessel for the separation of the heavier particles, as has been explained in my United States Letters Patent Nos. 444,614, 444,615, and 444,619, while the material is being treated in the revolving vessel the heavier particles lodge and accumulate on the interior surface of the accumulated and accumulating deposit or mass of material retained in the vessel, while the lighter particles or portions of the material pass over the surface of the accumulated mass to the points of discharge, and is thrown off or discharged by the action of centrifugal force. I have found that, during this operation it is usually desirable and advantageous to use water with the material while being so treated, and that while the material being treated together with the water is passing up over the surface of the accumulated mass in the vessel from the

point where it is being introduced or first acted upon, as above explained, it tends to cut or wash channels or grooves in the surface of the accumulated mass in the vessel, which prevents an effective separation of the heavier particles, and often causes portions of the mass of heavier particles that have already accumulated in the vessel to be washed and carried away, discharged and lost. This erosion or washing of channels in the surface of the accumulated material in the vessel is caused by the very rapid passage, mainly of the water introduced into the vessel over its surface in a thin or very shallow layer or sheet. To avoid this difficulty I find it desirable or necessary to construct a vessel that will hold a quantity of water or other liquid in a way to submerge the surface of the accumulated material in the vessel, and also the material introduced and being treated; and to accomplish this and effect a continued discharge of the lighter material I find it necessary to provide means for the discharge of the lighter material under and beneath the surface of the water and further to facilitate the use of as small a quantity of water or other fluid as practicable, and to maintain in the submerged condition of the materials in the vessel I find it desirable to provide means for regulating the discharge of the material from the vessel.

In making my improved machine I provide a suitable revoluble vessel A, mounted upon a shaft B, revolved by means of any convenient and sufficient motive power. The vessel is provided with an opening C, in its top for the admission of the water and the particles of material to be treated, and with any desired number of discharge orifices D, located in the side of the vessel at a point near the top thereof. For the purpose of closing or diminishing these orifices, I provide valves or stoppers E, attached to rods e, which are supported in suitable bearings F, so that they are free to slide back and forth as hereinafter described. These stoppers may be operated simultaneously or separately as preferred, and in the drawings I have shown two means whereby they are operated simultaneously, without, however, intending to limit myself to the precise means shown, or either of them, since such means are intended but as illustrations of two

ways in which the desired results can be accomplished.

In the first three figures of the drawings, I have shown means whereby the stoppers are 5 intermittently advanced to close the holes and then retracted to open them. Levers G are pivoted or movably supported in the top of the vessel, one end of each of such levers being connected in any suitable manner with 10 one of the rods e, and the other end extending up through the top of the vessel and being preferably provided with a beveled surface g, as shown. In their normal position the stoppers are advanced so as to close the 15 orifices and to maintain this position I prefer to provide springs g', attached to the vessel, and engaging with or bearing against the levers G. I next construct a ring or collar H, preferably beveled as shown, which is connected to a lever or arm I, pivoted at some 20 fixed point in the machinery outside of the vessel. To restore this lever and ring to their normal position, in which they are shown in the drawings, after they have been moved therefrom in the manner hereinafter to be 25 described, I provide a spring i. I next construct a cam J, mounted upon a shaft j, which is journaled in suitable bearings, as shown. This shaft is provided with a pulley j', and a 30 belt J', passes over the shaft B, over suitable pulleys and around the pulley j', whereby the revolution of the shaft B revolves the shaft j, and the cam J. As this cam revolves toward the left (Fig. 2.) it comes in contact with the 35 under side of the lever I, rocking it upon its bearings and depressing the ring H. This ring, as it moves downward, engages with the beveled faces on the upper ends of the levers G, rocking these ends outward and thereby 40 withdrawing the stoppers and opening the discharge orifices. As long as the cam J remains in contact with the levers I, these orifices will remain open. After the cam has passed the levers the latter will be restored 45 to their normal position by means of the spring i, and the springs g', will restore the normal position of the levers G, thereby moving the stoppers to again close the orifices.

In the form shown in Figs. 4 and 5 I dispense with the ring H, and the devices intended to operate this ring and also with the 50 levers G, and in place thereof I mount floats K upon the rods e. As the vessel is revolved the water will be driven by centrifugal force 55 toward the side thereof, leaving a hole or well in the center thereof as shown in Figs. 4 and

5, and the floats rest as shown on the side or surface of said well, their position being maintained by the centrifugal force and the pressure of water. As the amount of water 60 in the vessel increases the floats will be moved away from the side of the vessel and as it diminishes the floats will approach the side of the vessel. The parts are so adjusted that when the quantity of water in the vessel is 65 diminished to the least quantity desired the floats will have moved sufficiently to close the orifices by means of the stoppers. As the quantity of water increases in the vessel the floats will gradually move away from the orifices, opening them to allow the discharge of 70 the contents of the vessel. In this way a practically constant quantity of water is maintained in the vessel, notwithstanding that the amount being introduced may be limited and 75 vary from time to time, since if the quantity falls below the amount desired or to the least desirable amount, the floats will close the orifices until the quantity in the vessel rises sufficiently, after which they will open them 80 again, as already described.

By the word stopper I mean any device applicable to be used in this connection and do not wish to limit myself to the use of mere 85 plugs as shown in the drawings.

I claim:

1. In centrifugal ore separators, a revoluble vessel provided with one or more discharge orifices below the water surface, and means 90 for mechanically and automatically regulating the discharge of water and material through the orifices, substantially as described.

2. In centrifugal ore separators, a revoluble vessel provided with one or more discharge 95 orifices below the water surface, and a stopper for each orifice, operated mechanically and automatically, to regulate the discharge of water and material through the orifices, substantially as described. 100

3. In centrifugal ore separators, a revoluble vessel provided with one or more discharge orifices below the water surface, a stopper for each orifice, and a float for automatically operating the stoppers to regulate the discharge 105 of water and material through the orifices, substantially as described.

ORRIN B. PECK.

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