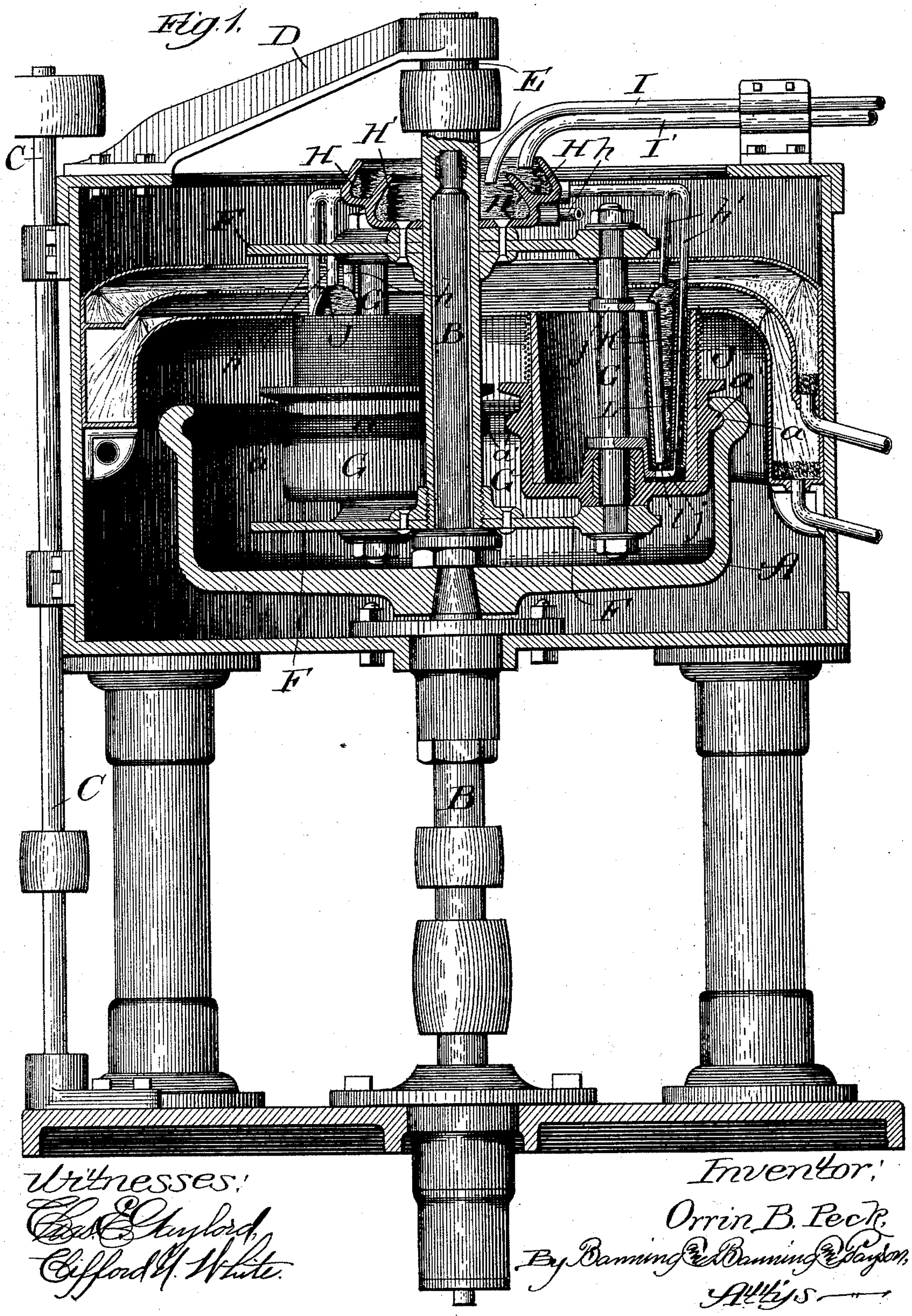
(No Model.) 3 Sheets—Sheet 1.

O. B. PECK.

CENTRIFUGAL ORE SEPARATOR.

No. 489,203. Patented Jan. 3, 1893.

Fig. 1.



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Att'ys.

(No Model.) 3 Sheets—Sheet 2.

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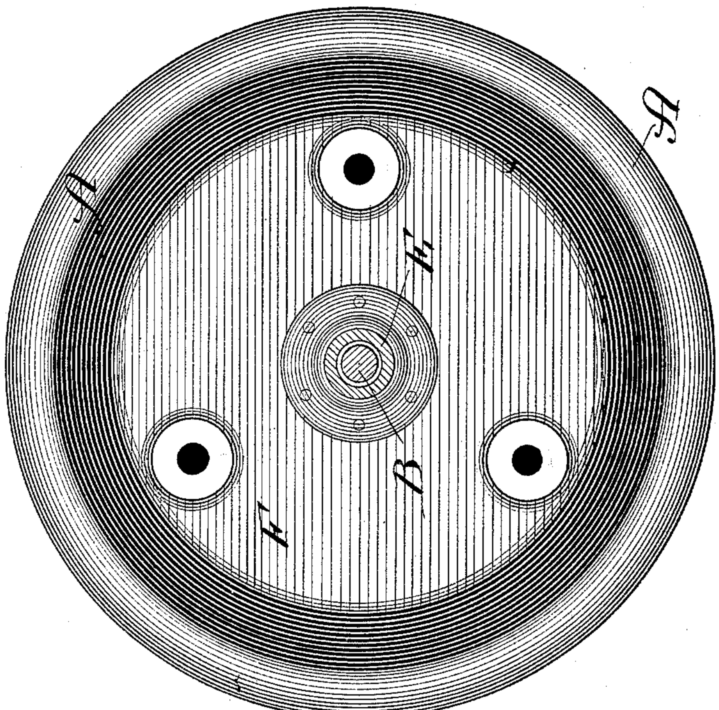

Fig. 2.

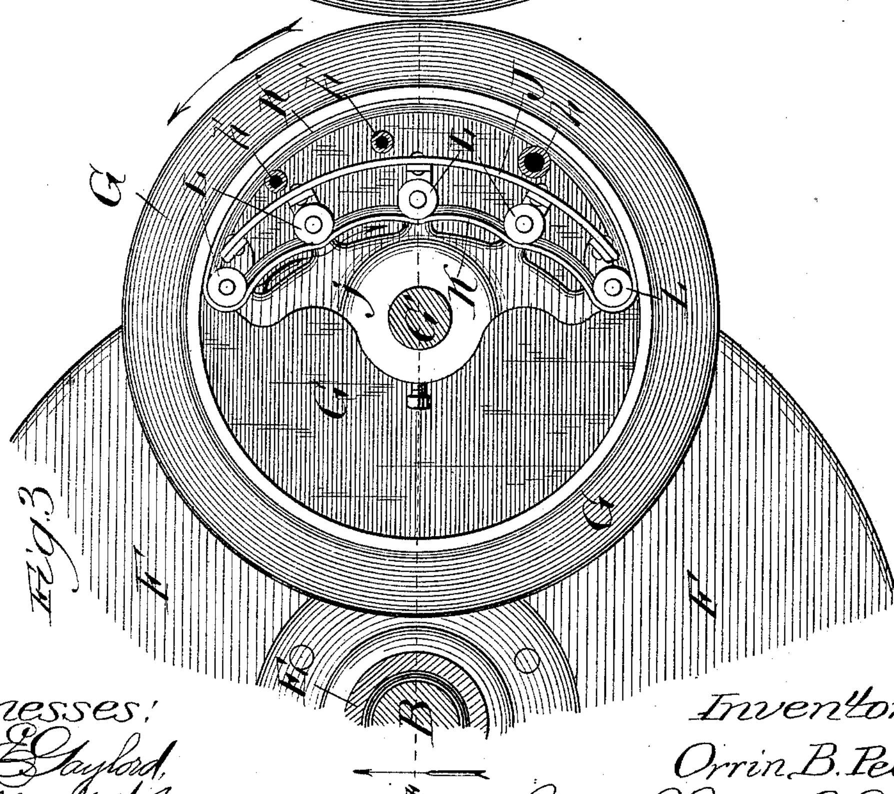

Fig. 3.

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3 Sheets—Sheet 3.

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CENTRIFUGAL ORE SEPARATOR.

No. 489,203.

Patented Jan. 3, 1893.

Fig. 4.

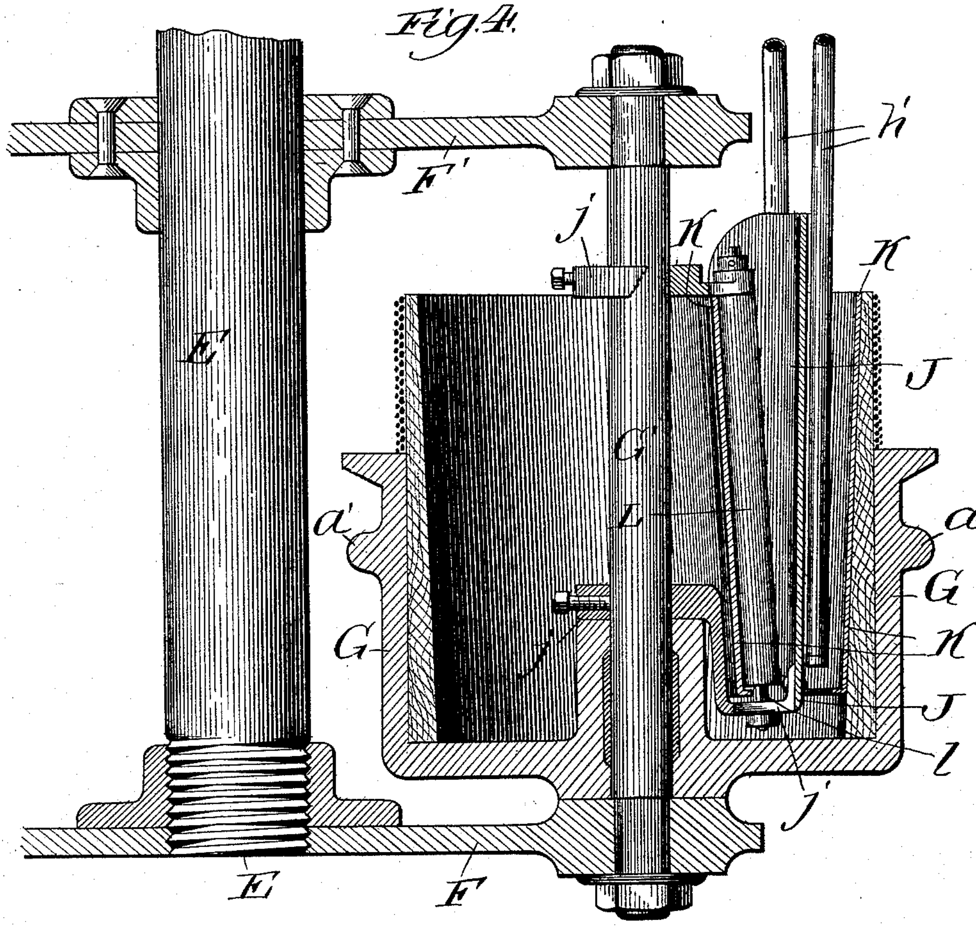
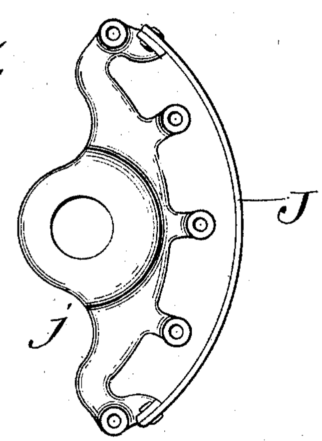


Fig. 5.



Witnesses:
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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. 489,203, dated January 3, 1893.

Application filed January 11, 1892. Serial No. 417,689. (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, Illinois, have invented certain new and useful Improvements in Centrifugal Ore-Separators, of which the following is a specification.

In the drawings Figure 1 represents a vertical section of my improved apparatus; Fig. 2 represents a plan view of a plate to be hereinafter lettered F and a revoluble vessel hereinafter to be lettered A; Fig. 3 is an enlarged plan view of the bottom of one of the treatment chambers and of the plate F; Fig. 4 is a vertical section of one of the treatment vessels taken in the line 4 of Fig. 3, looking in the direction of the arrows, and Fig. 5 is a detail of one of the parts.

In making my improved apparatus for the separation of powdered or finely divided particles containing mineral bearing substances of different degrees of specific gravity, I preferably make a revoluble vessel A, mounted upon and rotated by a revoluble shaft B, which may be supported in position in any desired manner and rotated by any suitable motive power. The shaft B is extended up through the rotatable vessel A, preferably to the top of the apparatus, as shown in the drawings. Arranged preferably at one side of the apparatus, in convenient position, and supported in suitable bearings, is a countershaft C, carrying a pulley, so that it may be rotated by a belt running on a pulley on the shaft B. A bracket D extends from a suitable support, preferably the top of the curbing of the apparatus, to a central position over the apparatus, to furnish a bearing for the upper end of a hollow shaft E which is placed around the upper portion of the shaft B, extending down to a suitable step near the bottom of the revoluble vessel A. A belt connects a pulley on the top of the countershaft with a pulley near the top of the hollow sleeve E, so that as the countershaft is rotated it causes the hollow shaft to be also rotated. At the bottom of the hollow shaft is arranged a plate or disk F, and at a suitable position near the top of the apparatus is arranged another disk or plate F′. These plates are connected to the hollow shaft in any suitable manner, so that they may be rotated with such shaft. Arranged between the two plates F and F′ are preferably three treatment vessels G arranged around shafts G′, supported at top and bottom in the plates or disks F and F′. In the form of apparatus shown in the drawings, these shafts are fixed and stationary, and the treatment vessels G are arranged to be rotated around them. Near the top of the rotatable vessel A is a groove or tread a, and in proper position around the outer edges of the treatment vessels G is a tire or flange a'. This tire or flange fits into the tread or groove, so that there is frictional contact between them. The vessels G are carried around by the rotation of the hollow shaft, which rotates the plates or disks by which the treatment vessels are supported. As they are thus carried around, frictional contact between the flanges or tires a' and the groove or tread a causes the treatment vessels each to rotate on its own axis. When, however, the rotatable vessel A, carried on the shaft B, is rotated at the same speed as the hollow shaft E, the treatment vessels being carried around at the same speed as the rotatable vessel A, would have no independent rotation on their several axes, but would simply be carried around the common center in a circle, as it were. By regulating the rotation of the shaft E, which carries the treatment vessels around, therefore, such vessels may be either rotated on their respective axes, or simply carried around, as may be preferred, and when they are rotating, the speed of their individual rotation may be regulated or modified irrespective of the speed of rotation of the vessel A. The treatment vessels, therefore, have a capacity for compound rotation, all around the common axis B, and each around its own axis G′, as may be desired in operation. Each treatment vessel thus rotates around its own axis and around an axis external to it.

Arranged near the top of the hollow sleeve E is what may be termed a receiving bowl, divided into compartments H and H′, which is rotated with the shaft. A pipe I delivers the material to be treated into the compartment H′, and a pipe I′ delivers water into the compartment H. In the treatment vessels are arranged fixed and nearly vertical troughs J, which preferably describe the arc of a circle, as shown particularly in Figs. 3 and 5. In the apparatus as illustrated in the drawings, these troughs are shown as supported on the fixed shafts G′, through means of the brackets *j*. They are preferably located near the outer sides of the treatment vessels, measuring from the common center B. A pipe *h* leads from the compartment H′ of the receiving bowl to each of the treatment vessels to deliver the material to be treated behind or outside of the troughs J, while spray pipes *h*′ lead from the compartment H of the receiving bowl of the treatment vessels, to introduce the desired supply of water.

To assist in separating the material on the inside of the treatment vessels, and to facilitate the continuous removal and recovery of the heavier particles, I arrange in each of the treatment vessels a broad belt or canvas K, supported within the vessel substantially paralel to its axis of rotation. To support the side of this canvas nearest the shafts G′ I arrange rollers L, supported between the brackets *j*, mounted on the shafts G near their bottom and top. These rollers are preferably cut away at their lower ends, as shown at *l*, and the belt or canvas is preferably provided with an inwardly extending flange which projects in under the ends of the rollers L, as shown particularly in Fig. 4. The brackets on which the rollers are mounted, as above explained, remain in a fixed position, while the treatment vessels are intended to rotate about their shafts G′. The belt or canvas is made of a size to pass around these rollers on the inside and hugging the interior of the treatment vessel on its outside. As the vessel is rotated the centrifugal force developed will hold the belt out tightly against the rollers and against that portion of the inner wall of the vessel farthest from the common center of rotation, as particularly shown in Fig. 3. The frictional contact between the canvas belt and the inner side of the treatment vessels, will cause the belt to travel around the rollers. The arrangement of the canvas or belt is such that as it travels it passes entirely around the trough J. As the material and water are introduced at the back of the trough, and within the traveling belt or canvas, the action of centrifugal force will cause them to be carried against the side of the belt farthest from the common axis of rotation. The lighter particles and water will be driven up by the action of centrifugal force and passed over the upper edge of the treatment vessels into a curbing or receptacle adapted to receive them, whence they may be carried off. The heavier particles will be caused, by the action of centrifugal force, to adhere to the belt or canvas and be carried around beyond the first end roller that they reach after being deposited on the belt or canvas. Immediately upon passing this roller the action of centrifugal force will cause them to be thrown off from the canvas into the scoop J, up which they will be driven and over its top into a suitable curbing or receptacle to receive them, whence they may be carried to a desired place of deposit.

What I regard as new and desire to secure in this application, is:—

1. In centrifugal ore separators, the combination of a revoluble treatment vessel, a traveling belt or canvas supported within such vessel substantially parallel to its axis of rotation, and caused to travel by frictional contact with a portion of the interior wall of the vessel, and means for introducing the material to be treated within the belt, and means for rotating the treatment vessels substantially as described.

2. In centrifugal ore separators, the combination of a revoluble treatment vessel, a traveling belt or canvas supported within such vessel substantially parallel to its axis of rotation, and caused to travel by frictional contact with a portion of the interior wall of the vessel, a trough arranged within the belt, and means for introducing the material to be treated between the back of the trough and the belt, and means for rotating the treatment vessels substantially as described.

ORRIN B. PECK.

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