

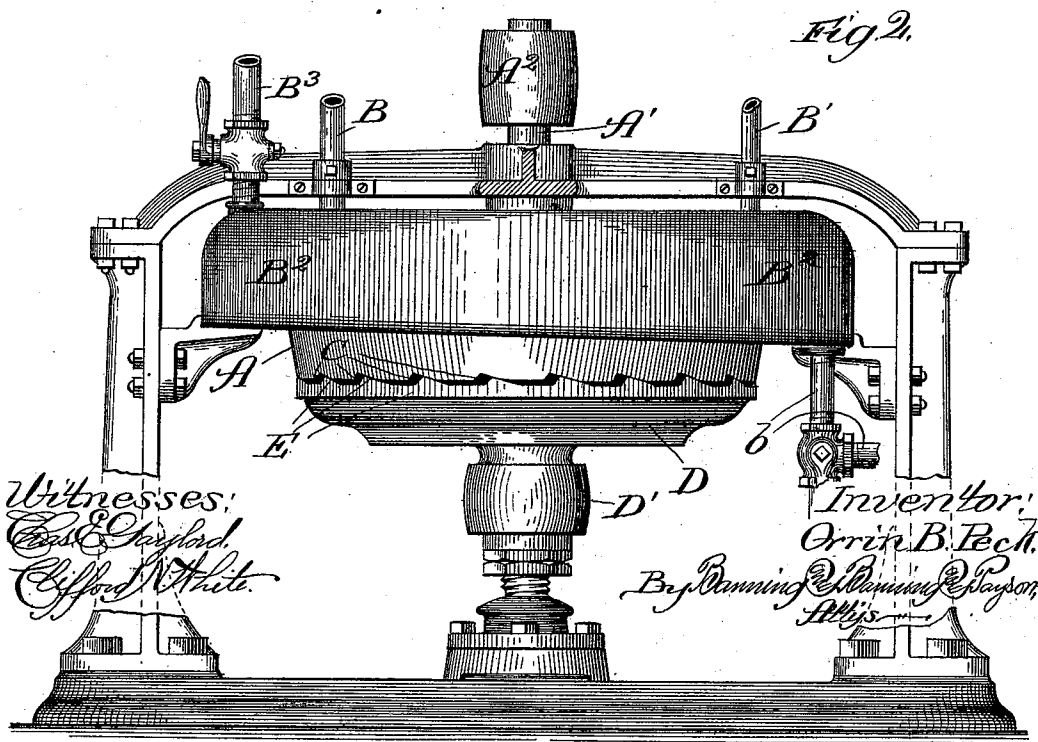
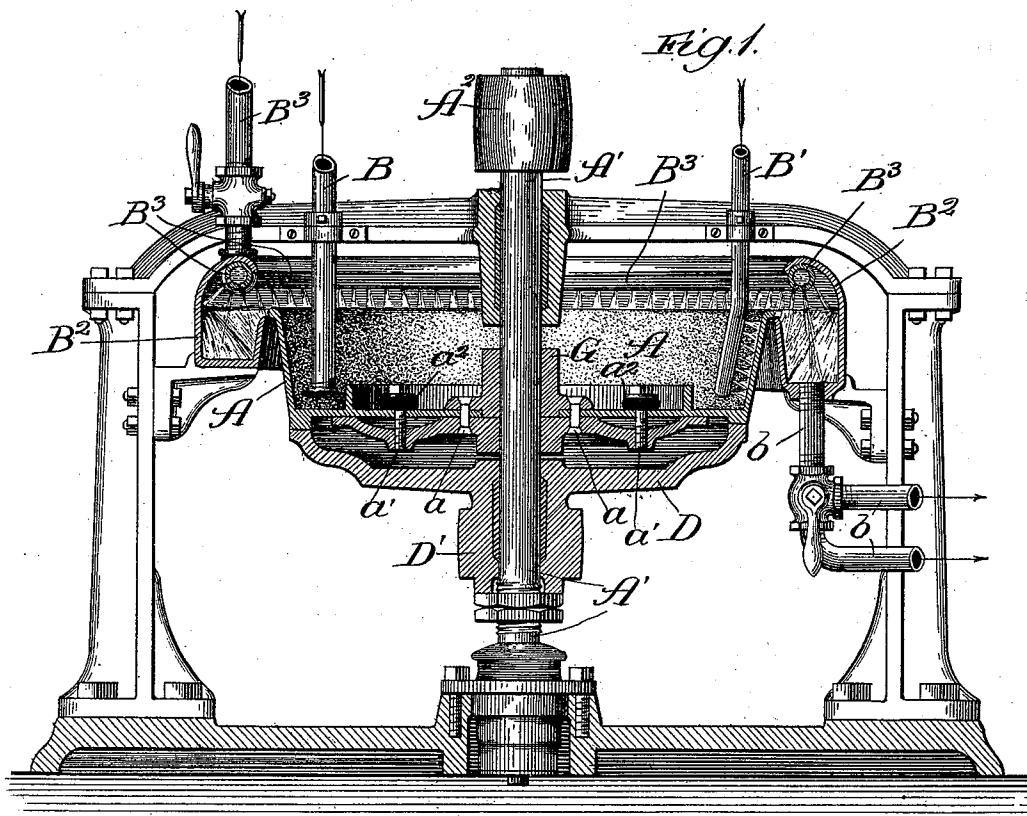
(No Model.)

3 Sheets—Sheet 1.

O. B. PECK.
CENTRIFUGAL ORE SEPARATOR.

No. 499,344.

Patented June 13, 1893.



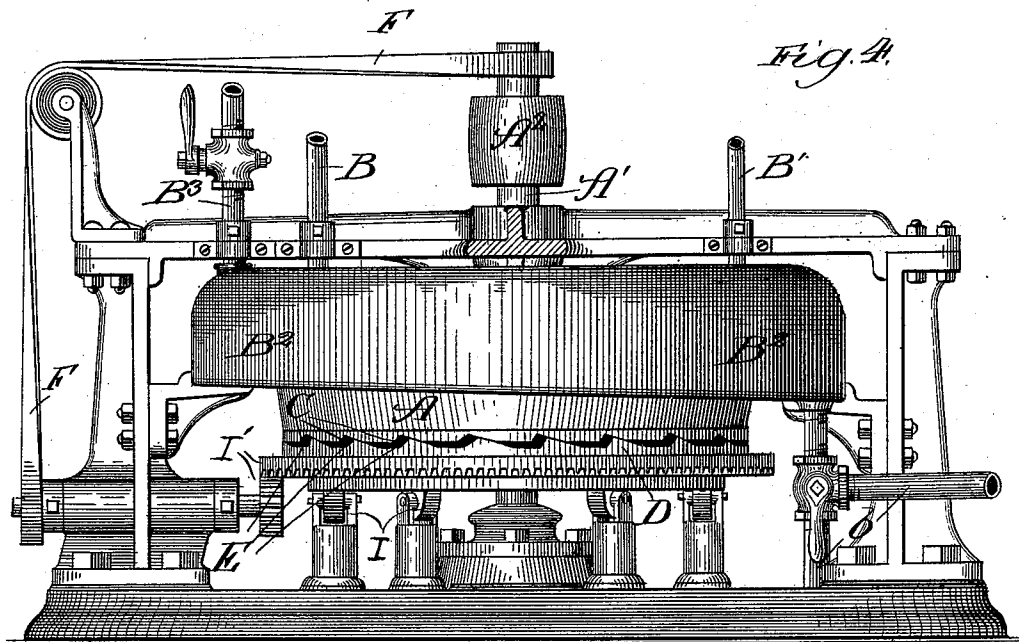
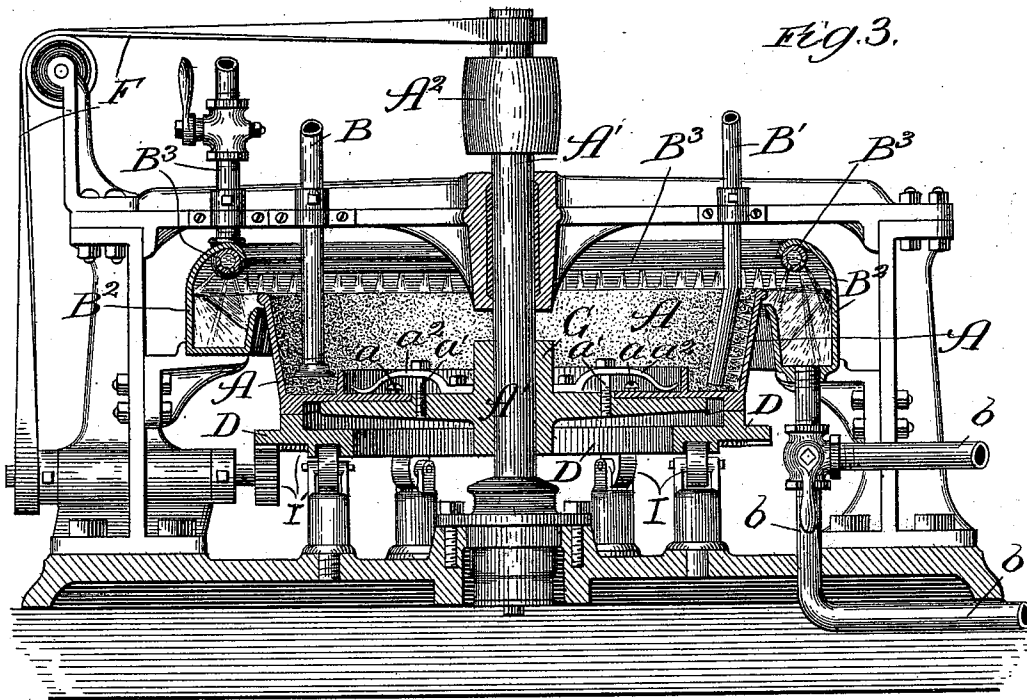
(No Model.)

3 Sheets—Sheet 2.

O. B. PECK.
CENTRIFUGAL ORE SEPARATOR.

No. 499,344.

Patented June 13, 1893.



Witnesses:

Edw. Chaylard,
Clifford White.

Inventor:

Orrin B. Peck,
By *William P. Manning & Payson*
Attys.

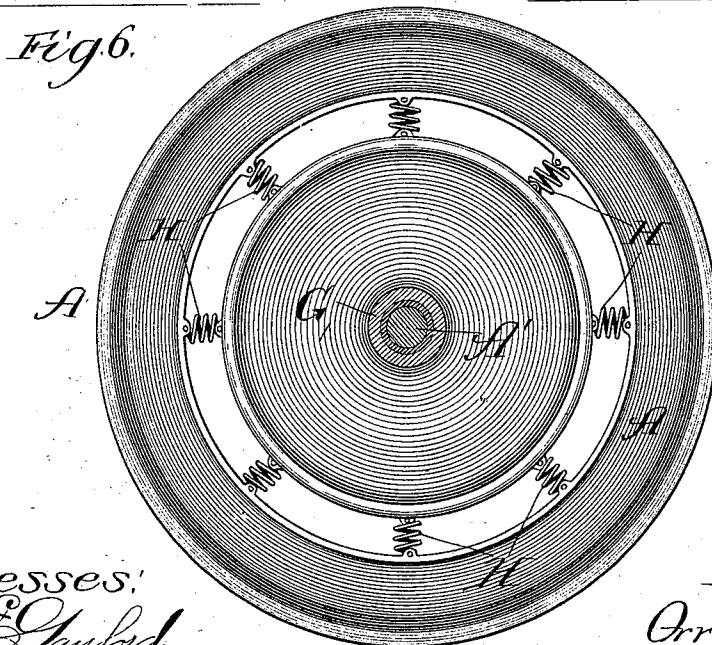
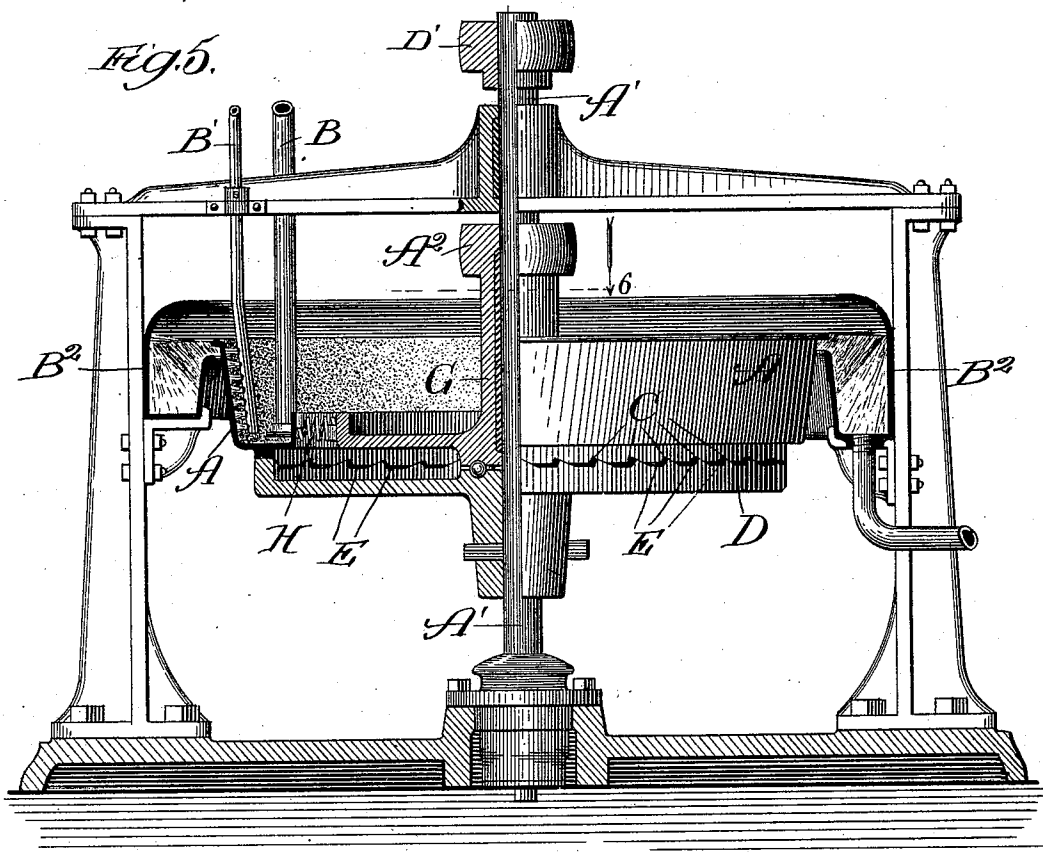
(No Model.)

3 Sheets—Sheet 3.

O. B. PECK.
CENTRIFUGAL ORE SEPARATOR.

No. 499,344.

Patented June 13, 1893.



Witnesses:
Chas. Gayford,
Clifford White.

Inventor
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By *Banning & Banning & Payson*
Attys

UNITED STATES PATENT OFFICE.

ORRIN B. PECK, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO THE PATENT TITLE COMPANY, OF SAME PLACE.

CENTRIFUGAL ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 499,344, dated June 13, 1893.

Application filed June 20, 1892. Serial No. 437,361. (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.

The object of my invention has particular reference to the construction of the separating wheel or vessel used in centrifugal ore separators, and more specifically to the means for imparting a vibratory motion to such vessel, as it performs its work; and my invention consists in the features and details of construction hereinafter described and claimed.

In the drawings, Figure 1 represents a central vertical section of my improved separator. Fig. 2 is a side elevation of the complete apparatus. Fig. 3 is a central vertical section. Fig. 4 is a side elevation of the apparatus shown in modified form. Fig. 5 is a side elevation, showing one half in vertical section, of a modified form of apparatus; and Fig. 6 is a plan view, taken in the line 6 of Fig. 5, looking in the direction of the arrow.

In making my improvements in centrifugal ore separators, for separating the worthless from the valuable particles of finely divided or powdery material, I make a rotatable wheel or vessel, having a separating portion or surface, A, the whole being mounted on a shaft, A', driven by a pulley, A², connected by belting to a suitable motive power, or any other convenient way. The material to be treated is introduced through a pipe B, and deposited on the separating surface of the vessel. Water is introduced through spray pipes, B', to spray water upon the material being treated. A trough or curbing, B², surrounds the treatment vessel to receive the material discharged therefrom, which is carried off from time to time through the pipe b. Water is also preferably carried through a pipe, B³, and sprayed on the curbing to facilitate the removal of the material. As to these matters of construction and operation, however, I will not enter into minute details, as my invention relates more particularly to other features of construction.

As illustrated in the drawings, I prefer to make the treatment vessel in two parts—the outer rim or portion of which affords a con-

tinuous separating surface, and is preferably flexibly or elastically connected to the inner or central portion, which may serve as a supporting frame work.

In Figs. 1, 2, 3 and 4, I have shown the outer portion or separating surface of the vessel, connected to the central portion by means of rivets or screws *a* and screw bolts *a'* provided with elastic cushions or springs *a*² under the heads of the screw bolts. In this way, the separating surface is elastically connected to the central portion or frame work. The screw bolts and cushions or springs afford means through which the tension or degree of yielding ability of the separating surface may be adjusted.

In order to impart a vibratory motion to the treatment vessel, I arrange cam surfaces, C, around its bottom or lower edge, as shown particularly in Figs. 2, 4 and 5. Immediately beneath these cam surfaces I arrange a disk or ring D, adapted to be rotated independently of the treatment vessel, by means of a pulley D'. The upper edge of this disk or ring is provided with cam surfaces, E, alternating in direction of cam surface with the cam surfaces C. As the treatment vessel is rotated, the cam surfaces, C, pass over the cam surfaces E, and produce a constant vibration or jarring of the treatment vessel. The ring or disk D may be rotated independently of the treatment vessel, and at a different desired rate of speed, or it may be allowed to remain stationary. If the disk or ring D remains stationary, then it is obvious that the amount of vibration in the treatment vessel will be determined by the speed of its rotation. If, however, the disk or ring be rotated in the direction of rotation of the treatment vessel, a less amount of vibration will be produced, depending upon the speed with which the ring or disk D is rotated. If the parts carrying the cam surfaces be rotated at the same speed, then of course no vibration or jarring will be produced. I am thus able to vary and regulate the amount of jarring or vibration imparted to the treatment vessel or separating surface, as circumstances may render desirable.

In Figs. 3 and 4 I have shown the ring or disk D supported on rollers I, and rotated by

means of gear wheels I' driven by a belt, F, from the main shaft A'. The arrangement of these gear wheels, and the application of the power to drive them, will be understood from an inspection of Figs. 3 and 4, and need not be further described in detail.

In Figs. 5 and 6 I have shown a modification designed to impart quick, sudden motions, accelerations and retardations, to the treatment vessel, in the path of its rotation, as well as the jarring or vibratory motions above explained. To effect this, I have connected the separating portion or surface of the treatment vessel to the inner or hub portion, G, by which it is rotated, by flexible connectors, H. These connectors are shown in the form of coiled springs, but it is immaterial whether they be confined to this form, or otherwise made, so as to flexibly connect the separating portion with the inner or hub portion of the wheel or vessel. I have also shown the cam surfaces C and E as somewhat more abrupt or inclined in Fig. 5 than in the other figures, but I do not insist upon this particular form of arrangement of the cam surfaces. As the treatment vessel is carried around in its rotation, the cam surfaces C, when they come into contact with the cam surfaces E, somewhat retard the speed of the separating portion of the vessel. This deflects the springs or flexible connectors backward and upward until the cam surfaces C have reached the top or highest part of the cam surfaces E, when the tension of the springs or flexible connectors instantly asserts itself, and throws or impels the separating portion or surface of the treatment vessel downward and forward again. In this way I am able to impart a compound vibration or jarring motion to the separating portion of the treatment vessel, consisting of a vertical jarring or vibration caused by the cam surfaces, and successive jarrings or movements forward and backward in the path of rotation of the treatment portion or surface of the vessel, which in other words will be subjecting the separating surface of the vessel to shocks by retardations and accelerations in the path of its rotation and at the same time, to shocks or vibrations transverse to the path of its rotation.

From the above description it will be understood that the inner or hub portion of the treatment vessel serves as a supporting frame work for the separating surface or portion, and affords means for imparting the desired rotary movement to it, but if desired, other means may be employed for supporting and rotating the separating surface, and such other changes or modifications may be made

in my apparatus, or in the details thereof, as may be desired, so long as they embody the invention as set forth in the claims.

Such matters of invention as are herein shown and described, and not broadly claimed, are described and claimed in my application, Serial No. 436,734, filed contemporaneously herewith.

What I regard as new, and desire to secure by Letters Patent, is—

1. In centrifugal ore separators, the combination of a rotating supporting frame work, a continuous separating surface mounted thereon by elastic connectors, and means for imparting shocks or vibrations to said separating surface, substantially as described.

2. In centrifugal ore separators, the combination of a supporting frame work, a rotatable separating surface mounted thereon, and means for imparting shocks or vibrations to such separating surface by retardations and accelerations in the path of its revolution, substantially as described.

3. In centrifugal ore separators, the combination of a supporting frame work, a rotatable separating surface mounted thereon by elastic connectors and provided with a series of cam surfaces, an independently rotatable disk or ring provided with another series of cam surfaces engaging with the first series, and means for effecting the independent rotation of the two, substantially as described.

4. In centrifugal ore separators, the combination of a supporting frame work, a rotatable separating surface mounted thereon and connected thereto by flexible connectors, means for temporarily retarding the speed of revolution of the separating surface against the tension of the flexible connectors, and means through the flexible connectors for recovering the speed of revolution temporarily lost, and means for rotating the separating surface, substantially as described.

5. In centrifugal ore separators, the combination of a supporting frame work, a rotatable separating surface mounted thereon, and connected thereto by flexible connectors, means for temporarily retarding the speed of revolution of the separating surface against the tension of the flexible connectors, means through the flexible connectors for recovering the speed of revolution temporarily lost, means for imparting vertical shocks or vibrations to the separating surface, and means for rotating the separating surface, substantially as described.

ORRIN B. PECK.

Witnesses:

THOMAS A. BANNING,
SAMUEL E. HIBBEN.