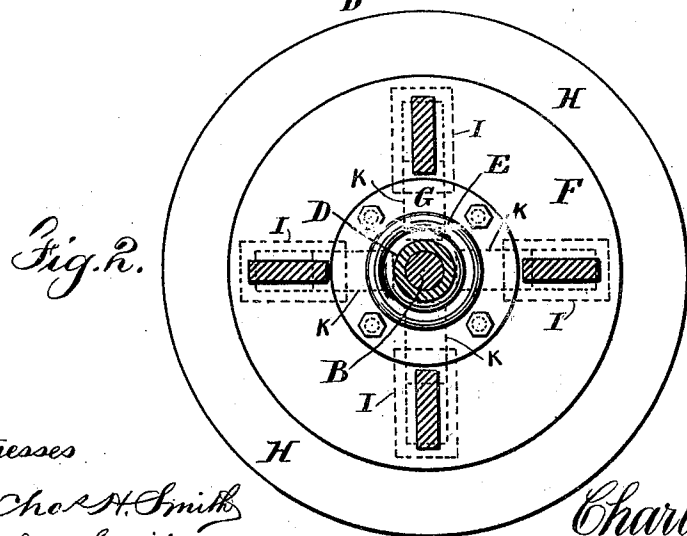
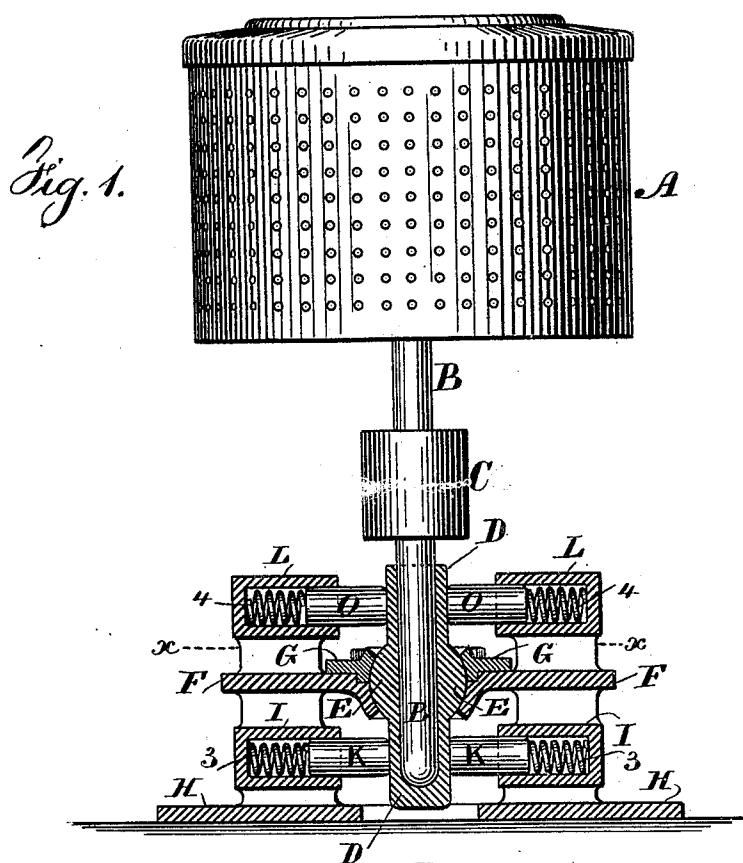


C. L. CAIRNS.
CENTRIFUGAL SEPARATOR.

Patented Aug. 13, 1889.



Witnesses

Chas H. Smith
J. Staib

Inventor

Charles L. Cairns.

For Lemuel W. Perrell atty

UNITED STATES PATENT OFFICE.

CHARLES L. CAIRNS, OF JERSEY CITY, NEW JERSEY.

CENTRIFUGAL SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 408,791, dated August 13, 1889.

Application filed April 15, 1889. Serial No. 307,218. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. CAIRNS, of Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Centrifugal Separators, of which the following is a specification.

Centrifugal separators have heretofore been supported by a central shaft with a basket at the upper end thereof, and in some instances the lower end of the shaft has been received into a socket mounted in yielding lever-bearings, so that the separator was free to yield to inequalities of the weight contained in the basket as such separator was rotated or spun around rapidly.

My present invention is made with reference to simplifying the construction of the yielding supports for the socket at the lower end of the vertical shaft to render such yielding supports more durable and less cumbersome than those heretofore employed.

In the drawings, Figure 1 is a vertical section of the apparatus; and Fig. 2 is a plan view, partially in section, below the line *x x*, Fig. 1.

The basket A is of any desired size or shape, and the vertical shaft B is securely fastened to the center of the bottom of the basket and provided with a pulley C for a belt by which the centrifugal separator is revolved. The lower end of the vertical shaft A is received into a socket D, and it is free to be revolved therein. There is a globular bearing E around the central portion of the socket D, and this bearing E is received into the concave upper surface of the ring F. A concave cap G is placed above the globular bearing E and bolted to the ring F, by means of which the globular bearing is held in place and the socket left free to rock in any direction upon this globular bearing.

The base II is of suitable size and shape—preferably circular, with a central hole—and supports are provided between the base II and the ring F. I prefer to make these supports tubular, as at I, with their outer ends closed, and these tubular supports receive within them the plugs K, that stand radially to the lower portion of the socket D. Spiral springs 3 are provided between the inner ends of the plugs and within the ends of the tubular

sockets I, said springs being under a slight compression in their normal condition.

Rising above the ring F are brackets L, the upper portions of which are tubular and closed at their outer ends. These tubular brackets receive the plugs O, that slide freely therein, and are provided with springs 4 at their inner ends for forcing the plugs against the exterior of the socket D near the upper end thereof, said plugs O occupying radial positions, or nearly so, to the socket D.

It is now to be understood that the plugs K and O, surrounding the upper and lower portions of the socket D, hold the said socket in a vertical position, and that the basket A and vertical shaft B can be revolved at any desired speed by the pulley C and a belt; but if the contents of the basket are unequal, so that the centrifugal apparatus is thrown out of balance, the plugs K and O will yield, and the socket D will oscillate more or less upon the globular bearing E, thus allowing the shaft to revolve or spin freely without injury to the apparatus.

It is not necessary that the springs 3 and 4 be very heavy or strong, as but little power is required to maintain the separator in a vertical position while being revolved, and I remark that in some sizes of centrifugal separators it is not necessary to use both ranges of plugs K and O, as either the top range O or the bottom range K of the plugs and their accompanying springs will serve to maintain the socket D in the proper position.

It is to be understood that the basket A is perforated, as usual, to enable the liquid materials to pass away from the basket under the centrifugal action.

I claim as my invention—

1. The combination, with the basket A and vertical shaft B, of the tubular socket D, having a globular bearing around the exterior surface thereof, the ring F and cap G for receiving such globular bearing, and a range of tubular supports, springs, and plugs occupying radial positions to the socket for sustaining the same, substantially as set forth.

2. The combination, with the basket, the vertical shaft, and the pulley, of the tubular socket D, having a globular bearing, the ring F and cap G, the base II, the tubular sup-

ports I between the base II and ring F, the plugs K, and springs 3 within the tubular supports and bearing against the lower part of the tubular socket, substantially as set forth.

5 3. The combination, with the vertical shaft and the basket, of the tubular socket D, having a globular bearing, the ring F and cap G for supporting said bearing, the base-plate II, with which the ring F is connected, and two
10 ranges of plugs and springs placed radially

to the socket and acting against the same, said plugs being received into tubes upon the ring and base respectively, substantially as set forth.

Signed by me this 12th day of April, 1889.

CHARLES L. CAIRNS.

Witnesses:

GEO. F. PINCKNEY,
WILLIAM G. MOTT.