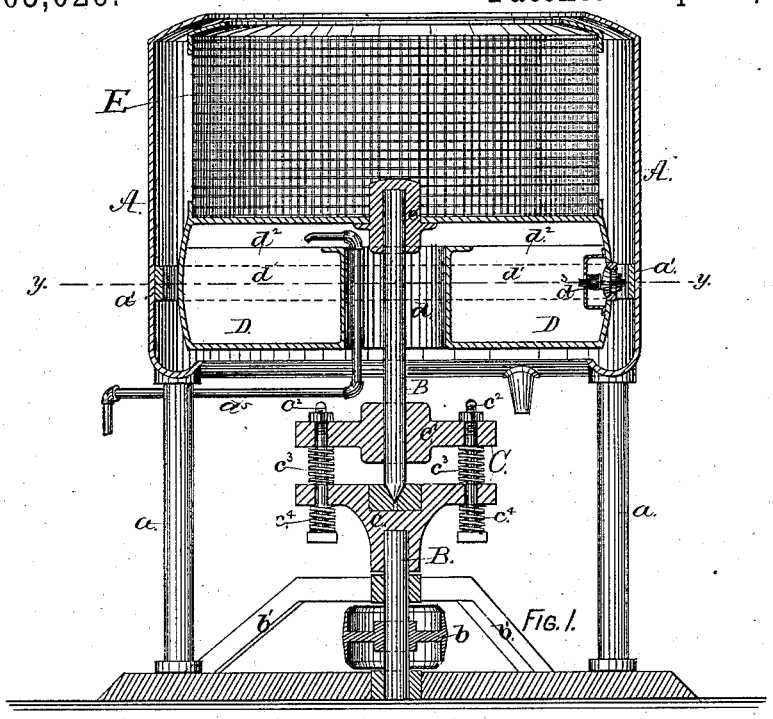
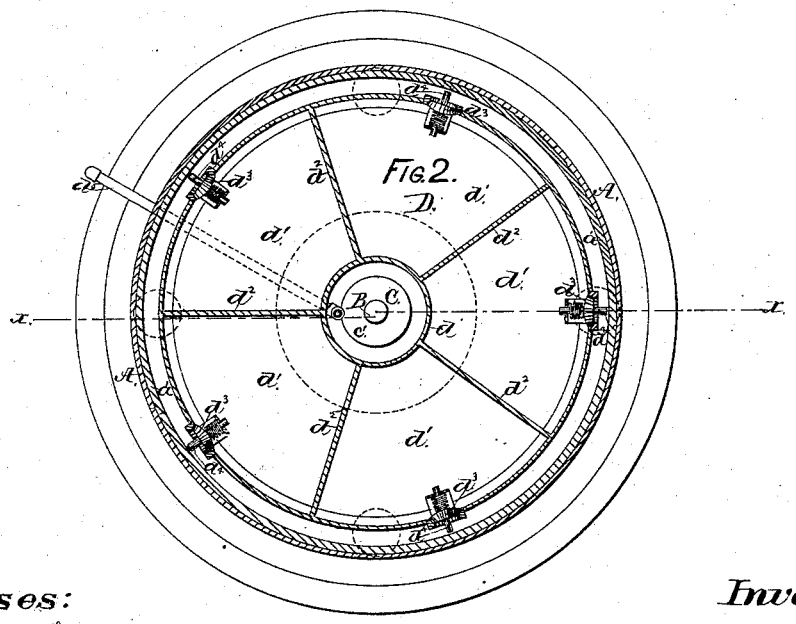
(No Model.)

G. E. STILLMAN.

CENTRIFUGAL MACHINE.

No. 305,026. Patented Sept. 9, 1884.





Witnesses:

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UNITED STATES PATENT OFFICE.

G. EDWARD STILLMAN, OF TROY, NEW YORK, ASSIGNOR OF ONE-HALF TO EZRA STILLMAN, OF SAME PLACE.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 305,026, dated September 9, 1884.

Application filed November 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, G. EDWARD STILLMAN, of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Centrifugal Machines, of which the following is a specification.

My invention relates to improvements in centrifugal machines or hydro-extractors; and the object of my improvements is to provide means for automatically balancing such machines, in order to overcome the wabbling motion produced by an unequal distribution of the weight of the load placed in the machine. I attain this object by means of the mechanism illustrated in the accompanying drawings, which form part of this specification, and in which—

Figure 1 is a vertical section at the line *x x*, and Fig. 2 a horizontal section at the line *y y*.

As represented in the drawings, A is the casing of the machine; B, driving-shaft; C, yielding coupling in driving-shaft; D, automatic balancing device, and E the basket.

The casing A is made cylindrical in form, and is supported by the columns *a*. A band or hoop, *a'*, is secured to the inner side of said casing, for a purpose hereinafter explained.

The driving-shaft B is divided into two sections—an upper and lower one—that are connected together by means of a yielding coupling, C, which consists of a lower flanged piece, *c*, which contains a conical depression or chamber in its upper face. The said lower flange-piece is secured to the lower section of the driving-shaft, and a disk or flange, *c'*, secured to the upper section of said shaft. The parts *c* and *c'* are connected together by means of driving-pins c^2, around which the springs c^3 are fixed to form an elastic cushion between the flanges *c* and *c'*, and springs c^4 are interposed between the lower heads of said driving-pins and the under side of the disk *c*, so as to preserve a pressure at all times to keep the flanges *c* and *c'* in their required positions. The lower end of the upper section of the shaft B is made pointed, so that it may tilt, as occasion requires, in the conical seat in the flange *c*. The lower section of the shaft B is provided with a pulley, *b*, and is arranged to rotate in the bracket *b'*.

The automatic balancing device D consists of a circular casing provided with an open central cylinder or sleeve, *d*, which is attached to the bottom of the casing D, but does not reach to the top of said casing. By this means an opening is made through the bottom of the casing D, so as to obtain free access into the interior thereof. The annular space between the circular casing and the sleeve *d* is divided into several compartments, *d'*, by means of the radial partitions d^2. Each of said compartments has a separate opening made through the outer side of the casing D, and into each of said openings a spring-actuated valve, d^3, is fitted. Said valves are provided with stems d^4, which project beyond the diameter of the casing D, but which, when the revolving part of the machine is in its true central position, do not come in contact with the hoop *a'* of the external casing, A. The compartments of the casing D are supplied with water or other liquid by means of a supply-pipe, d^5, which passes up through the sleeve *d*, and is arranged to deliver the water into the compartments *d'*.

The basket E is made in the usual form, and is fixed to the uppermost side of the casing D, as shown in Fig. 1, the top plate of said casing serving as a bottom for the basket.

The balancing device and basket are secured to the upper end of the upper section of the shaft B by means of the hub *e*.

The operation of my automatic balancing device is as follows: The load being placed in the basket E, and the compartments *d'* being filled with water or other liquid, the necessary rotatory motion is imparted to the shaft B to produce the required action of the machine. The yielding coupling C permits the basket E and its attached balancing device D to incline in the direction due to any unequal distribution of the load in the basket. By this inclination the stems d^4 of the valves on the overweighted sides of the device are brought into contact with the hoop *a'*, whereby the valves d^3 on the overweighted sides are forced inwardly, thereby permitting the liquid to es-

cape from those compartments that are situated beneath the excessive part of the load until a perfect equilibrium of weight is established, after which the machine will run without any wabbling motion.

I claim as my invention—

1. The method herein described for balancing a centrifugal machine by means of water or other liquids contained in separate compartments, provided with means, substantially as described, for automatically effecting the discharge of liquids therefrom until an equilibrium is established, as herein specified.

2. The combination, in a centrifugal machine, of the driving-shaft B, provided with a yielding coupling, C, substantially as herein described, and an automatic device consisting of the casing D, having compartments d', for containing water or other liquids, each of said compartments being provided with a valve, d^3, all being constructed and arranged to operate substantially as specified.

3. In a centrifugal machine, the driving-shaft B, made in two sections, and connected together by means of a yielding coupling, C, composed of the disks c and c', driving-pins c^2, and springs c^3 and c^4, all constructed substantially as herein specified.

G. EDWARD STILLMAN.

Witnesses:
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