(No Model.)

D. M. WESTON.

CENTRIFUGAL MACHINE.

No. 302,611. Patented July 29, 1884.

Fig. 3.

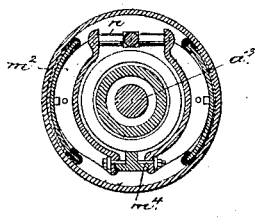


Fig. 4.

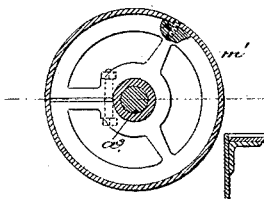


Fig. 5.

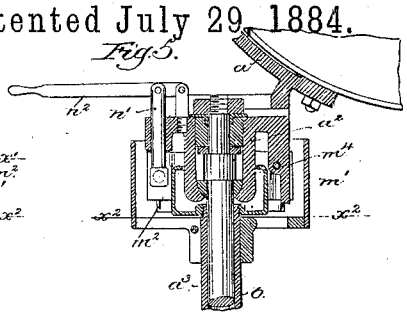


Fig. 1.

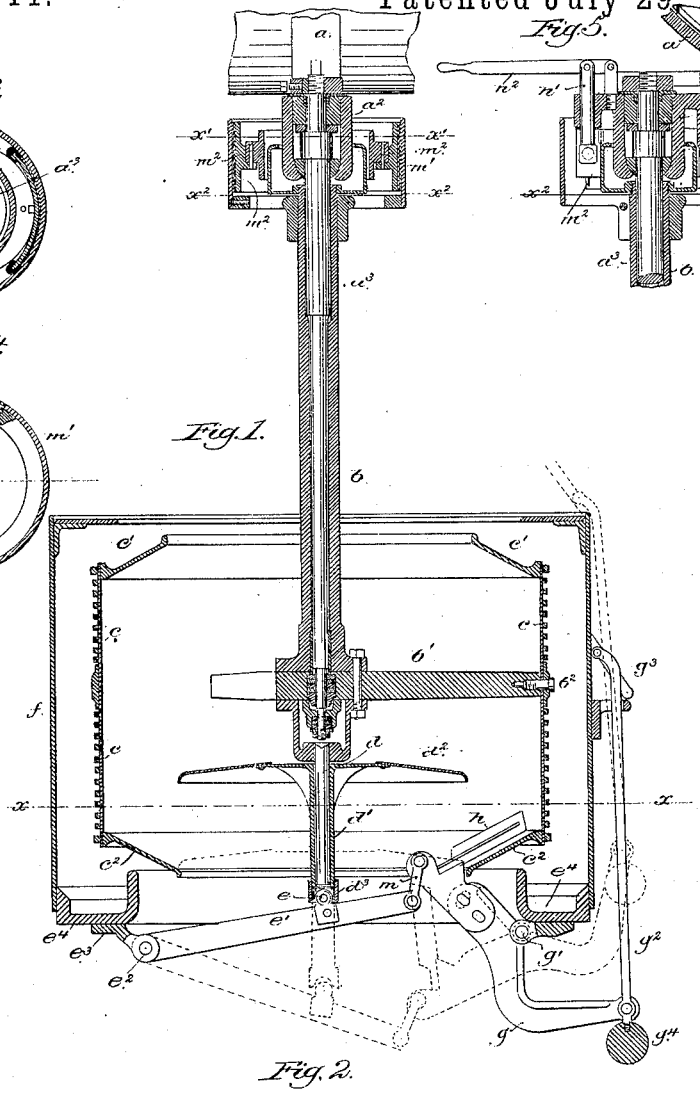
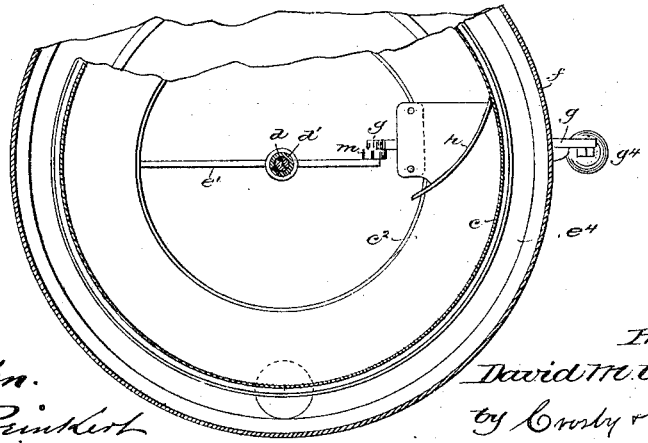


Fig. 2.



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UNITED STATES PATENT OFFICE.

DAVID M. WESTON, OF BOSTON, MASSACHUSETTS.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 302,611, dated July 29, 1884.

Application filed October 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, DAVID M. WESTON, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Centrifugal Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to simplify and increase the efficiency and ease of operation of centrifugal machines, especially those used in the manufacture of sugar, my present invention being an improvement upon that class of machines represented in United States Letters Patent No. 275,874, granted to me April 17, 1883, to which reference may be had.

One part of my invention herein contained includes the combination, with a rotating open-ended cylinder, of a valve for closing the lower end thereof, the said valve being raised or opened by actuating devices located below the said cylinder, as will be described.

Another part of my invention consists of a rotating cylinder open and unobstructed at its lower end, and a valve to close the lower end of the said cylinder, combined with a plow and with means to simultaneously actuate the said plow and valve, as will be described.

Other features of my invention will be described and set forth in the claims at the end of this specification.

Figure 1 is a vertical section of a centrifugal machine embodying my invention, with the valve raised and the plow in position to attack the sugar or other wall forced against the interior of the cylinder or basket, the dotted lines showing the valve and plow in the positions which they will occupy when the cylinder is to be filled and started for the separation of its contents varying in specific gravity. Fig. 2 is a section of Fig. 1 on the dotted line $x\ x$, a part of the bottom of the cylinder being broken out above the bottom of the cage, and a part of the latter being broken out to save space upon the drawings. Fig. 3 is a section of Fig. 1 on the dotted line $x'\ x'$. Fig. 4 is a section on the dotted line $x^2\ x^2$, and Fig. 5 is a partial vertical section of the bearing and brake mechanism at the upper end of the machine, but at right angles to the line of section, Fig. 1.

The suspending plate a—a strong, stiff, metal plate bolted upon a fixed part of the building—has as part of it the socket a^2, in which are held the usual movable or yielding bearings which permit the shaft a^3, suspended thereon, to move freely and enable the loaded cylinder to seek its true center of rotation. The shaft a^3, at its lower end, has nuts and washers, substantially such as in my Patent No. 275,874, by which to support the hollow spindle b, which, at its lower end, is provided with the usual spider, b', upon the ends of which are bolted at b^2 the cylinder c, having at its ends inclined annular flanges $c'\ c^2$, or rims, which leave both ends of the said cylinder open or unobstructed, as described in my Patent No. 275,875, the said cylinder being supported by the spider near the center of the length of the cylinder. The lower end of the hollow spindle is provided with a valve-guide, shown as a rod, d, that receives the sleeve d' of the valve d^2, which, when the cylinder is at rest and being filled, and while the contents of the cylinder are being massed or thrown against its inner wall, remains down, as in dotted line. The lower end of the sleeve d' has a concaved foot, d^3, which, when the valve d' closes the cylinder, rests just above but not in contact with the hemispherical step e, bolted upon the lever or step support e', pivoted at e^2 upon an ear, e^3, of the bottom curb, e^4, of the rigid cage f, into which the liquid contents of the perforated cylinder are thrown as the cylinder is rotated.

In my Patent No. 275,875 the stem or sleeve of the valve is directed upward toward the tip of the cylinder, and to operate the valve by hand the attendant has to reach over the top of the cylinder, which is not so easy, quick, convenient, or safe as to operate the valve by means of devices especially adapted for such purpose and located outside of and below the said cylinder, and in the said patent it will be noticed that mechanism for moving the said valve is altogether wanting, and that the same is intended to be and is operated chiefly by the weight of the mass discharged into the cylinder.

The plow-carrier g, pivoted at g', is provided at its inner end with a plow, h. The outer end of the plow has a link, g^2, connected with it, and at its upper end this link has a pivoted dog, g^3, which engages the flange at

the top of the cage, as in dotted line, Fig. 1, to thus hold up the outer end of the plow, as in dotted lines. The weight g^4 is sufficiently heavy to counterbalance the weight of the plow, lever e', and valve. When the sugar wall has been formed, the dog g^3 will be loosened, and the rod g^2 will be pushed down, which will cause the plow-carrier g to be turned from its dotted into its full-line position, causing the plow to pass up into the cylinder over the rim of the lower flange, c^2, and cut into the sugar wall near its base, which will cause the sugar above the point so attacked to fall and be discharged through the open or unobstructed lower end of the cylinder. As the plow-carrier is raised, the link m lifts the lever e', brings the step e into the concavity of the foot d^3, and the step, acting on the said valve, lifts the same sufficiently in advance of the plow to uncover the lower end of the cylinder for the entrance of the plow, as described, the valve sliding on the guide d'.

The hollow spindle is provided at its upper end with a belt-pulley, m', inside of which is arranged a brake, m^2, composed of two jaws pivoted at m^4, and acted upon at their free ends by toggles $n\ n$ or stiff links, which are engaged by a rod, n', adapted to be lifted by a lever, n^2. By arranging the brake inside the pulley rather than outside of it, as heretofore, I am enabled to make one pulley answer for both the belt-pulley and the brake-pulley, the belt and brake acting against the said pulley in the same horizontal line and in substantially the line of the movable support for the shaft a^3, the point of contact of both the belt and the brake with the pulley being such as to obviate the deflection of the spindle from perpendicular position.

I claim—

1. The rotating suspended cylinder supported by spider b' at a point between its ends, and having annular flange-like ends unobstructed within the edges of the said flanges, combined with a valve to close the lower end of the cylinder, and with a guide located below the said spider, and upon which to slide the said valve vertically, to operate substantially as described.

2. The suspended shaft having yielding bearings, the hollow spindle, the spider b', the rotating cylinder supported by said spider between its ends, and open or unobstructed at each end in the line of the axis of rotation of the cylinder, and the guide d, located below the spider, to which the cylinder is attached, combined with the vertically-movable valve, and with means located below the cylinder to raise and lower the same, to operate substantially as described.

3. The suspended shaft, its spider, the rotating open-ended cylinder attached to the said spider, and the valve to close its open lower end, combined with a plow which is adapted to be turned up from below through and into the open lower end of the said cylinder, to attack the sugar wall after the said valve has been moved to open the lower end of the cylinder, substantially as described.

4. The open-ended suspended rotating cylinder, its hollow spindle, the valve to close the open lower end of the said cylinder, and a plow, combined with the plow-carrier, and with connecting mechanism, substantially as described, actuated by the plow-carrier to lift the said valve, as set forth.

5. The suspended rotating cylinder open at both ends, and the outer cage, f, combined with the plow, and the counterbalanced plow-carrier pivoted on the said cage, and adapted to be moved in the arc of a vertical circle into and from the said cylinder over its rim, substantially as described.

6. The suspended rotating cylinder, its spindle, and the belt-pulley attached thereto, combined with the expansible brake applied to the interior of the said pulley, the belt and brake being and acting, substantially as described, upon the same pulley, substantially in the line of the movable supports for the said spindle, as and for the purposes set forth.

7. The spindle and its attached belt-pulley, combined with the brake applied within it, and composed of two jaws pivoted at one end and actuated at their other ends by movable toggles, substantially as shown and described.

8. The rotating suspended cylinder, open or unobstructed at its lower end, and the guide for the valve, combined with the valve to slide on the said guide, and with a lever located below the lower end of the cylinder and attached to the said valve to lift the same on its guide, substantially as described.

9. In a centrifugal machine having a suspended rotating cylinder, a valve to co-operate with the central opening in the lower flange of the said cylinder, combined with means located below and outside the said cylinder to operate the said valve, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID M. WESTON.

Witnesses:
G. W. GREGORY,
S. B. KIDDER.