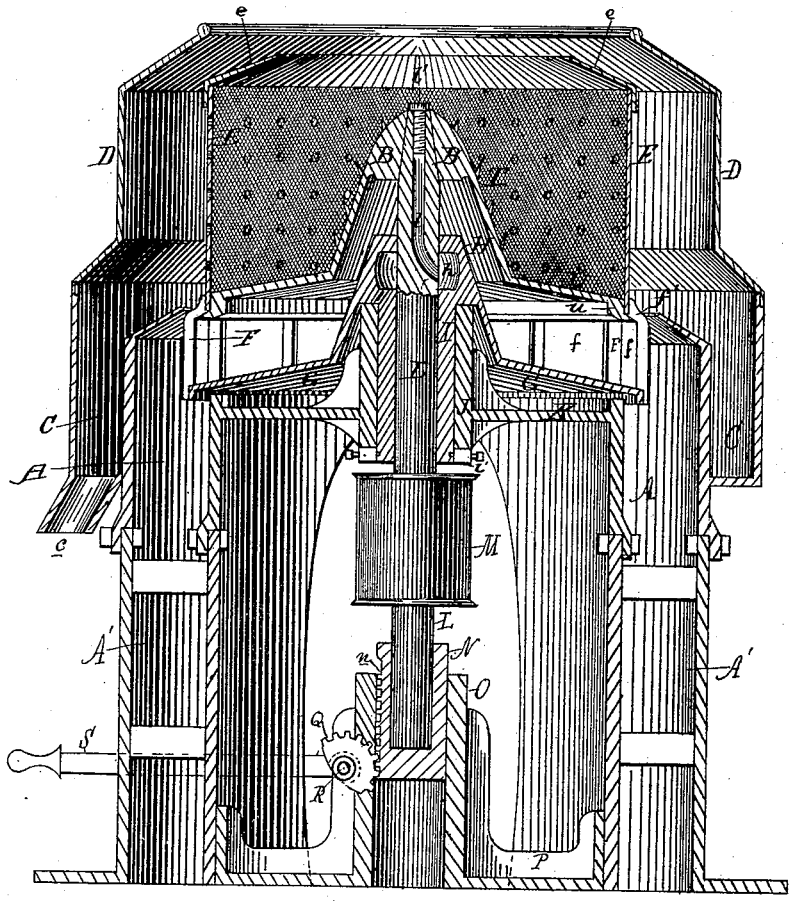
(No Model.)

J. W. PALMER.

CENTRIFUGAL MACHINE.

No. 306,769. Patented Oct. 21, 1884.



WITNESSES:

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JOHN W. PALMER, OF QUINCY, ILL., ASSIGNOR TO R. B. PALMER & SONS, OF SAME PLACE.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,769, dated October 21, 1884.

Application filed June 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. PALMER, a citizen of the United States of America, residing at Quincy, in the county of Adams and State of Illinois, have invented certain new and useful Improvements in Centrifugal Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an improvement in centrifugal machines of that class shown in the Patent No. 277,155, issued to R. B. Palmer May 8, 1883; and it relates to the peculiar combinations and the construction and arrangement of parts hereinafter more particularly described, and then pointed out in the claims.

The accompanying drawing shows a vertical central section of a machine constructed according to my improvement, in which A represents a hollow cast-shell forming a part of the frame, which is provided with supports or legs A′, also hollow, which legs may be cast in one piece with the shell A, or made separately therefrom, as shown in the drawing, and bolted or otherwise secured thereto. Around this shell a gutter, C, is formed, of gradually-increasing depth, which is provided with a spout, *c*, at its lowest point. Mounted and secured by bolts and nuts upon this gutter is a casing, D, within which is the basket E, having the inwardly-projecting flange *e*, and supported upon standards F, connected to the basket-carrier G, and arranged in such manner as to leave a series of openings, *f f f*, between the standards F, the bottom edge of the basket, and the basket-carrier. The basket-carrier G is of the shape shown in the drawing, and is provided with a cone, H, in which is cast or otherwise formed an oil-reservoir, *h*, and a sleeve, I, depends from said cone and works in a bearing, J, connected with the shell A by the plate K, which may, however, if preferred, be a series of arms. Below the bearing J is a collar, *i*, bolted to the sleeve I to keep the basket from rising. Passing through sleeve I is a shaft, L, carrying a band-pulley, M, and supported and revolving in a step, N, which is supported and held in a hub, O, of a spider, P, connected with the legs A′. The step N is provided with a rack, *n*, in which mesh the teeth of a segment, Q, turning on a shaft, R, on which is keyed the lever S, which shaft is supported in suitable bearings in the spider P, and the whole is so arranged that by raising or depressing the lever S the segment will move the step up or down, as the case may be, and thus raise or lower the shaft.

Attached to the upper end of the shaft L is a dome, T, similar to the dome in the patent above referred to, and having a distributing-plate, U, which also forms the bottom of the basket, whose outer edge terminates in a flange, *u*, that projects under shoulders *f′*, that are formed on the upper parts of the standards F, which flange *u* thus forms a friction-driver.

In the upper part of the shaft L is an oil-channel, *l*, whose lower end terminates at the oil-reservoir *h*, and whose upper end is preferably provided with a screw, *l′*, to stop up said channel when the machine is in use. On removing the screw the reservoir *h* can be supplied with oil.

When in operation, a very rapid motion is given to the distributing friction-plate U and dome T by means of a belt passing around the pulley M. The dome and friction-plate are raised by means of the lever S, segment Q, rack *n*, step N, and shaft L until the flange *u* presses tightly against the shoulders *f′* or against the lower part of the basket E, thus making friction at this point, which causes the basket to revolve at the same speed as the shaft.

The molasses or other material to be dried is fed into the center of the machine upon the dome T, and by the centrifugal force generated by the rapid rotation of the dome it is thrown off again against the basket with great force, the granules of sugar adhering thereto, and the liquid portion, passing through it, comes in contact with it and runs down the inside of the casing D into the gutter C, where it escapes through the spout *c* into any suitable receiving-vessel. When the sugar or other material has revolved with the basket until it has become dry, the lever S is reversed, lowering the bottom or plate U, and leaving the apertures *f f f* above said plate. The motion of the air caused by the revolving dome and friction-plate is now diverted from going through the small apertures in the inside of the basket, covered by the mass of sugar or solids adhering to or resting against it, and finds exit through the large apertures *f f f* be-

neath. The basket now stops, being relieved of its propelling-motor, (or it may be stopped more rapidly by means of a brake, not shown,) and the sugar or other material that has accumulated at the sides of the basket, having nothing to support it—the centrifugal force being diverted, and the material being also acted upon by the diverted current of air—falls down upon the continually-revolving plate U, where it is expelled by the centrifugal power there in action, through the apertures *f f f*, into the hollow shell at A, where it falls through the hollow supports or legs A′ into any receiving-receptacle placed below. When the sugar is discharged, the plate is again raised by the lever S and its connections, the charge again run in, and the operation repeated.

From this description it will be seen that by my improvement a very convenient and effectual machine is made that will not only rapidly drive out the liquids from the solids, but will quickly and easily discharge the solids.

The friction driving device will be found to be very advantageous, and it has at least four distinct functions, viz: First, it drives the basket; second, it serves as a distributing-plate when the machine is in operation; third, it acts as a valve to close the discharge-apertures, and, fourth, it discharges the solids through said apertures when open.

It is evident that my machine may be varied essentially in construction and arrangement without departing from the spirit of my invention—for instance, in some cases I may make my machines without the hollow supports or legs A′; or, instead of making the plate G and standards F separate, the plate G may be made with a vertical flange to support the basket, and be provided with openings, through which the discharge may be made; or the basket E and standards F may be made in one piece. These and many other variations may be made at the option of the constructer without essentially changing my invention.

What I claim as new is—

1. The combination, in a centrifugal machine, of the basket thereof, and a vertically-moving dome constructed to revolve independently of the basket, substantially as described.

2. The combination, in a centrifugal machine, of the basket thereof, and a vertically-moving distributing-plate constructed to revolve independently of the basket, substantially as described.

3. The combination, in a centrifugal machine, of the basket thereof, and a dome and distributing-plate constructed and arranged to be moved vertically and revolved independently of the basket, substantially as described.

4. The combination, in a centrifugal machine, of the basket thereof, and a dome and distributing-plate constructed and arranged to be moved vertically and simultaneously and to revolve independently of the basket, substantially as described.

5. The combination, in a centrifugal machine, of the basket thereof, and a bottom constructed to close a set of apertures in the basket, or to open the same to discharge the solids, and adapted to revolve independently of the basket, substantially as described.

6. The combination, in a centrifugal machine, of the basket thereof, and a bottom constructed to be lowered to disclose a series of openings at the bottom of the basket, and rise to shut off communication therewith, and adapted to revolve independently of the basket, substantially as described.

7. The combination, in a centrifugal machine, of the basket thereof, and a plate revolving in said basket and driving the latter by friction, substantially as described.

8. The combination, in a centrifugal machine, of the basket thereof, a vertical shaft constructed to move independently of the basket, and a friction-driver giving motion to the basket, substantially as described.

9. The combination, in a centrifugal machine, of the basket thereof, a vertical shaft constructed to move independently of the basket, and a friction-driver attached to said vertical shaft and giving motion to the basket, substantially as described.

10. The combination, in a centrifugal machine, of the basket thereof, a vertical shaft constructed to move independently of the basket, and a friction-driver attached to said vertical shaft and revolving inside of and giving motion to said basket, substantially as described.

11. The combination, in a centrifugal machine, of the basket thereof, and a driver constructed and arranged to both give motion to the basket and close the discharging-apertures, substantially as described.

12. The combination, in a centrifugal machine, of the basket thereof, and a driver constructed to close the discharge-openings and start the basket in operation by the same movement, substantially as described.

13. The combination, in a centrifugal machine, of the basket thereof, and a plate acting both as a distributer and as a friction-driver for the basket, substantially as described.

14. The combination, in a centrifugal machine, of the basket thereof, and a plate acting in the threefold capacity of a distributer, a friction-driver, and as a valve to close the discharge-passages, substantially as described.

15. The combination, in a centrifugal machine, of the basket thereof, and a plate constructed and arranged to drive the basket, to distribute the combined liquid and solid materials and drive the liquid through apertures in the basket, to act as a valve, and to drive the solid material through the apertures at the bottom of the basket, substantially as described.

16. The combination, in a centrifugal machine, of the basket thereof, a friction-driver connected with the shaft supporting the dome,

and a lifter for raising or lowering said shaft, substantially as described.

17. The combination, in a centrifugal machine, of the basket thereof and a distributing-plate, U, having a friction driving-flange, *u*, attached thereto, substantially as described.

18. The combination, in a centrifugal machine, of the basket thereof, a friction-driver, and the shaft L, connected with said driver, and constructed and arranged to be raised and lowered, substantially as described.

19. The combination, in a centrifugal machine, of the basket thereof, a vertical shaft, a friction-driver connected to said shaft, and the step N, supporting the same, constructed to be raised and lowered, substantially as described.

20. The combination, in a centrifugal machine, of the basket thereof, a vertical shaft, a friction-driver attached thereto, the step N, supporting said vertical shaft and provided with a rack, and the segment Q, for raising or lowering the step, substantially as described.

21. The combination, in a centrifugal machine, of the basket thereof, a valve, *u*, and the shaft L, connected with said valve, and a lifter for raising and lowering said shaft, substantially as described.

22. The combination, in a centrifugal machine, of the basket thereof, a vertical shaft, a valve connected to said shaft, the step N, supporting the same, and a lifter for raising and lowering the said step, substantially as described.

23. The combination, in a centrifugal machine, of the basket thereof, a vertical shaft, a valve attached thereto, the step N, supporting said vertical shaft and provided with a rack, and the segment Q, for raising or lowering the step, substantially as described.

24. The combination, in a centrifugal machine, of the basket thereof, a valve for closing the discharge-openings thereof, and a shaft constructed and arranged to operate the valve independently of the basket or turn both together, at the will of the operator, substantially as described.

25. The combination, in a centrifugal machine, of the basket thereof, a valve for closing the discharge-openings thereof, a shaft connected with said valve, and mechanism, substantially as described, constructed to operate said valve independently of the basket or turn both together, substantially as described.

26. The combination, in a centrifugal machine, of the basket thereof, a valve for closing the discharge-openings thereof, a friction-driver connected with said valve, a shaft also connected with the valve, and means, substantially as described, for giving an endwise motion to said shaft, whereby the valve may be opened and the basket stopped, or the valve closed and motion imparted to the basket, substantially as described.

27. The combination, in a centrifugal machine, of the basket thereof, a valve for closing the discharge-openings thereof, a friction-driver connected with said valve, a shaft also connected with the valve, and a movable step for giving an endwise motion to the shaft, substantially as described.

28. The combination, in a centrifugal machine, of the basket thereof, a valve for closing the discharge-openings thereof, a friction-driver connected with said valve, a shaft also connected with said valve, a step having a rack, and a segment meshing into and operating said rack, substantially as described.

29. The combination, in a centrifugal machine, of the basket thereof, provided with a series of openings, and a distributer constructed and arranged to discharge the material through said openings when the basket is at rest, substantially as described.

30. The combination, in a centrifugal machine, of the basket thereof, provided with a set of discharge-openings in its lower part, and a distributing-plate constructed and arranged to throw the material being acted on against the upper part of the basket when the latter is in motion, and through the discharge-openings thereof when the basket is at rest, substantially as described.

31. The combination, in a centrifugal machine, of the basket thereof, provided with a set of discharge-openings in its lower part, a distributing-plate provided with means for giving motion to the basket, and a shaft connected with said distributing-plate, constructed and arranged to cause the distributing-plate to throw the material being acted on against the upper part of the basket when the latter is in motion, and through the discharge-openings thereof when the basket is at rest, substantially as described.

32. The combination, in a centrifugal machine, of the basket thereof, a distributing-plate, U, having a friction-flange, *u*, and the shaft L, connected with said plate, constructed and arranged to be raised and lowered substantially as described.

33. The combination, in a centrifugal machine, of the basket thereof and a friction-driver acting directly on the basket, substantially as described.

34. The combination, in a centrifugal machine, of the basket thereof and a friction-driver revolving inside of the basket and acting directly thereon, substantially as described.

35. The combination, in a centrifugal machine, of the basket thereof, an independently-revolving bottom to discharge the same, and a frame provided with a hollow shell to receive the discharge from the basket, substantially as described.

36. The combination, in a centrifugal machine, of the bearing J, the basket E, connected with the sleeve I, supported in said bearing, and the shaft L, constructed to move independent of said sleeve when the basket is at rest, and provided with a driver to give motion to the basket when desired, substantially as described.

37. The combination, in a centrifugal machine, of the bearing J, the sleeve I, supported in said bearing, the basket-carrier G, the standards F, and the basket E, with the shaft L, revolving in said sleeve and giving motion to the plate U, substantially as described.

38. The combination, in a centrifugal machine, of the basket thereof, a distributing-plate having a friction-flange, *u*, for driving the basket, the shaft L, the basket-carrier G, standards connecting the basket with said carrier G, and means, as I J″, for supporting said basket independent of the shaft, substantially as described.

39. The combination, in a centrifugal machine, of the basket thereof, a distributing-plate having a friction-flange for driving the basket, the sleeve I, the basket-carrier G, standards connecting said basket and carrier, and the shaft L, revolving loosely in said sleeve, substantially as described.

40. The combination, in a centrifugal machine, of the bearing J, the sleeve I, supported in said bearing, the basket-carrier G, the standards F, and the basket E, with the shaft L, carrying the plate U, and revolving independently of the basket, and giving motion to said plate U when the basket is at rest, substantially as described.

41. The combination, in a centrifugal machine, of the bearing J, the sleeve I, supported in said bearing, the cone H, having oil-reservoir *h*, the basket-carrier G, connected with said cone, the standards F, and basket E, with the shaft L, having oil-channel *l* and supporting and giving motion to the friction-driver *u*, substantially as described.

42. The combination, in a centrifugal machine, of the hollow shell A, the plate K, bearing J, sleeve I, and cone H, supporting the basket E, with the shaft L, dome T, distributer U, and friction-flange *u*, substantially as described.

43. The combination, in a centrifugal machine, of the hollow shell A, having a gutter, C, and casing D, the plate K, bearing J, sleeve I, and cone H, supporting the basket E, with the shaft L, pulley M, dome T, distributer U, flange *u*, step N, having rack *n*, and the segment Q, all constructed and arranged substantially as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 17th day of June, 1884.

JOHN W. PALMER.

Witnesses:
C. G. VOLK, Jr.,
G. F. JONES.