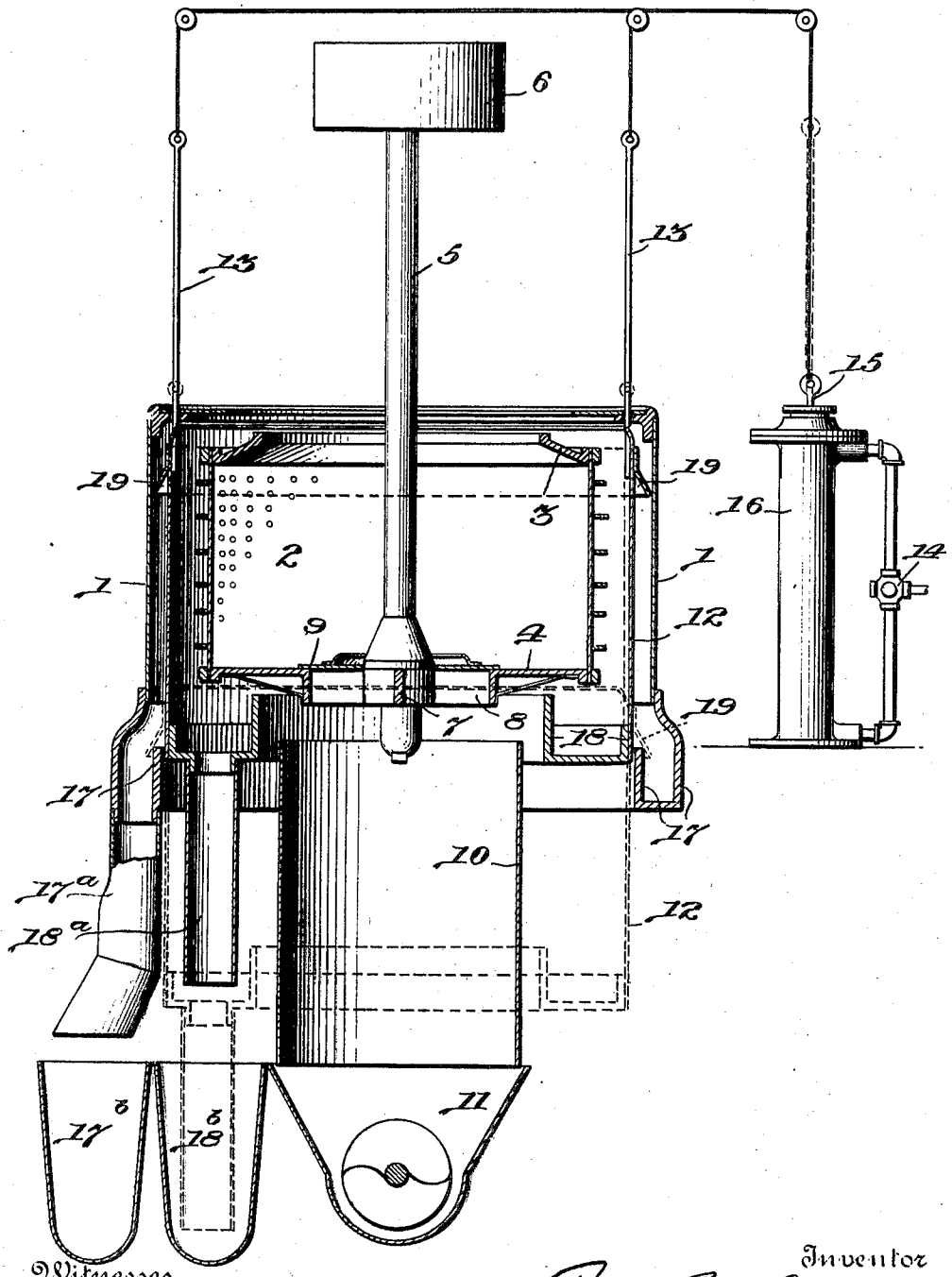
P. M. GROVER.

CENTRIFUGAL MACHINE.

APPLICATION FILED APR. 5, 1915.

1,189,812. Patented July 4, 1916.



Witnesses

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CENTRIFUGAL MACHINE.

1,189,812. Specification of Letters Patent. Patented July 4, 1916.

Application filed April 5, 1915. Serial No. 19,251.

To all whom it may concern:

Be it known that I, PERRY M. GROVER, a citizen of the United States, residing at Ernfold, in the county of Saskatchewan, Canada, have invented new and useful Improvements in Centrifugal Machines, of which the following is a specification.

This invention relates to centrifugal machines and particularly to those machines used in the manufacture of sugar, in which it is necessary and desirable to separate the different grades of liquid or runnings thrown off from the centrifugal during the separation of the liquid from the solid matter within the centrifugal drum.

One feature of the invention consists of providing a machine having two separate curbs or casings surrounding the centrifugal drum, the outer curb being stationary and the inner one movable. The inner curb is arranged for movement so that it may be raised to hang between the centrifugal drum and the outer curb or may be lowered to leave the space between these two members unobstructed.

Another object of the invention is to provide a centrifugal machine which may be easily cleaned and operated. It has been found that the simplicity of the machine described and the small number of working parts provide such a structure and one which will not become fouled by the heavy syrups and matter thrown off by the centrifugal drum.

Further objects of the invention include the specific arrangement and forms of the catch troughs for the syrup and limit stops for the movement of the inner curb.

The invention consists of the novel construction, arrangement and operation of the parts and will be more fully described and set forth in the following specification and claims and illustrated in the accompanying drawing in which,—

1 represents the outer casing or curb of a centrifugal machine.

2 is a perforate screen of a centrifugal drum, 3 is its upper flange and 4 is the base of the drum. Power may be obtained from any suitable source. The drum 2 is shown mounted to turn with the shaft 5 and pulley wheel 6, a spider 7 on the shaft connecting the base 4 with the shaft. The base of the drum around the shaft 5 is provided with a valve opening 8 concentric with the shaft for the discharge of the crystallized sugar or other solid matter remaining in the drum. A cover 9 is adapted to slide on the shaft 5 and close the valve opening 8. Immediately below the valve opening 8 is a chute 10 through which sugar dumped from the drum passes on its way to a trough 11 below. A scroll or screw conveyer in this trough is arranged to withdraw the mass and carry it away for further treatment.

A second or auxiliary curb or casing 12 is suspended between the drum 2 and outer casing 1. This curb is designed to be of imperforate metal, preferably cylindrical in form and is hung by rods 13 or other means. Suitable power and control means are provided for raising or lowering the auxiliary casing by these rods. An efficient form is shown in the drawing in which a four-way cock 14 controls the movement of the piston rod 15 in the fluid motor 16. It will be obvious that when the piston is forced down the connecting ropes will pull the rods 13 upward and raise the auxiliary casing 12 vertically until it comes between the drum 2 and outer casing 1. A reverse movement of the motor will allow the auxiliary casing to lower into the inoperative position below the plane of the centrifugal drum.

In addition to the feature of having an extra casing adapted to be interposed between the drum and outer casing it will be observed that each casing is provided with a separate and independent gutter mounted on and carried by the respective casings. The outer casing 1 has connected at its lowermost edge a gutter 17. This is arranged to catch any material dropping from the inner wall of the casing. At the lower edge of the auxiliary casing 12 is firmly mounted a gutter 18 which gutter is arranged to catch any material dropping from the inner face of the auxiliary casing. Each of these gutters 17 and 18 have their respective discharge spouts 17^a and 18^a leading to their respective troughs or tanks 17^b and 18^b. Near the top of the auxiliary casing 12 and extending around the outer surface is a flange 19 which projects downwardly and outwardly from the casing 12. This flange serves as spacing means when the casing is in its uppermost position, keeping the auxiliary casing concentric with the outer casing and the drum. When the casing 12 is lowered this flange 19 extends over the edge of the gutter 17 and limits downward movement of the casing as well as preventing any

waste of material outwardly between the side of the gutter 17 and the outside wall of the casing 12.

In the operation of the machine, when the drum 2 is filled with massecuite or other matter and is set in motion the inner auxiliary casing is to be at its highest position completely surrounding the sides of the centrifugal drum. The first running or green syrup thrown from the drum is caught by the auxiliary casing 12 and runs down the smooth inner walls thereof to the gutter 18 and escapes through the spout 18^a into the trough 18^b or other receptacle provided for the green syrup. When the drum has ceased discharging and it is desired to wash the sugar therein the auxiliary casing is lowered and water may be applied to the sugar in the drum. As this wash water and second batch of syrup leaves the drum it is thrown against the walls of the outer casing 1, the liquid escaping through the gutter 17, discharge spouts 17^a to the troughs or other containers 17^b, set aside for material of this class. In this manner the high purity and low purity syrups are kept separate.

It will be obvious from the foregoing that this invention provides means for facilitating the operations of centrifugal machines. Heretofore it has been necessary in the manufacture of sugar to stop the centrifugal machine or change the position of the receiving tanks when it was desired to separate the different runnings taken from the machine. By the present method made possible by this invention a more economical handling of both machines and juices is provided, the boiling will not be so expensive and a discarded syrup will be provided having a much lower purity than was formerly possible. In addition to the sharp line which the machine makes possible between the high and low grade syrups a most important feature is the absolute simplicity of the construction. The syrup comes into contact with no working parts and flows over the smooth surfaces, insuring perfect cleanliness and freedom from the trouble common to most machines caused by the heavy syrup gumming the operating parts.

Changes in form, material, size and proportion of parts may be made without departing from the scope of the invention.

I claim:

1. A centrifugal machine comprising the combination of a main outer casing, a centrifugal drum therein, an auxiliary casing adjustably mounted between said drum and said outer casing, means for moving said auxiliary casing bodily into and out of operative relation with respect to said drum, and means on said auxiliary casing constituting a combined limit stop for said casing and cleaning means for the inner wall of said outer casing.

2. A centrifugal machine comprising the combination of a main outer casing, a centrifugal drum therein, an auxiliary casing adjustably mounted between said drum and said outer casing, a gutter on said outer casing, means for moving said auxiliary casing bodily into and out of operative relation with respect to said drum, and means on said auxiliary casing constituting combined spacing means for said auxiliary casing relative to said outer casing and limit stop for said auxiliary casing, said limit stop catching on said gutter to limit the movement of the auxiliary casing when the latter is in one extreme position.

3. A centrifugal machine comprising the combination of a main outer casing, a centrifugal drum therein, an auxiliary casing adjustably mounted between said drum and said outer casing, means for moving said auxiliary casing bodily into and out of operative relation with respect to said drum, and means on said auxiliary casing extending from the latter to said outer casing and constituting combined spacing means for said auxiliary casing relative to said outer casing and cleaning means for the inner wall of said outer casing.

4. A centrifugal machine comprising the combination of a main outer casing, a centrifugal drum therein, an auxiliary casing adjustably mounted between said drum and said outer casing, means for moving said auxiliary casing bodily into and out of operative relation with respect to said drum, and an annular flange on said auxiliary casing extending from the latter to said outer casing and constituting combined spacing means for said auxiliary casing relative to said outer casing and cleaning means for the inner wall of said outer casing.

5. A centrifugal machine comprising the combination of a main outer casing, a centrifugal drum therein, a gutter mounted on said outer casing, a rigid auxiliary casing adjustably mounted between said drum and said outer casing and adjacent said gutter, an oblique downwardly projecting flange on said auxiliary casing overhanging one edge of said gutter, and means to lower and raise said auxiliary casing bodily out of and into the operative position relative to said drum.

6. A centrifugal machine comprising the combination of a main outer casing, a centrifugal drum therein, a gutter mounted on said outer casing, a rigid auxiliary casing adjustably mounted between said drum and said outer casing and adjacent said gutter, a gutter mounted on and carried by said auxiliary casing, an oblique downwardly projecting flange on said auxiliary casing overhanging one edge of the gutter on said outer casing, said auxiliary casing and gutter mounted thereon being smaller than said outer casing and gutter and free to move

vertically within and closely adjacent to the latter.

7. A centrifugal machine comprising the combination of a rotary drum, a main outer casing, a movable auxiliary casing between said drum and said outer casing, means for moving said auxiliary casing vertically into and out of operative relation with respect to said drum, and a flange on said auxiliary casing extending around the same and projecting into close proximity to the inner surface of said outer casing, said flange positioned to travel from the upper to the lower portion of said outer casing and vice versa during the movement of said auxiliary casing.

8. A centrifugal machine comprising the combination of a rotary drum, a main outer casing, a gutter connected with said outer casing provided with an inwardly extending rim, a movable auxiliary casing between said drum and said outer casing, means for moving said auxiliary casing vertically into and out of operative relation with respect to said drum, and a flange on said auxiliary casing extending around the same and projecting into close proximity to the inner surface of said outer casing, said flange positioned to travel from the upper to the lower portion of said outer casing during the downward movement of said auxiliary casing and to rest upon said rim when said auxiliary casing is in its lowered position.

In testimony whereof I affix my signature in presence of two witnesses.

PERRY M. GROVER.

Witnesses:
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