No. 801,055. PATENTED OCT. 3, 1905.

C. ALDEREGUIA.

CENTRIFUGAL MACHINE.

APPLICATION FILED NOV. 16, 1904.

2 SHEETS—SHEET 1.

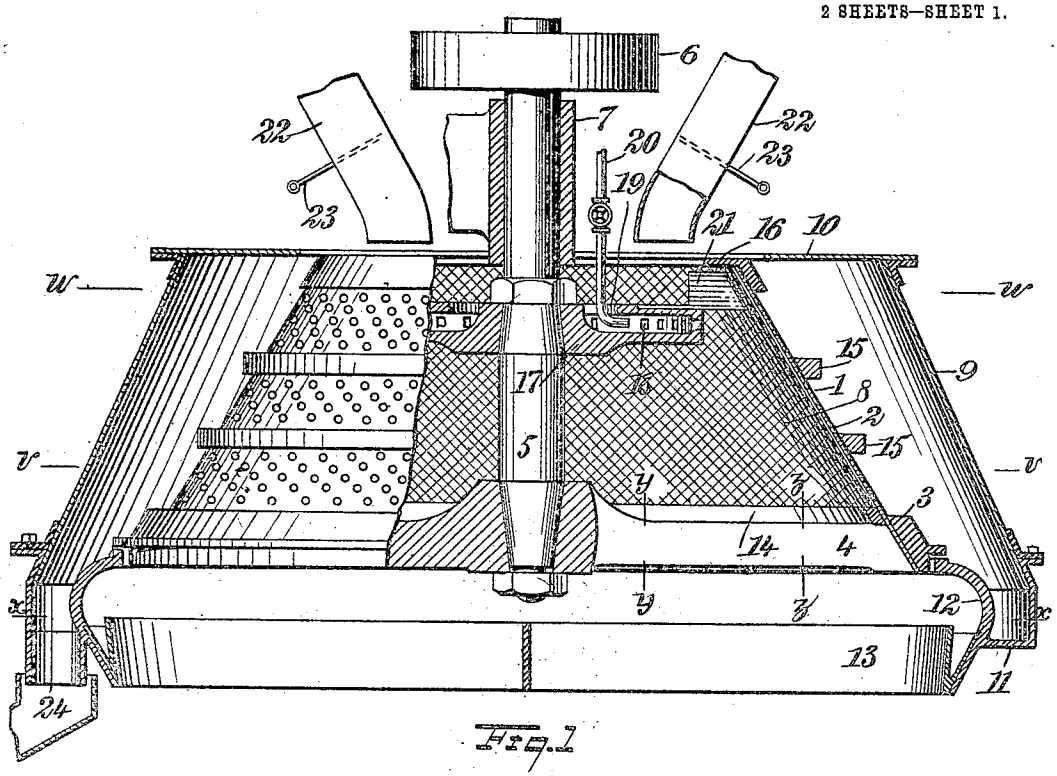


FIG. 1

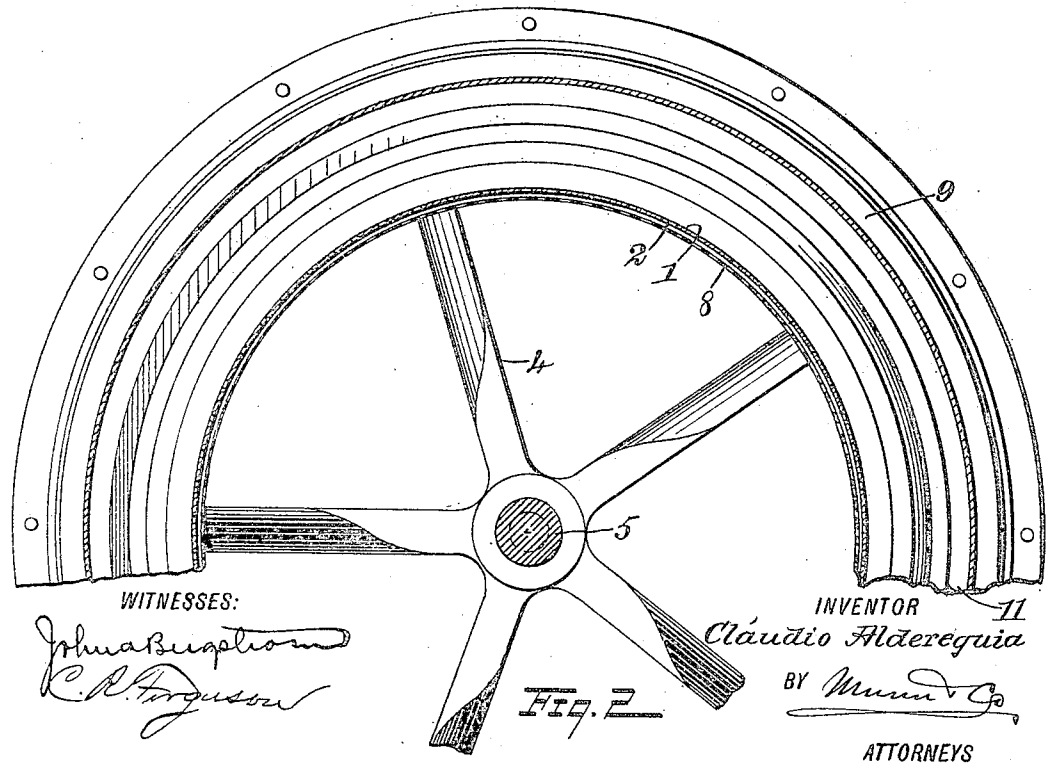


FIG. 2

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2 SHEETS—SHEET 2

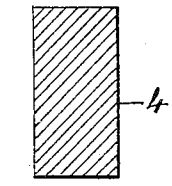


Fig. 5

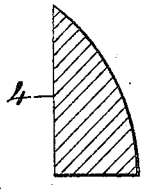


Fig. 6

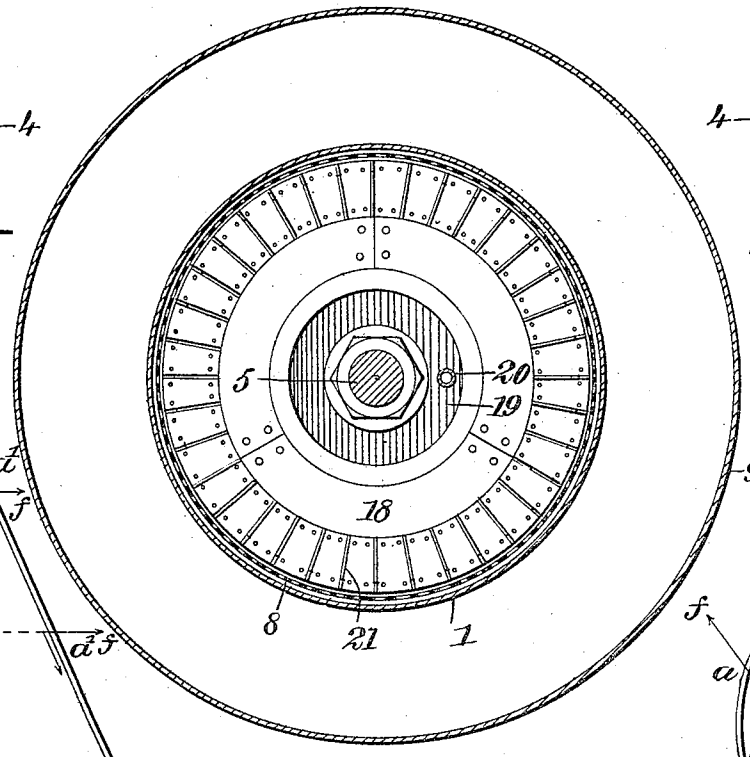


Fig. 3

Fig. 7

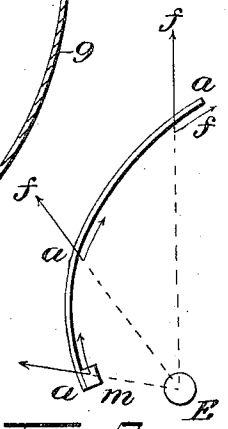


Fig. 8

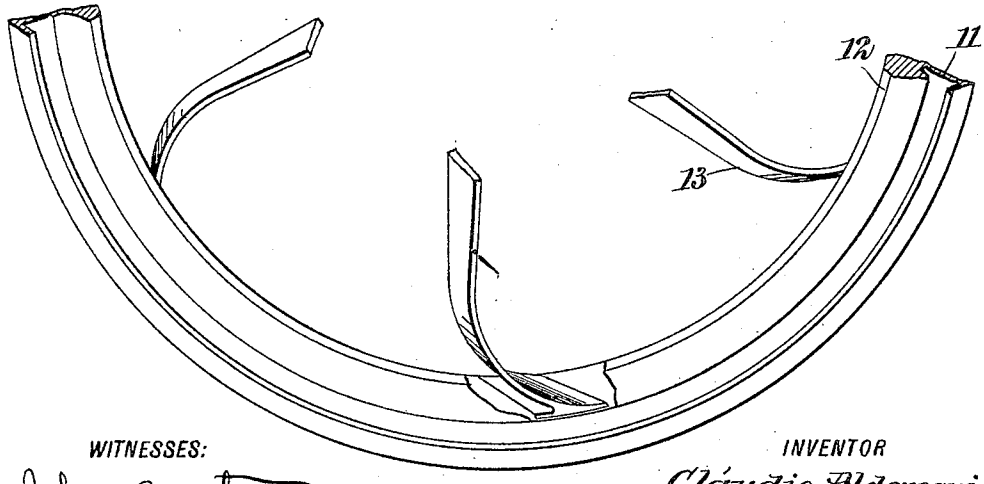


Fig. 4

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CLÁUDIO ALDEREGUIA, OF HAVANA, CUBA.

CENTRIFUGAL MACHINE.

No 801,055. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed November 16, 1904. Serial No. 232,969.

To all whom it may concern.

Be it known that I, CLÁUDIO ALDEREGUIA, a subject of the King of Spain, and a resident of Havana, Cuba, have invented a new and Improved Centrifugal Machine, of which the following is a full, clear, and exact description.

The invention relates particularly to improvements in centrifugals for separating molasses from raw sugar, the object being to provide a machine of this character, of simple and inexpensive construction, by means of which the separation may be complete and the work rapidly carried on.

I will describe a centrifugal separator embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of the specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a centrifugal separator embodying my invention. Fig. 2 is a section on the line *v v* of Fig. 1. Fig. 3 is a section on the line *w w* of Fig. 1. Fig. 4 is a section on the line *x x* of Fig. 1. Figs. 5 and 6 are sections, respectively, on the lines *y y* and *z z* of Fig. 1; and Figs. 7 and 8 are sections of oblique surfaces of centrifugal force.

My invention consists in utilizing centrifugal force on surfaces oblique to said force in order to provide a continuous separation of sugar and molasses, provided that the sugar and molasses do not gravitate on the said surfaces.

If we have an oblique surface to the centrifugal force *f* produced, this force by the rotation of the oblique surfaces around the shaft E, (the surfaces may be horizontal *a* or inclined *a'*,) and we throw on the inner side *m* or on the upside *m'*, respectively, raw sugar, if the component of the centrifugal force, horizontal or downward, according to the direction of the surface, is greater than the friction, sugar moves itself according to said surface, compressing itself against the same. If this surface is perforated in such a way as to allow to pass through the molasses, but not sugar, molasses shall go out, the sugar remaining, at the same time that it runs over the length of the surface. This dry sugar can be taken separately from the molasses in suitable receptacles, and if raw sugar is thrown continually on the indicated points *m m'* the separation of sugar from molasses and the gathering of both sugar and molasses shall be continual also. To put in practice my system, it is necessary then, first, to have a rotary surface or perforated metal shell with an inclination with respect to the centrifugal force developed by rotation of the shell around a vertical shaft equal or greater than the angle of friction corresponding, this angle of friction, to the friction between the metal shell and the sugar—that is to say, such an angle that the component horizontal or downward action of the centrifugal force according to the surface or shell shall be equal or greater than the friction; second, to place the raw sugar inner or up the origin of the surface; third, that the perforation of the surface shall allow molasses to pass through, but not sugar; fourth, suitable receptacles to gather separately dry sugar and molasses.

The machine comprises a metal shell 1, made in the form of a truncated cone, open at the top and bottom and provided with perforations 2. The lower edge of the shell is secured between a ring 3, which is tapered to correspond to the taper of the shell, and the ends of arms 4, extended from a shaft 5, provided with a band-wheel 6, and this shaft has bearings in a support 7. The arms 4, as clearly indicated in Fig. 2, for a portion of their length are tapered especially in cross-section from a sharp upper edge to a broad base, as indicated in Fig. 6. By this construction the passing of sugar downward through the open end of the device is not retarded.

Arranged at the inner side of the shell and spaced slightly therefrom is a metal netting 8 of finer mesh than the openings through the shell. This netting is designed to prevent the passing therethrough of the sugar, but allows the molasses to pass through and out through the perforations.

Surrounding the shell and spaced therefrom and corresponding substantially to the shape thereof is a casing 9, at the upper end of which is an inwardly-extended flange 10, and the lower end is detachably connected to an annular trough 11 for receiving the molasses. The inner wall 12 of this trough is vertically curved and is extended outward beyond the lower edge of shell 1, and against this curved surface the sugar is thrown by centrifugal force and then passes downward to a suitable receptacle. Extended inward from the wall 12 are curved blades 13.

Attached to the outer ends of the arms 4 and engaging against the inner surface of the shell 1 is a ring 14, which serves to direct mo-

lasses that may pass to the bottom of the shell outward through the lower row of perforations. The shell is strengthened or braced by rings 15, and a collar provided with an inwardly-extended flange 16 is attached to the top.

Secured to the shaft 5, near the open upper end of the shell, is a distributer 17 of box-like form, having a series of perforations 18 in its peripheral wall, and in its top wall it has an annular opening 19, through which a pipe 20 passes, this pipe being designed to discharge hot or cold water or steam into the box-like distributer for bleaching the sugar. Secured to the upper side of the distributer and extended upward and outward from the edge thereof are blades 21, which serve to carry the sugar around as the device rotates and discharge the same against the screen material 8. The sugar is discharged onto the upper side of the distributer through spouts 22, and the discharge may be regulated by valves 23.

In the operation the raw sugar is discharged from the spouts onto the distributer while the machine is in rapid rotation, and the sugar will be thrown outward by the centrifugal force against the screen and flow down the incline of the same, while the heavier molasses will pass through the screen and through the perforations and flow into the trough 11 and out through the outlet 24. The sugar discharged by the distributer will be met by the bleaching agent thrown out through the perforations 18.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A centrifugal separator comprising a casing having an annular trough at the lower portion, a vertical shaft, a perforated shell carried by said shaft, a distributer mounted on the shaft within the shell and having a peripheral wall provided with perforations, and a series of upwardly-extended blades on said distributer outward of said peripheral wall.

2. A centrifugal separator comprising a casing having an annular trough at the lower portion, the inner wall of said trough being vertically curved, curved blades extended inward from said wall, a vertical shaft, a perforated shell carried by said shaft, said shell being open at the top and bottom, and a distributer carried by the shaft within the shell.

3. A centrifugal separator comprising a casing having an annular trough at the lower portion, a vertical shaft, arms extended from said shaft, the said arms being tapered in cross-section from a sharp edge with the sharp edge upward, a truncated-cone-like perforated shell having its lower portion engaged with the ends of said arms, a ring engaging with the outer portion of the shell at the lower edge, and a distributer carried by the shaft within the shell.

4. A centrifugal separator comprising a casing having an annular trough at the lower portion, a vertical shaft, a perforated shell carried by the shaft, said shell being in the form of a truncated cone open at the top and bottom, and a box-like distributer carried by the shaft within the shell, and having peripheral openings and also an annular opening through its top, and a pipe leading through said top opening for discharging a bleaching agent into the distributer.

5. A centrifugal separator comprising a casing having an annular trough at the lower portion, a vertical shaft, a perforated shell carried by said shaft, a distributer mounted on the shaft within the shell, and a series of upwardly-extended blades on said distributer.

6. A centrifugal separator comprising a casing having an annular trough at the lower portion, a vertical shaft, arms extended from said shaft, the said arms having sharp upper edges and wide bases for a portion of their length, a truncated-cone-like perforated shell having its lower portion engaged with the ends of said arms, a ring engaging with the outer portion of the shell at the lower edge, and a distributer carried by the shaft within the shell.

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

CLÁUDIO ALDEREGUIA.

Witnesses:

JOSEPH A. SPRINGER,

JAMES P. SPRINGER.