G. W. LEDYARD.

AUTOMATIC BALANCER FOR CENTRIFUGAL MACHINES.

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1,183,745. Patented May 16, 1916.

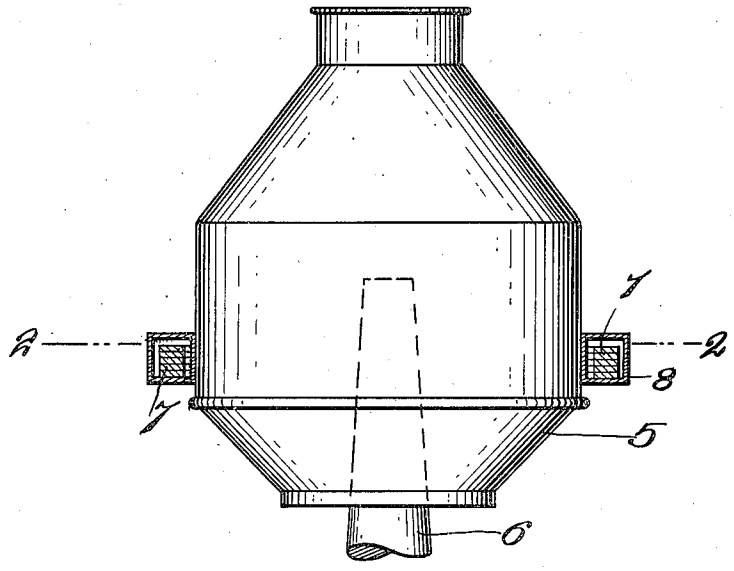


Fig. 1.

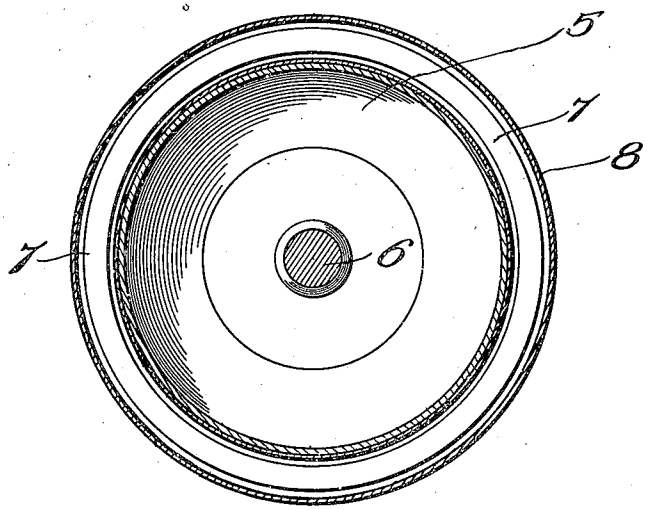


Fig. 2.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

GILBERT W. LEDYARD, OF CHICAGO, ILLINOIS.

AUTOMATIC BALANCER FOR CENTRIFUGAL MACHINES.

1,183,745. Specification of Letters Patent. Patented May 16, 1916.

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To all whom it may concern:

Be it known that I, GILBERT W. LEDYARD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Balancers for Centrifugal Machines, of which the following is a specification.

This invention relates to cream separators or other centrifugal machines having a rotary bowl or receptacle in which the liquid or other material to be treated is placed and subjected to a centrifugal action for separating or dividing the heavier elements from the lighter.

It is the object of the invention to provide a simple and efficient means whereby the unequal loading of the bowl, due to the construction of the bowl itself, or the unequal distribution of the material in the bowl, is automatically balanced.

The invention also has for its object to provide a balancing means which can readily be applied to any ordinary centrifugal machine of the kind stated without modifying or changing the interior structure thereof, the balancing means being located entirely on the outside of the bowl.

These objects are attained by means of a novel combination and arrangement of parts to be hereinafter described and claimed, reference being had to the accompanying drawing, in which—

Figure 1 is an elevation of the bowl showing the application of the invention thereto, the same being shown in section, and Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

Referring specifically to the drawing, 5 denotes the bowl of an ordinary cream separator or other centrifugal machine, the same being mounted for rotation on a vertical spindle 6. The other parts of the machine have not been shown and need not be described, as they form no part of the present invention.

The automatic balancing device for the bowl 5 comprises a series of rings 7 mounted in superposed relation in an annular support 8 extending around or encircling the bowl on the outside thereof. The support may be in the form of a housing secured to the bowl; or the wall of the bowl may be shaped to produce an annular groove or channel to hold the rings, said groove or channel being suitably capped over. The rings may be flat or otherwise shaped in cross-section, and they rest loosely on one another. The support 8 is dimensioned to allow the rings to shift or gravitate transversely of the axis of revolution of the bowl, in view of which, if the bowl is loaded heavier on one side, or otherwise unbalanced, the rings will, under the influence of centrifugal force, move in the opposite direction and thus reëstablish the equilibrium by bringing the geometrical center of the bowl, the center of gravity, and the axis of rotation into coincidence. As the support 8 is shaped to encircle the rings, it also serves to limit the outward travel thereof.

The support 8 may be located at the bottom, the middle or the top of the bowl 5, as will be found most effective, and the number of balancing rings 7 may be varied to produce the desired effect. As the device is located entirely outside the bowl, it can be readily applied thereto without any change in the interior structure of the bowl or its associate parts.

I claim:

1. In a centrifugal machine, the combination with the revoluble bowl thereof; of an annular support fixed to and encircling the bowl on the outside, and revolving with the bowl, said support having a bottom and an encircling wall spaced from the outside of the bowl, and balancing rings mounted on said bottom and encircling the bowl between the outside thereof and the aforesaid encircling wall of the support, the inside diameter of the rings being greater than the diameter of that portion of the bowl which is encircled by the rings, and their outside diameter being less than the diameter of the encircling wall, and said rings being free to shift independently transversely of the axis of revolution of the bowl.

2. In a centrifugal machine, the combination with the revoluble bowl thereof; of an annular support fixed to and encircling the bowl on the outside, and revolving with the bowl, said support having a bottom and an encircling wall spaced from the outside of the bowl, and superposed balancing rings mounted on said bottom and encircling the bowl between the outside thereof and the aforesaid encircling wall of the support, the inside diameter of the rings being greater than the diameter of that portion of the bowl which is encircled by the rings, and their outside diameter being less than the

diameter of the encircling wall, and said rings being free to shift independently transversely of the axis of revolution of the bowl.

3. In a centrifugal machine, the combination with the revoluble bowl thereof; of a series of superposed balancing rings encircling the bowl externally and having an internal diameter greater than the outside diameter of that portion of the bowl which is encircled by the rings, said rings being free to shift independently transversely of the axis of revolution of the bowl, and a channeled annular support for the rings mounted on the outside of the bowl and revoluble therewith, the bottom one of the series of rings seating in the bottom of the channel, and the width of the channel being greater than the width of the rings.

4. In a centrifugal machine, the combination with the revoluble bowl thereof; of gravitating balancing rings encircling the bowl externally, and having an internal diameter greater than the outside diameter of that portion of the bowl which is encircled by the rings, said rings being free to shift independently transversely of the axis of revolution of the bowl, and a support for said rings mounted on the bowl and revoluble therewith.

5. In a centrifugal machine, the combination with the revoluble bowl thereof, said bowl having an external annular channel revolving therewith; of a series of superposed balancing rings seating on the bottom of the channel and free to shift in the channel transversely of the axis of revolution of the bowl, the width of the channel being greater than the width of the rings.

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

GILBERT W. LEDYARD.

Witnesses:
S. J. LEHRER,
H. G. BATCHELOR.