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O. OHLSSON

CENTRIFUGAL FOR SEPARATING SOLIDS FROM LIQUIDS.

(Application filed Sept. 24, 1900.)

(No Model.)

Fig: 1

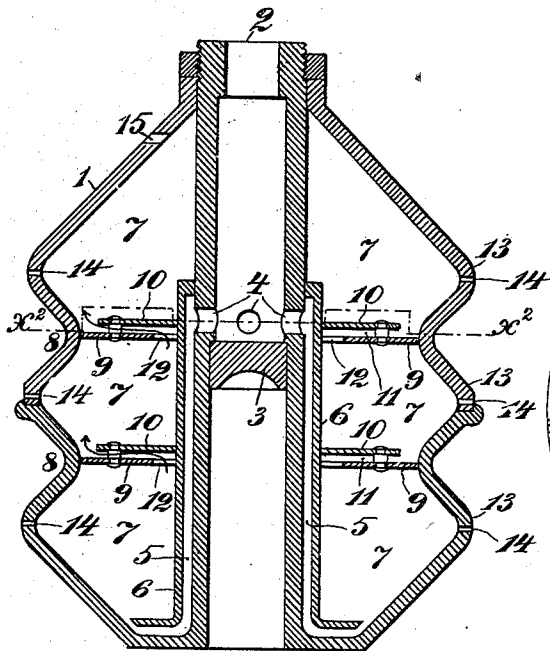


Fig. 2.

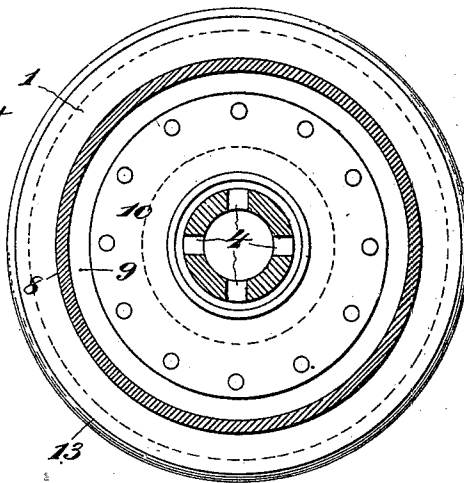
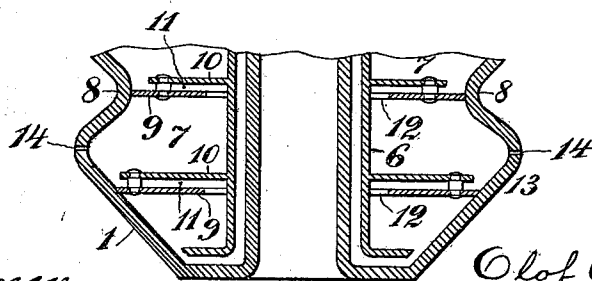


Fig. 3.



WITNESSES:

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CENTRIFUGAL FOR SEPARATING SOLIDS FROM LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 669,732, dated March 12, 1901.

Application filed September 24, 1900. Serial No. 30,943. (No model.)

To all whom it may concern:

Be it known that I, OLOF OHLSSON, a citizen of the United States, residing at Södertelje, in the Kingdom of Sweden, have invented certain new and useful Improvements in Drums for Centrifugal Machines, of which the following is a specification.

In separating by centrifugal action the solid particles from a liquid in which they are suspended the said solid particles may be allowed to pass out through an aperture in the wall of the rotating drum and the liquid be allowed to discharge through an outlet nearer the drum-axis. A difficulty, however, usually arises in this procedure because the solid particles, instead of discharging, collect and form a deposit or solid layer on the inner face of the drum-wall. Attempts have been made to remedy this defect by giving the drum a conical shape—namely, narrow or contracted at the top—and locating the outlet at the wider part of the drum. In this case, however, the efficiency is much impaired from the fact that it is at the widest part only, which is a very limited portion of the entire height, that the centrifugal force is sufficient to effect the proper separation of the solid from the liquid.

The object of the present invention is to provide a centrifugal drum or vessel which shall overcome in a good degree the difficulty above indicated.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a vertical axial section of the drum, and Fig. 2 is a transverse section of the same at line x^2 in Fig. 1. Fig. 3 illustrates a slightly-modified construction.

As indicated clearly in Fig. 1, the drum has a somewhat-corrugated marginal outline at its upright sides, the outlets for the solid particles being situated at the points of greatest diameter, and it has diaphragms at the points of least diameter which compel the liquid mass in flowing upward to pass the first or lowermost plate of the diaphragm near the drum-axis, then flow outward between the plates of the diaphragm and enter the next chamber above near the outer wall of the drum. Thus the upward flow of the liquid is

in a zigzag direction from one chamber to another, by which means a substantially complete separation of the solid particles is effected.

Referring to the drawings, 1 designates the drum as a whole. It may be circular in cross-section at all points in its height. At top and bottom it is tapered or conical, and at the middle part its side wall is corrugated. 2 is the upright axial inlet-tube of the drum, which is closed at the proper point by a bottom or plug 3. Above this plug, in the walls of the tube 2, are apertures 4 for the inflowing liquid. The liquid flows through these apertures into an annular space 5, between the lower part of the axial tube and an outer tube 6, which extends down nearly to the bottom of the drum, and thence down through this passage to the bottom of the drum.

The drum is divided into superposed chambers 7 by diaphragms situated at the points of least diameter 8 and extending from the tube 6 out to the drum-wall. Each diaphragm consists of a lower metal plate 9 and an upper metal plate 10 separated from the lower, so as to leave a space or passage 11 between them. The plate 9 fits closely to the drum-wall; but at its inner edge next to the tube 6 it has apertures 12 for the liquid to pass upward into the space 11. The upper plate 10 fits snugly to the tube 6, but does not extend quite out to the drum-wall, so that the liquid flows outward into the chamber 7 of the drum next above about the outer edge of the plate 10.

In the wall of the drum at the points of greatest diameter 13 are the outlets 14 for the solid particles, and in the narrow upper part of the drum-wall is the outlet 15 for the pure liquid.

The particular number of superposed chambers 7 in the drum is not important to my invention, nor is it important just how the diaphragms which separate the chambers are constructed so long as they perform the functions for which they are intended.

It is preferred to place diaphragms at the points 8 of least diameter; but they may also be placed at other points, as indicated in Fig.

3, where such an extra diaphragm is shown in the lower chamber 7. The outlets may be of any known form. It will be noted that there may be several outlets 14 in each tier 5 or from each chamber 7 in the drum.

Having thus described my invention, I claim—

1. A drum for a centrifugal machine, having a circumferentially-corrugated side wall, 10 with tiers of outlets for the heavier particles at the points of greatest diameter, and having between said points of greatest diameter transverse diaphragms, said diaphragms being provided with passages for the flow of 15 the liquid upward and outward, substantially as set forth.

2. A drum for a centrifugal machine, having a circumferentially-corrugated side wall, with tiers of outlets for the heavier particles 20 at the several points of greatest diameter, and having at the points of least diameter, between said outlets, transverse diaphragms provided with passages for the upward and

outward flow of the liquid, substantially as set forth.

3. A drum for a centrifugal machine, having a circumferentially-corrugated side wall with tiers of outlets for the heavier particles at the points of greatest diameter, and transverse diaphragms between said tiers of outlets and dividing the drum into superposed 30 chambers, each of said diaphragms comprising a lower plate 9, fitting to the side wall of the drum and having apertures 12 at its inner edge, and an upper plate 10, elevated 35 above the plate 9, so as to provide a passage 11 for the outward flow of the liquid, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing 40 witnesses.

OLOF OHLSSON.

Witnesses:

ERNST SVANQVIST,
A. F. LUNDBORG.