

No. 635,780.

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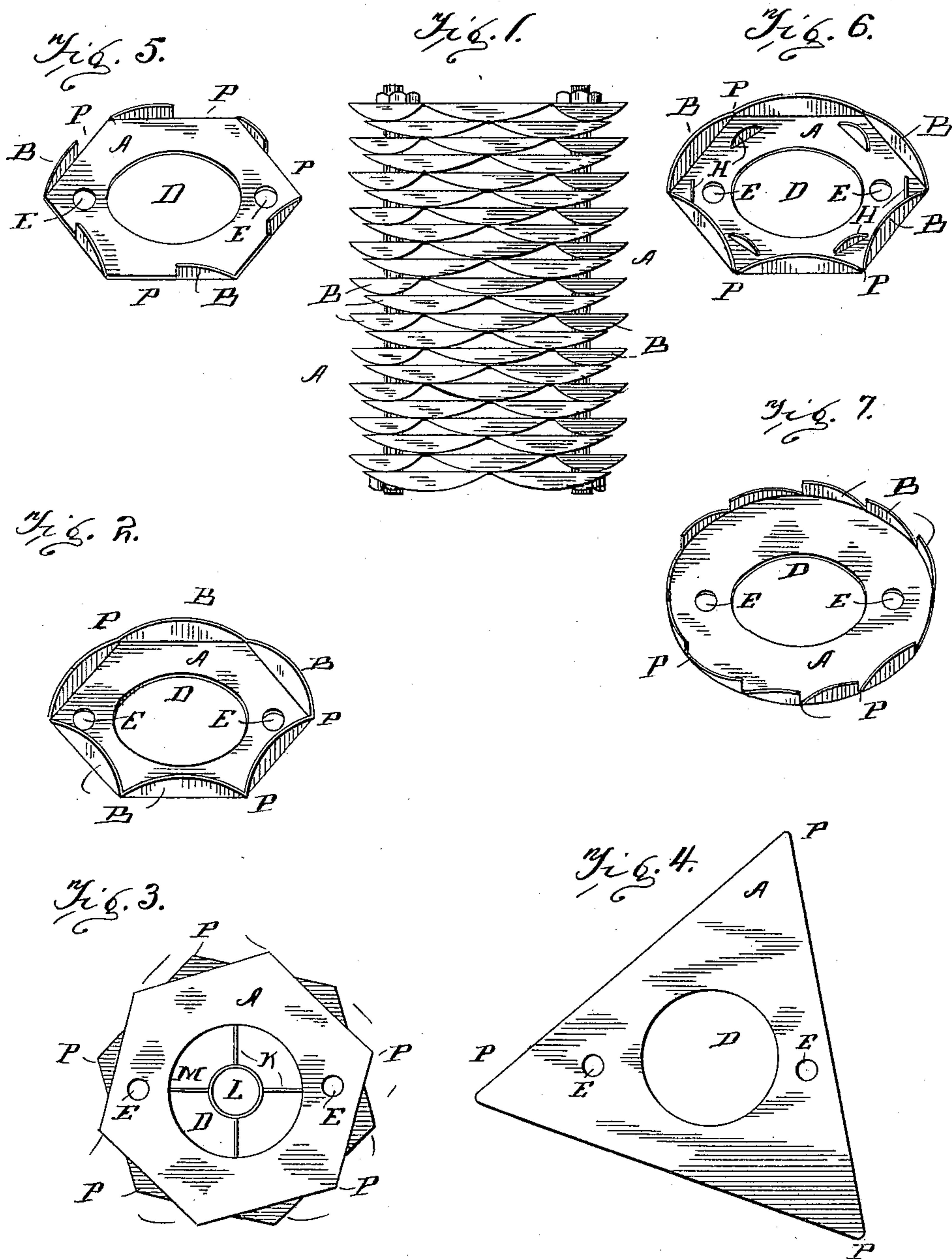
S. E. JARVIS.

LINER FOR CENTRIFUGAL CREAMERS.

(Application filed Sept. 17, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES  
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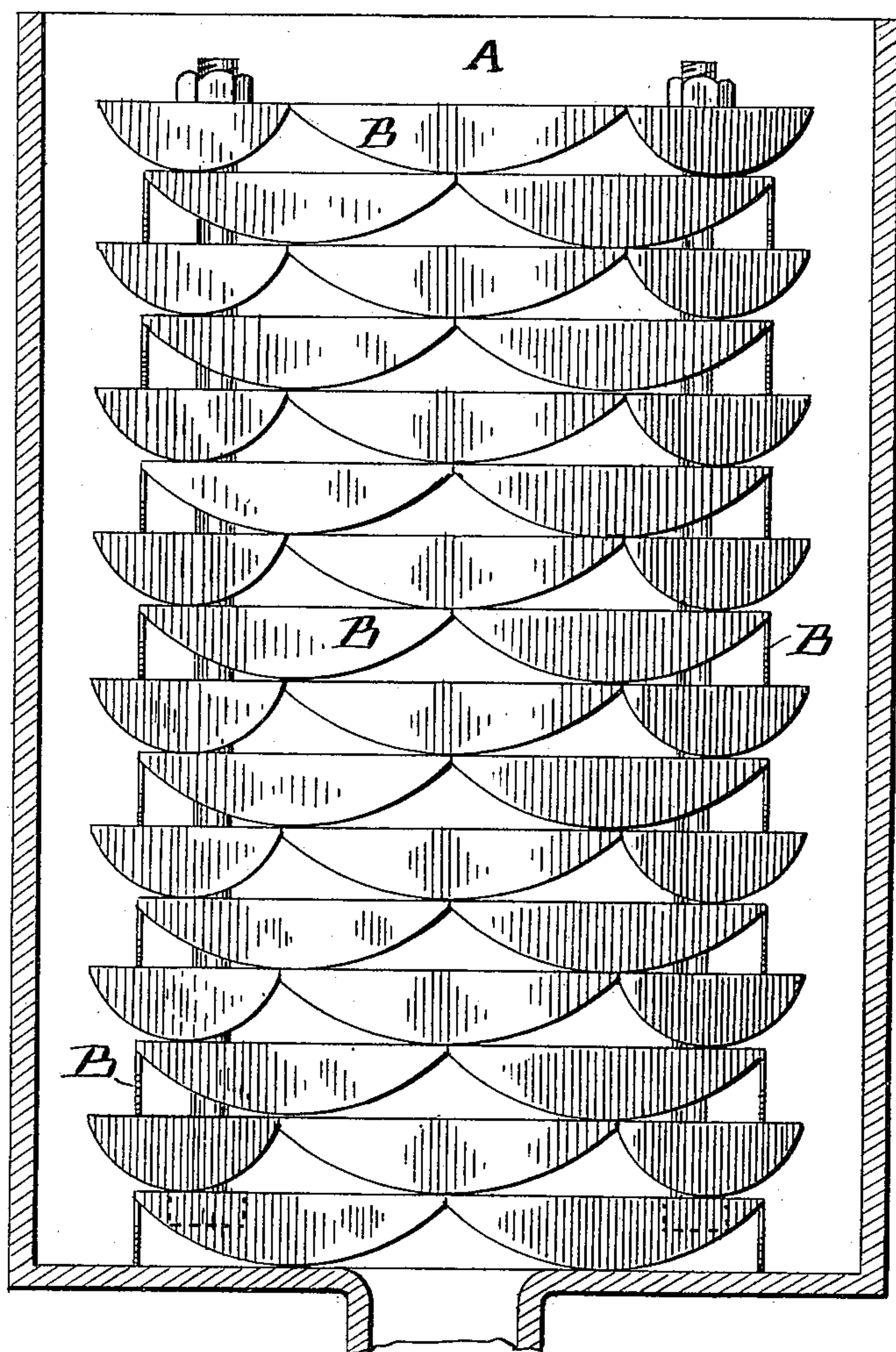
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*Fig. 8.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

SAMUEL ERLER JARVIS, OF LANSING, MICHIGAN.

## LINER FOR CENTRIFUGAL CREAMERS.

SPECIFICATION forming part of Letters Patent No. 635,780, dated October 31, 1899.

Application filed September 17, 1898. Serial No. 691,267. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL ERLER JARVIS, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented a new and useful Improvement in Milk-Steadying Devices for Centrifugal Cream-Separators, of which the following is a specification.

My improvement relates to devices which are placed in the revolving bowls of centrifugal separators for the purpose of holding the milk steady and free from circulatory currents, which tend to mix the cream and milk together, and thus facilitating the rapid and efficient separation of the cream from the milk.

The objects of my invention are to provide a simple cheap device which shall operate rapidly, perfectly, and uniformly, that will not clog by the accumulation of cream, and that will be more easy to clean after use than the ordinary styles of separating devices. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the steadying device complete. Fig. 2 is a perspective view of one of the plates. Fig. 3 is a plan of the steadying device with core. Fig. 4 is a plan of a triangular plate. Figs. 5, 6, and 7 are perspective views of modifications. Fig. 8 is a side elevation of a steadying device shown in a section of a bowl X, said bowl forming no part of the present invention.

Similar letters refer to similar parts throughout the several views.

Referring to the drawings, Fig. 1 shows the complete device, which is composed of numerous horizontal plates A, of thin metal, circular, angular, or polygonal in form. The plates A are bent or turned at the edges, as indicated, preferably at about a right angle, so as to produce teeth, ribs, walls, or flanges B, said teeth, ribs, or walls extending in a direction generally transverse to the radii of the plates. The plates are superposed, so that one plate rests against the teeth or ribs of the next plate, and the ribs or teeth alternate, as indicated in Fig. 1. Between the teeth or ribs A there are spaces or notches P. When arranged as indicated in Fig. 1,

with the plates A horizontal, there are narrow flat spaces or chambers between the bodies of plates A, said spaces or chambers being partly closed at the outer edges by the flanges or walls B. The plates alternate, so that the downturned edges or flanges of one plate lie next to the projecting angle of the next plate above or below.

In some forms of the device the plates may have walls or flanges H extending from their faces in lines tangent to the radii of the plates. Each plate has a large central opening D, and when the plates are assembled the openings are superposed in alinement. Each plate preferably has holes E at opposite sides of the opening D, and bolts C, passing through all the holes, hold all the plates together, so that the teeth or flanges B H extend about in vertical direction when the plates are horizontal, there being narrow spaces between the plates caused by the edges of the teeth B H resting against the face of the next plate.

The device is inclosed in the bowl of a centrifugal machine, the extreme diameter of the steadying device being a little less than the interior diameter of such bowl. The openings D then form the cream-pool at the center of the bowl. The teeth or guide-walls B and H have two main objects—first, to catch the particles of cream in their upward passage and direct them toward the cream-pool in the center; second, to separate between the inflowing cream particles and the outflowing milk particles in a manner to be more fully explained hereinafter. They also incidentally serve to keep the plates at a fixed distance from each other and to compel the milk to move in every part with the same velocity as the bowl, which in connection with the thin layers into which the milk is divided by the numerous plates brings about that absolute quiet and freedom from circulatory currents which is essential to efficient and rapid separation. The opening D is circular. The succession of these openings when the plates are placed one upon the other forms a cream-pool, in which is preferably placed a cream-steadying core composed of vanes K, surrounding a central ring or tube L, but which may be of any approved design. If desired, slight notches may be cut in the



plates A, as shown at M, and the vanes K being made wide enough to fit into these notches will take the place of the bolts C.

The separate plates may be held in position with reference to each other in the manner hereinbefore specified or by bolts C. If the bolts are used, they are preferably fastened into the lowest plate G and pass through holes E in the several plates, being secured by nuts F or other suitable means at the top. The plates are preferably so placed with reference to each other that the notches P in the marginal guide-walls of each plate will alternate with those of the adjoining plate, as shown in Figs. 1 and 3, and are mounted one upon the other in the manner shown in Fig. 1—viz., with the projecting guide-walls downward, so as to rest on the flat surface of the plate next below—but may be slightly separated from each other, if desired.

In using my invention the milk is admitted to the bowl in the usual manner below the bottom plate and passes upward and outward into the marginal space until the bowl is filled with milk. The separating process then begins. The heavier milk particles are driven by the centrifugal force directly outward from the center in radial lines until they strike the inner side of one of the guide-walls B or H. The current of milk then moves along this guide-wall until it finally escapes through the notches P into the skim-milk space between the plates and the margin of the bowl. In the same manner the cream particles, being lighter, move toward the center of the device in radial lines, and thus come in contact with the outside of one of the guide-walls B, when they pass upward and inward over these walls into the space between two of the plates. Then passing inward they strike the guide-walls H also on the outer side and move along them, finally escaping into the cream-pool in the center, the guide-walls serving to keep the inflowing and outflowing particles separate. A partial separation of the cream from the milk is thus produced. After escaping from the first plate the partially-separated milk and cream pass upward and are caught by the guide-walls B of the next plate in the series. This process is repeated by each successive plate, and an extremely rapid and effective separation is thus produced. The perfectly-separated milk and cream finally escape from the bowl by separate passages in the usual manner, and the process may be continued indefinitely.

The terms "walls," "teeth," "ribs," or "flanges" as used in this specification and

applied to the parts B or H of plates A are intended to describe those portions of the plates which in the completed device do not form parts of the flat bodies of the plates, but are projections or pendants from the plates, in the case of the parts or projections B being at the outer edges of the flat body portions of the plates and in case of parts or projections H being inside the outer edges of the plates.

What I claim, and desire to secure by Letters Patent, is—

1. A milk-steadying device for centrifugal machines consisting essentially of a series of flat metallic plates having central openings forming a cream-pool, each plate having flanges at its edges extending in substantially vertical direction and transverse to the radii of the plate, the plates being held apart by these flanges and connected together by suitable mechanism, substantially as described.

2. A milk-steadying device for centrifugal machines consisting of a series of thin metallic plates having flanges turned at the edges said flanges supporting the adjacent plate, said plates having openings forming a central cream-pool, and connected by bolts passing through holes in the flat plates, substantially as described.

3. A milk-steadying device consisting essentially of a series of thin metallic plates with edge flanges turned out of the plane of the plate, the angles of one plate projecting radially beyond the downturned flanges of the next plate, and means for holding the plates together in series, substantially as described.

4. A milk-steadying device for centrifugal machines, consisting essentially of a series of flat metallic plates with flanged edges and with projections inside the edges extending in direction transverse to the radii of the plates, there being passages between such projections and means for holding the plates together, substantially as described.

5. A milk-steadying device consisting essentially of a series of flat metallic plates each having a central opening and a number of flanges at its periphery, substantially as described, means for holding these plates together as described, and cross-vanes dividing the chamber formed by the central openings in the plates, substantially as described.

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Witnesses:

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