

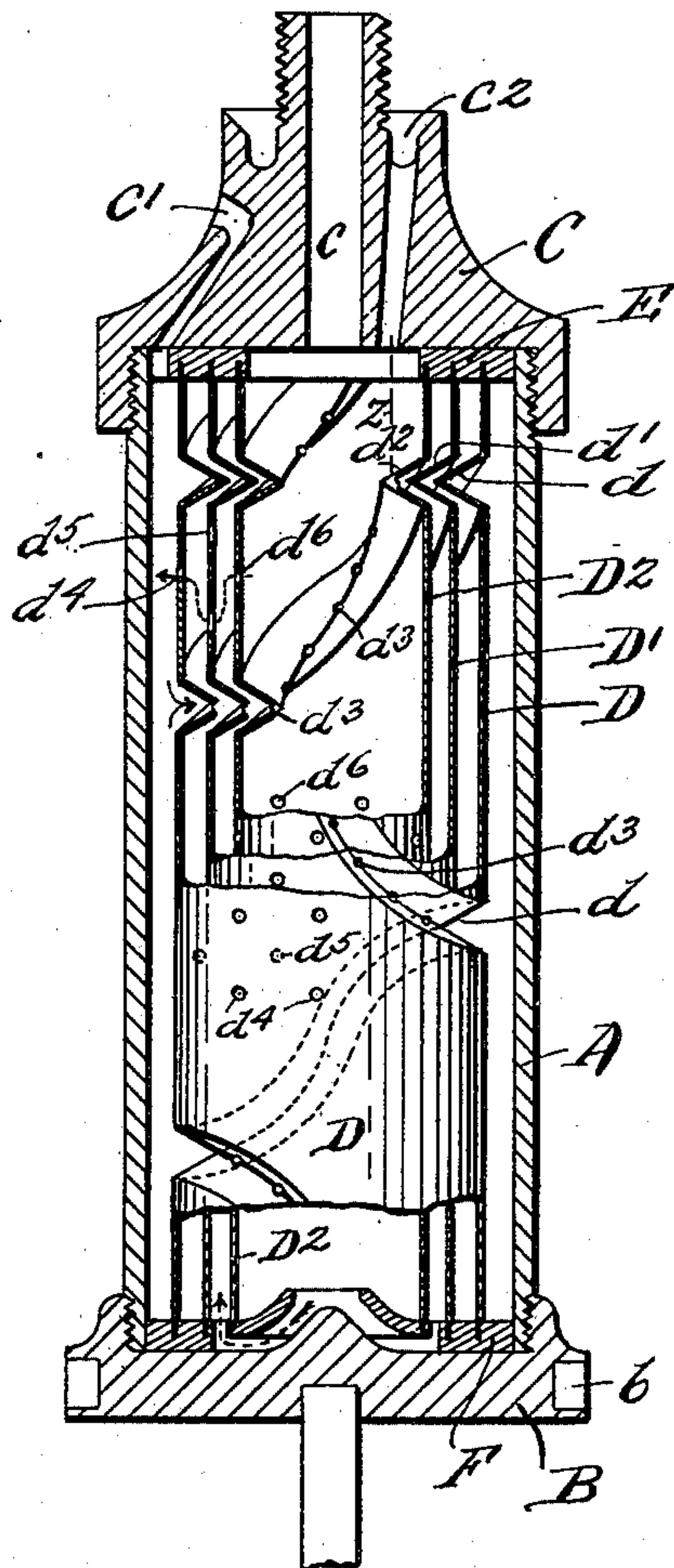
No. 685,875.

Patented Nov. 5, 1901.

P. M. SHARPLES.
CENTRIFUGAL SEPARATOR.

(Application filed Jan. 11, 1900.)

(No Model.)



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by

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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 685,875, dated November 5, 1901.

Application filed January 11, 1900. Serial No. 1,051. (No model.)

To all whom it may concern:

Be it known that I, PHILIP M. SHARPLES, a citizen of the United States of America, and a resident of Westchester, in the county of Chester and State of Pennsylvania, have invented certain new and useful Improvements in Centrifugal Separators, of which the following is a specification.

My invention relates to centrifugal liquid-separators and particularly to interior devices designed to facilitate the separation and collection of the constituent elements preparatory to separately discharging the same from the rotary vessel. Among the numerous devices heretofore devised for this purpose a concentrically-arranged series of partitions has been employed having cream-collecting recesses intended to extend through the spaces between the partitions, so as to enable a separated constituent in any part of the vessel to move into its proper zone without coming in contact with the liquid in said intermediate spaces. These collecting recesses have heretofore been formed either in separate protuberances each arranged in communication with one of an adjacent partition to form a radial passage-way or in such shape as to prevent the easy formation of a rigid partition from light material, such as sheet metal, as well as the engagement or overlapping of the communicating recesses, so as to insure the extension of each of said recesses beyond the annular spaces between the walls of the partitions. My invention overcomes both of these objections in a simple and advantageous construction, and at the same time provides for a tortuous flow of the unseparated liquid through said annular spaces, so as to more effectively utilize the latter. These improvements are fully described in connection with the accompanying drawing, and the novel features are particularly pointed out in the claims.

The drawing is a sectional elevation of a centrifugal separator vessel provided with partitions embodying my improvements.

A represents the body, B the base, and C the top, of a centrifugal separator vessel of any suitable construction, having a feed-inlet c and discharge-outlets c' and c'' for the heavier and lighter constituents, respectively, of the liquid operated on, most com-

monly milk. The liquid-space of the rotary vessel, which extends from the inner (cream) wall z to the outer wall of the vessel, is divided, as shown, into annular chambers by concentric cylindrical partitions $D D' D''$, which are properly spaced within the vessel in any suitable manner—as, for instance, by top and bottom plates E and F . The inflowing liquid is in the construction shown introduced at the bottom of the vessel outside of the inner partition D'' .

To provide a direct conducting-passage for the cream as separated from each of the annular chambers through the intervening separating-space to the normal cream zone, I form in each partition cylinder or tube $D D' D''$ a spiral grooved rib or ribs $d d' d''$, extending entirely around the same and practically the full height of the vessel. The pitch of these spiral grooves or gutters may be more or less, as desired, but is uniform on all the partitions, and the depth of the grooves is preferably greater than the space between them, so that when assembled by screwing each partition into the next larger one and properly spacing them, as by means of the plates E and F , a continuous and direct radial passage inward to the cream zone is provided through openings d^3 in the bottom of each communicating grooved rib, through which the cream as soon as separated in any part of the vessel can pass without coming in contact with any of the heavier constituents. The new milk entering at the bottom of the vessel causes a comparatively slow upward movement of the body of liquid in the bowl, thus insuring the prompt escape of a separated particle of cream from the inner wall of the chamber in which it is separated to one of the spirial gutters which crosses its upward path, and as soon as it gets into this gutter it will move directly inward, as stated, under centrifugal action.

To provide for the outward movement of the skimmed or partially-skimmed milk from each of the separating chambers or spaces between the partitions, I preferably provide exit-openings $d^4 d^5 d^6$ directly in the cylindrical wall of the vessel between the coils of the cream-gutters, through which the milk can pass to the adjoining outer space or chamber under centrifugal action; but in order to

insure the proper use of each separating-space I arrange these milk-openings in one partition, as d^5 , out of line radially with those d^4 d^6 in the adjacent partitions, thus causing the outward flow of milk to be in a somewhat tortuous course, as indicated by the curved arrow.

It is obvious that the particular construction shown may be varied. Any desired number of partitions may be used, and the pitch, depth, and number of cream-grooves may be made as preferred. The grooving of the partitions spirally, as described, serves to considerably stiffen them in every direction instead of weakening them and allows of the use of very light material.

What I claim is—

1. In a centrifugal separator vessel a cylindrical partition formed with a spiral collecting-groove with unbroken side walls forming a confining passage-way, and having exit-openings at the bottom of said groove and other openings in the ungrooved portion thereof.

2. In a centrifugal separator vessel a series of two or more concentric partitions each hav-

ing a grooved spiral rib arranged to loosely enter the similar groove of an adjacent partition and to communicate therewith.

3. In a centrifugal separator vessel a series of two or more concentric partitions each having a grooved spiral rib arranged to loosely enter the similar groove of an adjacent partition, and each of said partitions having cream-exits at the bottom of the grooves and milk-inlets in the cylindrical wall thereof, substantially as set forth.

4. A centrifugal separator vessel having the liquid-space thereof divided into annular separating-chambers each having a spiral collecting-channel forming an extension of said chamber toward the axis, with cream-exit openings from said inwardly-extending spiral channel and milk-exit openings in the outer wall of the chamber.

Signed by me at Westchester, Pennsylvania, this 26th day of December, A. D. 1899.

PHILIP M. SHARPLES.

Witnesses:

LAURA DAY ALDRED,
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