(No Model.) 2 Sheets—Sheet 1.

R. E. EVENDEN.

CENTRIFUGAL CHURN.

No. 522,339. Patented July 3, 1894.

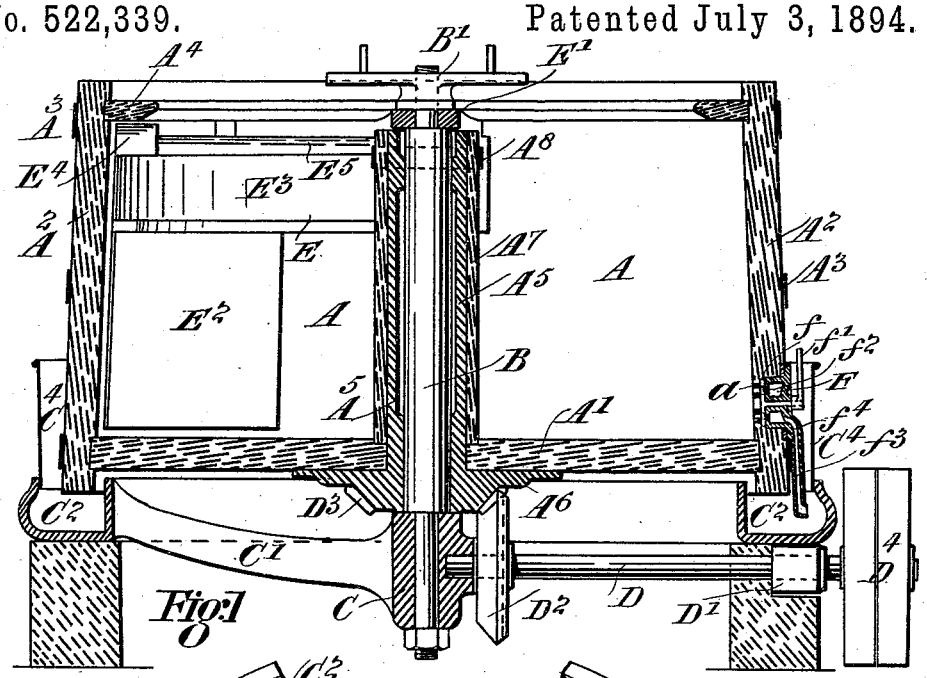

Fig. 1.

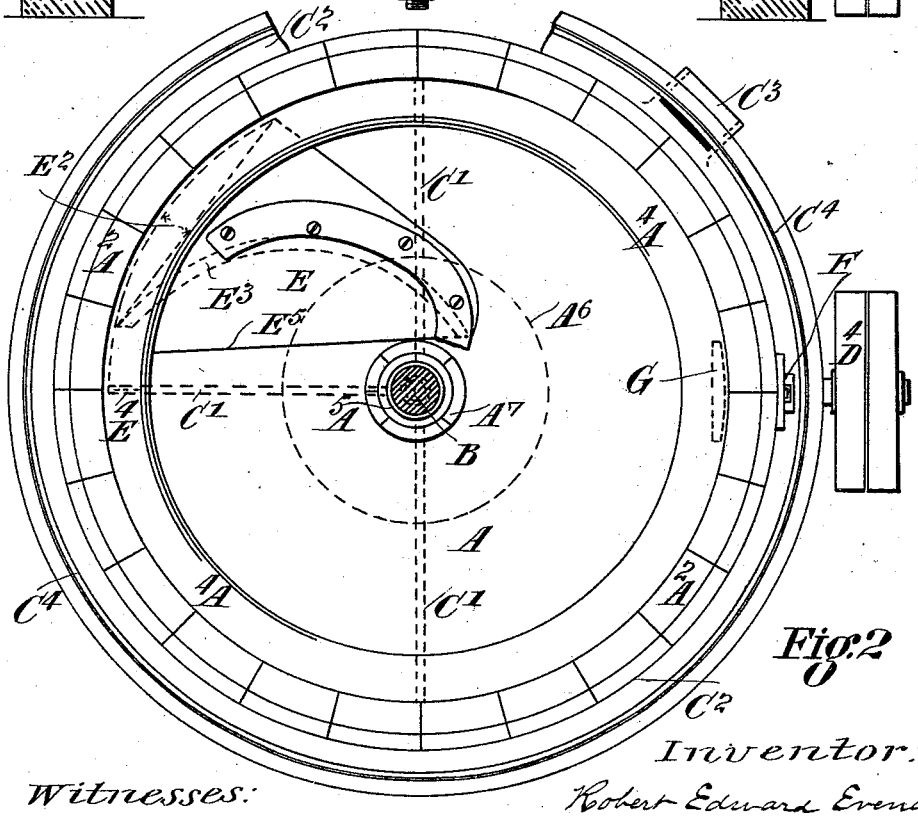

Fig. 2.

Witnesses:
E. B. Bolton
H. Van Oldenneel

Inventor:
Robert Edward Evenden
By Richards & Co.
his Attorneys.

(No Model.) 2 Sheets—Sheet 2.

R. E. EVENDEN.

CENTRIFUGAL CHURN.

No. 522,339. Patented July 3, 1894.

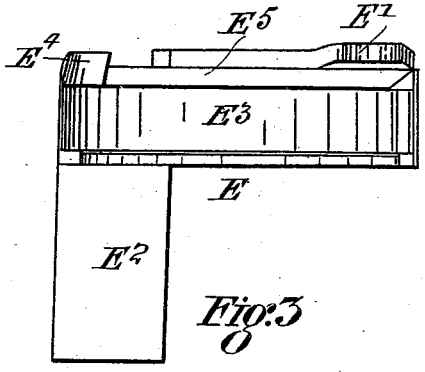

Fig. 3.

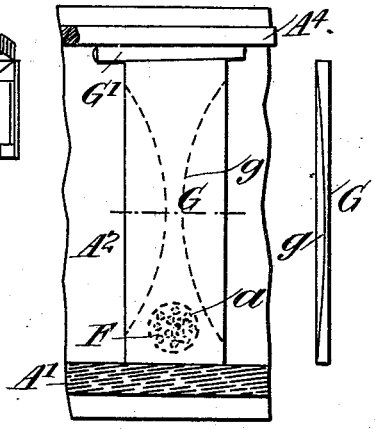

Fig. 6.

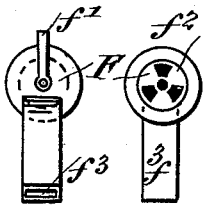

Fig. 5.

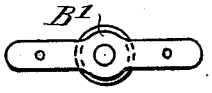

Fig. 7.

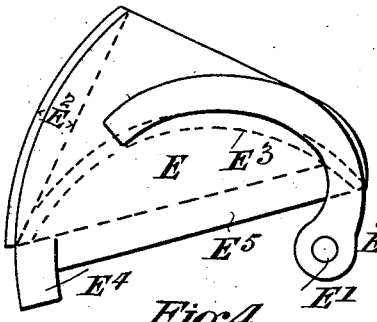

Fig. 4.

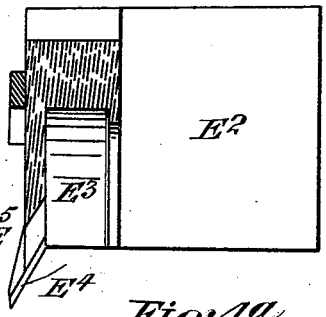

Fig. 4a.

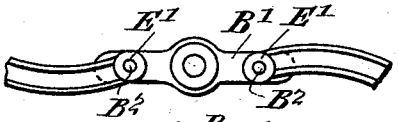

Fig. 8.

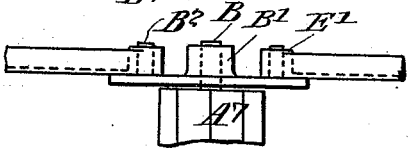

Fig. 8a.

Witnesses:
E. R. Kolton
H. van Oldenneel

Inventor:
Robert Edward Evenden
By Richards Lea
his Attorneys.

UNITED STATES PATENT OFFICE.

ROBERT EDWARD EVENDEN, OF NORTH COBURG, VICTORIA.

CENTRIFUGAL CHURN.

SPECIFICATION forming part of Letters Patent No. 522,339, dated July 3, 1894.

Application filed October 7, 1893. Serial No. 487,482. (No model.) Patented in Victoria October 27, 1892, No. 10,094; in New South Wales December 19, 1892, No. 4,190, and in South Australia March 7, 1893, No. 2,430.

To all whom it may concern:

Be it known that I, ROBERT EDWARD EVENDEN, churn manufacturer, a subject of Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, residing at Heaton, North Coburg, in the British Colony of Victoria, have invented certain new and useful Improvements in Centrifugal Churns, (for which I have obtained patents in New South Wales, No. 4,190, dated December 19, 1892; in South Australia, No. 2,430, dated March 7, 1893, and in Victoria, No. 10,094, dated October 27, 1892,) the following being a specification of my invention.

My churn includes an arrangement of diverter to direct or divert the liquid toward the center of the revolving case to be again thrown toward the periphery by the centrifugal force.

In constructing churns of large diameter I prefer to employ two or more curved races or channels so as to provide return channels for the cream from two or more points of the inner periphery of the churning vessel, and I prefer to support them in such a manner that either one or both can be removed at pleasure.

The buttermilk outflow valve I construct in the form of a perforated or slotted disk valve bearing upon a face or surface that forms the back of a chamber and from which latter an outlet port descends to the buttermilk channel. The said disk valve is opened and closed by a movable key or handle while the machine is at rest.

In order that my invention may be clearly understood I will now describe it with reference to the accompanying drawings, in which—

Figure 1. is a central section through the churn and Fig. 2. a plan of it with some parts removed; Fig. 3. a side view, and Figs. 4 and 4^a a plan and face view of the share or diverter; Fig. 5. details of the buttermilk outlet valve; Fig. 6. details of the strainer that is placed over the outlet openings leading to disk valves while the buttermilk is being drawn off; Fig. 7. a plan of the nut for securing the diverter in position upon central stationary spindle; Figs. 8 and 8^a, details of the alternative means for supporting each curved race or diverter when two or more are employed.

A is the churning vessel shown constructed with a solid wooden bottom A′ and with its side made up of wood staves A^2 bound with hoops A^3.

A^4 is the upper internal flange.

A^5 is a central metal hub or journal for vessel A, said hub having a broad flange A^6 at its lower end that is secured by screws or otherwise to the wood bottom A′. Said central hub is also covered with wood liners or staves A^7 the lower ends of which are let into a groove in bottom A′ and bound by a hoop A^8 near their upper ends as shown in Fig. 1.

B is a central vertical spindle on which hub A^5 rotates, said spindle being secured in a boss C carried by arms C′ stretching from buttermilk annular channel casting C^2 and which casting forms the bed for the machine.

C^3 is an outlet spout from said channel and C^4 a sheet metal splash casing.

D is a horizontal shaft the inner end of which is supported by a bearing in or upon boss C while its outer part is supported by bearing D′ secured to bottom of casting C^2.

Upon shaft D near its inner end is a bevel wheel D^2 which gears with a bevel wheel D^3 shown as forming part of the flange A^6 of the aforesaid hub casting.

D^4 are the fast and loose pulleys for the driving belt.

E is the share or diverter secured in its working position by its eye E′ at the end of an upper arm clamped upon the central stationary spindle B by the nut B′. The lower part E^2 of the diverter projects down to near the bottom of the vessel said lower part being in horizontal section similar to a segment of a circle its outer face lying close to the inner surface of the churning vessel while its inner surface is flat or fish backed as desired. Above said lower part is the curved channel E^3 leading from near the inner surface of the churning vessel to near the central hub of the vessel for the purpose already stated. The part E^4 of the top plate has a chisel shaped edge designed to scrape the cream or butter from the under surface of the internal flange A^4 and lead it to the channel E^3. The

front edge E^5 of the top plate of diverter E, is also beveled or chisel shaped for a similar purpose. F is the buttermilk outlet valve sunk in one of the staves of the churn opposite the perforations *a*, the valve being in the form of a perforated or slotted disk *f*, the spindle of which projects outside the vessel, its outermost part fitting a key or handle *f'* while the disk valve works upon a perforated face f^2 leading to a hollow chamber from which is an outlet branch or port f^3 leading downward to the buttermilk channel. In order to allow of said valve being easily removed I secure it in position by screws that pass into a fixed metal ring f^4 let into the stave.

G is a wood plate which is placed in front of the outlet valve F when the buttermilk is to be strained off, said plate being secured in position between bottom A' of vessel and the internal flange A^4 by the key G'. The under surface of such strainer plate is chamfered off as shown at *g* to form a passage for the buttermilk. It will be understood that the board G is placed over the outlet F, so as to leave a narrow crevice through which the discharge may pass. The chamfers *g* serve to catch the buttermilk and to direct it to the said narrow crevice. Figs. 8 and 8^a show the alternative means for supporting the diverter E the eye strap E' of each being placed on a pin B^2 projecting upward from the nut B' and so one or both can be removed at pleasure simply by lifting them off their pivotal pins.

The mode of operation of a centrifugal churn constructed according to this invention is as follows:—The share or diverter being secured in position upon the stationary spindle B by the nut B' as before described, the churning vessel is charged with the proper quantity of cream, then upon its being driven at the requisite velocity, the cream by reason of centrifugal force will assume a torrent wall within the vessel and by the rotation of the latter the wall or torrent of cream is being continuously broken or diverted, the lower part to over the back of the segmental part E^2 of the diverter and thence to the wall again and the upper part into the channel E^3 which returns the cream to near central hub and becoming free thereat it is again thrown outward by centrifugal force and so it is continuously being agitated and aerated for the purpose before described. When the butter globules have been separated from the buttermilk the share or diverter is removed and the strainers G are wedged in position in front of the outlet valves which are now opened and then upon the machine being again set in motion the buttermilk will be drained off through said valve and be led by spout f^3 to the channel C^2 from which it passes through outlet spout C^3 to waste or otherwise. When the buttermilk is drained off the butter may be washed by spraying clean water on it while the machine is in motion and when washed the butter is ready for removal.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination, the rotary case A, the means for turning the same the internal flange A^4, and the stationary diverter, comprising the upper portion, having the channel E^3 opening laterally thereof, the beveled top plate overhanging the return channel and the share E^2 depending from the upper part, and having its outer face curved to conform with the curve of the case, while its inner face is flat, said beveled overhanging top plate being adjacent to the internal flange and adapted to divert the liquid downwardly therefrom to the channel E^3 substantially as described.

2. In combination, the casing, means to revolve the same, the flange A^4 at the top thereof, the diverter arranged in fixed position within the casing and having the scraper E^4 to remove the material from the flange A^4, substantially as described.

3. In combination, the casing, the rotating mechanism, the valve device comprising the box F, let into the side wall of the casing and having perforations f^2, the perforated disk *f* arranged against the inner face of the box F, and having a handle projecting through the same to the outer side, the channel extending about the rotary case and the spout extending from the box into the said channel, substantially as described.

4. In combination, the casing, the perforated valve with its stem, the perforated hollow valve box against the inner side of which the valve bears said box having a bearing for the valve stem and a suitable outlet from the interior of the box, and the annular channel extending about the casing to receive the liquid discharged through the valve substantially as described.

5. In combination, the casing, the valve in the side of the same, and the strainer board G arranged over the valve and at a proper distance therefrom to leave a narrow discharge crevice between it and the side of the casing, substantially as described.

6. In combination the casing having the outlet F and the strainer board arranged over the outlet and having the chamfers *g*, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ROBERT EDWARD EVENDEN.

Witnesses:
ROBERT BODYCOMB, Jr.,
ALFRED FORD, *J. P.*