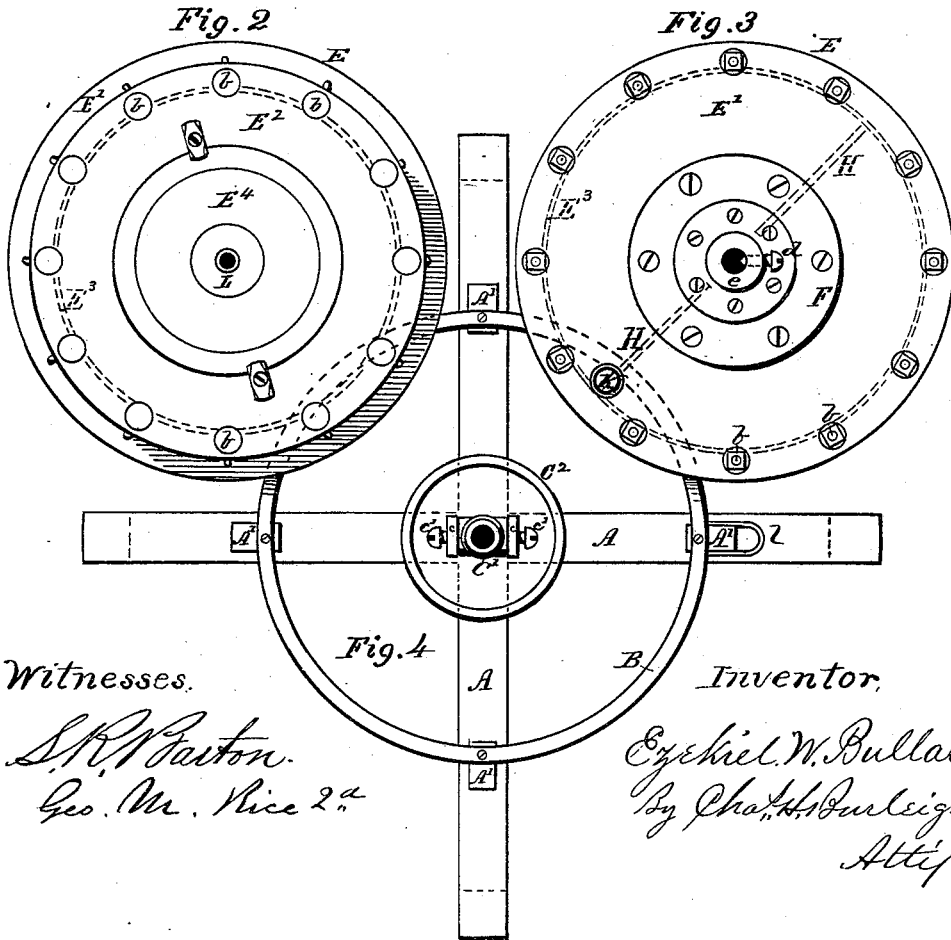
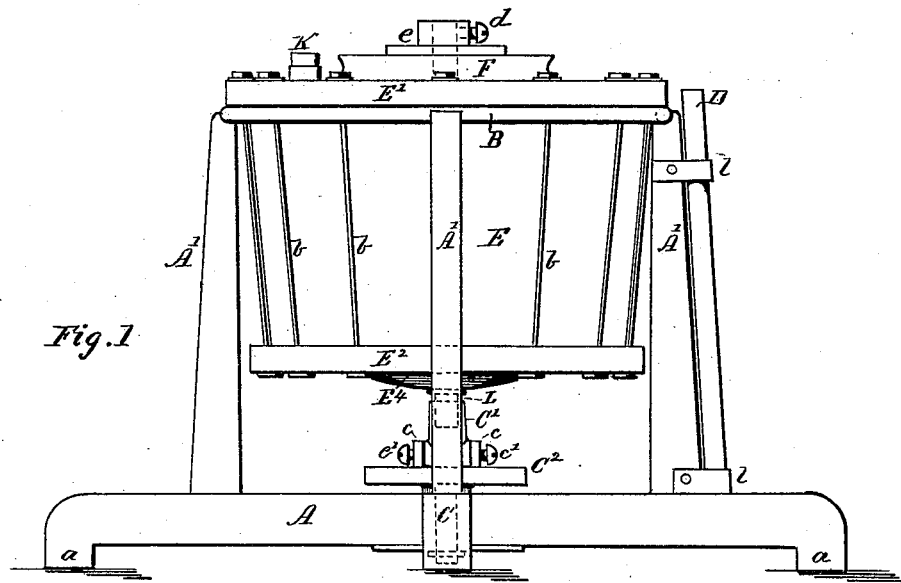


E. W. BULLARD.
Churn.

No. 217,678.

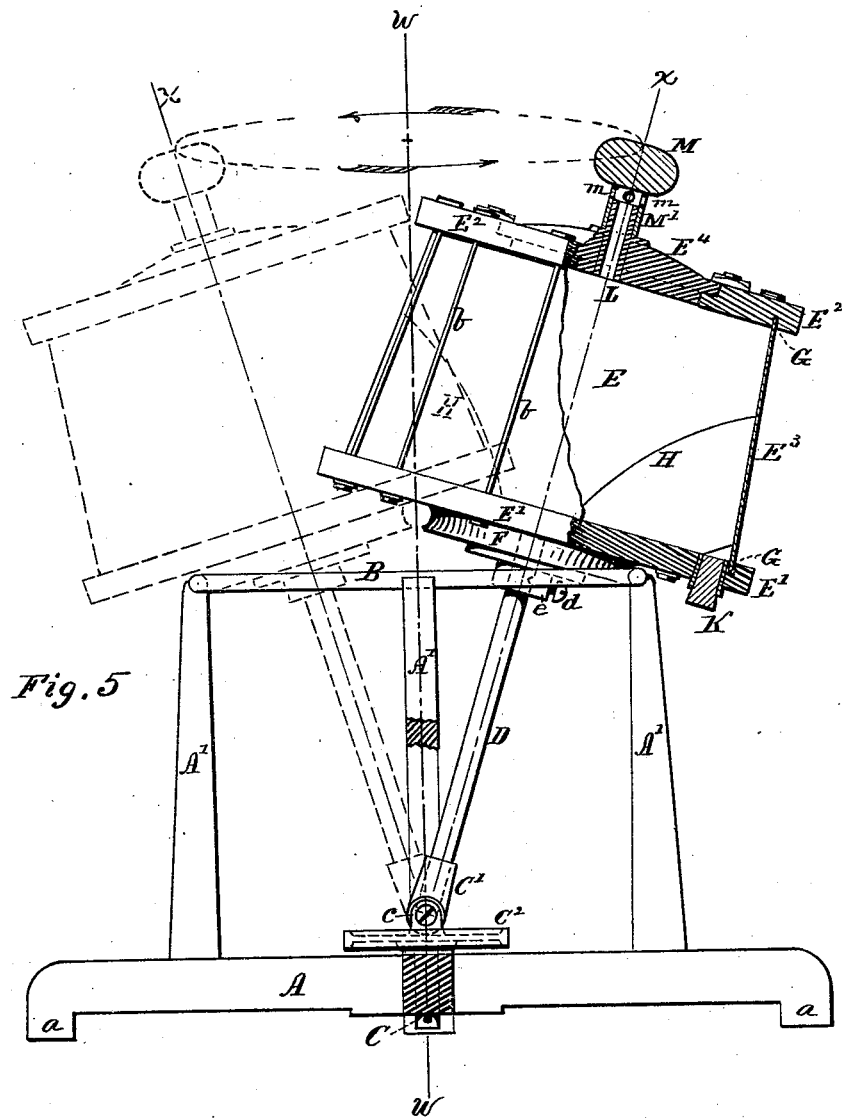
Patented July 22, 1879.



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Witnesses

S. R. Bartore.

Geo. M. Rice 2^d

Inventor.

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UNITED STATES PATENT OFFICE.

EZEKIEL W. BULLARD, OF BARRE, MASSACHUSETTS.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. **217,678**, dated July 22, 1879; application filed February 13, 1879.

To all whom it may concern:

Be it known that I, EZEKIEL W. BULLARD, of Barre, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Churns; and I declare the following to be a description of my said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side view of my improved churn, showing the parts in position as packed for shipment or storage. Fig. 2 is a plan view of the receiver. Fig. 3 is a bottom view of the receiver. Fig. 4 is a plan view of the supporting-frame and revolving step or bearing; and Fig. 5 is a part side, part sectional, view of my improved churn, showing the parts in position as set up for use and illustrating the nature of operation.

The nature of my invention consists in the arrangement, in a churn, of a revoluble cream receiver or vessel supported in an inclined position by a shaft or guiding-standard having its lower end swiveled in a step or bearing placed centrally and below a circular track or hoop-frame, against which said receiver is supported by means of a traverse wheel or surface formed on the receiver concentric with its axis, and adapted to roll on said track or hoop, for imparting rotative movement to the receiver, as hereinafter more fully explained.

Another feature of my invention consists in the peculiar construction, proportion, and arrangement of the receiver and its supporting frame, as hereinafter described, whereby said receiver, when reversed, can be securely and closely packed within its frame, in the manner and for the purpose hereinafter set forth.

Minor features of my invention—the construction of the various parts and the method of operation—will be understood from the following detailed description, the subject-matter claimed being hereinafter definitely specified.

Like letters denote the same parts where used on different figures of the drawings.

A denotes the supporting-frame, consisting of a cross or spider provided with bearing-feet *a* and a series of uprights, *A'*, upon which is supported a hoop or circular track, B, preferably formed from round iron, and arranged concentric with the center or vertical axis of the spider A, as illustrated.

C denotes the vertical bearing or center stud for supporting the swivel-step C', which is, in the present instance, pivoted between ear-pieces *c c*, on the top of the pulley-plate C², by the screws *c' c'*.

D indicates the shaft or standard for supporting the cream-receiver E. One end of said shaft D fits loosely in the swivel-step C', while its other end is secured within the hub *e*, on the bottom of the receiver, by the screw *d*. The receiver E is provided with a traverse wheel or surface, F, on its lower end, E¹, which surface F rests against and rolls upon the circle-track B.

The wheel-surface F is concentric to the axis of the receiver E and its shaft D, and is of such proportion that when the parts are set up for use (with the foot of shaft D in the step C' and the wheel-surface F against the circle B) the receiver or vessel E will stand in an inclined position, or with its axial line *x* inclined outward relative to the vertical center of the apparatus or axial line *w* of the frame A and circle B.

The receiver E is made, in the present instance, with ends E¹ E² of wood and an intermediate shell, E³, of sheet metal, preferably circular, and slightly conical, or smaller toward the top end. Other forms could be used if desired. The edges of the sheet metal are let into grooves (see G, Fig. 5) formed at the inner sides of the head-pieces E¹ E², and said heads are securely clamped to each other by bolts or rods *b*, placed exterior to the shell E³, as shown.

By constructing the receiver in this manner, any change in the heads by shrinking and swelling simply renders the joint at G closer and more secure, instead of causing it to leak.

H indicates breakers arranged within the receiver E, (two or more may be used,) consisting of thin triangular plates placed radially

across the lower angle, as indicated, their top edges being diagonal to the shell E^3 , and either curved or straight, as preferred.

K indicates the opening and plug for drawing off the buttermilk. Said opening is placed directly under one of the breakers H, so all liquid can be drained off without changing the position of receiver.

E^4 indicates a circular cover, supported on suitable flanges at the central part of the head E^2 , and furnished with buttons or other suitable fastenings for retaining it in place. Said cover is provided with a central projecting vent-tube, L, the axis of which corresponds with the axial line x of the receiver E and shaft D.

M indicates a knob or handle having a tubular shank, M' , arranged to fit over the tube L. It serves as a means wherewith to conveniently operate the churn. Lateral vent-holes m are formed through the shank M' above the end of the tube L, so as to permit free passage of air.

The diameter of the head E^2 is less than the diameter of the circular frame B, while the diameter of the bottom piece, E^1 , is greater, so that by inverting the receiver the churn can be closely packed for storage or shipment, in the manner illustrated in Fig. 1, the receiver being placed within the frame, with the rim of the head E^1 resting on the circle B and the vent-tube L inserted within the swivel-step C^1 , the shaft D being removed from the hub e and passed through loops l , attached to one of the uprights A' , and the knob or handle M placed within the receiver.

When setting up the churn for operation the shaft D is first secured in the hub e by means of the set-screw d . The receiver is then turned to proper position, and the opposite end of the shaft D is inserted in the bearing-step C^1 , and the receiver supported by resting the wheel or surface F against the circular track or hoop B. The cover E^4 is then removed, and the knob M taken from the receiver and placed on the vent-tube L. The proper quantity of cream can then be introduced into the receiver and the cover replaced and secured. The operator then takes hold of the knob M and moves it, in the manner of a crank, about the central axis, w , (see diagram-lines, Fig. 5,) causing the wheel or surface F to roll upon the circular track B, thereby imparting to the receiver E a rotary movement about its own axial line x , while at

the same time said axis x revolves or moves about the vertical axis w , and, as the axial lines intersect near the bearing C, the inclination of the receiver constantly changes from right to left, and vice versa, as it traverses about the circle, while a peculiar epicycloidal movement is imparted by reason of the diameter of the traverse-wheel F being less than the diameter of the receiver E. The cream is thus dashed about the receiver with a peculiar concussive action, which gives a rapid and superior effect in the production of butter, while the operation is performed with very little labor, the slightest exertion of force being sufficient to roll the receiver around the traverse-circle B.

If desired to employ power to operate the churn, it can be applied by running a belt on the pulley C^2 , or connecting therewith by means of toothed gears.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, in a churn, of a circular track or hoop-frame and a revoluble cream-receiver provided with a traverse wheel or surface resting against and rolling upon said track, and having an axial shaft or guide-standard, the lower end of which is swiveled in a bearing or step located centrally and below said circular track, whereby said receiver is supported in an inclined position and adapted to receive rotary movement by being rolled around said track, substantially as set forth.

2. In combination, the supporting-frame A, with central stud or bearing-step C^1 and circular track B, the cream-receiver E, provided with traverse wheel or surface F, hub e , and centrally-located vent-tube L, the standard or shaft D, and hand-knob M, substantially as and for the purposes specified.

3. In a churn, the combination of the frame A, with circle B and central bearing-step C^1 , the receiver E, with heads E^1 E^2 , respectively of greater and less diameter than the circle B, the centrally-located cover with projecting vent-tube L, and the removable shaft D, constructed as set forth, whereby said parts can be packed for storage or shipment in the manner shown and described.

Witness my hand this 10th day of February, A. D. 1879.

EZEKIEL W. BULLARD.

Witnesses:

HENRY J. SHATTUCK,
J. W. JENKINS.