A. W. MINOT & M. RHOADES

Churn.

No. 219,290. Patented Sept. 2, 1879.

Fig. 1.

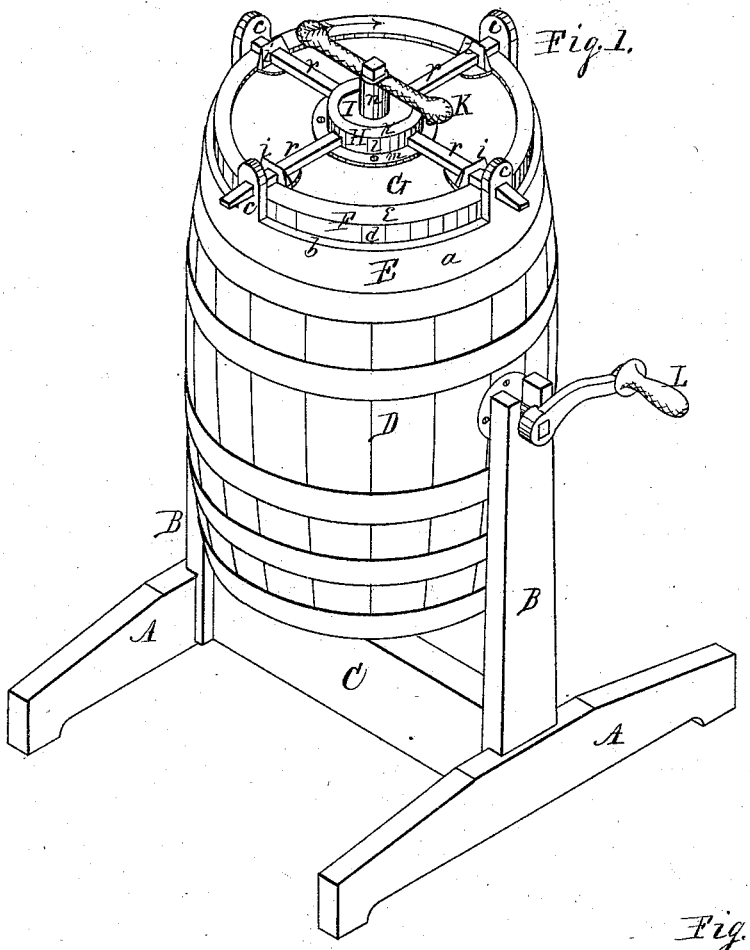


Fig. 2.

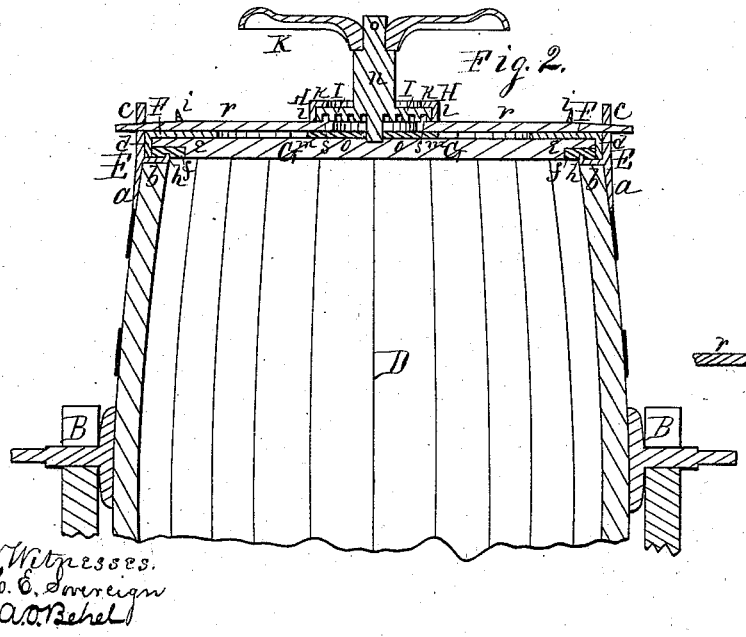


Fig. 3.

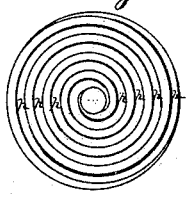
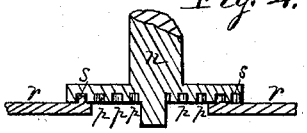


Fig. 4.



Witnesses.
C. E. Sovereign
A. O. Behel

Inventors.
Alonzo W. Minot.
Martin Rhoades.
Per Jacob Behel
Atty.

UNITED STATES PATENT OFFICE.

ALONZO W. MINOT AND MARTIN RHOADES, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. **219,290**, dated September 2, 1879; application filed July 22, 1879.

To all whom it may concern:

Be it known that we, ALONZO W. MINOT and MARTIN RHOADES, of the city of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Churns, of which the following is a specification.

This invention relates to that class known as "end-over-end revolving churns." It, however, relates more particularly to the removable lids employed in this class of churns.

The object of this invention is to produce a reliable close-fitting removable lid for this class of churns and other vessels requiring a close-fitting and readily removable lid.

In the drawings, Figure 1 is an isometrical representation of an end-over-end revolving churn embodying my invention, of which Fig. 2 is a vertical central section on a plane passing through its trunnion-supports; and Fig. 3 is an under-face view of the spirally-grooved cam by which the radial bolts are operated, of which Fig. 4 is a vertical central section.

In the figures, A represents sills, having the central portions on their under sides relieved to produce feet-like portions at their ends.

B are vertical posts or standards, framed into the central portion of the sills, from which they rise to receive the trunnions of the churn in their slotted upper ends. These parts form the end portions of the supporting-frame. These end portions are separated a proper distance to receive the churn between them, and are connected and held in a vertical position by means of a central connecting-beam, C, framed and firmly bolted to each other, forming the supporting-frame, on which the churn is mounted to revolve therein on its trunnion-supports.

D represents the churn, which is of barrel form, constructed of staves hoop bound and fitted with one fixed head, constructed and applied in the manner common in the manufacture of barrels or other hoop-bound vessels.

E represents a metallic ring, of angle-iron form, composed of a vertical ring or hoop-like portion, *a*, which embraces the stave ends of the open end of the churn, operating as a hoop to bind the staves, and of a horizontal portion, *b*, which overlaps the ends of the staves. This ring is provided with uprising ears *c*, which rise from its outer upper angle above its horizontal portion, and are perforated radially to receive radial sliding bolts employed to hold the lid in place on the churn. This ring is provided on its inner upper angle with an uprising rim, *h*, designed to receive the packing of the lid to produce a close-fitting joint.

F represents a metallic ring, of angle-iron form, composed of the vertical ring portion *d* and the horizontal portion *e*, and is of such diameter as to freely enter between the uprising ears *c* of the ring E. This ring is provided with uprising ears *i*, perforated radially to receive the radially endwise sliding bolts and guide them in their endwise movements, as employed to hold the lid to the churn.

G represents the main portion of the lid, fitted to enter the vertical ring portion *d*, and rests against the horizontal portion *e* of the ring F, and is fixed thereto by means of screws or in other equivalent manner. The outer edge of the lid G is rabbeted on its under face and outer edge, forming a groove, in which is fitted a packing, *f*, made from cork, which, when the lid is in place, rests on the rim *h* on the inner upper angle of the ring E.

H represents a casing, consisting of an inward-projecting cap-flange, *k*, a vertical cylindrical portion, *l*, and a foot-flange, *m*, formed from a single piece, as represented in the drawings. The foot-flange is provided with radial slots, which extend upward into the cylindrical portion, and are adapted to receive radial bolts to slide freely therein.

I is a cam, of disk form, fitted to freely enter the casing H, and is provided with a vertical shaft, *n*, the lower end of which is fitted in journal form to enter and revolve in a central bearing in the spider *o*, having the ends of its arms fitted to enter the radial grooves in the foot-flange of the casing. The under face of the cam I is formed with a spiral or scroll groove, *p*, winding from near its center outward, and is adapted to receive the upturned ends of the radial sliding bolts.

r are radial sliding bolts, fitted to slide endwise in the radial slots in the foot-flange of the casing H and through the guide-ears *i* on ring F. The inner ends of these sliding bolts are fitted with an uprising portion, *s*, which enters the spiral groove in the cam, and their outer

ends are beveled in wedge form, adapted to enter and slide through the perforated ears *c*.

The upper portion of the vertical shaft *n* is fitted with a wrench, K, employed for the purpose of rotating the spiral-grooved cam. These parts, constructed as shown and described, are fixed centrally on the lid by means of screws passed through the foot-flange of the casing into the main portion of the lid. This lid is then applied to the open end of the churn, entering between the uprising ears thereon in such relative position therewith that the sliding bolts, when moved outward, will enter the uprising ears; and when in such relative position, by means of the wrench turned in the direction indicated by the arrow, the bolts, by means of their connection with the spiral groove of the cam, will be made to slide endwise outward through the uprising ears on the churn, in which movement the wedge-formed ends of the bolts will operate to force the lid in close contact with the churn, and the packing thereof in contact with the uprising rim on the inner edge of the ring E, which will produce a close joint to prevent leakage, and by a rearward movement of the wrench the bolts will be withdrawn, which will permit the removal of the lid.

In use, the lid being removed, the cream is then placed in the churn and the lid replaced and fixed in position. The churn is then made to revolve on its trunnion-supports end over end by means of the hand-crank L, which motion will cause the cream to be thrown from end to end in the churn, the throwing action of which will soon cause the cream to separate from the milk and collect the butter, after which the lid can be removed and the butter taken from the churn, which can then be emptied of its remaining contents.

In the employment of the spirally-grooved or scroll-formed cam to operate the sliding bolts, we produce a convenient removable lid, which can be pressed to its seat on the churn with great force to insure a close-fitting lid to prevent leakage, and that is not liable to accidental displacement.

We claim as our invention—

1. The combination, with a removable lid, of a spirally-grooved cam and radially-sliding bolts, substantially as described, operating as and for the purpose hereinbefore set forth.

2. The combination, with the spirally-grooved cam and the radially-sliding bolts, of the casing fitted with guideways, in which the radial bolts slide endwise, substantially as and for the purpose set forth.

3. The combination, with the metallic ring embracing the open end of the churn, having perforated ears or lugs and a rim rising above the plane of its upper surface, of a removable lid provided with packing, adapted to engage the uprising rim of the ring, and radial sliding bolts to engage the perforated ears, operated by a spirally-grooved cam to fit the lid to the churn in a removable manner, substantially as and for the purpose hereinbefore set forth.

ALONZO W. MINOT.
MARTIN RHOADES.

Witnesses:
A. O. BEHEL,
JACOB BEHEL.