(No Model.) 3 Sheets—Sheet 1.

E. H. HAYWORTH & S. L. DAVIS.

CHchurn.

No. 304,727. Patented Sept. 9, 1884.

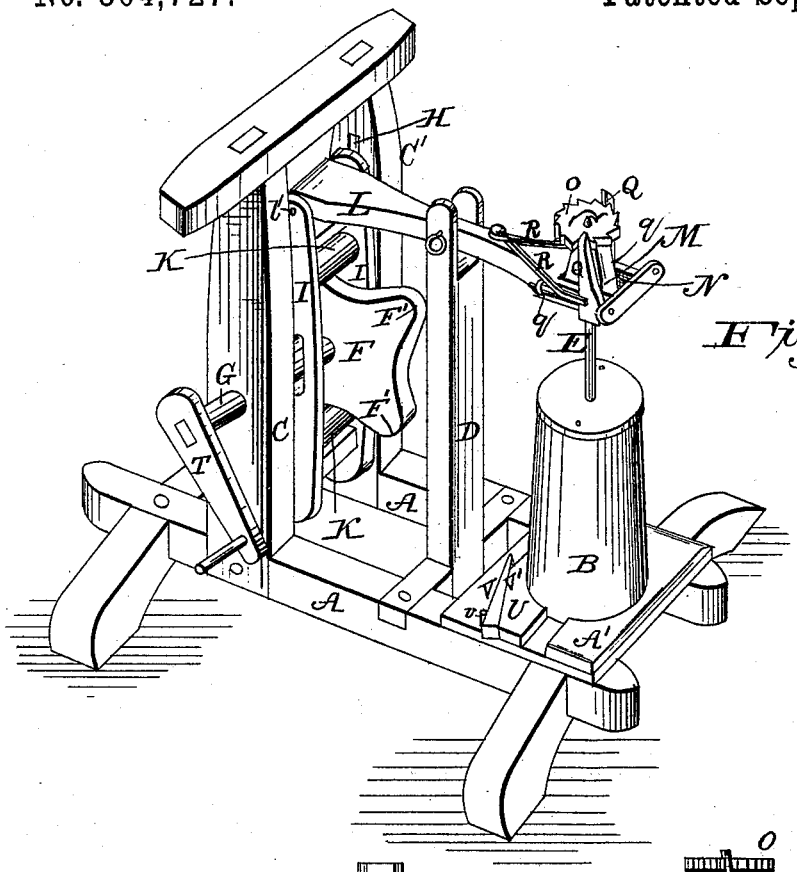

Fig. 1.

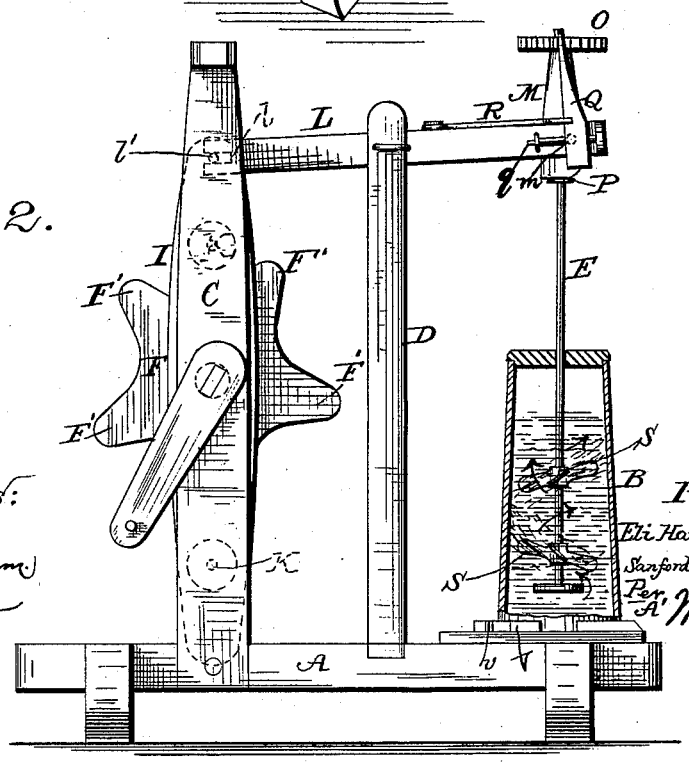

Fig. 2.

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Fig. 3.

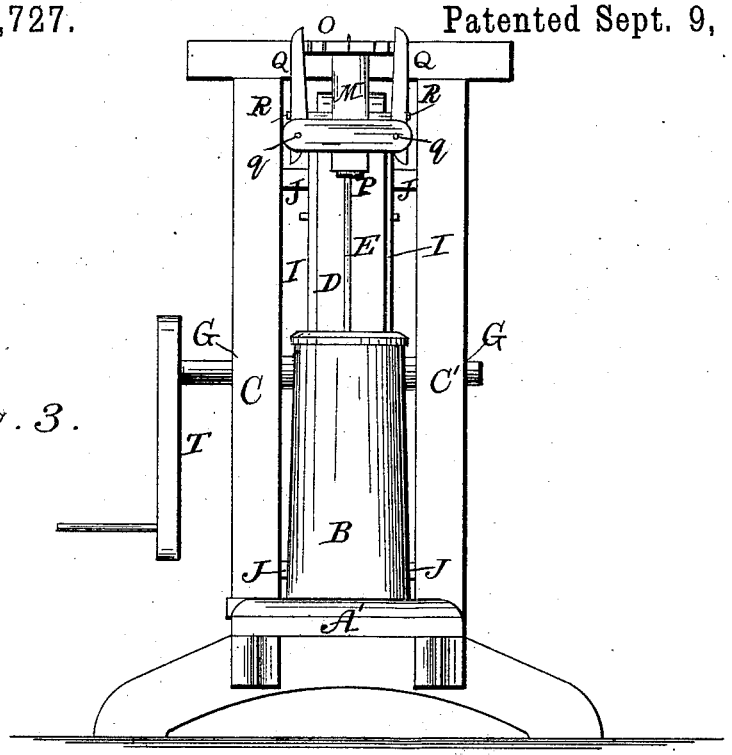

Fig. 4.

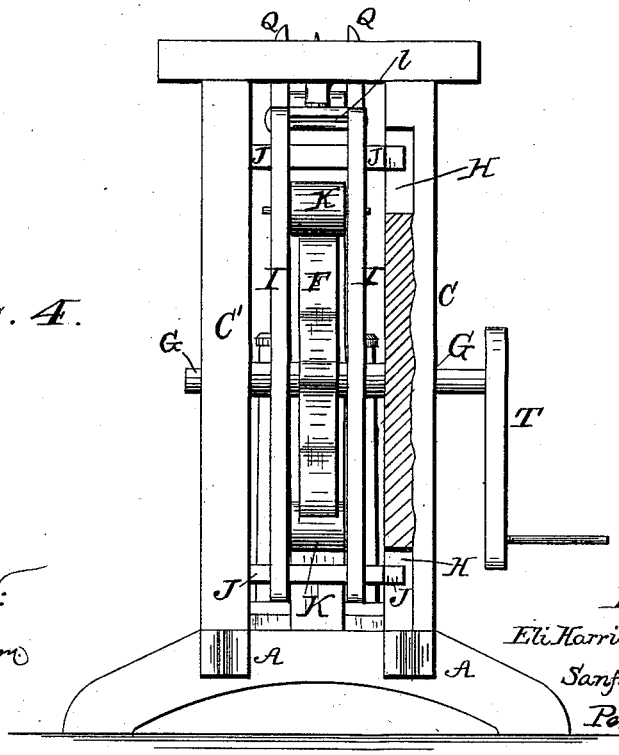

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Fig. 5.

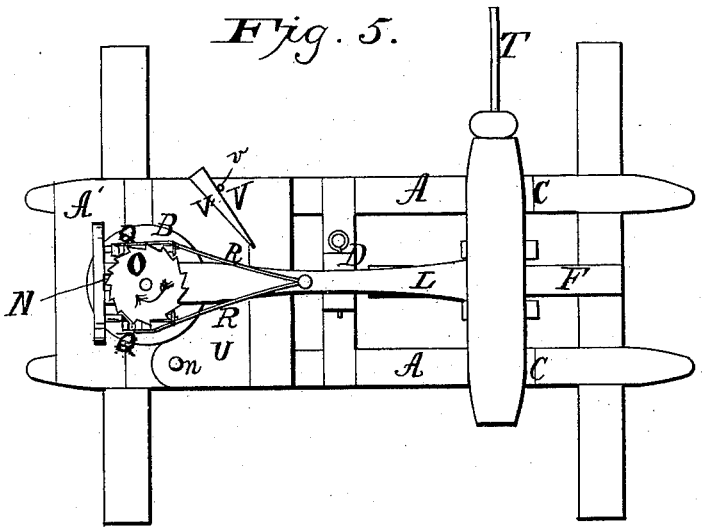
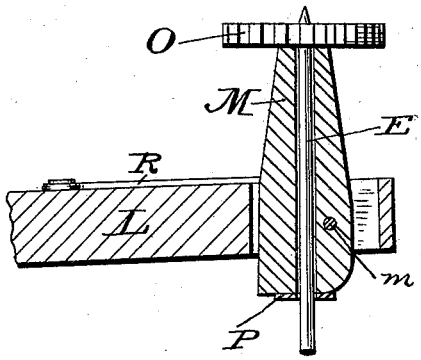


Fig. 6.



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UNITED STATES PATENT OFFICE.

ELI HARRISON HAYWORTH AND SANFORD LEANDER DAVIS, OF NEAR HIGH POINT, NORTH CAROLINA.

CHURN.

SPECIFICATION forming part of Letters Patent No. 304,727, dated September 9, 1884.

Application filed September 12, 1883. (No model.)

To all whom it may concern:

Be it known that we, ELI HARRISON HAYWORTH and SANFORD LEANDER DAVIS, citizens of the United States, residing near High Point, in the county of Davidson, State of North Carolina, have invented certain new and useful Improvements in Churns; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to churns, particularly that old-fashioned style of barrel-churn having a dash vertically reciprocated by hand; and our said invention consists of a novel construction and arrangement of the parts, whereby to produce or give to the dash the necessary vertical oscillation, and at the same time to give to the same a rotary movement upon its axis.

The object of this invention is to so construct and arrange the parts that a direct and positive movement is given to the dash, and all sudden jerks and jars of the dasher-rod, as the same goes up and down, is avoided. The parts being simple of construction and few in number, the operation of churning is rendered easy of accomplishment and without the exercise of skill or labor.

Referring to the drawings forming a part of this application, and in which similar letters of reference indicate like parts in the several views, Figure 1 represents a perspective view of a churn-power constructed according to our invention as applied to operate the dasher of an old-fashioned vertical barrel-churn; Fig. 2, a sectional side elevation showing the dasher as in an elevated position; Fig. 3, a front, Fig. 4 a rear, and Fig. 5 a plan, view of the same. Fig. 6 is an enlarged detail view in sectional elevation of the mechanism arranged upon the end of the lever-arm to impart a rotary motion to the dasher-rod.

Upon a suitable base, A, arranged at one end to receive and hold the churn B upon a platform, A′, are mounted three uprights, C, C′, and D, which support the mechanism for operating the dasher-rod E. This operating mechanism consists of a wheel, F, journaled in bearings G between the uprights C C′; also between these uprights C C′, and encompassing the wheel F, is arranged to vertically reciprocate in bearings H in the said uprights a frame composed of two side pieces, I I, of like form, having lateral projections J J at top and bottom, which enter the bearings H, and by which said frame is held in position, and rollers K K, journaled between the side pieces, I I, above and below the center thereof, and above and below the bearing projecting bars J J. These rollers K K are arranged in such relation to the wheel F as to always rest against the same, for the purposes as will hereinafter appear.

L is a lever-arm pivoted at its central portion to the upright D, and connected at one end to the vertically-reciprocating frame I I, and at the other to the top end of the dasher-rod E. The connection with the frame I of this pivoted arm L is by a slot, *l*, in the end of said lever, into which is received a bar or pin, *l′*, which passes and is rigidly secured transversely through the top end of the frame I I. The connection of the lever-arm with the dasher-rod is as follows: Upon the top end of the dasher-rod is secured a head or part, M, which is pivoted at *m* to the arm L in a slot, N, in the end thereof. The dasher-rod passes loosely through this piece M, and has rigidly secured at its top end, in a horizontal position, a ratchet-wheel, O, which rests upon the top end of said piece M. By means of this wheel O and a washer, P, on the dasher-rod at the lower end of the piece M, the said dasher-rod is held in its proper elevated position.

Attached at each side of the end of the arm L are pawls Q Q, arranged or mounted in a vertical position upon bearings *q q*, and so as to engage at each side the teeth of the ratchet-wheel O. R R are springs arranged to impinge against said pawls Q Q and hold them in proper position against the ratchet-wheel. The object of this ratchet-wheel and pawls above set forth is as follows: The pawls being secured in a vertical right-angled position with relation to the arm, and having only a slight movement at right angles or transversely of the length of said arm, and by reason of the pivoted piece M, secured on the end of the dasher-rod, said dasher-rod has only a straight vertical movement. Therefore, as the arm L is

oscillated or moves up and down, the positions of the right-angled pawl or pawls at the end thereof are caused to assume an inclination with reference to the vertical position of the dasher-rod. As the said pawls alternately assume a right-angled and inclined position, as above set forth, or, in other words, as the ratchet-wheel O is by the oscillation of the arm L caused to move back and forth between said pawls, because of the contact of said pawls with the teeth of the ratchet-wheel alternately at opposite sides thereof, said wheel is caused to revolve in the direction of the arrow, and thereby carries with it the dashers. A rotary movement is therefore imparted to the dashers in addition to the usual necessary vertical movement. The operation of churning can therefore be quickly and thoroughly effected. The dasher-rod is supplied with two dashers, as shown at S S, arranged at right angles to each other, or so as to cause the cream to take opposite directions, as shown by the arrows. The butter-globules are therefore quickly and effectually broken down and the butter liberated therefrom.

The operation is as follows: Upon turning the crank T the driving-wheel F is caused to revolve, and because of the projections F′ thereof the frame I I is reciprocated or alternately driven upward and downward as the said projections successively ride or impinge against the rollers K K and force the frame alternately up and down. Because of these rollers resting flush against the periphery of the driving-wheel, whether they be at the top of the projection or in the hollow between the same, all knocking and jarring which would result because of the jumping of the projections of the wheel from one roller to another is avoided, and a smooth, steady, and regular movement is obtained, the vertically-reciprocating movement imparted to the pivoted arm L, which is caused to vibrate and carrying with it the dasher, thereby effecting the churning.

The churn is secured in position upon the platform by a piece, U, pivoted at *u*, which fits against the lower end of the churn, and a wedge, V, which is driven between a pin, *v*, and bevel end V′ of the pivoted piece U.

We claim as new and desire to secure by Letters Patent—

1. In a churn-power, the combination, with the frame A, vertical uprights C C′, having the longitudinal slots H H, and bearing for the axle G, and upright D, slotted at its top end, of the driving-wheel F, having the projections F′, frame I I, arranged at each side of said wheel and having rollers K K, which impinge against the wheel at the top and bottom thereof, and projections J J, which enter the slots H in the uprights C C′, and lever L, pivoted at its central portion in the slotted top end of the upright D, connected at one end to the dasher-rod and at the other to the frame I I, all as and for the purposes described and shown.

2. In a churn-power, the combination, with the pivoted lever-arm L and suitable means for oscillating the same, of the dasher-rod E, having a head, M, pivoted to the end of the said lever-arm L, ratchet-wheel O, secured upon the top end of the dasher-rod, pawls Q Q, arranged at each side of the lever-arm to impinge against the said ratchet-wheel and turn the same as the lever-arm is oscillated, and springs R R, arranged to impinge against the said pawls Q Q and keep them in position against the ratchet-wheel, whereby a rotary motion is imparted to the dasher-rod by the vertical oscillation of the lever, which imparts the usual vertical reciprocating movement to the dasher.

3. The combination, in a churn-power, with the wheel F, having projections F′, and frame I I, arranged in suitable bearings at each side of said wheel F, and vertically reciprocated by the same, having rollers K K, lateral projections J J at top and bottom, and pin *l′* at its top, of the centrally-pivoted lever-arm L, carrying at its outer end the dasher-rod, having a slot, *l*, in its end, into which the pin *l′* of the frame I is received, whereby the said lever is removably secured to the motive power, substantially as and for the purposes described.

In testimony whereof we hereby affix our signatures in presence of two witnesses.

ELI HARRISON HAYWORTH.
SANFORD LEANDER DAVIS.

Witnesses:
N. B. ORRELL,
ELSIE B. ORRELL.