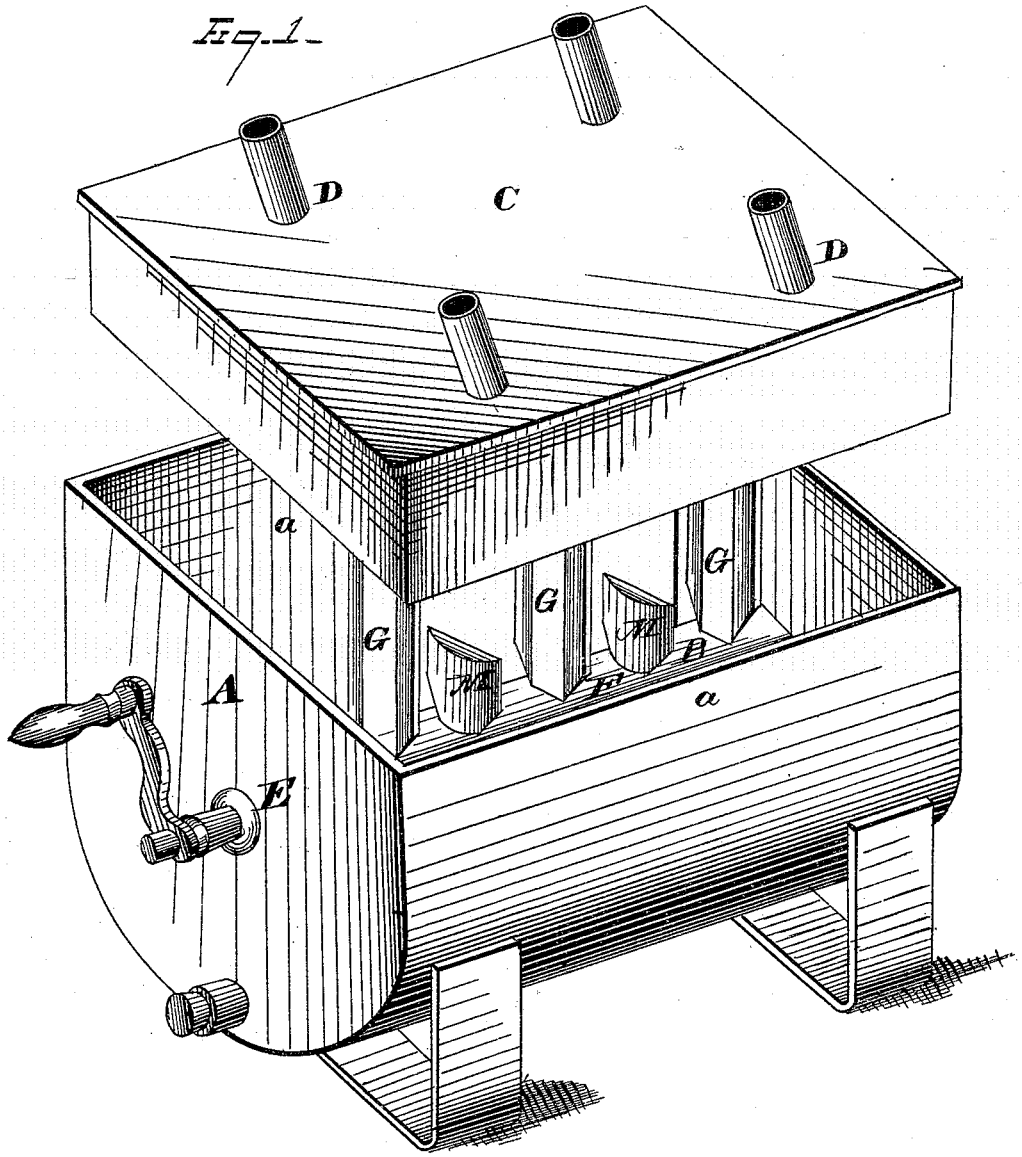
2 Sheets—Sheet 1.

D. L. WESTCOTT.

ROTARY-CHURN.

No. 191,210. Patented May 22, 1877.

Fig. 1.



WITNESSES

E. L. Nottingham

A. M. Bright

INVENTOR

Daniel L. Westcott,

By H. A. Seymour

ATTORNEY

2 Sheets—Sheet 2.

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Fig. 2.

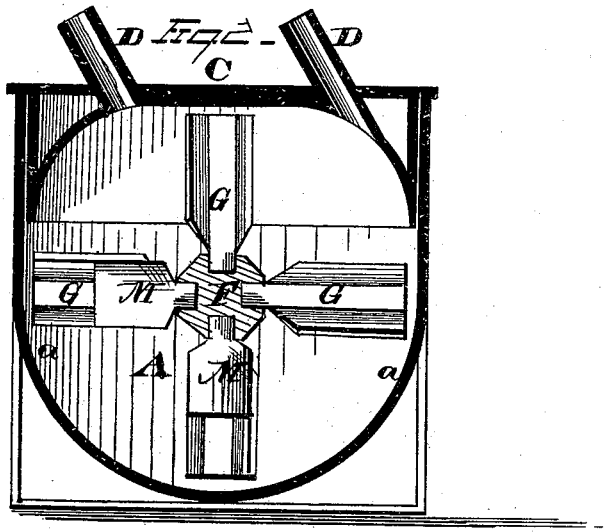


Fig. 3.

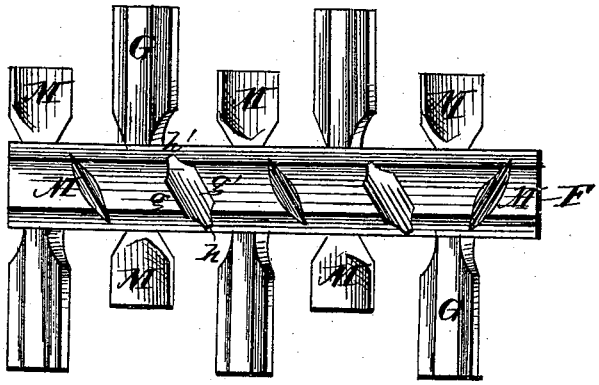
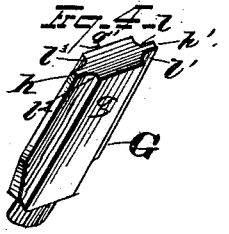


Fig. 4.



WITNESSES

Ed. F. Nottingham

A. W. Bright.

INVENTOR

Daniel L. Westcott.

By H. A. Seymour.

ATTORNEY

UNITED STATES PATENT OFFICE.

DANIEL L. WESTCOTT, OF FORT WAYNE, INDIANA.

IMPROVEMENT IN ROTARY CHURNS.

Specification forming part of Letters Patent No. **191,210**, dated May 22, 1877; application filed February 13, 1877.

To all whom it may concern:

Be it known that I, DANIEL L. WESTCOTT, of Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Churns; and I 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in churns, more especially to the class called "rotary churns," and is designed to provide a means for the easy, quick, and efficient production of butter. It consists in the parts and combination of parts hereinafter described and claimed.

Referring to the drawings, Figure 1 is a view in perspective of a churn embodying my invention, with its cover, the latter raised from its seat. Fig. 2 is a cross-section of the churn with its several parts in place. Fig. 3 is a view in elevation of the dash-wheel detached from the churn.

In constructing my churn, I make a semi-cylindrical box, A, with the sides *a* above the horizontal diameter rising perpendicularly to about the height of the completed cylinder, leaving it open above for the purpose of removing the wheel within when needful, and for convenience in manipulation. In this box I place a revolving wheel, B, horizontally and close the box with a cover, C, so made that the inside of the cover being concave and of about the same radial curvature with the box, completes internally the cylinder, and leaves but little or no vacant space around the wheel within. I also place in the cover tubes D for the necessary ventilation, these tubes being set inclined toward the course of rotation of the wheel in order to provide against spattering out the cream when the wheel is in motion. I also provide journals or journal-boxes E in the ends of this cylindrical box, for bearings for the revolving wheel within.

The revolving dash-wheel B constitutes the main feature of my invention, and is constructed with an alternate series of radial arms and short wings on each of the four sides of the axis F of the wheel. These several alternating series of respectively long sweeping arms and short flattened wings acting as different mechanical agitators in the disturbance of the cream, are especially adapted to the easy formation of butter, and are constructed in detail, as shown in Fig. 4.

The radial arms G are formed as oblong octagonal paddles, whose several faces are alternately straight and curved planes. The two faces $g\ g'$ of greatest cross-dimension, and the two faces $h\ h'$ of least cross-dimension, are severally straight plane surfaces, while the remaining four faces, $l\ l^1\ l^2\ l^3$, are plain curved or channeled surfaces, the dip or inclination of whose transverse central curvature is approximately forty-five degrees.

The working faces of each paddle-arm thus afford eight bruising or cutting surfaces of two different kinds, each alternating with the other, and this, together with the diagonal or inclined position of the arms relative to the axis F, causes a thorough agitation of the cream under the operation of churning. Each of these radial arms is attached to the single bearing-shaft F at an angle both to the axial length of this shaft, and also to the plane of its rotation, and each of the quadrilateral series of the arms are placed at different angles to the axis, so that each series is inclined approximately ninety degrees from the plane of the inclination of either of the series, respectively, on its two bounding sides.

Thus a quadrantal angle is formed between each two arms, respectively, on different and adjoining sides of the axial shaft F, and hence a circle, or line having an angular curve of three hundred and sixty degrees, is completed by the aggregate degree of inclination of each of the four series of diagonally-radial arms G. The short flattened wings M are interposed between each consecutive pair of the radial arms, and are of a like inclination, each longitudinal series of wings being in the same plane of inclination to the plane of axial rotation as is its alternating series of radial arms.

Each wing M is wedge-shaped, having its greatest cross-measurement at its junction with the bearing shaft F, and while its several working faces number eight, the same as the

radial arms, yet they are all straight plane surfaces and are not curved, channeled, or fluted, as are four of the arm-faces.

The homogeneous mixture of the cream is thus still further facilitated by having these short wings agitate the cream in the central portion of the churn, and on account of their inclined or beveled faces an added centrifugal force is thus imparted to the cream, which necessarily results in a greater disturbance and more thorough working of the cream.

The advantages materially dependent upon using my improvements will be at once recognized from the following explanation: It is well known that the philosophy of butter-making consists in the breaking or rupturing of the oil globules or sacs of fatty matter in the cream or milk, and exposing the fatty matter to the air, by which it is hardened and forms butter. It will now be readily seen that when the churn is fitted with this radial wheel of this peculiar construction, and the latter revolved rapidly, these ribbed arms will strike forcibly against the cream, and by reason of their numerous cutting or bruising edges will rapidly break up the oil globules; and as the air follows in along the little grooves formed by the four curved faces, whirling eddies will be produced in their rear, and becoming entangled with the cream this fatty matter at the moment of its breaking up will come at once in contact with the air. The result is a rapid formation of butter, which is further facilitated by the centrifugal force or motion given to the cream by the rotation of the peculiarly-armed wheel, the cream being thereby mixed equally throughout the whole mass, and on account of the form and fit of the churn no portion of the cream is left unchurned and thus lost, no corners or spaces being left inside wherein the cream can lie still, the wheels being also made of such dimensions as to fill, as nearly as possible, the space within.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A churn-dash, constructed with the oblong radial arms, whose two sides are wide plane surfaces, and whose edges are narrow double-grooved surfaces, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of February, 1877.

DANIEL L. WESTCOTT.

Witnesses:
THOMAS B. HALL,
F. O. MCCLEARY.