(No Model.)

J. D. NOBLE & B. F. METZLER.

CHURN.

No. 345,529. Patented July 13, 1886.

Fig. 1.

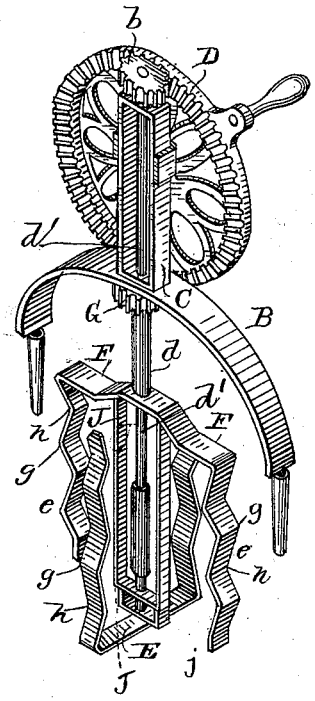
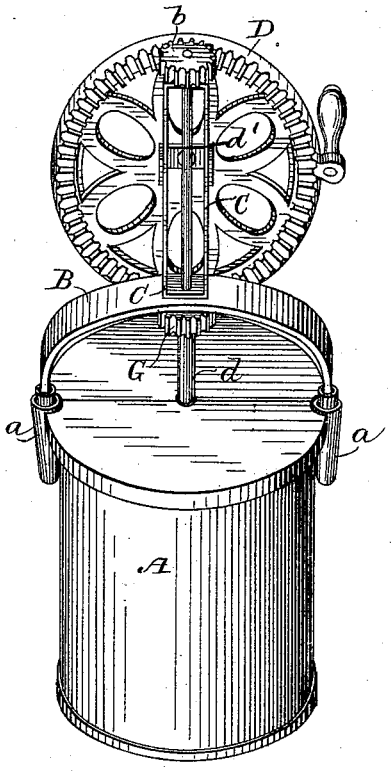


Fig. 2.



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CHURN.

SPECIFICATION forming part of Letters Patent No. 345,529, dated July 13, 1886.

Application filed March 22, 1886. Serial No. 196,135. (No model.)

To all whom it may concern:

Be it known that we, JOHN D. NOBLE and BENJAMIN F. METZLER, citizens of the United States, residing at Holden, in the county of Johnson and State of Missouri, have invented certain new and useful Improvements in Churns; and we do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to churns; and it has for its object to improve upon that class of churns in which dashers are arranged to rotate in opposite directions, one within the other, as will be fully understood from the following description, when taken in connection with the annexed drawings.

In the accompanying drawings, illustrating our invention, Figure 1 is a view of the dashers and their operating mechanism removed from the body of the churn; and Fig. 2 is a view of the churn complete, showing the parts in their proper relative positions.

Referring by letter to the said drawings, A indicates a churn-body, which may be of any suitable material and circular in form. This churn-body is provided at or near its mouth, and preferably at diametrically-opposite points, with external vertical socket-apertures, *a a*, to receive the opposite ends of the transverse bar which supports the dashers and their driving mechanism. This cross-bar B we have shown as curved upward longitudinally, or of bow shape, and have made it such for the purpose of convenience in attaining access to the churn-body and inspecting the cream therein.

C indicates a vertical frame, which is rigidly secured to the upper side of the central portion of the transverse bar B, and to which the drive-gear D is journaled. Through this frame C is passed the dasher-shaft *d'*, which has secured to its upper end a pinion, *b*, engaging the drive-gear, and its lower end, which extends a sufficient distance into the churn-body, is secured to the lower dasher-section, E. To the upper or transverse portion of the outer dasher-section, F, is fixed a tube, *d*, surrounding the dasher-stem *d'*, provided at its upper end with a pinion, G, which also meshes with the teeth of the drive-gear, and moves in a direction opposite to that of the upper pinion. Thus it will be seen that the dashers may be rotated in opposite directions, one within the other, at a rapid rate of speed. The dasher-blades are of a peculiar construction, and may be composed of strips of sheet metal or other suitable material, the upper one having its lateral vertical branches *e e* extending downwardly exterior and concentric to the inner dasher, which is of a smaller or less diameter, and bent inwardly and outwardly at regular intervals, so as to present alternate projections and depressions *g h*, the projections of one dasher corresponding in a transverse plane with the depressions of the other.

J indicates a dasher-section or rectangular frame, which is arranged within the dasher-section E, and is rigidly secured to the horizontal portion of the outer section, F. This auxiliary dasher-section J consists of broad vertical and straight dasher-strips, which are parallel to the axis of the dasher-shaft *d'*, and are connected below by cross-pieces, through which the shaft *d'* passes freely. This section J thus serves as an auxiliary dasher, and also as a means for steadying the outer dasher-section, F, and supporting it. It is rapidly rotated with the latter section, and in a direction contrary to the direction of rotation of the section E.

It will be observed that the action of the vertically crimped or corrugated strips on the cream is to forcibly agitate it and to induce counter-currents upward, downward, outward, and inward. At the same time the broad and thin blades, by reason of their angular or crimped form, afford a very large amount of dasher-surface in a comparatively short vertical space, and, being presented edgewise to their direction of rotation, they cut freely through the cream and rapidly effect the churning process. It will also be observed that the currents which are directed inward by the inner surfaces of the four limbs of the two dasher-sections E F, will be abruptly arrested by the vertical straight blades of the auxiliary dasher-section J, which latter is sustained at both ends, as clearly shown in the annexed drawings.

The cover is formed of two sections, so that

either section may be removed to inspect the cream.

We are aware that it is not new to provide a dasher-shaft with staples extending in opposite directions therefrom, and arrange around the same a wire which is bent so as to enter in loop form the spaces between the respective staples, the loop-wire and the staples being rotated in opposite directions. We are also aware that it is not new to have one waved dasher working within another, such dashers being formed with four rectangular branches from a solid piece of material; but we are not aware that any one has heretofore formed dashers from single strips of sheet metal, and arranged them one within the other with their vertical corrugated free branches in opposite directions, the upper horizontal portion of the outer section being secured to a pinion-sleeve, and the lower horizontal portion of the inner section being secured to the dasher-shaft.

Having described this invention, what we claim is—

1. In a churn, the combination of the dasher-section F, having broad and thin depending crimped or corrugated limbs, and mounted to rotate about a rotative dasher-shaft, the dasher-section E, having similar crimped limbs rising from a horizontal portion secured to the lower end of the dasher-rod, the intermediate frame, J, secured to the dasher-section F, and the devices for actuating said sections and frame, substantially as described.

2. The combination, with the churn-body and its bail, removably applied in socket portions on said body, and the frame C, secured to said bail and supporting the dasher-shaft and the driving-gear described, of the crimped dasher-section F, rotative about the dasher-shaft, the crimped dasher-section E, secured to the lower end of said shaft, and the inner auxiliary dasher-section, J, secured to said section F, and receiving freely through its lower end the dasher-rod, substantially as described.

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

JOHN D. NOBLE.
BENJAMIN F. METZLER.

Witnesses:
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