T. T. FFIRTH.

Rotary Churn.

No. 37,254. Patented Dec. 23, 1862.

Fig. 1

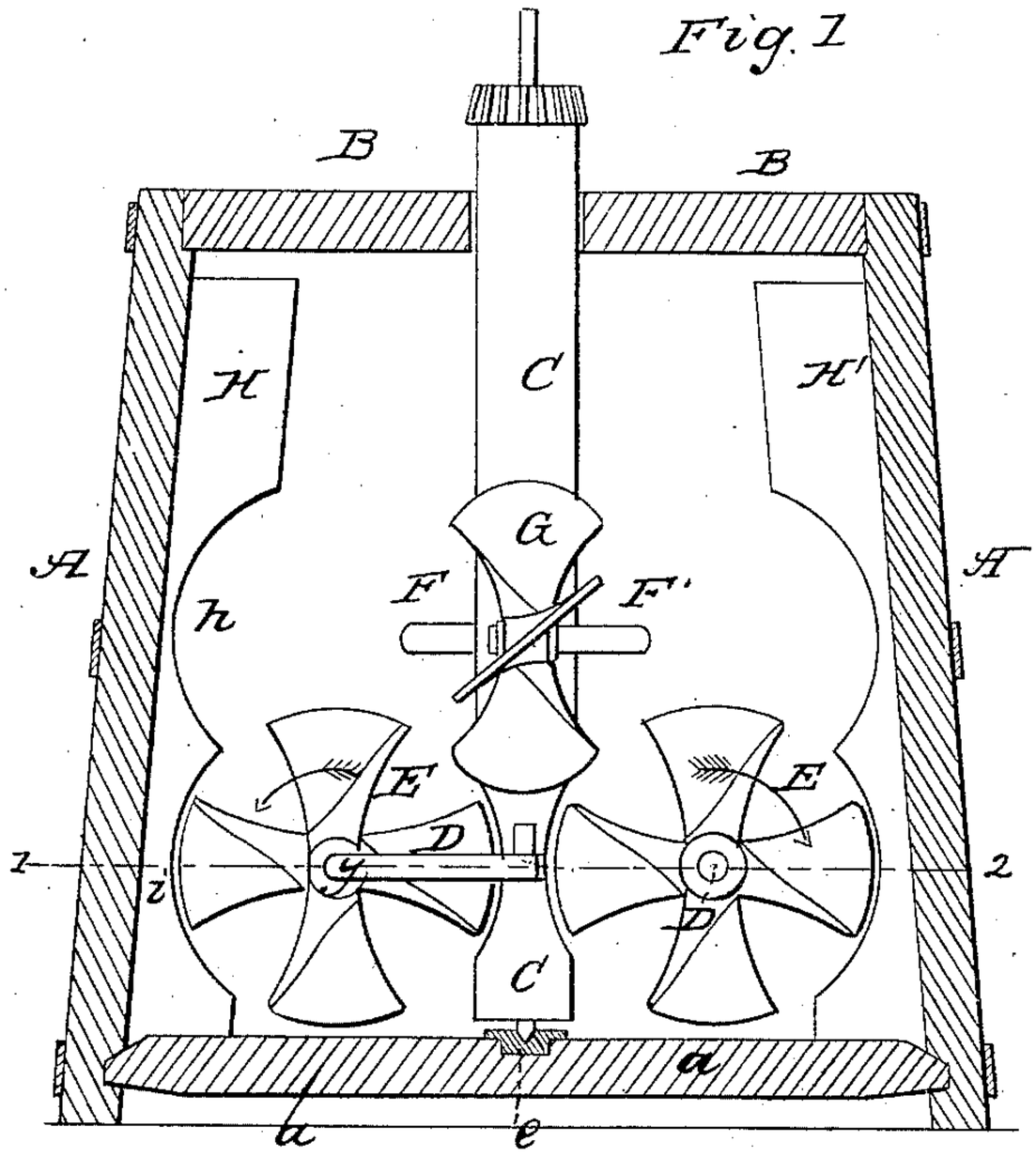
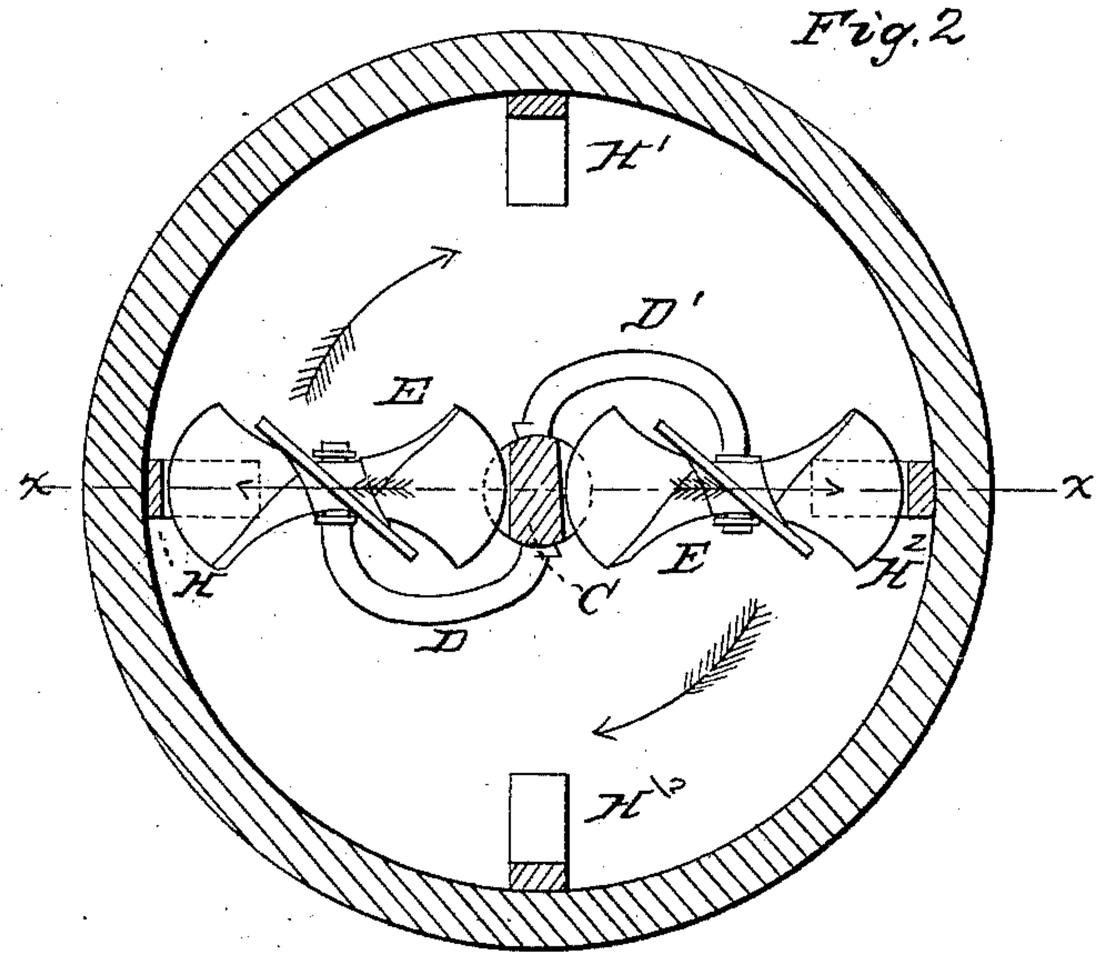


Fig. 2



Witnesses

Chas. E. Foster

Charles Howson

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T. T. Ffirth

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UNITED STATES PATENT OFFICE.

THOMAS T. FFIRTH, OF CAMDEN, NEW JERSEY, ASSIGNOR TO HIMSELF AND BENJAMIN L. WOOLSTON, ASSIGNORS TO THOMAS T. FFIRTH, ASSIGNOR TO HIMSELF AND G. W. ADLER.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. **37,254**, dated December 23, 1862.

To all whom it may concern:

Be it known that I, T. T. FFIRTH, of Camden, Camden county, New Jersey, have invented an Improvement in Churns; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of any suitable number of flutter or propeller wheels arranged to revolve in the direction described hereinafter, in combination with any convenient number of ribs which have concave recesses, and which are secured to the inside of the barrel, the whole being arranged and operating in the manner described hereinafter, so as to cause a friction and thorough agitation of the cream.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a vertical section of sufficient of a churn to illustrate my improvements, and Fig. 2 is a sectional plan.

A is the barrel of the churn, *a* being the base, and B the detachable cover through a central opening in which passes the spindle *c*, a pointed projection on the lower end of the latter turning in a step, *e*, let into and secured to the base *a* of the barrel.

To the spindle *c*, and near the lower end of the same, are secured the two bent arms D and D′, which bear the position illustrated in Fig. 2 in relation to each other. On the outer end of each arm a propeller or flutter wheel, E, with inclined blades, is allowed to revolve freely, a line, *x*, Fig. 2, drawn through the centers of the two wheels, coinciding with the center of rotation of the spindle *c*.

Above the bent arms D and D′, and to the spindle *c*, are secured two similar arms, F and F′, each carrying a propeller-wheel, E, similar to those below. A line, however, drawn through the centers of these wheels and through the center of the spindle, is at right angles to the line *x x*.

To the inside of the barrel A are secured the four ribs H, H′, H², and H³, which are situated at equal distances from each other. It will be observed that each rib has two concave recesses, *h* and *i*, the latter forming the segment of a circle somewhat larger in diameter than that of the outside of the flutter-wheels E, and the center of the circle being at *y*, Fig. 1, the same as the center of the wheel, so that the concavity thus formed will conform to the circumference of the wheels, which, as they revolve, will be very near to the rib without being in actual contact therewith. In like manner the concave recess *h* will conform and nearly coincide with the circumference of the upper flutter-wheels, G, without being in contact therewith as the latter revolve. The cream having been deposited in the barrel of the churn, a rotary motion in the direction of the arrow is imparted to the spindle *c* by a handle or any suitable system of gearing. As the spindle, with its propellers, revolves in the direction of the arrow, each propeller will revolve on its own axis, hence a thorough agitation of the cream must ensue; but this agitation alone would not be sufficient to separate the butter from the whey with the desired rapidity, hence the use of the ribs H, H′, H², and H³, with their concave recesses.

It is well known that butter is produced rapidly by the friction of the cream between two surfaces, which effect is produced in the present instance by the close contiguity of the revolving flutter-wheels with the concave recesses of the ribs H, H′, H², and H³. The flutter-wheels, owing to the inclination of the blades, revolve in the direction of the arrows, hence the cream is propelled from the center toward the sides of the barrel, and must be forced against the above-mentioned ribs in constant streams. By the combined action of the wheels and ribs, therefore, the cream is thoroughly agitated, and more or less fric-

tion imparted to it by the flutter-wheels as they pass in close contiguity to the concave recesses of the ribs.

I do not desire to claim, broadly, the use of flutter-wheels in churns; but

I claim as my invention and desire to secure by Letters Patent—

Any suitable number of flutter-wheels, E and F, when arranged to revolve in the direction shown, in combination with any convenient number of ribs, H H′, &c., and their concave recesses, the whole being arranged and operating as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOS. T. FFIRTH.

Witnesses:

HENRY HOWSON,

JOHN WHITE.