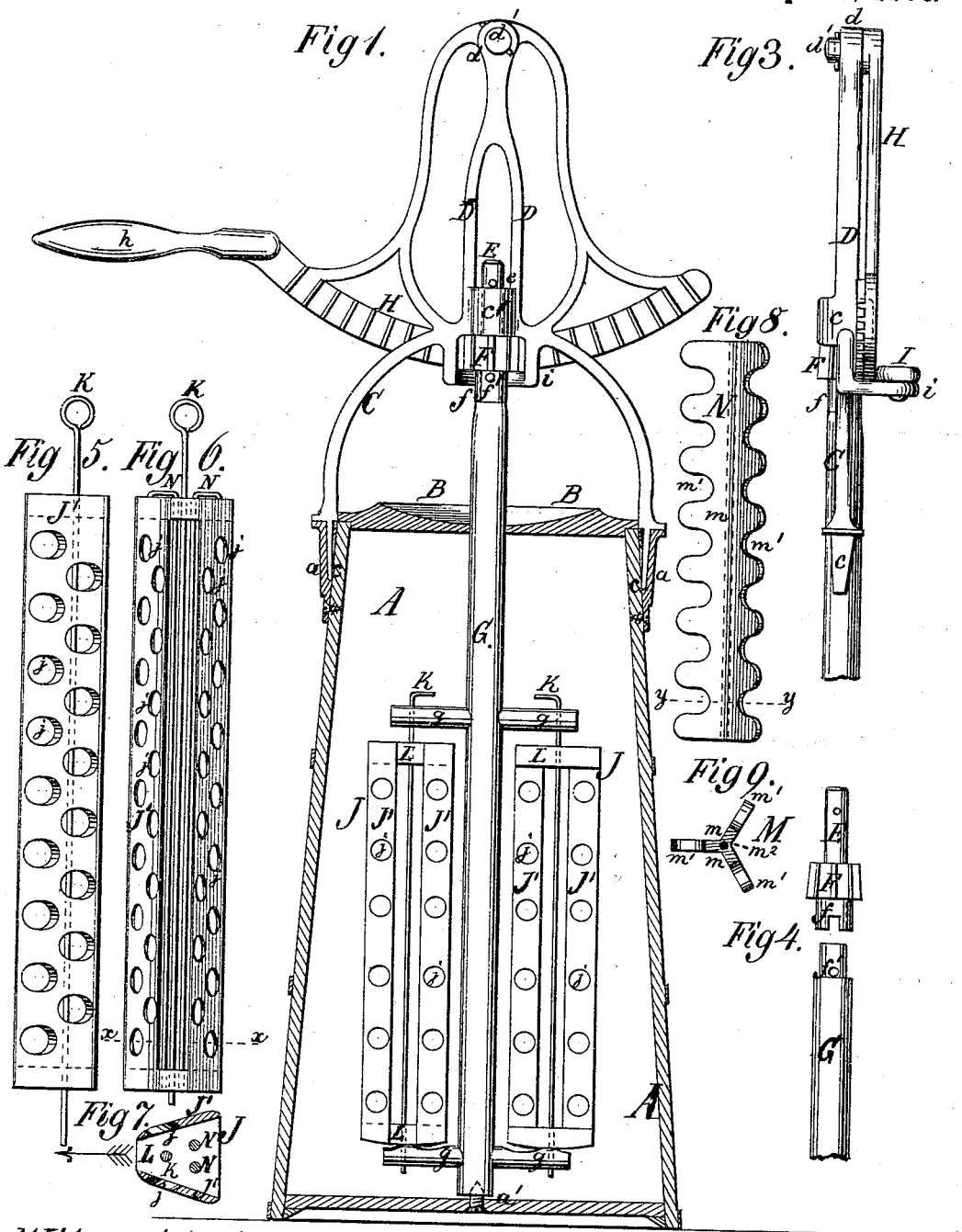
W. M. K. THORNTON.

CHURNS.

No. 182,001. Patented Sept. 5, 1876.



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UNITED STATES PATENT OFFICE.

WILLIAM M. K. THORNTON, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. **182,001**, dated September 5, 1876; application filed July 26, 1876.

To all whom it may concern:

Be it known that I, WILLIAM M. K. THORNTON, of the city and county of St. Louis, and State of Missouri, have invented a new and useful Improvement in Churns; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical central section of the tub of my improved churn, showing the parts in working order. Fig. 2 is a transverse section of the dasher. Fig. 3 is a side elevation of the parts by which the dasher is operated. Fig. 4 is a modification, showing the manner of connecting the dasher with its operating parts. Fig. 5 is an elevation of a dasher of somewhat modified construction. Fig. 6 is a front view of the same. Fig. 7 is a transverse section of the same in the line *x x* of Fig. 6. Fig. 8 is an elevation of a butter-gatherer, used after completing the churning operation. Fig. 9 is a transverse section of the same in the line *y y*.

The nature of my invention consists in the construction, combination, and arrangement of parts hereinafter described and specifically claimed, whereby a very durable, cheap, and efficient churn is produced.

The object of my invention is to effect the churning and gathering of butter more rapidly and perfectly, and to make the operation of handling and cleaning the parts more convenient.

To enable others skilled in the art to understand my invention, I will proceed to describe it.

In the accompanying drawings, A represents the tub of the churn, covered by a lid consisting of two halves, B. Diametrically opposite each other, at or near the top of the tub A, are two sockets, *a*, made, by preference, of metal, and fastened to the sides of the said tub in a convenient manner. The sockets *a* receive the shanks *c* of a bail, C, which supports the dasher motion. The said bail C has a boss, *c'*, between two curved uprights, D, which end in a boss, *d*, with a horizontal pivot-pin, *d'*, through it. The boss *c'* is provided with a bearing for a vertical shaft, E, which is prevented from falling out of its bearings by a pin, *e*, or other similar means, and which, below the boss *c'*, is provided with a beveled pinion, F, and a socket, *f*. The socket *f* receives the shaft G of the dasher, with which it is rigidly connected by a pin, *f'*. The pinion F is driven by a toothed sector, H, which is supported by the pivot-pin *d'*, and provided with a handle or crank, *h*. The plain back of the sector bears against a steady-wheel, I, which is pivoted to a yoke-shaped bracket, *i*, attached to the bail C. The dasher consists of a shaft, steadied by a center pin, *a'*, at the bottom of the tub A, with two horizontal cross-arms, *g*, between which bottomless troughs J are pivoted by means of rods K. The said rods K pass through the arms *g* and the V-shaped connecting-boards L of the trough-boards J', and thus permit the said troughs to freely revolve. The centers of revolution of the troughs J on the bearings *l* in the boards L for the rods K are placed much nearer to the converging ends of the boards L than to their diverging ends, and by which the troughs are thrown out of balance. In consequence of the said construction the converging ends of the boards L always present "front" in their operation, or the closer edges of the side boards J' are ahead, as shown by an arrow in Fig. 7. The boards J' are provided with one or more rows of holes, *j*, made obliquely in the said boards, so that their center lines will meet at the rear of the trough. This construction of the holes *j* facilitates the motion of the troughs J through the cream, as the cream passes more rapidly and almost withou friction through the said holes. By sharpening up the front edges of the boards J', the friction of the dashers is still more reduced.

For gathering the butter, the troughs J are removed, and the butter-gatherers M put in their places. The said butter-gatherers M consist of three-winged boards *m*, with scalloped front edges m^1, and central holes m^2 for the insertion of the rods K, around which they swing or turn freely.

The dash-boards J may be provided with rods N, fastened between the boards L, to increase the number of currents created by the operation of the dash-boards, and thereby accelerate the formation of butter.

Operation: The tub A is filled two-thirds of its capacity with cream; the lids B are put in their places, and the handle *h* is moved up and down by the operator, thereby creating a number of alternate revolutions of the dasher to the right and left. The troughs J being overbalanced, they right themselves immediately at each reversed stroke of the sector H. The cream at and around the holes *j* is forced through the same in a number of currents, which have a very small allowance of space and time for reuniting, as they divide in the same manner in quick succession. The operator, in moving the sector back, causes the revolutions of the dasher to be reversed, and thereby prevents in time the inefficiency of the dasher created by the bodily revolution of the cream, and currents of great impetus, which are repeatedly united and separated and thrown upon each other, form innumerable eddies of very small compass, whereby the curd is so minutely broken up as to be very readily separated from the adhering atoms of butter, which, in rising toward the surface, unite in small lumps and clods, thereby notifying the operator that the churning is perfected. The operator now removes the dasher motion by taking the bail C from the sockets *a*. The lids B are then removed, and the shaft G taken from the tub. The troughs J are removed, the butter-gatherers M put in their places, and the shaft G inserted into the cream again. The dasher-motion is now put in place again, and the lids B are put upon the tub A. The operator sets the machine in motion, and the butter-gatherers, being balanced, but meeting with less resistance near the shaft G than near the inside periphery of the tub A, revolve around their own axes in a direction opposite to that of the revolving shaft G, according to well-known mechanical laws. The gyrations of the butter-gatherers cause the heavier parts of the cream to be dashed out of the way, while the lighter particles of butter are crowded into the corners near the center of the gatherer, to which they adhere, congregating gradually in big lumps. The scalloped edges of the butter-gatherers serve to keep the finely-divided particles of butter and curd separated, and prevent a massing and sinking down of butter-loaded curd in the milk. When the curd is freed from the butter, the operator removes the shaft G, with the butter-gatherers, from the machine in the above-described manner, and then secures the butter.

It is evident that as there are neither inclined floats nor guides, nor any vertical motion of the troughs, the agitation of the cream is entirely devoid of bubbling, squirting, and surging; but it simply consists in a swift motion of the cream in a horizontal direction, which does not prevent the rising of the lighter particles.

The more skeleton-shaped the troughs are the better they work.

By placing rods N between the dash-boards I subdivide the currents created by the holes *j*, and enhance the efficiency of my machine, especially when it is of large size.

The trough and the butter-gatherers might be altogether made of metal, but I prefer wood, on account of its cheapness, and because it does not corrode.

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

1. The dasher J, constructed, as described, in angular form, and pivoted to the arm *g* of the vertical shaft G, which has a number of revolutions, alternately, in right and left directions, substantially as and for the purpose set forth.

2. The dasher J, constructed of the diverging and converging sides J′ J′, adapted to automatically turn upon rods K, in combination with the shaft G, substantially as and for the purpose described.

3. In a churn, the combination of the shaft G, provided with arms *g*, pivoted dashers J J, and segment H, substantially as and for the purpose described.

4. In a churn, the combination of the shaft G, arms *g*, and removable rods K, whereby the troughs J may be substituted by butter-gatherers M, and vice versa, substantially as and for the purpose set forth.

Witness my hand in the matter of my application for a patent for an improved churn this 24th day of July, 1876.

WILLIAM M. K. THORNTON.

Witnesses:

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