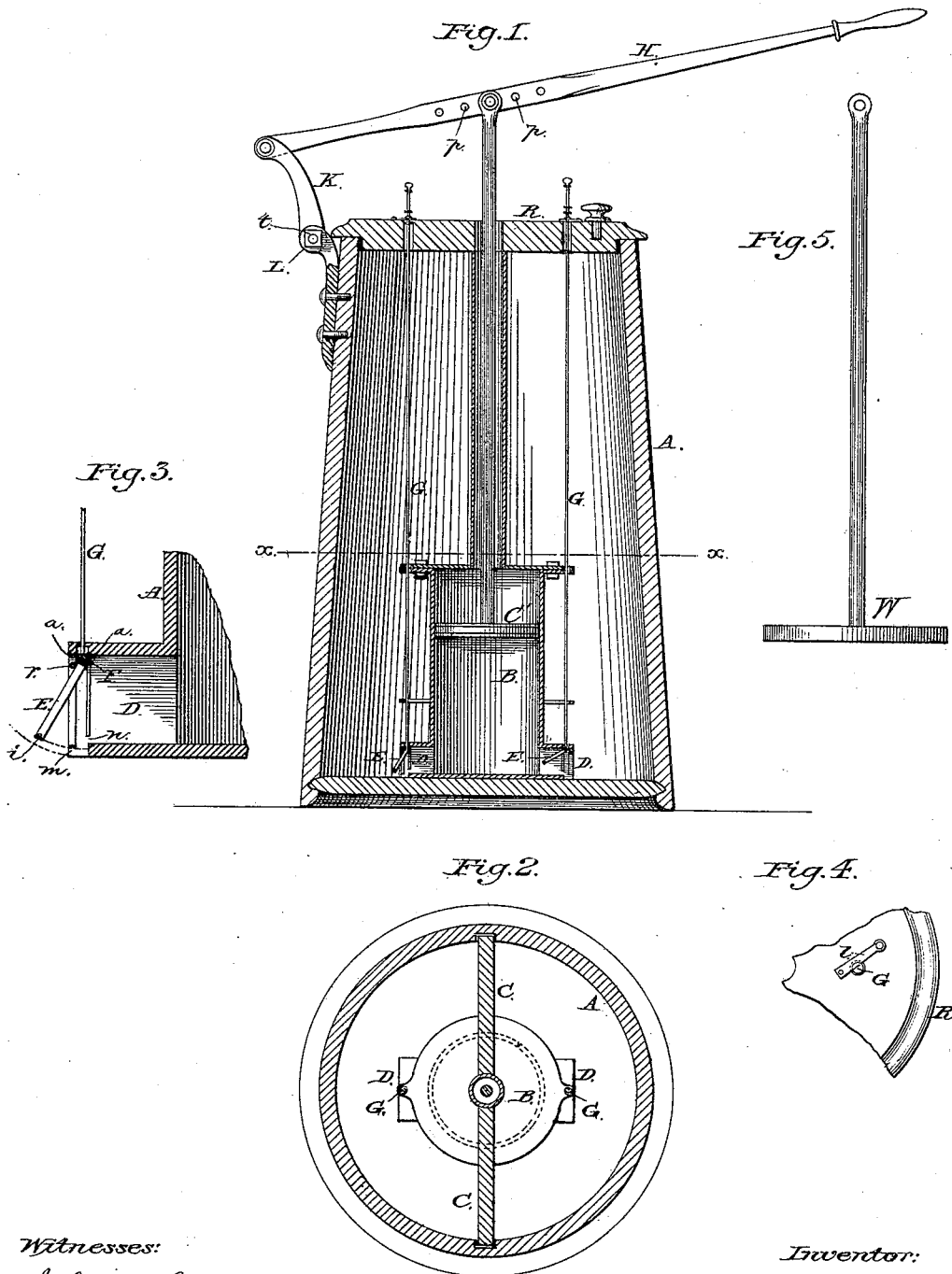


(No Model.)

B. S. MILES.
CHURN.

No. 262,810.

Patented Aug. 15, 1882.



Witnesses:

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BRADFORD S. MILES, OF GRAY'S SUMMIT, MISSOURI.

CHURN.

SPECIFICATION forming part of Letters Patent No. 262,810, dated August 15, 1882.

Application filed June 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, BRADFORD S. MILES, of Gray's Summit, Franklin county, Missouri, have invented certain new and useful Improvements in Churns; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to an improvement in upright dasher-churns, and is based upon the idea of forcing primarily all the milk or cream once or twice through a small aperture, so as to insure an equal agitation of each and every particle thereof.

It consists in the combination, with the churn, of a pump secured in an upright central partition, which divides it into two compartments, but is detachable and removable from the churn. By the use of the pump all of the milk and cream is forced violently from one side of the partition or one compartment of the churn to the other and then back again through a small aperture until all the globules are broken. The partition may then be removed with the pump and the butter assembled by means of an ordinary dasher adapted to the churn.

In the accompanying drawings, Figure 1 is a central vertical section through the churn and pump; Fig. 2, a transverse section in line *x x* of Fig. 1; Fig. 3, an enlarged sectional view of one of the pump-valves and valve-boxes; Fig. 4, a detached view of a section of the top of the churn, showing the catch for holding the valve-rods; and Fig. 5, an elevation of a dasher to be used when the pump is withdrawn.

A is the body of the churn, of the usual cylindrical upright form; B, a direct-acting pump, secured centrally in a vertical partition, C, sliding in ways or grooves formed in or upon the inside of the churn at diametrically-opposite points, so that the partition, when inserted in the grooves, shall bisect the interior of the churn, dividing it into two compartments of equal size. The pump-cylinder B is secured in the partition C, and is fitted with valve-boxes D D, arranged on opposite sides of the cylinder, near to the bottom thereof. The outer face of each valve-box D is adapted to receive a vertical valve; E, pivoted at the top to a cross-

bar, F, (see Fig. 3,) sliding up and down in grooves or ways *a a*, formed on either side of the port between cleats secured to the sides of the box. Pins *i i* project from the lower portion of each valve into the grooves, and the cleats are cut away at *m* and *n*, Fig. 3, so that when the valve is lowered by means of the cross-bar until its pins register with the lower slots, *m*, the valve will be free to open outward but not inward, and when raised to register with the upper slots, *n*, it may open inward but not outward. The raising and lowering of each valve sufficiently to control the direction in which it may move is effected by means of a rod, G, projecting upward from the cross-bar F through the cover of the churn, as shown in the drawings, and which is held in either position when raised or lowered by means of a latch, L, adapted to engage notches in the side of the rod, as shown in Fig. 4. A pin or stop, *r*, is fixed immediately below the point reached by the cross-bar F in such proximity to the valve as that when the valve is lowered far enough to allow it to swing outward its movement in opening shall be arrested by said stop, so that it may open but a short distance, leaving a small discharge-way. By lowering the valve to the full extent, however, so as to bring its hinge on a line with the stop, the valve will be free to open widely outward. A piston, C', completes the pump. The upper end of the piston-rod, led through the cover of the cylinder, is pivoted to a lever, H, which is hinged at one end to the end of an arm or bracket, K, secured to the side or top rim of the churn. This arm or bracket K is jointed in its length to permit its outer end to be swung to or from the churn, the pivoted joint at L being secured, when properly adjusted, by means of a thumb-screw, *t*. This adjustment of the fulcrum of the lever permits it to be lengthened or shortened at will to suit the strength of the person who is to work the churn, the pivotal adjustment of the end of the piston-rod to the lever being regulated as required by means of a series of pivot-holes, *p p*, in the length of the lever, adapted to receive the detachable pivot-bolt by which the rod is connected to the lever. The churn is covered by a lid or cover, R, properly fitted thereon.

In using the churn thus simply constructed the partition C, with the pump secured thereto,

is inserted in position, dividing the interior of the churn into two compartments. Into one of these—that adjacent to the inlet-port of the pump—the milk and cream is poured. The cover is then slipped on over the piston-rod and the ends of the valve-rods and secured, and the piston-rod is coupled with the lever H. The valves are now adjusted by means of the rods G, so that the pins on the valve on one side shall register with the upper slots, *n*, to open inward, the adjustment of the other valve being so made that it may open outward, but shall strike the stop-pin *r*, and thus leave but a small discharge-way. The pump being worked by the movement of the lever, all of the milk and cream is thrown thereby with great pressure and violence from the one compartment into the other, being forced through the restricted discharge-port and dashed against the sides of the second compartment, or against a plate inserted therein, in such manner as to break up the buttery globules. When the compartment on one side is thus emptied the adjustment of the valves is changed, so that their movements shall be reversed, the induction-valve being left free to open wide and the discharge-valve but a little, enabling the operator, as before, to apply heavy pressure upon the cream in driving it through the pump. All of the cream and milk, at the proper temperature, is thus churned back and forth from one compartment to the other and then back again until the buttery globules are all broken up. The discharge-valve is then to be pushed down to clear the stop *r* and opened wide, so that the cream shall pass through with less pressure; and, finally, the pump and partition are removed and a plain perforated dash, W, in-

serted into the churn in place thereof. By the use of this dash the butter may be properly gathered and separated from the buttermilk. The dash is operated either directly by hand or it may be connected with the lever H and worked thereby.

I claim as my invention—

1. The combination, in a churn, with a vertical partition adapted to divide the churn into two compartments, of a pump fitted in said partition, having its inlet and outlet ports on opposite sides thereof and controlled by reversible valves, substantially as herein described.

2. In a churning apparatus, the combination, with the body or cylinder of the churn, of a detachable partition, C, carrying a pump, B, a dash, W, interchangeable with said partition and pump, and a pivoted lever, H, adapted to operate the pump or dash, all substantially in the manner and for the purpose herein set forth.

3. The combination, with the pump B, interposed between the compartments in the churn A, of the adjustable valves E, cross-bars F, from which the valves are suspended, adjusting-rods G, actuating the cross-bars, pins *i i* on the ends of the valves, grooves *a a*, engaging said pins, and lateral slots *m n*, permitting the pins to pass out from the grooves, all substantially in the manner and for the purpose herein set forth.

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

BRADFORD S. MILES.

Witnesses:

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