(No Model.)

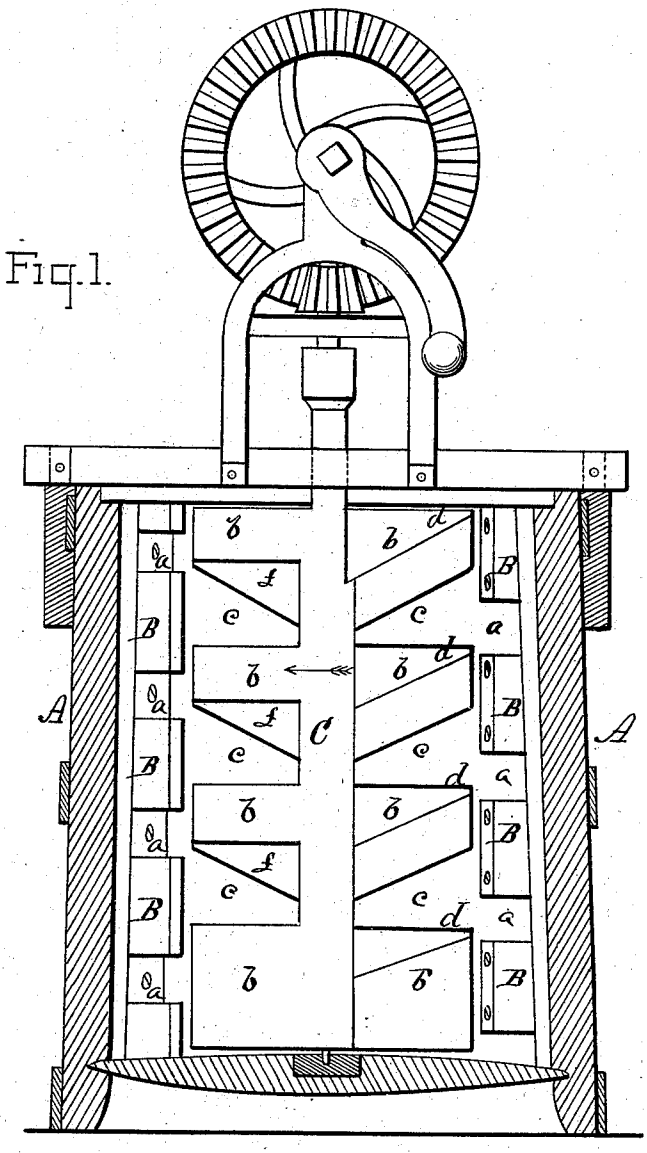
2 Sheets—Sheet 1.

V. STIREWALT.

CHURN

No. 257,902. Patented May 16, 1882.

Fig. 1.



WITNESSES

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INVENTOR,

Valentine Stirewalt

By J. S. Brown,

his Attorney.

(No Model.) 2 Sheets—Sheet 2.

V. STIREWALT.

CHURN

No. 257,902. Patented May 16, 1882.

Fig. 2.

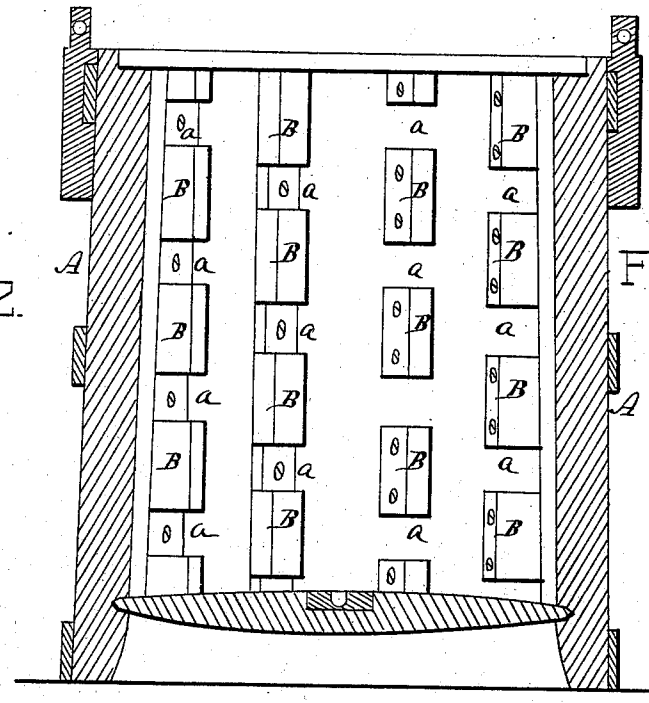


Fig. 4.

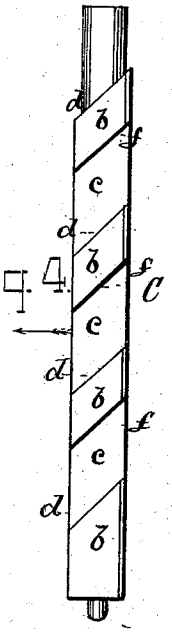


Fig. 3.

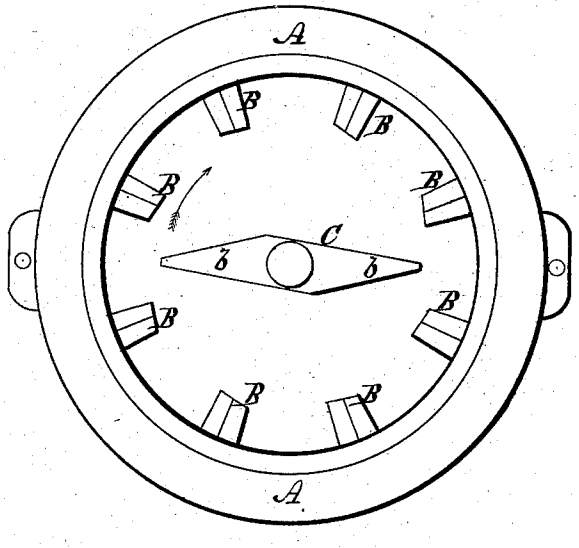
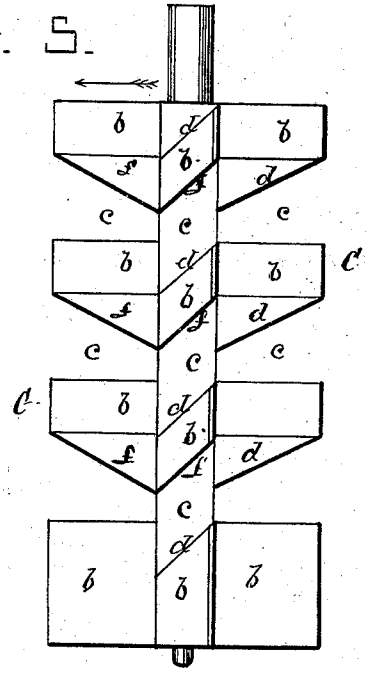


Fig. 5.



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UNITED STATES PATENT OFFICE.

VALENTINE STIREWALT, OF DAVIDSON COLLEGE, NORTH CAROLINA.

CHURN.

SPECIFICATION forming part of Letters Patent No. 257,902, dated May 16, 1882.

Application filed December 12, 1881. (No model.)

To all whom it may concern:

Be it known that I, V. STIREWALT, of Davidson College, in the county of Mecklenburg and State of North Carolina, have invented an Improved Churn; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a central vertical section of a churn-body constructed with my improvements, the dasher and other parts of the churn being shown in elevation; Fig. 2, a central vertical section of the churn-body; Fig. 3, a horizontal section of the churn through the churn-body; Fig. 4, an edge view of the dasher; Fig. 5, a side view of a dasher, showing a modification of the construction.

Like letters designate corresponding parts in all of the figures.

My invention belongs to the class of rotary-dasher churns.

In a former patent granted to me February 12, 1861, No. 31,413, I represented and described improved deflectors attached to the inner surface of a vertical cylindrical churn-body, the said deflectors consisting of vertical cleats arranged at regular distances apart, and each broken with openings or notches arranged along their length, so disposed that the openings of any one are horizontally opposite to unbroken portions of adjacent cleats, thereby causing the currents to continually deflect first upward and then downward, and to cross one another and produce intense agitation of the cream and intermingling air therewith. In my present invention I employ similar cleats or deflectors, B B, with notches *a a*, on the inner surface of the churn-body A, as one element of the organization; but I employ an entirely different construction of dasher C in connection with these cleats, as follows: The dasher is made solid in the middle, along the axis or shaft, while the wings thereof have alternate blades *b b* and notches or intermediate spaces *c c*, the blades extending radially, or nearly so, outward, nearly but not quite reaching to the cleats or deflectors B B. The upper and lower surfaces of the blades which bound the intermediate spaces are inclined substantially as follows: The forward faces, *d d*, on each wing all incline downward and forward, as shown in Figs. 1 and 4, or the opposite, if preferred, the particular direction not being important, while the rear faces, *f f*, are nearly or exactly parallel with the front faces, thus inclining the intermediate spaces *c c*. When they incline as shown and just described they cause currents of cream to ascend obliquely between the buckets; but if the surfaces should incline in the other direction they would cause the cream-currents to descend, as if the dasher were turned in the opposite direction from that indicated by arrows in Fig. 3. The motion of the currents thus produced is to be immediately reversed by some means. If there are only two opposite wings to the dasher, as shown in Figs. 1 and 3, or even if there were three, all the buckets are inclined in the same direction, thus all lifting or all depressing the cream simultaneously; and there is space enough between the wings, or both or all sides, to allow the currents of cream to reverse by gravity between the successive wings; but if there are four wings of dashers, as shown in Fig. 5, (or more than four,) then the wings would follow one another so quickly that gravity could not be relied on to reverse the currents in the intervals. In such case, instead of having all the buckets incline alike, I make the buckets on one wing incline one way and those of the next wing the opposite way, and thus all around the circle, so that the currents of cream are alternately forced upward and then downward by positive action. This construction is shown in Fig. 5. There should in such case be an even number of wings.

With the above described construction of the dasher, in combination with the cleats on the churn-body, I produce, in addition to the cross-currents caused by the notched cleats effected in my former invention, also very active and forcible cross-currents between the blades of the dasher, while the centrifugal currents between the dasher and cleats are maintained, notwithstanding that the dasher is revolved with less resistance and expenditure of power than if solid or entire. Three sets of different and powerful alternating currents are thus produced by this simple construction. The dasher may be cut from wood or cast in metal, and made very cheaply.

The combination of this peculiar dasher with the churn-body having the inside cleats and

notches therein, as above set forth, produces a peculiar and improved effect. While the cleats alone produce alternate ascending and descending currents of cream, crossing one another, and thereby greatly agitate the cream subjected thereto, and effectually mingle air therewith, yet the mass of the cream inside of the cleats passes round without much agitation, and the operation of an ordinary dasher only serves to dash the cream against and between the cleats. On the other hand, while my improved dasher produces a similar crossing and intermingling of the currents of cream, yet, without the cleats or their equivalent, this motion of the cream, produced simply by the dasher, would be comparatively weak and ineffectual, because of the motion imparted to the body of the cream by the dasher, which would carry it round and round with itself; but by combining the two not only the aggregate effects of the two are produced, but much more, for then the resistance offered by the cleats to the carrying round of the cream in a body makes the dasher action on the cream forcible and effectual, while this resistance also increases the effect of the cleats. The two make a combined result superior to that of any other churn known to me.

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

The combination of the dasher C, constructed with sets of blades *b b*, having inclined surfaces and alternating spaces *c c*, as described, and the churn-body A, constructed with vertical cleats B B on its inner surface, the said cleats being broken or interrupted by cross notches or spaces *a a*, the notches of one cleat alternating in position with those of adjacent cleats, substantially as and for the purpose herein specified.

The foregoing specification signed by me this 4th day of October, 1881.

VALENTINE STIREWALT.

Witnesses:

JNO. D. BROWN,

F. J. KNOX.