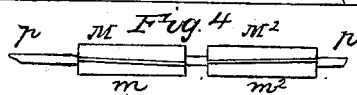
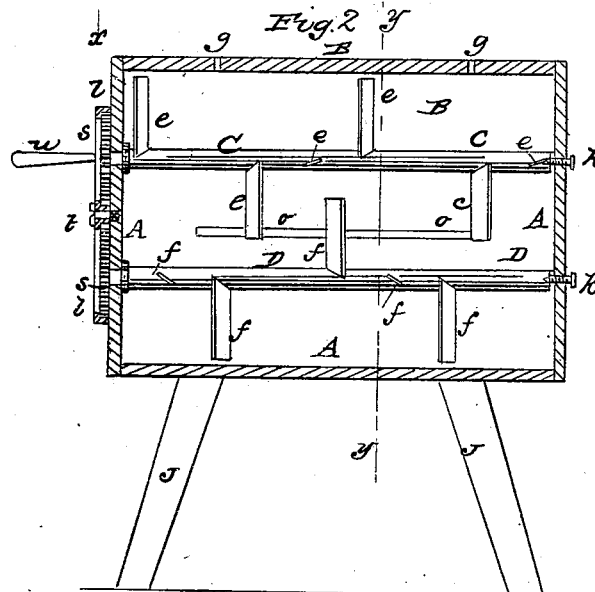
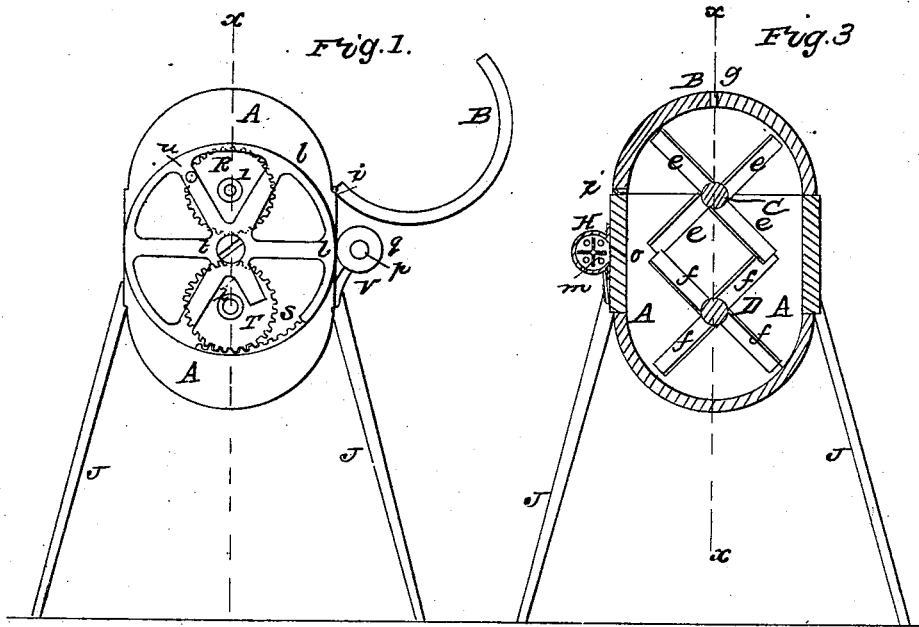


J. RANKIN.

Churn.

No. 52,075.

Patented Jan'y 16, 1866.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

JOHN RANKIN, OF NEW YORK, N. Y.

## IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. 52,075, dated January 16, 1866.

*To all whom it may concern:*

Be it known that I, JOHN RANKIN, of New York, of New York county, in the State of New York, have invented certain new and useful Improvements in Churns; 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.

My invention has for its object to provide a churn which will churn butter with greater facility and expedition than churns heretofore used, and which at the same time shall be simple and durable in its construction, and easily cleaned; and to these ends my invention consists in the use of a box or case nearly cylindrical in form, and having arranged within it two dasher-shafts provided with dashers placed in helical form and arranged to screw or feed in opposite directions, all as hereinafter more fully explained; and my invention further consists in the use of an oblong fan-blower, in connection with and outside of the churn-box, and so arranged with and adapted to the said churn-box and the driving-machinery as to cause a blast of air to be forced in (through a long slot in the side of the box) a thin sheet to the lower part of the churn-box and into the mass of cream contained therein, all as hereinafter more fully explained; and my invention further consists in the combined arrangement of the driving-gears and fan-pulley, as hereinafter set forth, whereby the several parts are put in motion from the main driving-wheel; and my invention further consists in the employment on the fan-shaft of two sets of helically-arranged fans for the purpose of inducing to a concentration of the blast nearer the center of the churn-case, as hereinafter more fully described.

To enable those skilled in the art to make and use my invention, I will proceed to describe fully the construction and operation of one of my improved churns, referring by letters to the accompanying drawings, in which—

Figure 1 is an end elevation of my improved churn. Fig. 2 is a longitudinal section at the line *x x*, Fig. 1. Fig. 3 is a vertical cross-section at the line *y y* of Fig. 2, and Fig. 4 detail view of blower-shaft.

In the several figures the same part is designated by the same letter of reference.

A is the case or box of the churn, which may be supported on suitable legs J J, &c., and B is the lid or cover, which is hinged at *i*, and opens in the manner illustrated at Fig. 1, and is provided with vent-holes *g g*, for the escape of the air forced into the case by the blower. As will be seen, the contour of the case or box A in cross-section is oblong, its top and bottom being semicircular.

C and D are two dasher-shafts running longitudinally within the case A and mounted to turn freely in their bearings at each end. On the shaft C are arranged a series of fans or beaters, *e e*, &c., which are so placed on said shaft and so shaped as to constitute a sort of screw, which, when the shaft is rotated, will operate to force or feed the contents of the box A in a given direction from one end to the other of said box. On the shaft D are similar fans or beaters, *f f*, which, however, are arranged to screw or feed in the opposite direction to those on shaft C. Each of said shafts is mounted at one end on the taper end of a set-screw, *k*, and at the other end in a socket formed in the stud or short shaft 1 2. On each of said studs 1 2 (which turn freely in their bearings in the end of the case A) is fastened, outside of the box A, a spur-gear, R and T, and these gears R T engage with or mesh into an internal or rim gear, S, which is formed on the inner face of the main driving-wheel *l*. This wheel *l* is mounted to turn freely on a stud or pin, *t*, which projects from the end of box A. (See Figs. 1, 2.) The said wheel *l* may have a suitable handle, *u*, by which it is turned in the usual manner.

In one side of the box or case A is cut a long slot, *o*, and over this slot, on the outside of the case, is placed a cylindrical blower-case, H, which is arranged to lift out of its seat, or retaining-straps at pleasure. The shaft *p* of said blower extends some ways beyond one end of the case H, and is supported where it projects by a stand, *r*, and the end of said shaft is provided with a small pulley, which runs against the outer face or periphery of the main wheel *l*, and which is rotated or driven through friction with the latter.

*m m*<sup>2</sup> are two sets of curved or helical vane on the shaft *p* of the blower, which vanes are so curved and arranged as to induce to a feeding or forcing of the blast somewhat toward

the center of the cylindrical case H, and consequently insure the full discharge of the blast down through the slot *o* in the box's side.

It will be seen by reference to Fig. 3 that the beaters *e* and *f* on shafts C and D sweep round in circles concentric to the circles of the top and lower portions of case or box A, and so as just to clear them, and also so as just to clear the said shafts C D, so that when both shafts are in motion, with their numerous beaters, *e* and *f*, the whole space within the case or box A is filled with or occupied by beaters, the two sets feeding in opposite directions, and producing the greatest possible agitation in the mass of cream, and while the mass of cream is thoroughly agitated in consequence of the arrangement of the two screw-dashers and the peculiar shape of box A, a long and continuous sheet of blast is forced down through the inclined slot *o*, (see Fig. 3,) which will completely intermingle with all the particles of the whole mass of cream to the greatest possible extent and with the greatest advantage.

It will be observed that the shafts C and D are so arranged that by simply turning back the set-screws *k* one or both of said shafts may be lifted out of the box for cleaning purposes, &c., without in the least interfering with or deranging the driving mechanism.

By the arrangement, as shown, of the internal driving-gear, S, and friction-face of wheel *l* with the gears R T and pulley *q*, it will be seen the whole driving mechanism is rendered compact and effective, and any and all belts or bands dispensed with.

Having fully described the construction and operation of my improved churn, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The use of a case or box, A, of a nearly cylindrical form, substantially as described, in connection with the two screw-dashers, the whole arranged to operate in the manner and for the purposes set forth.
2. Introducing a blast of air in a sheet through a long slot in the side of the box A, and by means of a blower, substantially as described.
3. The use of the internal gear, S, friction-face wheel *l*, gears R and T, and friction-pulley *q*, the whole combined and arranged to operate as and for the purposes set forth.
4. The employment of a double set of vanes, *m m'*, in the shaft *p* of the blower, whereby a tendency is created in the blast to concentrate somewhat toward the center of the slot *o*, substantially as and for the purposes set forth.
5. Making the slot *o* inclined or oblique in cross-section, so as to tend to conduct the sheet of blast downward into the mass of cream.

In testimony whereof I have hereunto set my hand and seal this 7th day of October, 1865.

JNO. RANKIN. [L. S.]

In presence of—

J. N. MCINTIRE,  
CHARLES SPEER.