J. G. DUNGAN.

Churn.

No. 13,638. Patented Oct. 9, 1855.

Fig. 1

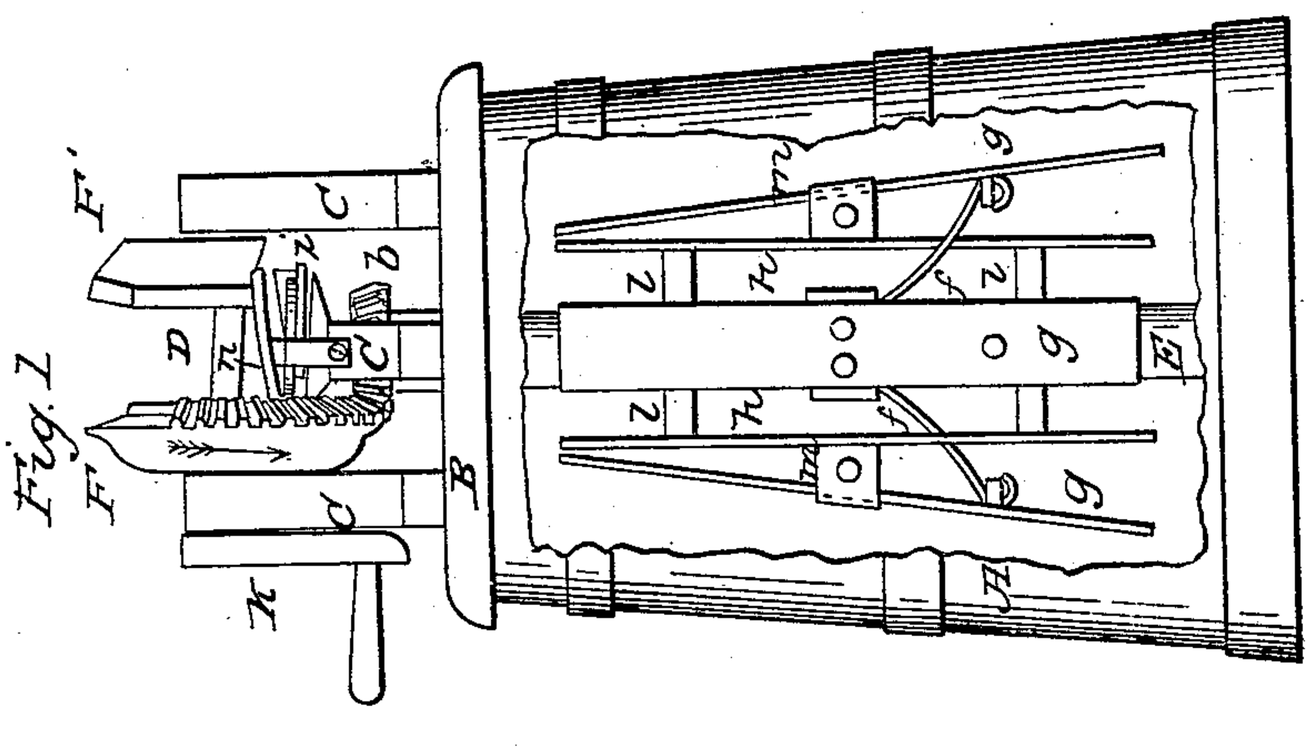
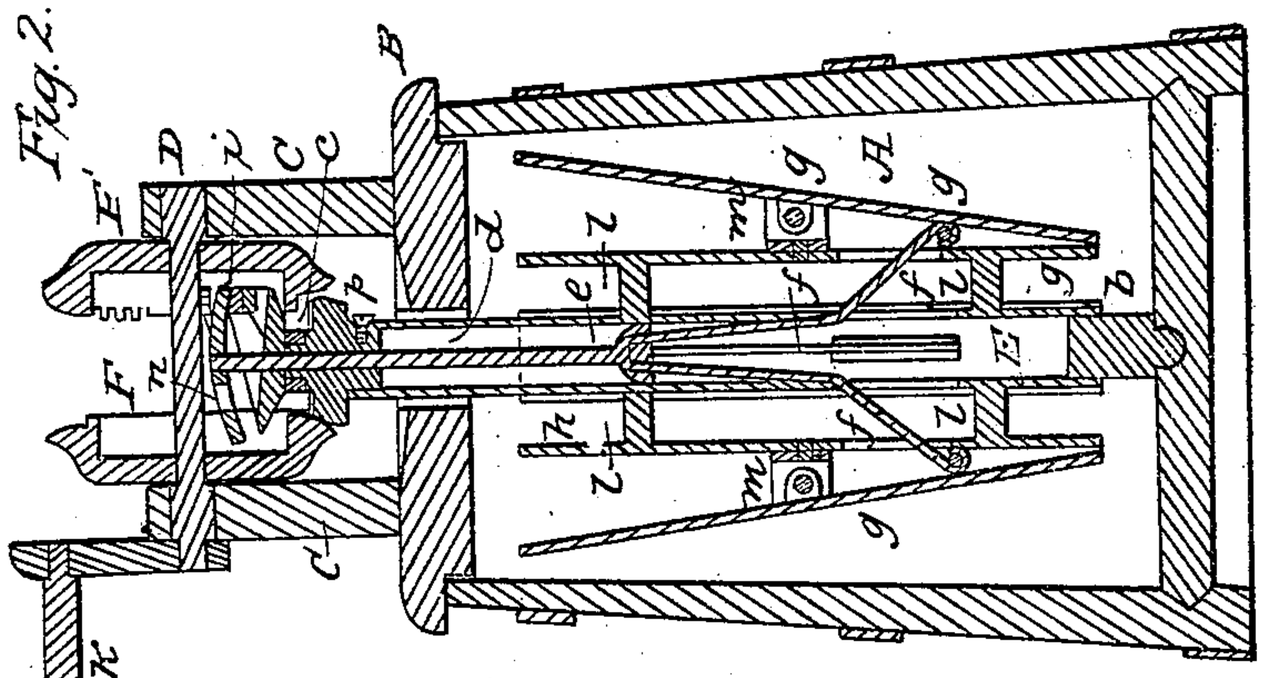


Fig. 2.



UNITED STATES PATENT OFFICE.

JNO. G. DUNGAN, OF STEUBENVILLE, OHIO.

CHURN.

Specification of Letters Patent No. 13,638, dated October 9, 1855.

To all whom it may concern:

Be it known that I, J. G. DUNGAN, of Steubenville, in the county of Jefferson and State of Ohio, 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 annexed drawing, forming part of this specification, in which—

Figure 1 is an elevation of the churn, having casing broken to show agitator. Fig. 2 is a section through axes of main and wheel shafts.

Similar characters of reference in the several figures denote the same part of the churn.

The nature of my invention consists in so constructing an alternately opposite revolving agitator that its outer leaves shall move about their middle portions, alternately to and from the sides of the churn, simultaneously with their rotation; so that they shall at each rotation of the agitator, furnish inclined surfaces, upon which the minute globules of butter developed by the agitation, may abrade at the time of their formation, and at the change of the agitator's motion, for the more rapid aggregation of the said particles, and consequent facility of the churning operation, as will be fully set forth.

The details of construction and operation will readily be understood from the following description and reference to the drawing, in which the several parts are thus represented.

A is the body of churn, having a circular cross section; B, cover, having an opening through its center for the passage of main shaft, and to which are secured the standards C, supporting the operating shaft; C C, standards secured to cover B, and supporting operating shaft D; D, operating shaft, to which are secured the wheels F, F′, partially cogged on their inner faces, so that the gear of one will engage the pinion *p* on head of main shaft, at the moment the said pinion leaves the teeth of the other wheel, the number of cogs on each wheel being sufficient to insure the entire revolution of the pinion *p*, the effect of this construction being by the revolution of shaft D to impart to the main shaft an alternate opposite revolution, through the connection of pinion *p;* E, main shaft, stepped at *b*, and held at top by bridge *c* on cover B, rotation being communicated to this shaft as above set forth. The central portion of this shaft is hollow, as shown in Fig. 2, and contains a rod *d* having at its lower extremity a head *e*, and at its upper an arm *i*. The head *e* is connected by the spring rods *f* with the outer leaves *g* of the agitator, passing through slots in the shaft and inner leaves, as seen in Fig. 2. The inner leaves *h* are permanently secured to the shaft by arms *l*, and support the outer leaves *g* by a joint connection *m* that permits the ends of the outer leaves to move from the position shown in Fig. 1 to that of Fig. 2. Upon the bridge *c* is a cap piece *n* containing a spiral groove in which the arm *i* at the upper extremity of *d* is movable as and for the purposes to be set forth.

The operation of the churn is as follows. Power applied to crank K produces an alternately opposite rotation of the agitator, with the usual effect of such operation in developing the minute particles of butter existing in the cream, which if they were left free to float around would eventually collect into lumps. To effect this aggregation in a shorter time I furnish an inclined surface against which these particles may abrade, during the time of agitation, and in the slight cessation that takes place at the time the motion changes, so that a union of particles is effected at each movement of the said surface, that otherwise would be left free to float in the body of cream until brought into contact with other particles by agitation. This movement of the abrading surfaces is effected by the rise and fall of the arm *i* in the spiral groove of head piece *n* at each alternate revolution of main shaft. The said arm resting at the lowest portion of the spiral groove as in Fig. 1 and giving the outer leaves *g* the positions shown in that figure, the cogs of wheel F at that time engaging pinion *p* as the said wheel rotates in direction of arrow; rotating main shaft and causing arm *i* to travel up the spiral groove until it reaches the position shown by Fig. 2; the rod *d* being drawn up and the leaves *g* brought into the position indicated in said Fig. 2. At that time the cogs of wheel F′ engage the pinion *p* and the arm *i* travels down the groove to its first position and the four leaves *g* assume the position at which we began the description. In this manner the operation continues, the leaves *g* rocking on the joints *m*

and furnishing the surfaces to aid in the aggregation of the particles of butter as above set forth.

In the practical construction of this churn many modifications and changes may be made which will not effect the principle of its action; but will render the construction more simple as respects connection of parts. The slots in the shaft will each be covered by a slide that will prevent the entrance of cream to the interior. The head *e* of rod *d* may be brought lower down and connected with rigid rods by joints, instead of the spring rods *f*. Other analogous devices may be used instead of cap piece *n* for moving the rod *d* longitudinally, and many of the details varied to the same extent; each and all of which I claim the right to do so long as substantially the same churn is produced.

What I claim as new and of my own invention, is—

Giving the outer leaves of an alternately opposite rotating agitator, a rocking motion to and from the sides of the churn substantially as set forth.

In testimony whereof, I have hereunto signed my name before two subscribing witnesses.

JOHN G. DUNGAN.

Witnesses:
D. B. WILKIN,
JAMES MELVIN.