

A. McMULLAN.
ROTARY CHURN.

No. 524,071.

Patented Aug. 7, 1894.

Fig. 1.

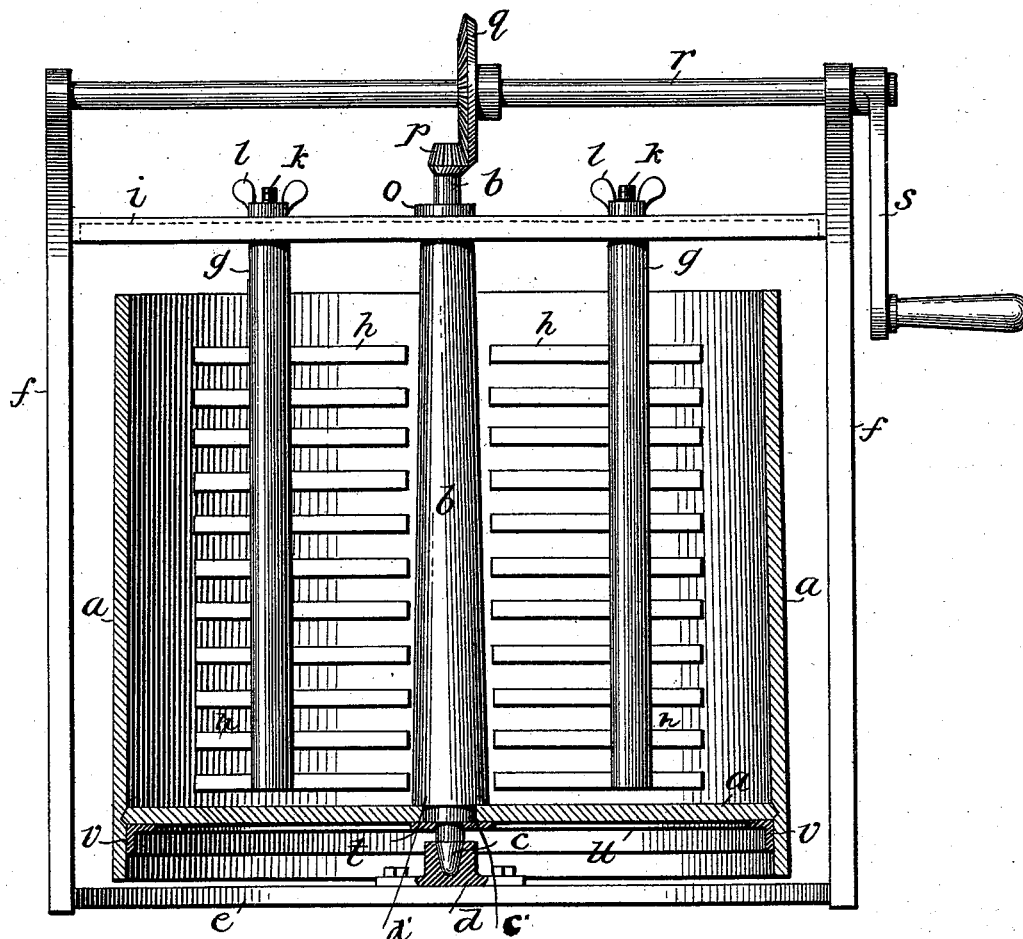


Fig. 5.

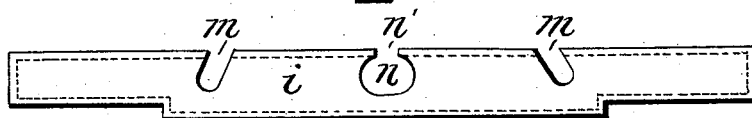


Fig. 6.



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Fig. 2.

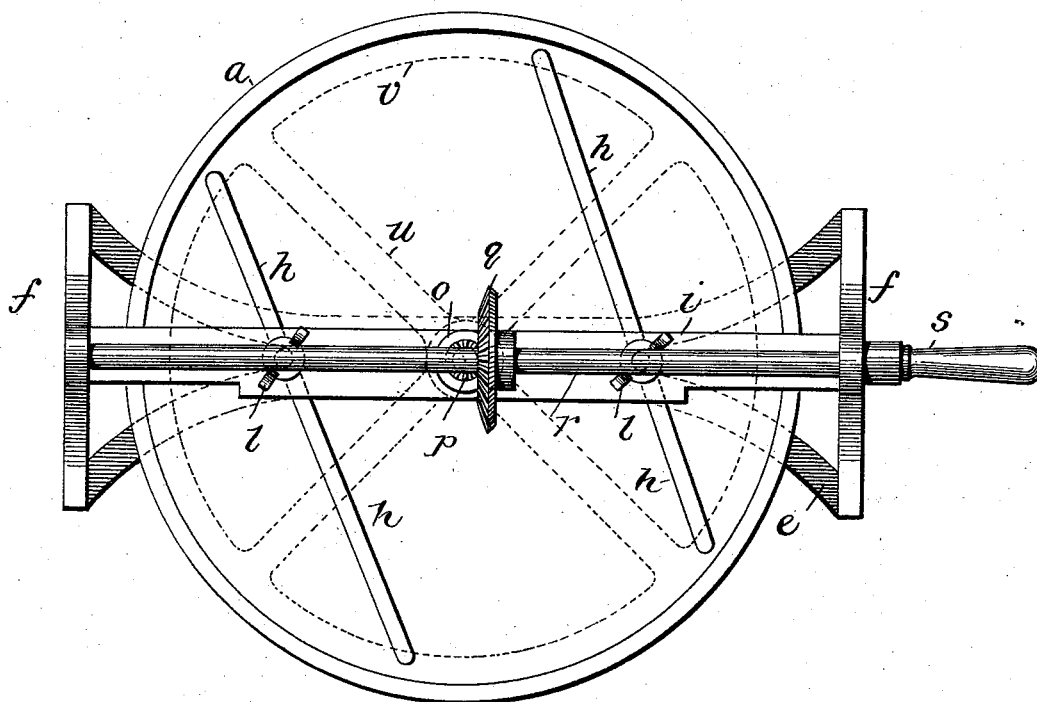


Fig. 3.

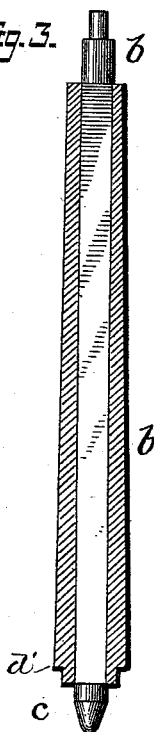


Fig. 4.



Fig. 7.



Fig. 8.



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UNITED STATES PATENT OFFICE.

ARCHIBALD McMULLAN, OF TULLYDOEY, IRELAND.

ROTARY CHURN.

SPECIFICATION forming part of Letters Patent No. 524,071, dated August 7, 1894.

Application filed October 20, 1893. Serial No. 488,712. (No model.) Patented in England September 14, 1893, No. 17,250.

To all whom it may concern:

Be it known that I, ARCHIBALD McMULLAN, gentleman, of Tullydoey, in the county of Tyrone, in that part of the United Kingdom of Great Britain and Ireland called Ireland, have invented certain new and useful Improvements in Rotary Churns, (for which I have obtained Letters Patent of Great Britain, dated September 14, 1893, and numbered 17,250;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in rotary churns, and it consists substantially in such features of construction, arrangement, and combinations of parts, as will hereinafter be more particularly described.

The object of the invention is to provide a rotary churn of comparatively few parts, and one in which the operation of churning may be effected with very little labor and in a comparatively short space of time.

The invention also has for its object to provide a rotary churn in which the construction of the parts is simple, and cheap, and in which the several parts may be readily disconnected and removed either for the purpose of cleaning or repairs.

A still further object of the invention is to render the operation easy and free from various objections found to exist with many forms of rotary churns at present in use.

In the accompanying drawings, Figure 1, is an elevation of my improved churn, showing the rotary tub or barrel in section. Fig. 2, is a top plan view. Fig. 3, is a sectional elevation of a central vertical spindle, showing the inclosing shell therefor more clearly. Figs. 4, 6 and 7, are detail views and Fig. 5, is a plan view in detail of the upper slotted cross bar, showing the slots and recesses therein. Fig. 8 is a plan view of the central bushing of the cross piece which supports the central rotary spindle.

In carrying my invention into effect, I provide a circular tub or barrel *a*, preferably ta-

pering slightly toward the top, and which is designed to rotate with the central vertical spindle *b*, which, as shown, consists of a rod inclosed in a casing of wood or other suitable material, the construction thereof being more clearly indicated in Fig. 5. The said vertical central spindle *b*, is finished off at the lower end as a conical pivot *c*, while the lower end of the inclosing case is provided with a shoulder, as shown at *d'*. The lower contracted portion *c'*, of the inclosing case of the spindle fits into a central opening formed in the bottom of the circular tub or barrel, as more clearly shown in Fig. 1, and fitting tightly between the bottom of said tub or barrel and surrounding the lower end of the spindle is a collar *t*, which serves to maintain the spindle and tub in fixed relation to each other so that as the spindle is rotated the tub or barrel will be carried with it.

The bottom of the tub or barrel *a*, is raised or elevated somewhat from the lower edge of the surrounding wall thereof, as shown in section in Fig. 1, so that when said tub or barrel is removed from the supporting frame, it may be placed upon a level surface and stand in an upright position, thus not encountering any obstruction from the conical pivot *c*, when placed upon the floor or ground, for instance, whenever the tub is removed for any purpose.

The lower conical end *c*, of the central spindle *b*, is seated within a step bearing *d*, secured in place on the lower bottom cross piece *e*, of the supporting frame *f*, the said supporting frame consisting mainly of two uprights, arranged on opposite sides of the tub or barrel and supporting in their ends an operating shaft *r*, having to one end thereof a handle *s*, by which the same is turned. The said shaft *r*, is provided about centrally of its length with a beveled gear *g*, meshing with a corresponding pinion *p*, formed with or arranged upon the upper end of the central spindle *b*, so that as the shaft is turned the spindle, together with the rotary tub or barrel will also be rotated.

i, represents an upper horizontal cross piece secured in any suitable manner to the side pieces of the frame *f*, and said upper horizontal cross piece is formed about centrally of its length, with an opening *n*, leading to one

edge of the cross piece at n' , thus enabling the upper end of the vertical central spindle to be slipped into the opening n , from the side or edge of the said upper horizontal cross bar in an obvious manner. The cross bar i is likewise provided on opposite sides of the central opening n , with oblique notches m, m , into which are slipped the upper ends of stationary adjustable breaker shafts g, g , having horizontal spokes or blades h , extending outwardly therefrom into the interior space of the circular tub or barrel. The said breaker shafts are constructed of any preferred material, such as wood, and they are secured in place in the upper horizontal cross bar i , by means of screw pins k, k , and thumb nuts l, l , the said screw pins passing into the upper ends of the breaker shafts, and the nuts being screwed thereon in an obvious manner. It will be seen that the shafts are readily removable from the notches of the upper horizontal cross bar whenever it is desirable to take them out for any purpose. The horizontal blades standing outward therefrom intersect the vertical plane of the cross bar i , in an oblique direction so as to neutralize the centrifugal tendency of the cream or milk and divert the position of it at or near the circumference of the wall of the tub or barrel toward the spindle with which it revolves and to more equally distribute its speed. The said blades preferably extend from both sides of the breaker shafts as shown, and they reach nearly to the wall of the tub or barrel, leaving only enough space between their ends and said wall for freedom in their adjustment or removal. The blades on each side of the breaker shafts are preferably, but not essentially in the same continuous straight line. The vertical positions of the said breaker shafts may be fixed by any well known adjusting screw and nut, suitable for the purpose.

In order to maintain the upper end of the central upright spindle in its proper position, or alignment, I preferably insert within the central opening n , a plug or hollow bushing o , up through which the upper end of the spindle passes and it is evident that during the operation of the churn, the spindle will not be permitted to work through the opening n' , leading to the said central opening from the edge of the cross bar.

I may surround the tub or barrel centrally with any suitable form of strengthening hoop or band, and preferably I arrange beneath the raised or elevated bottom of the said tub or barrel an annular flanged hoop or ring v , which serves to strengthen the parts and securely fasten the bottom to the sides of the tub.

From the foregoing, it will be seen that I have provided a very simple form of churn, and one in which the parts can be readily disconnected and removed for any purpose whatever.

It is obvious that various immaterial

changes might be resorted to in the general construction and arrangement of parts without necessarily departing from what is intended to be covered. For instance, instead of the beveled gearing for rotating the central spindle and the tub I may resort to the use of friction cones or disks, and instead of driving the churn by hand I may employ suitable driving mechanism or motive power usually employed for similar purposes.

It will be seen that when the shaft r , is rotated the spindle and tub will be correspondingly rotated, while at the same time the breaker shafts, together with their projecting spokes or blades will remain stationary, thus resisting the centrifugal action of the milk, and tending to break up all the particles of fatty matter, producing as a result an excellent quality of butter.

Without limiting myself to the precise details of construction and arrangement of parts shown and described, I claim—

1. In a rotary churn, the combination with a central rotary spindle provided at its lower end with a conical bearing point, and inclosed in a casing constructed at its lower end with an annular shoulder d' , of the tub or barrel having its bottom raised or elevated above the lower edge of the sides and provided with a central opening to receive the lower contracted end of the spindle, a collar for securing the spindle to said bottom, an upper horizontal cross bar in which the upper end of the spindle is removably supported, a lower step bearing for said spindle, means for rotating the tub and spindle, and removable stationary breaker-shafts depending from said cross bar, substantially as described.

2. In a rotary churn, the combination of a central rotary spindle provided at its lower end with a conical bearing point and inclosed in the casing constructed at its lower end with an annular shoulder, the tub or barrel having its bottom raised or elevated above the lower edge of the sides and provided with a central opening to receive the lower end of the spindle, a collar for securing the spindle to said bottom, an upper horizontal cross-bar provided with the central opening to receive the upper end of the spindle and also having the oblique openings m, m , a lower bearing for the spindle, means for rotating the tub and spindle, and removable stationary breaker shafts fitting within said oblique openings and secured in place by suitable nuts, substantially as shown and for the purpose described.

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

ARCHIBALD McMULLAN.

Witnesses:

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