H. J. WARREN.

CHURN.

APPLICATION FILED JULY 1, 1910.

992,304.

Patented May 16, 1911.

2 SHEETS—SHEET 1.

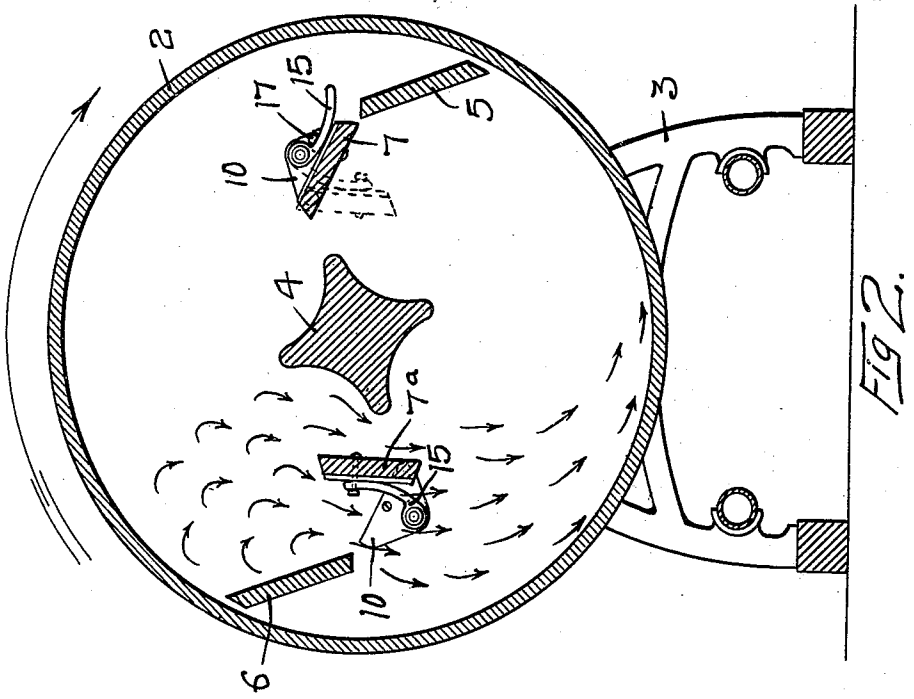


Fig 2.

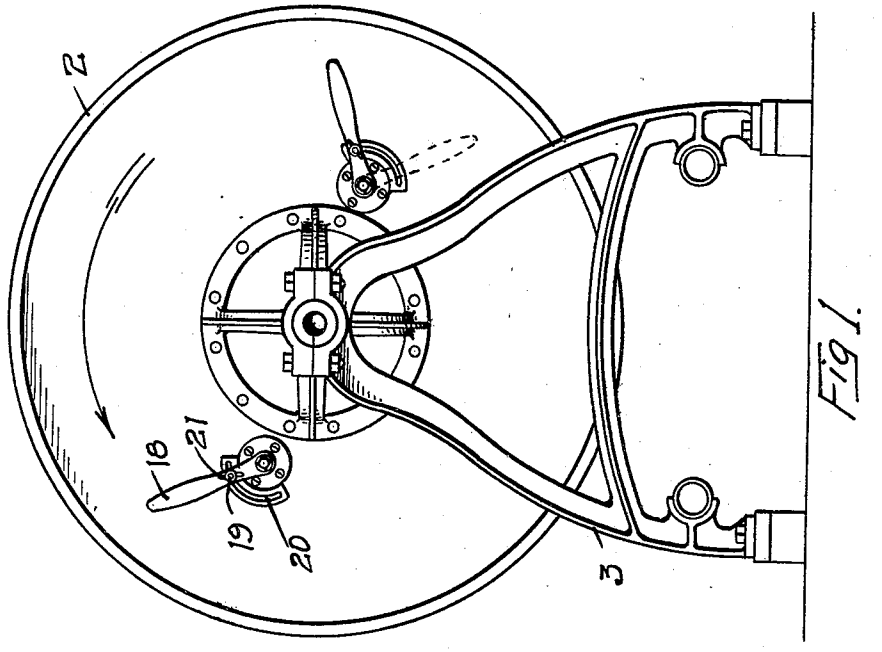


Fig 1.

WITNESSES

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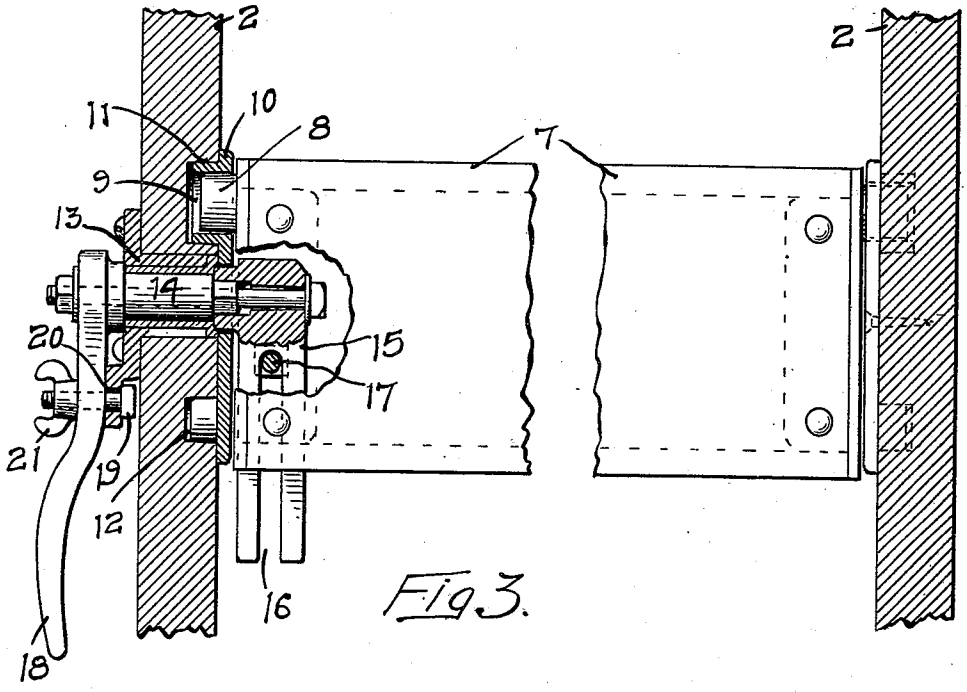


Fig 3.

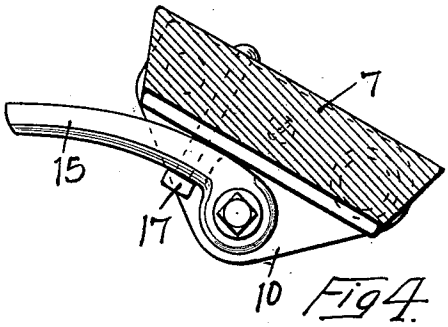


Fig 4.

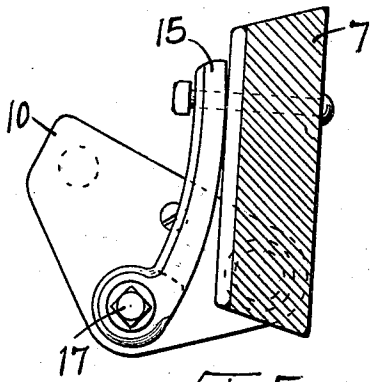


Fig 5.

WITNESSES

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# UNITED STATES PATENT OFFICE.

HUGH J. WARREN, OF OWATONNA, MINNESOTA, ASSIGNOR TO PERFECTION CHURN COMPANY, OF OWATONNA, MINNESOTA, A CORPORATION OF MINNESOTA.

## CHURN.

992,304. Specification of Letters Patent. Patented May 16, 1911.

Application filed July 1, 1910. Serial No. 569,942.

*To all whom it may concern:*

Be it known that I, HUGH J. WARREN, of Owatonna, Steele county, Minnesota, have invented certain new and useful Improvements in Churns, of which the following is a specification.

My invention relates to churns of a combined butter-worker type and the object of the invention is to adapt the butter-working means of the churn so that it will be more efficient in the churning operation.

The invention consists generally in pivoted shelf sections near the butter-working roll that are capable of adjustment to adapt the machine more particularly for churning purposes.

In the accompanying drawings forming part of this specification, Figure 1 is an end view of a combined churn and butter-worker embodying my invention, Fig. 2 is a transverse, sectional view of the same, Fig. 3 is a sectional view illustrating the manner of supporting the movable shelf section, Figs. 4 and 5 are detail views of the shelf supporting means.

In the drawing, 2 represents the drum of the churn having supports or standards 3 at each end and operated by a suitable mechanism in the usual way.

4 is a driven roll arranged concentric with the drum and 5 and 6 are shelves, rigidly mounted on the walls of the drum. Between the roll 4 and the rigid shelves 5 and 6 I provide movable shelf sections 7 and 7ª. These shelf sections have gudgeons 8 which project into sockets 9 in castings 10 which are mounted in the heads of the drum in any suitable way, as by means of the recesses 11 and 12 therein that are adapted to receive bosses on the casting 10. Hubs 13 are mounted in one of the drum heads and studs 14 have bearings in the hubs 13 and support cranks 15 having longitudinal slots 16 in which the bolts 17, which pass through the shelf sections, are adapted to slide. An operating lever 18 is provided for each crank on the outside of the drum and is locked in any desired position by means of a bolt 19, slidable in a curved slot 20 and provided with a thumb nut 21. By loosening this thumb nut and moving the lever 18, the shelf section can be adjusted at any desired angle, such as the vertical position indicated in Fig. 2 or the inclined position shown therein at the right of the figure, where the shelf is in place for the butter-working operation.

In churning, the shelves 7 and 7ª are swung to a position, substantially vertical, as indicated at the left side of the roll in Fig. 2, and in this position the cream, as it is in the state of passing from cream to butter and has a tendency to mass or clog in the machine, will pass freely between the pivoted shelf sections and the roll without danger of clogging therein, so that the mass can be rolled freely around the churn during its revolution. There is a tendency for the cream in this condition to pocket, and interfere with the completion of the churning operation. All this danger is avoided by the use of these pivoted shelf sections, which can be adjusted at any desired angle with respect to the horizontal to increase or decrease the distance between them and the surface of the roll. The shelves in their upright position will divide the mass passing between the roll and the flights so that a portion will move down on one side of a shelf and a portion on the opposite side. This will prevent the material from clogging between the roll and the flights or between the roll and the shelf where the shelf presents a flat surface to the moving mass. In the position shown in Fig. 2, the shelf is vertical and presents its edge to the mass, dividing it into two streams, positively preventing any lodging or clogging between the roll and the flights. As here shown, one shelf is in position for working the butter and the other for churning, but during the operation of churning both shelves will be preferably swung to a vertical position and locked and upon completion of the churning operation they may be swung down to form a narrow space between their inner edge and the working surface of the roll. This will cause a thorough working of the butter as it passes between them.

The shelves may be made of any suitable width so that the space between them and the roll will vary to suit different conditions or to obtain the desired result.

I claim as my invention:—

1. The combination, with a drum and a roll mounted therein, of a shelf or flight mounted near the wall of said drum and a shelf section interposed between said roll and flight, said shelf section being adapted

to swing to a substantially vertical position and present its longitudinal edge to the material, a portion of the material passing between the roll and the shelf and a portion between the shelf and said flight, whereby the tendency to clog is avoided.

2. The combination, with a drum and a roll mounted therein, of fixed flights secured to the wall of said drum on each side of said roll, passages being formed between said flights and said roll, and pivoted shelves supported midway substantially between said flights and roll and adapted to swing to an upright position and present their longitudinal edges to the material in said drum, a portion of the material passing on one side of said shelves and a portion on the opposite side thereof, for the purpose specified.

3. The combination, with a drum and roll, of flights mounted in said drum on opposite sides of said roll, there being passages formed between said flights and roll, shelves mounted in said passages and adapted to swing to a position in line substantially with the direction of movement of the material in said drum, the longitudinal edges of said shelves operating to divide the material into two streams on each side of said roll, whereby clogging between said roll and flights is prevented, and means outside said drum for operating said shelves.

4. The combination, with a drum and roll, of pivoted shelf sections having gudgeons at each end near one of their longitudinal edges, a crank having an operating lever journaled in the head of said drum and said crank having a slidable connection with said pivoted shelf section, said sliding connection comprising a crank having a longitudinal slot, and a bolt passing through said slot and through said pivoted shelf section.

5. The combination, with a drum and a butter-working roll mounted therein, of a shelf pivotally supported between said roll and the wall of said drum and constructed to swing to a substantially vertical position, a crank journaled in the head of said drum having a longitudinal slot and a bolt fitting loosely in said slot and connected with said shelf section, whereby, when said crank is oscillated, said shelf will be tilted to vary its angle with respect to said roll, substantially as described.

6. The combination, with a drum, of a roll and flights mounted therein, passages being provided between said roll and flights, shelves disposed in said passages and pivotally supported in the heads of said drum, studs having bearings in said heads and operating levers outside said heads, cranks mounted on said studs within said drum and bearing on said pivoted shelves and having sliding connections therewith, the rotation of said studs operating to tilt said shelves to a vertical position in said passages or to a position inclined to the horizontal therein.

In witness whereof, I have hereunto set my hand this 27th day of June 1910.

HUGH J. WARREN.

Witnesses:
CARL K. BENNETT,
G. B. BENNETT.