

R. B. DISBROW.
COMBINED CHURN AND BUTTER WORKER.
APPLICATION FILED SEPT. 2, 1909.

949,757.

Patented Feb. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1

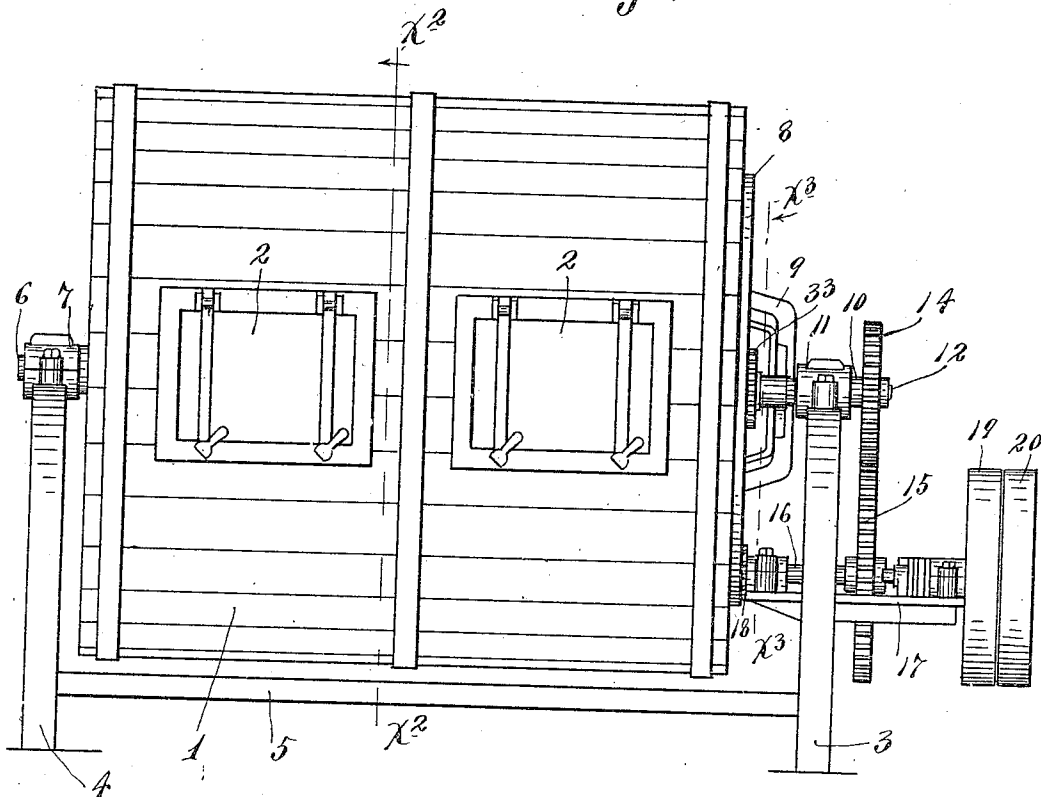
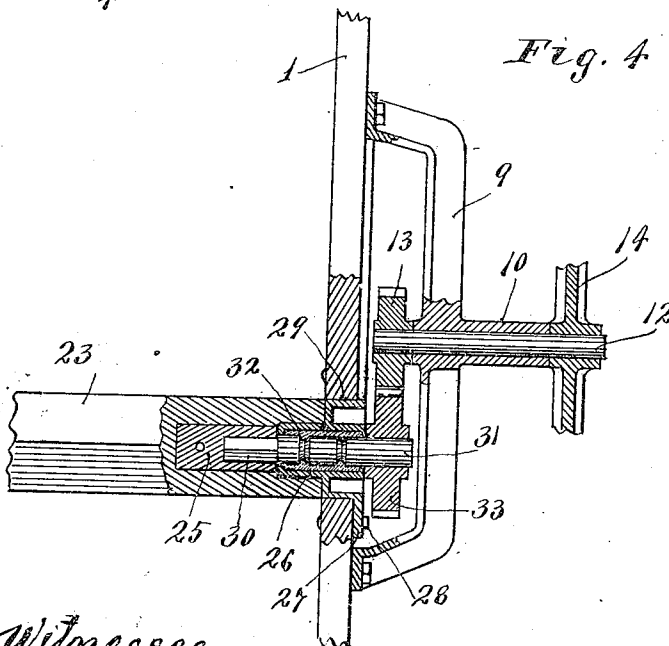


Fig. 4



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2 SHEETS—SHEET 2.

Fig. 2

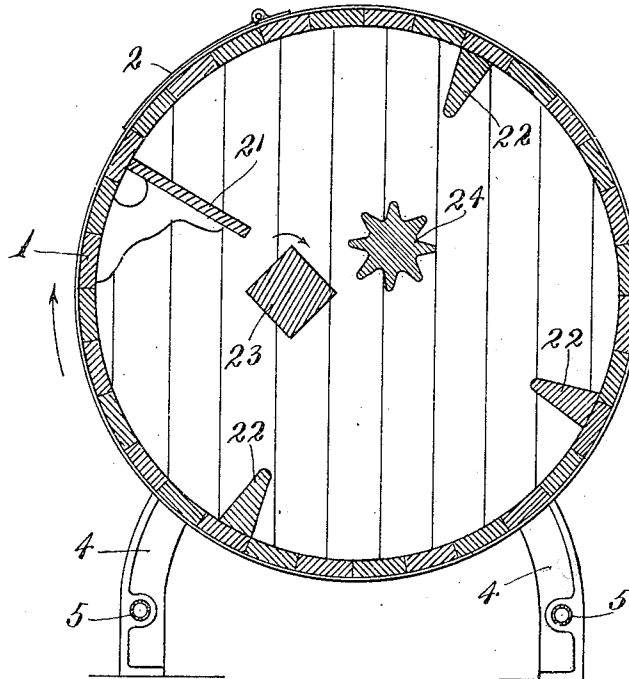
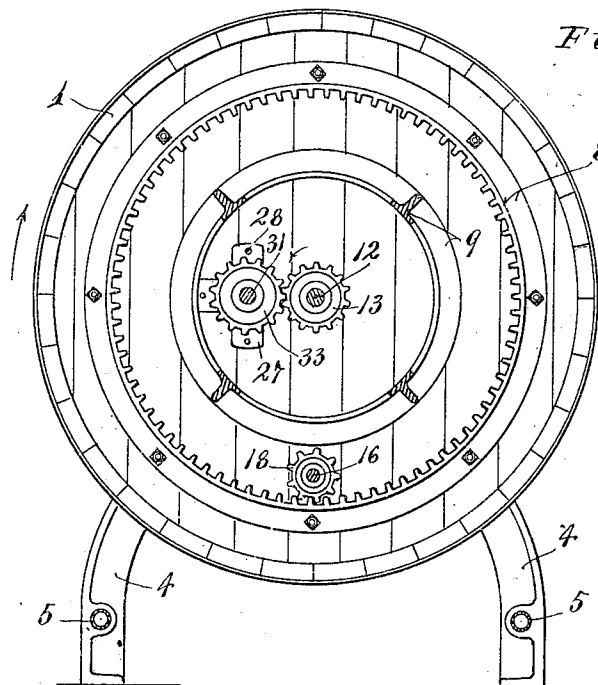


Fig. 3.



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UNITED STATES PATENT OFFICE.

REUBEN B. DISBROW, OF OWATONNA, MINNESOTA.

COMBINED CHURN AND BUTTER-WORKER.

949,757.

Specification of Letters Patent.

Patented Feb. 22, 1910.

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To all whom it may concern:

Be it known that I, REUBEN B. DISBROW, a citizen of the United States, residing at Owatonna, in the county of Steele and State of Minnesota, have invented certain new and useful Improvements in Combined Churns and Butter-Workers; 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.

My invention relates to combined churns and butter workers and has for its object to simplify the construction and improve the operation thereof.

To the above ends, the invention consists of the novel devices and combination of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in side elevation showing the improved churn-butter worker; Fig. 2 is a transverse vertical section taken on the line $x^2 x^2$ of Fig. 1; Fig. 3 is a view of the machine in end elevation, some parts being sectioned on the line $x^3 x^3$ of Fig. 1 and some parts being removed; and Fig. 4 is a fragmentary view, partly in section and partly in plan, showing the connection between one end of the working roller and adjacent drum head and driving gear.

In this machine, as in other commercial machines of this general character, a large horizontally disposed wooden drum 1, having normally closed peripheral doors 2, is employed and this drum is journaled on heavy end brackets 3 and 4, tied together at their lower portions by bars or rods 5. One head of the drum 1 has an axial trunnion 6 and is journaled in the bearing 7 of the bracket 4. To the other drum head is rigidly secured a large annular internal gear 8 and a spider bracket 9, on which latter is a hollow trunnion 10 loosely journaled in the bearing 11 of the bracket 3.

A short countershaft 12 is extended through and journaled in the hollow trunnion 10 and, at its inner end, is provided with a spur pinion 13 and, at its outer end, with the spur gear 14. The spur gear 14 meshes with a larger spur gear 15, carried by a countershaft 16, journaled in suitable

bearings on an extension 17 of the bearing bracket 3. This countershaft 16, at its inner end, has a spur pinion 18, that meshes with the annular gear 8, and, at its outer end, it is provided with a fixed pulley 19 and a loose pulley 20.

Within the drum, extending approximately radially inward from the cylindrical shell thereof and from end to end of the drum, is a quite wide lifting shelf 21 and, preferably, also a multiplicity of agitating flights 22. Journaled within the drum and extending from head to head thereof is a pair of butter working rollers 23 and 24, both of which are located eccentric to the axis of the drum, and the former of which is located adjacent to the inner edge of shelf 21, while the latter is located upward of the same when the shelf is in a horizontal position. The roller 24 is an idle or loose roller, which is suitably journaled to the heads of the drum and is provided with a multiplicity of deep grooves which provide the roller with a multiplicity of radially projecting blades or deep ribs. The roller 23 is a positively driven roller and is preferably made square in cross section. At the gear-equipped end of the drum, the roller 23 is provided with an inset metal socket 25 and, outwardly thereof, it is provided with a deep cylindrical trunnion seat that nominally rotates upon the inwardly projected portions of a hollow trunnion 26, shown as cast integrally with a closure plate 27, rigidly but detachably secured to the adjacent head of the drum, preferably by nutted bolts 28. This closure plate 27 fits and normally closes a perforation 29 in the drum head, which perforation is of such size that the roller 23 may be removed endwise therethrough from the drum or inserted therethrough into the drum, when the said plate is removed. Both of the rollers 23 and 24 are preferably wooden rollers. The socket 25 is pinned or otherwise secured in said roller 23 so that it must always rotate therewith, and is formed with an angular seat, adapted to receive an angular end 30, of a short shaft 31, which shaft is grooved at its intermediate portions and journaled in a babbitt lining 32, cast within the hollow trunnion 26. To the outer end of the shaft 31 is rigidly secured a small spur gear 33 that meshes with the pinion 13 of the countershaft 12. At its opposite end, the roller 23 is detachably journaled in any

suitable way, to the adjacent head of the drum. In the position of the drum, shown in Fig. 2, it will be noted that the lifting shelf 21 and the two rollers form a sort of
 5 a hopper for holding the butter. The drum should be rotated in the direction of the arrow mark adjacent thereto, and the roller 23 is driven in the same direction, but at a relatively high rate of speed. In the churning
 10 action, the flights 22, the shelf 21 and the two rollers cooperate to agitate the cream. In the butter working action, some of the butter will be thrown against the rollers immediately after the shelf 21 passes
 15 its lowermost vertical position and the working of the butter between the two rollers will continue until all the butter is passed between the same or until the lifting shelf approximately reaches its uppermost
 20 vertical position. In this butter working action, the driven roller 23, four times in its rotation, reaches a position in which one of its flat surfaces alines with the lifting shelf 21, and, at such times, the butter slides
 25 very freely downward and in contact with the rollers. When the butter is passed between the two rollers, the working roller 24, as well as the positively driven roller 23, will, of course, be caused to rotate. The
 30 roller 24 cuts the butter without rubbing the same and hence does not destroy its globular structure.

The machine, while of simple construction, at a comparatively small cost, has high
 35 capacity and turns out a high grade of butter.

What I claim is:

1. In a machine of the kind described, the combination with a horizontal rotary
 40 drum, having an inwardly extended lifting shelf, of a pair of cooperating working rollers within and carried by said drum, one of which is square in cross section, is positively driven and is located adjacent to the inner edge of the said lifting shelf, substantially as described.

2. In a machine of the kind described, the combination of a horizontal rotary
 50 drum, provided with a multiplicity of agitating flights and with a relatively wide lifting shelf, of a pair of cooperating working rollers within and carried by said drum,

both located eccentric to the axis thereof, 55 and one thereof being positively driven and located adjacent to the inner edge of the said lifting shelf, substantially as described.

3. In a machine of the kind described, the combination with a horizontal rotary
 60 drum, provided with an inwardly extended lifting shelf, of a pair of cooperating working rollers, one of which is rectangular in cross section, is positively driven and is located adjacent to the inner edge of the
 65 said lifting shelf, and the other of which is loosely journaled and has a multiplicity of corrugations, and both of which rollers are located eccentric to the axis of the said drum and are both carried by said drum, 70 substantially as described.

4. In a machine of the kind described, the combination with a rotary drum, of a working roller within said drum, a hollow
 75 trunnion extending through one head of said drum and into one end of said roller, a shaft extending through said hollow trunnion and coupled to the interior of said roller, and means connected to the outer end of said shaft, for rotating the same on the
 80 said roller, substantially as described.

5. In a machine of the kind described, the combination with a rotary drum, of a working roller within said drum, provided with an inset socket having an angular seat, 85 a closure plate normally closing an opening in one head of said drum adjacent to one end of said roller and having a hollow trunnion extending into a seat in the adjacent end of said roller and affording a journal
 90 therefor, which plate, when removed, permits said roller to be moved endwise through the opening closed thereby, a shaft journaled in said hollow trunnion and having an angular inner end fitting the angular seat in
 95 said roller socket, a gear secured to the outer end of said shaft, and driving gears, one of which meshes with the gear of said shaft, substantially as described.

In testimony whereof I affix my signature 100 in presence of two witnesses.

REUBEN B. DISBROW.

Witnesses:

HARRY D. KILGORE,
 F. D. MERCHANT.