

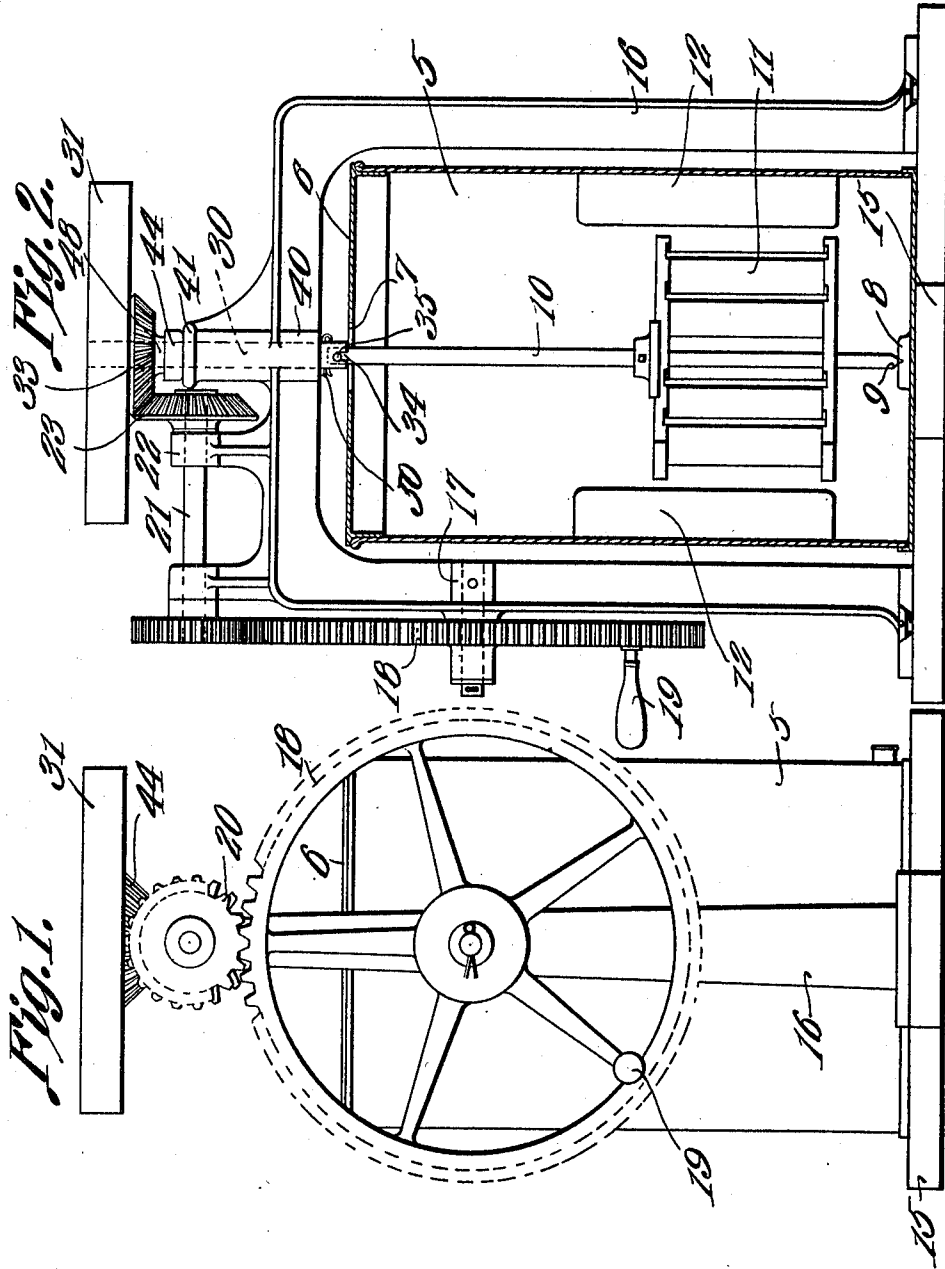
R. D. SIMPSON.
CHURN.

APPLICATION FILED APR. 15, 1911.

Patented Sept. 26, 1911.

2 SHEETS—SHEET 1.

1,004,305.



Witnesses

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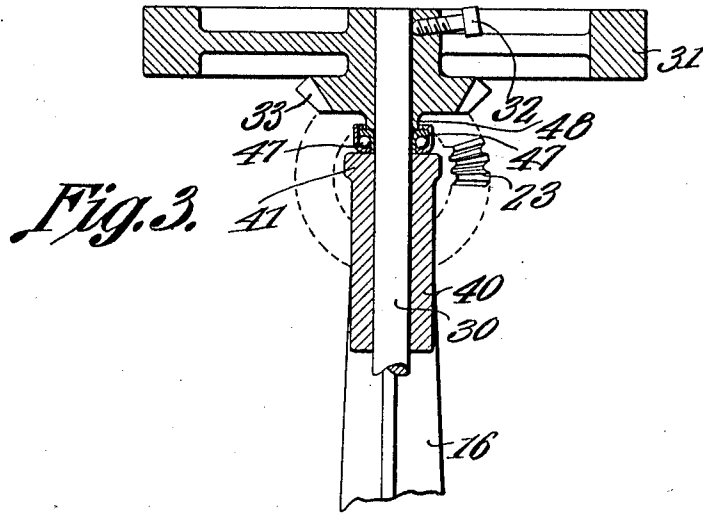


Fig. 4.

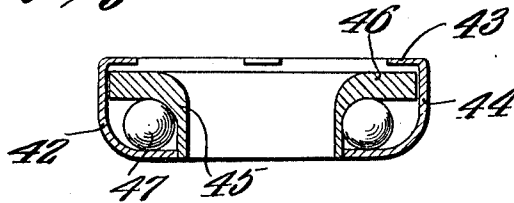
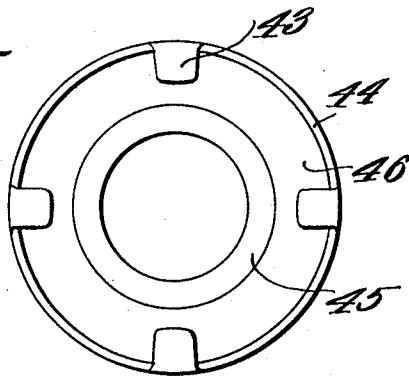


Fig. 5.



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UNITED STATES PATENT OFFICE.

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CHURN.

1,004,305.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT D. SIMPSON, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Churn, of which the following is a specification.

This invention relates to churns, and more especially to those having a single and vertically disposed dasher; and the object of the same is to support the driving shaft and fly wheel on ball bearings and mount them rotatably and slidably within a yoke across the top of the churn body, and connect the shaft detachably with the dasher staff so that easy access can be had to the dasher and the interior of the churn body. These objects I carry out by the construction hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a side elevation of this churn complete, with the churn body in sections to show its interior mechanism. Fig. 2 is a side elevation viewed from the left of Fig. 1. Fig. 3 is an enlarged central vertical section through the driving shaft and the ball bearings. Figs. 4 and 5 are still further enlarged views of the ball bearing alone, the former being in section and the latter a top plan view.

The churn body is by preference a cylindrical metal member 5 stood on end and having a cover 6 removably closing its upper end, the cover being provided with a central hole 7; and inside the body its bottom is provided at its center with a step bearing 8 within which is mounted the pointed lower end 9 of the dasher rod 10. Upon the latter near its lower end is fixed the dasher 11 which rotates on a vertical axis between two or more wings 12 that are fixed within the body 5 in the usual manner. When the cover is removed the cream is put into the body, after which rotation of the dasher converts into butter as usual. I might add here with this device could be employed perhaps equally well for the making of ice cream, and with slight modification it might become a washing machine, or in fact anything wherein it is necessary to rotate or agitate some fluid or partially fluid agent within a fixed upright body.

The essential feature of the present invention lies in mounting the dasher rod at its lower end in a step bearing whereby it is removable from the body and connecting it

at its upper end with the power shaft in a detachable manner, so that when the cover 6 is removed the connection can be broken and the entire body and the dasher rod and dasher withdrawn from the remainder of the mechanism which I will now describe.

Supported on a base 15, upon which the body rests, is a yoke 16 into and through which the body may be passed in a well known manner, and in a bearing 17 in one side of this yoke is mounted the shaft of the driving wheel 18 which may be rotated by power although in the present instance I have shown it as provided with a crank handle 19. This wheel is here shown as a gear wheel, meshing with another gear wheel 20 on a counter shaft 21 that is mounted in bearings 22 rising from the top of the yoke 16, and the inner end of this counter shaft carries a bevel gear 23 which is of about the size of the driven gear 20, the latter being so proportioned with reference to the driving gear 18 that one rotation of said driving gear will rotate the counter shaft and its gears several times and therefore at a high rate of speed.

The numeral 30 designates the power shaft which stands vertical, and secured to the upper end thereof is a fly wheel 31 which stands horizontal and extends across the upper side of the gear wheel 23. The hub of this fly wheel is formed into a gear wheel 33 meshing with the driving gear 23, and through said hub passes a set screw 32 by means of which both the fly wheel and its gear-hub are detachably connected with the upper end of the power shaft 30. Said shaft extends downward through the top of the yoke 16 and has a notch 34 in its lower end, and the dasher shaft 10 extends upward through the hole 7 in the cover 6 of the body 5 and has a pin 35 across its upper end. The latter is of a size to pass into the lower end of the power shaft 30 as seen in dotted lines in Fig. 1, for which purpose said shaft, especially at its lower end, is made tubular. By this means it will be clear that the power shaft may be detachably connected with the upper end of the dasher rod 10, and therefore when the driving wheel 18 is rotated, the counter shaft 21 is rotated at a higher rate of speed and the intermeshing gears cause the power shaft 30 to drive the dasher rod 10 and with it the dasher at considerable speed within the churn body. When it is desired to gain access to the interior of the

latter, however, it is obvious that the upper end of the rod 10 must be disconnected from the lower end of the shaft 30, and this disconnection is rendered possible by means of the notch in one and the pin in the other, save it becomes necessary for the power shaft to be raised in its bearings.

The yoke 16 is preferably a stout casting, and formed with it through the center of its cross bar is a tubular post 40 whose bore is of a size to loosely receive the shaft 30. The upper end of this post is headed as at 41, and upon the head rests the ball bearing best seen in Figs. 4 and 5. This bearing comprises an annular cup-shaped member 42 having inturned lips 43 at the upper edge of its upright wall 44, and an inner complementary member 45 whose upper horizontal wall 46 is peripherally of a size to fit within said wall 44 where it is held by said lips 43. Both walls are dished on their contiguous surfaces to form ball races, and between the latter is disposed a series of balls 47. As seen in Fig. 3 the outer member 42 normally rests upon the head 41 of the tubular post 40, the inner member surrounds the power shaft 30, and a downwardly projecting collar or flange 48 and the driven gear 30 extends between the inner ends of the lips 43 and rests upon the top of the horizontal wall 46 of the inner member of this ball bearing. Finally, a pin or other detachable fastening 50 is passed through the power shaft 30 beneath the lower end of the tubular post 40, and in such position that the entire shaft 30 and with it the fly wheel and driven gear can be raised within said post so as to disengage the notch 34 from the pin 35 when desired.

All parts of this machine are by preference made of metal, excepting the base 15 possibly, and if of metal it is suitably treated so as to prevent rust and to give the necessary strength to the various places where it is liable to be subjected to strain.

As I lay no claim to the dasher, neither its construction nor its material need be amplified.

The use of such a machine as either a churn, ice cream freezer, washing machine, or for any other similar purpose is well known and needs no description here, further as to how the operator shall gain access to the interior. When this is desired, the fly wheel is lifted until the pin 50 strikes the lower end of the tubular post 40 at which time it will be found that the teeth of the gears 33 and 23 have become disengaged and the flange 48 has been lifted off of the ball bearing, and also the notch 34 has been disengaged from the pin 35 and the upper end of the dasher rod 10 is free from the socket in the lower end of the driving shaft 30. The entire churn body 5 with its cover 6 can then be drawn laterally out of the

yoke, the cover removed, and the dasher and its contents withdrawn. After they are replaced, the body and its cover are again pushed in under the yoke, and while holding the upper end of the dasher rod with one hand the fly wheel and its connected parts are manipulated by the other hand so as to drop the socket at the lower end of the power shaft over the upper end of the dasher and reengage the notch with the pin. Such movement drops the gear wheel 33 into reengagement with the driving gear, and permits the flange 48 to descend between the lips 43 of the outer member of the ball bearing and rests upon the wall 46 of the inner member thereof. Thus it will be seen that the weight of the heavy fly wheel is sustained by the inner member of the ball bearing, and the ball communicates this weight to the outer member thereof which in turn is sustained by the head 41 of the tubular post 40, and hence this weight is not communicated to the dasher rod and by it to the point 9 in the step bearing 8 and these members are not worn out. Rotation of the driving wheel 8 by power or by hand imparts rapid rotation to the counter shaft 21, and the latter through the gears 23 and 33 communicates rotation through the power shaft which in turn drives the dasher in the manner which will be clear.

It will be obvious that the direction of rotation is not important to the present invention, and this I consider one of its important and valuable features, because in many cases it becomes desirable after rotating the dasher in one direction to revert the direction of rotation for certain reasons. I have shown the dasher 11 mounted upon the dasher rod 10 by means of a set screw, and this is a desirable construction in many cases where it becomes desirable to remove the dasher from the rod for certain purposes as for instance for the substitution of another dasher when other work is to be done than churning.

The wings 12 are only theoretically illustrated in the drawings, and may in fact be omitted or replaced by others of different and for different purposes.

I reserve the right to amplify details and to make such changes as come within the spirit of my invention, and of course the materials and proportion of parts are essential to this patent.

What is claimed is:

1. In a churn, the combination with an upright body, a cover therefor having a hole therein, a dasher rod having its upper end normally projecting through said hole, of a yoke under which the body is adapted to be slid and having a tubular post on the cross bar of the yoke, an upright driving shaft mounted rotatably and slidably within said post and having the lower end thereof

adapted to engage the upper end of the dasher rod, a gear member secured upon the upper end of said shaft, and a driving mechanism mounted upon the yoke including an upright gear meshing with said geared member when the latter is in its lowermost position.

2. In a churn, the combination with a yoke having an upright tubular post, a driving shaft mounted slidably and rotatably therein, a bevel gear secured to the upper end of said shaft and having a flange depending therefrom, of a ball bearing in two members whereof the outermost rests upon the upper end of said post and has inturned lips at the upper edge of its wall and the innermost surrounds said driving shaft and

has its horizontal wall engaged under said lips, the flange of the bevel gear being adapted to pass between the inner ends of said lips and rest upon said horizontal wall of the innermost member of the bearing, and a driving mechanism mounted upon the yoke and including an upright bevel gear adapted to engage the former gear when the latter descends so that the flange rests upon the ball bearing.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ROBERT D. SIMPSON.

Witnesses:

JOSEPH P. EAGLESON,
ALVIN A. ALBERT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."