No. 697,715. Patented Apr. 15, 1902.

J. M. HARPER.

CHURN.

(Application filed Feb. 9, 1901.)

(No Model.)

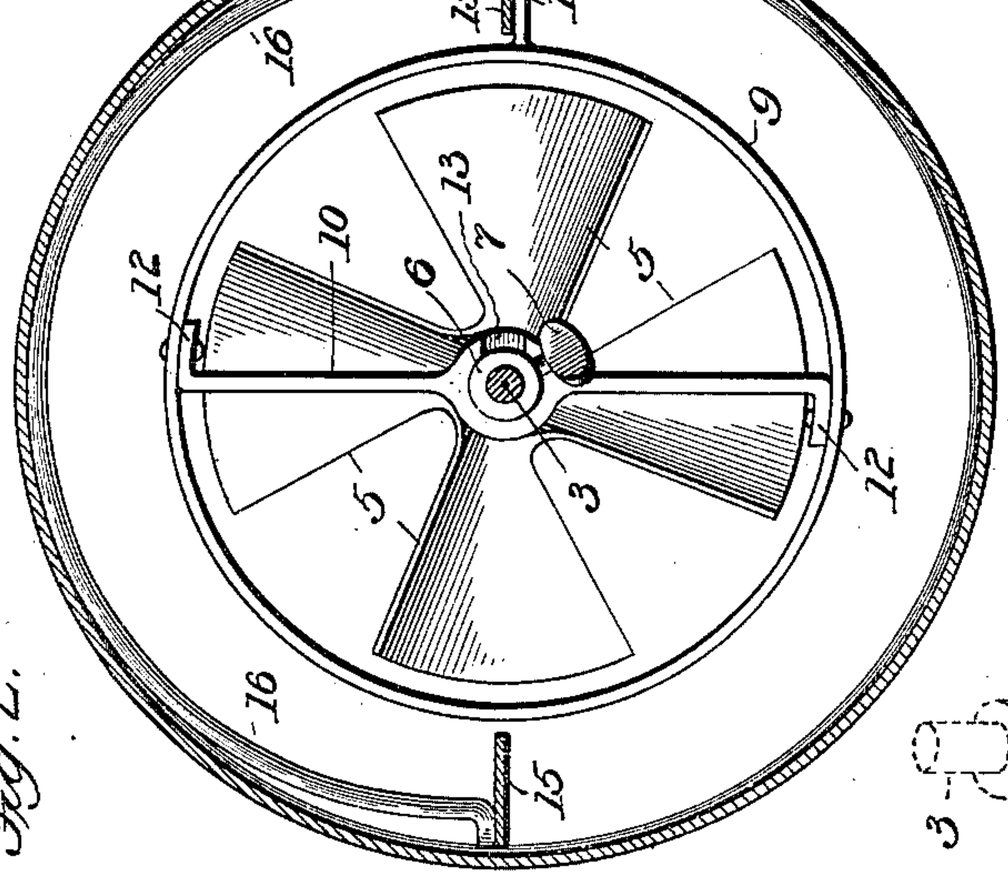

Fig. 2.

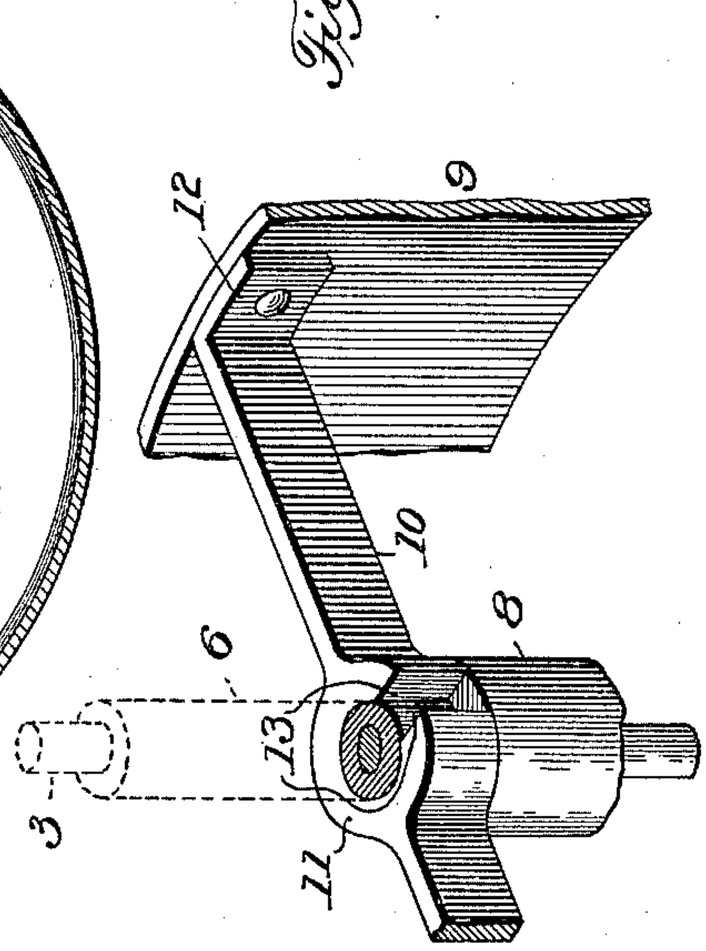

Fig. 3.

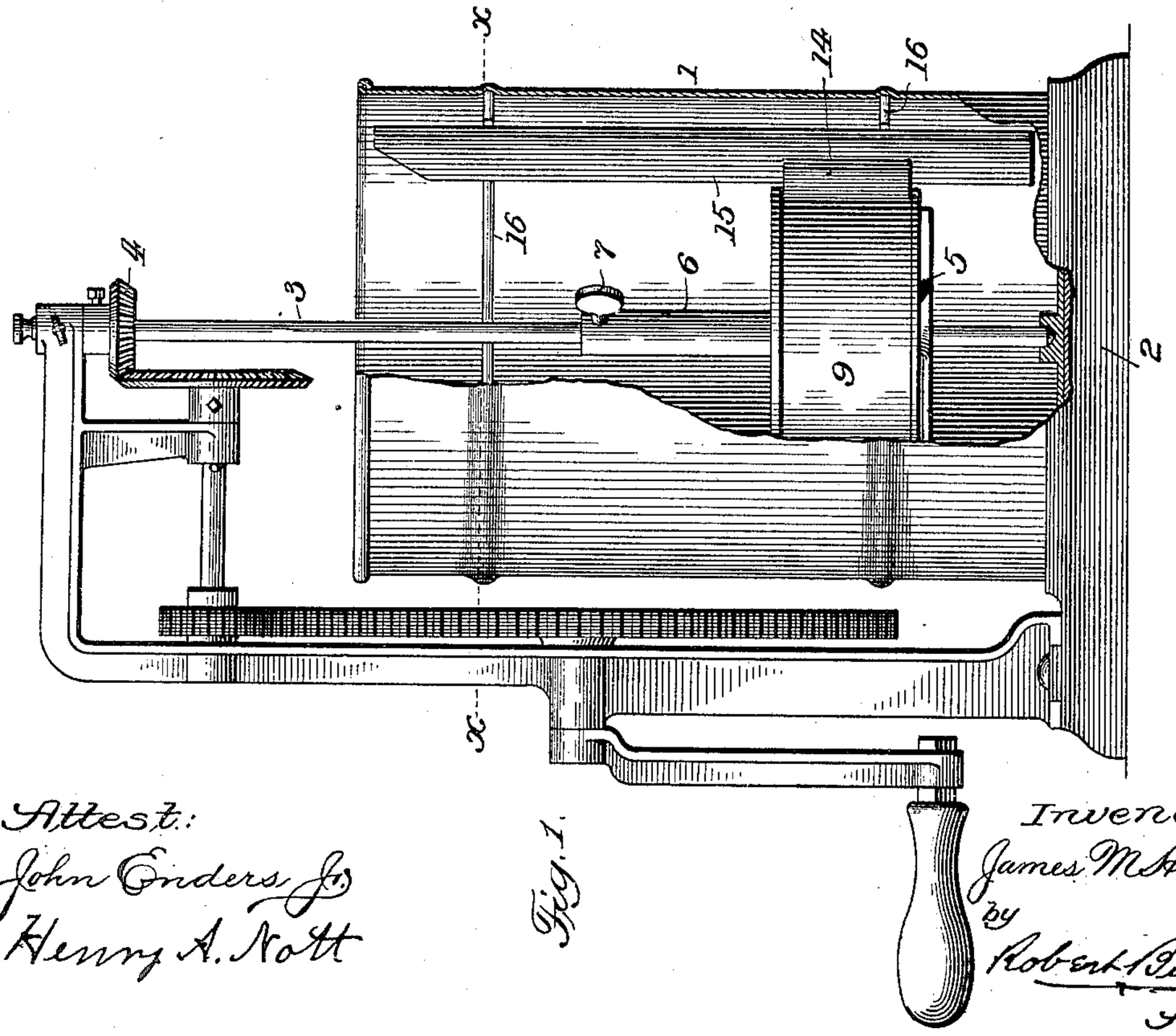

Fig. 1.

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JAMES M. HARPER, OF CHICAGO, ILLINOIS.

CHURN.

SPECIFICATION forming part of Letters Patent No. 697,715, dated April 15, 1902.

Application filed February 9, 1901. Serial No. 46,600. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. HARPER, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Churns, of which the following is a specification.

This invention relates to that type of churns in which a revoluble shaft is arranged vertically within the containing vessel of the churn and carries a dasher in the form of a propeller-screw to effect the desired churning action by a continued rotation of such shaft and the propeller-screw; and the object of the present improvement is to provide a simple and efficient construction and arrangement of the directing and confining annulus by means of which the cream is guided to and from the screw-formed dasher or propeller in the churning operation, all as will hereinafter more fully appear and be more particularly pointed out in the claims. I attain such objects by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, illustrating the general arrangement and operating mechanism of the present improvement; Fig. 2, a horizontal section at line $x\,x$, Fig. 1; Fig. 3, a detail perspective view illustrating the detachable connection between the hub or spider of the confining annulus and the shaft or spindle of the dasher-shaft.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents the containing vessel of the usual cylindrical shape and provided at top with a removable cover (not shown) and at bottom with a centrally-arranged bearing-step for the lower end of the revoluble dasher rod or shaft; 2, a supporting-base or bed-plate upon which the containing vessel 1 is supported in proper position and which base-plate carries the usual frame for the gearing and shafts by which a movement of rotation is imparted to the dasher rod or shaft and the propeller or dasher carried thereby, such mechanism and frame being of the usual construction and arrangement common to the present type of churns.

3 is the revoluble dasher rod or shaft, stepped in the step-bearing of the containing vessel and carrying at its upper end a bevel-gear 4, adapted to mesh with and be driven by a similar gear of the driving mechanism, as shown.

5 is the revoluble dasher of a screw-propeller form, the central hub 6 of which engages the dasher rod or shaft 3 in a vertically-adjustable manner and is clamped thereon by a set-screw 7, so as to have positive rotation along with such shaft in the practical use of the apparatus. In the present invention the propeller-hub 6 is of an elongated form and is provided with an enlargement 8 to form a rest or stop for the non-revoluble annulus, hereinafter described, and maintain the proper relative arrangement between the same and the revoluble dasher or propeller.

9 is a non-revoluble annulus maintained in concentric relation to the dasher 5 and its central elongated hub 6 by a web or spider 10, having a central hub 11, embracing the hub 6 of the dasher 5 and resting upon the enlargement 8 of the same to maintain the proper relative vertical relation of the two parts. Such spider at its outer ends is provided with ears 12 for the attachment of the annulus 9, as shown in Figs. 1, 2, and 3. In the present invention the hub 11 is formed with a side slot 13, communicating with its bore, and of a width equal to the diameter of the dasher rod or shaft 3, the purpose being to permit of a lateral detachment of such hub and the annulus 9 from around such rod and the dasher or propeller without necessitating a detachment of the dasher from its rod. The annulus 9 will be arranged with relation to the revoluble dasher 5, so as to entirely inclose the same, with its upper edge arranged some distance above said dasher, while its lower edge is about even with the central portion of such dasher, as shown in Fig. 1. As so arranged a very efficient churning action of the contents is attained in a rapid manner.

14 is a projection on the exterior of the annulus, which is adapted to engage against one of the breaks on the interior of the containing vessel to hold the annulus against rotation in use.

15 represents the vertically-arranged breaks

of the present invention, which for convenience in cleaning are made readily detachable from the main casing 1 in the following manner: The pair of breaks 15 are connected together by one or more semicircular connecting-rods or connections 16, of approximately the same radius as the interior of the main casing and preferably adapted to engage in the cavity or cavities, as the case may be, of an annulus-bead in the wall of such main casing and as illustrated in Fig. 1 of the drawings, so that some resistance will be offered to a vertical disengagement of the said breaks. The said breaks will have the usual vertical arrangement common to the present type of churns and will extend, as usual, the greater part of the height of the containing vessel 1, as shown.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a churn, a revoluble dasher-rod, a dasher carried thereby and having a propeller form, a stationary annulus arranged to surround said dasher, and held in concentric relation therewith by a web or spider engaging the dasher-rod, an exterior projection on said annulus forming a stop, a containing vessel, and means within said vessel for engaging said stop.

2. In a churn, a revoluble dasher-rod, a dasher carried thereby and having a propeller form, a stationary annulus arranged to surround said dasher, and held in concentric relation therewith by a web or spider, the hub of which is provided with a side opening to permit lateral disengagement, an exterior projection on the annulus forming a stop, a containing vessel, and means within said vessel for engaging said stop.

3. In a churn, the combination of a main cylindrical casing, a revoluble dasher-rod arranged vertically therein, a dasher secured to the said rod, means for imparting rotary movement to the dasher, a pair of vertical plates or breaks arranged within the casing in diametrically-opposed relation, a pair of elastic semicircular connections uniting said breaks together, a stationary annulus encompassing the dasher, a spider on said annulus engaging the dasher-rod to maintain concentric relation between the parts, and a stop on the exterior of such annulus for engagement with one of the vertical breaks to prevent a turning movement of such annulus, substantially as set forth.

Signed at Chicago, Illinois, this 4th day of February, 1901.

JAMES M. HARPER.

Witnesses:
ROBERT BURNS,
HENRY A. NOTT.