

No. 638,234.

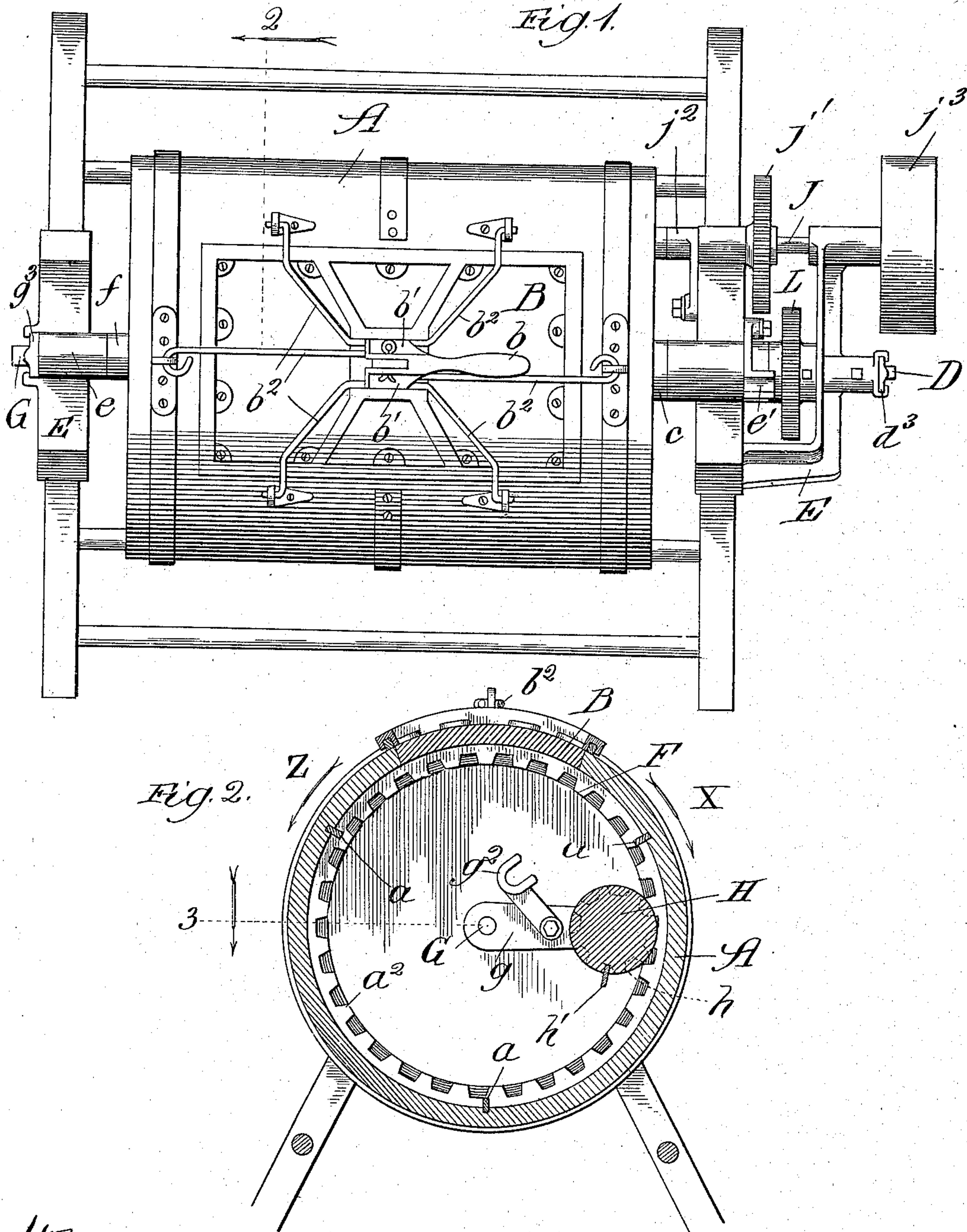
Patented Dec. 5, 1899.

F. E. GILMORE.
COMBINED CHURN AND BUTTER WORKER.

(Application filed Oct. 23, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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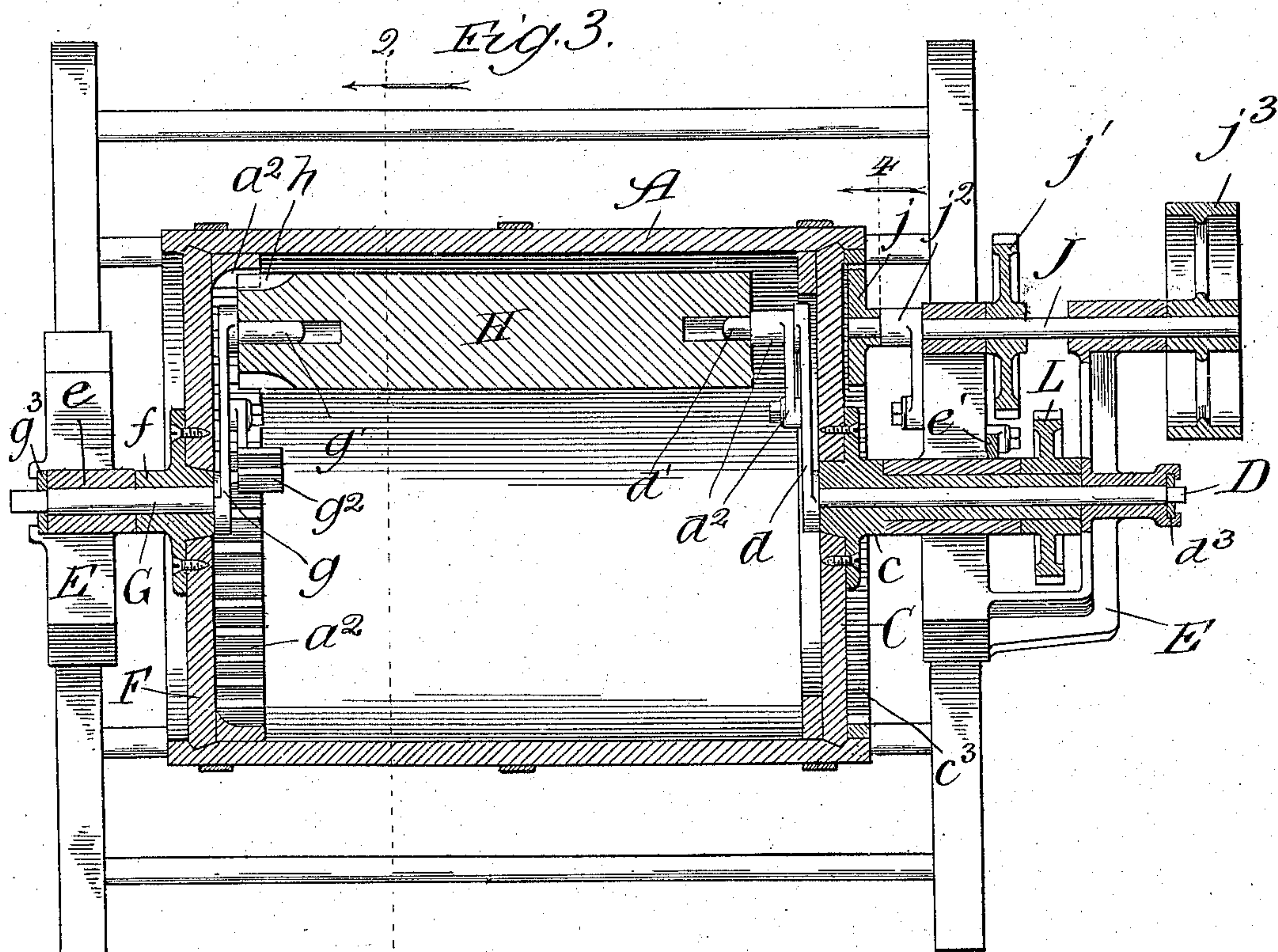


Fig. 4.

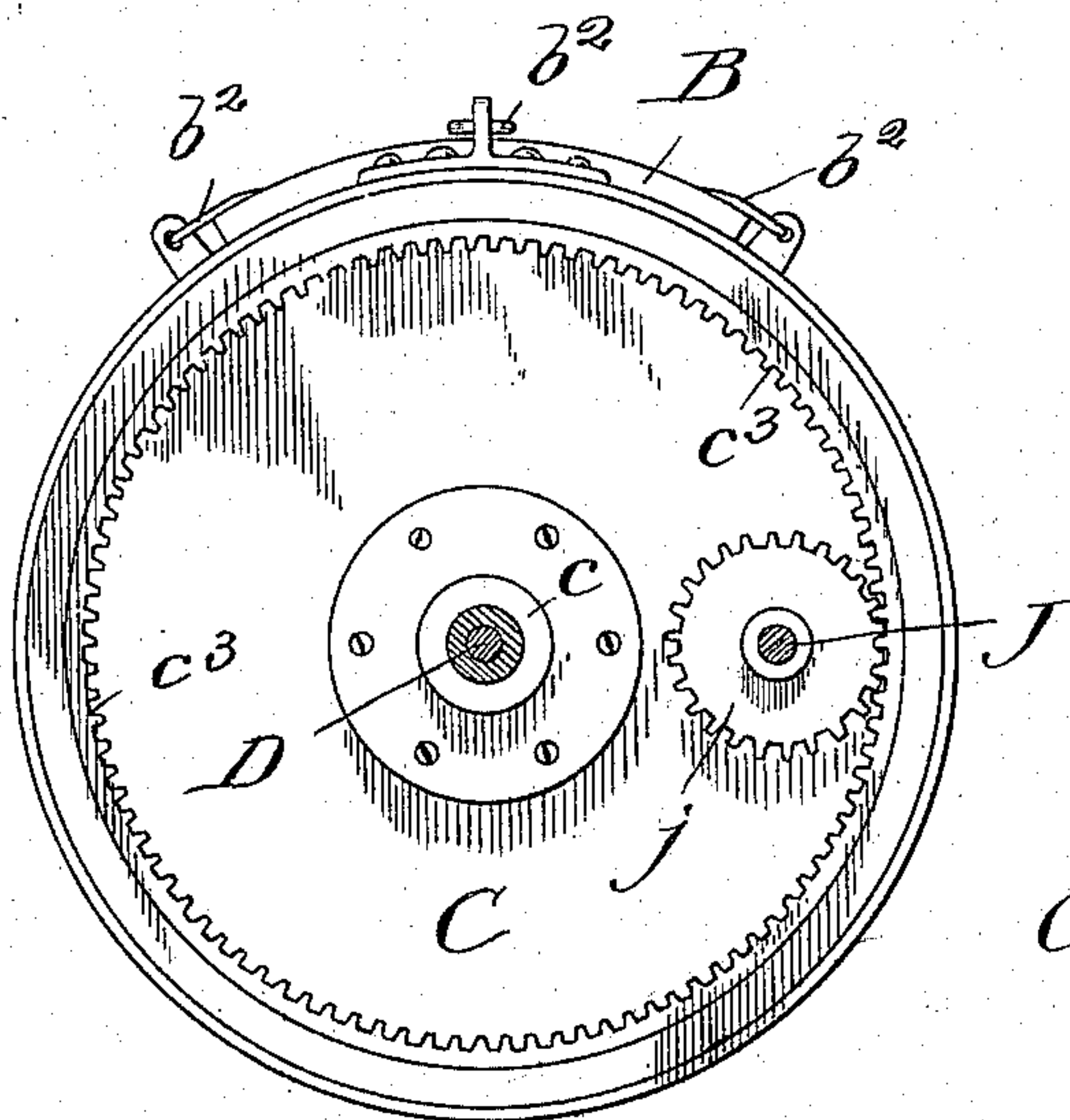
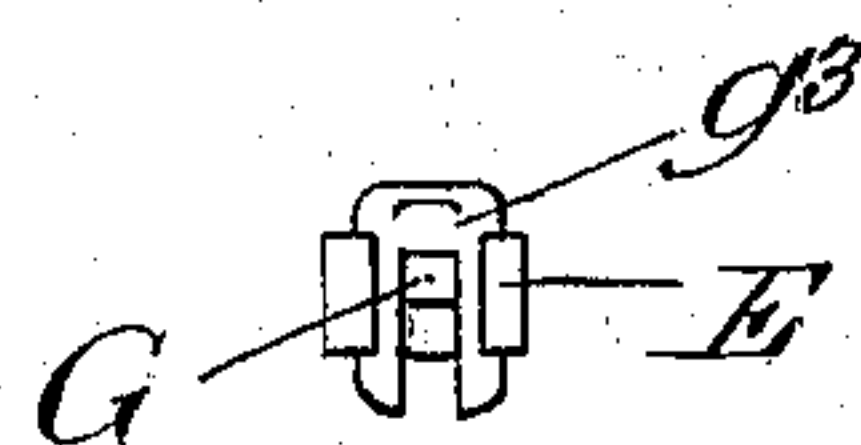


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK E. GILMORE, OF WARREN COUNTY, ILLINOIS.

COMBINED CHURN AND BUTTER-WORKER.

SPECIFICATION forming part of Letters Patent No. 638,234, dated December 5, 1899.

Application filed October 23, 1896. Serial No. 609,779. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. GILMORE, a citizen of the United States, residing in the county of Warren, State of Illinois, have invented certain new and useful Improvements in a Combined Churn and Butter-Worker, of which the following is a specification, which will enable others skilled in the art to which it belongs to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Prior to my invention, so far as known to me, in all combined churns and butter-workers in which the butter-working roller or rollers have been mounted within a revoluble cylinder near to the periphery of said cylinder and parallel with the axis of said cylinder said roller or rollers have been provided with shafts which projected through a head of the cylinder, which shafts served to carry the roller or rollers and were geared with driving mechanism for rotating the rollers. With roller-shafts thus projecting through the cylinder-head between its axis and periphery it was absolutely necessary to have loose cylinder-heads or heads formed in parts, such as shown and described in the Owens patent, No. 511,275, of December 19, 1893, in order to permit of rotating the cylinder, while the roller or rollers would not be revolved or carried around in an orbital path, but remain in stationary positions.

The leading object of my invention has been to solve the problem of providing a combined churn and butter-worker of the type referred to above and in which the churn-cylinder would have heads fixed thereto, and thus dispense with the loose heads or two-part heads, with their evident objectionable features.

To the end of carrying out the aforesaid object of my invention it consists in its main feature in a churn drum or cylinder having heads fixed thereto, which heads are each formed of an undivided part or part not separated into parts movable with respect to each other, and stub-axles, one of which projects through each of said heads and together form bearings on which the drum or cylinder is rotated, while the stub-axles are fixed, said stub-

axles within said drum or cylinder carrying radial arms, on the outer ends of which are mounted a butter-working roller or rollers parallel with the axis of the cylinder and a short distance from the inner periphery thereof, as hereinafter fully described.

The invention further consists in constructions and combinations hereinafter described, and the different features of the invention are made the subject-matter of claims hereto appended.

In the annexed drawings, Figure 1 is a plan of my improved combined churn and butter-worker. Fig. 2 is a transverse sectional elevation thereof on line 2 2 of Figs. 1 and 3. Fig. 3 is a horizontal sectional plan on line 3 3 of Fig. 2. Fig. 4 is a sectional elevation taken on line 4 4 of Fig. 3. Fig. 5 shows a detail of locking device for holding shaft.

The cylindrical vessel A has an opening in its side for putting in cream, taking out butter, &c., which is closed by a suitable lid B, preferably of the kind shown in the drawings. When the clamp-handle *b*, pivoted on the lid B, is pressed down, its cam-flanges *b'* clamp upon the levers or arms *b²*, pivoted on the body of the vessel, and thus the lid B is tightly fastened. The vessel A is provided with inwardly-projecting wings *a*, three or four in number, which act as dashers in churning. One of the heads C of the cylinder A has the hub *c* fixed thereto at its center, and the short shaft or stub-axle D, which is releasably fixed to the frame E, passes through said hub and forms one of the bearings on which the cylinder A revolves. The other head F of the cylinder A has the hub *f* fixed thereto at its center, and the short shaft or stub-axle D, which is also releasably fixed to the frame E, passes through said hub and forms the other bearing on which the cylinder A revolves. The shafts D and G, which project into the cylinder A, have fixed to their inner ends, respectively, the radius-arms *d* and *g*. The arms *d* and *g* are inside of the cylinder A and are held in horizontal positions by the shafts D and G when said shafts are fixed in position, as hereinafter described. The arms *d* and *g* have confronting short stub-axes *d'* and *g'*, respectively, on which a roller H is journaled. The roller H carries a pinion *h* at one of its ends, which meshes with

a pinion a^2 , that is fixed to one of the cylinder-heads. The roller H has a rib or ledge h' to cut the butter in working it. The roller H may be shifted longitudinally on its stub-
 5 axles d' and g' , so as to throw it in or out of gear with the gear a^2 , and is secured in gear by the button d^2 , pivoted on the arm d , being turned as shown in Fig. 3. The roller H is
 10 secured out of gear by throwing back button d^2 , shifting the roller to the right, and then throwing the button g^2 , pivoted to the arm g , into position.

When desired, for the purpose of cleaning, &c., the roller H may be taken out of the ves-
 15 sel by first moving the locking device g^3 , which fits on the squared end of the shaft G and locks and fixes said shaft to the frame E to prevent its rotation until so removed, when it allows the shaft G to revolve in the jour-
 20 nal-box e on the frame E. The shaft G, revolving while the other main shaft D remains stationary, releases the roller H at one end or the other from the stub-axles d' or g' . The
 25 locking device d^3 , which is constructed as the device g^3 , may be withdrawn from the squared end of the other shaft D, and the roller may be released in this way.

The head C has a gear c^3 , into which mesh the teeth of the cog-wheel j , carried by the
 30 shaft J. This is secured in gear by the button j^2 , as shown in Fig. 3. The button j^2 may be thrown back and the shaft J shifted to the right, which brings the cog-wheel j out of gear and brings the cog-wheel j' into gear with the
 35 cog-wheel L on the hub c , which gear is secured by throwing the button e' into position. Power is applied to the shaft J in any suitable manner, as by the pulley j^3 .

This machine is used as a churn in the fol-
 40 lowing manner: The roller H is thrown out of gear with the pinion a^2 . The cog-wheel j' is thrown in gear with the cog-wheel L. Power is then applied to the shaft J, as by the pulley j^3 , rotating the vessel A in the direction
 45 shown by the arrow X in Fig. 2. The wings a strike the cream contained in the vessel A, thus churning it.

This machine is transformed into a butter-
 50 worker in the following manner: The roller H is thrown in gear with the pinion a^2 . The shaft J is shifted to the left, throwing the cog-wheel j into gear with the gear c^3 . The shaft J being then rotated in the same direction as in churning will rotate the vessel A
 55 in the direction of the arrow Z in Fig. 2. The butter is thus compressed again and again between the roller H and the side of the vessel nearest thereto. Experience has shown that butter cannot be worked effectually be-
 60 tween such rollers and the inner side of the churn-cylinder without the roller is given positive rotations at substantially the same rate of speed at its periphery as has the adjacent inner side of the cylinder, whereby the
 65 butter will be compressed by direct pressure between the cylinder and the roller and not by any sliding action between the coacting

parts and on the butter. The butter itself cannot be depended upon for rotating the roller, as it will accumulate at one side of and
 70 between the roller and cylinder, if said parts are located at but a short distance apart, and when it does pass through between them will be damaged by the indirect pressure it re-
 75 ceives by sliding action of the parts on the thin sheet of butter, and if the roller is located farther from the cylinder the butter will not be thoroughly worked, as the sheet thereof is too thick for proper working. I
 80 have overcome these difficulties by giving positive rotary motion to the roller through the instrumentality of a pinion or gear wheel
 85 fixed to the inner side of one of the cylinder-heads and with which a pinion on the roller can be moved into gear. Thus I effect a gear
 90 connection between the roller and the cylinder without any holes for the roller-journals extending through the cylinder head or heads and which holes are indispensable in churns
 95 in which two-part cylinder head or heads are used and a gear with the roller is on the outer side of the cylinder-head.

Of course I do not confine myself to the mechanism hereinbefore described any more
 95 than is pointed out in the claims.

I claim—

1. In a combined churn and butter-worker, and in combination, a cylinder having heads
 100 fixedly connected thereto, a fixed concentric shaft at each end of said cylinder on which shafts it rotates, radial arms inside said cylinder and fixed each to the inner end of one
 105 shaft, a roller mounted in the ends of said radial arms near the inner surface of said cylinder a gear within said cylinder near one head, a pinion fixed to said roller and mesh-
 110 ing with said gear to give positive motion to the roller, and means for rotating said cylinder, substantially as described.

2. In a combined churn and butter-worker, and in combination, a cylinder having heads
 115 fixed thereto, which heads are each formed of undivided parts and not of parts movable with respect to each other, a concentric shaft at each end of said cylinder on which shafts it
 120 revolves, means for locking said shafts against rotation, radial arms inside of said cylinder and fixed to the inner ends of said shafts, a roller journaled in the ends of said radial arms and means for adjusting said roller length-
 125 wise of itself, a pinion on one end of said roller, and a pinion fixed to the inner side of one of the cylinder-heads, whereby said roller may be geared with or ungeared from said pinion and cylinder, substantially as described.

3. In a combined churn and butter-worker, a cylindrical vessel A having closed ends C
 130 and F, a wing a , trunnions D and G, arms d and g , trunnions d' and g' , a roller H, a gear h on the roller, a gear a^2 on the inside of the vessel A, buttons d^2 and g^2 , and means for rotating the vessel A on its axis.

4. In a combined churn and butter-worker, the vessel A having cream or liquid tight ends

or heads immovably fixed in place, trunnions for said vessel having arms d g on the inside of the vessel, the butter-working roller H journaled to said arms, a gear h on the roller, a
5 gear a^2 on the inside of the vessel meshing with gear h , means for maintaining the engagement or disengagement of said gears, gear c^3 on the outside of the vessel, shiftable gear j to engage gear c^3 , gear L connected with the vessel, and the shiftable gear j' to engage gear L , substantially as shown and described.

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Witnesses:

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