(No Model.) 3 Sheets—Sheet 1.

C. S. BROWN.

COMBINED Cchurn AND BUTTER WORKER.

No. 565,720. Patented Aug. 11, 1896.

Fig. 1.

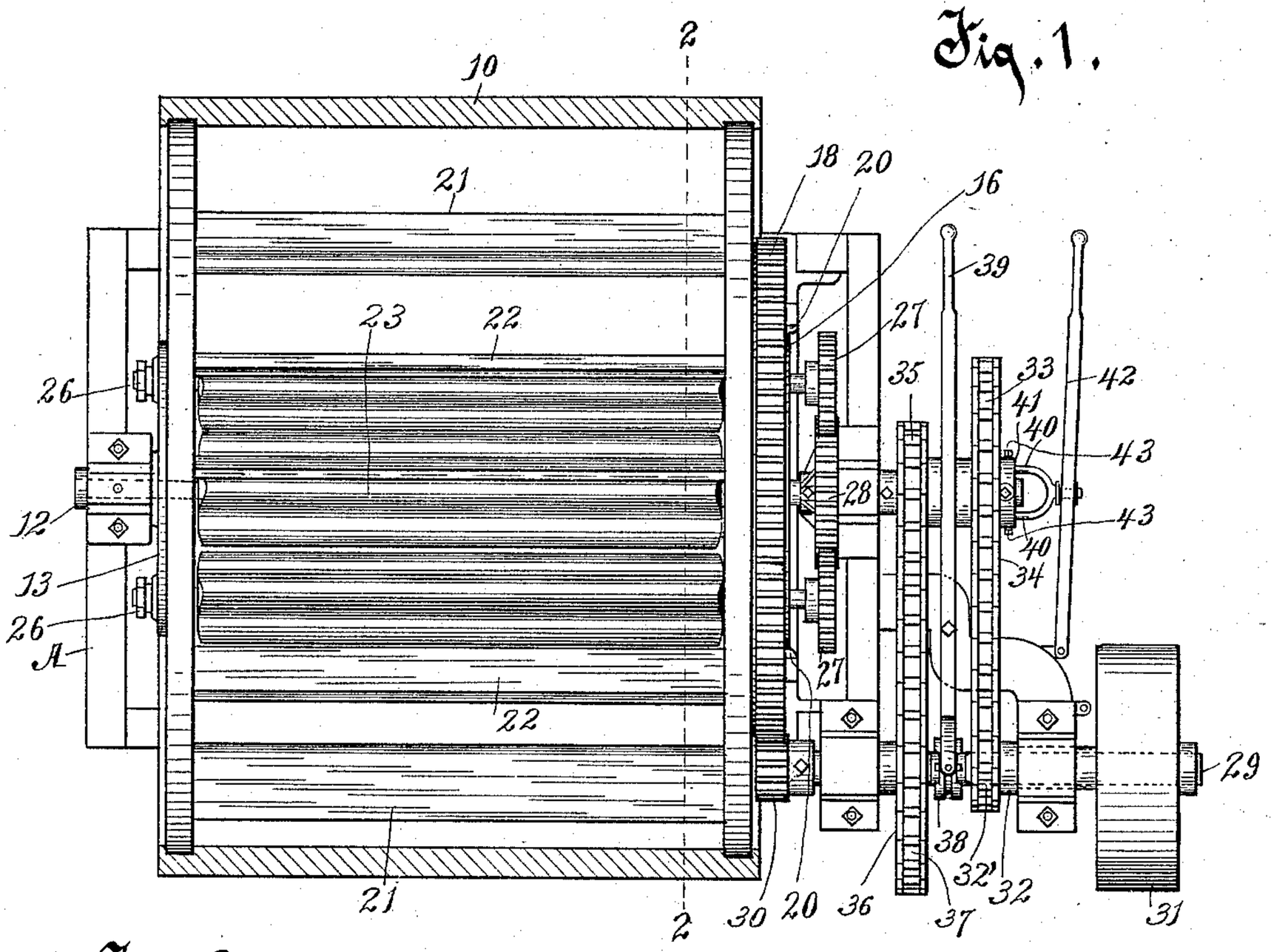
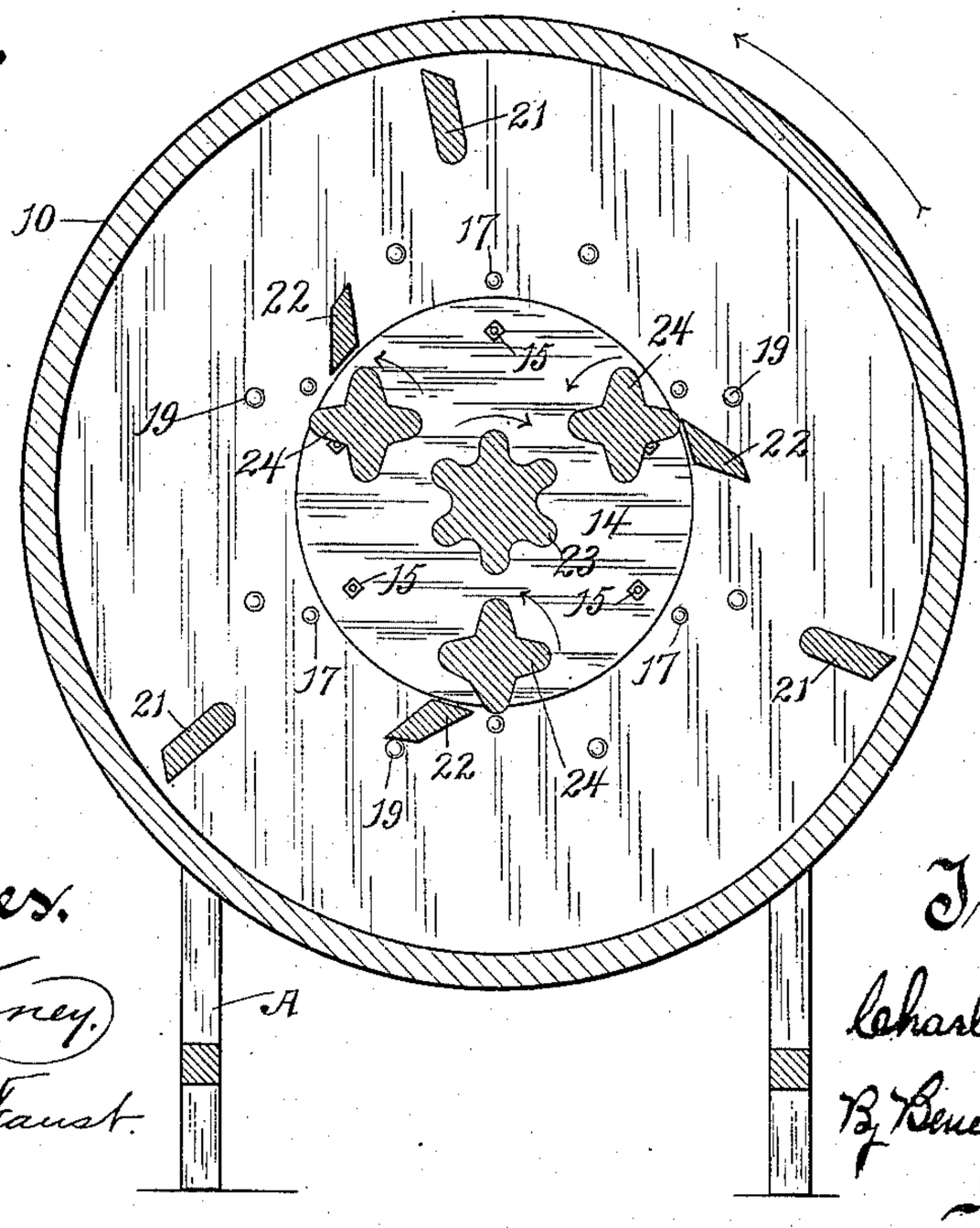


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

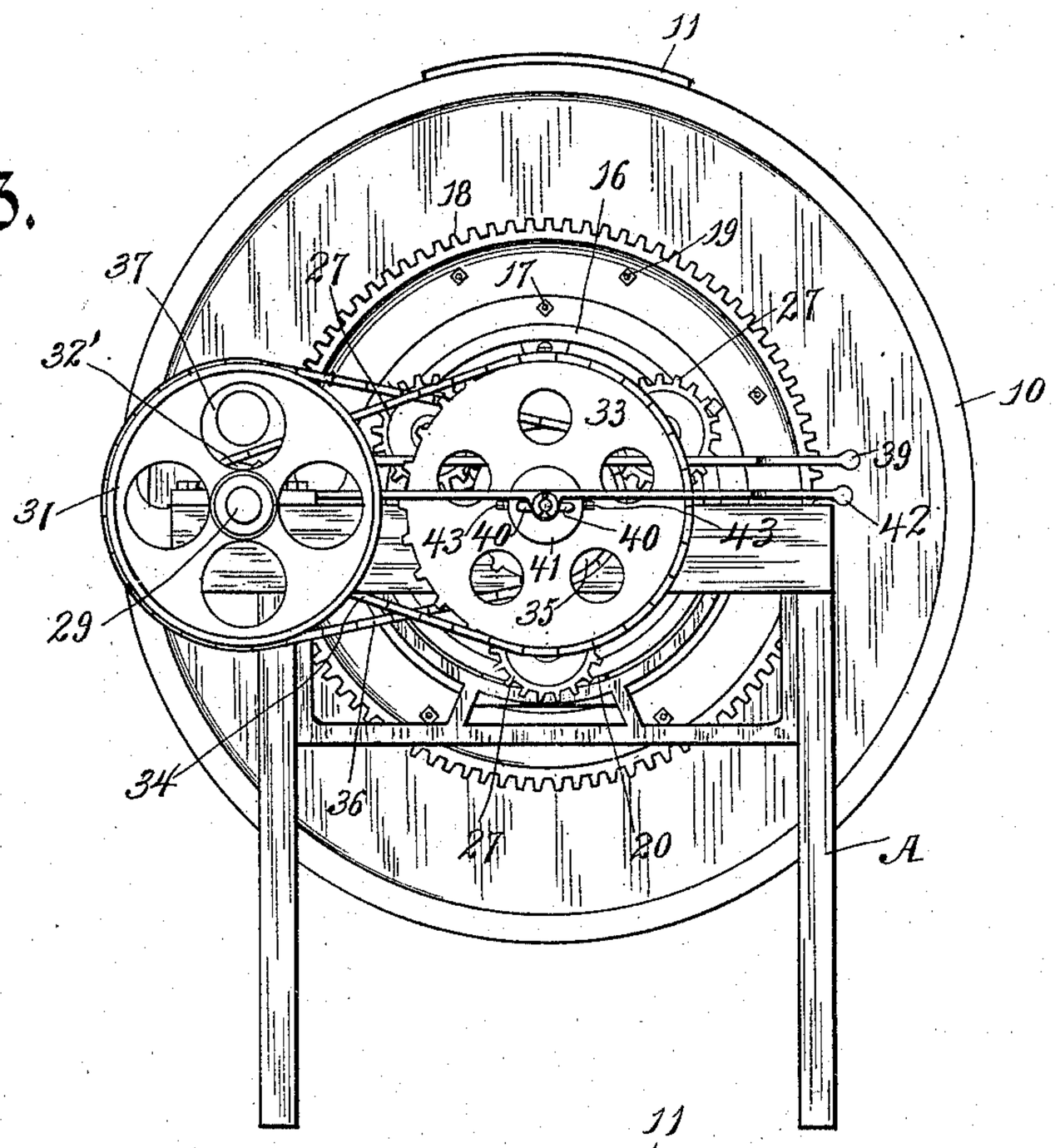
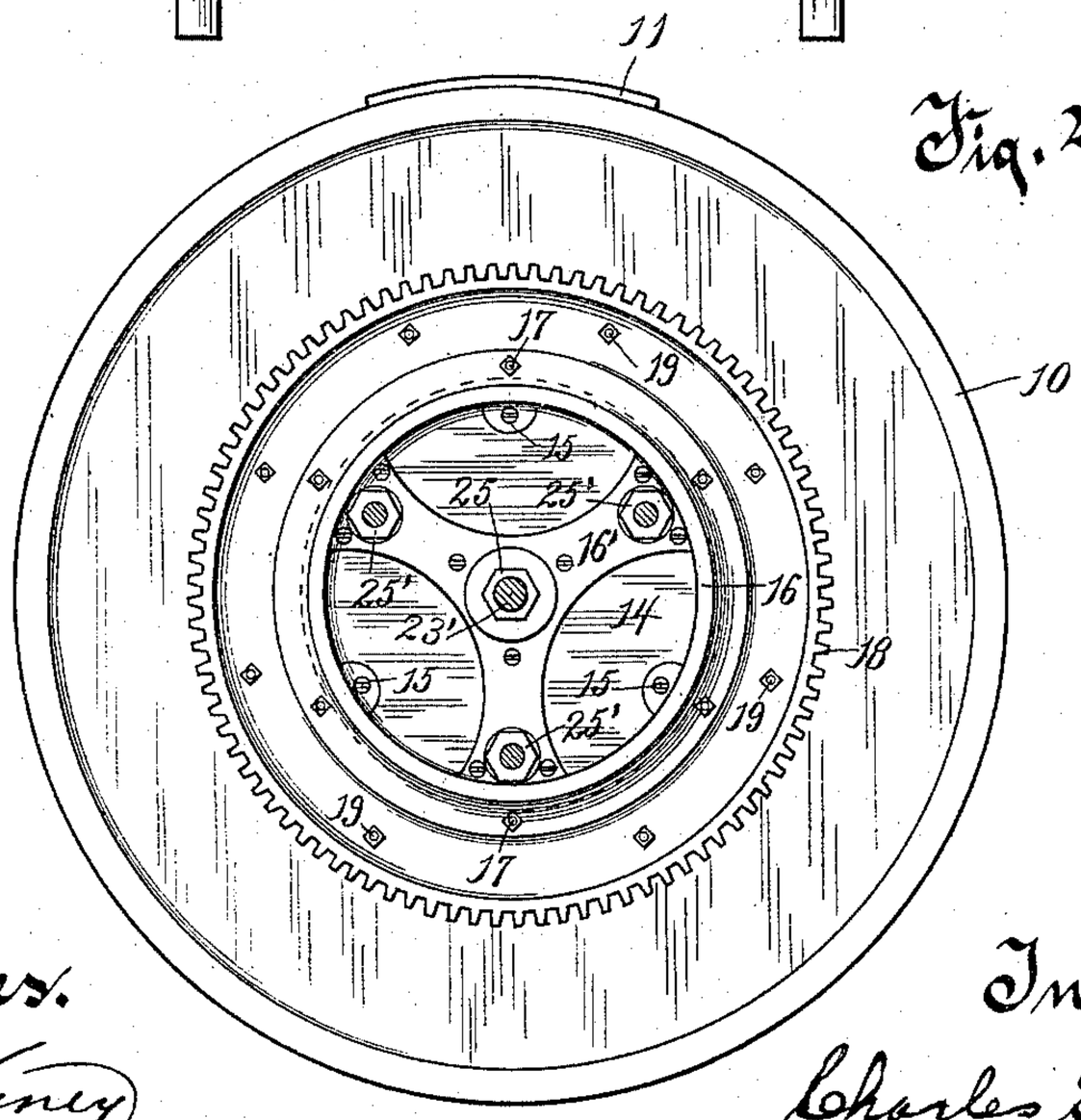


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

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COMBINED Cchurn AND BUTTER WORKER.

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Fig. 5.

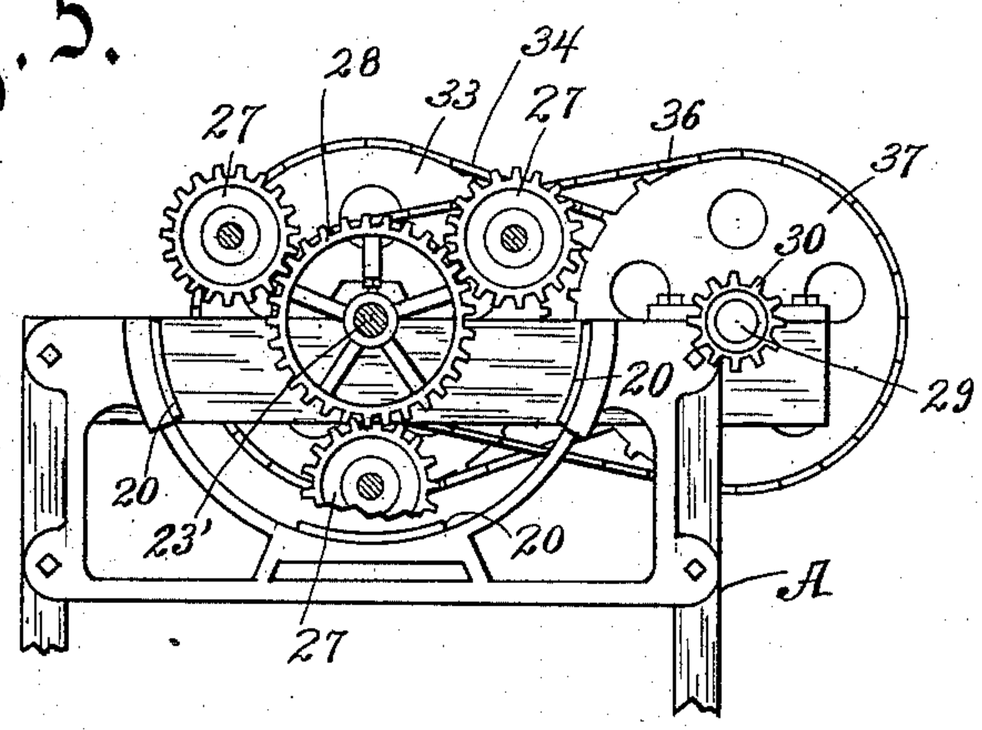
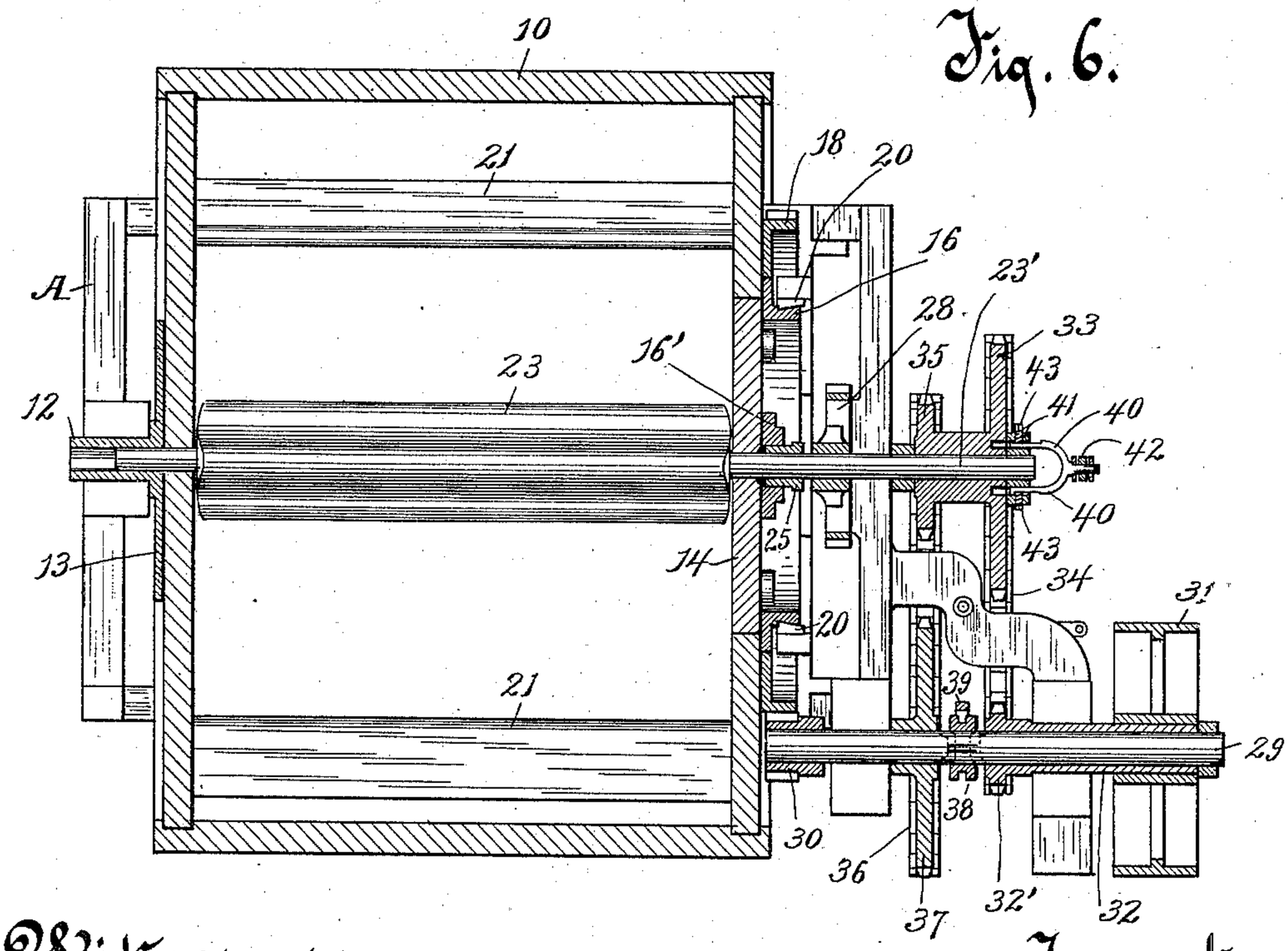


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES S. BROWN, OF LAKE MILLS, WISCONSIN, ASSIGNOR TO THE F. B. FARGO & COMPANY, OF SAME PLACE.

COMBINED CHURN AND BUTTER-WORKER.

SPECIFICATION forming part of Letters Patent No. 565,720, dated August 11, 1896.

Application filed September 3, 1895. Serial No. 561,183. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. BROWN, of Lake Mills, in the county of Jefferson and State of Wisconsin, have invented a new and useful Improvement in Churns and Butter-Workers, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention relates to improvements in combined churns and butter-workers of a class to which the machine belongs, for which Letters Patent No. 537,600 were on April 16, 1895, issued to myself and Frank B. Fargo.

The object of the present invention is to provide a machine in which both heads of the drum are practically permanently tight, a central part of one head only being releasable and detachable merely and only for fitting interior devices in the drum and for getting at or removing them for repairs, and to provide well-adapted and simple mechanism that can be made at a minimum of expense for operating the drum and butter-working rollers independently of each other and conjointly, as desired.

The invention consists of the mechanism and its parts and combination of parts, as hereinafter described and claimed, or their equivalents.

In the drawings, Figure 1 is a top plan view of my improved machine, the upper portion of the perimeter of the drum being removed to show the interior construction. Fig. 2 is a transverse section on line 2 2 of Fig. 1. Fig. 3 is a front end view of the complete machine. Fig. 4 is a front end view of the drum. Fig. 5 is a detail of the mechanism and framing at the front end of the machine, and Fig. 6 is a central longitudinal section of the complete machine.

In the drawings, A is the frame of suitable size and form to properly support the operative mechanism. The cylindrical drum 10 is provided with a door 11 in its perimeter for introducing milk and cream thereto and for removing butter and milk therefrom. At the rear end the drum is provided with a hollow gudgeon 12, which projects axially therefrom and has its bearings in a suitable box therefor on the frame. The inner extremity of the gudgeon 12 is expanded into a laterally-extending base or plate 13, which is adapted for securing the gudgeon to the head of the drum, and also provides suitable bearings for butter-working rollers hereinafter described.

At the front end the drum-head is provided with a central aperture closed by the partial head 14. This head 14 fits into the drum-head aperture, and is secured by bolts 15 to the enlarged annular hollow gudgeon 16, which gudgeon is provided with a radially-extending flange that projects over the abutting edge of the drum-head, and is secured thereto releasably by bolts 17. An enlarged annular gear 18 is secured permanently to the drum-head, concentrically therewith, by bolts 19. The gudgeon 16 has bearings and slides revolubly on a series of segmental Babbitt-metal bearings 20, fixed on the frame and individually suitably curved and collectively arranged in a proper arc therefor.

In the interior of the drum there are buckets 21, preferably three, at equal distances apart, secured to the drum adjacent to its perimeter, and also dashboards 22, which are secured to the heads of the drum and extend longitudinally of its chamber at equal distances apart near to and parallel with a series of butter-working rollers 23 and 24 therein. The central roller 23 at its rear end is journaled in the gudgeon 12, and at its front end is provided with a journal 23′, that passes centrally through the partial head 14, and has its bearing in a suitable box therefor on the frame. All the butter-working rollers 23 24 are preferably corrugated, and the rollers 24 are grouped about and are disposed parallel with and at a little distance from the central roller 23. The dashboards 22, which in churning serve to agitate the milk or cream, are so located and disposed with reference to the rollers 24 as to serve as aprons or hoppers to receive butter falling from a bucket 21, when near the upper limit of its travel, and guide it into a space between two of the rollers 24, so that it shall pass downwardly between one of these rollers and the central roller 23, and be thereby so compressed as to force the milk or water therefrom.

A stuffing-box 25, fixed on the partial head 14 about the journal 23′, where it passes through the head provides for a suitably-tight joint about the journal. The rollers 24 at the rear end are journaled in the plate or base 13, and are made liquid-tight in their journal-bearings by means of stuffing-boxes 26. At their front ends these rollers 24 are journaled in a spider or arms 16′ of the gudgeon 16, and are suitably packed by boxes 25′, so as to be liquid-tight therein. The journals of the rollers 24 are provided with spur-wheels 27, which severally mesh with the spur-wheel 28 on the shaft 23′ of the central roller.

For rotating the drum, and at different rates of speed, a driving-shaft 29, journaled on the frame, is provided with a pinion 30, which meshes with the annular gear 18 on the drum. The band-wheel 31, which is on the sleeve 32, is preferably loose on the sleeve, but is provided with clutch mechanism whereby it can be coupled to the sleeve at the will of the operator, and thus provide for putting the mechanism actively into operation. The clutch for this purpose is not shown in the drawings, and as the band running on the wheel 31 may be shifted at the other limit of its travel to a loose pulley, the band-wheel 31 may in the present instance be considered as fixed on the sleeve 32. The sleeve 32 is provided with a small sprocket-wheel 32′, and a larger sprocket-wheel 33 is loose on the journal 23′, these two sprocket-wheels being connected operatively by a sprocket-chain 34. Another sprocket-wheel 35, fixed on the hub of the wheel 33, is connected operatively by the sprocket-chain 36 to a larger sprocket-wheel 37, loose on the shaft 29. A clutch-collar 38, splined on the shaft 29, is adapted to be put into engagement either with the sleeve 32 or with the wheel 37, as desired, conveniently by means of a shifting-lever handle 39, pivoted on the frame and provided with a finger or terminal projection that rides in an annular groove in the collar. By putting the sleeve 32 into direct engagement with the shaft 29 by means of the clutch-collar 38 a rapid motion is communicated directly from the band-wheel 31 to the drum 10, which is suitable for churning. By releasing the direct engagement between the shaft 29 and the sleeve 32 and putting the sprocket-wheel 37 into engagement with the shaft 29 a slow motion is communicated to the drum from the band-wheel 31 through sleeve 32 and the sprocket-wheels 33, 35, and 37. This slower motion of the drum is used in working the butter to elevate it above and so as to fall onto the butter-working rolls.

To operate the butter-working rolls, the sprocket-wheel 33 is clutched to the journal 23′ of the central roller, preferably by means of clutch-pins 40, which slide in apertures therefor in a collar 41 adjustable on the journal 23′ adjacent to the sprocket-wheel 33. These clutch-pins are connected to a hand-lever 42, pivoted on the frame, the hand-lever being adapted to push the pins through the collar 41 into sockets therefor in the sprocket-wheel 33 and withdraw them therefrom, thus clutching the sprocket-wheel to the journal 23′ or releasing it therefrom. Set-screws 43, turning in the collar 41, enter longitudinal recesses therefor in the clutch-pins, and prevent their complete withdrawal from the collar, while permitting the proper amount of endwise movement thereof to permit them to suitably enter and be withdrawn from the sockets in the sprocket-wheel. By thus connecting the sprocket-wheel 33 operatively to the journal 23′ the rollers 23 and 24 are rotated suitably for working butter.

It is not important that the rollers rotate on their own axes at any other time than when they are working butter. When the machine is being operated as a churn, the rollers are disconnected from the sprocket-wheel 33 and are free to rotate or oscillate on their own axes, as the movement of the drum and its contents shall actuate them.

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

1. The combination with a cylindrical drum having a tight head and a head with a central aperture of considerable size, of a partial head fitting into and closing the aperture in the principal head, a hollow or annular gudgeon having a radially-extending flange fitted over the joint between and bearing against the partial head and the principal head, said gudgeon being secured to both the partial head and the principal head of the drum by bolting means securing the partial head permanently to the principal head, substantially as described.

2. The combination with a cylindrical drum having a central aperture of considerable size in one head, of a gudgeon having a flange or enlarged base fixed on the other or rear head of the drum, a partial head fitted into and closing the central aperture in the front head, an enlarged hollow gudgeon having a radial flange fitting over the joint between the partial and the principal heads and secured to both these heads by bolting means, a central roller journaled axially in the rear gudgeon and passing axially through the front head of the drum, and other rollers about the central roller journaled in a plate or flange on the outside of the rear head and in a spider or arms of the front gudgeon on the outside of the front head, substantially as described.

3. The combination with a revoluble drum, of a central roller disposed axially therein, a plurality of planetary rollers arranged parallel with and adjacent to the central roller, dashboards fixed in the drum parallel with and adjacent to the planetary rollers, and means substantially as described for rotating the drum and the rollers therein.

4. The combination with a cylindrical drum,

of a central roller disposed axially therein, three or more rollers arranged parallel with, adjacent to and about the central roller, means connecting the several rollers to each other rotatively, and other means for rotating the rollers and the drum simultaneously, substantially as described.

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

CHARLES S. BROWN.

Witnesses:
A. W. GREENWOOD,
F. B. FARGO.