(No Model.)

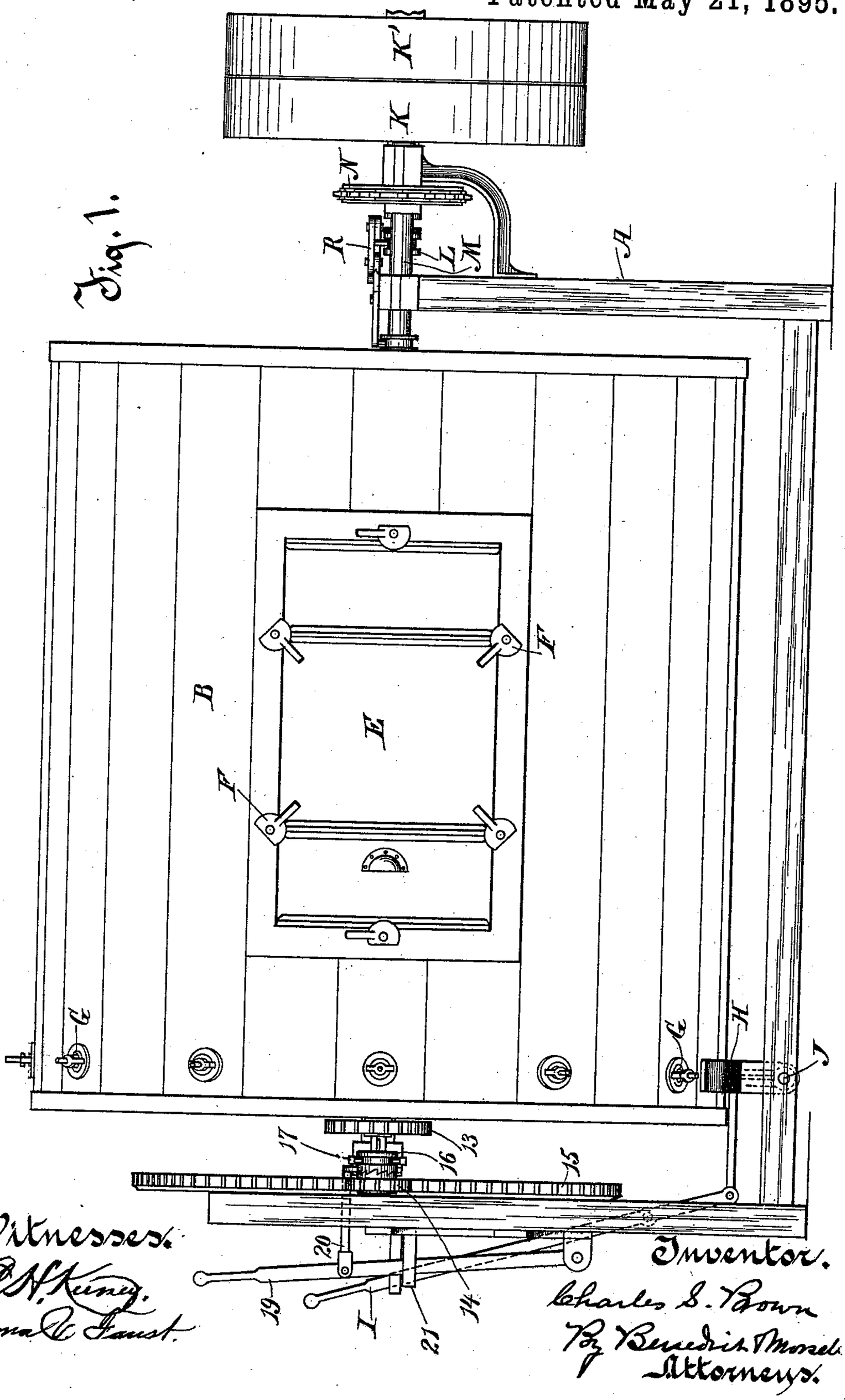
4 Sheets—Sheet 1.

C. S. BROWN.

COMBINED Cchurn AND BUTTER WORKER.

No. 539,571. Patented May 21, 1895.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

C. S. BROWN.

COMBINED CHURN AND BUTTER WORKER.

No. 539,571. Patented May 21, 1895.

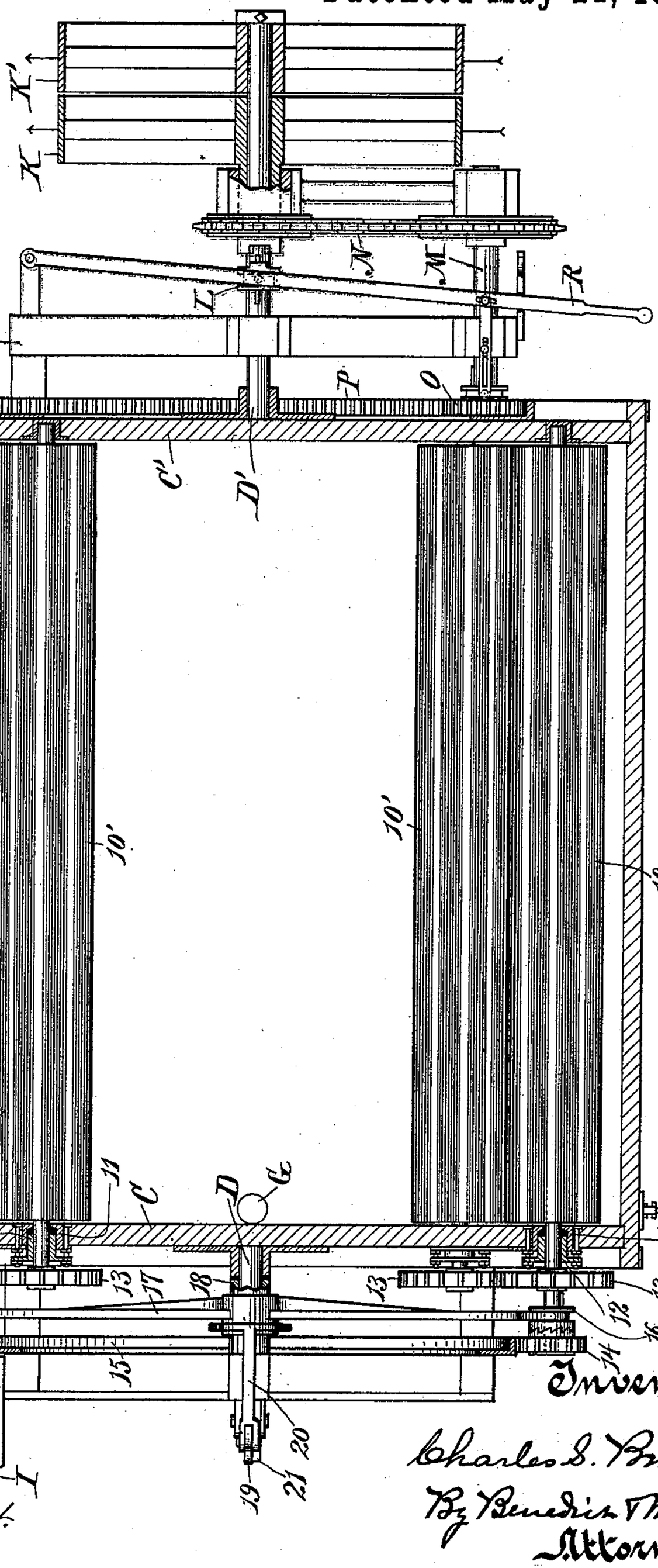

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

C. S. BROWN.

COMBINED CHURN AND BUTTER WORKER.

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Fig. 3.

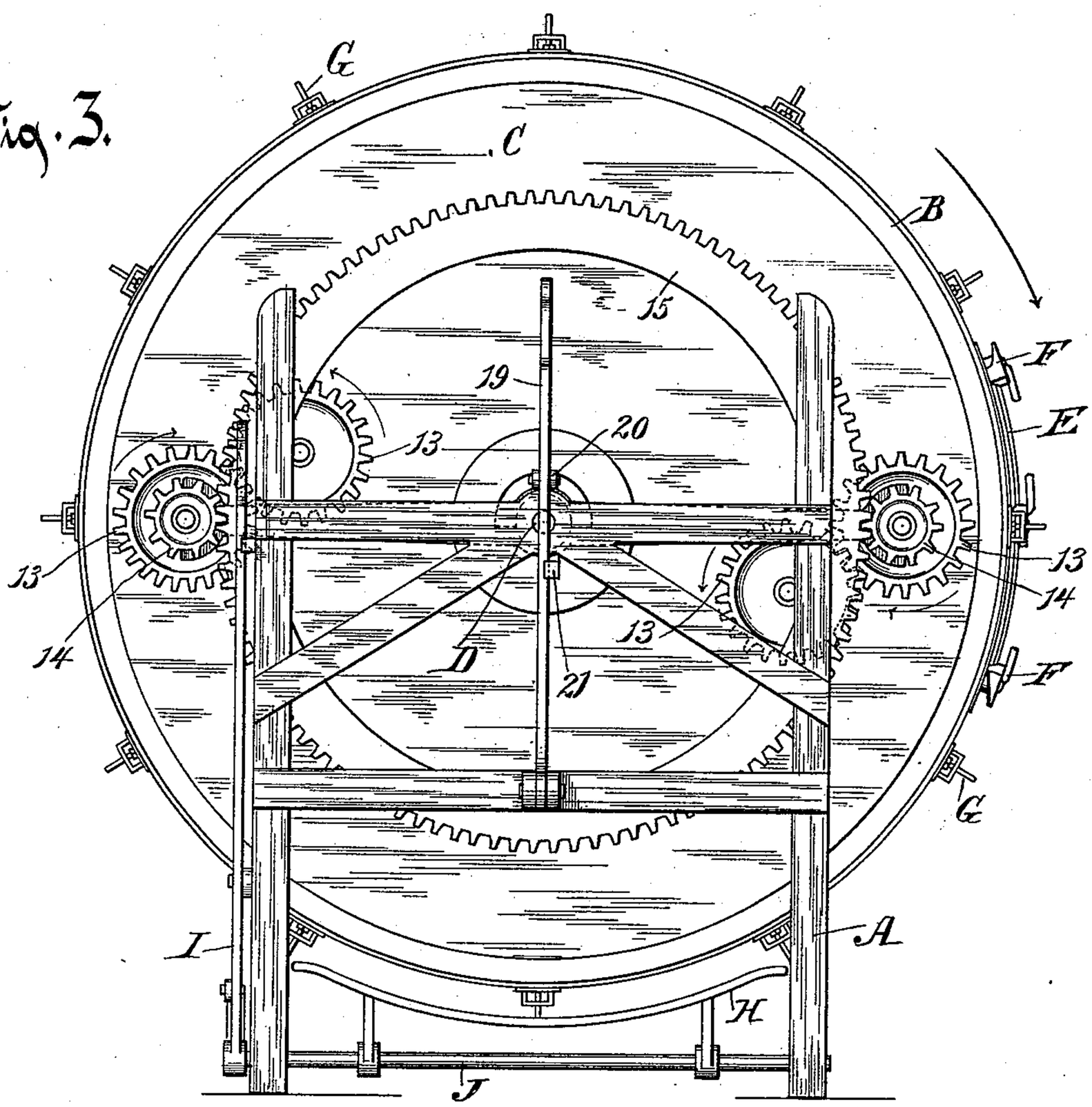
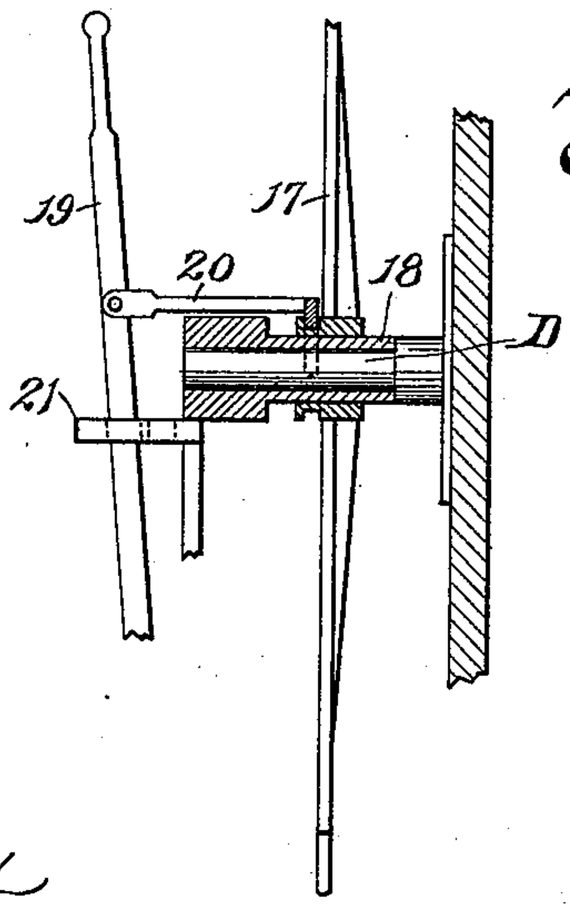


Fig. 5.



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(No Model.) 4 Sheets—Sheet 4.

C. S. BROWN.

COMBINED Cchurn AND BUTTER WORKER.

No. 539,571. Patented May 21, 1895.

Fig. 4.

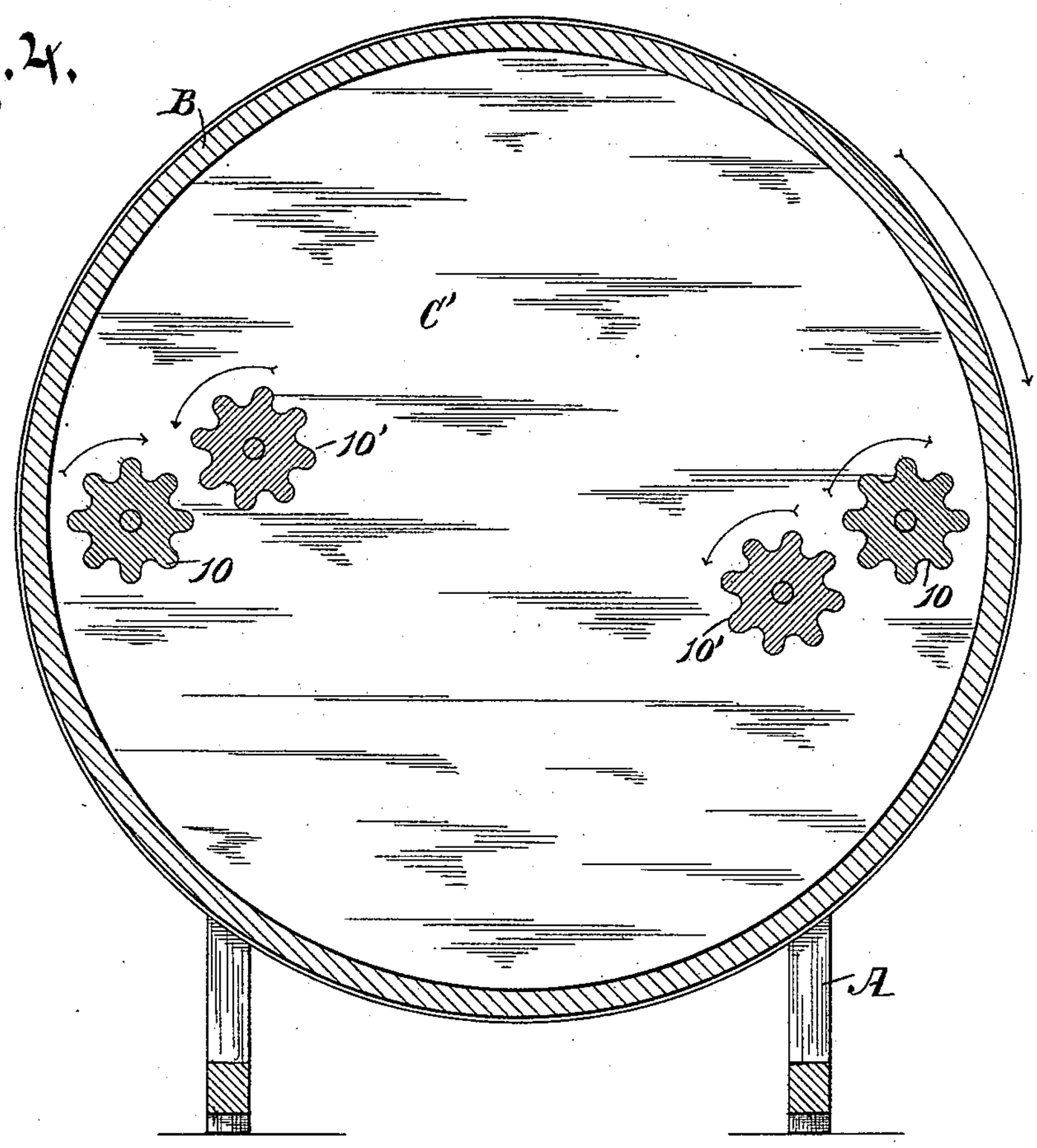
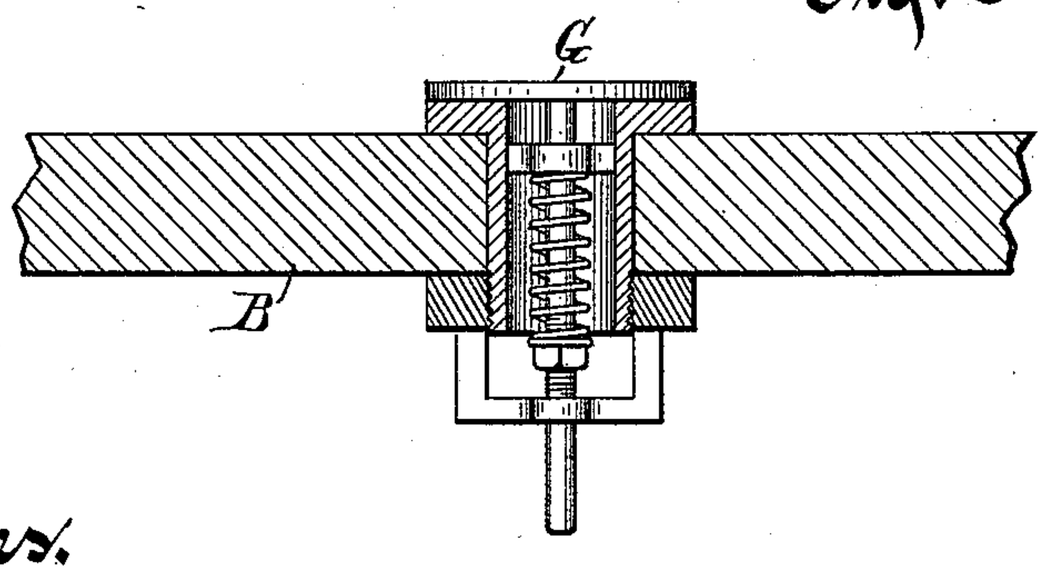


Fig. 6



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UNITED STATES PATENT OFFICE.

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

COMBINED CHURN AND BUTTER-WORKER.

SPECIFICATION forming part of Letters Patent No. 539,571, dated May 21, 1895.

Application filed October 17, 1894. Serial No. 526,117. (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.

The object of my invention is to simplify and improve churns and butter workers of the class in which there is mechanism so constructed and arranged that by simply shifting its relations and combinations the machine is adapted for use either as a churn or as a butter worker.

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

In the accompanying drawings, Figure 1 is a side elevation of the complete machine. Fig. 2 is a central longitudinal section of the drum, other parts being shown in plan and in section for convenience of illustration. Fig. 3 is a front end elevation of the machine. Fig. 4 is a transverse vertical section of the drum and related parts. Fig. 5 is a detail of the clutch mechanism. Fig. 6 is a detail of a water-discharging valve in the drum.

The frame A may be of such size and form as is best adapted for the support of the operative mechanism.

The drum B has tight heads C C′, and is provided with gudgeons D D′ fixed to the heads centrally respectively at the front and at the rear, and mounted in the frame.

An aperture in the drum, for inserting and removing the milk and butter, is closed by a door E, and is secured in place by the pivoted cam buttons F F.

A series of circumferentially disposed apertures in the drum, are closed by spring-actuated valves G G, the stems of which project radially and are adapted to be opened, as, rotating with the drum, they pass the plate H, when lifted into the path of the valve stems, by means of a lever handle I, which is adapted to oscillate the rock-shaft J, on which the plate is mounted.

The gudgeon D′ at the rear of the drum, is provided with loose belt pulleys K K′, the driven pulley K being arranged to be clutched revolubly to the gudgeon D′ by means of a collar L splined on the gudgeon and adapted to clutch the hub of the pulley. A countershaft M journaled in the frame is connected operatively to the pulley K by the sprocket chain N running on the hub of the pulley K and on a wheel fixed on the countershaft. A pinion O splined on the countershaft is arranged to mesh with an annular rack P fixed on the head of the drum.

A hand lever R pivoted to the frame is provided with a spanning finger riding in an annular groove in the collar L, and is connected by a link to a finger riding in an annular groove in the hub of the pinion O, and is adapted for shifting the collar L and the pinion O concurrently when desired.

By clutching the pulley K to the gudgeon D′ by means of the collar L, a relatively rapid rotation of the drum is secured, and by releasing the pulley K from direct engagement with the gudgeon D′ and putting the pinion O into mesh with the rack P, a comparatively slow movement of the drum is secured from the driven pulley K.

For agitating the milk when the machine is used as a churn, and for working the butter when the machine is used as a butter worker, I employ one or more pairs of rollers 10, 10′ in the drum. I preferably use two pairs or sets of these rollers and have so shown them in the drawings, although one pair or set of rollers could be used and more than two sets could be employed, especially in a large drum, and for very heavy work. These rollers are substantially as long as the chamber of the drum, and are preferably corrugated longitudinally. They are located in pairs near the periphery of the drum each pair being wholly at one side of the axis and parallel with each other and with the axis of the drum. They also preferably have their axes in a plane, at an oblique angle to a radius of the drum, the outer roller 10 being disposed slightly at the rear of the inner roller 10′, in the direction of the motion of the drum revolubly. At their rear extremities these rollers are provided with journals that enter suitable boxes

or bearings therefor fixed liquid tight in the head of the drum. At their front extremities the journals or arbors of the rollers have their support in and pass through the head C, in and by suitable boxes 11 therefor fixed in the head, and are packed liquid tight therein, conveniently by glands 12, 12. These rollers are geared to each other, in sets or pairs, by pinions 13, 13 fixed on their arbors, outside of the drum. For rotating these rollers the arbor of one roller in each set, preferably the arbor of the outside roller 10, is provided with a loose pinion 14 which meshes with a stationary annular rack 15 fixed on the frame concentric with the axis of the drum. Collars 16, 16 splined on the arbors are adapted to clutch the pinions 14 and hold the rollers to revolution with the pinions.

Arms 17 projecting radially from a hub loose on the sleeve box 18, terminate in spanning fingers that ride in annular grooves therefor in the collars 16.

A lever handle 19 pivoted at one extremity on the frame is provided with a finger 20 pivoted thereto medially, which finger at its other extremity is furcate and rides in an annular groove therefor in the hub of the arms 17. By shifting this lever handle, the clutch collar 16 can be put into or out of engagement with the pinions 14 as desired.

The sleeve box 18 is fixed at one extremity in the frame A but projects inwardly therefrom in the form of a cylindrical sleeve about the gudgeon D, on which cylindrical or sleeve part, the hub of the arms 17 is mounted loosely.

A rack 21 fixed on the frame and projecting along side the handle 19, is adapted to receive the handle in recesses, or interdental spaces therein, and thereby to lock the handle in position, and the clutch collar 16 either in or out of engagement with the pinions 14.

When this machine is used as a churn, the collars 16 are shifted out of engagement with the pinions 14, and the collar L is put into engagement with the pulley K, so that the drum is revolved with comparative rapidity, and at the same time the rollers 10, 10′ are not rotated in the drum, but rotate therewith serving as paddles or splashers, to agitate the milk therein.

When the machine is used as a butter worker the collar L is released from the pulley K and the pinion O is put into engagement with the rack P, whereby the drum is rotated more slowly, and at the same time the collars 16 are put into clutch with the pinions 14, whereby the rollers 10, 10′ are compelled to rotate in the directions indicated by the arrows on Fig. 4, the drum being rotated in the direction also indicated by the arrow on that figure. When in operation as a butter worker the butter at the bottom of the drum is caught by the outer roller and carried inwardly and downwardly between it and the inner roller, thereby expressing the milk from the butter, and allowing the butter to fall again to the bottom of the drum, to be again caught by the succeeding pair of rollers and put through the operation of compression, to force other milk therefrom.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a churn and butter worker, the combination with a revoluble drum, of a plurality of independently revoluble rollers mounted in the drum in pairs parallel with and near to each other and parallel with and at one side of the axis of the drum and revoluble with the drum, substantially as described.

2. In a churn and butter worker, the combination with a revoluble drum, of a plurality of independently revoluble rollers mounted in the drum in pairs parallel with and near each other and parallel with and at one side of the axis of the drum, said rollers in each set having their axes in a plane oblique to a radius of the drum, and being revoluble with the drum, substantially as described.

3. In a churn and butter worker, the combination with a revoluble drum, of rollers mounted in the drum in pairs parallel with and near each other, and parallel with and at one side of the axis of the drum, a stationary annular rack fixed on the frame concentric with and near the drum, a pinion on the arbor of a roller of said pairs of rollers meshing with the annular rack whereby the roller is revolved as the drum is rotated, substantially as described.

4. In a churn and butter worker, the combination with a revoluble drum, of rollers mounted in the drum in pairs parallel with and near each other and parallel with and at one side of the axis of the drum, a stationary annular rack fixed on the frame concentric with and near the drum, a pinion on the arbor of a roller of said pairs of rollers meshing with the annular rack, and pinions on the arbors of both rollers of each pair meshing with each other and compelling current rotation thereof, substantially as described.

5. In a churn and butter worker, the combination with a revoluble drum, of rollers mounted in the drum in pairs parallel with and near each other, and parallel with and at one side of the axis of the drum, an annular rack fixed on the frame concentric with the drum, a pinion loose on the arbor of a roller meshing with the annular rack, and a clutch collar splined on the arbor adapted to engage the pinion and compel rotation of the roller with the pinion, substantially as described.

6. In a churn and butter worker, the combination with a revoluble drum, of a plurality of pairs of rollers mounted in pairs parallel with and near each other and parallel with the axis of the drum each pair of rollers being at one side of the axis of the drum, pinions on the arbors of the rollers gearing the rollers in each pair together, a fixed rack concentric with the drum, a pinion loose on one arbor of each pair of rollers, clutch-collars splined

on the arbors releasably clutching the pinions thereon, and radial arms loose on an axis coincident with the axis of the drum, having fingers riding in the collars and adapted to shift the collars into engagement with the pinions, substantially as described.

7. In a churn and butter worker, the combination with a revoluble drum having fixed tight heads, of gudgeons fixed centrally on the heads and mounted on a frame, means substantially as described for rotating the drum rapidly or slowly, a plurality of rollers in the drum in pairs the rollers of each pair being geared to each other outside the drum, a stationary annular rack, concentric with and near the drum, and means in connection with the rack for revolving the rollers in the drum by the rotation of the drum, substantially as described.

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

CHARLES S. BROWN.

Witnesses:
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C. F. GREENWOOD.