(No Model.) 2 Sheets—Sheet 1.

S. H. WATERS.

BUTTER WORKER.

No. 457,413. Patented Aug. 11, 1891.

Fig. 1.

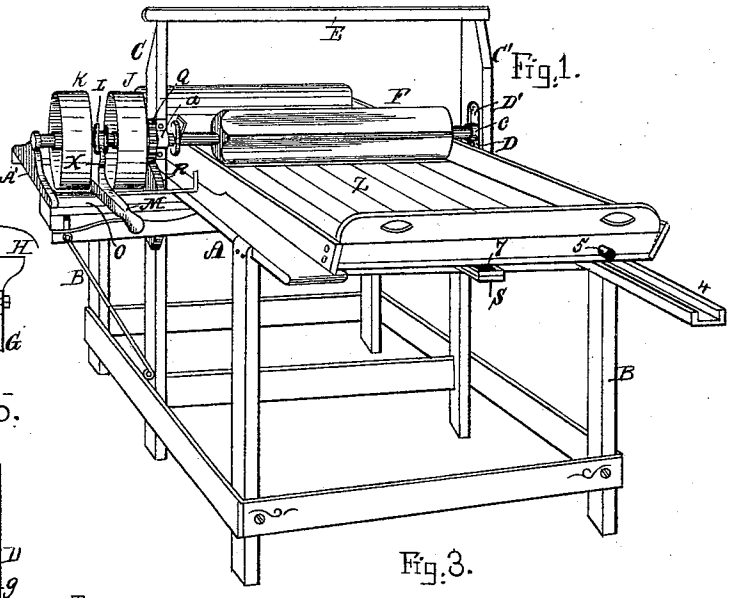


Fig. 6.

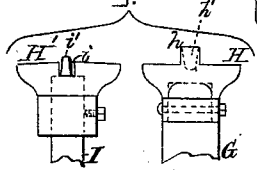


Fig. 4.

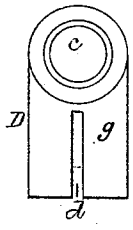
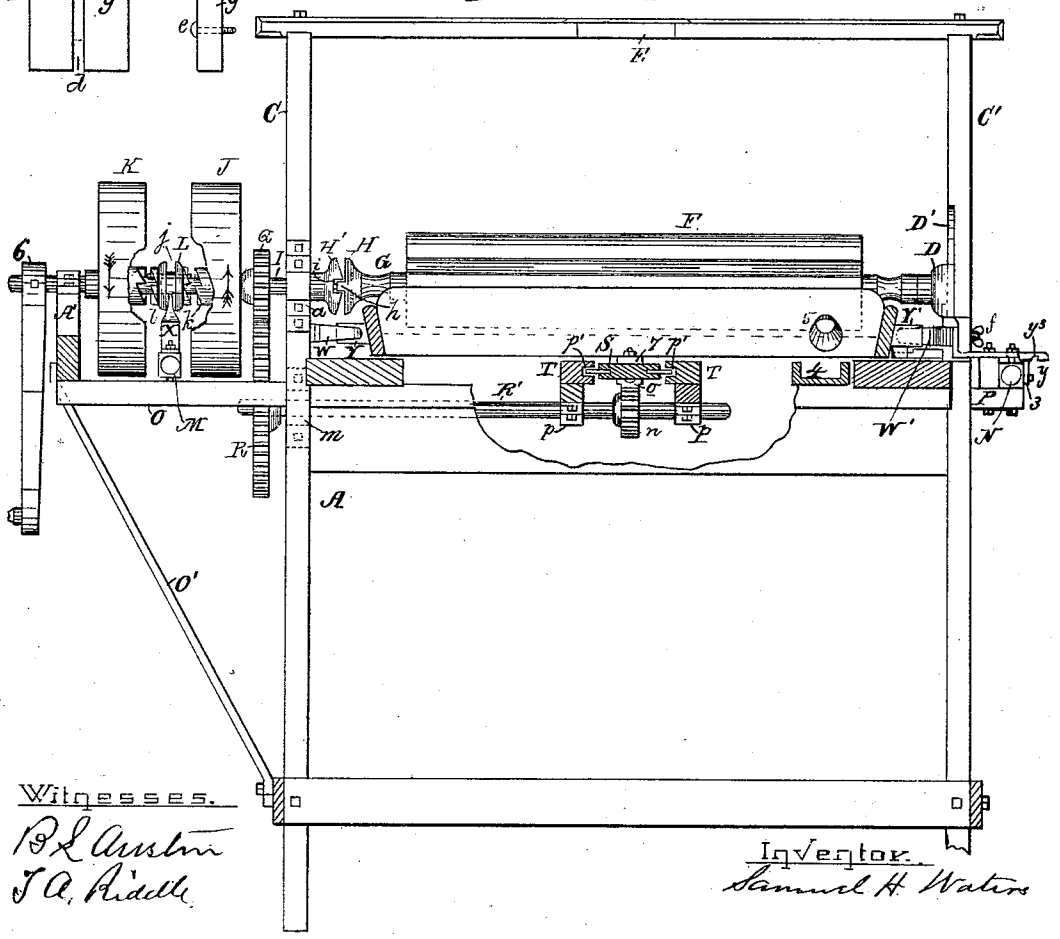


Fig. 5.



Fig. 3.



Witnesses.

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Inventor.

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(No Model.)

2 Sheets—Sheet 2.

S. H. WATERS.

BUTTER WORKER.

No. 457,413. Patented Aug. 11, 1891.

Fig. 2.

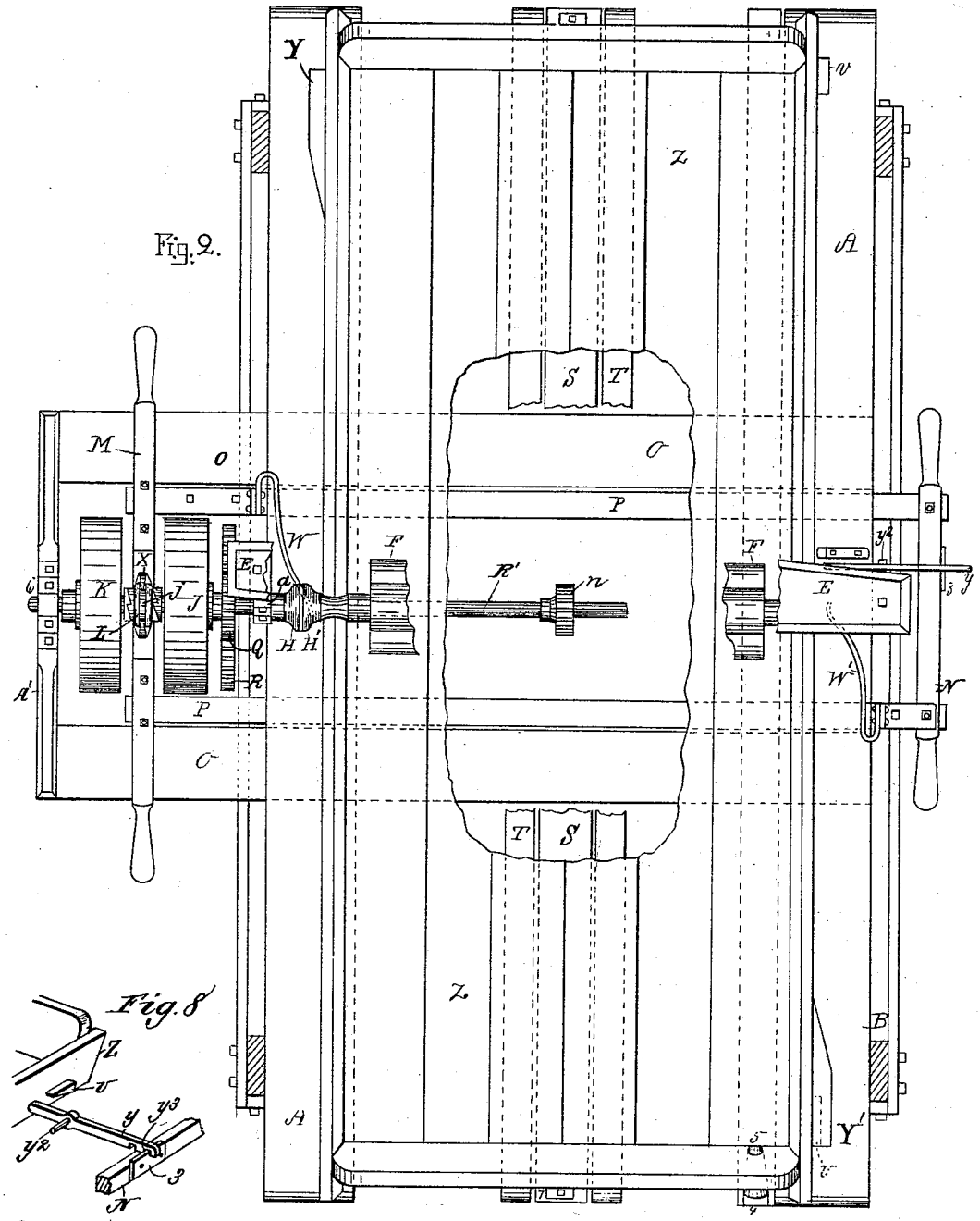
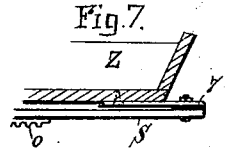


Fig. 8

Fig. 7.



Witnesses

B L Austin

J. A. Riddle

Inventor

Samuel H Waters

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL H. WATERS, OF JOHNSON, VERMONT, ASSIGNOR TO F. C. WHITING, OF SAME PLACE.

BUTTER-WORKER.

SPECIFICATION forming part of Letters Patent No. 457,413, dated August 11, 1891.

Application filed April 3, 1890. Serial No. 346,476. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL H. WATERS, a citizen of the United States, residing at Johnson, in the county of Lamoille and State of Vermont, have invented certain new and useful Improvements in Butter-Workers, of which the following is a specification, reference being had to the accompanying drawings.

It is the purpose of my invention to provide a butter-worker which may be operated by hand or power derived from any suitable source; but said invention is more particularly adapted to power-machines.

It is one purpose of my invention to provide a butter-worker with a working-roll which may be readily raised or lowered, and to combine therewith an automatic shifting device by which the revolution of the roll and the movement of the tray are reversed, thereby leaving the hands of the operator free to permit him to turn the butter while it is undergoing the process.

It is my purpose, also, to so construct the shifting device that the movement of the tray and the revolution of the roller may be reversed by hand at any point of said movement and from either side of the machine.

It is my purpose, also, to provide a butter-worker having a movable conductor which may be readily placed in position to have communication with an outlet-tube in the tray; to combine therewith a shifting device which shall be prevented from movement until the tray reaches the proper point; to afford a firm support for the bottom of the tray; to provide means for holding the pinion which moves the tray firmly in place, and to combine with a butter-worker means whereby the working-roll may be operated by a crank attached to the shaft of its pulley.

To these ends my invention consists in the several novel features of construction and new combinations of parts, hereinafter fully set forth, and then definitely pointed out in the claims following this specification.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the entire machine. Fig. 2 is a plan view, a portion of the machine being removed to more fully illustrate the construction. Fig. 3 is an end elevation of the machine, partly in section and with a portion of one pulley broken away to show the position of the lower shaft and its supports and the pinion which moves the tray. Fig. 4 is a front view of the slotted bearing-plate for one end of the fluted working-roller. Fig. 5 is a side elevation of Fig. 4. Fig. 6 is a view representing the coupling-disks and showing the rib and groove on said disks, respectively. Fig. 7 is a detail view showing the manner of attaching the tray to the slide. Fig. 8 is a detail perspective showing the tripping device by which the latch is released from the catch-plate to permit the movement of the shifting-bars actuating the clutch.

In the said drawings, the reference-letters A A denote the frame and body of the worker, which are supported by legs or standards B B. (Shown in Fig. 1.) From a portion of the frame A A, lying between the ends thereof and not far from the central portion thereof, rise standards C C′, the function of which will be fully set forth hereinafter. These standards are connected at their upper ends by a transverse bar or brace E. The standard C forms a support for the rigidly-attached box *a*, which forms a bearing for the arbor of the pulley-shaft. This standard also supports a box *m*, which provides a bearing for one end of the lower shaft R′. The other standard C′ forms a support for the adjustable bearing-plate D, within which is journaled one end of the shaft G, supporting the working-roll F, which is fluted in the manner usual in rolls of this character. The journal of this shaft lies in a seat *c*, Figs. 4 and 5, below which is a depending plate or portion having a vertical slot *d*. The bearing-plate D lies in a vertical slot D′, formed in the inner face of the standard C′, within which it is adjustable. The gudgeon or journal of the said shaft B being supported in the recess in the bearing-plate D, the opposite end or journal of said shaft is connected to a pulley-arbor I, supported in the box *a*, mounted on the other standard C, as described hereinafter. Through the standard C′ is inserted a bolt *e*,

lying in the vertical slot *d* in the bearing-plate and having a threaded end projecting beyond the outer face of the standard, by which the bearing-plate D is locked against the said standard by manipulating a thumb-nut *f*, turned upon said threaded end. The slot D′ is of such length that all necessary adjustment is permitted, while the bearing-plate D may be moved therein far enough to disengage it from the bolt *e* to allow the removal of said bearing-plate D.

At that end of the shaft G of the roll F which lies adjacent to the standard C is formed a coupling H, Fig. 6, consisting of a disk-shaped head having a substantially flat face and provided with a transverse or diametrical rib *h*. Upon the end of a pulley-arbor I, which is supported in the box *a*, is mounted a disk H′, similar substantially to the disk H, save that it has a slightly-convex head or surface which is provided with a diametrical groove or channel *i*. To prevent the rib *h* from dropping out of the slot *i*, a hole *h*′ (shown by dotted lines in Fig. 6) is drilled centrally through the rib *h* to receive the tapered central extremity *i*′ of the pulley-arbor I. Upon the pulley-arbor I are mounted two loose pulleys K and J, revolving in opposite directions, as shown by arrows in the drawings, by straight and crossed belts driven from any suitable source of power. The pulley-arbor I is supported at its outer end by a bracket A′, rising from parallel and substantially central bed pieces or extensions O, receiving support at one end from one or more braces O′. These pulleys are provided upon their adjacent ends or hubs with clutch-teeth *k*, adapted to mesh with a clutch L, movable longitudinally upon the pulley-arbor I, to which it is splined or keyed. This clutch is double, having teeth upon each face adjacent to the pulleys K J, respectively, and it is moved upon the pulley-arbor I to engage the said pulleys alternately by means of a forked arm X, Figs. 2 and 3, working in a groove *j*, Fig. 3, cut circumferentially in the clutch. This forked arm X is rigidly mounted upon a cross-piece M, extending across and supported by the bed-pieces O and having such length that its ends project beyond the parallel edges of the said bed-pieces, its ends being formed into or provided with handles, by which the forked arm may be operated to reverse the action of the machine.

Upon the opposite side of the machine is arranged an auxiliary arm N, which is connected to the ends of parallel shifting-bars P, which are parallel with the pulley-shaft and connected at their other extremities to the cross-piece M, so that the machine can be reversed from either side.

Upon the pulley-arbor I is mounted, at a point near the standard C, a pinion Q, which meshes with a large gear R, mounted on a shaft R′, which rotates within a box *m*, as shown in Fig. 3. Upon the opposite end of the shaft R′ is mounted a rack-pinion *n*, and this shaft has support in two drop-bearings *p*, attached to the under sides of guides T, mounted on the frame of the machine. These guides T have channels *p*′, which receive the guiding-wings of a slide S, attached to the bottom of the movable tray in the manner hereinafter described. The slide S is attached to the bottom of a movable tray Z, the connection being effected by means of a strap 7, of iron or other metal, bolted at one end to the slide S and at the other to the tray-bottom at the ends of the said tray, as shown in Fig. 7. Upon the lower face of this slide S is mounted a rack *o*, with which the pinion *n* meshes, by the revolution of which movement is given to the tray, said pinion being held closely in mesh by its shaft being supported from the guides T, which receive the wings of the slide S, carrying the rack. A steel spring W is bolted to one of the shifting-bars P, and thence, being bent upon itself, is carried substantially into the central plane between the shifting-bars P P, where the free end of said spring is curved slightly and brought as close to the side of the tray as possible without producing actual contact. Upon the other shifting-bar P and upon the opposite side of the tray Z is mounted a like spring W′, having a construction similar to that described. These springs lie in a horizontal plane a little above the bottom of the tray, as seen in Fig. 3.

Upon the diagonally-opposite corners of the tray are mounted wedge-shaped pieces Y and Y′, having their sharp or pointed ends directed toward the opposite ends of the tray. As the tray moves in either direction by the action of one or the other of the pulleys J or K, one of the wedges Y or Y′ engages the free end of the spring W or W′, and as it enters between the said spring and the side of the tray the shifting-bars, which are locked and unlocked in the manner hereinafter set forth, are forced to move, and the clutch L is thus thrown from one pulley to the other and the rotation of the pinion *n* is reversed, causing an opposite movement of the tray.

Upon the standard C′ is a latch *y*, pivotally mounted upon a pin y^2. This latch is provided with notches y^3, which are adapted to engage a catch-plate 3, bolted to the end piece N of the shifting-bars P P. When the tray has traveled the required distance, a projection *v*, mounted upon the end of the tray, strikes the end of this latch lying nearest the tray and trips it from off the catch-plate 3, leaving the shifting-bars P P free to move. This tripping action takes place an instant before the wedge Y or Y′ engages the spring W or W′. When the clutch is fully shifted and the action of the wedge is completed, the latch engages a second notch in the plate 3, locking the shifting-bars in their new position.

For the purpose of drawing off the buttermilk or water and holding the clutch in engagement with the clutch-teeth *k* when the butter is worked a short tube 5 is inserted in an opening at one corner of the tray, the bot-

tom of which is slightly inclined, so that the said tube opens from the lowest point and close to the bottom of the tray. From this tube 5 the buttermilk as it escapes enters a conductor 4, arranged beneath the angle or corner of the tray and capable of longitudinal movement, whereby it may be drawn out to any suitable point to receive the discharge from the tube 5. When not in use, this conductor 4 may be pushed under the tray out of the way.

To operate the mechanism by hand it is only necessary to disconnect the gearing and apply a crank 6, as shown in Fig. 3, to the outer end of the arbor I, the opposite motion of the tray being produced by turning the crank in opposite directions.

What I claim is—

1. In a butter-worker, the combination, with a suitable frame, of a tray resting and movable thereon, gearing rotating a shaft having a pinion meshing with a rack, a clutch-shifting device automatically operated by the movement of the tray, and means for locking and unlocking the shifting devices automatically, substantially as described.

2. In a butter-worker, the combination, with a movable tray, of oppositely-revolving pulleys loose upon an arbor connected with a shaft provided with a fluted roll and having a gear driving a shaft which has a pinion meshing with a rack connected to the bottom of said tray, a clutch splined to the shaft between said pulleys, clutch-shifting bars arranged parallel to the shaft and a forked arm engaging the clutch and having connection with the ends of the shifting-bars, and springs connected to the opposite ends of the shifting-bars, said springs being adapted to slide the said bars by means of wedges on the tray, substantially as described.

3. In a butter-worker, the combination, with a movable tray, of oppositely-revolving pulleys loose upon an arbor, a shaft geared therewith and having a pinion meshing with a rack connected to the bottom of the tray, a clutch splined to the arbor between said pulleys, shifting-bars parallel with the arbor, a forked arm engaging the clutch and connected with the ends of the shifting-bars, springs connected to the opposite ends of the shifting-bars, and a pivoted latch having notches engaging a catch-plate on the other end of the clutch-shifting bars, said latch being operated to unlock said bars by projections on the tray, substantially as described.

4. In a butter-worker, the combination, with a suitable supporting-frame, of a tray movable thereon and having a rack attached to its bottom, a shaft having a pinion meshing with said rack, a pulley-arbor geared with said shaft and having two loose oppositely-driven pulleys, a clutch splined to the shaft, parallel shifting-bars connected at one end to a bar having a forked arm engaging the clutch and extending across the supporting-frame, upon the other of which their ends are connected by a bar having a catch-plate, a spring attached to each shifting-bar, one upon each side of the frame, the free ends of said springs being bent to engage projections on the diagonally-opposite sides of the tray, a pivoted latch having notches engaging the catch-plate and operated by projections on the ends of the tray, and a fluted roll having a ribbed disk-shaped head on one end of its shaft engaging a grooved disk on the pulley-arbor, the other end of said shaft being supported by a vertically-adjustable bearing-plate, substantially as described.

5. In a butter-worker, the combination, with a tray movable on a suitable frame, of a shaft mounted at one end in a vertically-adjustable bearing-plate and having a fluted roll, a clutch connecting said shaft with the driving mechanism, clutch-shifting bars having one end connected to a cross-piece, a forked arm moved by said cross-piece and connected with the clutch lying between two loose oppositely-revolving pulleys on an arbor connected with said shaft, a shaft geared with the arbor and having a pinion meshing with a rack-bar on a slide bolted to the bottom of the tray and moving in parallel guides, and means for actuating the clutch-shifting bars by the opposite movement of the tray, substantially as described.

SAMUEL H. WATERS.

Witnesses:
B. S. AUSTIN,
T. A. RIDDLE.