

(No Model.)

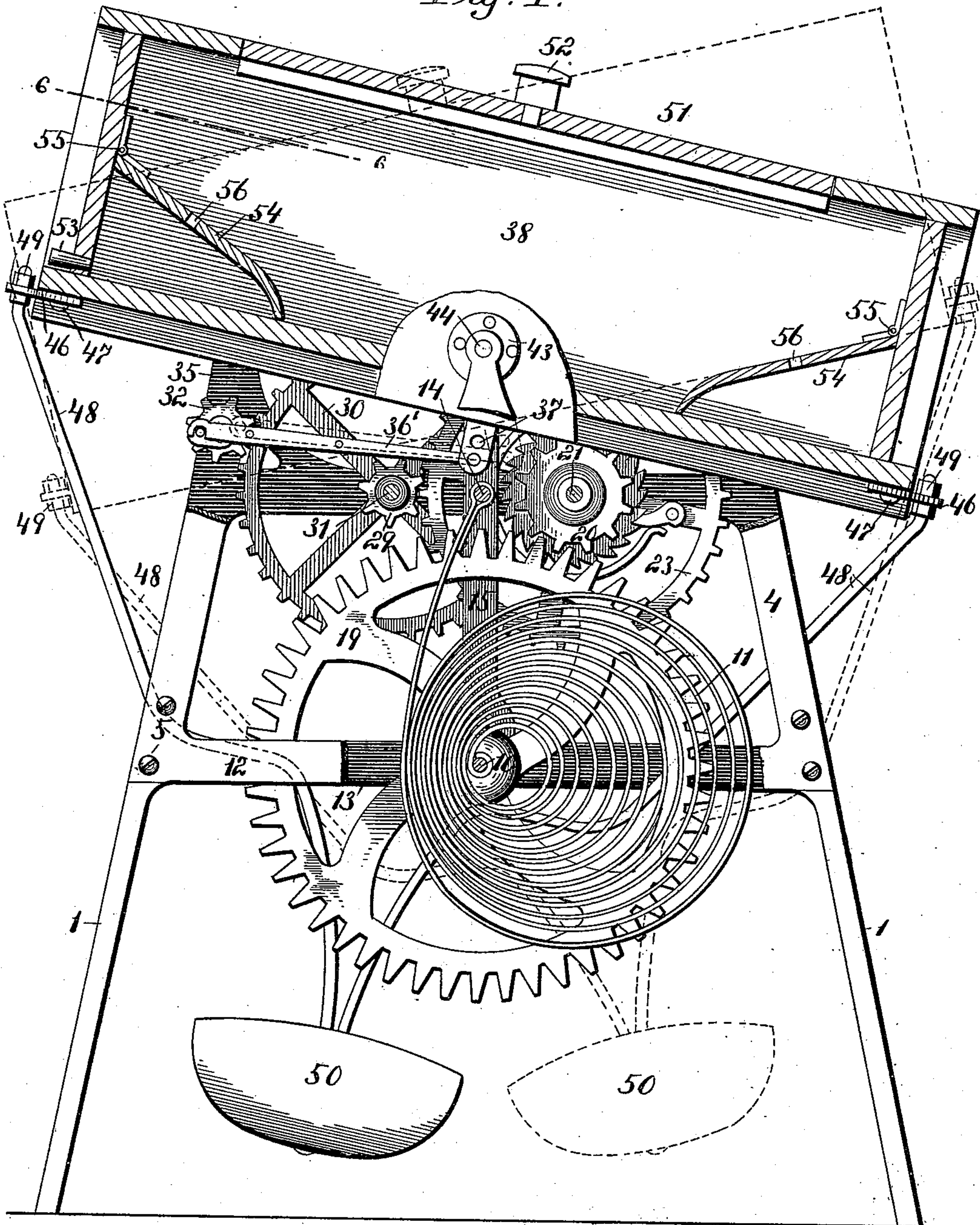
2 Sheets—Sheet 1.

J. B. MILLER.
CHURN MOTOR.

No. 464,226.

Patented Dec. 1, 1891.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

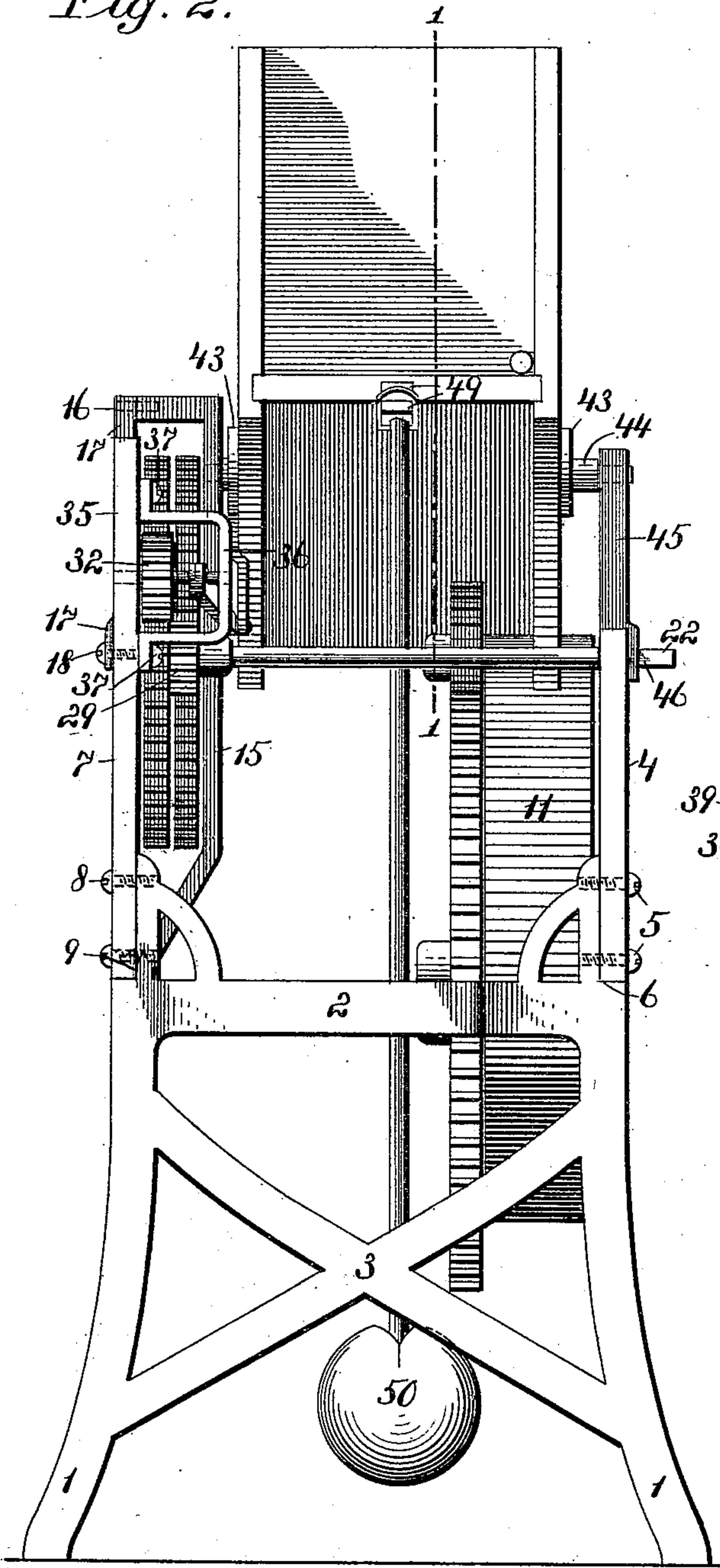


Fig. 3.

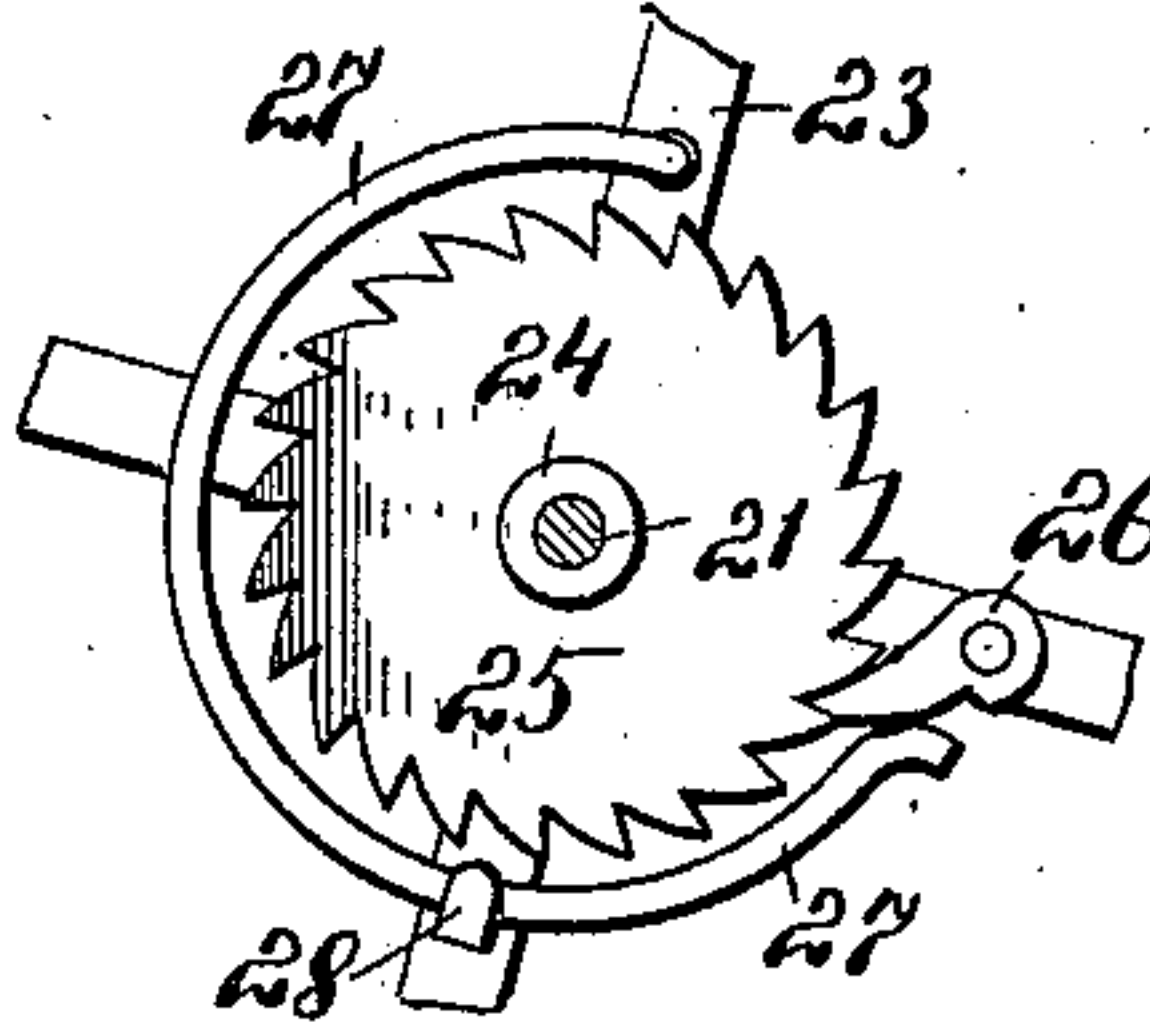


Fig. 4.

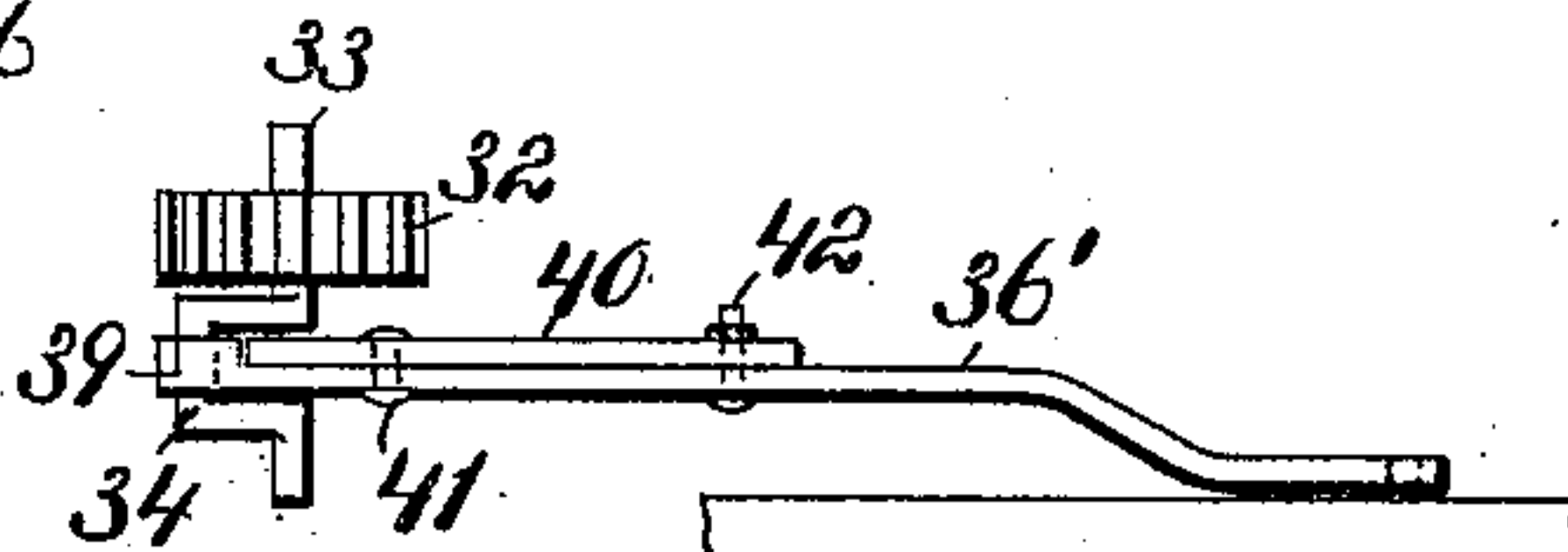


Fig. 5.

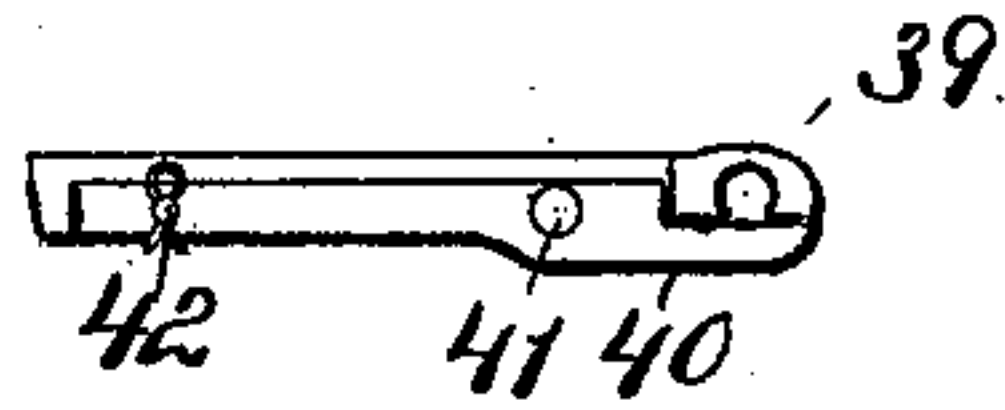
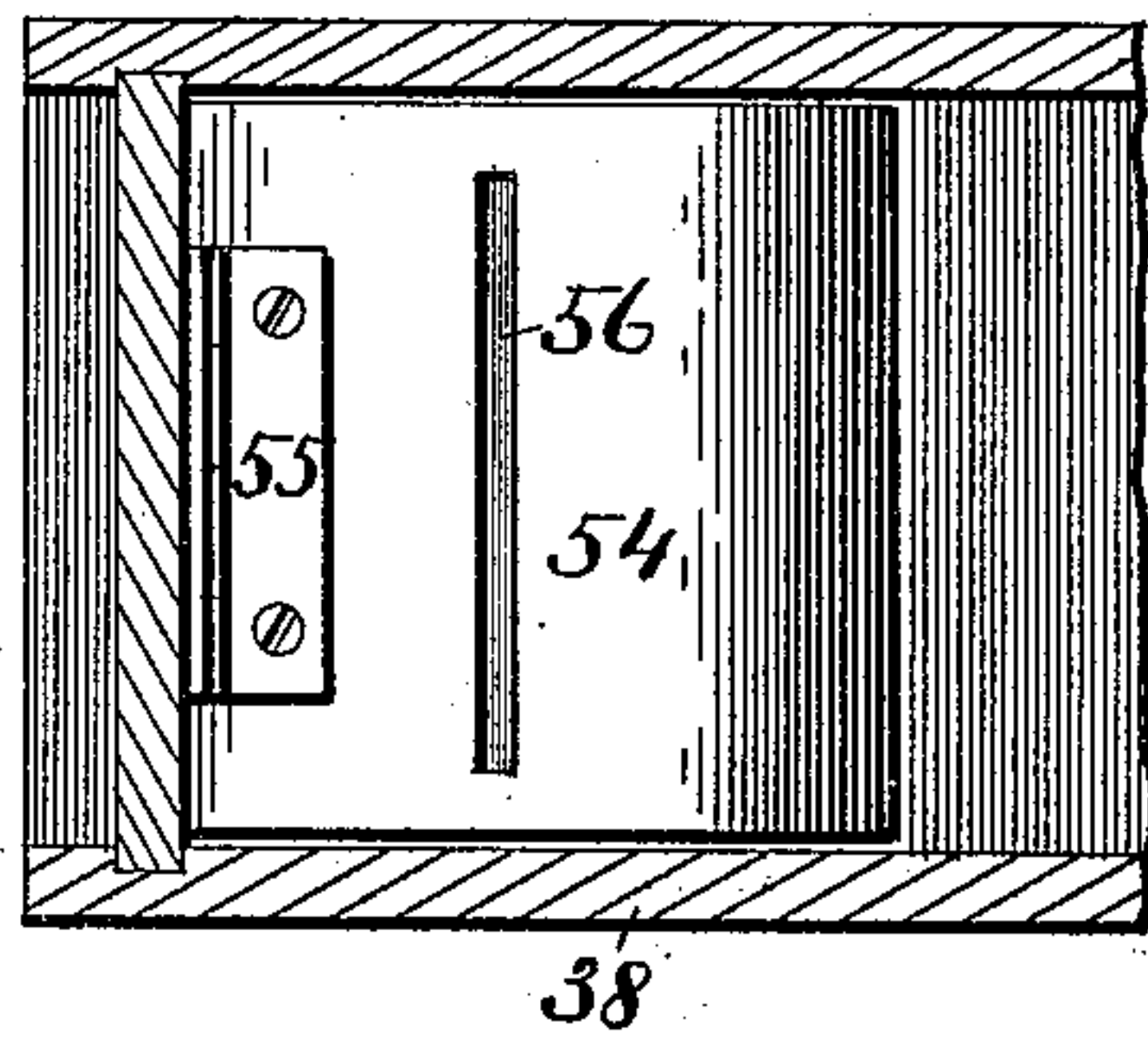


Fig. 6.



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UNITED STATES PATENT OFFICE.

JACOB B. MILLER, OF McCUNE, KANSAS.

CHURN-MOTOR.

SPECIFICATION forming part of Letters Patent No. 464,226, dated December 1, 1891.

Application filed June 18, 1891. Serial No. 396,739. (No model.)

To all whom it may concern:

Be it known that I, JACOB B. MILLER, of McCune, Crawford county, Kansas, have invented certain new and useful Improvements in a Churn-Motor, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to that class of churns in which the butter is produced from the cream by oscillating movements of the churn-body; and my invention relates more particularly to a motor for producing said oscillating movements of the churn-body.

The objects of my invention are to produce a simple, compact, durable, and inexpensive form of motor, which shall be reliable and effective in its action, and which shall require but little attention in order to remain in running order.

To the above purposes my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the motor, the near standard being partially broken away, and a vertical longitudinal section of the churn-body on the line 1 1 of Fig. 2, the movement of the churn-body and pendulum being shown in dotted lines. Fig. 2 is an end elevation of the motor and churn. Fig. 3 is a detached view, in side elevation, of the detent ratchet mechanism of the winding-arbor of the motor. Fig. 4 is a detached plan view of the detachable pitman for transmitting motion from the motor to the churn-body. Fig. 5 is a detached side elevation of the separable bearing for the pitman. Fig. 6 is a horizontal cross-section of one end of the churn-body on the line 6 6 of Fig. 1.

In the said drawings, 1 designates two end standards of the motor, the said standards being shown as of skeleton form, and composed each of two vertical parallel side pieces connected together at their upper ends by an integral cross-bar 2, and also braced together at their inner sides by an integral X-shaped portion 3, interposed between the upper and

lower ends of the upright portions. These standards incline upwardly and inwardly, as shown, and at their front sides said standards are connected together by an open rectangular frame 4. This frame 4 is secured removably to the upper sides of the standards 1 by any suitable number of screws 5, or equivalent devices, inserted through the lower parts of the end portions of the frame 4 and entering the upper ends of the standards 1, said standards being recessed at their upper ends, as shown at 6, to receive the lower corners of the frame 4. At their rear sides the standards 1 are connected together by a rectangular open frame 7, said frame being secured removably to the upper sides of the standards by any suitable number of screws 8, or equivalent devices, inserted through the lower parts of the end portions of the frame 7 and entering the upper ends of the standards. The standards are also recessed at their upper ends, as shown at 9, to receive the lower corners of the frame 7.

10 designates the arbor of the main spring 11, said arbor extending horizontally across the machine from front to rear, and being journaled at its front end in the lower horizontal portion 12 of the frame 4 and at its rear end being similarly journaled in the lower horizontal portion 13 of the frame 7. Upon one end of this arbor is secured one end of the main spring 11, said spring being wound in convolutions around the end of the arbor and its opposite end being secured to a rod 14. This rod 14 extends horizontally across the machine from front to rear thereof, its front end being secured in the upper cross-piece of the frame 4 and its rear end being secured in the vertical portion of a bracket 15. The lower end of the bracket 15 is suitably secured to the inner side of the horizontal portion 13 of the frame 7, and its upper end, which extends rearward horizontally, is secured by a screw 16, or an equivalent device, to the upper end of a vertical standard 17. The lower end of this standard 17 is secured by any suitable number of screws 18, or equivalent devices, to the upper horizontal portion of the frame 7. The main-spring arbor 10 also carries a large gear-wheel 19, which is mounted upon the said arbor just back of the main spring, and which is mounted in such a manner as to turn with the arbor. The teeth

of the gear-wheel 19 mesh with the teeth of a gear-pinion 20, which is mounted upon the front end portion of an arbor 21 so as to turn therewith. This arbor extends horizontally of the machine from front to rear thereof, and its front end is journaled in the upper cross-piece of the frame 4, while its rear end is similarly journaled in the upper horizontal portion of the rear frame 7. The front end of this arbor is formed square or angular, as shown at 22, and such angular portion of the arbor projects beyond the front side of the frame 4 so as to receive a key or crank-arm (not shown) by which the motor is wound, the arbor 21 thus being the winding-arbor of the machine. Upon the rear end of this winding-arbor 21 is mounted a gear-wheel 23, which is arranged to turn with or upon the arbor, and a ratchet-wheel 25 lies closely adjacent to the inner sides of the spokes of said wheel 23 and is rigidly secured to the arbor 21. The teeth of the ratchet-wheel 25 are engaged by a detent-pawl 26, which is pivoted upon one of the spokes of the wheel 23 and which is held in engagement with the ratchet-wheel by a semicircular spring 27. One end of this spring is secured to one of the spokes of the wheel and its opposite end presses upon the outside of the pawl or detent, thus retaining its point in engagement with the ratchet-teeth. The spring is also held in position by a guide-lug 28, projecting from one of the spokes of the wheel 23. The ratchet-teeth of the wheel 25 incline oppositely from the direction of operative movement of the wheel 23, and thus the pawl or detent 26 compels said ratchet-wheel to turn with the gear-wheel 23, while when the winding operation is being performed the arbor and ratchet-wheel rotate in the opposite direction, the detent slipping over the teeth of the ratchet-wheel. The teeth of the gear-wheel 23 mesh with the teeth of a gear-pinion 29, which is formed upon the hub of a gear-wheel 30, the said gear-wheel being mounted upon the rear end of an arbor 31, so as to turn with said arbor. This arbor 31 extends horizontally of the machine from front to rear thereof, and its front end is journaled in the upper horizontal portion of the frame 4, while its rear end is similarly journaled in the horizontal upper portion of the rear frame 7. The teeth of the gear-wheel 30 mesh with those of a gear-pinion 32, which is mounted upon a short arbor 33, so as to turn with said arbor. This arbor 33 is formed with a crank-section 34 and extends horizontally of the machine, its rear end being journaled in a vertical standard 35, which projects upward from the upper left-hand corner of the frame 7, viewed from the front side of the machine. The front end of this arbor is journaled in a U-shaped bracket 36, which is placed in a vertical position and the ends of which are secured to the front or inner surface or side of the standard 35.

36' designates a pitman or connecting-rod, one end of which is pivotally connected to

the lower end of a hanger 37, which depends from the middle of the rear side of the churn-body 38, to be hereinafter fully described. The outer end of this connecting-rod is formed with an inverted-U-shaped bearing 39, which embraces the crank-section 34 of the arbor 33. The crank-section 34 is retained in this bearing 39 by a bar 40, which is pivoted near its outer end upon the connecting-rod, as shown at 41, and which is held in closed position by a suitable pin 42, extending transversely through the inner end of the bar 40, and also similarly through the adjacent part of the connecting-rod. When in closed position, the upper side of the outer end of the bar 40 comes into contact with the under surface of the crank-section, and it will be seen that by withdrawing the pin 42 the outer end of the bar 40 can be moved away from the bearing of the connecting-rod, thus permitting the disconnection of the connecting-rod from the crank-section 34 for the removal of the churn-body.

The churn-body 38 is shown as of oblong rectangular form, and said body is pivotally supported at its opposite sides upon the machine-frame by two trunnions 44, projecting horizontally outward from opposite sides of the churn-body. Each of these trunnions is formed upon a trunnion-plate 43, which is secured to the side of the churn-body midway of its length. The rear one of these trunnions is journaled in the upper part of the standard 15 before described, and the opposite or front trunnion is similarly journaled in the upper part of a vertical standard 45, the lower end of which is bolted or otherwise similarly secured, as at 46, to the upper horizontal portion of the frame 4.

At each end of the churn-body is placed a bracket 46, which is secured to the under side of the bottom at its end by a bolt 47, or equivalent device, said brackets projecting beyond the ends of the churn-body. Through the outer ends of these brackets extend the upper screw-threaded ends of two pendulum-arms 48, two nuts 49 being screwed upon each screw-threaded end of the arms and inclosing the brackets 46 between them, for a purpose to be presently explained. The two pendulum-arms 48 are preferably formed from a single rod, which is bent into approximately V form, and the pendulum-weight 50 is mounted upon the angle or bend at the lower end of the arms, as shown, said bend passing through the body of the weight. It will thus be seen that by tightening and loosening the upper nuts 49 the pendulum-weight 50 can be brought directly beneath the exact middle of the churn-body if for any cause it has varied from such position, and thus the action of the motor can be always rendered perfectly regular.

The churn-body is shown as provided on its top with a suitable lid or cover 51, having a handle or knob 52, and at one end of the body of the churn is shown an opening near the bottom of the churn, into which open-

ing is inserted a plug 53. By removing this plug the liquid contents of the churn can be readily discharged when desired. A movable partition 54, which normally inclines downwardly and inwardly from the end of the churn-body, is shown as placed within the churn-body at each end thereof. Each of these partitions is connected at its upper or outer end to the inner surface of one end of the churn-body by a hinge 55, and each of the partitions is also shown as provided with one or more elongated transverse openings or slots 56. It will thus be seen that as the churn-body is oscillated by the motor, so as to cause its ends to alternately rise and descend, the hinged partitions 54 will also alternately rise and descend at their inner ends, thus producing a suction and causing the cream to rush through the openings 56 and consequently to be thoroughly agitated. In this way the butter globules of the cream are rapidly broken up and the butter is quickly produced from the cream. It is to be understood, however, that while I have thus described the particular construction of the churn-body and the internal mechanism of the churn-body which I have shown, my present invention contemplates only the presence of an oscillating churn-body pivoted upon the motor-frame and serving as the means for carrying the adjustable pendulum, and also as the means for connecting the motor mechanism with its pendulum, the interior mechanism of the churn being either employed or dispensed with, as desired.

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

1. An improved churn-motor comprising a suitable supporting frame-work, a train of spring-actuated gearing mounted in said frame-work, a revoluble crank-arbor having a crank-section and forming a part of the spring-actuated gearing and also carrying a gear-pinion meshing with one of the gear-wheels of said gearing, pendulum-carrying arms arranged to be attached to a suitable churn-body pivoted upon the motor frame-work, and a connecting-rod detachably con-

nected at one end to the said crank-section and arranged to be connected at its opposite end to the churn-body, substantially as set forth.

2. An improved churn-motor comprising a suitable supporting frame-work, a clock-work train mounted in said frame-work, a pair of divergent pendulum-carrying arms having screw-threads at their upper ends and nuts carried by said arms for adjustably connecting the latter to a pivoted churn-body, and a connecting-rod detachably connected at one end to a crank-arbor of the clock-work and arranged to be adjustably connected at its opposite end to the churn-body, substantially as set forth.

3. An improved churn-motor comprising a suitable supporting frame-work, a crank-arbor carrying a gear-pinion meshing with a gear-wheel of a clock-work train mounted in the frame-work, and a connecting-rod arranged to be pivotally connected at one end to a churn-body and provided at its opposite end with a U-shaped bearing to embrace the crank-section of the crank-arbor, and provided also with a pivoted arm extending across the said bearing and held removably in operative position by a cross-pin, substantially as set forth.

4. An improved churn-motor comprising a suitable supporting frame-work, a winding-arbor journaled therein and carrying a gear-wheel, a ratchet-wheel mounted on the arbor and engaged by a pawl pivoted upon the gear-wheel, a main-spring arbor carrying a gear-wheel meshing with a gear-pinion on the winding-arbor, a second arbor carrying a gear-pinion meshing with the gear-wheel on the winding-arbor and carrying also a gear-wheel, and a crank-arbor carrying a gear-pinion meshing with said gear-wheel, substantially as set forth.

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

JACOB B. MILLER.

Witnesses:

WILLIAM P. CASEY,
JOHN W. GRACEY.