No. 644,068. Patented Feb. 27, 1900.

E. B. EVERLY.

CHURN.

(Application filed Jan. 3, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

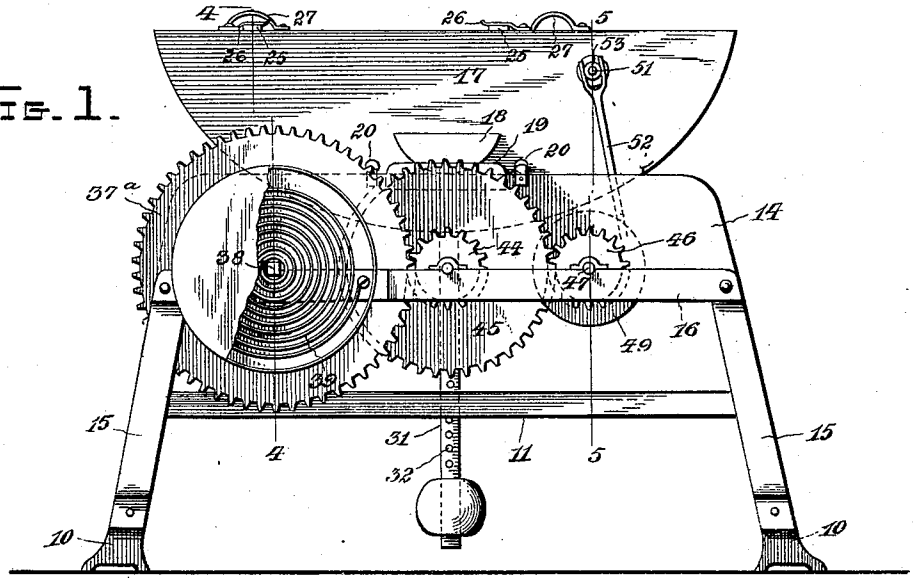


FIG. 2.

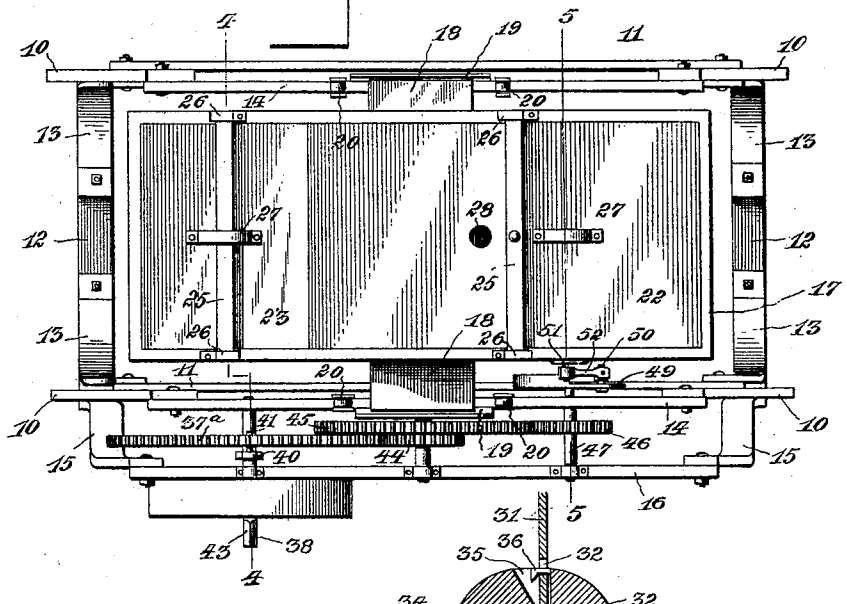


FIG. 7.

Witnesses

John F. Dewferwiel

Inventor

By his Attorneys. Edgar B. Everly,

Church & Co.

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

No. 644,068. Patented Feb. 27, 1900.

E. B. EVERLY.

CHURN.

(Application filed Jan. 3, 1899.)

(No Model.) 2 Sheets—Sheet 2.

FIG. 3.

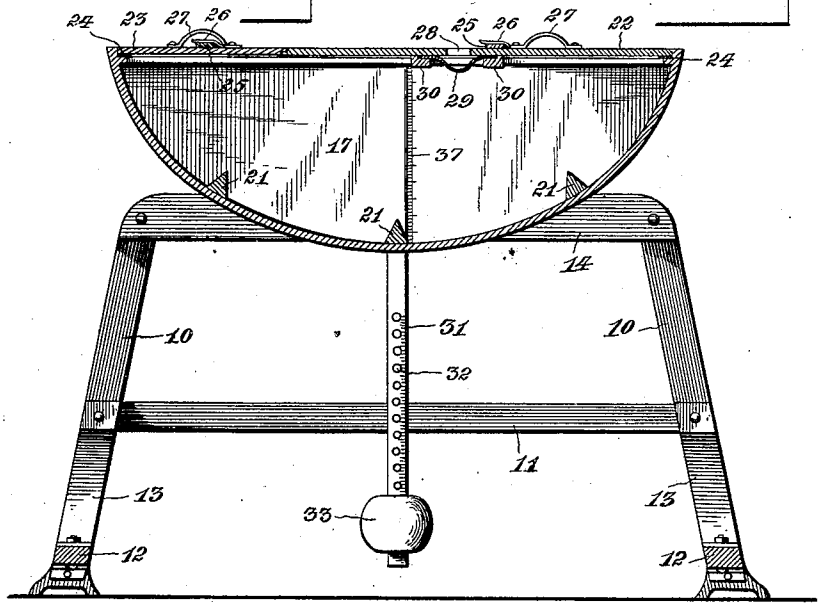


FIG. 6.

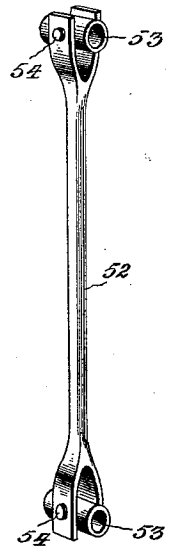


FIG. 4.

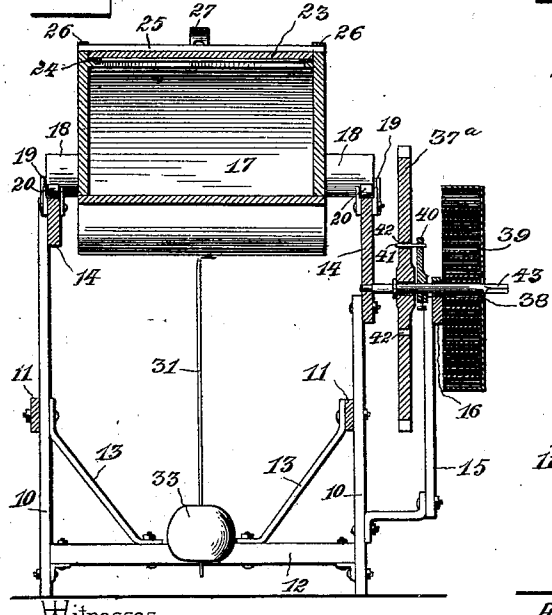
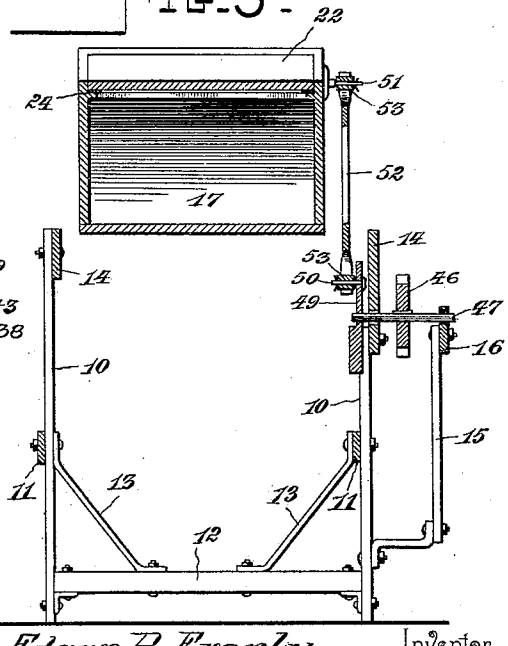


FIG. 5.



Witnesses

John F. Dempewolf

C. E. Hoyt

Edgar B. Everly, Inventor

By his Attorneys.

C. A. Snow & Co.

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

UNITED STATES PATENT OFFICE.

EDGAR B. EVERLY, OF COFFEYSBURG, MISSOURI.

CHURN.

SPECIFICATION forming part of Letters Patent No. 644,068, dated February 27, 1900.

Application filed January 3, 1899. Serial No. 700,992. (No model.)

To all whom it may concern:

Be it known that I, EDGAR B. EVERLY, a citizen of the United States, residing at Coffeysburg, in the county of Daviess and State of Missouri, have invented a new and useful Churn, of which the following is a specification.

My invention relates to churns, and particularly to churn-operating motors of the spring type; and the object in view is to provide a simple and efficient construction of parts whereby an oscillatory or rocking movement may be imparted to a churn body or receptacle by means of a comparatively-light operating-spring, the mechanism being provided with means whereby compensation is made for the varying resistance offered to the movement of the churn-body in its various positions.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side view of a churn constructed in accordance with my invention. Fig. 2 is a plan view of the same. Fig. 3 is a longitudinal vertical section. Fig. 4 is a transverse vertical section of a portion of the apparatus upon the plane indicated by the lines 4 4 of Figs. 1 and 2. Fig. 5 is a detail transverse section on the plane indicated by the lines 5 5 of Figs. 1 and 2. Fig. 6 is a detail view of the pitman, whereby motion is communicated from the crank-disk to the churn-body. Fig. 7 is a detail sectional view of the adjustable pendulum bob or weight and the adjacent portion of the stub.

Similar reference characters indicate corresponding parts in all the figures of the drawings.

The supporting-frame of the apparatus embodying my invention consists of end standards 10, connected by longitudinal and transverse bars 11 and 12, inclined braces 13 being arranged upward from the centers of the transverse bars 12 to the standards, and churn-body-supporting bars 14, connecting the upper ends of the standards. Also an auxiliary or side frame, consisting of uprights 15 and a connecting-bar 16, is arranged parallel with one side of the main frame.

The churn body or receptacle 17 is of the oscillatory or rocking type and is mounted upon the main frame with a shifting fulcrum, such fulcrum consisting of rockers 18, seated upon the upper edges of the supporting-bars 14 and held from endwise or axial displacement by means of guards 19. Also displacement of said rockers parallel with the bars 14 is prevented by means of rolling stops 20, consisting of antifriction-rollers arranged adjacent to the extremities of the guards 19. Furthermore, the churn body or receptacle is provided with a segmental or curved bottom fitted at intervals with transverse cross-sectionally-triangular breaker-bars 21, and the lid of the churn body or receptacle is of sectional construction, comprising the members 22 and 23, having rubber packing-strips 24, adapted to be seated upon the upper edges of the churn-body walls and being held in place by intermediately-fulcrumed locking-levers 25 for terminal engagement with clips 26, secured to the walls of the churn-body. These lid sections or members are preferably provided with handles 27, and one of them is also provided with a vent or air hole 28, below which is arranged a guard 29 to prevent the splashing of the contents of the churn-body therethrough. In the construction illustrated this guard consists of a longitudinally corrugated or bowed plate having its terminal edges fitted to slide between guide-cleats 30 and the under surface of the lid section or member.

As the churn-body rocks to cause the liquid contents thereof to gravitate toward one end the fulcrum-point shifts toward the depressed end, thus causing the opposite or elevated end of the churn-body to partially counterbalance the weight of the liquid which has accumulated at the depressed end; but this compensation, due to the shifting fulcrum, is not sufficient to preserve an even balance of the churn-body and its contents, and therefore in addition thereto I provide a counterbalancing-pendulum comprising a shank or stem 31, which consists of a flat spring-metal blade or strip having a plurality of spaced perforations 32 and a pendulum bob or weight 33, having therein a guide-opening 34, through which the shank or stem extends. At its upper end the guide-opening 34 is flared, as shown at 35, and projecting inward from one

of the walls of this flared portion is a stud or hook 36 for engagement with one of the openings 32. Also the shank of the pendulum is graduated to correspond with a scale 37, arranged within the churn body or receptacle on one wall thereof, said scale serving to indicate the depth of the liquid contents thereof. The graduations upon the pendulum shank or stem are relative to those of the scale, and therefore the operator is enabled by reference to the scale to adjust the bob or weight to suit the depth of the liquid in the churn-body, the said bob or weight being arranged farther from the fulcrum of the churn-body as the depth of the liquid in the churn-body increases. I have deemed it unnecessary to illustrate the comparative marking upon the relative scales carried by the churn-body and pendulum stem or shank, as it is obvious that the same will depend upon the proportions of the parts both as to size and weight and will be ascertained by experiment in connection with the manufacture of the apparatus. When it is desired to adjust the bob or weight upon the pendulum shank or stem, the latter is flexed laterally within the flared portion 35 of the guide 34 sufficiently to disengage the shank from the stud 36, whereupon the bob or weight may be moved until said stud is in registration with the desired opening or until the bob or weight is at a distance from the fulcrum of the churn-body to suit the depth of the liquid contents of the latter. The described construction of means for securing the bob or weight at the desired adjustment avoids the use of separate parts, such as set-screws, and thus simplifies the construction and operation of the device in this particular.

The means for communicating a rocking motion to the churn-body preferably include a driving or master gear 37^a, loosely mounted upon a shaft 38, upon which is coiled and to which is attached one end of an actuating-spring 39, said master-gear being loosely mounted upon the shaft 38 to provide for the independent rotation of the latter to wind the spring, and a clutch being employed for communicating motion from the drum or shaft to said wheel, said clutch in the construction illustrated consisting of an arm 40, fixed to the drum or shaft and extending radially therefrom, and a clutch-pin 41, extending through an opening in said arm and engaging with one of a series of openings 42 in the wheel. When it is desired to wind the spring, this clutch-pin may be withdrawn from engagement with the gear-wheel, and a suitable crank or key may be fitted upon the angular key-seat 43 at the outer extremity of the drum or shaft, after which the clutch-pin is returned to cause the drum to communicate rotary motion to the gear. The master-gear meshes with a pinion 44, attached to a second or intermediate gear 45, which in turn meshes with a pinion 46 upon a driven shaft or spindle 47, which in common with the drum 38 and the spindle of the connected gears 44 and 45 is mounted in parallel bars 16 of the supporting-frame. The shaft 47 carries in addition to the pinion 46 a crank-disk 49, having a wrist-pin 50, and this wrist-pin is connected with a fulcrum-pin 51 upon the side of the churn body or receptacle by means of a pitman 52. This pitman is terminally bifurcated, and in the bifurcations are fitted rocking bearing-boxes 53, having lateral gudgeons 54, fitted in suitable bearings in the arms of the bifurcations. Said boxes are also removably mounted, respectively, upon the wrist-pin 50 and the fulcrum-pin 51 and are held in place by keys 54, passed through openings in the respective parts 50 and 51, and when it is desired to release the churn body or receptacle the required key 54 is removed and the pitman may be deflected from its normal position in a vertical plane, the bearing-boxes turning or assuming an angular position with relation to the plane of the pitman to provide for detachment without cramping or straining the wrist and fulcrum pins.

It will be understood that in operation the spring-actuated drum communicates motion through the train of gears to the crank-disk, the latter receiving motion at an increased rate of speed, depending upon the relative diameters of the gears comprising said train, and motion is communicated from said crank-disk through the pitman 52 to the churn-body to oscillate the latter, as above indicated. Owing to the shifting fulcrum, together with the pendulum, having its adjustable counterbalance, consisting of the bob or weight 33, an even balance of the churn body or receptable is maintained in all positions, and hence the operation of the mechanism is rendered uniform.

The advantage of the smooth-surfaced rockers, in connection with limiting means or stops to prevent said rockers from leaving the desired positions upon the rest or bearing bars, resides in the reduction of friction, and hence in the freedom of movement of the churn body or receptacle. The rolling stops 20 are also of advantage over fixed stops, for the reason that should the rocker move toward one of the stops sufficiently to ride thereon when the churn-body is rocked in one direction the roller will turn and at once reseat the rocker in its proper position upon the rest or bearing bar. In other words, the roller allows the rocker to slide back to its proper position should it become displaced in one direction or the other longitudinally of the frame.

It will be understood in practice that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having described my invention, what I claim is—

1. A rocking or vibratory churn-body and actuating mechanism therefor, in combina-

tion with a stem pendent from the churn-body and having a series of openings at intervals in its length, a weight having a vertical guide-opening therethrough to receive the said stem, one wall of the guide-opening being straight and the other inclined or flared at its upper end to admit of relative movement of the stem from the wall, and a stud projecting laterally from the upper end of the straight wall toward the inclined wall of the guide-opening and adapted to make detachable connection with the aforesaid stem by entering in one of the openings formed therein, substantially as set forth.

2. In a churn, the combination with an oscillatory churn-body and actuating mechanism therefor, of a counterbalancing-pendulum having a transversely-yielding spring-shank, a bob or weight having a guide through which said shank extends, said guide being flared at one end, and a stud arranged in the flared portion of the guide, to engage one of a series of spaced openings in the shank, to maintain the bob or weight at the desired adjustment upon the shank, the shank being capable of lateral deflection within the flared portion of the guide to disengage the same from the stud, and thereby release the bob or weight for adjustment, substantially as specified.

3. A rocking or vibratory churn-body, a motor connected therewith for operating the churn, a pendulum attached directly to the churn-body to control its movements and govern the motor, supporting bars or rockers attached to the sides of the churn-body and mounted upon the supporting-bars, guards attached to the sides of the supporting-bars and overlapping the outer sides of the rockers to prevent transverse displacement of the churn-body, and rolling stops attached to the supporting-bars at the ends of the guards to limit the extreme rocking movements of the churn and prevent its longitudinal displacement, substantially as specified.

4. In a churn, the combination with a supporting-frame and a rocking churn-body mounted thereon, of operating mechanism including a crank-disk, and means for communicating continuous rotary motion thereto, a wrist-pin carried by said crank-disk, a fulcrum-pin carried by said churn-body, a terminally-bifurcated pitman, rocking bearing-boxes 53 mounted in the terminal bifurcations of the pitman and fitted upon said wrist-pin and fulcrum-pin, respectively, and keys detachably engaged with said pins to hold the bearing-boxes in place thereon substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EDGAR B. EVERLY.

Witnesses:
E. ELLIS,
T. R HENDERSON.