(No Model.)

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CHURN.

No. 589,717. Patented Sept. 7, 1897.

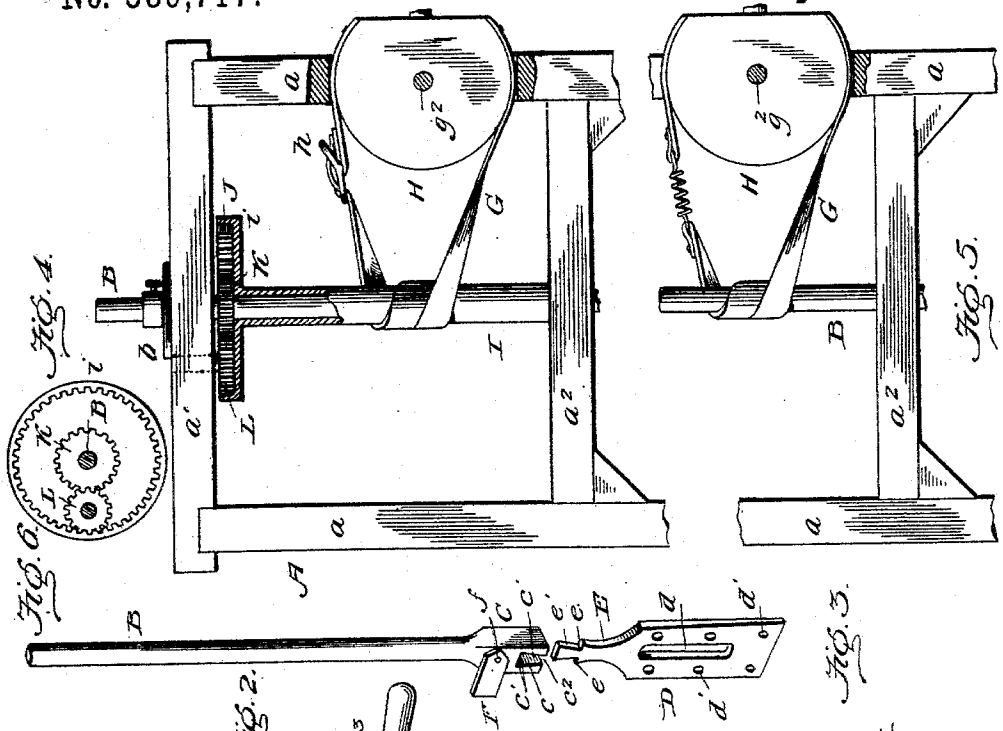


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 2.

Fig. 3.

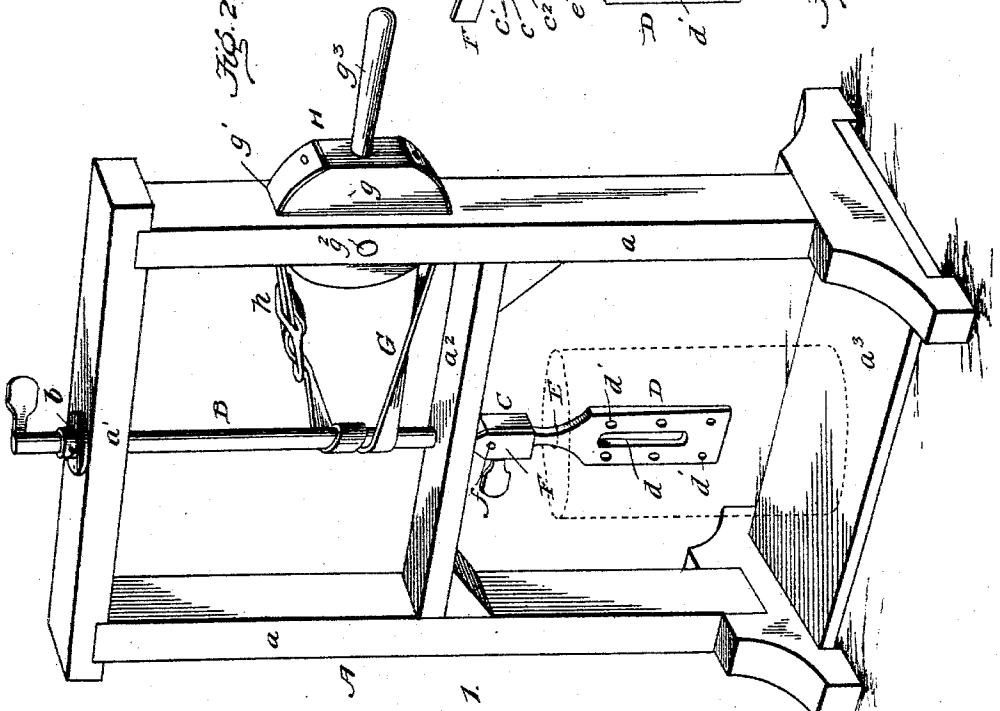


Fig. 1.

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UNITED STATES PATENT OFFICE.

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CHURN.

SPECIFICATION forming part of Letters Patent No. 589,717, dated September 7, 1897.

Application filed May 6, 1897. Serial No. 635,424. (No model.)

To all whom it may concern:

Be it known that we, PLEASANT N. GREEN, JAMES H. THOMPSON, and ALLEN FOWLER, citizens of the United States, residing at Union City, in the county of Obion and State of Tennessee, have invented certain new and useful Improvements in Churns; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in churns of that class which employ a horizontally-rotatable dasher attached to a staff which is vibrated rapidly by a belt or strap connection with an oscillating operating device; and the object of our improvement is to provide means for imparting an exceedingly rapid vibration to the staff and dasher.

With these ends in view our invention consists in the novel combination of devices and in the construction and arrangement of parts which will be hereinafter fully described and claimed.

To enable others to understand our invention, we have illustrated the same in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a perspective view of a churn mechanism, showing the vessel by dotted lines. Fig. 2 is a detail view of the dasher-staff, showing the pivoted catch in its raised position to illustrate the construction of the socket. Fig. 3 is a detail view of the dasher. Figs. 4 and 5 represent our invention, in which provision is made for rapidly driving the dasher-staff and for taking up the slack in the belt or strap connection. Fig. 6 is a horizontal sectional view on a plane below the top cross-piece of the supporting-frame to illustrate the multiplying gearing between the tubular shaft and the dasher shown by Fig. 4 of the drawings.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A designates a suitable supporting-frame, which in the present instance is shown as consisting of the uprights a, the top and intermediate cross-rails a' a^2, and the platform a^3, the whole suitably joined together to present a substantial structure. In the rails a' a^2 are vertically-alined openings, through which passes the vertical dasher-staff B, the latter having a collar b clamped thereto, which collar is adapted to rest on the rail a' to sustain the dasher-staff at the desired elevation. The lower end of the dasher-staff terminates in an enlarged foot C, which is made as an integral part of the staff, and in this foot is produced a socket c. This socket opens through one face or side of the foot and also opens through the lower end of said foot, but the opposite side and top of the socket are closed. The walls of the socket are not straight and parallel to each other, but said walls c' are inclined so that they diverge upwardly from the lower open end or throat c^2 of the socket toward the closed upper end of said socket.

The dasher is represented at D in the drawings as consisting of a flat blade having a longitudinal slot d and with transverse perforations d'. The upper end of the dasher is extended to form a projecting shank E, which is narrower than the dasher-blade and which is made an integral part of said dasher. The shank E of the dasher is formed with transverse ledges or shoulders e on two sides thereof, and from these shoulders the edges of the dasher diverge upwardly, so as to produce a tapered tenon e', the form and dimensions of which are such that it may fit snugly within the socket c in the foot of the dasher-staff. The dasher-tenon e' is adapted to be placed laterally through the open vertical side of the socket c, so that the tenon fills the socket and the throat c' at the lower end thereof, and the shoulders or ledges e of the dasher-shank abut against the lower end of the foot C. To hold the dasher against lateral displacement in the foot of the staff B, a catch or button F is pivoted at f to the foot C, above the socket c therein, and this catch is adapted to drop or fall by gravity across the open vertical side of the socket c and to prevent the dasher from working out of the same.

The dasher is adapted, as usual, to work in a churn vessel, (indicated by dotted lines in Fig. 1,) and said dasher is suspended from the staff and so connected thereto as to rotate with the same. As the dasher is inter-

locked with the staff in vertical alinement therewith to prevent it from having vertical movement either up or down, the construction of the foot C is important in that provision is thereby made for removing the dasher laterally or sidewise from the staff to permit of the withdrawal of the dasher from the churn preliminary to the removal of the churn vessel from the platform on which it rests. The pivoted catch serves, when the dasher is in place in the socket of the staff, to effectually prevent the dasher from being disconnected, but at the same time the catch can be easily raised to permit of the removal or replacement of the dasher.

The staff B is designed to be vibrated in a horizontal plane by the belt or strap G and the operating-piece H. This operating-piece consists of a disk-like plate g, fitted in a mortise g' in one of the rails a, to which it is pivoted by a transverse shaft or bolt g^2, said plate having an outwardly-extending handle g^3, by which it may be rocked by hand back and forth. To the periphery of the operating-piece are attached the ends of the divided belt or strap G, which is coiled one or more times around the dasher-staff, and this strap or belt is divided and provided with a buckle or other take-up device h, by which the strap may be shortened to take up any slack which may occur in the belt or strap.

In the embodiment of our invention shown by Figs. 4 and 6 of the drawings we provide simple mechanism by which the rotation or vibration of the dasher-staff and dasher may be multiplied in proportion to the oscillation of the operating-piece. In this embodiment we employ a dasher-staff, an operating-piece, and a belt or strap; but we supplement these elements by the addition of a novel multiplying-gearing, in which the motion of the belt or strap is applied to a sleeve I, which is fitted loosely on the dasher-staff, and this sleeve transmits the motion through gearing to the dasher-staff. The sleeve I has the strap or belt coiled or wound one or more times on the outside thereof, and the upper end of this sleeve terminates in a flared or enlarged head i, in which head is secured or provided an internal gear J. A spur-gear pinion K is fastened to the dasher-staff in the plane of the internal gear, so that said pinion will rotate with the dasher-staff, and said gears J K are connected together by an intermediate idler-pinion L, which is suitably supported on the frame A and arranged to have its teeth mesh with the teeth on the internal gear J and the pinion K. The strap or belt may also be provided with another style of take-up device to compensate for slack therein, and such take-up device may consist of a coiled spring to keep the strap taut, or the operating-piece may be constructed with a detachable section, by which the ends of the strap or belt may be clamped adjustably to the operating-piece.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination with a frame and a dasher-staff, of a sleeve fitted on said staff, gearing connecting said sleeve and dasher-staff, a pivoted operating-piece mounted on said frame and a belt connection between said sleeve and said operating-piece for driving said sleeve, substantially as described.

2. The combination with a dasher-staff and an operating-piece, of a sleeve fitted loosely on the staff and provided with an internal gear, a spur-pinion fixed to the staff, an intermediate idler-pinion meshing with said internal gear and with the spur-pinion, and a strap or belt connected to the operating-piece and coiled on the sleeve, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

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Witnesses:
J. W. BURNEY,
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