(No Model.)

H. FELT.

CHURN.

No. 414,506. Patented Nov. 5, 1889.

Fig. 1.

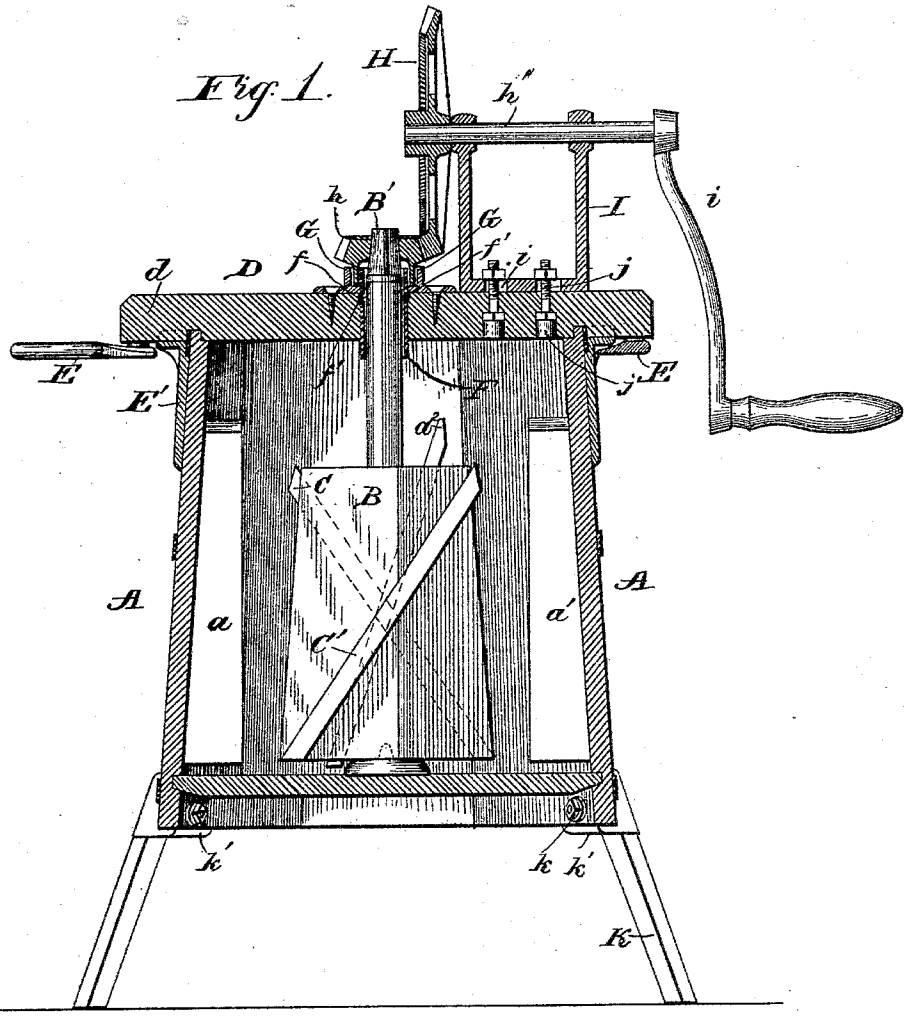


Fig. 3.

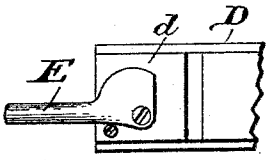


Fig. 2.

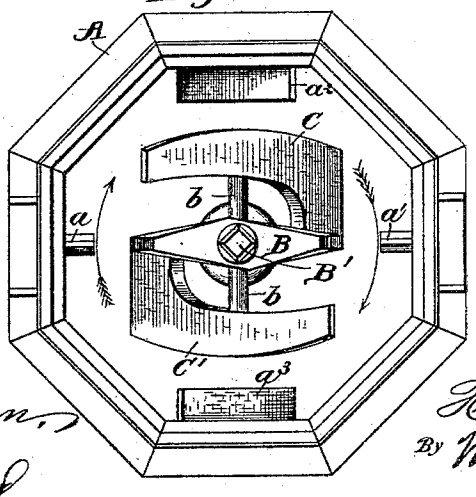
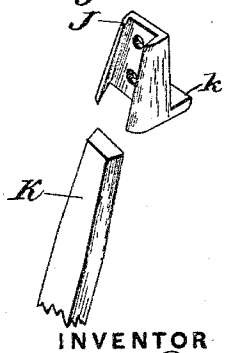


Fig. 4.



WITNESSES:

Percy C. Bowen,

W. F. Burchard

INVENTOR

Hannibal Felt

By McGrew & Small

his Attorneys.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

HANNIBAL FELT, OF GALLATIN, TENNESSEE.

CHURN.

SPECIFICATION forming part of Letters Patent No. 414,506, dated November 5, 1889.

Application filed March 8, 1889. Serial No. 302,465. (No model.)

To all whom it may concern:

Be it known that I, HANNIBAL FELT, a citizen of the United States, residing at Gallatin, in the county of Sumner and State of Tennessee, have invented certain new and useful Improvements in Churns; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in churns; and it has for its object, primarily, to create a violent agitation of the cream and thus break up the molecules within a very short time; to provide for the secure fastening of the cover to the body of the churn by devices which will enable the cover to be easily and expeditiously removed, and to provide a novel driving mechanism for rotating the dasher.

The receptacle has two vertical straight abutments at diametrically-opposite points and two inclined abutments intermediate of the vertical straight abutments, and a vertical rotary dasher having its lateral faces inclined to deflect the cream radially from the center of the body toward vertical abutments, and carrying two inclined wings which are located on opposite sides of the body of the dasher and inclined in reverse directions to throw the cream upwardly and outwardly against the inclined abutments, whereby the cream is violently agitated, and is given a long range of movement, which rapidly breaks up the molecules of the cream within a very short time. The driving mechanism of the churn is mounted on a central section of a three-part cover, said central section being extended at its ends beyond the body of the churn and having transverse recesses or grooves in its lower side into which is received the edges of the churn-body. At each end of the central section of the cover I provide a cam-lever, which is pivoted to the lower face of the cover and adapted to take beneath the brackets which are fixed to the outer side of the churn-body. A vertical tube or thimble is fixed centrally to the central section of the cover, through which tube passes the upper angular end of the dasher-staff, the lower end of the thimble being extended below the lower face of the cover and into the body of the churn to prevent the cream from being thrown out of the body through the aperture in the cover thereof when the cream is agitated. A casting is fixed exteriorly to the central section of the cover, and it has a vertical annular flange or rim which surrounds the upper end of the thimble, but is out of contact laterally therewith to leave an intervening space between said flange and the thimble, into which space is fitted a depending hub or rim of a bevel-pinion. This bevel-pinion has a square central socket, through which passes the upper angular end of the dasher-staff, and this pinion is supported by its depending hub and prevented from lateral play and displacement by the dasher-shaft, the flange of the casting, and the upper extremity of the thimble. A master-gear meshes with the bevel-pinion to rotate the latter and the dasher, and the shaft of said master-gear is journaled in a slotted frame or standard which is secured to the central member of the cover in such a manner that said frame and the master-gear can be adjusted toward the bevel-pinion to take up and compensate for wear between the master-gear and the bevel-pinion which meshes therewith.

I will now proceed to describe my invention in connection with the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved churn. Fig. 2 is a plan view thereof with the cover removed. Fig. 3 is a detailed under side view of a part of the central member of the cover and the cam-lever for securing the latter in place. Fig. 4 is a detailed perspective view of one of the leg-receiving sockets and a part of a leg.

Like letters of reference denote corresponding parts in all the figures of the drawings.

In the embodiment of my invention I provide a receptacle A, which is preferably hexagonal in form and of the ordinary construction. Upon the inside this receptacle is provided at opposite points with straight vertical abutments $a\ a'$, and at points between the vertical straight abutments, equidistant therefrom, I provide oblique abutments $a^2\ a^3$, which

are inclined in reverse directions, these abutments being suitably fixed to the inside of the receptacle or body.

B is the dasher, which is centrally stepped or pivoted at its lower end in the receptacle A, and is bodily of diamond shape in cross-section, with its lateral faces or sides converging from a central point through its vertical axis toward its outer vertical edges, as shown in Fig. 2. The dasher B is provided with wings or blades C C′, which extend diagonally upward and stand outward from the body of the dasher. Said wings are located on opposite sides of the body of the dasher, and are inclined in reverse directions with relation to each other, the lower ends of the wings being fixed to the body and suitably braced to said body, as at *b b*. This construction of dasher effects, by means of said blades, the throwing of the cream or contents of the receptacle upward and outward against the vertical abutments as they (the blades) face or come opposite the latter, and in like manner throw said cream or contents against the oblique or reversely-inclined abutments as said wings or blade come opposite or face said oblique abutments. Thus the cream or contents, instead of being thrown directly against the sides of the receptacle, are given a circuitous route or long range of movement, its molecules thus receiving a maximum breaking-up action in a minimum space, as also in the shortest possible amount of time.

The receptacle A is provided with a lid or cover D, centrally through which passes and projects the dasher staff or shaft B′. The cover D is preferably formed in three sections, the middle or bar section *d* of which holds the dasher and its shaft in position, and this central member or section is clamped or held in place on the churn-receptacle A by means of cam-levers E E, which are pivoted to the under side of the central section *d*, and are adapted to fit or take beneath socket-like angle-plates or brackets E′ E′, which are fixed or bolted to the sides of the receptacle A at its upper edge.

The brackets or angle-plates embrace and bear against the under side of the central member or section *d*, while against the under side of the horizontal or socket portions of said brackets or plates are adapted to fit the inclined or cam portions of the levers E, thus securely retaining the central section of the cover in place. This construction and arrangement of levers and socket-plates also permits of the ready and expeditious removal of the cover and the dasher-driving mechanisms.

A vertical sleeve or thimble F passes centrally through the middle section or member of the cover, and this thimble has a bead *f* formed near its upper edge or end, which bears or rests in a cavity *f′* in the side walls of the aperture or passage which receives said sleeve or thimble to hold the latter from vertical or downward displacement and form, in conjunction with the inner edge of the casting G in contact with the outwardly-flaring portion of the head, a liquid-tight joint, the lower end of this thimble being extended below the lower face of the central member or section of the cover and into the body of the churn to prevent the cream from being thrown out of the body through the central passage in the cover. Encircling the upper end of this sleeve or thimble F is a cup-shaped casting G, which receives the dripping lubricant or oil from the dasher-operating gearing, presently referred to. The upper end of the boxing or sleeve F thus forms the inner wall of the lubricant-receiving cup G and prevents the dripping or passing of the lubricant or oil into the churn. The cup-shaped casting G is suitably fastened or screwed to the cross-bar *d*, as shown, and it is arranged laterally of and out of contact with the upper extremity of the thimble.

By forming the oil-cup in two sections I am enabled to secure a smooth bearing-surface on the inner face of the upwardly-projecting flange of the casting G without the necessity of having the casting turned or fitted, as would be necessary in casting the inner and outer walls of the cup integral, and at the same time keeping the width of the annular cup within suitable limits.

The gearing for operating the churn-dasher consists of a small beveled pinion *h*, having an angular or square socket for receiving the upper end of the dasher-shaft B′, and this pinion meshes with the large beveled gear-wheel or master-gear H, which is carried by a horizontal shaft *h′*, that is suitably supported upon a frame or standard I, and this shaft has applied to its outer extremity a handle or crank *i*. The frame or standard I has longitudinal slots *i′ i′* in its lower end, through which are passed the holding clamp screws or bolts *j j*. The slots and screws permit of the adjustment of the large gear-wheel or master-gear and its supporting-frame up to the pinion to compensate for wear, &c. The inner ends or heads of the screws or bolts *j j* are let into countersinks or recesses *j′ j′* to remove the same from contact with the cream or contents of the churn-receptacle.

Bracket-like castings or sockets J are also applied to the sides of the receptacle at its lower edge, each socket being secured through the projecting bottom edge or flange of the receptacle by a single bolt *k*. These leg-sockets J have at their lower or bottom edges inward-projecting ledges or flanges *k′*, which take under the bottom edges of the receptacle A, thus assisting the retention of said sockets in place. These sockets may also have passed through them, and entering the receptacle about opposite the union of its bottom with sides, screws, if desired. These sockets serve to receive the legs K, the latter being proximately dovetailed in cross-section, which fit between the corresponding-shaped flange of the socket to prevent lateral dis-

placement of the legs. The upwardly-converging leg-openings in the sockets J are located on the side walls of the churn and obliquely to its vertical axis, and are preferably open at the top as well as at the bottom for the purpose of access to the upper ends of the legs when it is desired to release them. The legs have a gradual taper corresponding to the taper of the holes in the sockets and extending for a distance below the lower ends of the holes in the sockets, when the legs are at first inserted, in order to provide for the self-tightening of the legs as they shrink.

Changes in the form and proportion of parts and details of construction can be made without departing from the spirit or sacrificing the advantages of my invention; and I would therefore have it understood that I do not confine myself to the exact details of construction herein shown and described as an embodiment of my invention.

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

1. A churn having its receptacle provided with straight vertical abutments at diametrically-opposite points and the oblique abutments intermediate of and equidistant from said straight abutments, in combination with a dasher having an approximately diamond shape in cross-section with its lateral or side faces converging from its vertical axis toward its edges, substantially as and for the purpose described.

2. In a churn, the combination of a receptacle having the straight vertical abutments at diametrically-opposite points and the oblique abutments intermediate of said vertical abutments, and a vertical rotary dasher carrying two oblique wings which are arranged on opposite sides of the body of the dasher out of contact laterally therewith, substantially as and for the purpose described.

3. In a churn, the combination of a receptacle having the straight vertical abutments and the intermediate oblique abutments, and a vertical rotary dasher having the lateral faces thereof converging from the center toward the edges and carrying two oblique wings or blades which are fixed at their lower ends directly to the body of the dasher, said wings being located on opposite sides of the body of the dasher out of contact laterally therewith and inclined in opposite directions, substantially as and for the purpose described.

4. In a churn, the combination, with a cover, of a vertical sleeve or thimble fixed to the cover and having its lower end extended below the lower face of the cover into the body of the churn, for the purpose described, a cup-shaped casting having an annular socket which is of greater diameter than the thimble to leave an intervening space between the wall of said socket and the thimble, a dasher-staff passing through the thimble, and a drive-pinion having an extended hub which fits in the space between the socket and upper end of the thimble, substantially as described, for the purpose set forth.

5. The combination, with a churn-cover, a dasher-shaft extending through the cover, and a pinion engaged with the shaft and provided with a depending annular flange spaced from the shaft, of a casting surrounding the shaft and provided with an uprising flange back from the inner edge of the casting, and a thimble surrounding the shaft and provided with an expanded portion in immediate engagement with the inner edge of the casting, the thimble and casting forming a cup-bearing to receive the flange on the pinion, and the expanded portion of the thimble insuring a tight joint, substantially as set forth.

6. In a churn, the combination, with a receptacle having secured to its inner walls vertical and oblique abutments alternating with one another, of a vertical rotary dasher carrying oblique wings secured to the opposite sides of the body of the dasher, substantially as set forth.

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

HANNIBAL FELT.

Witnesses:
JOS. FORREST,
H. I. BERNHARD.