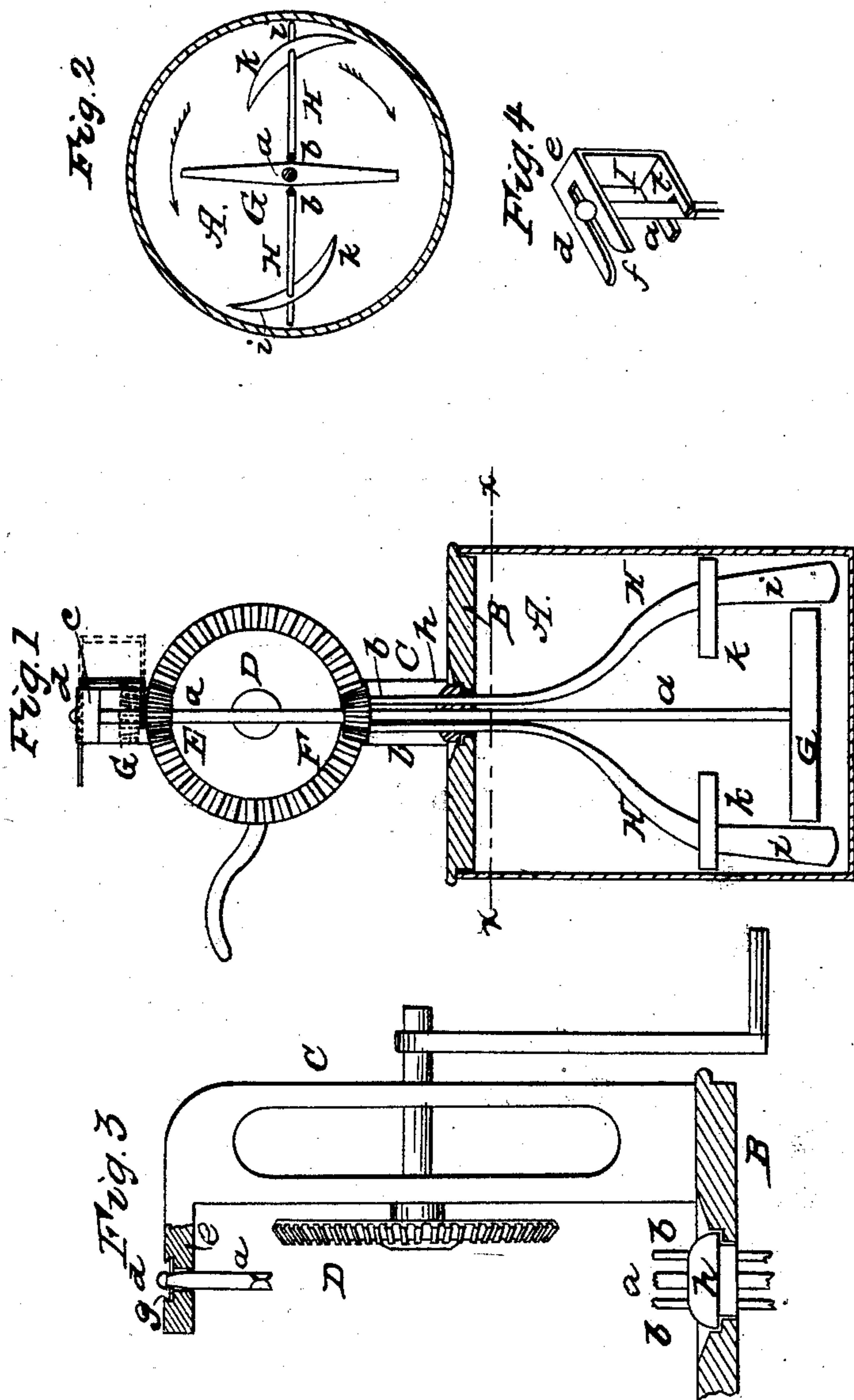


S. D. FRAZIER.

Churn.

No. 41,693.

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Witnesses
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UNITED STATES PATENT OFFICE.

S. D. FRAZIER, OF TEKONSHA, MICHIGAN.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. 41,693, dated February 23, 1864.

To all whom it may concern:

Be it known that I, S. D. FRAZIER, of Tekonsha, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Churns; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a central vertical section of my improved churn, the operating parts being shown in elevation; Fig. 2, a transverse horizontal section of the churn-body in the plane of line *x x*, Fig. 1; Fig. 3, an elevation of the bearing or standard supporting the driving-wheel and central shaft and showing more particularly the arrangement for suspending said shaft; Fig. 4, a perspective view of the slotted plate and the upper portion of the central shaft which it supports.

Like letters of reference indicate corresponding parts in all the figures.

My improved churn is of that class in which two dashers are used, revolving one within the other in opposite directions.

The principal object of my invention is to suspend the dashers at the top in such a manner that the necessity of a step for the central shaft at the bottom is avoided, while the dashers are of such form as to produce an intense action at the greatest depth and the whole diameter of the churn-body, and at the same time so arranged that the motion of the central one may be stopped, and it may be lowered to the floor of the churn, while the outer one gathers the butter after it is churned.

As represented in the drawings, the churn-body *A* is of the usual cylindrical form, with a cover, *B*, fitting in its top. To the cover is secured a standard, *C*, supporting the usual beveled cog-wheel *D*, which gears with the beveled pinions *E F* at top and bottom, said pinions being connected, respectively, with the shafts *a b* of their inner and outer dashers, *G H*, as usual. The arrangement of these dashers and the manner of sustaining them are peculiar. In ordinary arrangements the lower end of the inner dasher rests in a step in the bottom of the churn to sustain it, while the bearing at the top merely serves to keep it in place. I suspend both dashers at the top, their lower ends being thus entirely free and disconnected from the churn-body. To

accomplish this the standard *C* is provided with a projection, *c*, through which passes the end of the inner shaft, *a*. The upper end of this shaft is provided with a head, *d*, Figs. 3 and 4, which rests over the slot *f* of an angular plate, *I*, whose upper bend or projection, *e*, slides in a groove or depression, *g*, in the projection of the standard. The slot *f* is of just such size as to embrace the shaft under the head, but allow the latter to hold over its edges. This supports the central shaft. It is steadied by the lower pinion, *F*, through which it passes, and by the revolving block *h*, hereinafter described, in which parts it turns freely. If desirable, several heads or enlargements, *d d*, one above another, may be employed, so that the central dasher may be adjusted higher or lower at pleasure.

The shaft of the outer dasher consists of two or more rods, *b b*, situated outside the central shaft, and secured at their upper ends rigidly to the lower pinion, *F*, and passing downward through a central circular revolving block, *h*, Figs. 1 and 3, that rests in a suitable seat in the cover. This block sustains on the cover the weight of the outer dasher, while the latter is steadied by its connection with the inner one, the two thus forming a mutual guide and support.

The central dasher, *G*, is merely a straight bar of suitable length and size secured to the lower end of the shaft. In its natural position it is raised a little distance above the floor of the churn, as shown in Fig. 1.

The outer dasher, *H*, is formed by expanding or spreading the rods *b b*, or by securing thereto other parts, so as to make wide paddle-shaped arms *i i*, Fig. 1, extending to the outside of the churn-body and reaching to its bottom, inclosing the central dasher. I make these arms usually of considerable width, so as to act with effect on the cream. At a suitable height to act near the surface of the cream under ordinary circumstances wings *k k* are secured to the arms *i i* either rigidly or adjustable up and down, as may be desired. These wings are secured at an angle, as indicated in the plan, Fig. 2, so as to draw the cream from the outside toward the axis of the churn as they are carried around.

The advantages of the arrangement above described are obvious. The necessity of a step or bearing at the bottom of the churn is

obviated, thus saving much labor and difficulty in cleaning, as well as lessening the expense. The use of two shafts, one inclosing the other, within the churn-body, is also avoided. Where such are used the cream or milk enters the tubular shaft, and the two have to be taken apart for washing, and the difficulty of cleaning a tube adds considerable labor. In my arrangement the parts are all exposed in such a manner as to be easily cleaned without taking the dashers apart. Indeed, it is only necessary to agitate water thoroughly in the churn-body to clean the whole. In ordinary arrangements, in placing the dashers in the churn, it is frequently difficult to guide the lower journal into its step. In my device there is no difficulty of this kind. By suspending the dashers in the manner described I am enabled to make them as firm and strong as if they had a bearing on the inside, while the revolving block *h*, by its peculiar shape, more effectually insulates the cream and prevents its working out through the center of the cover than if the shafts only ran directly through, as usual, as the weight on said block has a tendency to pack it in its seat.

While I obtain the advantages above described by the suspension of the dashers, the peculiar arrangement and form of the dashers themselves are such as to make them very effective in their action on the cream. The central dasher, *G*, gives a current in one direction, which is effectually broken by that given in the opposite by the arms *i i* of the outer dasher. These arms, by extending to the floor of the churn, impart an intense agitation to the whole depth, or to the bottom, which is not usually the case with this class, from the fact that the outer shaft cannot extend to the bottom, but must leave room for the dasher of the inner one to be attached. Therefore, one dasher is usually above another. The horizontal form of one dasher and the vertical form of the other also produce a more violent agitation and a better effect than if both were either horizontal or vertical. The preponderance in extent of the outer dasher, together with the centrifugal action, has a tendency to create the strongest current on the outside, but this is overcome by the wings *k k* at the top, which draw it to the center again. The whole thus acts together

in a most efficient manner to produce the desired result.

The slotted plate *I*, before mentioned, has a projection, *l*, parallel with the bevel *e*, and its situation is such that when the churn is in action it will rest over the pinion *E* and hold it in gear with the driving-wheel, as indicated in Fig. 1. The pinion is made to slide up and down on its shaft, so as to throw it into or out of gear. When out of gear, it rests above the projection *l*, as indicated in red lines in Fig. 1. By drawing the slotted plate out, as indicated by the dotted lines, the projection *l* not only allows the pinion to be raised, but the bend *e* releases the central shaft, so that the dasher *G* drops to the bottom of the churn-body, as shown in red lines; then by pressing the plate in again it holds the pinion elevated. The plate, therefore, serves several purposes—viz., to sustain the central shaft and to hold the pinion in place either elevated or lowered.

The throwing of the central dasher, *G*, out of gear and allowing it to fall to the floor of the churn is for the purpose of gathering the butter after it has been churned. This requires a slow and regular motion. The dasher *G*, by impeding the motion of the current at the bottom, has a tendency to direct the particles of butter to the top, so as to bring them more immediately within the influence of the wings, which, from their angular position, gather the butter in a solid mass in the center.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the central dasher, *G*, and outer dasher, *H*, provided with the arms *i i* and angular wings *k k*, when the same revolve in opposite directions and are suspended from the top of the churn, substantially as herein set forth.

2. The slotted plate *I*, in combination with the central dasher-shaft, *a*, and the adjustable pinion *E*, whereby the same device answers the double purpose of suspending the shaft and holding the pinion either in or out of gear, substantially as herein described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

Witnesses:

J. E. PERINE,

SYLVESTER S. GRANGER.

S. D. FRAZIER.