

(No Model.)

E. A. RUDASILL & N. R. LONG.

CHURN.

No. 387,185.

Patented July 31, 1888.

Fig 1

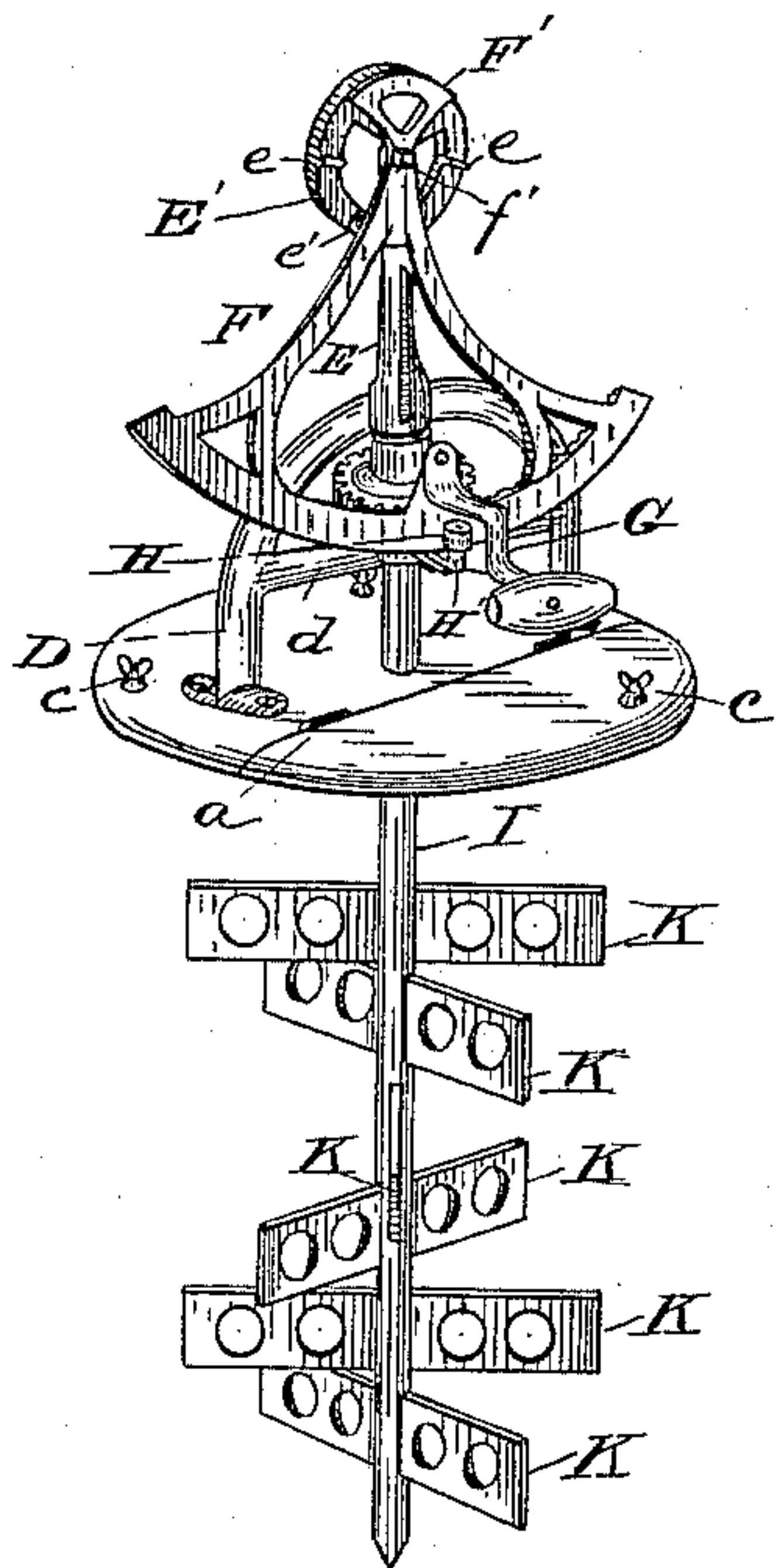


Fig. 2.

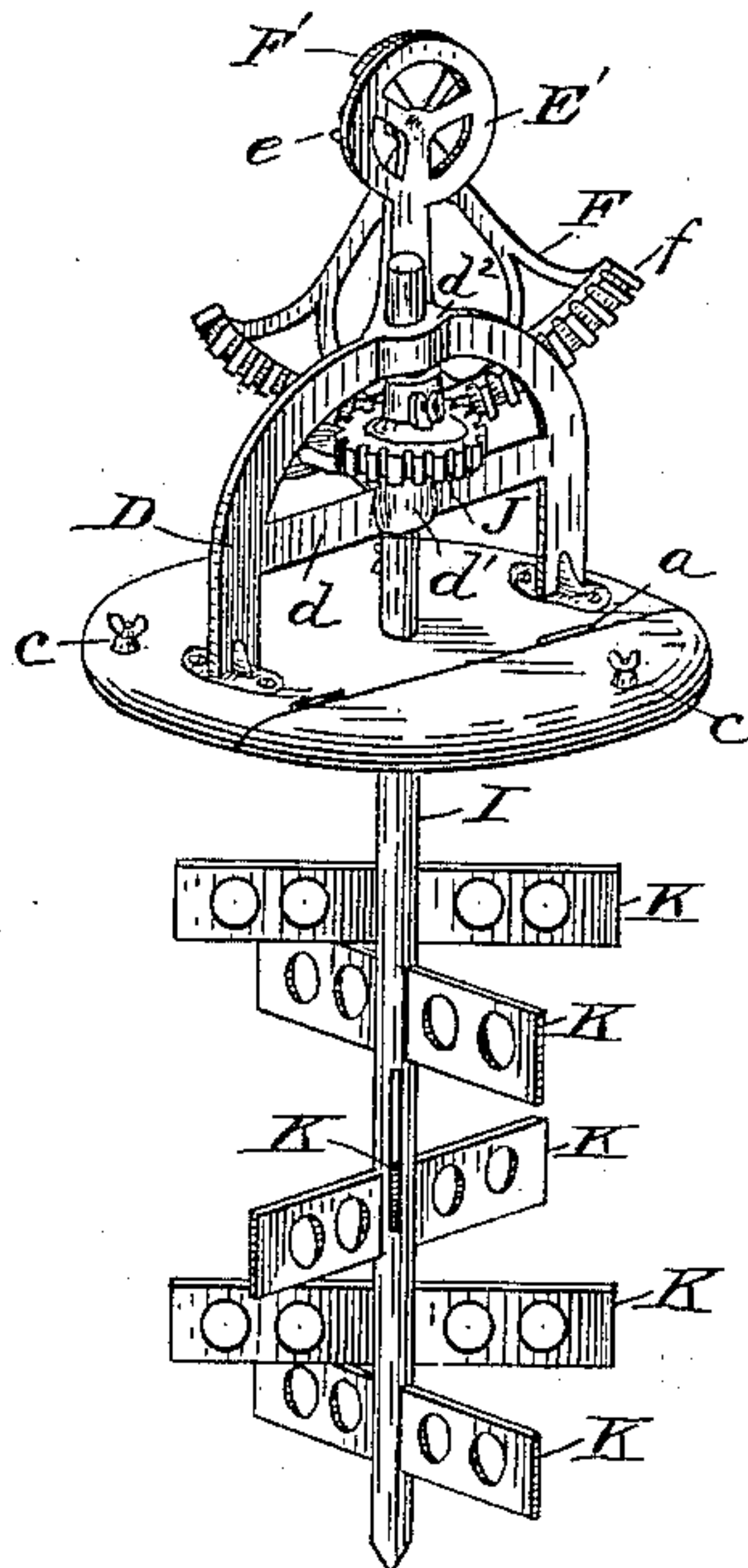
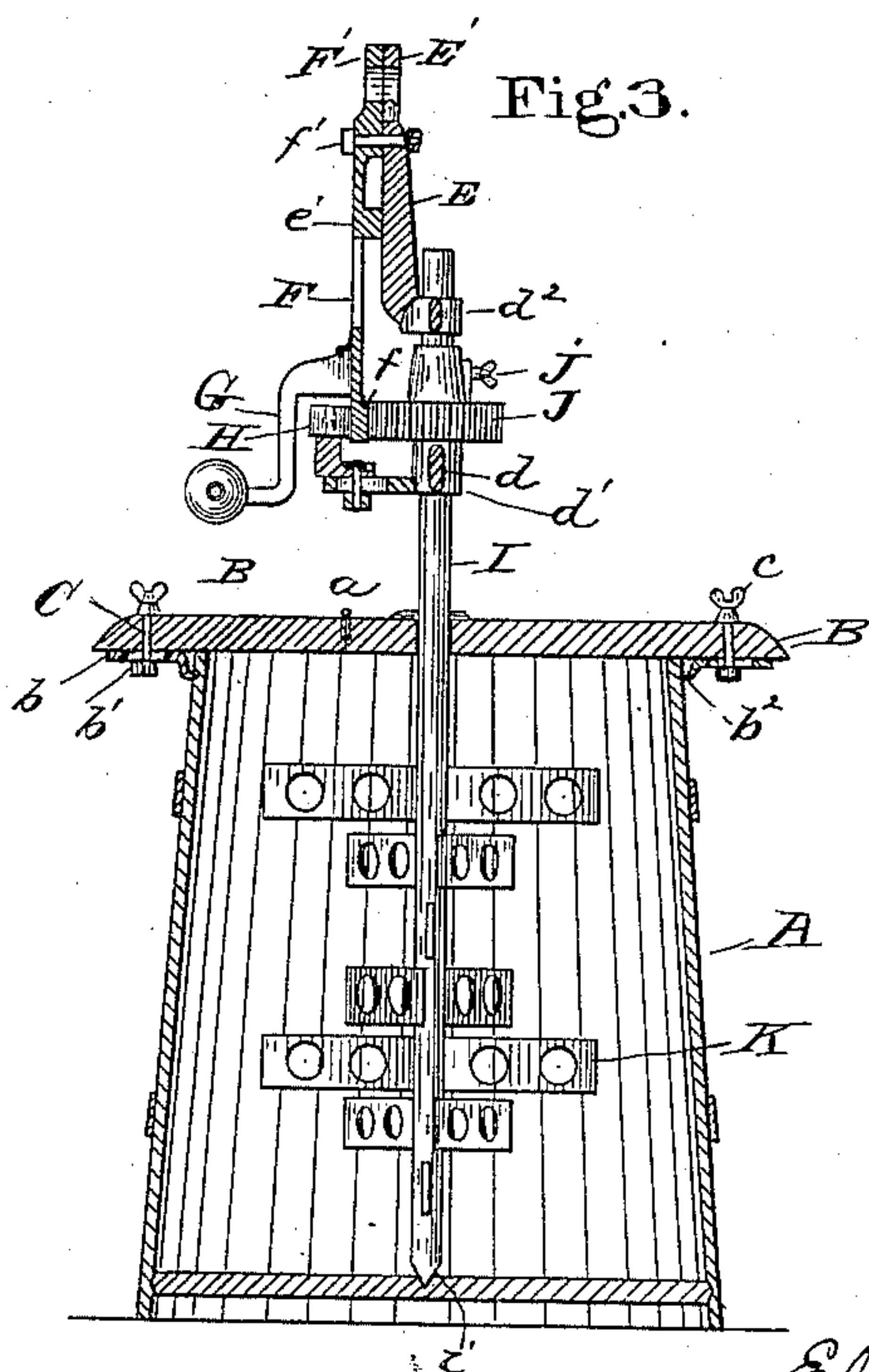


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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CHURN.

SPECIFICATION forming part of Letters Patent No. 387,185, dated July 31, 1888.

Application filed January 20, 1888. Serial No. 261,373. (No model.)

To all whom it may concern:

Be it known that we, ELI A. RUDASILL and NOAH R. LONG, citizens of the United States, residing at Shelby, in the county of Cleveland and State of North Carolina, 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, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to an improvement in vibrating churns, and has for its object to provide mechanism for rendering the operation of the segmental racks more true than has been the case in churns of a like nature heretofore, and in providing means for equalizing their concussion or jar when in operation, and an adjustable arm for guiding the rack; and it consists in the peculiar construction of parts, which will be more fully hereinafter described, and definitely pointed out in the claims.

In the accompanying drawings, wherein like letters of reference indicate corresponding parts in all the views, Figure 1 is a perspective view showing the front of the operating device. Fig. 2 is a similar view showing the rear portion. Fig. 3 is a vertical sectional view showing portions of the churn in side elevation.

In the drawings, A represents the barrel of the churn, and B the cover or lid, which has an even under side and is made somewhat greater in diameter than the churn-body, and is in two sections, hinged together at *a* on one side of its center. The cover has secured to its under side, near its edge, a series of slides, *b*, which have elongated slots *b'* formed near their centers, and downwardly-projecting inner ends, *b''*, which abut against or fit into grooves in the side of the top of the churn-body. To adjust the slides *b* in or out and hold them in the required position to enable the top B to be fitted to different-sized churns, bolts C are inserted through openings in the cover, having their lower ends passed through the slots in the slides and capped by suitable heads of a size larger than the slots, their upper

ends being provided with the ordinary thumb-screw nuts, *c*, as shown.

There is mounted on and rigidly secured to the top of cover B an arched standard, D, having a cross piece or brace, *d*, which has a collar, *d'*, formed at its center.

The top or crown of the standard D has a collar, *d''*, formed thereon, which has a vertical arm, E, secured to its side and extending up some distance beyond the same and the top of the standard. The arm E has a wheel-like or circular frame, *E*, on its upper end, made integral with and extending above the arm, which has upon its front face, near its outer edge, double stops *e*, which are located at opposite sides of the frame and on the same plane with each other. At the converging point of the spokes or hub of this wheel-like frame, and at the top of the arm E, there is an opening, in which a sector-rack, F, is pivoted by means of a bolt, *f'*. The sector-rack has a rack-bar, *f*, on its lower end, which meshes with the pinion on the dasher, and has upwardly-extending arms, that are united at about the lower edge of the wheel-like frame, upon the inner side of which, at this point, there is formed a lateral curved rib, *e'*, that rests against the side of and conforms to the contour of the wheel-frame. The united arms of the sector-rack extend above the rib *e'*, and have upon their inner side a projecting hub, that rests against the hub or enlargement of the wheel and standard at their pivotal point. Above the pivotal point of the rack and frame the arms of the rack diverge to the periphery of the wheel-frame, and have their ends united by a curved segment, *F'*, which rests against and conforms to the shape or arc of the wheel-frame.

A handle, G, is secured to and extends out from and below the sector-rack F, it being attached at the center of the length of the rack to a lug on the upper edge of the rack-bar.

A friction-roll or guide-wheel, H, is adjustably secured to an arm projecting out from collar *d'* of the brace of the arched standard D, and is arranged to come in contact with the outside of the rack-bar *f*, for the purpose

of holding the rack-bar loosely or tightly to its work on the pinion of the dasher.

The dasher-shaft I is extended through an opening in the center of the cover B, and has
5 a conical lower end, *i*, which is placed in a suitable bearing in the bottom of the barrel.

The shaft I is made of one piece and of a uniform size throughout its entire length, its upper end being extended through the collars
10 *d'* and *d''* on the arched standard D and being adjustable up and down by the side of the vertical arm E. The shaft has a pinion, J, adjustably secured thereto by a suitable set-screw, *j*, at a point between said collars and
15 directly opposite the rack-bar *f* of the sector F, so that the teeth of the pinion and rack-bar will mesh with each other.

Agitators or beaters K are adjustably secured in the dasher-shaft by inserting them
20 through slots formed in a spiral line in the shaft, thus forming a spiral arrangement of the agitators throughout that portion of the shaft which is placed in the body of the churn.

The agitators K being adjustably secured in
25 the shaft I, they can be readily removed therefrom to decrease the number when it is desired to use a smaller churn, or increase them when a larger churn is found necessary, and to replace them by shorter ones when a churn
30 of smaller diameter is used.

Having thus fully described the several parts of our invention, the operation of the same is as follows: When it is desired to apply the cover B to the body A, the slides *b*
35 are moved in to conform to the size of the top of the churn-body and to hold the cover in place. When the cream is placed in the churn ready for churning, the handle G is grasped and reciprocated back and forth, carrying
40 with it the sector-rack F and rack-bar *f*. The latter, being of a length equal to the circumference of the pinion J and meshing with said pinion, causes it to make a complete revolution. The pinion, being secured to the dasher-shaft,
45 carries the shaft with it in its revolution, thereby revolving the beaters on the lower part of the shaft. The beaters being spirally arranged on the dasher, the dasher is easily rotated and a complete agitation of the cream
50 takes place. In churns of a somewhat similar form of construction now in use it has been very difficult to freely move the sector-rack on account of its lateral play caused by the reciprocating movement, any deviation
55 from a straight line causing it to bind, thus stopping the movement and wrenching the whole structure, thus causing it to soon become useless. By our form of construction this objection is entirely overcome by the
60 sector-rack F, having the segment F' and the rib *e*, which closely fit and slide upon the face of the circular stationary frame E', thus forming, as it were, two disks, with their faces placed in contact with each other, and preventing any lateral movement of the rack-bar
65 *f*. This steadiness of motion is also aided by

the handle being placed at the center of the length of the rack-bar extending outward and downward, tending to hold the rack against the pinion.

To prevent the rack-bar from being forced out of mesh with the pinion by reciprocating it too far in either direction the stops or lugs *e* are formed on the frame E', and as the sector F is moved the ends of the rib *e'* and segment F' thereon come in contact with the stops *e*, the rib striking the under side of the lug on one side of the frame, while at the same time the end of the curved segment strikes against the upper side of the lug on the opposite side of the frame, thus limiting the movement of the sector-rack and equalizing the concussion or jar produced by stopping the rack to both sides of the churn alike. As above stated, the dasher-shaft is of the same diameter
85 throughout its entire length, thus admitting of its being adjusted up or down by the side of the vertical arm E, when a different size churn is to be used, by loosening the thumb-screw *j* and forcing the shaft through the
90 collars on the standard and brace and the pinion.

It is evident that many minor changes in the construction and arrangement of our improvement can be made and substituted for those shown and described without in the least departing from the nature and spirit of our invention.

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

1. The combination, with an arched standard having a dasher therein and a vertical arm extending above the same, with a wheel-frame on the upper end of the arm, having stops on opposite sides of its front face, of a sector-rack meshing with a pinion on the dasher, having upwardly-extending arms united and pivoted to the wheel-frame, the arms of the sector-rack extending above their pivotal point and provided with a segment resting against the upper front face, and a curved rib on their inner side resting against the lower front face of the wheel-frame, the end of said segment and rib coming in contact with said stops at the same time, one above and the other below, as set forth.

2. The combination, with a standard having a dasher therein and a vertical arm on one side thereof extending above the same, with a wheel-frame on the upper end of the arm, having stops on opposite sides of its front face on the same plane with each other, of an adjustable guide-wheel secured to the standard resting against a rack-bar having upwardly-extending arms united and pivoted at the top of the vertical arm and in the center of the wheel-frame, said rack-bar arms extending above their pivotal point and diverging from each other to the periphery of the wheel-frame, and having their upper ends united by a segment resting against the up-

per front face, and a curved rib on their inner side resting against the lower front face of said frame, the end of said sector and rib coming in contact with said stops on the frame
5 at the same time, one above and the other below, substantially as and for the purpose set forth.

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

ELI A. RUDASILL.
NOAH R. LONG.

Witnesses:

JOHN S. WRAY,
M. L. HAMICK.