

(No Model.)

D. W. CURTIS.

CHURN.

No. 297,233.

Patented Apr. 22, 1884.

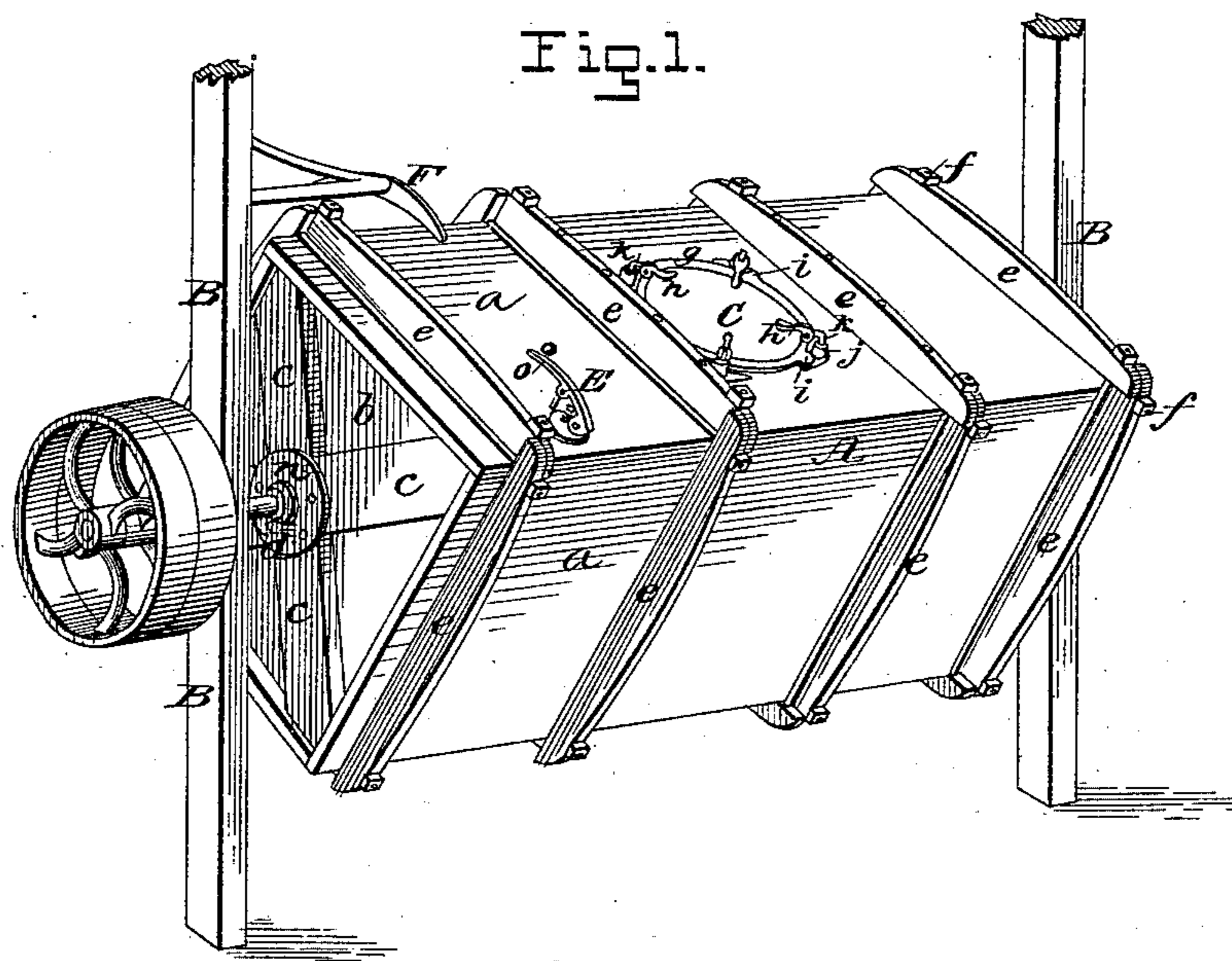


Fig. 1.

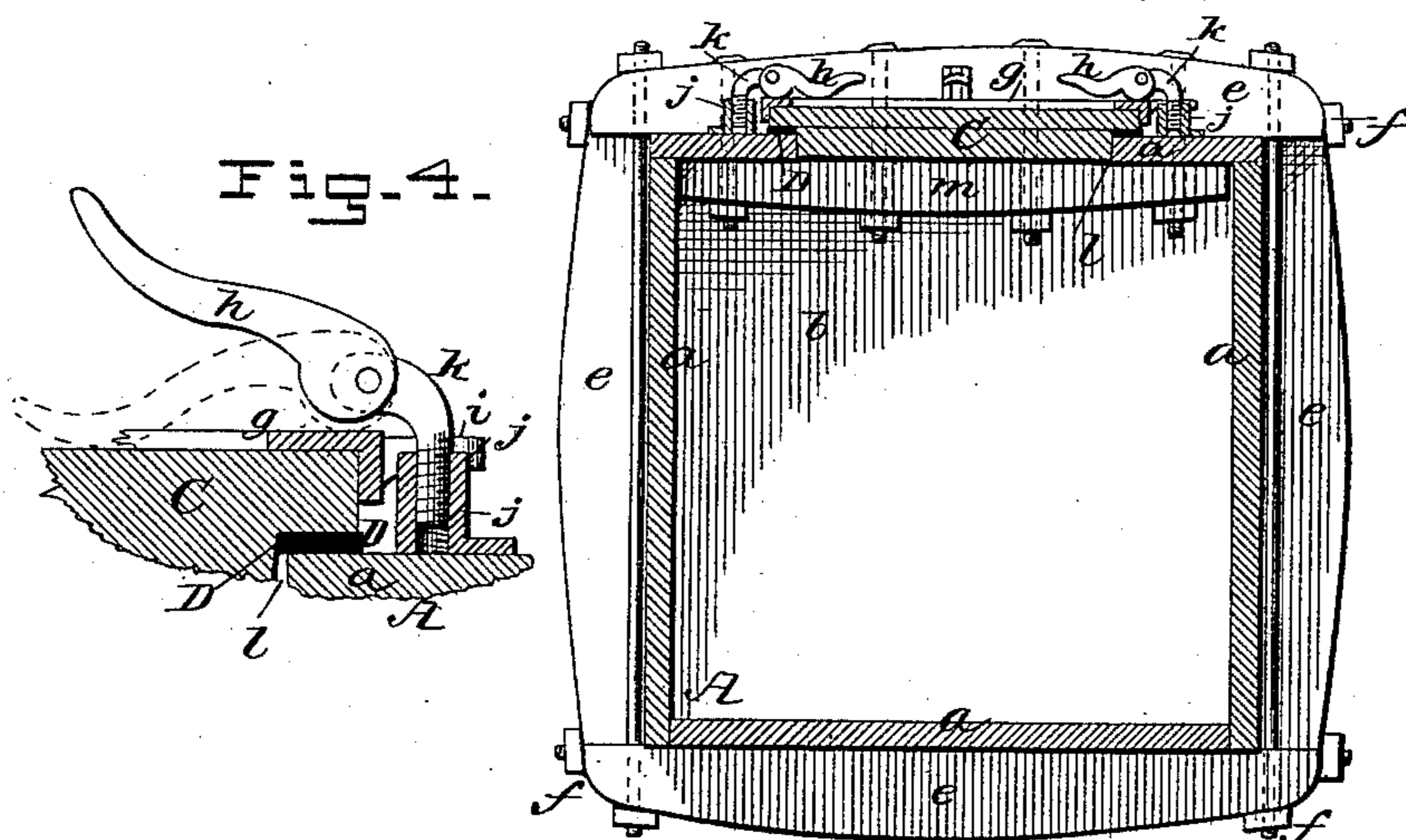


Fig. 4.

Fig. 2.

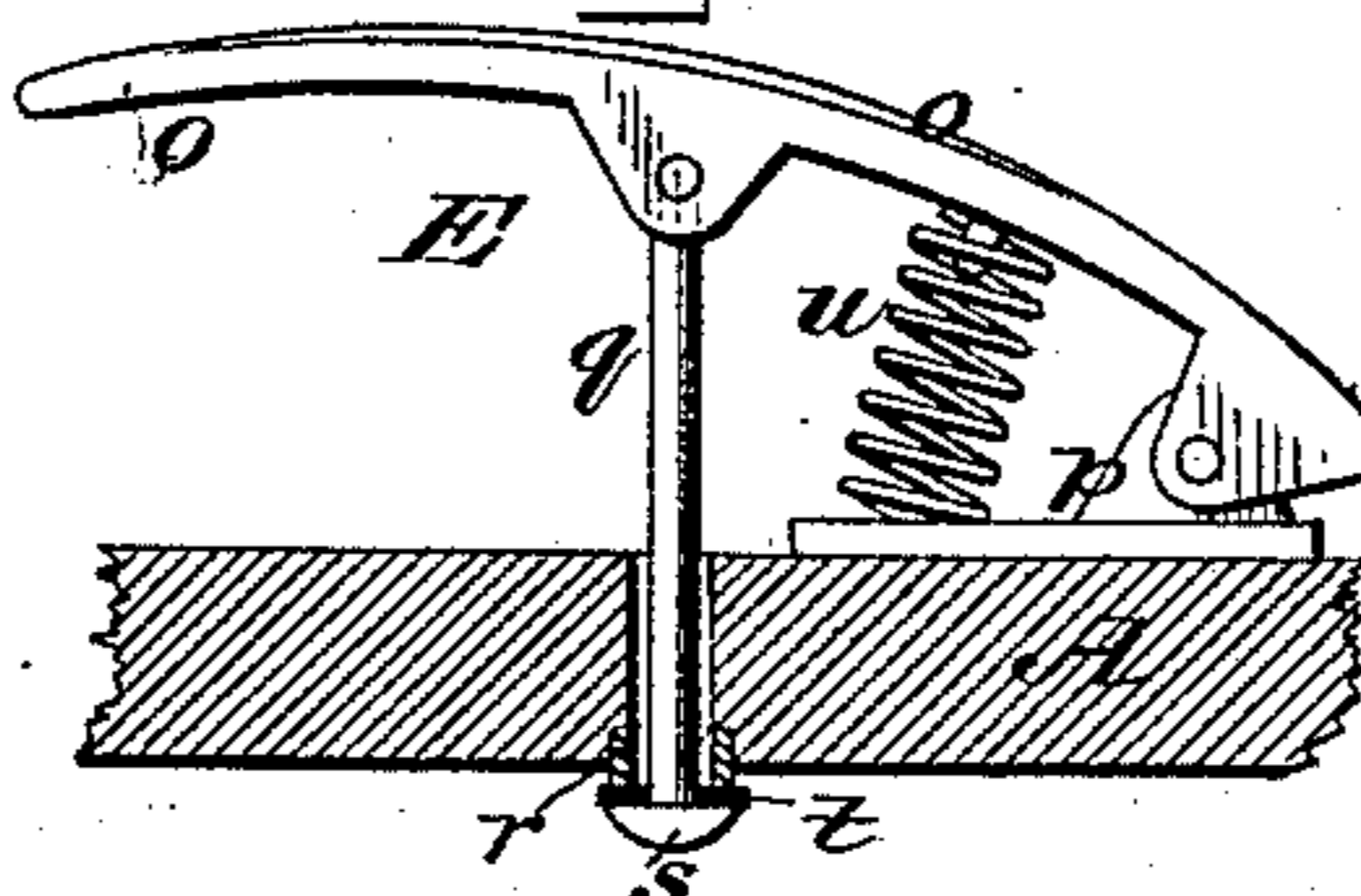
Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

DAVID W. CURTIS, OF FORT ATKINSON, WISCONSIN, ASSIGNOR OF ONE-HALF TO OSCAR S. CORNISH, OF SAME PLACE.

CHURN.

SPECIFICATION forming part of Letters Patent No. 297,233, dated April 22, 1884.

Application filed August 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, DAVID W. CURTIS, of Fort Atkinson, in the county of Jefferson and State of Wisconsin, have invented certain Improvements in Churns, of which the following is a specification.

This invention relates to churns, and more particularly to that class of churns in which a rectangular body is rotated upon its longitudinal axis, though the improvements are applicable to other forms of churn also.

The improvements consist in a novel manner of bracing or stiffening the body of the churn, and particularly that side or face to which the removable head or cover is applied, in order to prevent warping or bulging of said side or face, and the consequent difficulty of effecting a tight joint between the cover or cap and its seat, and in a novel construction of the clamps for securing the cover in place, all as hereinafter more fully pointed out and claimed.

In the accompanying drawings, Figure 1 represents a perspective view of the improved churn; Fig. 2, a transverse vertical section of the same, taken through the cover and opening; Fig. 3, an enlarged view of the ventilator, and Fig. 4 a sectional view showing the clamp or lever by which the cover or lid is held in place.

A represents the body of the churn, consisting of four sides, *a*, and two fixed heads, *b*, the latter provided with cross-bars *c*, for the purpose of bracing and stiffening the head and to afford a firm support or body for the attachment of the journals *d*, by which the churn is supported or carried in uprights B.

e represents a series of braces or bars applied to the exterior of the churn-body, and tied together by tie rods or bolts *f*, and also bolted to the sides, as indicated.

C represents the cover or lid, provided with an annular metallic rim, *g*, which is clamped to the head or side of the churn by eccentric clamps or levers *h*, as shown in Figs. 1, 2, and 4, the cover being provided with lugs or projections *i*, which, coming in contact with the threaded socket *j*, bring the cover in the proper position to be clamped by the levers *h*, and serve as bearing-surfaces for said

clamps, the ends of which project beyond the lugs in position for easy manipulation. These levers are each pivoted to a threaded stem, *k*, adapted to be screwed into the correspondingly-threaded socket *j*, attached permanently to the body of the churn, and they are provided with an eccentric bearing-face, so that when brought into the position shown by dotted lines in Fig. 4 they firmly secure the cover in place and prevent any movement of the same. The stems *k* may be screwed in or out to adapt the clamps to varying thicknesses of packing or to secure proper clamping adjustment.

D represents a packing-ring applied to the cover, and of a size to fit around the opening *l*, which ring may be of any suitable material and of any thickness desired, the screw-stems *k* permitting the thickness to be increased or diminished without in any way affecting the efficiency of the cover and its clamps. It is obvious that any number of these clamps or levers *h* may be used, though four, or even three, will be found sufficient in most cases.

Under ordinary construction it is found that the side or head to which the cap or cover C is applied warps and bulges outward and inward to such an extent that the cover cannot be brought sufficiently firm and close to its seat to prevent the escape of the milk or cream, and even when the braces are applied to the outside, as indicated in the drawings, such warping still takes place to a sufficient extent to materially interfere with effecting a tight joint. After a long series of unsuccessful experiments looking to the remedy of this evil, I have adopted the construction shown in Fig. 2, and find that all difficulty is obviated thereby, and that a tight joint may be maintained under all circumstances. This feature of the improvement consists in applying the braces or cross-pieces *m* to the inner or end face of the side or head in which the opening *l* is made, as more plainly shown in Fig. 2, and bolting, screwing, or otherwise firmly securing them to the side or head of the churn, it being preferred to arrange these inner cross-bars or braces directly beneath the corresponding outer braces or cross-bars, and to pass bolts through both and through the

intermediate side or head of the churn, thereby binding the three firmly together. This construction absolutely prevents all difficulty through warping, bulging, or twisting of the churn head or side, and has converted an unsuccessful and comparatively useless churn into one of great desirability, churns of this general construction being adapted for factories where butter is made in large quantities at a time.

Hitherto it has been customary to secure the journals directly to the head or end of the churn-body; but, inasmuch as the journals are subjected to considerable strain, the support afforded by the head is found to be insufficient; hence the cross-bars or braces *c* are applied and their ends extended up into the angles formed by the union of the sides, as plainly shown in Fig. 1, thus serving to brace the sides and stiffen the heads, and in turn receiving support from the sides and head, as will be plainly seen. The journals are formed with wide plates or flanges *n*, which are secured by bolts to the cross-braces *c*, said bolts preferably passing through the cross-bars and head or end of the churn, though in some cases it may be found desirable, in order to avoid the presence of metal on the interior of the churn, to pass the bolts through the cross-bars only. Screws or tap-bolts may, however, be substituted for the through-bolts, if preferred.

It is well known that gases and vapors are liberated in the operation of churning, which must be permitted to escape from the churn to avoid their undesirable effect upon the butter, and to allow such escape to take place regularly and without any assistance from attendants; hence a valve, *E*, is provided which is automatic in its action during the operation of the churn. This valve consists of a curved arm or lever, *o*, pivoted at one end to a plate, *p*, attached permanently to the churn-body *A*, a rod or valve-stem, *q*, which is pivoted or jointed to the lever *o*, and extends through a tube, *r*, of materially larger diameter, inserted in the churn-body, the lower end of the stem being provided with a head, *s*, and packing-disk *t*, which is normally pressed or seated against the end of the tube, and a spring, *u*, which serves to thus keep the valve normally closed.

F represents an arm, which is preferably attached to the uprights *B*, and which is placed in position to strike and depress the lever *o* of the valve *E* as the churn rotates, care being taken to place this arm in such position as to open the valve when the latter is at the uppermost side of the churn, as otherwise it would allow the cream to escape.

The tube *r* is by preference extended about an inch beyond the inner face of the churn, so as to prevent any possible escape of cream when the valve is opened.

By curving the lever *o*, as shown, the churn can be run in either direction at will without in any manner interfering with the operation of the same, and the action is caused to take place gradually enough to avoid danger of breakage.

The valve may be placed either upon the ends or on the sides of the churn, and will be found to work in either position with equal efficiency.

I am aware that a clamp has been patented in which a clamping-bar pivoted to a threaded adjustable stem carried an eccentric, which in turn bore upon an adjustable screw-stem; but such device is not only more complicated and costly in construction than my clamp, but is likewise less convenient of manipulation, and not well adapted to the purposes of my invention.

I make no claim to a clamp constructed in accordance with such prior patent.

Having thus described my invention, what I claim is—

1. In combination with a churn-body and a cover applied thereto, an eccentric clamping-lever pivoted directly to an adjustable threaded stem, substantially as shown.

2. In combination with a churn-body, *A*, and a cover, *C*, applied thereto, adjustable clamping devices consisting of threaded sockets *j*, secured to the body, threaded stems *k*, screwed into said sockets, and eccentric levers *h*, pivoted directly to the stems *k*, substantially as shown.

3. The herein-described churn-body *A*, provided with opening *l*, outside braces or cross-bars, *e*, and inside braces or cross-bars, *m*, substantially as and for the purpose explained.

4. In combination with the churn-body *A*, the outside braces, *e*, inside braces, *m*, and bolts passing through the inside and the outside braces and the intermediate body, substantially as and for the purpose set forth.

5. In combination with a churn-body having an opening, *l*, cross-braces or supports *m*, applied to the inner face and firmly secured to the side or head in which the opening is made, whereby the side or head is prevented from warping.

DAVID W. CURTIS.

Witnesses:

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O. B. CORNISH.