

E. GROAT
CHURN.

No. 187,130.

Patented Feb. 6, 1877.

Fig. 1.

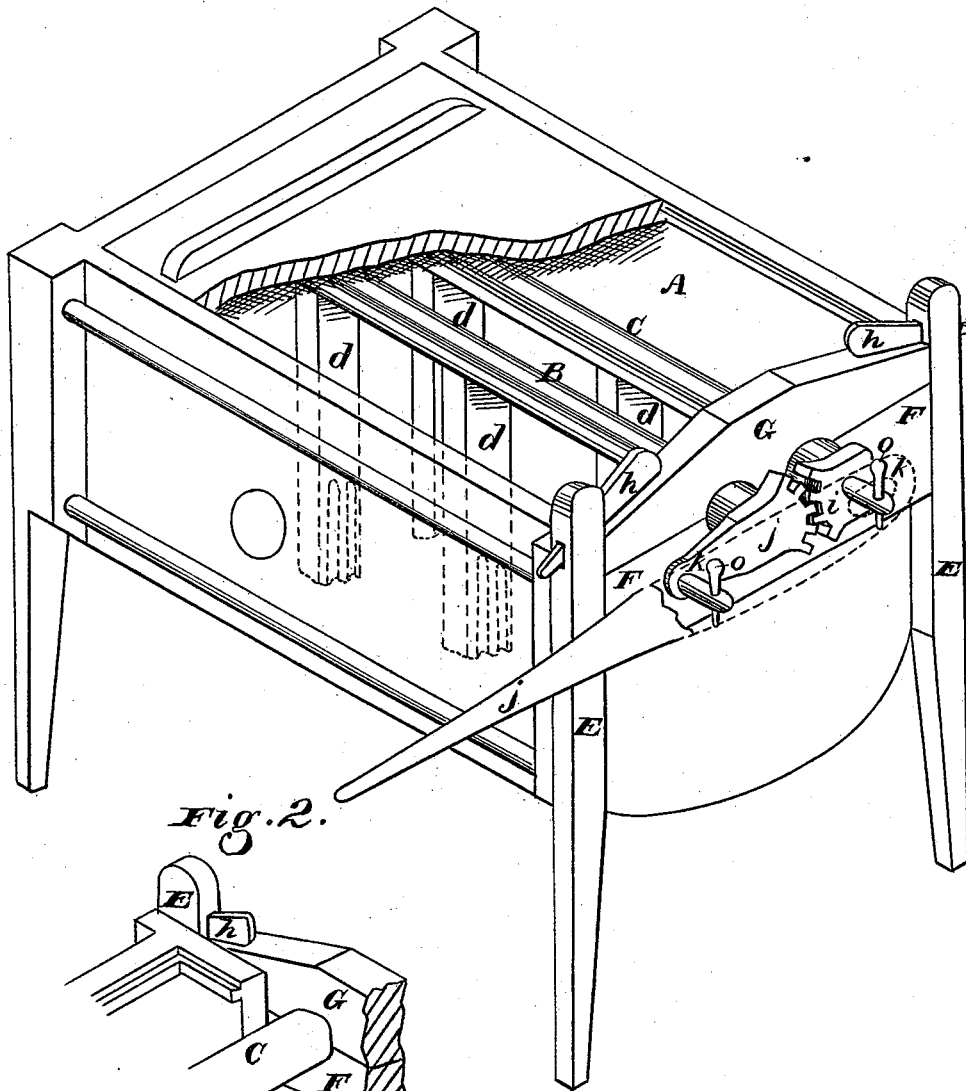
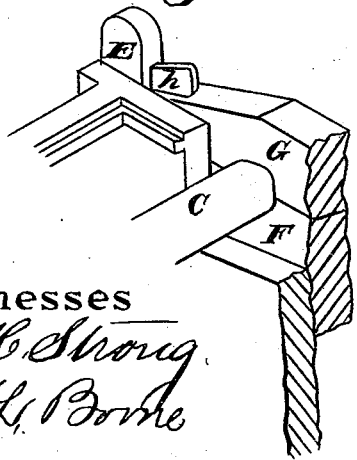


Fig. 2.



Witnesses
Geo. H. Strong
John L. Borne

Inventor
Elias Groat
by *Dewey & Co.*
Attys.

UNITED STATES PATENT OFFICE.

ELIAS GROAT, OF NAPA, ASSIGNOR OF ONE-HALF HIS RIGHT TO MILO B. POND, OF SAME PLACE, AND WILLIAM CANTELON, OF VACAVILLE, CALIFORNIA.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. **187,130**, dated February 6, 1877; application filed July 6, 1876.

To all whom it may concern:

Be it known that I, ELIAS GROAT, of Napa city and county, State of California, have invented an improvement in Churns; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most clearly appertains to make and use my said invention without further invention or experiment.

My invention relates to certain improvements on the churn which is described in my former Letters Patent, Nos. 118,712 and 118,713, dated September 5, 1871, and 167,893, dated September 21, 1875.

The churn therein described consists, essentially, of a box, case, or vessel having two parallel horizontal shafts extending longitudinally across it near its top. Each of these shafts I provided with two or more depending beaters, which were so arranged that the beaters of one shaft alternated with the beaters of the other shaft. I then imparted a rocking motion to the two shafts, so as to cause the beaters to be reciprocated alternately past each other inside of the box, case, or vessel, thus producing the necessary agitation to accomplish the churning.

Experience has demonstrated that the device for communicating this alternate rocking motion to the horizontal shafts must not be connected with the frame-work or case of the churn, as the racking strain which results from the short up and down strokes of the operating-lever is too severe upon the joints of the case or frame-work. I have therefore devised a cheap and simple mechanism for operating these shafts directly from their projecting ends, so that the strain will not be communicated to the case or frame-work.

I have also invented an improved manner of constructing that end of the box, case, or vessel from which the journals or shafts project, the object of which improvement is to allow the shafts and beaters to be easily removed when it is desired to cleanse them or clean out the box or vessel.

Referring to the accompanying drawings, Figure 1 is a perspective view of my inven-

tion. Fig. 2 is a section of a part of the machine.

Let A represent the box, case, or vessel, across the upper end of which the two parallel horizontal shafts B C are placed, and let *d d* represent the depending beaters, which are arranged alternately as above described.

The ends of the shafts project through one end of the box or case, as shown, and to these projecting ends I attach the operating mechanism, as hereinafter described. In constructing the frame, at this end of the box or case I extend the corner posts or legs E, above the top of the case, and connect them by a cross-piece, F, outside of the end of the churn, and which passes across below the top of the end board of the box. I then cut away a portion of the end board above this cross-piece, so that when the shafts B C are in position they will rest in bearings in the upper edge of the cross-piece, all as represented. I then employ a cap-piece, G, which is long enough to fit down between the posts or legs E E above the cross-piece F. This cap-piece has suitable grooves to fit down over the upper halves of the journals, thus virtually forming the upper half of the box, and closing the opening which was made by cutting away a portion of the end of the churn. I then secure this cap-piece in place by means of two tapering keys or wedges, *h h*, one of which passes through a mortise in the upward-projecting end of each post or leg E.

In the present instance I have represented the cap-piece G as having its upper edge made tapering or inclined; but this is not necessary, although quite convenient. This arrangement provides stability of the frame, and permits of the ready and convenient removal of the shafts B C when necessary or desired, as the wedges can be quickly removed, so that the cap-piece and shafts can be lifted entirely out of the box. For imparting the desired rocking motion to the shafts I employ the following device: To the projecting end of each of the shafts I secure a toothed segment, *i j*, which engage with each other midway between the two shafts. The segment *j* is toothed on one end, while its opposite end is extended so as to form a crank-arm, K. The

operating lever *j* has a slotted hole, *h*, made in it near its end, through which a pin, *l*, which projects from the center of the segment *i*, passes, thus providing a fulcrum for the lever to work about. The lever *j* has another hole in it at the proper point to allow the pin of the crank-arm *K* to pass through it. The lever is then secured in place by keys *o o*, which pass through the pins outside the lever.

It will thus be evident that an up-and-down movement of the handle of the lever will cause the segments to impart to the shafts the required rocking motion. I thus provide a compound lever, by means of which I can receive a sufficient movement of the beaters with a short stroke of the lever. The fulcrum could be applied outside of the projecting ends of the shafts; but it would necessarily have to be in line or nearly in line with them. The principal feature of this part of my invention, therefore, consists in providing one of the projecting ends with a crank-arm, and then operating this crank-arm by a secondary lever, and transmitting the motion from one shaft to the other by gearing. I thus apply the power directly to the shafts, so that no strain comes upon the box or frame, save such as is com-

municated from the friction of the journals of the shafts working in their boxes.

Having described my improvements in churns, I claim—

1. The churn-box *A*, having the end posts or legs *E* extended above the top of the box, and connected by the cross-piece *F*, the end of the box being cut away so as to permit the journals of the shafts *B C* to rest upon the cross-piece, in combination with the cap-piece *G* and wedges or keys *h h*, said wedges being arranged to key into mortises in the posts or legs *E*, substantially as and for the purpose described.

2. The crank-arm *K*, applied to one of the shafts *B C*, in combination with a secondary lever, *j*, whose fulcrum is distant from its point of attachment to the crank-arm, in combination with the toothed segments *i j*, for transmitting the motion from one shaft to the other, substantially as and for the purpose above described.

In witness whereof I hereto set my hand and seal.

Witnesses: ELIAS GROAT. [L. S.]
 GEO. H. STRONG,
 CHAS. G. PAGE.