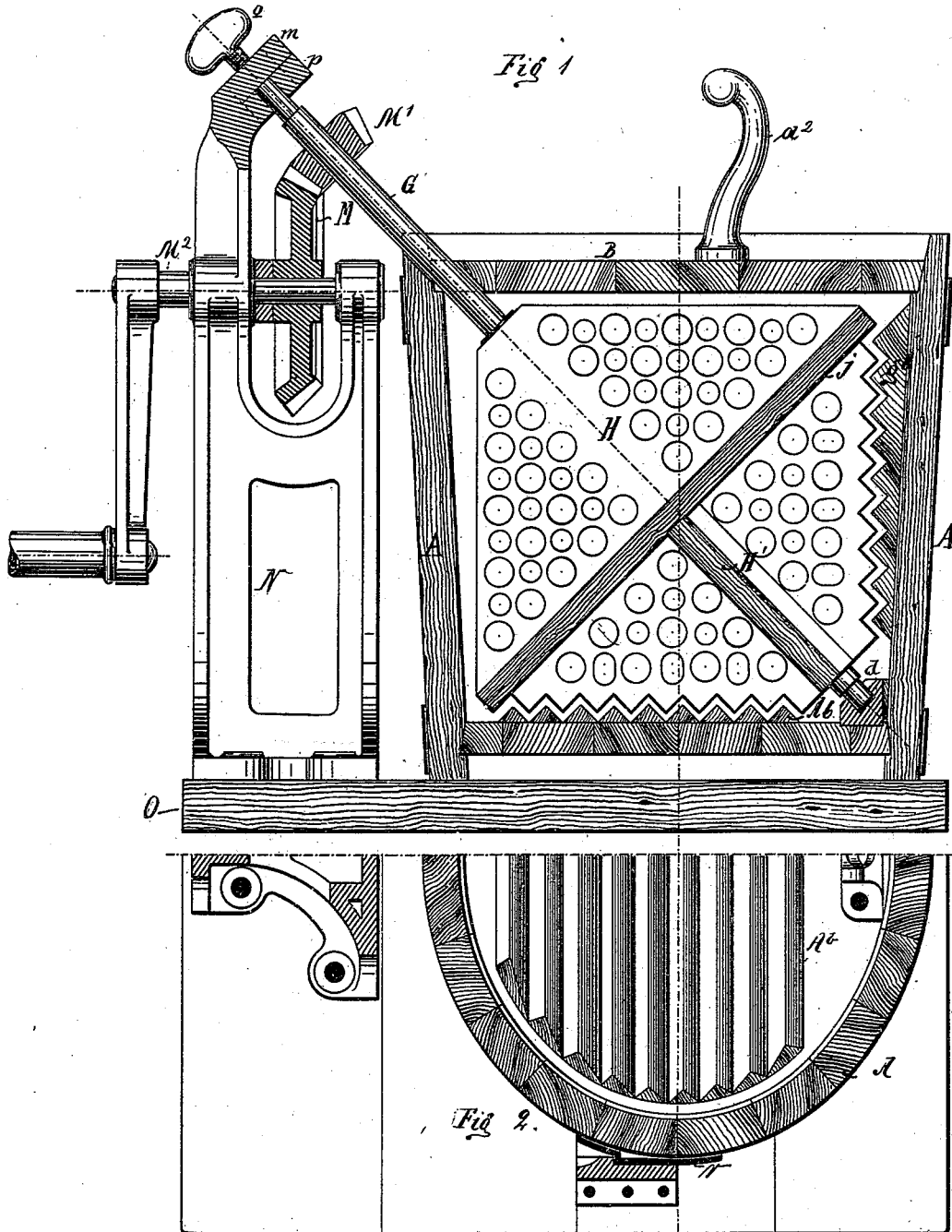


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No. 213,127.

Patented Mar. 11, 1879.



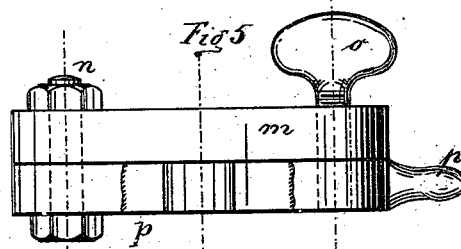
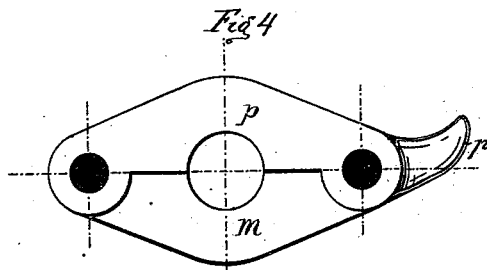
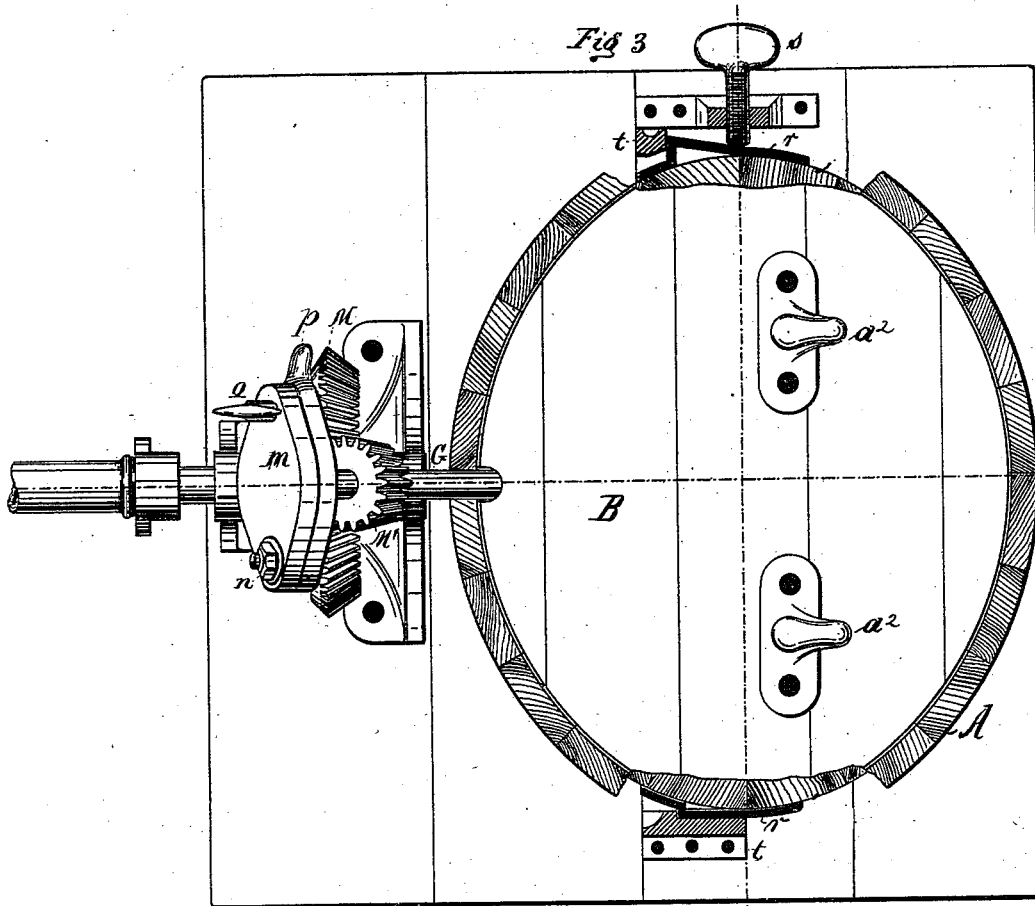
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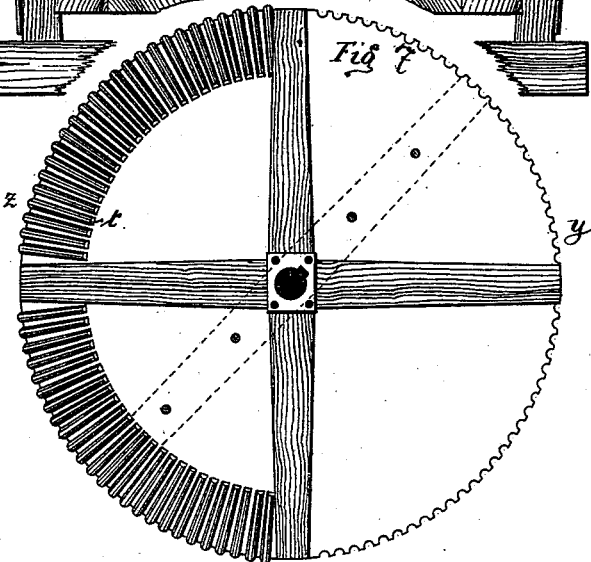
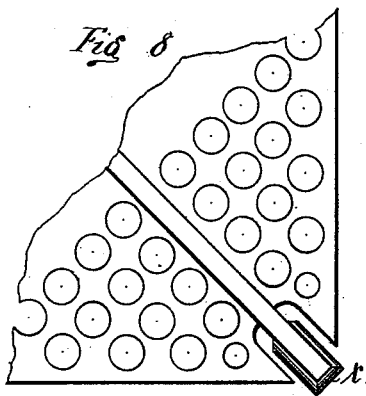
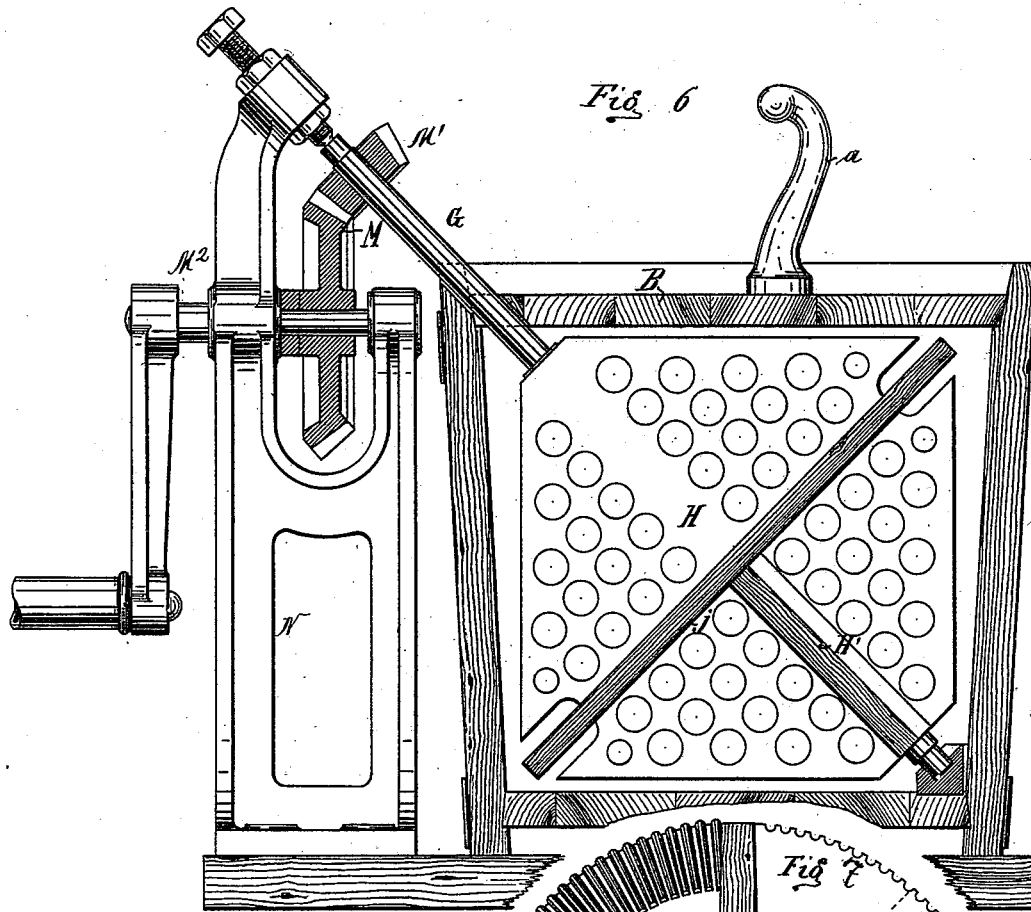
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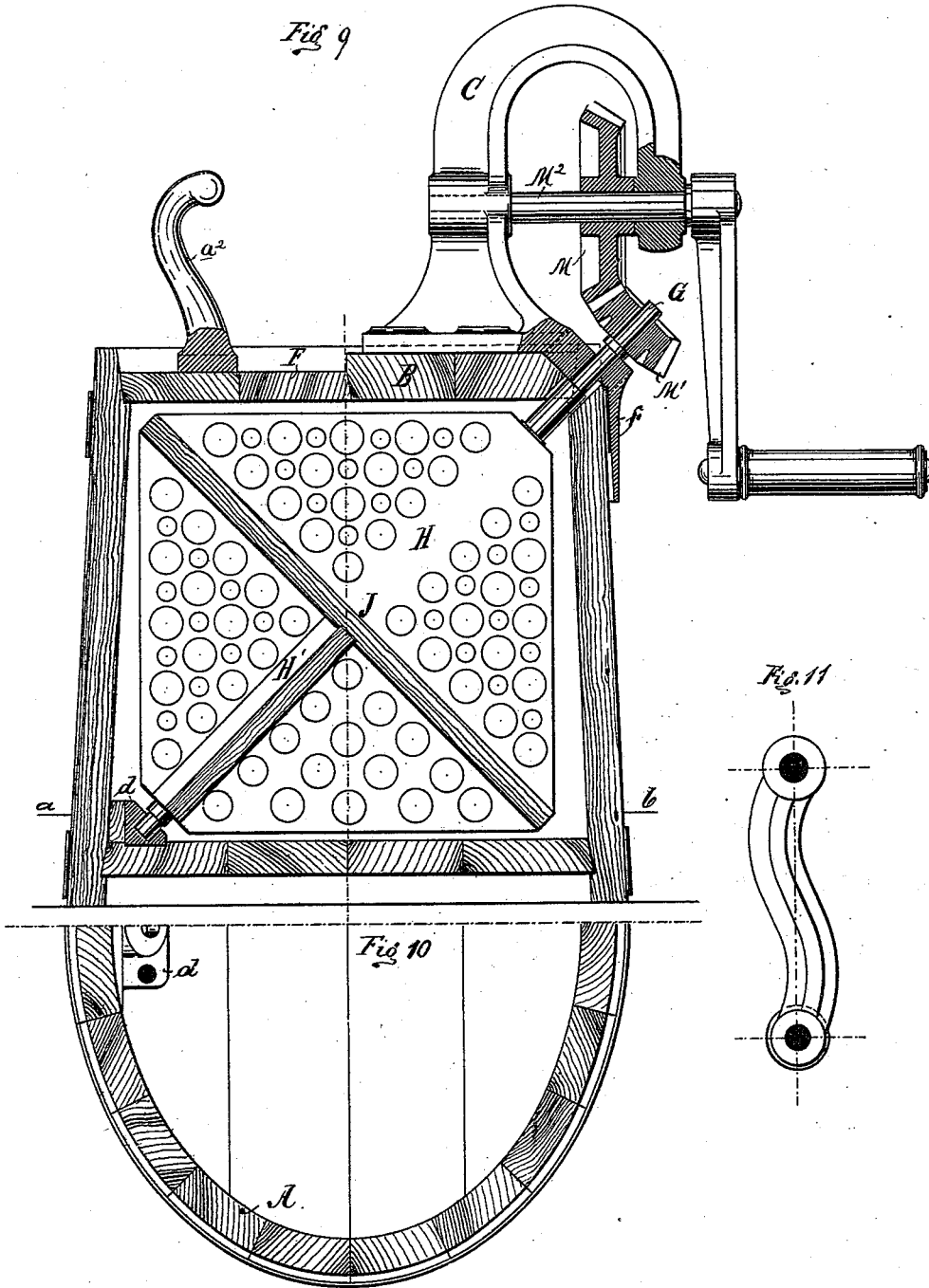
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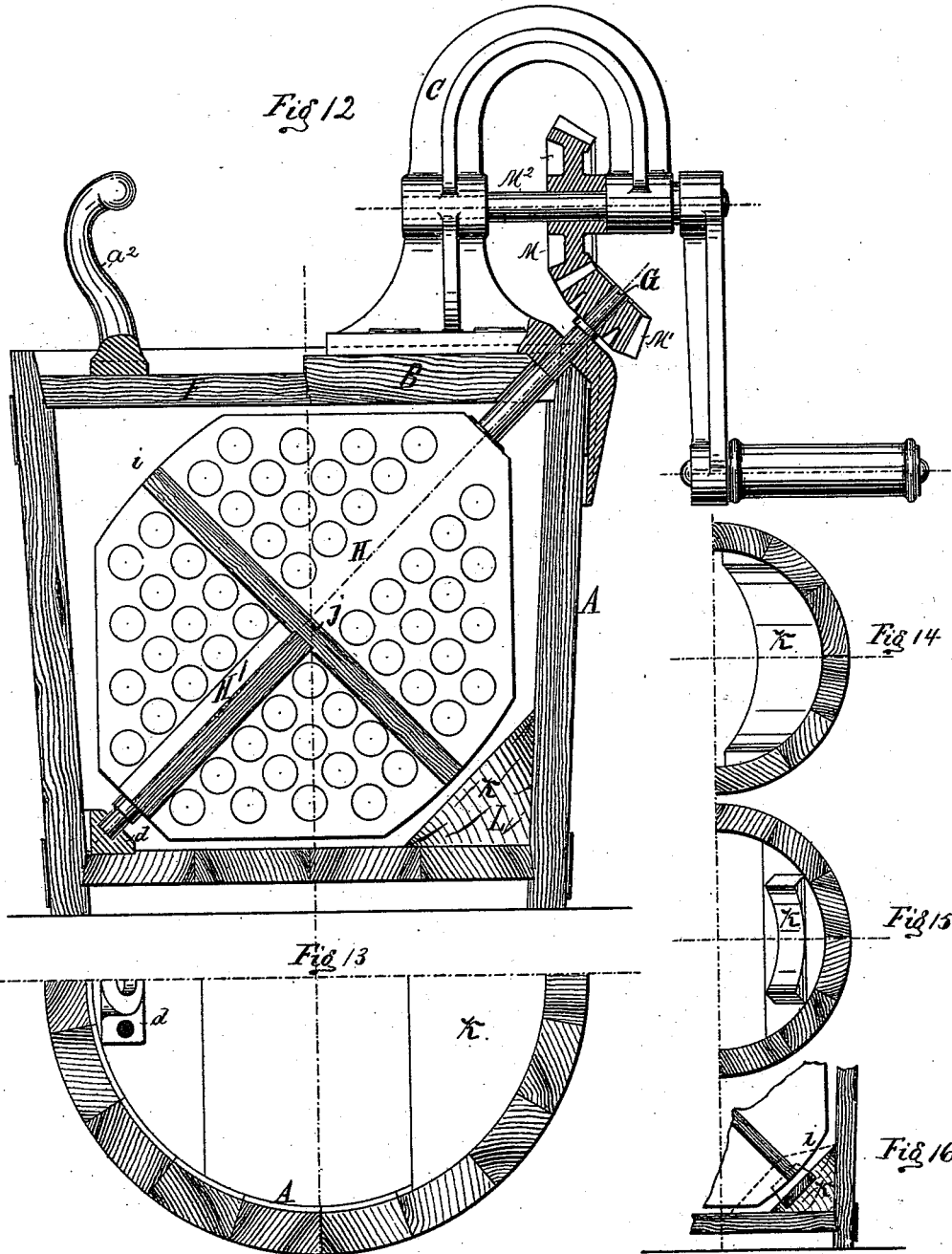
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Fig 17

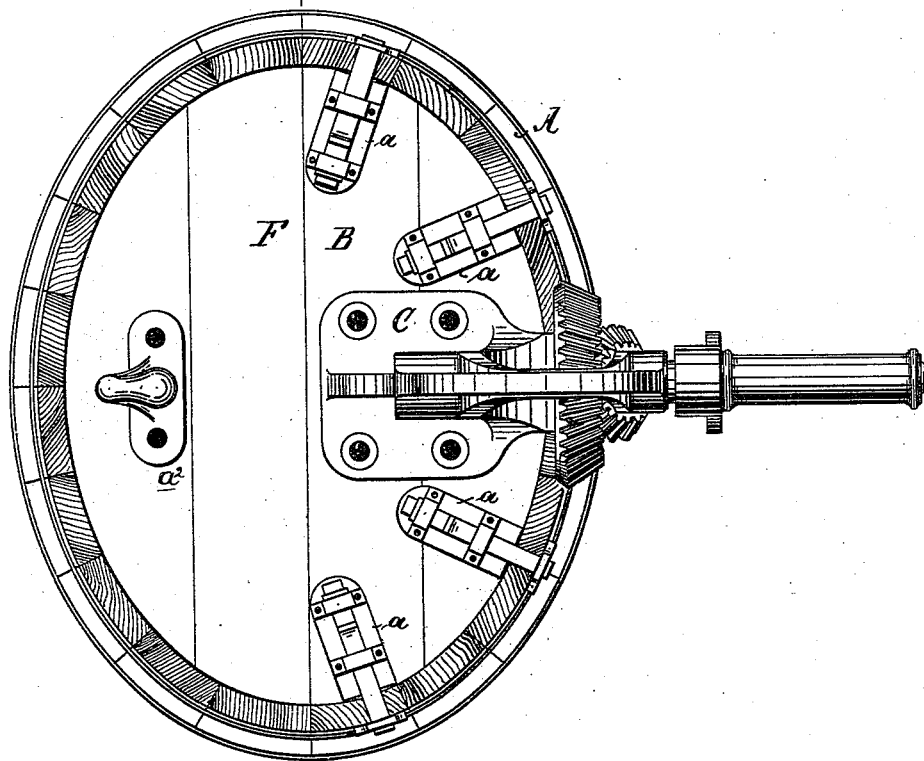


Fig 18

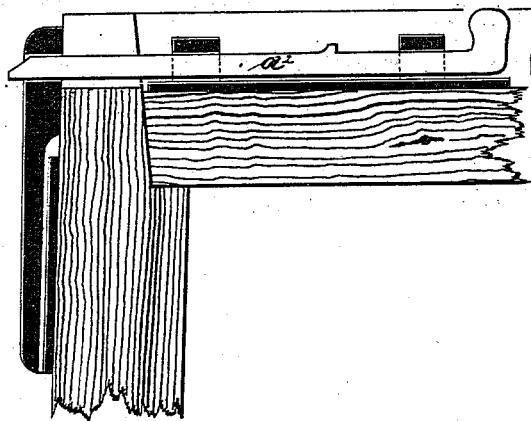
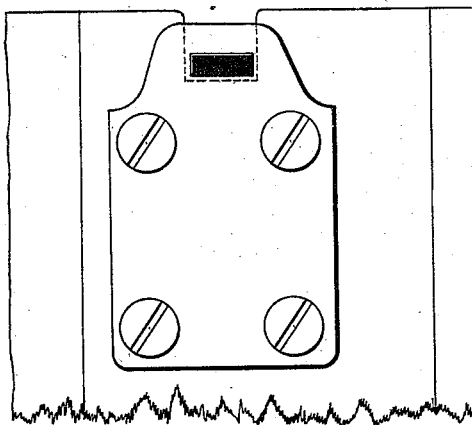


Fig 19



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UNITED STATES PATENT OFFICE.

ADOLPH MÜLLER, OF LENZEN, PRUSSIA.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. 213,127, dated March 11, 1879; application filed December 12, 1878.

To all whom it may concern:

Be it known that I, ADOLPH MÜLLER, of the city of Lenzen, in the Kingdom of Prussia, have invented certain Improvements in Machines for Making Butter, of which the following is a specification:

The present invention relates to certain improvements in that class of churns or machines for making butter in which the dasher is arranged obliquely or diagonally within the churn-barrel or cream-receiver, and is combined with driving-gearing for imparting a rotary motion to the same.

The invention consists in the construction and combination of parts, which will be hereinafter fully described, and then set forth in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical section of a churn constructed according to my invention. Fig. 2 is a cross-section of a portion of the churn-barrel, representing the ribbed bottom of the latter and manner of securing it to the base-plate or stand. Fig. 3 is a plan or top view, partly in section, representing the driving-gearing and the fastening devices at both sides of the churn-barrel for securing the same to the base-plate. Figs. 4 and 5 are detail views of the device for retaining the upper bearing of the dasher-shaft. Fig. 6 is a vertical sectional view of a modified form of churn. Fig. 7 is a plan view of a corrugated division-board of the revolving dasher. Fig. 8 is a detail view of the dasher, representing the ribbed portion of the division-board. Fig. 9 is a vertical sectional view of a modified form of churn, the driving-gearing being in this instance supported on the churn-barrel. Fig. 10 is a cross-section of a portion of the churn-barrel, representing the smooth bottom and the shaft-bearing. Fig. 11 is a detail view of the hand-crank. Fig. 12 is a vertical sectional view of a churn in which the beater-wings are rounded off, and the churn-barrel is provided with a bottom block or cream-breaker. Fig. 13 is a cross-section of a churn-barrel having such a bottom block. Figs. 14 to 16, inclusive, are detail views of said bottom block or cream-breaker. Fig. 17 is a plan or top view of a churn-barrel, representing the manner of supporting the driving-

gearing and fastening the cover. Figs. 18 and 19 are detail views of the cover-fastening device.

The churn-barrel or cream-receiver A is preferably made of an elliptical form, and is provided with a cover, B, which is detachably fastened to the churn-body by means of bolts *a* carried by the cover and projected into slotted plates on the churn-body. The dasher-shaft G passes diagonally or obliquely through the churn-barrel, and has its lower end stepped into a bearing-block, *d*, at the side of the churn-barrel. The shaft G carries a quadrangular beater-board, H, which assumes a vertical position within the churn-barrel; or, in other words, the bearing-points of the shaft are located at diagonally opposite corners of said beater-board. The latter is perforated in the customary manner.

A circular board, *j*, is secured to the shaft G in such a manner as to divide the beater-board into two triangular sections, and this circular board stands always at an angle of about forty-five degrees in respect to the churn-barrel.

The object of the board *j* is to divide the cream-receiver into two compartments, and it may for this reason be termed a "division-board."

It will, of course, be obvious that there will always be a communication maintained between these two compartments, so as to enable the proper circulation of the cream to take place.

The lower portion of the beater-board—that is, the portion below the division-board—is provided with a second beater-board, H', which is formed of two triangular sections running parallel with the shaft.

To one side of the churn-receiver is secured a vertical corrugated or notched strip, *g*, and the edges of the wings, located below the division-board, are notched or corrugated in a corresponding manner, so as to intermesh with said corrugated strip when the dasher is revolved.

The bottom of the churn-barrel is also provided with ribs or corrugations A^b, running lengthwise of the bottom, so that the dasher-wings will, during their operation, also intermesh with said corrugated bottom.

The dasher-shaft, as previously mentioned, has its lower end stepped within the churn-barrel. Its upper end is journaled in a bearing of such a construction that the shaft can be readily removed therefrom, when, by removing the cover B through the medium of the handles a^2 thereon, the dasher can be withdrawn from the churn-barrel.

A stand or column, N, secured to the foundation or base-board O, has suitable bearings for a horizontal crank-shaft, M², and this shaft carries a large bevel-gear wheel, M, which meshes into a smaller gear-wheel, M¹, on the dasher-shaft. These devices constitute the driving-gearing.

The upper bearing for the dasher-shaft is constructed as follows, viz: An angular block or lateral enlargement, m , at the top of the stand N, has a semicircular groove for receiving the journal on the dasher-shaft, and this angular block carries a pivoted latch, P, which is correspondingly grooved, so as to receive the dasher-shaft or the journal of the latter.

The latch is pivoted to the block m by the bolt n , and is held in a locked position by the screw o , passing through the block m and latch.

I will now proceed to describe the operation of a churn constructed in the manner above described.

The cream will, by the rotation of the dasher, be carried from one compartment to the other, and in doing so will be subjected to the beating action of the wings and the grinding or rubbing action of the corrugated strip on the side and bottom. By the position of the wings of the dasher and the oblique arrangement of the dasher-shaft the cream will not be thrown up on the side of the churn-barrel through which the shaft passes, and thus leakage will be prevented at the shaft-opening. As the diagonal division-board does not come in contact with the sides or bottom of the churn-barrel the cream can easily circulate from one compartment to the other, and in doing so the globules of butter will be caused to coalesce in a quick and perfect manner. If the dasher is rotated to the right the wings on the under side of the division-board will cause a downward current of the cream, and then an upward current will take place on the upper side of the division-board, the wings on that side carrying the cream in an upward direction, and forcing or throwing it over the highest portion of the division-board.

I may state that the corrugations on the bottom of the churn-barrel do not extend to the sides thereof, thus not interfering with the easy cleaning of the churn-barrel. The latter is secured to the base-board O by means of blocks or abutments t , which are shouldered,

so as to enable the angular plates r on the churn-barrel to be pressed against said shoulders by a screw, s , passing through one of said blocks t .

In order to make the division-board a more active agent in rubbing or grinding up the butter-globules, I propose to corrugate or notch the periphery thereof, as shown at y in Fig. 7; or else to provide said board with top and bottom ribs t around its margin, as shown in the same figure and in Fig. 8.

In certain instances I propose to dispense with the corrugated strip and corrugated bottom, and resort to the construction exhibited in Figs. 9, 10, and 17. In this form of churn the cover of the churn-barrel is made in two parts, B and F, the part B being locked to the churn-barrel, and the part F being easily detachable. A curved support, C, secured to the stationary part of the cover, receives the shaft which has the bevel-gear wheel meshing into the gear-wheel on the dasher-shaft. By withdrawing the bolts (shown more fully in Fig. 17) the part B of the cover, with its attached parts, can be removed, and then the dasher can be withdrawn.

The above is the most simple form of churn that can be devised.

I also propose to round off the edges of the dasher-wings, as shown by the letter i in Figs. 12 and 16, and use in connection with such a dasher concave cream-breaking blocks K, as is shown in Figs. 12 to 16, inclusive. A single block of the required concavity or curvature is secured to the bottom of the churn-barrel, at one side thereof. The block K may also be made straight, if desired.

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

1. The combination of the perforated beater-board H, the bottom beater-wings, H', the diagonal shaft G, and the circular division-board j , extending diagonally through the beater-board, with the churn-barrel or cream-receiver, having suitable bearings for the dasher-shaft, as and for the purpose set forth.

2. The combination of the churn-barrel, having corrugated side strip or cream-breaker and a corrugated bottom, with the dasher, composed of the oblique shaft, perforated and corrugated beater-board, perforated and corrugated beater-wings, and the circular division-board, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADOLPH MÜLLER.

Witnesses:

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EDWARD P. MACLEAN.