

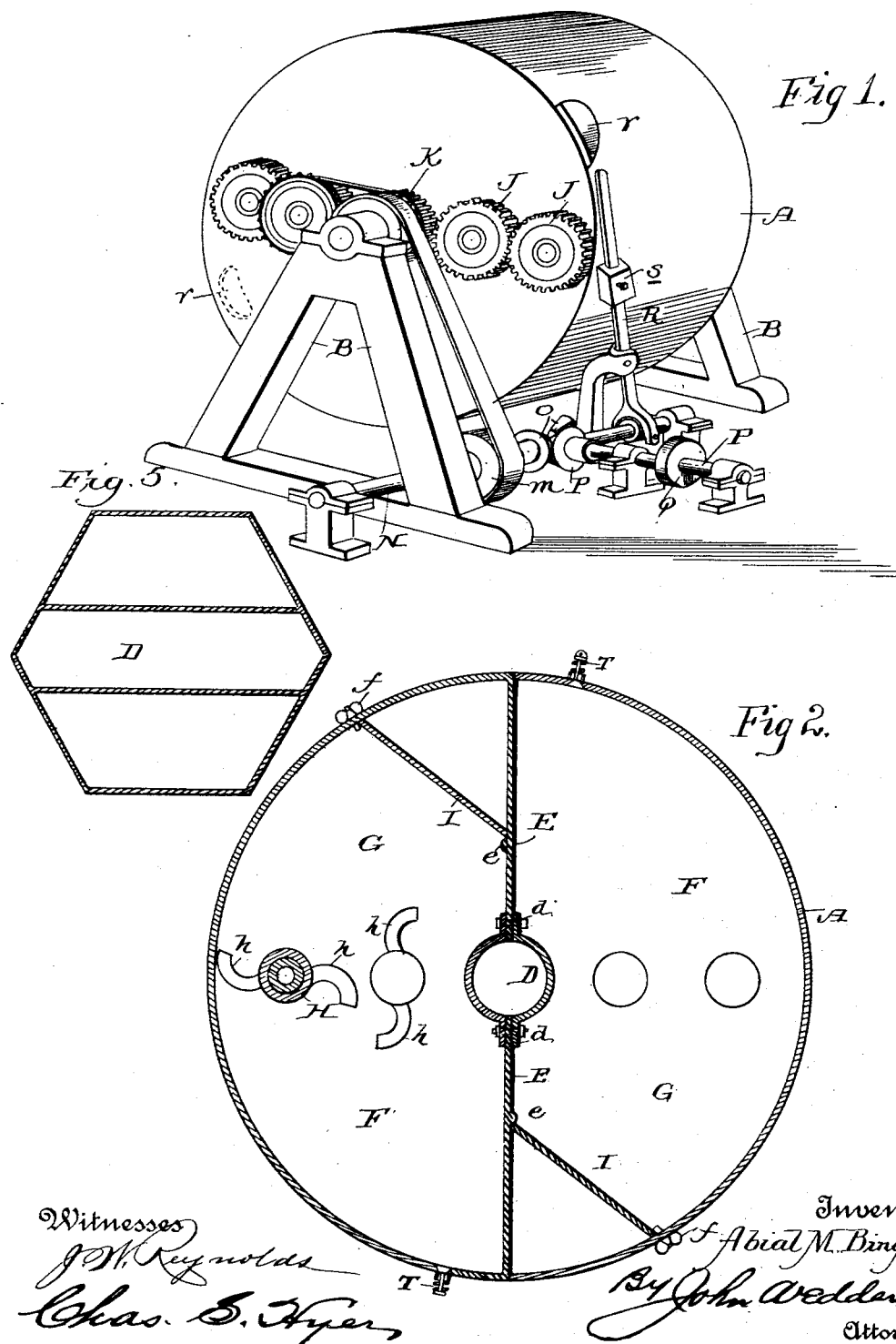
(No Model.)

2 Sheets—Sheet 1.

A. M. BINGHAM.
COMBINED CHURN AND BUTTER WORKER.

No. 525,580.

Patented Sept. 4, 1894.



Witnesses

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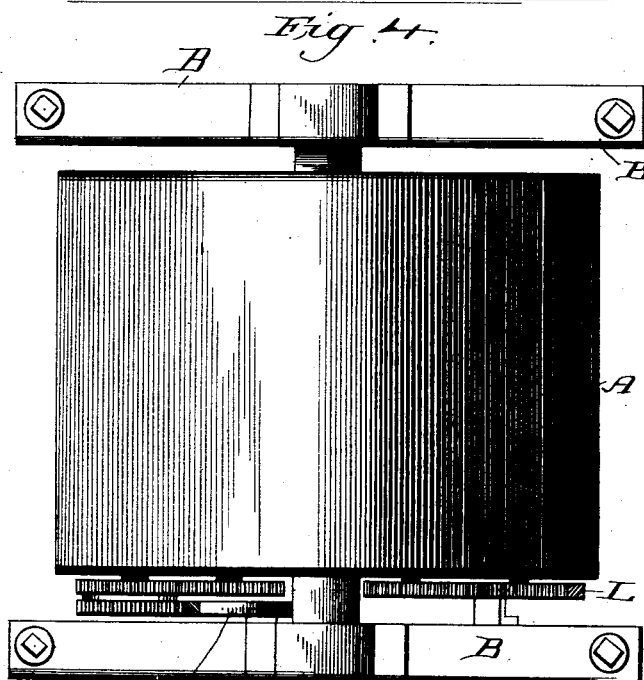
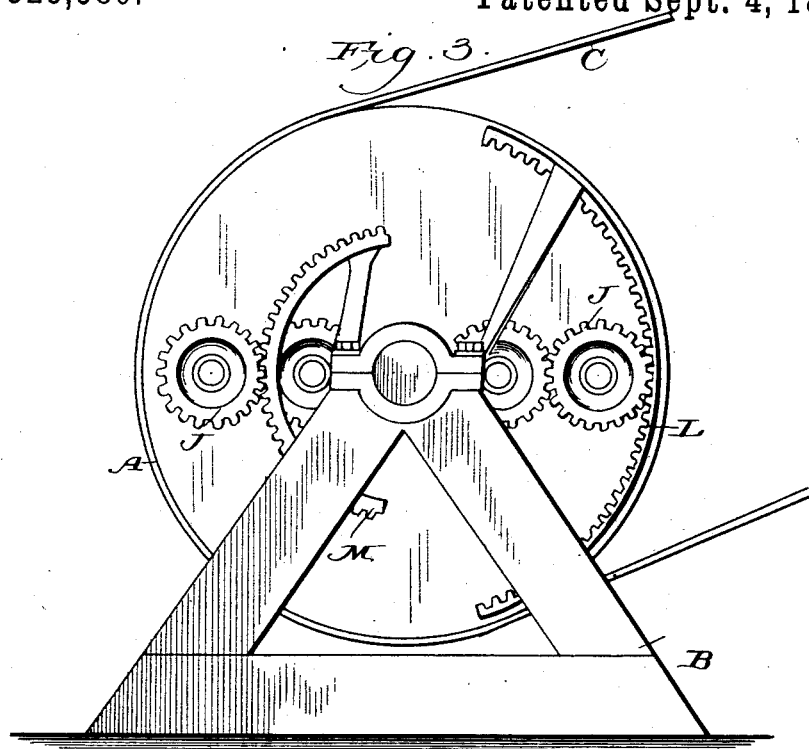
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UNITED STATES PATENT OFFICE.

ABIAL M. BINGHAM, OF JESUP, IOWA.

COMBINED CHURN AND BUTTER-WORKER.

SPECIFICATION forming part of Letters Patent No. 525,580, dated September 4, 1894.

Application filed March 23, 1894. Serial No. 504,795. (No model.)

To all whom it may concern:

Be it known that I, ABIAL M. BINGHAM, a citizen of the United States, residing in Jesup, in the county of Buchanan and State of Iowa, have invented certain new and useful Improvements in a Combined Churn and Butter-Worker; and I 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.

The object of the present invention is the combination in a single organized structure of means for tempering cream, churning the same, salting and working the butter, the several steps being performed in a single body or vessel without the contents being removed until the product is ready for the market.

The improvement consists essentially of a vessel having a centrally disposed tempering chamber to receive either a heating or a cooling medium; also in partitions for dividing the said vessel into different compartments.

The improvement further consists in providing each of the compartments with removable butter-working devices.

The improvement also further consists in removable partitions for reducing the space of the compartments and confining the butter within the limits and insure it being freed from butter-milk and mixed with salt before delivery upon the said butter-working devices.

The invention also further consists in the novel features and the peculiar construction and arrangement of the parts which will be hereinafter more fully described and claimed and which are shown in the accompanying drawings, in which—

Figure 1 is a perspective view of the combined churn and butter-working device embodying my invention, the butter-working device being independently operated and a reversing mechanism being actuated by tappets on the churn body. Fig. 2 is a cross-section of a churn body, showing it provided with relief valves and showing a pair of the butter working devices in working relation. Fig. 3 is an end view of a modified form of churn showing the churn body receiving a positive rotary movement and the butter-working devices operated by toothed segments attached

to the supporting frame. Fig. 4 is a top plan view of the churn shown in Fig. 3, portions of the toothed segments being broken away. Fig. 5 is a detail view showing a modified form of tempering chamber and churn body.

The churn body A is mounted at its ends on journals which obtain bearings in standards B and may be of any desired form in cross-section, either cylindrical or polygonal, the latter form being shown in Fig. 5. The contour of the churn body is not essential to the spirit of the invention and may be varied at will. In the form of churn which is positively rotated on its axis by means of an endless belt C, as shown in Fig. 3, the churn body will be cylindrical. The tempering compartment D may be tubular as shown in Fig. 2, or rectangular in cross-section as shown in Fig. 5. In the tubular form shown in Fig. 2, it will be composed of two sections which have flanged edges *d*, which are bolted together. This compartment may be of steel or aluminum and will be covered with cotton or muslin to prevent the butter adhering thereto. Partitions E secured at their outer edges to the body A and at their inner edges to the compartment D, divide the churn body into compartments F. The inner edge portion of the partitions E are secured between the flanges *d* of the sections comprising the tube or compartment D. Doors G are provided in the end of the churn body to admit of the cream being placed into the churn and the butter being removed therefrom. The butter-working devices H are also placed in position through these doors G. Removable partitions I are located in the angles formed between the partitions E and the churn body. These partitions I are supported at their inner ends on ribs *e* provided on the partitions E and are shown held in place at their outer ends by binding screws *f*, which pass through the body of the churn.

The butter-working devices H comprise a shaft, having arms *h*, which in the preferable form of construction are curved in the direction of their length. Each butter-worker comprises a pair of the said shafts which will be so disposed that the arms of one set will come opposite and work in the space between the arms of the other set. This is shown most clearly in Fig. 2. Gear wheels J are provided

and receive the projecting ends of the butter-working devices and serve to rotate the latter in the efficient operation of the machine. The gear wheels J, of each pair of butter-working devices intermesh and receive their motion either from a gear slip wheel K on the journal of the churn body or from toothed segments L and M fixedly attached to the frame B. Where the toothed segments L and M are provided as shown in Fig. 3, the churn body will be continuously rotated on its axis in the same direction and the gear wheels J of each pair of butter-working devices will alternately engage with the said toothed segments, thereby imparting a reverse movement to the said butter working devices in a complete revolution of the churn.

In Fig. 1 the churn body is alternately turned on its axis and the gear wheels J are alternately located from the gear wheels K by the following mechanism: A counter shaft journaled in suitable bearings, is provided with a drive pulley *m* and a pair of miter wheels *o* between which operates a corresponding miter wheel *p*, mounted on a shaft P placed at right angles to the said shaft N. A drive pulley Q mounted on the shaft P is operated from a suitable source of motive power and rotates the shaft P in one direction. A shipper lever R is provided to move the miter wheels *o* on the shaft N and bring them alternately in engagement with the miter wheel *p* at the proper time to impart an alternate reverse movement to the shaft N and through the drive belt S alternately operate the butter-working devices in the manner set forth. The shipper lever R is automatically operated by means of tappets *r* provided at the diametrically opposite points of the churn body. This lever is provided with a weight *s* which serves to carry the lever to the limit of its movement after being struck by the tappet *r*.

The operation of the invention is as follows:—The cream to be churned is placed in the compartment F of the churn and brought to the proper temperature by sending either a heating or cooling medium through the compartment D. This passage of the cooling medium through the compartment D tends to preserve a uniform temperature of the cream. The rotary movement of the churn on its axis, agitates the cream and produces the butter. After the churning is completed, the butter-milk is drawn off and the granules of butter are confined by the movable partitions and freed of butter-milk as the churn is rotated by the centrifugal force. The butter is salted while confined by the partitions which are arranged substantially in the manner shown in Fig. 2, and is then thoroughly

worked by the device H in the manner set forth.

It has been found necessary to provide the compartments F with devices to release the confined gases generated in the process of churning. For this purpose spring-actuated release valves T are located so as to project beyond the churn body. The stems of the said valves T are operated to open the valve during each complete revolution of the churn body to liberate confined gases by any suitable means.

Having thus described the invention, what is claimed as new is—

1. A combined churn and butter-working device comprising a body having a centrally disposed compartment to receive a tempering medium and subdivided into other compartments, each compartment being provided with butter-working devices, substantially as set forth.

2. A combined churn and butter working device, comprising a body having a centrally disposed compartment to receive a tempering medium, and subdivided into other compartments, each compartment being provided with butter working devices, and removable partitions to reduce the capacity of each of the said subdivided compartments, substantially as and for the purposes specified.

3. A combined churn and butter working device comprising a body having a centrally disposed compartment to receive a tempering medium, and subdivided into other compartments, removable butter working devices in each compartment, removable partitions to reduce the capacity of each of said subdivided compartments, and mechanism, substantially as described, for reversing the movement of the said butter working devices during the revolution of the churn, substantially as set forth.

4. In a churn, the combination of the following instrumentalities; a rotary body provided with tappets, butter-working devices, having intermeshing gearing, a positively operated gear wheel meshing with the gear wheel of the said butter-working devices, actuating mechanism, and a shipper lever for reversing the movement of the said actuating mechanism and operated automatically by the said tappets, substantially as described and for the purpose set forth.

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

ABIAL M. BINGHAM.

Witnesses:

WM. GOLDEN,

G. W. DICKINSON.