L. Runyon.

Churn.

No. 120,103.

Patented Oct. 17, 1871.

Fig 1.

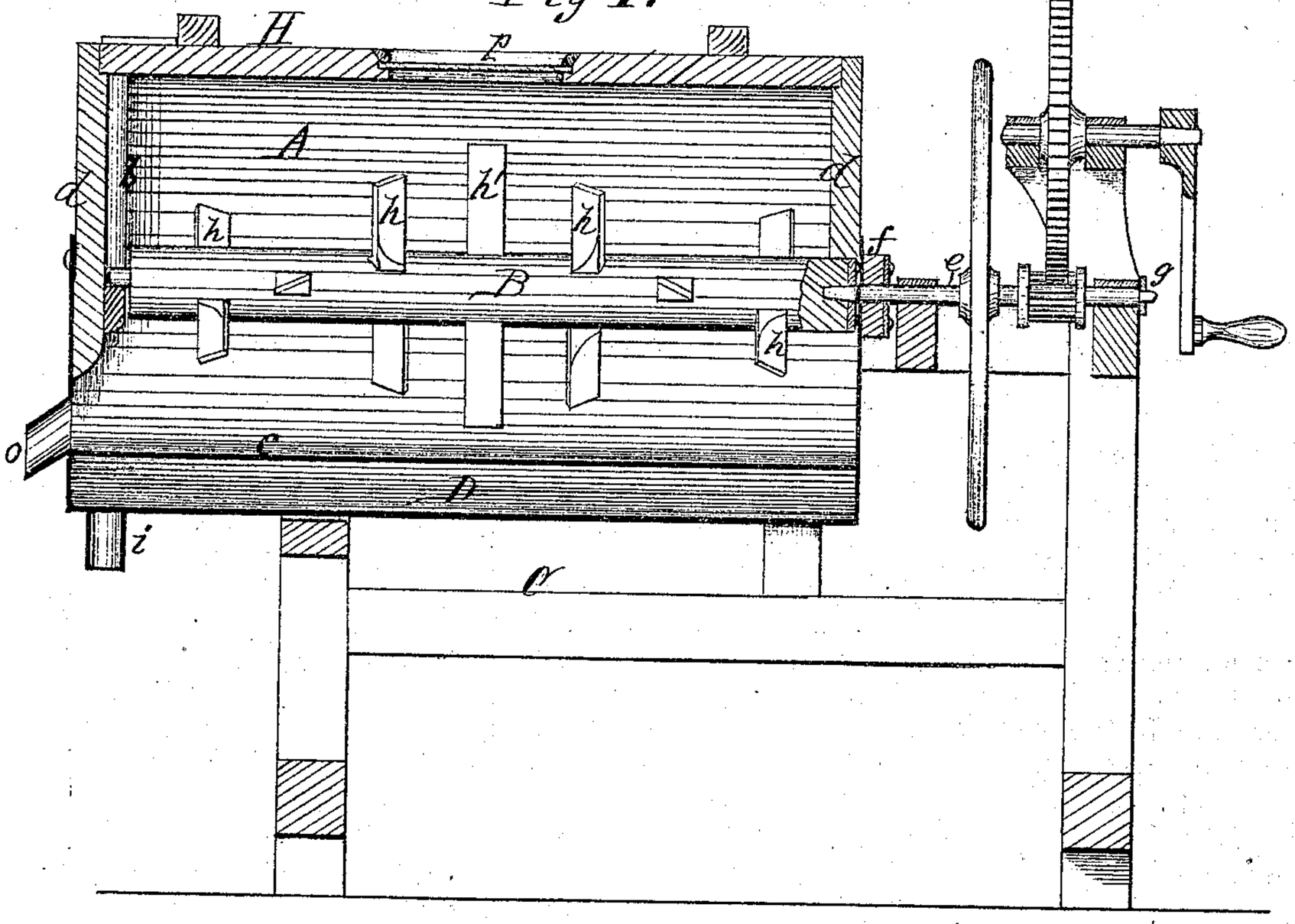


Fig 2.

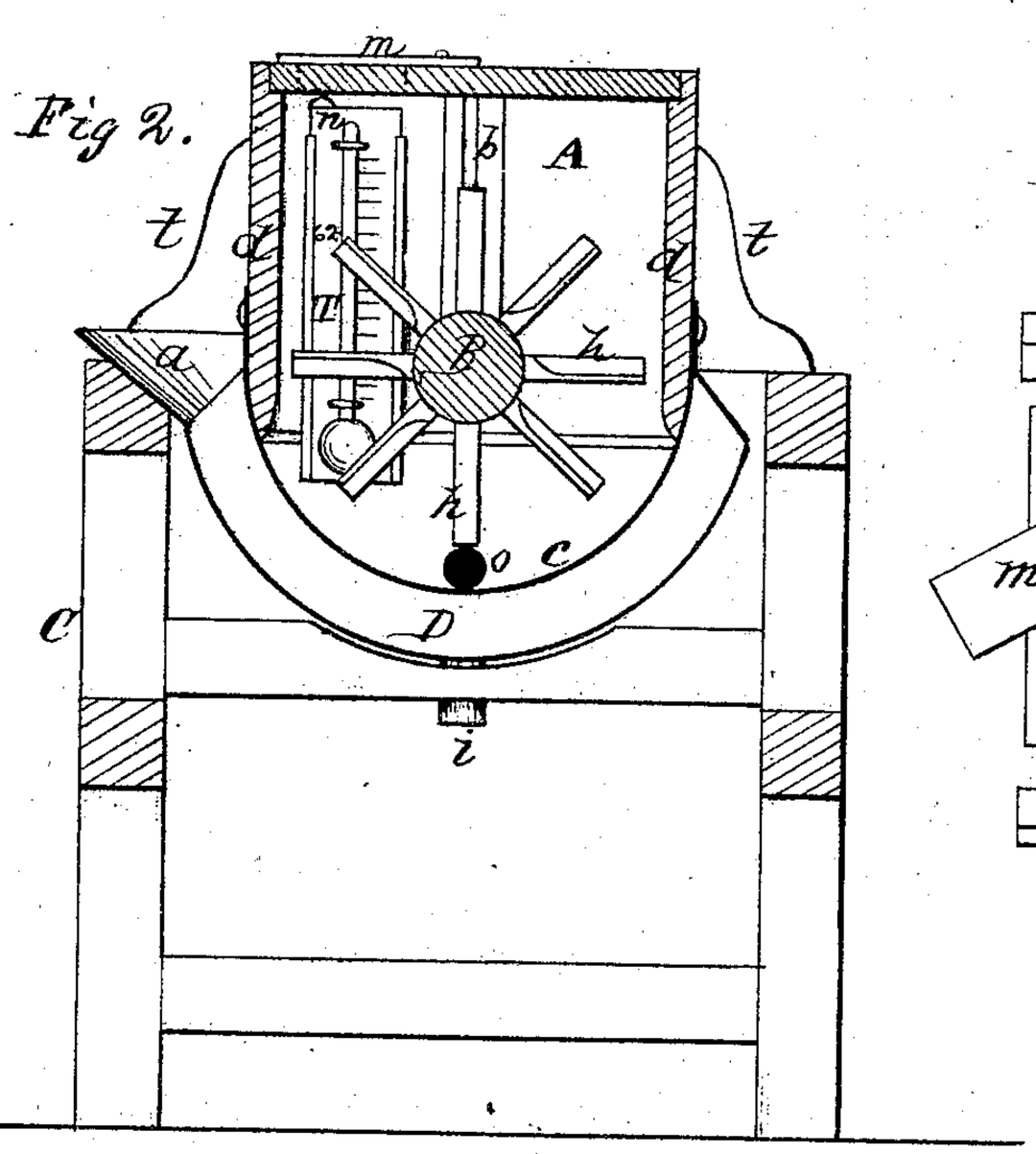
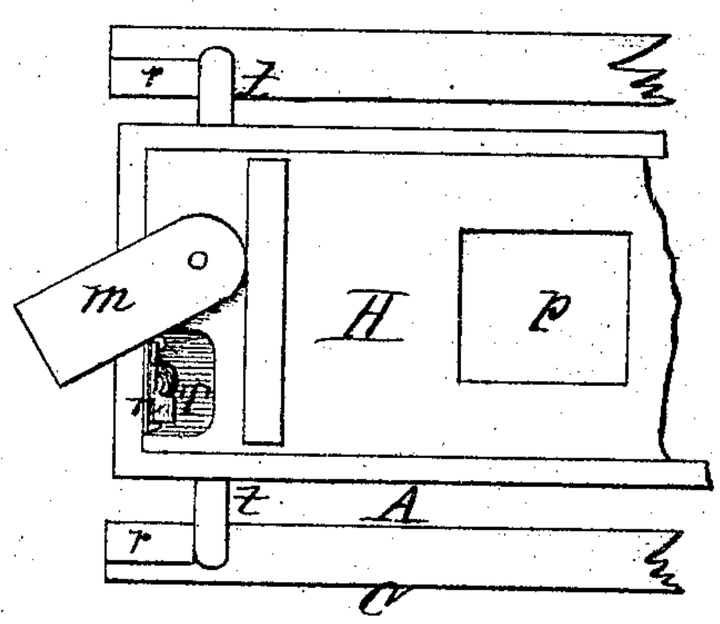


Fig 3.



Witnesses:

A. H. Langent.

D. L. Johnston

Inventor:

Lewis Runyon

per W. L. Langsborough & Co

Attys. Rochester N. Y.

UNITED STATES PATENT OFFICE.

LEWIS RUNYON, OF NEWARK, NEW YORK.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. 120,103, dated October 17, 1871; antedated October 13, 1871.

To all whom it may concern:

Be it known that I, LEWIS RUNYON, of Newark, in the county of Wayne and State of New York, have invented certain Improvements in Churns, of which the following is a specification:

My invention relates more especially to a novel arrangement of a horizontal churn-barrel and spiral agitator, and to the attachment thereto of a tempering-chamber and thermometer.

In the drawing, Figure 1 is a sectional side elevation of my invention. Fig. 2 is a transverse section. Fig. 3 is a plan view of a portion of the barrel.

It is the experience of dairymen and others who have investigated the subject, that butter can be produced more speedily and with less waste of material when the cream is of a certain uniform temperature during the process of churning, such temperature being usually about 62° Fahrenheit. Most butter-makers, however, have no conveniences for regulating or determining the temperature, and therefore much time is lost in churning, a considerable quantity of cream wasted or injured, and the resulting product is of inferior quality. In my improved churning and tempering apparatus I have succeeded in obviating these difficulties.

The churn-barrel A is composed of the sheet-metal bottom *c* and sides *d* of wood or other suitable material. Below the barrel I provide the chamber D, surrounding the metallic portion, and arranged to be filled with water or other liquid through the spout *a* and emptied through another opening, *i*, when required. A thermometer, T, is located at a convenient point upon the end of the barrel, so that the bulb comes in direct contact with the cream. Thus, when the cream has been introduced into the churn, and the temperature determined by the thermometer, the chamber D is filled with water of such temperature as to raise or lower, as the case may be, that of the cream to the required point, the thin metallic bottom *c* facilitating such equalization of temperature. The water in the chamber D may be either drawn off or allowed to remain during the process of churning, according to circumstances. The revolving agitator B *h* has bearings upon a block, *b*, secured to the end of the churn-barrel and upon the inner end of the shaft *e*, which projects into the barrel A, and is driven from without in any desirable manner. The extremity of this shaft may be squared and fitted to enter a socket in the spindle B, and a strip, *f*, Fig. 1, of leather or other soft fibrous material attached to the barrel to prevent leakage around the shaft. The gudgeon at the other end of the agitator is dropped into a socket in the block *b* through a vertical or inclined slot, whereby by lifting up said end the agitator may be withdrawn from the shaft *e* and wholly removed from the barrel A. If desirable the shaft *e* may slide a short distance in its bearings, thus permitting a more ready attachment of the agitator, the shaft being returned to its place by a suitable spring, *g*, or a set-screw. The spindle B is provided with agitating-arms *h' h'*, attached in a convenient and secure manner, and arranged in spiral lines each way from the center, the position of those upon the side of *h'* corresponding to the thread of a right-hand screw, and upon the other to that of a left-hand screw, and the faces of the arms are inclined with relation to the axis of the spindle, as shown, to increase their spiral action upon the cream. The effect of this arrangement is to force the cream continually to the center of the churn-barrel by the revolution of the agitator, thus thoroughly mixing and rendering it homogeneous, whereby the condition of the whole mass is the same at any one time during the process.

It will be observed that the direction of motion must also have a proper relation to the arrangement of the arms *h*, otherwise the opposite effect would be produced. By this means, also, the thermometer T is prevented from being injured or besmeared, and it may be left in the churn during the whole process, if desired.

The thermometer is secured in a slide or other convenient device, which allows it to be removed through an opening in the cover H, Fig. 3, and this opening is closed by a pivoted or sliding plate, *m*, Figs. 2 and 3. By this means the thermometer may be removed and examined without displacing the cover, which latter operation would necessarily admit air to the cream and change its temperature. A small plate of glass, *p*, is secured in an opening in the cover H, through which the condition of the cream may be observed at any time. The body of churn is supported by the frame C by means of the cleats *t*, Figs. 2 and 3; and by first removing the agitator the barrel may be readily lifted, drawn off from the shaft *e*, and

conveyed to any place to be emptied or cleansed. Stops *r*, Fig. 3, prevent the displacement of the barrel from the frame when in operation. A spout, *o*, is attached to the barrel A for the purpose of drawing off the liquid contents.

I am thus enabled, by the above-described invention, to bring the cream to a perfectly uniform temperature before churning; to accurately determine such temperature by a thermometer placed in direct contact with the cream and arranged to be removed at pleasure; to thoroughly mix and agitate the cream; and to render all parts of the device accessible and cheap in construction.

I am aware that it is not new to use a thermometer and a tempering-chamber, either or both, to determine and control the temperature of the cream in a churn; and I do not claim said devices; but

What I claim as my invention is—

In combination with the horizontal churn-barrel A, thermometer T, and tempering-chamber D, the agitator B having the flights *h* arranged as described, and each formed or set as herein set forth, when said barrel is provided with a small auxiliary cover, H, for the purpose of giving access to the thermometer without exposing the cream to the atmosphere, substantially as and for the purposes set forth.

LEWIS RUNYON.

Witnesses:
F. H. CLEMENT,
D. L. JOHNSTON.

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