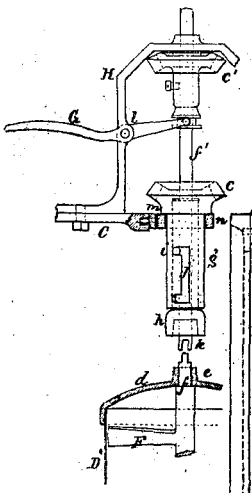
T. & G. M. Mills,

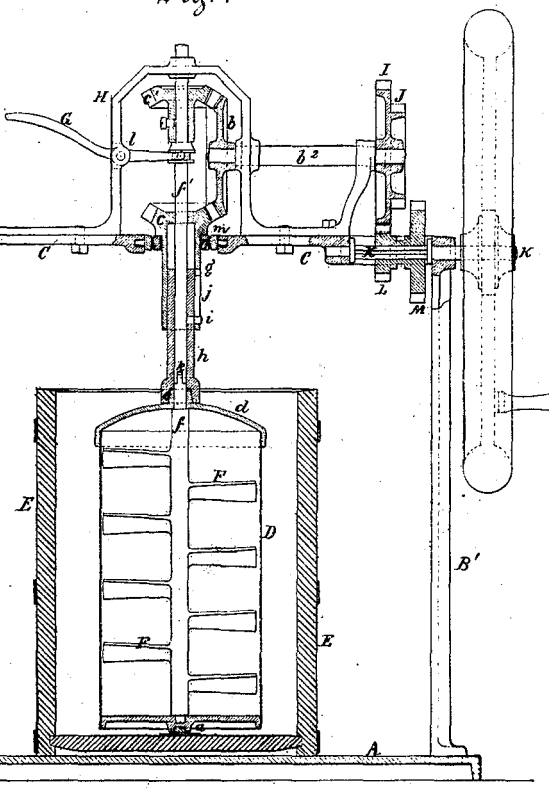
Ice Cream Freezer.

No. 100,918. Patented Mar. 15, 1870.

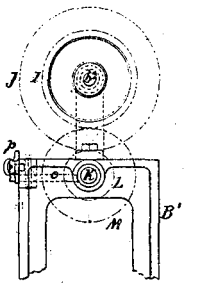
—Fig. 2.—



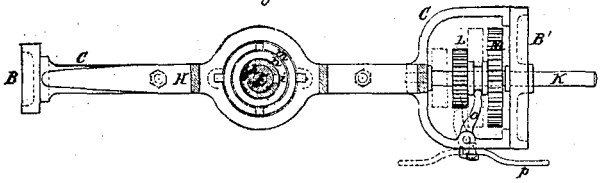
—Fig. 1—

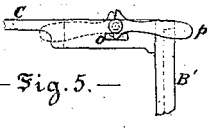


—Fig. 3.—



—Fig. 4.—





—Fig. 5.—

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THOMAS MILLS AND GEORGE M. MILLS, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 100,918, *dated March* 15, 1870

IMPROVED ICE-CREAM FREEZER.

The Schedule referred to in these Letters Patent and making part of the same

We, THOMAS MILLS and GEORGE M. MILLS, both of the city of Philadelphia, and State of Pennsylvania, have invented certain Improvements in Ice-Cream Freezers, of which the following is a specification.

The first part of our invention relates to a novel arrangement of couplings for connecting the driving power to the can and dasher, which system of couplings permits an easy attachment or release of these parts, and allows the tub containing the can and surrounding freezing-mixture to be put in place or removed without taking off any part of the framing or machinery, thus avoiding the annoyance and delay often due to loss or mislaying of detached parts of the machinery, and saving time in the actual operation of connecting and disconnecting the driving power.

The second part of our invention consists in suspending the vertical driving-sleeve and shaft and their couplings in a yielding or swiveled bearing, and thus providing the easiest running conditions by avoiding all undue strain on the working parts from unequal lateral pressure of the freezing-mixture against the sides of the can, or from inaccurate placing of the tub relative to the vertical axis of the driving-shaft.

A third feature of our improvement relates to combining with the above arrangement of the driving-gear, a means of varying the speed of the vertical shaft relative to the first driving-shaft. By running the dasher and can at a higher speed during the last part of the freezing operation the ice-cream is greatly improved in quality and swelled in bulk, and in order to accomplish this without increased exertion on the part of the operator, an easily transposed system of change-gears is provided, which gives, in addition to the ordinary speed, the required increased velocity to the vertical shaft from a uniform speed of crank.

Description of the Accompanying Drawings.

Figure 1 is a side elevation of a machine embodying our invention, and partly drawn in section.

Figure 2 is a view of the vertical shaft and clutches in their detached position.

Figure 3 is an end view of the change-gearing.

Figure 4 is a plan of the frame, swivel bearing, and change-gearing.

Figure 5 is a detached view of the shifter for the change-gearing.

The framing of the machine consists of an iron base, A, uprights B B′, and cross-girt C, the latter carrying the various parts of the driving-machinery.

The cream-can D has a pivot, *a*, at its lower end, resting and turning in a socket in the bottom of tub F, which contains the freezing-mixture surrounding the can D in the usual manner.

Revolving motion in opposite directions is imparted to the can D and dasher F by the usual train of bevel-wheels *b c c′*, but between this gearing and the can and the dasher intervenes a peculiarly-constructed system of clutch-couplings, arranged as follows:

The lid *d* of can D is provided with a square shank, *e*, through which passes the upper end of the dasher-spindle *f*.

The bevel wheel *c*, giving motion to the can D, has a long downward-extending sleeve, *g*, and this carries on its inside a long sliding sleeve-piece, *h*. The lower end of this piece forms a square socket, which fits the shank *e*, and acts as a carrier for revolving the can D.

The sleeve *h* has a pin, *i*, confined in a long vertical slot, *j*. It is thus driven by the hub *g*, and may be elevated or lowered within the same, to the extent of the length of said slot.

This has lateral recesses at each end, (see fig. 2,) into which the pin *i* may enter, and thus hold the sleeve *h* in either the connected or disconnected position.

The shaft *f′* of the upper bevel-pinion *c′* passes through the hub of *c* and through sleeve *h*, and its lower end is provided with a transverse slot, *k*, into which fits a correspondingly-flattened end of the dasher-shaft *f*. The dasher is thus driven by the shaft *f′*, which, being at its lower end confined within *h*, retains its hold upon *f* as long as *h* remains in its lower coupled position.

G is a handle, hinged to the wheel-frame H at *l*, and serving to elevate the shaft *f′*, for uncoupling the same from the dasher-spindle *f*.

The swivel bearing for the vertical shaft consists of two rings, *m* and *n*, placed one within the other, and each provided with a pair of pivots. Those on ring *m* have their bearings in suitable pockets provided in the frame-girt C, while the pivots on *n* rest in notches provided in *m* at right angles to its pivots. A universal joint is thus formed, which permits the hub *h* of wheel *c*, resting on *n*, to be deflected from a true perpendicular line in any direction without bringing any injurious strain on the bearings.

The change-gearing for varying the speed of the cream-can and dasher relative to that of the crank-shaft, is arranged as follows:

The horizontal shaft b^2, carrying the bevel-wheel *b*, has at its outer end two spur-wheels, I J, cast in one, of suitable varied diameters, and parallel with this shaft is placed the first driving-shaft K.

This is provided with a pair of spur-wheels, L M, of such relative diameters as to gear respectively with the first-mentioned wheels I J, but separated lengthwise upon their axis in such a manner that only one of the two wheels can gear with its mate at a time.

The hub of wheels L M is splined on the shaft K, and has a lengthwise motion on this shaft, in which motion it is so actuated and controlled by a shifting arm, *o*, that either one of the wheels L M may be thrown into gear with its respective mate on shaft b^2, by placing the handle *p* in the required one of two positions shown in full and dotted lines in fig. 5, this handle *p* being so placed as to hold the arm *o* securely in either position, by its overhanging weight bearing against the outward-projecting end of *o*.

The diameters of the two pairs of wheels L I and M J are relatively so arranged that, while the former pair gives a sufficiently rapid rotation to the can and dasher for the first part of the freezing operation with a moderate speed of the crank-shaft, the other pair of wheels, J M, will, without increased crank-speed, increase the speed of the can and dasher, as required, for a perfect finishing of the freezing operation.

Having thus described the nature and objects of our improvements, we do not broadly claim as new a clutch or coupling for connecting the rotative power to the cream-can or dasher; but

We claim as our invention—

1. The vertically-sliding coupling-sleeve *h* and clutching-shaft *f'*, when arranged relative to and operating in combination with the slotted hub *g* of bevel-wheel *c*, can D, and dasher F, substantially in the manner and for the purpose set forth.

2. In combination with bevel-wheel *c* and sleeve-coupling *h*, the swivel bearing *m n*, operating substantially as and for the purpose described.

3. In combination with the driving-shaft K, intermediate shaft b^2, bevel-gears *b c c'*, upright shaft *f'*, can D, and dasher F, and the described change-gears L I and M J, when operating in the manner shown and described.

4. In combination with the sliding change-gears L and M, the shifter-arm *o*, and locking-handle *p*, arranged as and for the purpose set forth.

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GEO. M. MILLS.

Witnesses:
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