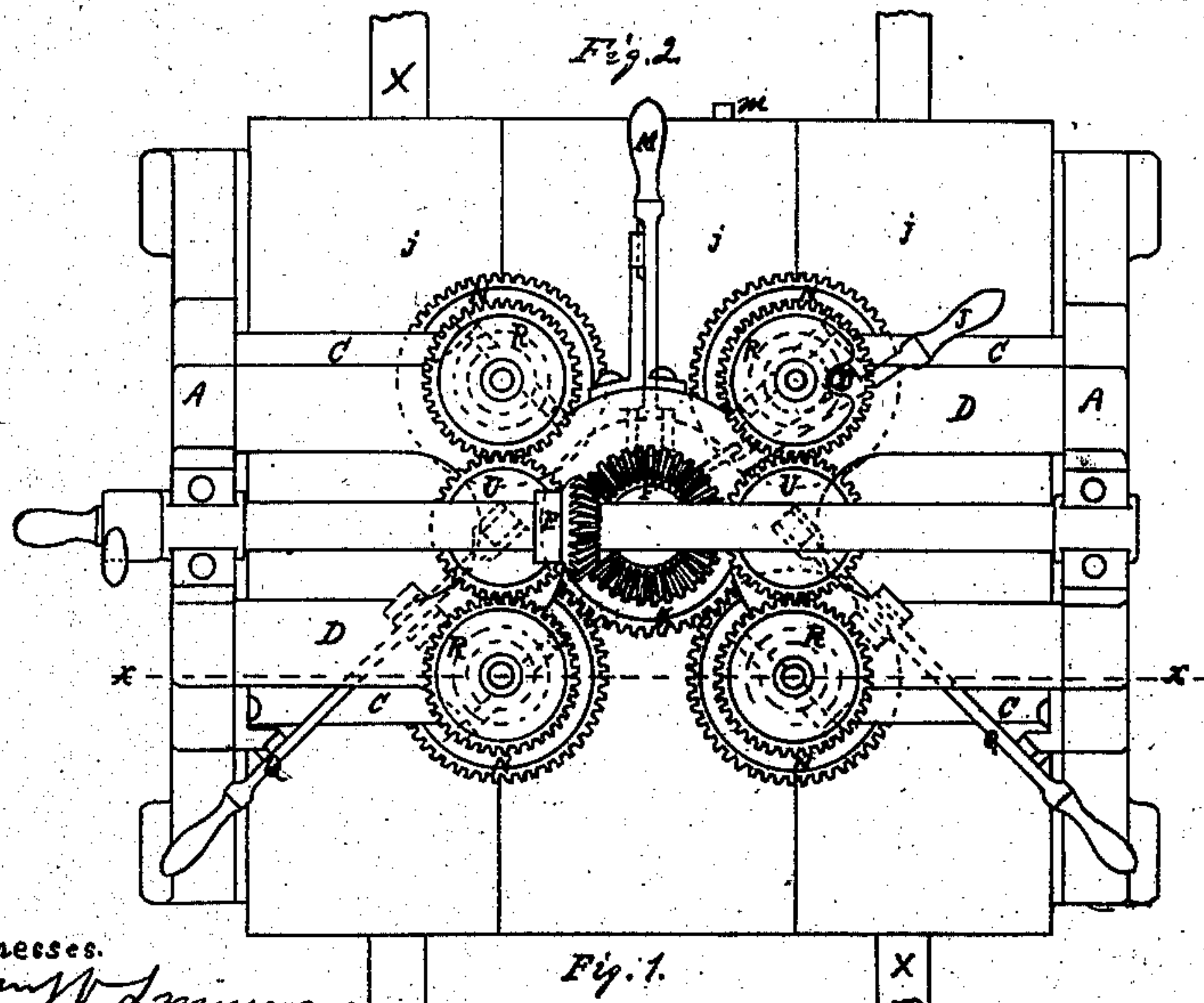
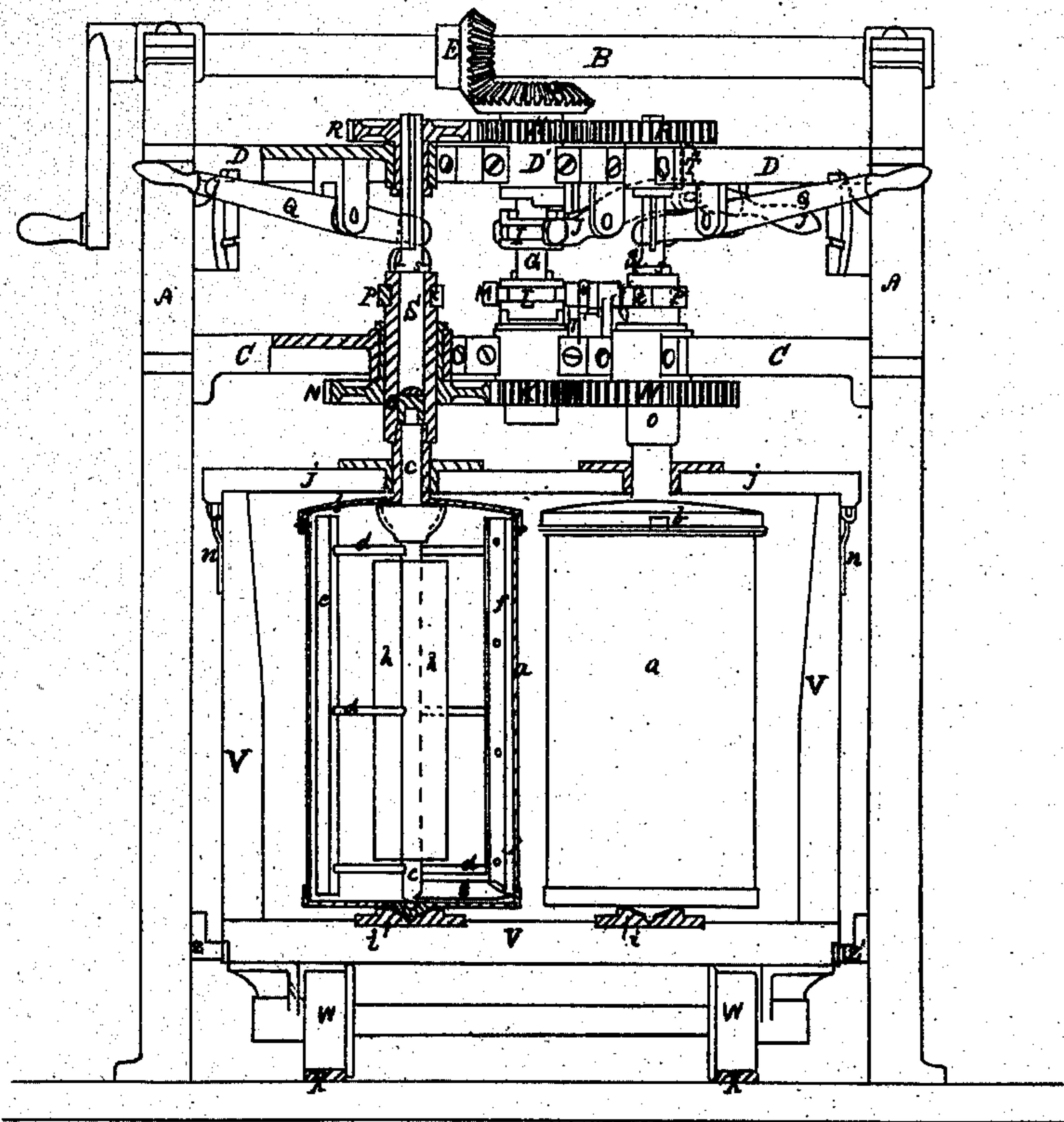


J. DOOLING.
ICE CREAM FREEZER.

No. 83,265.

Patented Oct. 20, 1868.



Witnesses.
Wm. B. Linn
N. B. Lombard

Fig. 1.

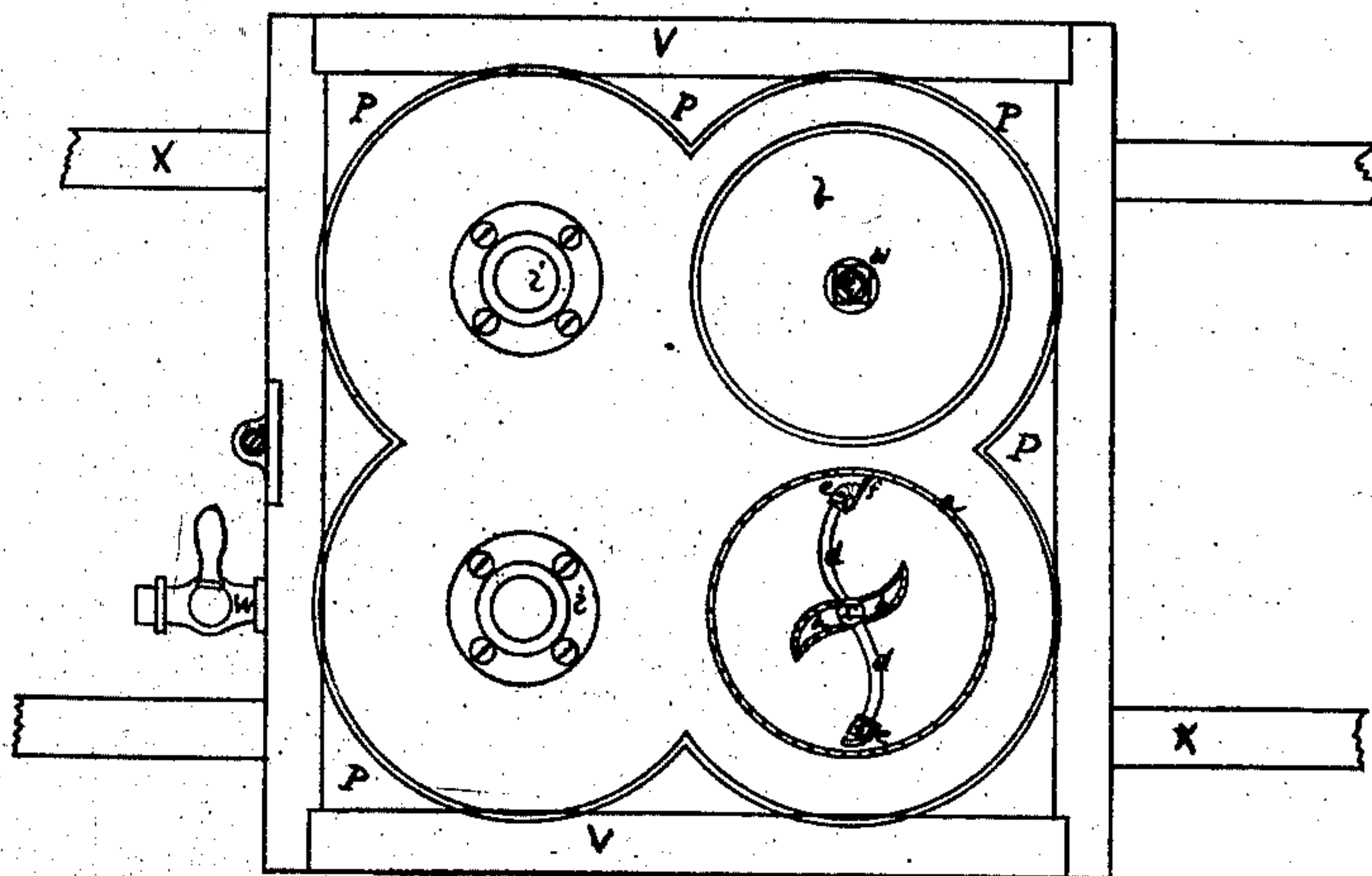
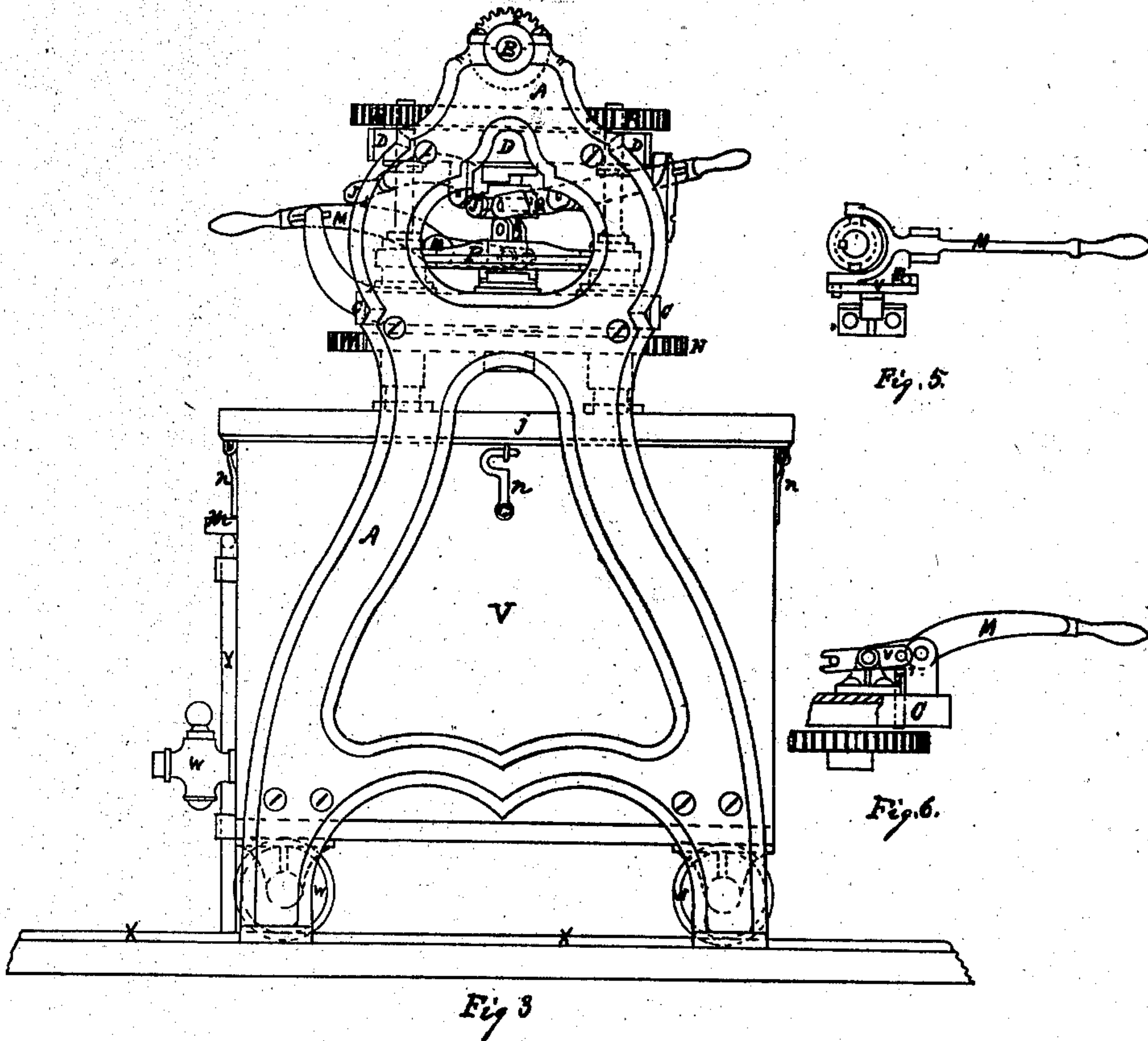
Inventor.

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United States Patent Office.

JAMES DOOLING, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 83,265, dated October 20, 1868.

IMPROVED ICE-CREAM FREEZER.

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

To all whom it may concern:

Be it known that I, JAMES DOOLING, of Boston, in the county of Suffolk, and State of Massachusetts, have invented a new and useful Improvement in Machines for Freezing Ice-Cream; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan of my machine, adapted to operate four cream-holders.

Figure 2 is a sectional elevation of the same, showing the ice-tank and one cream-holder in section, the cutting-plane being on line *x x* on fig. 1.

Figure 3 is an end elevation.

Figure 4 is a horizontal section through ice-tank and one cream-holder, showing one other cream-holder in plan, the other two being removed.

Figure 5 is a plan of the device for locking the lower train of gearing when the clutch is thrown out of gear.

Figure 6 is an elevation of the same device.

The subject-matter of my invention relates, in the first place, to the arrangement of the mechanism by which the cream-holders and beaters are operated, and consists in arranging the machinery for operating the cream-holders and beaters on a frame separate from said cream-holders, or the ice-tank, in which they are enclosed, in such a manner that it may readily be connected to or disconnected from the cream-holders and beaters, at the will of the operator, by the action of the lever and lifting-yoke upon the sleeve-shafts and spindles, as will be more fully described.

It also consists in the use, in combination with the central upright shaft of the machine, of two distinct and separate trains of gearing, so arranged that either or both may be coupled to the said shaft by means of suitable clutches arranged to slide upon a spline in said shaft, for the purpose of transmitting the motion of the said shaft to either the beaters or cream-holders, or to both, at the same time, and causing them to revolve in opposite directions, as will be described; and also in the manner of connecting the said trains of gears to the sleeve-shafts and spindles, so that while the gears will impart rotary motion to said sleeve-shafts and spindles, the said shafts are free to move up or down in the direction of their length, for the purpose of coupling to or uncoupling from the cream-holders or beaters.

And it also consists in the combination, with each train of gearing for transmitting motion from the central vertical driving-shaft to the cream-holders and beaters, of a locking-device, for holding said trains of gearing in a state of rest when not connected to the central vertical driving-shaft by its clutch, and thereby preventing either the cream-holders or beaters from being affected by the motion of the other when it is desirable to have either remain in a state of rest.

My invention relates, in the second place, to the construction of the ice-tank, and consists,

First, in constructing the interior of the ice-tank so as to conform in shape, as near as may be, to the exterior of the several cream-holders to be used therein, leaving only so much space between the interior of the ice-tank and the exterior of the cream-holders as is necessary to contain the requisite amount of the freezing mixture, by means of which a great saving in the amount of ice and salt used may be made. It also consists,

Secondly, in mounting the ice-tank upon a carriage fitted to run upon a track below the driving-mechanism, by means of which the tank may be more readily moved to and from said mechanism, for the purpose of removing the cream from the cream-holders when frozen, and filling them for another operation: and it consists,

Thirdly, in the use of suitable guides and locking-mechanism, in combination with the tank, by which the tank and cream-holders are guided into position to connect with the driving-mechanism, and secured when in operation.

My invention relates, in the third place, to the construction of the beaters, and consists in the use of a knife, working near the side walls of the cream-holder, for the purpose of cutting the cream from the walls, and throwing it towards the centre, and also in the curved form of the horizontal beater-arms, in combination with the knife, by which the knife is made to cut at a considerable distance in advance of the arms as they are carried through the cream; and also in the use of the curved central beaters, for beating up the cream and throwing it outward after it is cut from the walls of the cream-holder by the knife, as will be described hereafter.

The same letters refer to the same parts in all the drawings.

In the drawings, A A are the side frames of the machine, bolted firmly to the floor, and provided with bearings at their upper ends for the horizontal driving-shaft B, and tied together by the girts C and D, on which the mechanism for operating the cream-holders and beaters is mounted.

The horizontal driving-shaft B carries a bevel-wheel, E, gearing with the bevel-wheel F, which is keyed firmly to the shaft G, and by which it is made to revolve.

H is a spur-gear, fitted to the shaft G so as to revolve freely upon it, and provided with a long hub, upon which is turned a bearing, by which it is fitted to the box D' on the girt D. Said hub is also provided with a clutch, by means of which, and the movable clutch I sliding upon a spline in the shaft G, and the shipper J, the gear may be made to revolve with the shaft G, and, through the gears U U and R R,

transmit the motion of said shaft G to the spindles S S, and through them to the beaters, when the cream-holders and beaters are coupled to the driving-mechanism. To the lower end of the shaft G is also fitted, in the same manner, the spur-gear K, and mounted in a bearing in the girt C, and also provided with a clutch to work in conjunction with the movable clutch L, also sliding on a spline in the shaft G and the shipper M, by means of which it is made to revolve with the shaft G when thrown into gear, and, through its train of gearing, cause the sleeve-shafts O O, which connect to the cream-holders, to revolve, and thus give motion to the cream-holders. The gears N N are provided with long hubs, by means of which they are mounted in bearings in the girt C, and fitted to the sleeve-shafts O O with a spline, in such a manner that, while the gear and sleeve-shaft are rigidly connected, so far as revolution is concerned, the sleeve-shaft is free to be moved up or down in the direction of its length, for the purpose of connecting to or disconnecting from the cream-holders. The upper ends of the sleeve-shafts O O are provided with grooves *t t*, into which are fitted the forked ends of the lifting-yokes or bars P P, to the middle of which one end of the lever Q is attached by the link *l*, by means of which arrangement the sleeve-shafts O O are raised, and, by their action upon the collars or shoulders *s s* formed on the spindles S S, the spindles S S are also raised, and the machine is uncoupled from the cream-holders and beaters.

Although I have adopted the plan of lifting two sleeve-shafts and their accompanying spindles with one lifting-bar, I do not wish to be understood as confining myself to that particular mode of construction, for it is evident that each sleeve-shaft and its accompanying spindle may be raised separately, or they may all be raised together, if it is desirable in any particular case, without at all affecting the principle of operation.

The gears R R are also mounted in bearings in the girt D, in the same manner as the gears N N are mounted in the girt C, and they are also fitted to the shafts or spindles S S with a spline, so that, while the gear and spindle must revolve together if at all, the spindle is free to be moved up and down for the purpose of coupling with or uncoupling from the beaters.

The lower ends of the sleeve-shafts O O, and the central spindles S S, are provided with rectangular sockets, by which they are coupled to the cream-holders and the beaters, the sleeve-shafts O O coupling with the hubs on the covers of the cream-holders, said covers being made fast to the body of the cream-holders in such a manner that the cream-holders and covers must revolve together, while the central spindle S is coupled with the beater-shaft.

T is the locking-pin, having a bearing in the girt D, and acted upon by the shipper J in such a manner that when the shipper-handle is raised, and the clutch acted upon by it, is thrown out of gear from the clutch on the hub of the gear H, the locking-pin T is made to enter a hole provided for the purpose in one of the gears R, and effectually locks the whole train of gears connected with the spindles, and thus holds the beaters stationary, while the cream-holders continue to revolve.

T' is a locking-pin, having a bearing in the girt C, and connected by the lever *v* to the shipper M, in such a manner that when the shipper is operated to throw the clutch L out of gear with the clutch on the hub of the gear K, the pin T' shall be made to enter a hole provided for the purpose in the gear K, and lock it so that it cannot be turned by the friction of the parts.

U U are two intermediate gears, used to change the motion, so as to cause the beaters to revolve in a direction contrary to that of the cream-holders.

V is the ice-tank, made to accommodate four cream-holders, and having its corners and other parts filled in, as shown at *p*, and made somewhat smaller in diameter at the bottom than at the top, for the purpose of reducing the space to be packed with ice and salt, to the minimum quantity consistent with obtaining a good result in freezing.

The ice-tank V is also provided with a cover, *j*, made in three parts, and made fast to the ice-tank, and to each other, by means of suitable hooks, as shown at *n n*.

W W are the trucks on which the ice-tank is mounted, and by means of which it is readily moved to or from the machine on the rails X X.

Y is the bolt, by means of which the tank is held in position, and *w* is a drain-cock to draw off the brine.

Z Z are the guides, by which the tank is guided to position when being moved under the machine.

a is the cream-holder, *b*, the cover, fitted to the cream-holder in the usual way, provided with a long hub, projecting upward through the cover *j* of the ice-tank, and having a portion of its upper part made square, as shown at *w*, in fig. 4, to fit the socket in the lower end of the sleeve-shaft, by means of which it is coupled to the machine.

c is the shaft of the beater, also having its upper end squared, to fit the socket in the lower end of the spindles.

d d are horizontal arms put through the shaft *c*, at right angles to it, and bent somewhat in the form of the letter S, and carrying at their outer ends the beater-bars *e e*, on one or both of which is attached the knife-scraper *f*, which serves the purpose of cutting the cream from the side walls of the cream-holder, and throwing it toward the centre.

g is a scraper, designed to cut the cream from the bottom of the cream-holder, and raise it up.

h h are vertical beaters, attached directly to the beater-shaft, and curved, as shown in fig. 4, and serve the purpose of beating up the cream after it has been cut from the walls of the cream-holder by the knife-scraper *f*, and throwing it from the centre again.

i i are the steps, which serve for the lower bearings of the cream-holders, the upper bearings being in the cover to the ice-tank.

The beater-shafts are stepped in the bottoms of the cream-holders, and have their upper bearings in the hubs of the cream-holder covers, in the usual manner.

The operation of my machine is as follows:

The cream-holders being placed in position in the ice-tank, and packed with the freezing-mixture, of ice and salt, the cream-holders are filled, and the covers put on the cream-holders and the ice-tank and secured, when the tank is moved on the track till the hubs of the cream-holders are directly under the shafts of the machine, when the locking-bolt Y is operated to lock the tank in position. The handles of the levers Q are then raised, and at the same time a slight rotary motion is given to the main shaft, which allows the sleeve-shafts and the spindles to fall till the sockets in their lower ends embrace the upper ends of the hubs on the cream-holder covers and the beater-shafts, when the connection is complete, and the machine is ready for operation.

During the first part of the operation of freezing, while the cream is comparatively warm, to prevent the cream from buttering, as would be the case if the beaters were operated at the same time with the cream-holders, the upper clutch, I, is thrown out of gear, and the lower clutch, L, is put into gear with the clutch on the hub of the gear K, when the machine is set in motion, the cream-holders being revolved while the beaters are held stationary, which operation is continued until the cream has become sufficiently cold to allow of more rapid beating, when, without stopping the machine, the upper clutch I is thrown into gear

with the clutch on the hub of the gear H, which immediately sets the beaters in motion in a direction contrary to that of the cream-holders.

At the proper stage in the operation, the lower clutch L is thrown out of gear, without stopping the machine, when the cream-holders will be held stationary, while the beaters continue to revolve until the cream is frozen sufficiently to be removed from the cream-holders.

The handles of the levers Q are then depressed, and the connection between the driving-mechanism and the cream-holders and beaters is broken.

The bolt Y is then lifted, giving it a quarter turn, so that its handle shall rest on the top of the lug m, when the ice-tank, containing the cream-holders, may be moved from under the driving-mechanism, along the track provided for the purpose, to the desired position, when the contents of the cream-holders may be removed and the cream-holders refilled, ready for a repetition of the operation, without disturbing them from their position in the ice-packing.

By the use of the within-described mechanism for freezing ice-cream, the operation is more completely under the control of the operator, and more nearly approaches that of freezing by hand, than has ever been done before by the use of machinery.

What I claim as my invention, and wish to secure by Letters Patent, is—

1. The means, herein described, of coupling the cream-holders and beaters to the operative mechanism, and uncoupling the same, by giving to the sleeve-shafts O O and the spindles S S, a vertical motion up or down, by means of the lifting-bar P and the levers Q, or their equivalents, substantially as described.

2. The within-described arrangement of mechanism, or its mechanical equivalent, for controlling the operation of the cream-holders and beaters, so that the cream-holders may be made to rotate while the beaters remain inoperative, or the beaters may be rotated while the cream-holders remain inoperative, or both the cream-holders and the beaters may be rotated at the same time in opposite directions, substantially as described.

3. The combination, with the two separate trains of gearing for transmitting the motion of the vertical driving-shaft G to the cream-holders and beaters, of a locking-device for each, substantially as described.

4. Forming the interior of the ice-tank so that its surface shall be approximately concentric to the exterior of a group of cream-holders, substantially as described.

5. Mounting the ice-tank and contents upon a carriage moving on rails, in combination with stationary driving-mechanism, operating substantially as described.

6. The guides Z Z and the locking-bolt Y, in combination with an ice-tank mounted on a carriage, substantially as described.

7. The central beater-wings h h, attached to either side of the beater-shaft, and curved partially around said shaft, parallel to its axis, when so constructed and applied that a free passage for the cream is left between its edge and the walls of the cream-holder, substantially as described.

Executed at Boston, this day of June, 1868.

JAMES DOOLING.

Witnesses:

WM. W. LUMMERS,
N. C. LOMBARD.