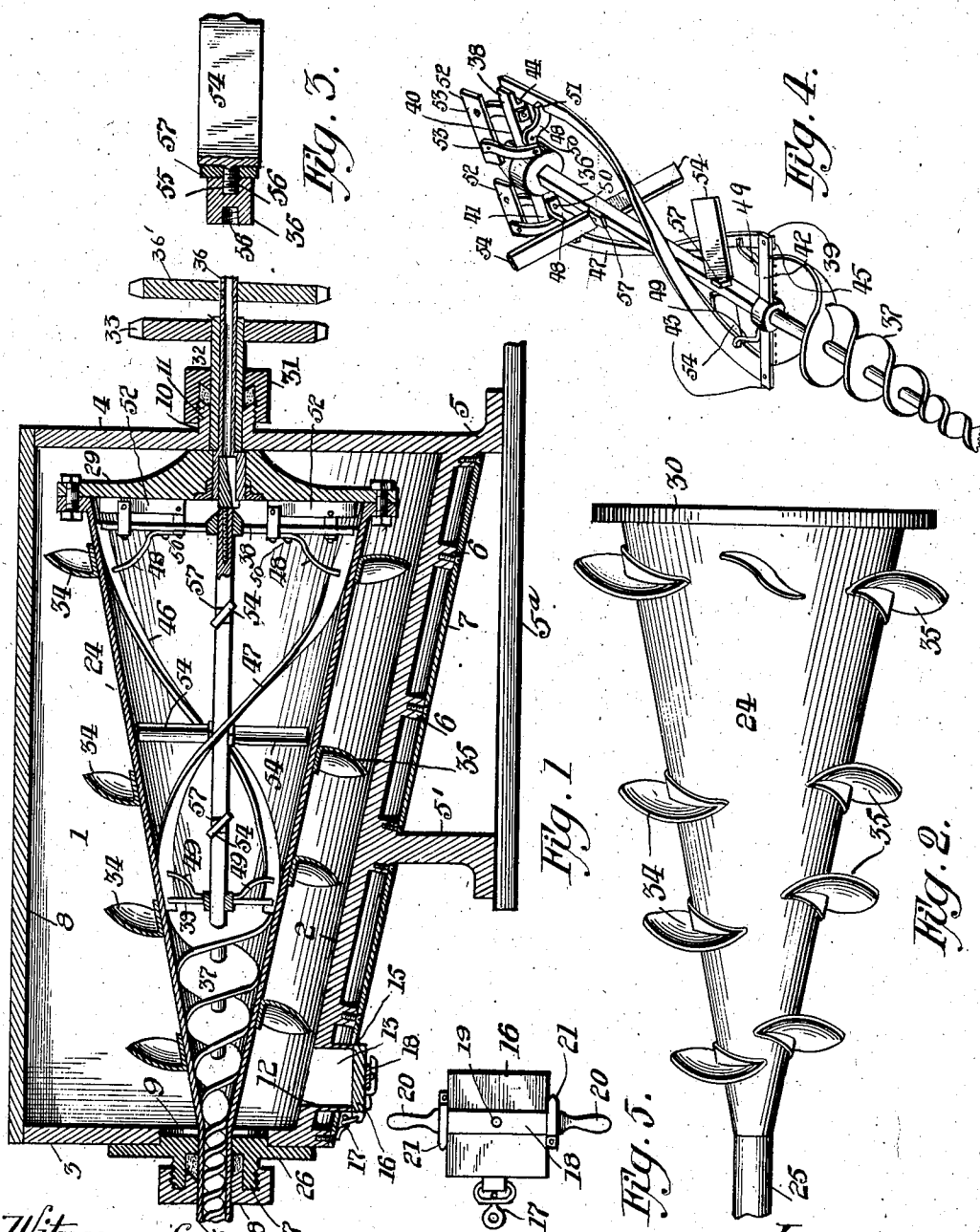


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H. J. GERNER.
ICE CREAM FREEZER.
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Witnesses:
E. W. Butler
E. C. Potter

Inventor
H. J. Gerner,
By *H. C. Everett & Co.*

Attorneys.

UNITED STATES PATENT OFFICE.

HENRY J. GERNER, OF VANDERGRIFT, PENNSYLVANIA.

ICE-CREAM FREEZER.

No. 824,075.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY J. GERNER, a citizen of the United States of America, residing at Vandergrift, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Ice-Cream Freezers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to ice-cream freezers, and relates in particular to continuous freezers of that class in which a can is journaled in a tub and revolved by suitable mechanism, the cream being fed in at one end of the can in a continuous stream and the frozen cream delivered from the other end of the can.

The object of the present invention is to provide a novel form of ice-box in which the can is revolubly mounted, and novel means is constructed in connection with the box whereby the ice may be easily removed when it is desired without removing the freezing-can therefrom.

Another object of my invention is to provide novel means in connection with the freezing-can and the tub whereby the ice which is contained within the tub will be continuously agitated and moved from one part of the tub to the other during the operation of the freezer.

A still further object of my invention is to provide novel means in connection with the dasher of the freezing-can for agitating the cream contained within the can, said means being so constructed that the same may be readily adjusted so as to produce a higher or lower grade of cream when the freezer is in operation, or which may be entirely removed if so desired.

A still further object of my invention is to provide novel means in conjunction with the dasher for removing any cream that may become frozen to the sides of the freezing-can, said means being so constructed as to permit the same to rotate within the can and have an even bearing upon all surfaces of said can.

The construction employed to accomplish the above results will be hereinafter more fully described, and, referring to the drawings accompanying this application, like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a longitudinal sectional view of a tub, showing my improved freezing-can mounted therein. Fig. 2 is a side elevation

of a freezing-can removed from the tub. Fig. 3 is a detail view of one of the cream-agitators. Fig. 4 is a detail perspective view of the dasher removed from the freezing-can, and Fig. 5 is an underneath plan view of the gate carried by the tub and the means employed to lock the same.

To put my invention into practice, I employ a box or tub in which the freezing agent is to be placed, and I preferably construct the tub 1 of a casting, the tub having a cylindrical bottom 2 and ends 3 and 4. The tub is preferably made with a tapering bottom, as illustrated in Fig. 1 of the drawings, the angle at which the bottom of the tub is formed generally coinciding with the angle of the tapered freezing-can contained therein, this construction permitting an equal space to exist between the freezing-can and the bottom of the tub at both ends. Formed integral with the end 4 of the tub is a suitable leg or support 5, and formed integral with the bottom 2 of the tub is another support 5', these legs or supports being adapted to sustain the tub upon a suitable platform or table 5^a. Around the sides and bottom of the tub are formed a plurality of ribs, and to these ribs are adapted to be secured slats or plates 7, providing an air-space between the sides and ends of the tub and the slats or plates 7, this construction preventing the cold air occasioned by the freezing agent from escaping from the sides of the tub and also preventing the warm air which surrounds the tub from in any manner reaching the sides of the casting and causing the freezing agent within the same to be effected by the warm air. The tub 1 is provided with a suitable lid 8, which may be hinged or otherwise secured to the casting, and the end 3 of the casting is provided with an opening 9, and the end 4 is provided with a bushing 10, having an aperture 11 formed therein.

The reference-numeral 12 indicates a bushing which is formed integral with the bottom of the tub, preferably near the front end thereof, this bushing being provided with an aperture 13, and the slats or plates 7 are provided with an opening 15, through which the bushing of the tub protrudes. Hinged upon the slats or plates 7, adjacent to the opening 15 and the bushing 12, is a gate 16, which is hinged, as indicated at 17, to the slats or plates 7, and this gate is provided with a locking-lever 18. This lever is pivoted to the gate, as indicated at 19, and is provided

with handles 20 20 upon its ends. Upon each side of the gate and secured to the bottom of the tub are the clips 21 21, one of said clips being mounted upon the bottom of the tub in a reverse direction to the other clip, whereby when the gate is in a closed position the locking-lever 18 may be swung upon its pivot to engage each clip, each end of the locking-lever taking into the clips 21 21 and firmly holding the gate against the bushing 12, closing the opening and preventing any freezing agent which is placed in the tub from passing through the opening formed in the bushing. By this construction it will be seen that in case it is desired to remove the freezing agent it is only necessary to strike the locking-lever 18 and knock the ends of the same out of engagement with the clips 21 21, at which time the gate will drop by gravity, and the contents or freezing agent of the tub may be removed through the opening formed in the bushing 12.

The freezing-can, as designated by the reference-numeral 24, is conical in shape and formed with a cylindrical discharge-tube 25 upon its cone-shaped end, the discharge-tube projecting through the opening 9 in the front end of the tub and is surrounded by a closure-disk 26, carrying a stuffing-box 27, upon which is screwed a gland 28, suitable stuffing being interposed between the gland and stuffing-box, so as to provide a water-tight joint around the discharge-tube 25. The can 24 is provided with a head 29 at its larger end, said head being secured to the flanged end 30 of the can, and the head 29 is journaled in the bushing 10, formed on one end of the tub, and a cap 31 screws on said bushing, a suitable packing being interposed between the bushing and the cap to produce a water-tight joint around the neck 32 of the head 29. The reference-numeral 33 designates a gear-wheel which is keyed upon the neck portion 32 of the head, whereby a rotary movement may be imparted to the freezing-can by any desired means.

The cone-shaped sides of the freezing-can 24 are provided with a plurality of wings or blades 34 and 35, said blades being secured to the surface of the can by any desired means, and, as illustrated in the accompanying drawings, these blades are soldered upon the inclined sides of the can. I have arranged one or more of these blades at a different angle to the other blades, and it will be observed in the drawings that the blades 35 are positioned at a different angle than the blades 34, this construction being employed, whereby when the ice is agitated by said blades the blades 35 will have a tendency to force the ice to the forward end of the tub, while the blades 34 will carry the ice to the rear end of the tub, continually moving and agitating the ice from one end to the other of said tub.

Within the freezing-can is mounted the

dasher, which consists of a shaft 36, the forward end of which is provided with a spiral conveyer 37, which terminates in the discharge-tube 25. The other end of the shaft 36 is journaled in the neck portion 32 of the head 29. The shaft 36 protrudes through the end of the neck portion 32 of the head 29 and carries a sprocket-wheel 36', to which rotary motion is communicated from any suitable source of power. Upon the shaft 36 are mounted two spiders 38 39, said spiders being arranged on the shaft in such manner that the arms 40 41 of the spider 38 will project outwardly at an opposite angle to the arms 42 43 of the spider 39, and in the outer ends of these arms I form slots 44 45. In the slot 44 of the arm 40 I mount a scraper 46, said scraper being so shaped as to conform to the tapering walls of the can, and the other end of said scraper is secured in the slot 45 of the arm 43. Another scraper 47 is mounted in the slot 44 of the other arm 41 of the spider 38, and this scraper conforms in shape to the tapering walls of the can and is secured in the slot 45 of the arm 42. To support and maintain the position of the scrapers 46 47 within their respective slots, I employ spring-clips 48 48 and 49 49, these spring-clips being secured upon the inner sides of the arms forming the spiders 38 and 39, as designated at 50, the outer ends of these spring-clips being slotted to engage the scrapers, as designated by the reference-numeral 51, any suitable means being employed to fasten the spring-clips to the scrapers.

In order to provide means to prevent any cream from freezing upon the inside of the head 29, I mount auxiliary scrapers 52 52 upon the arms 40 41 of the spider 38, which is adjacent to the head 29 of the freezing-can. The scrapers 52 52 are carried by the curved spring-clips 53 53, these clips being secured to the inner face of the arms 40 41 of the spider 38, and the scrapers are adapted to bear against the head 29 of the freezing-can.

The portion of the shaft 36 of the dasher which lies between the head 29 and the spiral conveyer 37 is made octagon shape or square in cross-section, whereby one or more flat surfaces are provided. In the different views of the drawings I have illustrated this shaft as being square in cross-section, and upon the flat surfaces of the shaft are mounted blades 54 54, one of these blades being shown on an enlarged scale in Fig. 3 of the drawings. Each one of these blades is provided with a screw-threaded shank portion 55, and by this screw-threaded shank the blade is secured in a screw-threaded recess 56, formed in one of the flat surfaces of the dasher-shaft, and interposed between the flat surface of the shaft and the blade 54 is a jam-nut 57, whereby the blades 54 may be locked in any desired position upon the dasher-shaft, this manner of securing the blades thereon permitting the

blades to be arranged at any desired angle whereby a finer or coarser grade of cream can be produced in said freezing-can than if the blades were arranged at angles coinciding with each other. Upon the opposite side of the dasher-shaft I secure a blade similar to the blade 54 just described, and by referring to Fig. 4 of the drawings it will be seen that one set of blades is arranged at right angles to the other set of blades, whereby the cream contained within the can may be agitated to produce a better quality of frozen cream. Where the cream to be frozen is of a high grade, these blades can be entirely dispensed with and removed from the shaft; but where the cream to be frozen is of a poor nature and probably of a large percentage of milk it is necessary to use these blades to produce a frozen cream of a fine and smooth consistency.

By experiment I have found that when I employ the blades 34 and 35 to agitate the ice within the tub it is only necessary to use a much smaller quantity of ice or freezing agent within the tub than if the agitating-blades 34 and 35 were not used, and by using this agitating means the freezing agent is continually moved in the tub, whereby all parts of the freezing agent will contact with the freezing-can at one time or another and all dead ice or ice not contacting with the freezing-can will from one time to another be brought into engagement with said can. The blades 34 and 53 further facilitate the mixing with the ice of salt or any brine that may be employed, and these blades will thoroughly agitate the brine and ice, whereby the freezing of the cream within the freezing-can will be greatly facilitated and the use of a freezing agent reduced to a minimum.

By employing the construction of the tub as illustrated in the accompanying drawings I have provided novel means whereby the expense of manufacturing a double-bottom tub is considerably reduced, and by forming ribs around its sides and placing slats or plates upon said ribs the cold air produced by the freezing agent within the tub is held in close proximity to the sides of said tub and the full benefit of the freezing agent derived therefrom. I have provided the opening within the bottom of the tub whereby the freezing agent placed in said tub may be easily and quickly removed when it is desired to cleanse the tub and place a new freezing agent therein. When it is necessary to remove the freezing agent, the locking-lever 18 is drawn out of engagement with the clips 21 21 and the gate will be permitted to drop by gravity to permit the freezing agent to pass through the opening formed in the bottom of the tub. The discharge of the freezing agent within the tub will be facilitated by rotating the freezing-can mounted therein.

While I have herein shown the agitating-blades as being arranged in a staggered position upon the freezing-can, I wish it to be understood that these blades may be arranged in any desired position, whereby the best results will be obtained by agitating the freezing agent, and other slight changes, such as the detail construction of the blades, may be varied without departing from the scope of the invention.

What I claim is—

1. In a freezing-machine, the combination with a tub adapted to contain a freezing agent, and means for removing said freezing agent from said tub, of a cone-shaped freezing-can rotatably mounted on a horizontal axis in said tub, a plurality of agitators mounted upon said freezing-can, a rotary dasher arranged within said can, means for rotating said dasher, and a plurality of agitators carried by said dasher.

2. In a freezing-machine, the combination of a rotary can, an independently-rotative shaft arranged in said can, spirally-shaped scrapers carried by said shaft, and flat radial blades also carried by the shaft and angularly adjustable thereon.

3. In a freezing-machine, the combination with a tub and a can mounted therein, of curved agitating-blades arranged in rows on the exterior of the can, the curvature of the blades of one row being reverse to the curvature of the blades of the adjacent row.

4. In a freezing-machine, the combination of a tub, a can rotatably mounted within said tub, agitating-blades secured to the exterior of the can, a shaft arranged within the can and rotatable independently thereof, spiral scrapers carried by said shaft and agitating-blades carried by said shaft, said blades being detached from said scrapers, and means for adjusting the angle of said blades and for fixing them in their adjusted positions.

5. In a freezing-machine, the combination with a tub having an inclined bottom, of a revoluble cone-shaped can, reversely-curved agitating-blades carried by said can and adapted to propel a freezing agent backward and forward in the tub, a rotary shaft arranged within the can, and a spiral conveyer carried by said shaft, and adapted to propel the freezing cream toward the smaller end of the can.

6. The combination with a tub for freezing-machines, of a cone-shaped can rotatably mounted within said tub, a plurality of curved blades secured upon said can, one or more of said blades being arranged at a different angle to the other blades.

7. In a cooling-machine, the combination with a tub adapted to contain a freezing agent, said tub having an opening formed therein, means for closing said opening, a cone-shaped freezing-can rotatably mounted

on a horizontal axis in said tub, means carried by said can to agitate said freezing agent, a dasher-shaft arranged within said can, and agitators mounted upon said shaft rotatable
5 on their longitudinal axis, and means for securing said agitators at any angle to which they may be adjusted.

8. In a cooling-machine, the combination with a tub adapted to contain a cooling
10 agent, said tub having an opening formed therein, means for closing said opening, of a cone-shaped can rotatably mounted within said tub, and a plurality of agitating-blades carried by said can, a dasher-shaft mounted
15 in said can, a plurality of blades secured upon said shaft, and means for adjusting said blades by turning them on their longitudinal axis and means for securing the blades in adjusted position.

20 9. In combination with a tub, a freezing-

can, a rotary shaft mounted in said can, radial arms carried by said shaft, scrapers mounted on said radial arms and adapted to scrape the sides of the can, springs carried by
25 said arms, and scrapers carried by said springs adapted to scrape the end of the can.

10. In a freezing-machine, the combination with the tub, and a cone-shaped can rotatably mounted in said tub, of a revoluble
30 shaft mounted in said can, slotted arms carried by said shaft, scrapers seated in the slots in said arms and movable therein, and spring-clips secured to said arms and engaging the scrapers.

In testimony whereof I affix my signature 35 in the presence of two witnesses.

HENRY J. GERNER.

Witnesses:

C. C. McMAHON,
JOHN PATERSON.