J. C. MILLER.

ICE CREAM FREEZER.

APPLICATION FILED APR. 30, 1910.

1,185,121.

Patented May 30, 1916.

2 SHEETS—SHEET 1.

Fig. 1

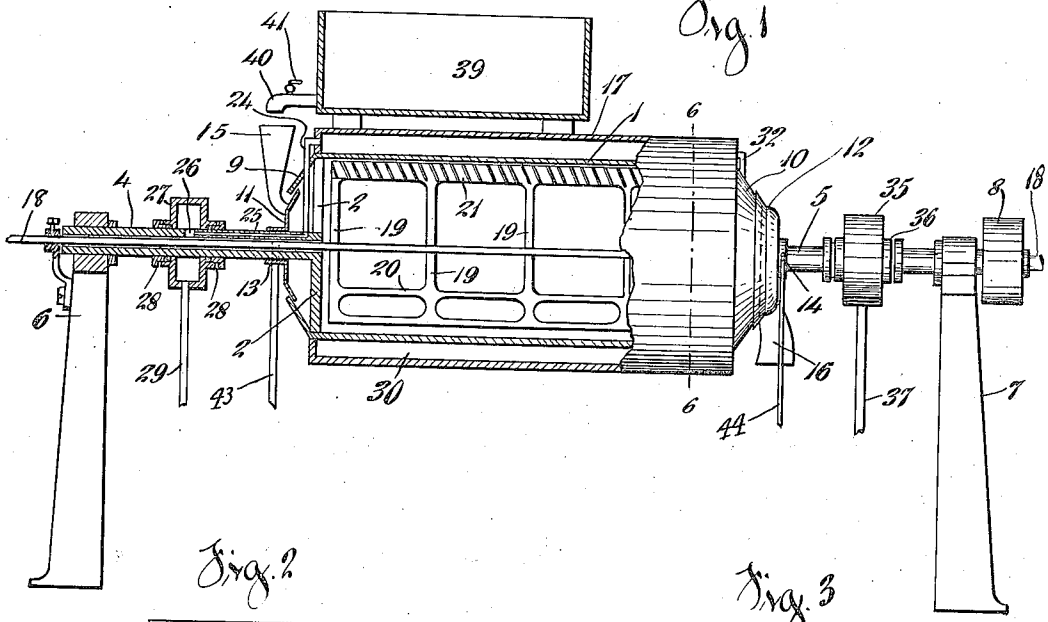


Fig. 2

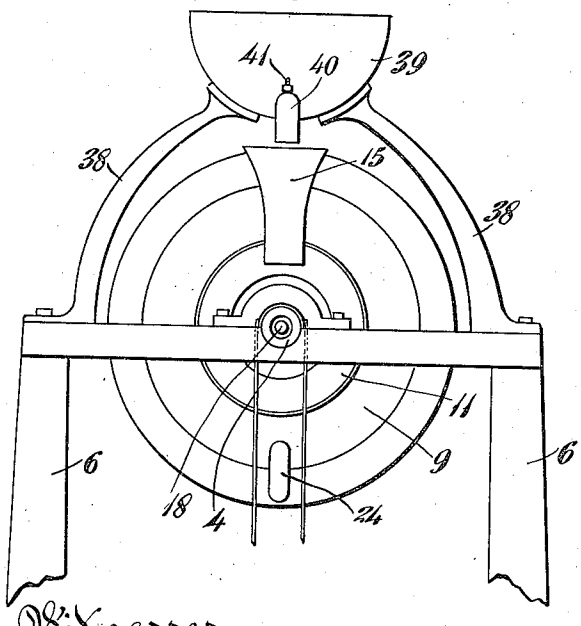
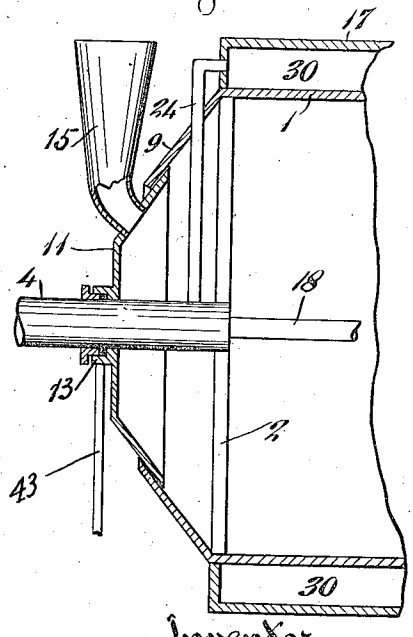


Fig. 3



Witnesses

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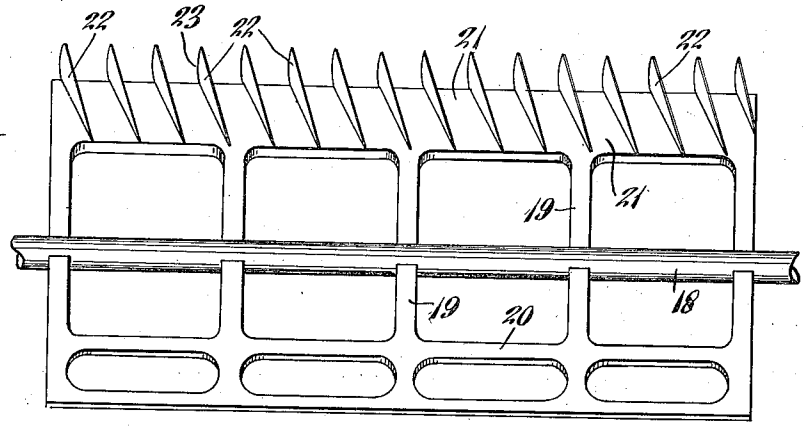
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2 SHEETS—SHEET 2.

Fig. 4



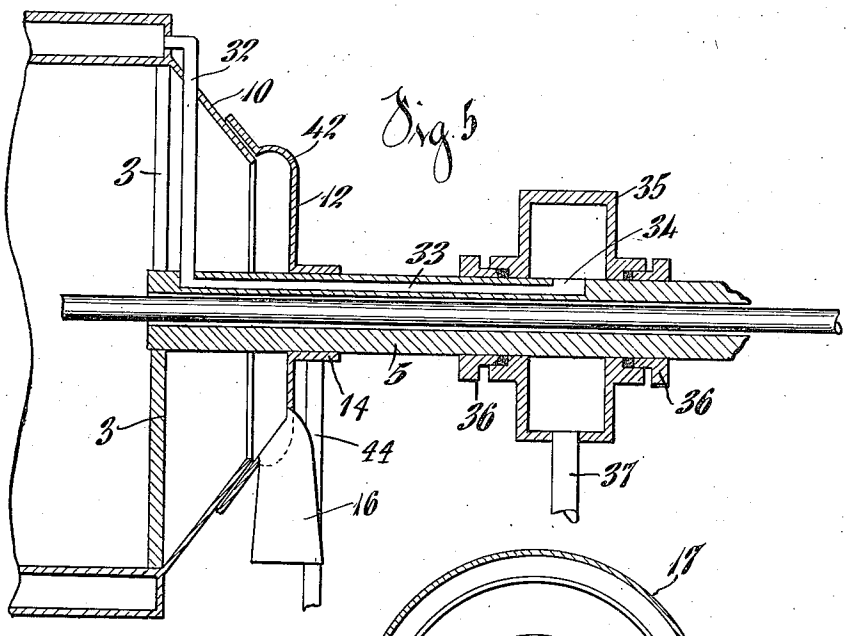


Fig. 5

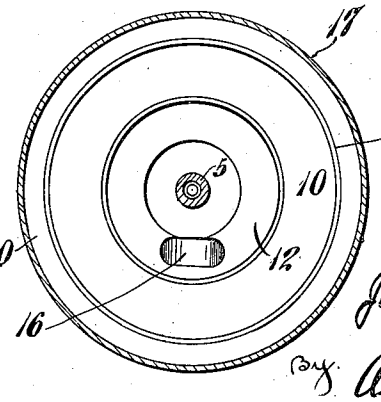


Fig. 6

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ICE-CREAM FREEZER.

1,185,121. Specification of Letters Patent. Patented May 30, 1916.

Application filed April 30, 1910. Serial No. 558,709.

To all whom it may concern:

Be it known that I, JOHN C. MILLER, a citizen of the United States, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Ice-Cream Freezers, of which the following is a clear, full, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to provide a construction of ice cream freezer which shall congeal and beat up the ice cream mixture to the extent required practically instantaneously, so that a continuous flow of material can be supplied to the machine, to be withdrawn continuously from the outlet in proper condition for packing and solidifying. To accomplish this purpose, I have provided a novel construction of apparatus to be hereinafter particularly pointed out and claimed in which the fluid mass to be congealed is instantly spread out as it is delivered to the machine, into a very thin sheet in contact with a metal casing to which is applied the temperature lowering medium, so that only a momentary contact of fluid with the inner surface of the casing is required to reduce the temperature the required amount.

In the drawings, Figure 1 is a side elevation of my improved machine, partly in vertical section. Fig. 2 is a front elevation of the same. Fig. 3 is a detail vertical section of the intake end of the machine. Fig. 4 is a perspective view of the scraper. Fig. 5 is a detail vertical section of the delivery end of the machine. Fig. 6 is a cross section on the line 6, 6, of Fig. 1 of the cylinder and casing removed from the supports.

1 is a metal cylinder of any desired diameter and length, provided with and supported at the ends by radial arms 2, 2, and 3, 3. These arms are secured at the center to hollow shafts 4, 5, respectively, which shafts are journaled in suitable bearings in standards 6, 7. The outer end of one of these shafts, as 5, is provided with a driving pulley 8, by means of which the hollow shaft and cylinder can be rotated at a very high rate of speed. The ends of the cylinder 1 are provided with inwardly projecting annular flanges 9, 10, and these flanges overlap disk plates 11 and 12 at each end respectively, so as to close up the cylinder 1 at each end. The disk plates 11 and 12 are secured in fixed position on the framework by supports 43, 44, respectively and are provided with flanges 13, 14, loosely mounted on the hollow shafts 4, 5, respectively, and provided with stuffing boxes.

The flange 9 of the cylinder 1 overlaps the disk plate 11 at the front end of the machine on the outside, and the flange 10 at the rear end of the machine overlaps the disk 12 on the inside. The fixed disk plate 11 is provided with an intake spout 15 extending vertically upward, and the disk plate 12 is provided with a depending delivery spout 16.

The cylinder 1 is provided with an external outer casing 17 closed at the ends, so as to form a jacket or compartment 30 completely surrounding the cylinder 1.

Mounted in fixed position in the frame and passing through the hollow shafts 4, 5, and longitudinally through the middle of the cylinder 1, is a shaft or rod 18, and on the inside of the cylinder and fixed to the fixed shaft or rod 18 is a scraper plate. This plate is cut away for the middle portion, leaving radial arms 19, 19, and on the ends of the arms on one side is secured or formed integral therewith the longitudinal plate 20. On the opposite end of these arms, and extending lengthwise of the cylinder is the scraper plate 21 which carries on one of its side faces a series of blades 22, preferably made of very thin metal and mounted diagonally on the scraper plate 21. The outer edges 23 of these blades 22 are segmental in shape to conform to the surfaces of the cylinder 1, and these inclined blades are set on the plate 21 so as to bring the edges of the blades almost in contact with the cylinder 1. The space between the edges of the blades and the cylinder is such as to allow the cylinder to rotate without being scratched by the blades.

The compartment or jacket inclosing the main cylinder 1 is continuously supplied with the temperature lowering medium, usually brine, through an inlet pipe 24, which is connected with a passageway 25 formed in the hollow shaft 4, which passageway opens at 26 into the box 27 fixed

in the frame and loosely mounted on the hollow shaft 4, the box being provided with stuffing boxes 28 to prevent leakage of the liquid.

The cooling medium is drawn or forced continuously into the box 27 through the pipe 29, and thence is carried through the passageway 25 and pipe 24 into the chamber 30 surrounding the main cylinder 1.

At the opposite end of the compartment 30, the cooling medium is drawn off through the pipe 32 which is connected with the passageway 33 in the hollow shaft 5, which passageway 33 opens at 34 into the box 35 fixed in the framework and loosely mounted on the shaft 5 and provided with the stuffing boxes 36, 37 is the delivery pipe through this box 35 to the cooling liquid supply. In this way we have a continuous flow of cooling medium over the external surface of the metal cylinder. The movement of the cooling medium is enforced by a pump (not shown).

Mounted on suitable supports 38 on the framework is the receptacle 39 provided with faucet 40, the mouth of which faucet is directly over the intake spout 15, and by opening the valve 41 the contents of the receptacle 39 are discharged into the intake funnel 16 and thence into the end of the cylinder through the end plate 11. The material goes through the spout and drops onto the annular end flange 9 of the cylinder 1, this cylinder 1 being rotated at a very high rate of speed, and the material, by reason of this high rate of speed, is instantly spread out over the inner surfaces of the cylinder in a very thin layer.

As the ice cream mixture is poured into the machine, a circulation of very cold brine or other cooling medium is enforced through the outer compartment, so that the temperature of the metal cylinder 1 is lowered to the freezing point or below, and the thin film of ice cream mixture which by the centrifugal movement of the cylinder is spread over the inner surface thereof, is at once reduced in temperature to the proper and desired point.

The blades 22, as the cylinder rotates, being set at an angle, carry the congealing mixture toward the rear of the machine, where the material is caught in the annular trough 42 formed on the disk plate 12 at the edge of the overlapping portion thereof, and this material is delivered through the outlet spout 16 in perfectly congealed condition for packing and solidifying.

As already stated, the cylinder 1, and its accessories, are rotated at a very high rate of speed while the scraper plate is stationary, and the cream mixture is thoroughly beaten up by contact with the plates and arms of the scraper and at the same time rapidly carried forward to the delivery end of the machine by contact with the angularly disposed blades.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an ice cream freezer, the combination of a metal cylinder, with an external casing carried thereby to form a compartment for the cooling medium, means for providing a continuous circulation of a liquid cooling medium over the external surface of the cylinder through said compartment, mechanism for rotating the cylinder at a high rate of speed, and means for delivering the material to be treated upon the internal surface of the cylinder during the rotation thereof, and means for collecting the material from said cylinder during its rotation.

2. In an ice cream freezer, the combination of a metal cylinder, with an external casing carried thereby to form a compartment for the cooling medium, means for providing a continuous circulation of a liquid cooling medium over the external surface of the cylinder through said compartment, mechanism for rotating the cylinder at a high rate of speed, and means for delivering the material to be treated upon the internal surface of the cylinder during its rotation, a fixed scraper to scrape the internal surface of the cylinder during its rotation, and means for collecting the material from said cylinder during its rotation.

3. In an ice cream freezer, a metal cylinder, means for providing a continuous circulation of a cooling medium over the external surface thereof, mechanism for rotating the cylinder at a high rate of speed, and means for delivering the material to be treated upon the internal surface of the cylinder during the rotation thereof, a fixed scraper to scrape the internal surface of the cylinder during its rotation, with blades, set at an angle to the cylinder surface to feed forward the material to the delivery end of the cylinder and means for collecting the material from said cylinder during its rotation.

4. In an ice cream freezer, a metal cylinder provided with an external casing to form a compartment for the cooling medium, mechanism for rotating the cylinder and casing at a high rate of speed, means for enforcing a continuous circulation of cooling medium through the external compartment during the rotation, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation and means for collecting the material from the cylinder during the rotation thereof.

5. In an ice cream freezer, a metal cylinder provided with an external casing to form a compartment for the cooling me-

dium, mechanism for rotating the cylinder and casing at a high rate of speed, means for enforcing a continuous circulation of cooling medium through the external compartment during the rotation, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation, a fixed scraper to scrape the internal surface of the cylinder, and means for collecting the material from the cylinder during the rotation thereof.

6. In an ice cream freezer, a metal cylinder provided with an external casing to form a compartment for the cooling medium, mechanism for rotating the cylinder and casing at a high rate of speed, means for enforcing a continuous circulation of cooling medium through the external compartment during the rotation, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation, a fixed scraper to scrape the internal surface of the cylinder with blades set at an angle to the cylindrical surface to feed forward the material to the delivery end of the cylinder, and means for collecting the material from the cylinder during the rotation thereof.

7. In an ice cream freezer, a rotatable metal cylinder, with shafts for the ends of the cylinder upon which the cylinder is mounted, an external casing for the cylinder to form a compartment for the cooling medium, with passageways in the shafts and connecting pipes for the cooling compartment to provide means for circulating a cooling medium therethrough, means for rotating said cylinder at a high rate of speed, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation and means for collecting the material from the cylinder during the rotation thereof.

8. In an ice cream freezer, a rotatable metal cylinder, with shafts for the ends of the cylinder upon which the cylinder is mounted, an external casing for the cylinder to form a compartment for the cooling medium, with passageways in the shafts and connecting pipes for the cooling compartment to provide means for circulating a cooling medium therethrough, means for rotating said cylinder at a high rate of speed, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation, a fixed scraper to scrape the internal surface of the cylinder, and means for collecting the material from the cylinder during the rotation thereof.

9. In an ice cream freezer, a metal cylinder with means for applying a cooling medium to the external surface thereof, fixed plates to inclose the cylinder at each end, with a passage through each of said fixed plates for the supply and removal of the material treated and means for rotating said cylinder at a high rate of speed.

10. In an ice cream freezer, a metal cylinder with means for applying a cooling medium to the external surface thereof, said cylinder provided with inwardly projecting end flanges, fixed plates to inclose the flanged cylinder at each end, with a passage through each of said fixed plates for the supply and removal of the material treated and means for rotating said cylinder at a high rate of speed.

11. In an ice cream freezer, a metal cylinder with means for applying a cooling medium to the external surface thereof, said cylinder provided with inwardly projecting end flanges, fixed plates to inclose the flanged cylinder at each end, with a passage through each of said fixed plates for the supply and removal of the material treated, the flange of the cylinder at the supply end overlapping the fixed plate and at the delivery end underlapping the fixed plate and means for rotating said cylinder at a high rate of speed.

12. In an ice cream freezer, a rotatable metal cylinder, with shafts for the ends of the cylinder upon which the cylinder is mounted, an external casing for the cylinder to form a compartment for the cooling medium, with passageways in the shafts and connecting pipes for the cooling compartment to provide means for circulating a cooling medium therethrough, means for rotating said cylinder at a high rate of speed, and fixed plates to inclose the cylinder at each end with a passage through each of said fixed plates for the supply and removal of the material treated.

13. In an ice cream freezer, a rotatable metal cylinder, with shafts for the ends of the cylinder upon which the cylinder is mounted, an external casing for the cylinder to form a compartment for the cooling medium, with passageways in the shafts and connecting pipes for the cooling compartment to provide means for circulating a cooling medium therethrough, means for rotating said cylinder at a high rate of speed, said cylinder provided with inwardly projecting end flanges, and fixed plates to inclose the flanged cylinder at each end, with a passage through each of said fixed plates for the supply and removal of the material treated.

14. In an ice cream freezer, a metal cylinder with means for supplying a cooling medium to the external surface thereof, said cylinder being provided with inwardly projecting end flanges, fixed plates to inclose the flanged cylinder at each end, with a passage through each of said fixed plates for the supply and removal of the material treated, and means for rotating said cylinder at a

high rate of speed, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation, a fixed scraper to scrape the internal surface of the cylinder, and means for collecting the material from the cylinder during the rotation thereof.

15. In an ice cream freezer, a metal cylinder with means for applying a cooling medium to the external surface thereof, said cylinder provided with inwardly projecting end flanges, fixed plates to inclose the flanged cylinder at each end, with a passage through each of said fixed plates for the supply and removal of the material treated, and means for rotating said cylinder at a high rate of speed, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation, a fixed scraper to scrape the internal surface of the cylinder with blades set at an angle to the cylindrical surface to feed forward the material to the delivery end of the cylinder, and means for collecting the material from the cylinder during the rotation thereof.

16. In an ice cream freezer, a metal cylinder with means for applying a cooling medium to the external surface thereof, said cylinder provided with inwardly projecting end flanges, fixed plates to inclose the flanged cylinder at each end, with a passage through each of said fixed plates for the supply and removal of the material treated, the flange of the cylinder at the supply end overlapping the fixed plate and at the delivery end underlapping the fixed plate, and means for rotating said cylinder at a high rate of speed, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation, a fixed scraper to scrape the internal surface of the cylinder, and means for collecting the material from the cylinder during the rotation thereof.

17. In an ice cream freezer, a metal cylinder with means for applying a cooling medium to the external surface thereof, said cylinder provided with inwardly projecting end flanges, fixed plates to inclose the flanged cylinder at each end, with a passage through each of said fixed plates for the supply and removal of the material treated, the flange of the cylinder at the supply end overlapping the fixed plate and at the delivery end underlapping the fixed plate, and means for rotating the said cylinder at a high rate of speed, means for delivering the material to be treated upon the internal surface of the cylinder during the rotation, a fixed scraper to scrape the internal surface of the cylinder with blades set at an angle to the cylindrical surface to feed forward the material to the delivery end of the cylinder, and means for collecting the material from the cylinder during the rotation thereof.

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