June 12, 1923.

1,458,855

E. D. SARGENT

ICE CREAM FREEZER

Filed March 31, 1923

2 Sheets-Sheet 1

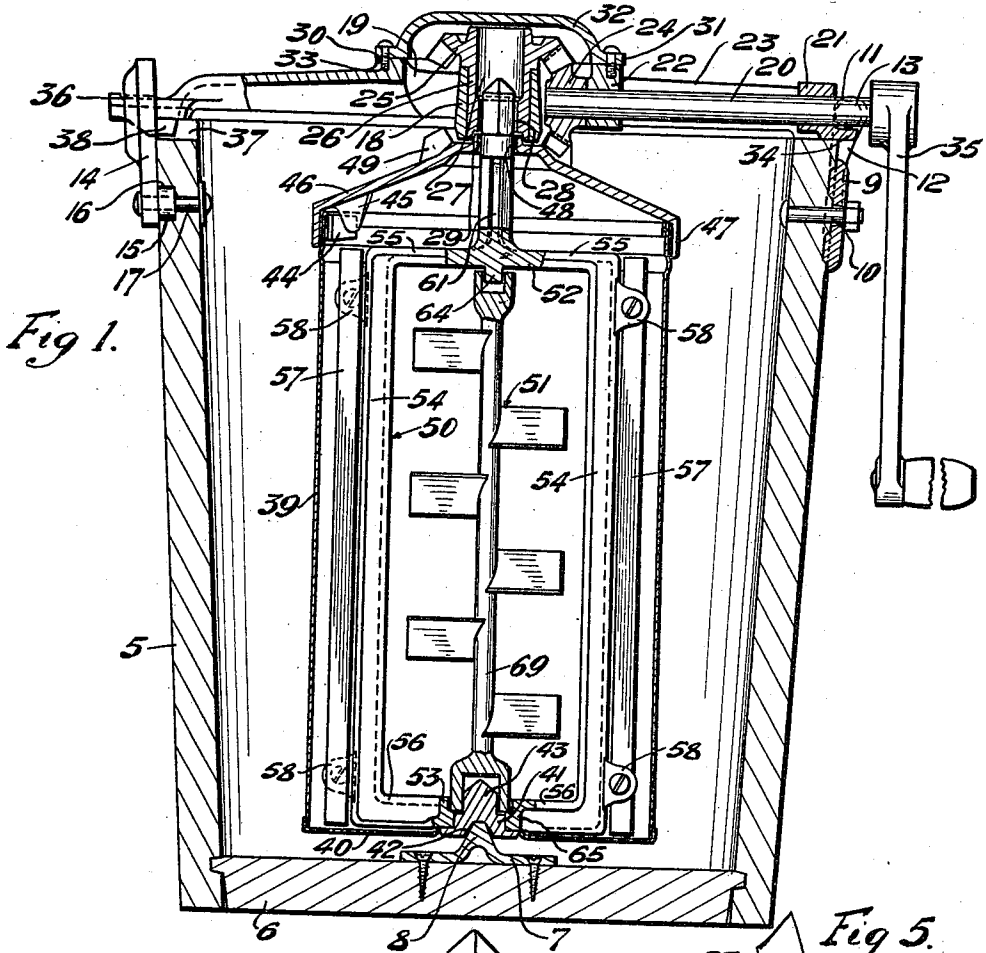


Fig 2.

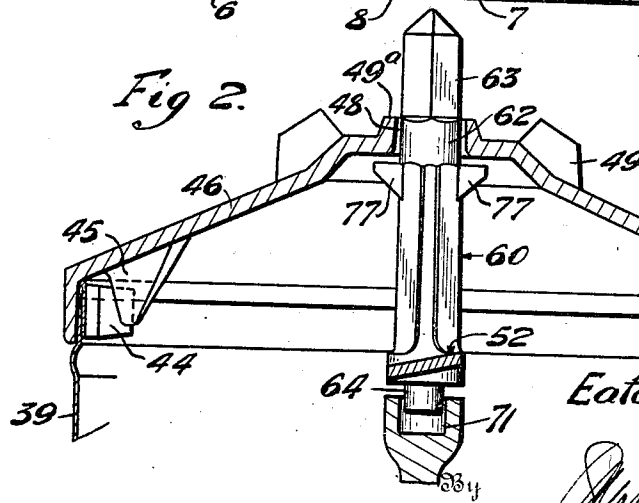
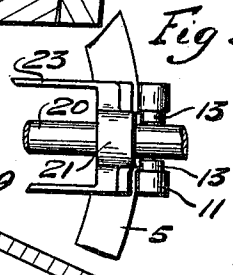


Fig 5.



Inventor

Eaton D. Sargent

By

James L. Norris

Attorney

June 12, 1923.

E. D. SARGENT

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2 Sheets-Sheet 2

Fig 3.

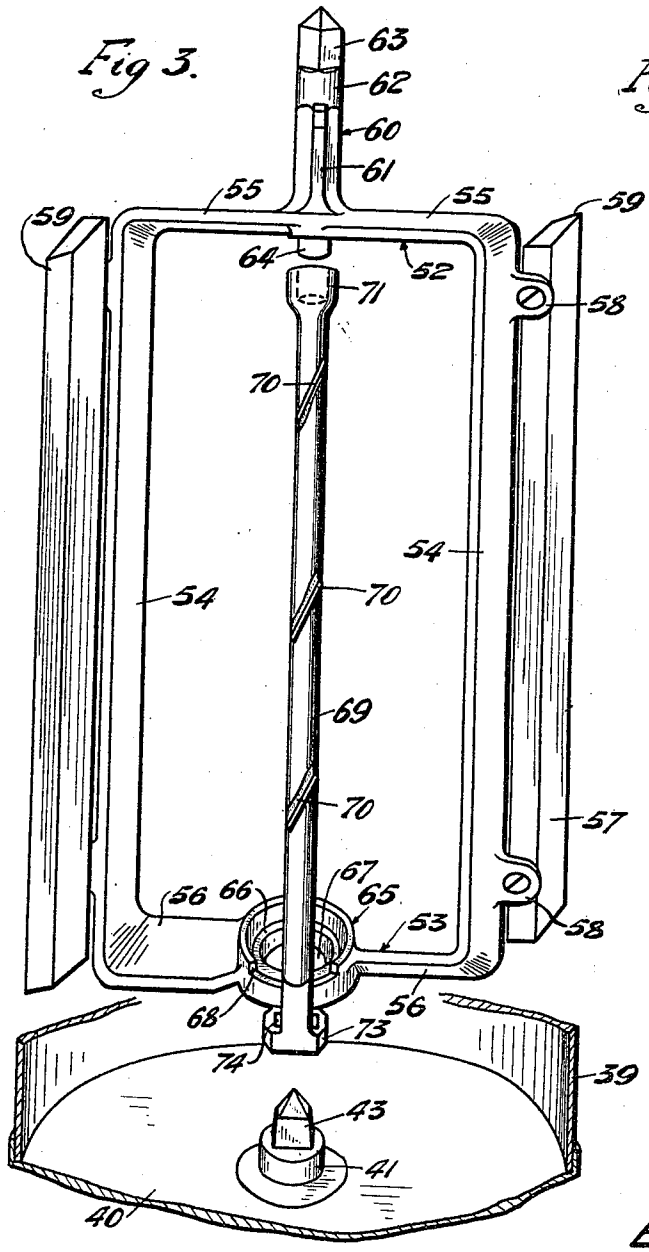
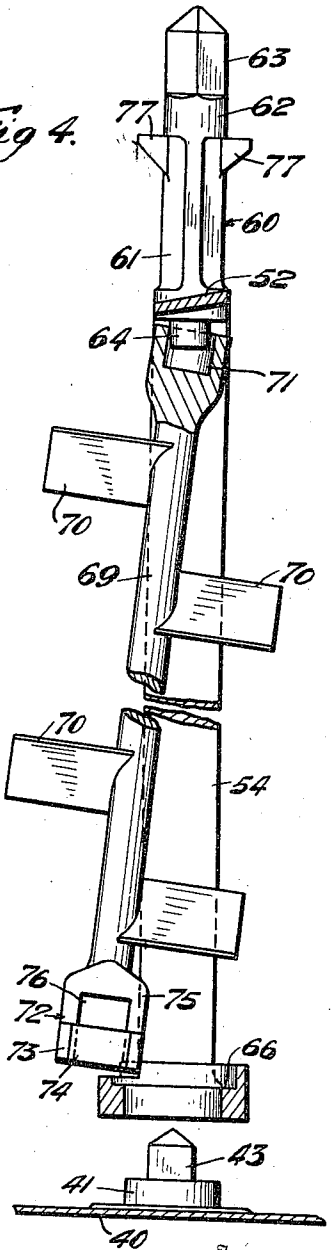


Fig 4.



Inventor

Eaton D. Sargent

By Adams & Norris

Attorney

Patented June 12, 1923. 1,458,855

UNITED STATES PATENT OFFICE.

EATON D. SARGENT, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR TO THE WHITE MOUNTAIN FREEZER CO., INC., OF NASHUA, NEW HAMPSHIRE, A CORPORATION OF NEW HAMPSHIRE.

ICE-CREAM FREEZER.

Application filed March 31, 1923. Serial No. 629,121.

To all whom it may concern:

Be it known that I, EATON D. SARGENT, a citizen of the United States, residing at Nashua, in the county of Hillsborough and State of New Hampshire, have invented new and useful Improvements in Ice-Cream Freezers, of which the following is a specification.

This invention relates to ice cream freezers of that type comprising an ice containing tub or bucket, a can and beaters removably mounted in the tub or bucket and rotatable in opposite directions, and a detachable cross bar or frame carrying operating mechanism including a drive shaft and beveled gears for actuating the can and beaters. The present freezer embodies features of improvement relatively to analogous devices heretofore adopted in ice cream freezers of the type specified, and particularly that shown by Patent No. 416,567, granted to F. P. Chandler December 3, 1889.

The objects of the present invention are, to provide novel means for assembling the beaters in the can and also for separating the one beater from the other, to render all parts thereof easily accessible for cleaning purposes, and to generally improve the details of construction of the several parts of the freezers, including the operating mechanism and means for separably applying said mechanism to the top of the tub or bucket.

The invention consists in the preferred construction and arrangement of the several parts which will be more fully hereinafter described and claimed, reference being made to the accompanying drawings, in which:—

Fig. 1 is a central vertical sectional view of a freezer embodying the features of the invention and showing in addition parts of the outer and inner beaters broken away and the remaining portion of the said beaters illustrated in side elevation;

Fig. 2 is an enlarged transverse vertical section through the upper portion of the can and top therefor together with a part of the inner beater spindle in section and the outer beater spindle partially in section;

Fig. 3 is a perspective view of the beaters on an enlarged scale, showing the inner beater detached from the outer beater and a part of the bottom and lower portion of the can in sectional perspective;

Fig. 4 is a sectional elevation through the beaters and a section transversely through a portion of the bottom of the can, showing the inner beater partially removed from the outer beater, the beaters being broken through at an intermediate point; and

Fig. 5 is a detail top plan view of a bearing plate and a part of the operating mechanism carrying frame at the top of the tub.

The numeral 5 designates the freezer tub or bucket of wood or other suitable material having on the inner side of its bottom 6 a step or bearing 7 consisting of a flat plate with an upwardly projecting tapered stud or bearing boss 8. At the top of the tub or bucket 5 a bearing plate 9 is secured and is suitably fastened, as for instance by means of bolts 10, to the tub or bucket. This bearing plate is formed or otherwise provided with an open hinge bearing 11 prejecting above the upper edge of the tub or bucket and comprising oppositely disposed arms 12 having inwardly projecting studs 13, as clearly shown by Fig. 5. At a diametrically opposite point the tub or bucket is provided with a pivoted hook catch 14, which is suitably connected to the tub and in its preferred construction is formed with a bearing boss 15 that extends into a recess 16, a pivot pin 17 passing through the boss and the wall of the tub or bucket and secured or headed over relatively to both the outer side of the lower portion of the catch and the inner surface of the wall of the tub or bucket.

The cross bar or frame is of skeleton form and essentially of the structure shown by the U. S. Patent No. 416,567, hereinbefore noted, and comprising a central sleeve bearing 18 joined to an annular web 19 in the same manner as illustrated by said patent. A drive shaft 20 is mounted in sleeve bearings 21 and 22 located in a line that passes between the two studs 13 of the arms 12 of the bearing plate 9, the bearings 21 being respectively formed at the one outer extremity of the cross bar or frame 23 and as a part of the web 19. The shaft 20 at its inner end carries a beveled gear wheel 24 revoluble within the annular web 19 and engaging a beveled gear 25 having a depending hub 26 rotatably mounted in and held by the sleeve 18, the said hub 26 being partially tubular, as at 27. This tubular construction of the hub continues upwardly

through the gear 25 and communicates with a lower angular bearing bore or socket 28 continuing through the lower end of the hub. The lower end of the hollow hub 26 around the bore or socket 28 is recessed, as at 29, for a purpose which will be presently explained. The annular web 19 is formed with a circular horizontal seat 30 on its upper side upon which is mounted the horizontal laterally projecting flange 31 of an arched or domed shield or guard 32 that extends over and covers the several gear wheels above the cross bar or frame 23. The lateral flange 31 of the domed shield is provided with perforations or screw holes through which are inserted metal screws or analogous devices 33, which engage screw sockets in the annular web, and whereby the domed shield may be conveniently and quickly removed and replaced as occasion demands. By covering and shielding the gears as explained, there is no liability of the fingers or parts of garments of the operator being accidentally caught therein, and moreover, the ice or freezing mixture can be inserted in or removed from the tub or bucket without liability of clogging the gears. The outer bearing 21 at one extremity of the frame 23 has a lower catch lip or projection 34, which is adapted to removably engage under the studs 13 of the arms 12 of the bearing plate 9, the inner ends of these studs being spaced far enough apart to permit the shaft 20 to be continued outwardly beyond the side of the tub or bucket to receive on operating crank handle 35, which may be removably applied to the outer end of the shaft. The opposite extremity of the frame 23 is projected in the form of a shouldered catch plate or extension 36 over which the hook catch 14 is adapted to engage, and to uphold this extremity of the frame 23 in stable position when applied, the upper edge of the side of the tub or bucket is formed with a slot 37 which is engaged by a depending lug or key 38 formed as a part of the plate or extension 36, and whereby the extremity of the frame engaged by the hook catch 14 will be prevented from working loose or out of place and thereby maintain the operating mechanism in proper associated relation with the remaining parts of the freezer for actuating the latter in a manner which will be hereinafter described. It will be understood that the revolving parts of the operating mechanism may be suitably lubricated as found necessary.

The can 39 is of the usual metal formation and may vary in capacity in accordance with the general proportions and dimensions of the complete freezer. The bottom 40 of the can has a central socket 41 fixed therein and provided with a downwardly opening socket recess 42 into which the tapered stub or bearing boss 8 of the step or bearing 7 secured to the bottom of the tub or bucket is adapted to project as a pivot or central fulcrum means for the can. The socket 41 is also formed with an upwardly projecting angular stud 43 in vertical alinement with the socket recess 42. At the upper open end and on the inner side of the cam 39 is a contact lug 44, which is adapted to be engaged by a depending operating lug 45 integrally formed with a top or cover 46 for the can. The top or cover 46 is detachable and has a peripheral flange 47 to loosely fit over the upper open end of the can 39 and also has a central top opening 48 surrounded by gear teeth 49, which provide an annular gear means integrally formed with the top or cover 26 to mesh with the beveled gear wheel 24 on the inner end of the shaft 20. The top or cover 46 is of conical formation and around the central opening 48 is stepped or shaped to conform to the lower contour of the sleeve 18 and hollow hub 26, a flange 49^a surrounding the top opening 48 and extending into the recess 29 in the lower end of the hub 26 around the socket bore 28. Through the medium of the top or cover 46, which is actuated by the gear wheel 24 engaging the gear teeth 49, the can 39 is rotated by engagement of the lugs 45 and 44.

The agitating means of the improved freezer comprises an outer beater or stirrer 50 and an inner beater or stirrer 51. The outer beater or stirrer consists of a substantially rectangular frame composed of integral parts preferably made of non-corrosive metal, or metal treated to resist corrosion, and having top and bottom cross members 52 and 53 and vertical side members 54. The top cross members comprise centrally coinciding arms 55 which have a reverse angle or torsion and the lower cross member 53 is likewise composed of opposite arms 56 with a more pronounced reverse angularity or torsion. The vertical side members 54 are also disposed at reverse angles, and this variation in the angular formation of the cross members and side members is of material advantage in the beating and stirring action of the outer beater. The side members 54 have reversely arranged vertically disposed scrapers 57 loosely attached to ears 58 projecting outwardly from said members, said scrapers being preferably formed of wood and having beveled scraping edges 59, to operate closely with relation to the inner surface of the side of the can 39 and constantly loosen up and move any of the frozen cream that might otherwise solidly adhere to the can body, with disadvantage in the freezing operation and subsequent removal of the frozen cream from the said body. The spindle means for the double beaters is sectional and a part thereof is integrally formed with, or otherwise secured

to, the top cross member 52 of the outer beater and projects upwardly a suitable distance to provide an operating stem 60, which is longitudinally ribbed for a portion of its length, as at 61, to lighten the same and also conserve its necessary strength, and has a smooth cylindrical portion 62 with an angular extremity 63 rising therefrom, the cylindrical portion engaging the opening 48 of the top or cover 46 and the angular extremity 63 fitting in the lower socket 28 of the hub 26, the said socket having a contour similar to the extremity 63 and whereby the hub driven by the gear 25 from the gear wheel 24 on the inner end of the shaft 20 will effect a positive rotation of the stem 60 and the outer beater 50 with its scrapers or scraper members 57. The angular extremity 63 and smooth cylindrical bearing portion 62 of the stem 60 separably extend through and into the opening 48 of the top or cover 46 and the upper end of the angular extremity 63 projects into the hollow portion 27 of the hub 26 above the socket 28, so that the operating gear mechanism may be readily removed or disengaged from the upper end or extremity 63 of the stem and the top or cover 46 subsequently easily drawn upwardly thereover, and conversely, the assemblage of these parts may be as readily accomplished. Depending below the center of the top cross member 52 of the outer beater 50 is a stud 64, and in the center of the lower cross member 53 and integrally formed with the arms 56 is a horizontally disposed bearing collar 65 having an annular shoulder 66 therein at a suitable distance below the upper edge of said collar and surrounding the opening 67 through the collar. A part of the wall of the collar 65 above the shoulder 66 is cut away or formed with a slot 68 which has a depth slightly less than the depth of the annular shoulder 66 below the upper edge of the collar 65, as clearly shown by Fig. 4. The remaining section of the spindle is in the form of a vertical rod 69 having angularly disposed blades 70 radially projecting therefrom in alternation in opposite directions, as shown by Fig. 4, this rod 69 or remaining section of the spindle and the blades 70 constituting the inner beater or stirrer. The upper end of the rod 69 is also provided with a socket 71, to removably receive the stud 64 depending from the top cross member 52 of the outer beater or stirrer. The lower end of the rod 69 is formed with a combined coupling and bearing head 72 comprising a lower socket 73 having an angular opening 74 extending vertically therethrough and integrally formed with a yoke 75 with a transverse opening 76, the yoke being continuous with the lower extremity of the rod 69. The opening 76 is over the socket opening 74 and the latter has an angular contour, the purpose of this construction being to permit easy cleaning of the lower end of the rod 69 and prevent accumulation and packing of material therein, particularly sugar, with obvious advantages in maintaining the inner beater in good working and cleanly condition. It will be readily understood that the formation of the combined coupling or bearing and socket at the lower end of the rod 69 with the open structure just explained will facilitate the removal of any material which would otherwise have a tendency to pack or lodge therein. The socket 73 is substantially square in its contour and may be moved outwardly and inwardly through the slot 68, to respectively separate the inner beater 67 from the outer beater and assemble the said inner beater with the outer beater. When the head 72 at the lower end of the rod is in engagement with the bearing collar 65, portions of the lower edge of the socket 73 bear on parts of the annular shoulder 66, and the lower head 72 with the remaining parts of the inner beater are maintained in operative associated relation with the outer beater by the angular stud 43 of the socket 41 secured to the center of the bottom 40 of the can 39, as clearly shown by Fig. 1, and by thus assembling the inner beater relatively to the outer beater, the said inner beater will rotate with or in the same direction as the can 39; whereas the outer beater 50 will rotate in a reverse direction within the can. The socket 71 at the upper end of the rod 69 of the inner beater is of greater depth than the length of the stud 64 and the said stud projects only partially into this socket, and by this means the rod and inner beater as a whole may be elevated a sufficient distance to permit the lower edge of the socket 73 of the head 72 to clear the shoulder and register with the slot 60, to permit the said inner beater to be detached or separated from the outer beater, as shown by Fig. 4. The inner beater when removed is disposed at an angle of inclination, and when this beater is re-assembled in operative relation to the outer beater, it will likewise be disposed at an angle and set in true vertical position with the lower edge of the socket 73 of the head 72 bearing on the shoulder 66 of the collar 65 in the manner hereinbefore explained. The distance between the surface of the collar 66 and the lower end of the stud 64 is less than the length of the rod 69, head 72 and socket 61, and there is therefore no liability of the inner beater becoming accidentally disengaged from the outer beater during the operation of these active elements of the ice cream freezer. Means are provided for preventing the outer and inner beaters from becoming disengaged from the stud 43 of the lower socket 41 and consists of oppositely projecting studs or lugs 77 formed as parts of

the stem 60 at the lower terminal of the cylindrical bearing surface 62, the upper contacting edges of these stops or lugs being slightly below the inner central upper portion of the top or cover 46 when the latter is applied to the can at such close relation to the upper part of the cover as to prevent the stem 60 from moving vertically any material extent, or a less distance than would be necessary to effect a separation of the collar 65 from the stud 43 and, likewise, the socket 71 of the head 72 at the lower end of the beater from the same stud, and moreover, this stop means will prevent separation of the stud 64 from the socket 71 at the upper end of the rod or sectional part of the spindle of the two beaters. This relationship of the stops or lugs 77 and the upper part of the top or cover 46 is clearly illustrated by Fig. 2, and it will be seen that the normal distance between the inner surface of the upper portion of the top or cover and the upper edges of the stops or lugs 77 is less than that which would be necessary to effect a separation of the united inner and outer beaters, or the inner beater from the outer beater. Moreover, the proportions of the parts are such that when the socket 42 at the center of the bottom 40 of the can 39 engages the stud or bearing boss 8 projecting up from the bottom 6 of the tub or bucket 5, disengagement and displacement of the can 39 during its operation will be obstructed. This obstruction to displacement of the can during operation within the tub is due to the contiguous position of the upper edge of the collar 40 with the upper terminal wall of the recess 29 in the bottom of the hub 26.

From the foregoing description the operation of the improved freezer will be understood, and it will be seen that the operating mechanism is all carried in one unit and readily applicable to and removable from the top of the tub or bucket, and, likewise, the cover may be applied over the stem 60 after the beaters have been inserted in the can in operative position, the cover holding the beaters in proper vertical position within the can. As hereinbefore explained, the operating mechanism carried by the cross bar or frame may be readily applied over the upwardly projecting angular extremity 63 of the steam 60, and after the said frame or cross bar is locked down on the top of the tub, the shaft 20 may be rotated to effect rotation of the can and the beaters within the latter, to thoroughly mix and agitate the contents of the can. It will also be understood that the refrigerant preferably used in the freezer will be the well known combination of ice and salt. After the contents of the can have been frozen, the frame or cross bar carrying the operating mechanism may be detached and the top or cover 46 removed, to permit withdrawal of the beaters and the frozen contents of the can may then be packed down and the cover replaced on the can, to maintain the frozen mixture in proper condition as described.

It will also be understood that all the parts of the improved freezer except the tub or bucket 5 will be formed of metal which may be of such character or treated to resist corrosion, and, likewise, the operating machinism and the parts of the frame or cross bar carrying the same may be galvanized or otherwise coated or treated to render the same resistful to corrosion. The same convenience in applying and removing the frame or cross bar carrying the operating mechanism for actuating the can and beaters therein as disclosed in the patent hereinbefore noted is present in the improved structure.

What is claimed as new is:

1. In an ice cream freezer, a tub, a can rotatably and removably mounted in the tub, a double rotating agitating and mixing means removably mounted in the can and consisting of an outer beater and an inner beater, the inner beater being loosely and as a whole confined within and laterally separable from the outer beater, and mechanism supported by the tub in separable relation to the can and agitating and mixing means for operating the latter.

2. In an ice cream freezer, a tub, a can rotatably and removably mounted in the tub, a rotating double agitating and mixing means removably mounted in the can and consisting of an outer beater, and an inner beater each beater having a section of an operating spindle as a part fixed thereto, the spindle section of the inner beater being less in length than and laterally separable from the outer beater, and mechanism removably associated with the can and agitating and mixing means for operating the latter.

3. In an ice cream freezer, a tub, a can rotatably and removably mounted in the tub, a rotating double agitating and mixing means removably mounted in the can and consisting of an outer beater and an inner beater, each beater having a section of an operating spindle as a part fixed thereto, the spindle section of the outer beater extending upwardly from the top of the latter and the spindle section of the inner beater being less in length than and laterally separable from the outer beater, and mechanism removably associated with the can and beaters for operating the latter.

4. In an ice cream freezer, a tub, a can rotatably and removably mounted in the tub, a rotating double agitating and mixing means removably mounted in the can and consisting of an outer beater and an inner beater each comprising an independ-

ent fixed part of a sectional spindle, the outer beater having upper and lower members provided with means for separably holding the spindle section of the inner beater as a whole within the outer beater between the upper and lower members of the latter, and mechanism removably associated with the can and agitating and mixing means for operating the latter.

5. The combination with the can of an ice cream freezer, of a rotating double agitating and mixing means removably mounted therein and consisting of an outer beater and an inner beater each having means for rotating the same and for holding the beaters in operative position within the can, the inner beater as a whole being vertically movable in the outer beater and removably confined between and laterally separable from the upper and lower portions of the said outer beater.

6. An agitating and mixing means adapted to be rotated, comprising an outer beater having scraper bars at opposite sides attached thereto and upper and lower members, a stem fixed to and projecting upwardly from the upper member of the outer beater, and an inner beater confined as a whole between the upper and lower members of the outer beater and having a spindle with means at its upper and lower extremities for separably engaging the upper and lower members of the outer beater and laterally removable from the latter.

7. The combination with a can having a lower stud projecting upwardly thereinto, of an agitating and mixing means removably mounted in the can and comprising an outer beater with a lower collar and an upper depending stud, an inner beater having a lower socket head to removably engage the collar and an upper socket to separably engage the stud, and means for operating the can and the agitating and mixing means as a whole.

8. The combination with a can having a lower stud, of an agitating and mixing means removably mounted in the can and comprising an outer beater with a lower apertured and shouldered collar to fit over the said stud and an upper stud depending from the center thereof, an inner beater having a rod with beating blades projecting therefrom and formed with a socket head at its lower end to removably engage the collar at the lower portion of the outer beater and the stud of the can, said rod also having a socket at its upper end for removable engagement with the stud of the outer beater, and means for operating the can and beaters.

9. The combination with a can having a stud projecting upwardly from the center of the bottom thereof and a removable collar provided with means for rotating the can, an agitating and mixing means consisting of an outer beater with a lower slotted collar and an upper depending stud, an inner beater having a rod with beating blades projecting therefrom and a lower socket head to engage the stud of the can and an upper socket to engage the stud of the outer beater, the inner beater being vertically movable within the outer beater and the lower end laterally shiftable through the slotted collar to remove the inner beater from the outer beater, and means for operating the can and beaters.

10. In an ice cream freezer, a tub, a can rotatably mounted within the tub and having a removable cover, an agitating and mixing means rotatably and removably mounted in the can and consisting of an outer beater with a lower collar to engage the stud of the can, an inner beater having its upper extremity removably engaging the top portion of the outer beater and having a lower socket head with an opening therethrough for cleaning purposes, the socket head being laterally movable from the collar of the outer beater and also adapted to engage the can stud, and means for operating the can and beaters.

11. In an ice cream freezer, a tub, a can rotatably and removably mounted in the tub, a double rotating agitating and mixing means removably mounted in the can and consisting of an outer heater and an inner beater, the inner beater being loosely and as a whole confined within the outer beater and vertically movable within the latter to permit said inner beater to be laterally separated from the outer beater, the outer beater being supported by the top and bottom portions of the can and the inner beater being supported by the outer beater, and mechanism supported by the tub in separable relation to the can and agitating and mixing means for operating the said can and means.

12. An agitating and mixing means for an ice cream can and the like, consisting of an outer beater having a fixed operating stem rising from the center of the top thereof, and an inner beater comprising a central stem section of less length than the distance between the top and bottom portions of the outer beater and carrying beater blades, the inner beater being vertically movable within the outer beater and laterally separable from the latter.

13. A double rotatable agitating and mixing means for removable disposition in an ice cream can and the like, consisting of an outer beater having upper and lower ends and side members of integral construction, the upper end member having an operating stem fixed thereto and extending above the same, and an inner beater having a centrally arranged stem with beater blades and vertically shiftable between the upper and lower

ends of the beater and laterally movable into and outwardly from the said outer beater, the upper and lower ends of the stem of the inner beater and the upper and lower end members of the outer beater having engaging means for operably and separably supporting the inner beater in the said outer beater.

14. A double rotatable agitating and mixing means for removable mounting in an ice cream can and the like, consisting of an outer beater having reversely arranged scrapers loosely attached to opposite sides, and an inner beater having a spindle section and blades and mounted within the outer beater, the said inner beater being laterally removable from the outer beater by having the spindle section of the inner beater of less length than the distance between the upper and lower portions of the outer beater for vertical movement within the latter.

15. In an ice cream freezer, a tub having a bearing plate at the top portion thereof provided with inwardly projecting studs having inner spaced ends, a pivoted hook catch mounted on a diametrically opposite portion of the tub, a gearing supporting frame having opposite extremities to respectively engage under the said studs in a removable manner and the hook catch, the said gearing supporting frame including a drive shaft which projects outwardly between the said studs and provided with an operating handle, a can with a cover mounted in the tub, and agitating means removably mounted in the can and in part projecting through the cover, the gearing of the frame engaging the projecting part of the agitating means and the cover for rotating said can and agitating means.

In testimony whereof I have hereunto set my hand.

EATON D. SARGENT.

Witnesses:

JOSEPH F. HARRISON,

R. JOE DEW.