Nov. 3, 1936. L. A. M. PHELAN ET AL 2,059,604

CONFECTION FREEZER

Filed March 26, 1934 4 Sheets-Sheet 1

Fig. 1.

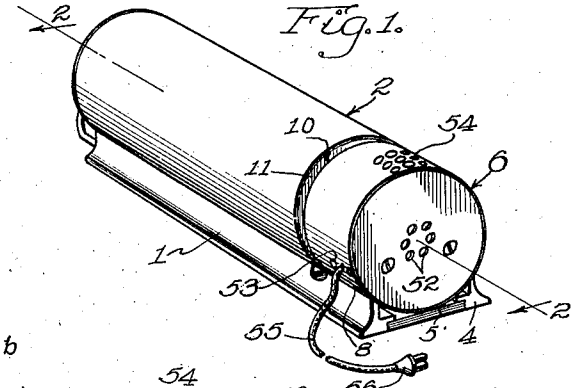


Fig. 3A.

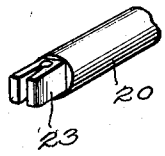


Fig. 2.

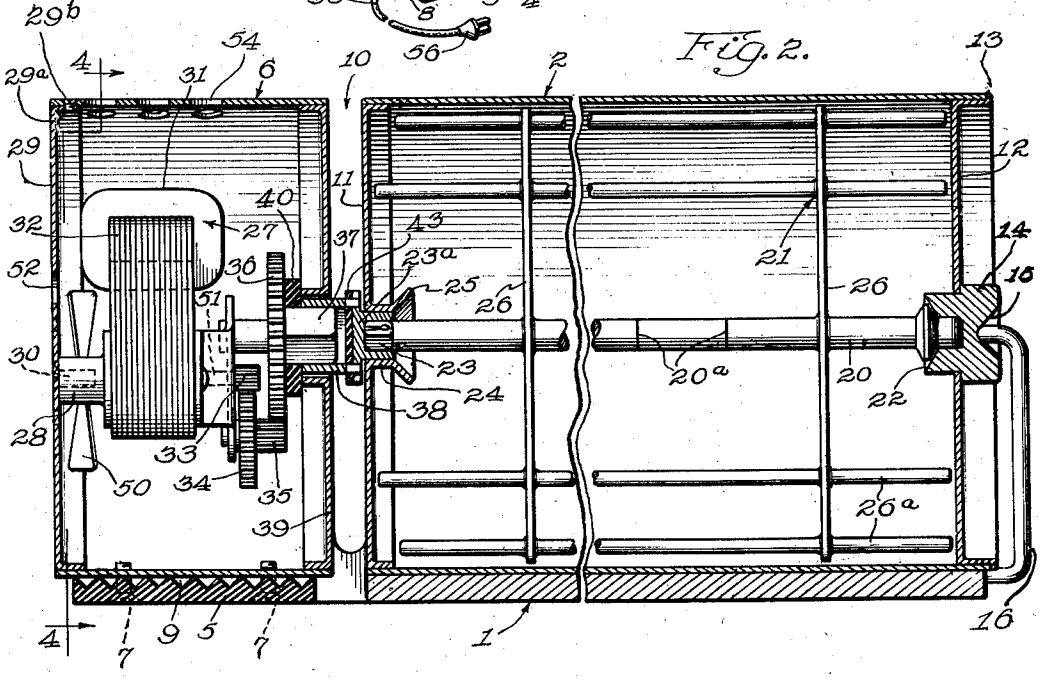
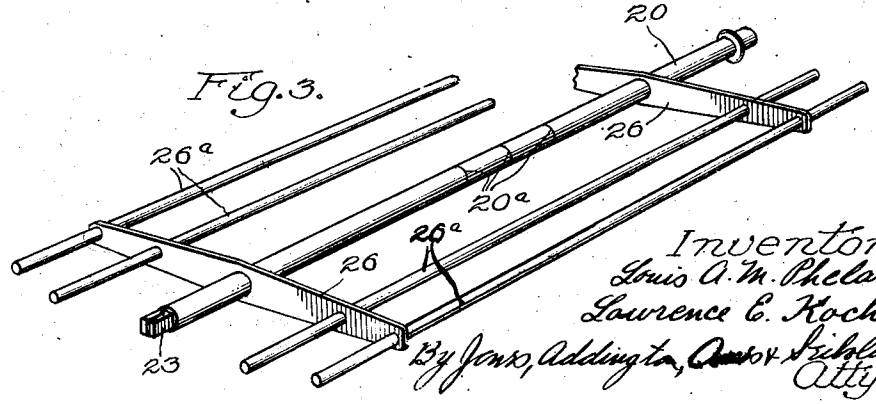


Fig. 3.



Inventors:
Louis A. M. Phelan
Lawrence C. Koch
By Jones, Addington, Amos & Nichols.
Attys.

Nov. 3, 1936. L. A. M. PHELAN ET AL 2,059,604

CONFECTION FREEZER

Filed March 26, 1934 4 Sheets-Sheet 2

Fig. 4.

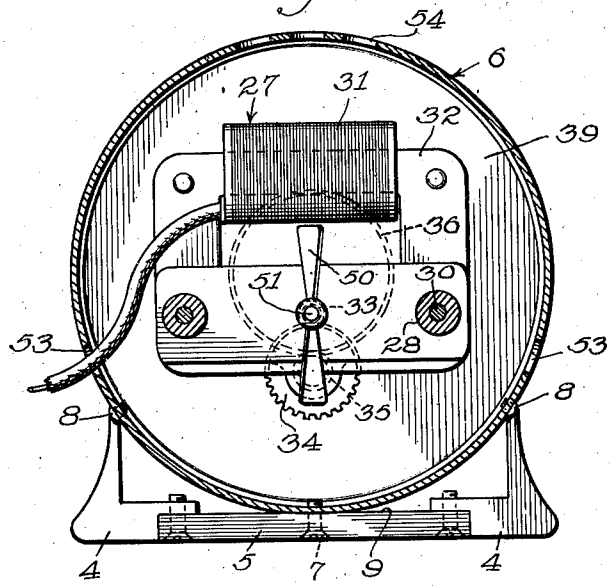


Fig. 5.

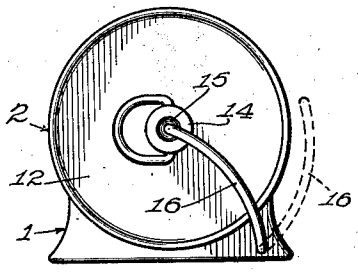


Fig. 6.

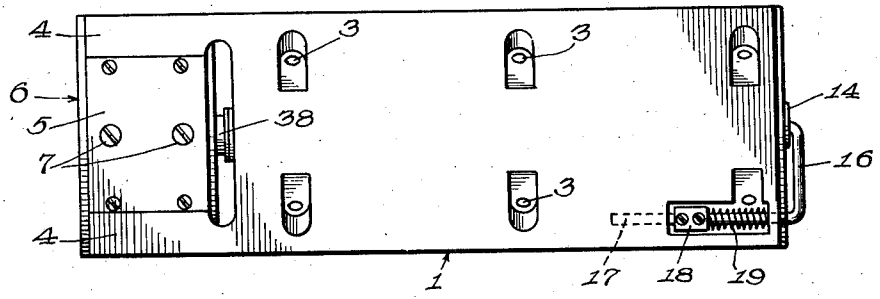


Fig. 7.

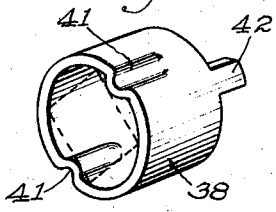


Fig. 8.

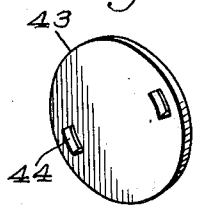
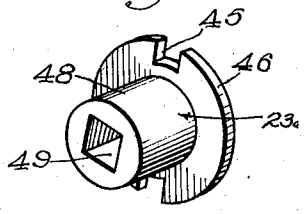


Fig. 9.



Inventors:
Louis A. M. Phelan
Lawrence E. Koch
By Jones, Addington, Anson & Aibel Attys.

Nov. 3, 1936. L. A. M. PHELAN ET AL 2,059,604

CONFECTION FREEZER

Filed March 26, 1934 4 Sheets-Sheet 3

Fig. 10.

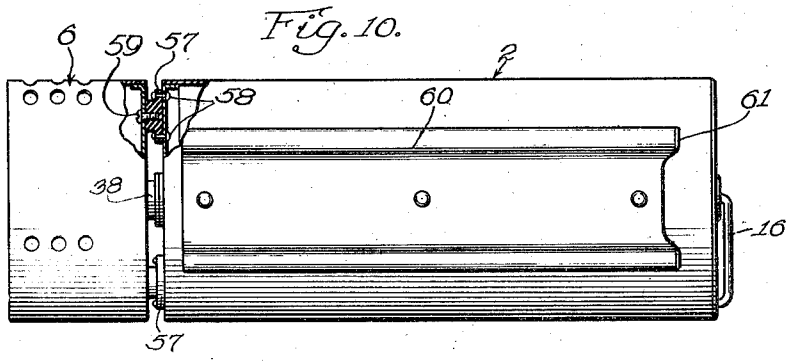


Fig. 11.

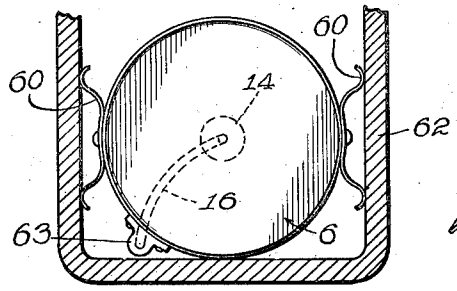


Fig. 12.

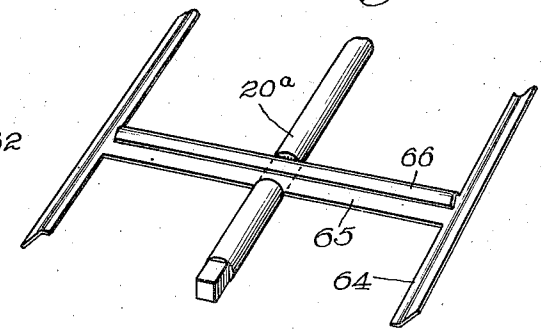


Fig. 13.

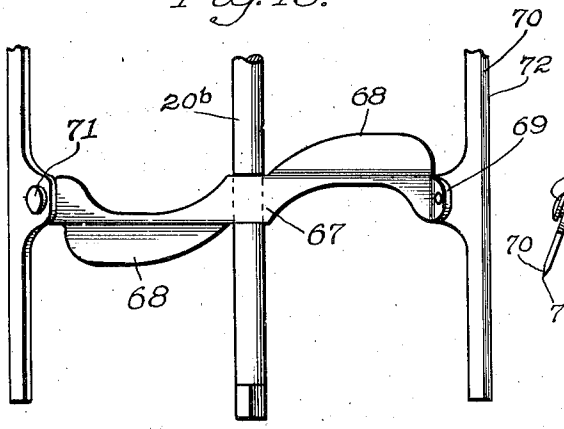
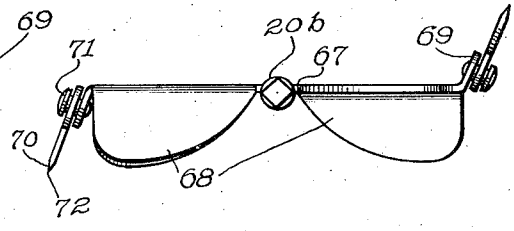


Fig. 14.



Inventors:
Louis A. M. Phelan
Lawrence E. Koch
By Jones, Addington, Ames & Seibold Attys.

Nov. 3, 1936. L. A. M. PHELAN ET AL 2,059,604

CONFECTION FREEZER

Filed March 26, 1934 4 Sheets-Sheet 4

Fig. 15.

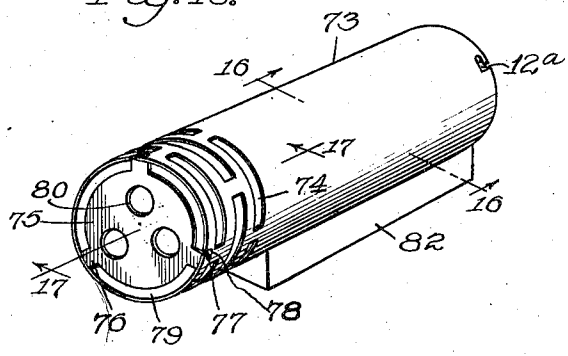
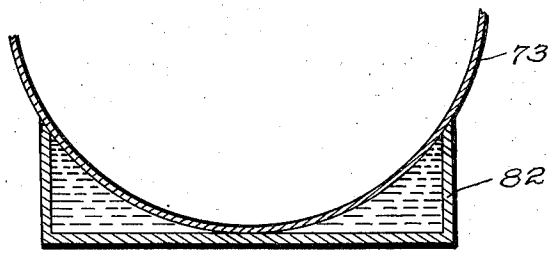


Fig. 16.



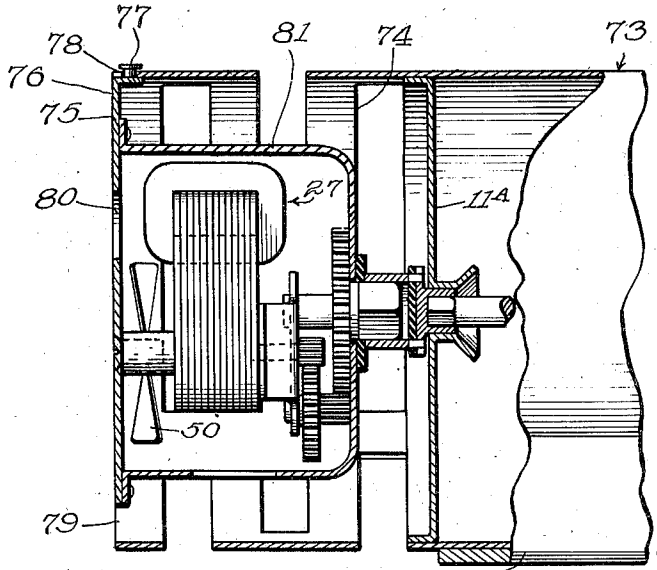


Fig. 17.

Inventors:
Louis A. M. Phelan
Lawrence E. Koch
By Jones, Addington, Ames & Sibold
Attys:

Patented Nov. 3, 1936 2,059,604

UNITED STATES PATENT OFFICE

2,059,604

CONFECTION FREEZER

Louis A. M. Phelan, Chicago, Ill., and Lawrence E. Koch, Beloit, Wis.; said Koch assignor to said Phelan

Application March 26, 1934, Serial No. 717,358

3 Claims. (Cl. 259—110)

This invention relates to confection freezers, such as ice cream batch freezers, for use in connection with electrical household refrigerators or with any of the usual household devices wherein refrigeration is mechanically controlled.

More particularly the invention relates to an electrically operated device wherein frozen confections, such as ice cream, may be prepared expeditiously in a simple and convenient manner in the usual household electrically or gas operated refrigerator. In this device the entire operation is automatic after the device is placed in the refrigerator and connected to a suitable power source.

It is an object of the present invention to provide an extremely simple and compact device which may be designated herein as an ice cream freezer and which may be readily inserted in, or removed from, the freezing chamber or so-called ice cube chamber of an electrically or gas operated household refrigerator, and in which the freezing will then be accomplished expeditiously without the attention of an operator.

A further object is the provision of an ice cream freezer for refrigerators in which the cream, custard or other material commonly known as the mix, may be easily and conveniently inserted by the user, and in which the heat will be quickly extracted therefrom by the combined action of conduction, convection and radiation, due to the new and novel construction of this invention.

The present invention also provides a motor-operated ice cream freezer for use in connection with household refrigerators of the common form now on the market, in which the motor is substantially heat-insulated from the freezing or mix chamber and in which transmission of heat from the motor to the mix chamber is substantially eliminated.

It is also an object to provide a freezer of the character described having a minimum number of parts necessary to be removed or replaced during the normal use of the device.

Another object is the provision of an ice cream freezer for use with the usual household mechanical refrigerator, which is of comparatively small size relative to its capacity and which is extremely compact and may easily be inserted in a standard form of freezing compartment of the usual household refrigerator.

These desirable features of the present invention are the result of the construction, arrangement and assembly of the parts whereby the device comprises substantially a single elongated unit, preferably substantially cylindrical in form and of uniform diameter over its entire length, thereby being easily inserted in the freezing or ice cube compartment of a household mechanical refrigerator, and in which the only parts necessary to be removed in the normal use of the device are a cover and an agitator which may be easily removed and replaced, and are retained in operative position by a single easily operated retaining device.

The embodiments illustrated and described herein provide a motor operated ice cream freezer for mechanical refrigerators which requires no attention after being filled and inserted in such a refrigerator, and in which the type and power and other characteristics of the motor bear such a relation to the finished frozen consistency of the product, that the thickening and freezing of the product may stall the motor when the confection has reached a predetermined consistency, and the motor may remain stopped or stalled on the line without the necesity for disconnecting the motor from the power line and without injury to the motor or the finished product. Also, the above characteristics are incorporated in a structure having peculiarly advantageous thermal insulating characteristics.

The construction of the present invention and the relation of parts is such that the device may be very easily cleaned and the possibility of leakage of the mix from the mix chamber to the motor chamber is substantially eliminated. The entire device may be immersed in water without injury to any of the parts, or the motor may be easily removed and inserted if desired.

It is another object to provide an efficient motor operated device of the character described having an agitator which eliminates friction with the mix housing, thereby greatly increasing freezing efficiency by eliminating friction and heat generation on the most effective freezing surface, and the construction of which also minimizes friction between the agitator and the mix.

The instant invention provides a compact, easily cleaned device which may be dipped bodily in water without injury and which may, due to weight distribution, be vertically positioned on a support for filling; may be easily sealed and inserted horizontally in the freezing compartment of a household mechanical refrigerator without danger of leakage, and will require no further attention after filling and insertion in the refrigerator.

It is also an object to provide a device of the character described which is of comparatively

few parts; cheap to manufacture; easy to assemble; convenient in use; and which will not easily get out of order.

We are aware that ice cream freezers for use in household refrigerators have previously been manufactured for sale. However, these devices have usually been designed for attachment to ice cube trays or to other parts of the refrigerators and have been of a complicated structure, inconvenient in use and requiring considerable time and skill in adjustment and use, and they have also been difficult to clean and to maintain in a sanitary condition, and have generally been adaptable only to a particular design of refrigerator.

If refrigerators are designed in the future to provide a lower temperature, particularly in the freezing compartment, the present invention will be adaptable thereto with a consequent reduction in freezing time as well as in current consumption.

The present invention provides a comparatively large capacity in an extremely small structure, the embodiment illustrated being adapted for use in any of the ordinary household refrigerators where a sufficiently low temperature may obtain, and while it may be made in various sizes, a three pint capacity may be obtained in a tubular or cylindrical structure only substantially three and one-half inches in diameter and eleven inches long.

Further objects will be apparent from the specification and the appended claims.

In the drawings:

Figure 1 is a perspective view of an embodiment of the invention and illustrates a base having a mix chamber and a motor chamber thereon, and further illustrates a method of heat or thermally insulating the motor chamber from the mix chamber.

Fig. 2 is a longitudinal vertical section through the embodiment illustrated in Fig. 1 and taken on a line substantially corresponding to line 2—2 of Fig. 1.

Fig. 3 is a perspective view of a preferred form of agitator.

Fig. 3A is a fragmentary perspective view of the end of the agitator shaft adjacent the motor.

Fig. 4 is a vertical transverse section through the motor chamber and taken on a line substantially corresponding to line 4—4 of Fig. 2.

Fig. 5 is an end elevation of that end of the freezer opposite the motor and in which the mix is inserted, and illustrates the method of retaining the cover of the mix chamber snugly in position.

Fig. 6 is a bottom view of the assembled device.

Fig. 7 is a perspective view of the transmission bushing forming a part of the universal or flexible joint connection between the motor and the agitator.

Fig. 8 is a perspective view of a heat or thermal insulating disc or washer used in connection with the universal joint member shown in Fig. 7, and by means of which the motor is connected to the agitator.

Fig. 9 is a perspective view of the driven part of the universal joint or flexible transmission device and which operates in conjunction with the members shown in Figs. 7 and 8, and is arranged to receive and drive the agitator shaft.

Fig. 10 is a side elevation of an embodiment in which the base is eliminated, and heat conducting resilient members are secured to the sides of the mixing chamber and arranged to support the device in a refrigerator freezing chamber. The base may also be used in this embodiment if desired.

Fig. 11 is an end view of the embodiment illustrated in Fig. 10, after insertion in a refrigerator freezing chamber.

Fig. 12 is a perspective view of another form of agitator.

Fig. 13 is a top plan view of still another form of agitator.

Fig. 14 is an end view of the agitator illustrated in Fig. 13.

Fig. 15 is a perspective view of an embodiment in which both the motor chamber and mix chamber are formed by a single cylindrical casing.

Fig. 16 is a fragmetary sectional view taken on a line substantially corresponding to line 16—16 of Fig. 15, and illustrates one type of base.

Fig. 17 is a longitudinal vertical section through the motor chamber and taken on a line substantially corresponding to line 17—17 of Fig. 15.

Referring to the drawings in detail, one embodiment illustrated comprises an elongated base 1 which is preferably of light weight material such as aluminum, but may be of any suitable material preferably of high heat conducting characteristics. A cylindrical confection or mix container or housing 2 is supported on the base 1 and secured thereto by any suitable means, such as rivets 3 (Fig. 6), whereby a substantially large portion of the surface of the base is in intimate and close heat conducting relation with the container 2.

The base 1 is provided with rearwardly extending arm portions 4 to which is secured a heat insulating member 5 for supporting a cylindrical motor housing 6 which latter is of substantially the same diameter as the mix chamber housing 2. The motor housing 6 may be secured to the insulating member 5 by means of screws 7. Also, as illustrated in Fig. 4, the motor housing 6 is rigidly retained in position relative to the base 1 by means of heat insulating bushings or rivets 8 which may be inserted in the motor housing in a position to rest against the upper edges of the base arms 4. The upper surface of the insulating support 5 may be corrugated as shown at 9 (Fig. 2), or otherwise arranged to provide air circulation between the member 5 and the motor housing. This method of supporting and thermally insulating the motor housing from the base 1 substantially eliminates or greatly minimizes conduction of heat from the motor housing and the motor to the mix chamber through the base 1. In order to further prevent heat conduction between the motor housing and the mix chamber, these units are spaced a short distance apart on the base substantially as shown at 10 to provide air circulation therebetween and the dissipation of heat by convection. The transmission from the motor to the agitator in the mix chamber is further thermally insulated in a manner which will be described later.

The mix chamber housing 2 comprises a cylindrical casing having a fixed wall or end plate 11 secured in the end adjacent the motor housing, and a removable cover 12 in the opposite end. In the present instance, the cover 12 telescopes slightly within the cylindrical portion 2 and is provided with a flange 13 engaging the outer end of the cylinder. This cover is provided with a centrally located bushing 14 which is secured in the cover by a forced fit or any other suitable means, and is provided at its outer end with a

conical central depression 15 having angular sides and arranged to easily receive and center an inturned end of a spring-pressed pivoted locking or retaining arm 16.

The retaining arm 16 which is preferably formed of a small diameter rod, is provided with an elongated inwardly extending portion 17 which extends into and is slidably supported in a suitable bearing opening in the end of the base 1 as shown in Figs. 5 and 6. A collar 18 is secured to the rod as shown in Fig. 6, and a compression spring 19 on the rod and between the collar and the base retains the arm 16 snugly in releasable engagement with the centering bushing 14. In order to remove the cover, it is only necessary to pull the arm 16 outwardly and move it to the dotted line position shown in Fig. 5, and the cover may then be easily removed and replaced.

The bushing 14 also extends inwardly and forms a bearing for the outer end of a shaft 20 of an agitator 21. This bearing is provided with a counter-sunk opening 22, whereby the shaft 20 will be automatically seated in the bearing when the cover is replaced. The opposite end of the shaft 20 is provided with a squared portion 23 which is removably supported in a suitable co-operating driven member 23a extending into the closed end 11 of the mix housing and forming a part of the transmission from the motor. The wall 11 of the mix housing is provided with an inturned bearing portion 24 for the driven transmission member 23a, and an outwardly flaring cone-shaped portion 25 is arranged to direct the squared end 23 of the shaft 20 into the squared opening in the transmission member 23a when the agitator 21 is inserted in the mix chamber.

The agitator 21 in the embodiment illustrated in Fig. 2 comprises comparatively narrow transverse strap portions 26 through which extend comparatively small round rods 26a. These rods are secured to the strap members by soldering, or any suitable means, and the straps 26 are in turn secured to the shaft 20.

The squared end 23 of the agitator may be slotted as shown at 23b whereby it may be retained in the squared opening in the member 23a, by friction, thereby preventing the agitator from falling out if the device is inverted while the cover is off. Also, this construction allows the device to be tilted with the cover off to remove the frozen cream and the motor may also be operated at the same time to assist in forcing the ice cream out of the container.

The peculiar construction of the agitator 21 provides a highly desirable agitating action and eliminates friction on the cylindrical inner surface of the mix chamber and the consequent generation of heat. When scrapers of the ordinary type are used, there is necessarily some friction between the scraper blades and the outer wall, and a certain amount of heat will be generated at the point of contact which is the particular point which most seriously interferes with the desired heat conduction from the mix inside the freezer to the refrigerator cooling element. The cross sectional contour of the rods 26a also provides a substantially streamline effect in their movement through the mix and thereby minimizes friction between the mix and the agitator.

In order to drive the agitator 21, a motor 27 is provided with outwardly extending threaded lugs 28, whereby the motor may be supported on the end plate 29 of the motor housing 6 by means of screws 30. This motor is preferably an induction motor, and it has been discovered that an approximately fifteen watt, high impedance motor, of the induction type, may be arranged to drive the agitator 21 until the ice cream or other confection has become stiff, or in other words, has reached a desired consistency and has frozen sufficiently to provide a desired finished confection having a desired air content. When this point is reached, the resistance of the material in the mix chamber stops the motor, and the construction of the motor and its electrical characteristics may be so correlated and coordinated with the characteristics of the finished frozen product that this stalling or stopping may be accomplished without breaking the power circuit, and the circuit may remain closed as long as desired without injury to the motor or the finished frozen product. This feature is desirable in the present invention as it permits the device to be partially filled with a suitable mixture and inserted in the freezing chamber of the refrigerator in which it will operate to freeze the confection to a predetermined consistency and volume, and the motor will then stall at the proper time without requiring personal attention from an attendant, and without overheating the motor.

The motor 27 preferably comprises the usual coil 31 mounted on a field magnet 32 and provided with the usual rotor or armature, and having a driving pinion 33 secured to the motor shaft. A speed reducing mechanism is provided and may comprise a gear 34 meshing with the pinion 33 and having a pinion 35 secured thereto which, in turn, meshes with a gear 36. The gear 36 is the final gear of the reducing train and is provided with a forwardly extending squared portion 37 which extends into a bushing 38 rotatably mounted in the end plate 39 of the motor housing. An insulating washer 40, preferably of fiber, is located on the squared portion 37 between the bushing 38 and the gear 36. The bushing 38 is illustrated in Fig. 7 and comprises a cylindrical portion having one or more depressions 41 therein, whereby the corners of the squared driving portion 37 will be engaged to drive the bushing 38. It will be noted that this construction provides a minimum area of heat conducting surface in contactual engagement between the squared portion 37 and the bushing 38.

The bushing 38 is provided with oppositely disposed outwardly extending lugs 42 and a fiber or other insulating disc 43 is provided with holes 44 arranged to receive the lugs 42. These lugs 42 extend through the disc 43 sufficiently to engage in notches 45 in a disc portion 46 forming a part of the final driven transmission member 23a. This member 23a is provided with an outwardly extending stub shaft portion 48 having a squared hole 49 therein to receive the squared end 23 of the agitator shaft 20 and, as previously described, the inturned portion 24 of the end plate 11 of the mix chamber, forms a bearing for the stub shaft 48.

The parts just described, and illustrated in detail in Figs. 7, 8 and 9, are somewhat loosely connected together by means of the lugs and openings, and therefore form a flexible or so-called universal joint which allows the device to function properly without the necessity for accurate adjustment in assembly. It also eliminates the generation of heat due to any friction which might otherwise arise because of misalignment of the associated parts. Also, this type of construction provides for a minimum of heat conducting surfaces in contact between the motor chamber and the mix chamber.

By the construction above described, heat conduction between the two main portions of the device is reduced to a minimum, and their relation and construction and their separation by the space 10, provides for dissipation of heat by convection and effectively prevents retarding the freezing of the confection. In most cases the freezing chamber of a household mechanical refrigerator is so arranged that the base 1 of the device will rest substantially on or immediately above the freezing coils, and the bottom of the base 1 provides a comparatively large surface area in contact with the bottom of the freezing chamber of the refrigerator, and therefore the heat from the mix chamber is conducted away very rapidly.

A fan 50 may be secured to the rotor shaft 51 of the motor if desired, and this fan is constructed to direct the air outwardly through ventilating holes 52 in the motor housing and away from the mix chamber. While this fan may be used, if desired, the device gives satisfactory results without its use, the motor housing 6 being provided with ventilating openings 53 and 54. The motor may be provided with an extension cord 55 and any suitable type of electrical connector 56, whereby connection may be made to a power circuit.

In the embodiment illustrated the motor is secured to the end wall 29 of the motor housing as described, and the end wall is provided with an inturned flange 29^a which telescopes within the motor housing and may be secured in place by means of screws 29^b or other suitable securing means. Therefore, the entire motor may be inserted and removed by the simple operation of inserting or removing the motor housing end plate 29. This provides a simple, efficient, and cheap method of assembling.

In making ice cream, large amounts of air are always mixed with the ice cream during the process of freezing and for this reason a series of marks or legends 20^a are scored in or otherwise applied to the agitator shaft 20, indicating the proper filling height for various percentages of so-called over-run.

The device is preferably constructed of aluminum although it may be of any suitable material preferably having high heat conducting characteristics, and it should be noted that a large part of the weight of the entire structure is concentrated in the motor housing, and, by having the open end of the freezer remote from the motor housing, the freezer may be vertically positioned on the end of the motor housing and will remain in this position without danger of tilting while the mixture is being inserted.

In some household mechanical refrigerators the freezing chamber is suspended below the coils or with the equivalent of coils forming the freezing chamber housing in a manner similar to that illustrated in Fig. 11. When desired, therefore, for some types of refrigerators, the base 1 may be entirely omitted, and a construction such as that illustrated in Figs. 10 and 11 may be used. In such construction the motor housing 6 may be supported upon the end of the mix chamber housing by means of insulating bushings 57 secured to the mix chamber end wall by means of rivets or other means 58, and the motor housing may be secured to the bushings by means of screws 59. When used in this manner, the base may be entirely eliminated if desired and resilient heat conducting side plates 60 may be secured to the sides of the mix chamber housing and extend substantially along its entire length. These spring members or resilient plates are formed inwardly at their outer ends at 61 whereby they may be easily pushed into a refrigerator freezing chamber 62, as shown in Fig. 11. The spring plates 60 afford considerable surface in contact with the mix chamber housing and with the freezing chamber of the refrigerator, and assist in the dissipation of heat by conduction and maintain the freezer snugly in position. When desired, however, the bushings 57 may be eliminated and the base 1 retained, and the resilient side conducting members 60 may also be applied to the structure shown in Fig. 1. When this is done, the base also assists in conducting the heat to the walls of the freezing chamber of the refrigerator.

When the base 1 is not used, the cover retaining member 16 may be slidably mounted in a small casting or other suitable support 63 secured to the outside of the mix chamber 2, and this casting may be arranged to support the cover holder 16 and the spring 19 in the same manner as previously described and as disclosed in Fig. 6.

In Fig. 12 is illustrated a somewhat modified form of agitator in which angularly positioned blades 64 and supporting cross bars 65 are preferably formed from a single piece of sheet metal, and the cross bars 65 are folded over at 66 to provide strength and rigidity. These cross bars are secured to the agitator shaft 20^a, as shown.

Another form of agitator is shown in Figs. 13 and 14, and comprises cross bars 67 secured to the agitator shaft 20^b and provided with oppositely disposed propeller-like portions 68. These cross bars 67 are also provided with angularly disposed lugs 69 having scraper blades 70 loosely secured thereto by means of rivets 71, and these scraper blades 70 may, therefore, automatically extend outwardly against the inner surface of the mix chamber. The blades 70 are oppositely disposed and pointed in the direction of rotation and are sharpened along their outer edge as shown at 72.

In Figs. 15 to 17 inclusive is shown an embodiment in which a single cylindrical member 73 forms both the mix chamber housing and the motor housing. In this embodiment the mix housing is similar to that previously described and is provided with a similar end wall 11^a adjacent the motor.

The housing 73 extends rearwardly to form a motor housing and this rearwardly extending portion is provided with elongated, staggered ventilating slots 74. These staggered slots not only provide ventilation, but also provide a minimum amount of heat conducting area from the end of the motor housing to the mix chamber, and the staggered relation of the slots provides a tortuous or sinuous path, thereby greatly reducing and, in fact, practically eliminating the conduction of heat from the motor to the mix chamber.

A motor-supporting end plate 75 is provided with outwardly and inwardly extending lug portions 76 having outwardly extending pins 77 thereon arranged to engage in bayonet slots 78, whereby the end plate may be removably retained in position in the housing 73. The end plate 75 is also cut away to provide ventilating slots or openings 79 between the end plate and the housing. The end plate 75 is also provided with a plurality of enlarged openings 80 therethrough, which are preferably three in number and provide means whereby the fingers may be inserted therein for inserting or removing the

end plate and for securing it snugly in the bayonet slots 78. This construction of end plate also provides for effective air circulation and for minimum conduction from the end plate to the housing.

The motor 27 may be of the same type as previously described and is supported on the end plate in a similar manner. If desired, a motor casing 81 may be arranged to enclose the motor and may be supported on the end plate 76 as shown in Fig. 17. This construction also provides an effective thermal insulation between the motor and the mix chamber which is very effective in operation. The motor casing 81 may be of insulating material if desired, or may be provided with an insulating lining.

The cover 12 may be provided with a bayonet slot and pin connection 12a with the mix chamber housing, as in Fig. 15, if desired, and the spring controlled arm may be dispensed with.

In the embodiment just described and as particularly shown in Fig. 16, a base 82 may be provided, which preferably comprises a formed sheet metal box-like structure having its upper edges conforming in contour to the cylindrical housing 73. This box-like member or base 82 may be soldered or otherwise secured to the housing as shown in Fig. 16 and forms an enclosing chamber which may be filled with asphaltum or suitable oil, whereby heat is rapidly conducted from the mix chamber to the support on which the base 82 may rest in the freezing chamber of a refrigerator.

It will be understood that in the structures herein disclosed, the motor may, of course, be considered to a certain extent as a heat source. However, this heat source, while comparatively close to the mix chamber, is thermally insulated therefrom, and although there is a positive drive transmission between the motor and the agitator, the motor is thermally insulated therefrom, and the insulation of the transmission is a part of the entire thermal insulating means.

It will be noted also that the construction is such that the motor may be easily removed and inserted, and while the entire device, including the motor, may be immersed in water without injury thereto, the construction is also such that the motor may be easily removed when desired and the remaining structure may be placed under a hot-water faucet or otherwise easily cleaned.

While it is preferable that the device should be constructed of aluminum or other suitable material of high heat conducting characteristics, it may be made of other material such as steel, preferably tin-dipped to prevent oxidation, and to allow it to be easily cleaned. The device provides an extremely small mass of metal or other material relative to the capacity.

The freezer, as disclosed herein, provides for maximum conduction therefrom to a cooling medium, and a minimum conduction from the motor, which may be considered a heating element, to the material in the mix chamber. The agitator requires a minimum of energy for operation and is arranged to produce a minimum of friction with the container as well as with the mix.

The invention herein disclosed minimizes the B. t. u. generation and maximizes the conduction or means for transferring heat units from the device to a cooling medium.

Modifications may be made in the embodiment herein illustrated and described, and we therefore desire to be limited only by the prior art and the scope of the appended claims.

Having thus described our invention what we claim and desire to secure by Letters Patent is:

1. A freezer unit of the character described comprising a tubular mix chamber housing closed at one end and open at the other end, a removable cover for said open end, a removable rotary agitator in said mix chamber, a tubular motor housing in axial alignment with said mix chamber housing and spaced from the closed end thereof to allow air circulation therebetween, a removable end plate on said motor housing remote from said air space, a motor secured to said end plate and removable therewith, and a transmission between said motor and said agitator and having a slip connection therein to allow the removal of said motor or said agitator or both.

2. A freezer structure of the character described comprising an elongated tubular housing member having a mix chamber in one end and a motor chamber in the other end, a removable agitator in said mix chamber, a motor in said motor chamber, a motor mounting means arranged for restricted conductional contact with said casing, and a substantially non-heat-conducting transmission between said motor and said agitator, said motor chamber housing being constructed to provide a long tortuous conductive path of small cross sectional area between said motor and said mix chamber and to provide air circulating passages sufficient to cause substantially all of the heat conducted from said motor to be dissipated by convection before reaching said mix chamber.

3. A freezer unit of the character described comprising a tubular mix chamber housing means closed at one end and open at the other end, a removable cover for said open end, a removable rotary agitator in said mix chamber, tubular housing means in axial alignment with said mix chamber housing means, a removable end plate on said second housing means, a motor mounted on said end plate and removable therewith, and a transmission between said motor and said agitator having a slip connection therein to allow the removal of said motor or said agitator or both.

LOUIS A. M. PHELAN.
LAWRENCE E. KOCH.