F. P. MILLER.

REFRIGERATING MECHANISM.

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915,621.

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Fig. 1.

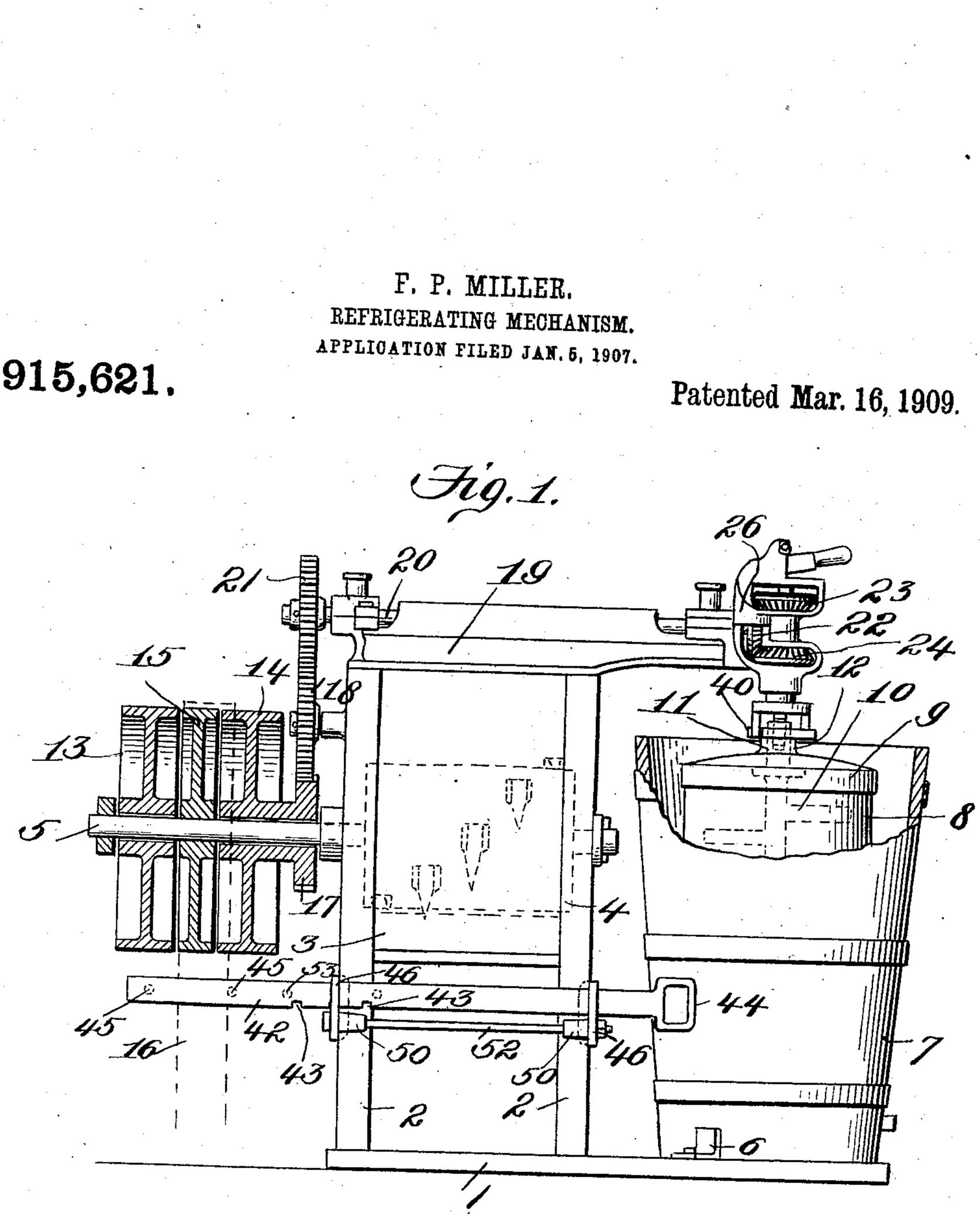



Fig. 2.

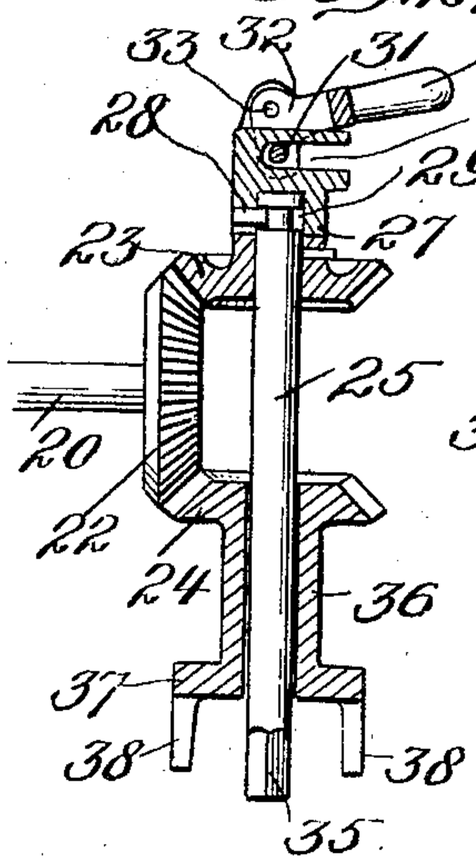



Fig. 3.

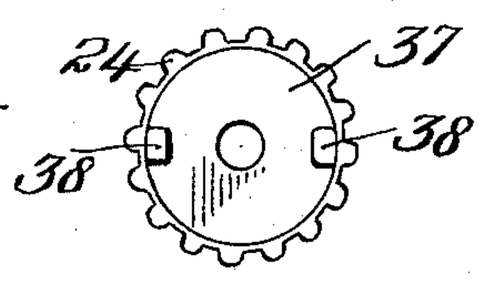



Fig. 4.

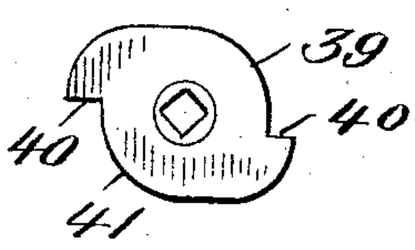



Fig. 5.

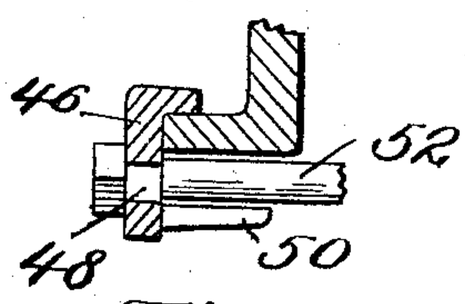
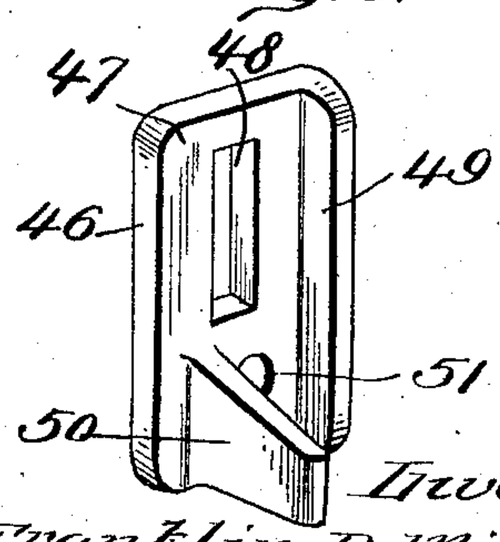



Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## REFRIGERATING MECHANISM.

No. 915,621. Specification of Letters Patent. Patented March 16, 1909.

Application filed January 5, 1907. Serial No. 350,977.

*To all whom it may concern:*

Be it known that I, FRANKLIN P. MILLER, a citizen of the United States, residing at Bloomfield, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Refrigerating Mechanism, of which the following is a specification.

This invention relates to refrigerating mechanism for making ice cream and other analogous substances or materials, and the primary object of the same is to provide a novel association of driving devices for operating an ice breaker and a freezing can and dasher, either independently or conjointly.

A further object of the invention is to provide a simplified organization of driving devices for operating a can and dasher in reverse directions and permitting a ready separation and removal of the can and dasher and a withdrawal of the tub without disturbing the relative arrangement of the driving devices.

The invention is included in preferred form in the construction and arrangement of parts which will be more fully hereinafter specified.

In the drawing: Figure 1 is a side elevation, partially broken away and partially in section, of an ice breaker, a freezing can and tub or receptacle, and driving devices disclosing the features of the invention. Fig. 2 is a detail sectional elevation of a portion of the driving mechanism which coöperates directly with the can and dasher. Fig. 3 is a bottom plan view of the can controlling gear or pinion. Fig. 4 is a detail plan view of the can actuating device which is secured on the top of the can and engaged by a portion of the can controlling gear. Fig. 5 is a detail horizontal section showing the supporting means for a belt shifting slide. Fig. 6 is a detail perspective view of a part of the supporting means or one of the guides for the belt shifting slide.

Similar characters of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates a base support or bed of any suitable structure having uprights 2 rising therefrom and supporting an ice breaking case 3 having a toothed cylinder 4 rotatably held therein on a drive shaft 5 which projects outwardly a considerable distance, for a purpose which will be presently set forth. The base 1 also has suitable retaining devices 6 disposed thereon to engage the bottom of a tub or receptacle 7, which, in the present instance, is shown as the tub of an ice cream freezer and having therein a freezing can 8 with a removable lid or cover 9 and a dasher 10 provided with a shaft 11. The dasher shaft 11 projects upwardly through an apertured head or tubular boss 12 on the center of the lid or cover 9, and the upper end of said shaft is preferably formed with a socket for separably receiving an operating means which will be more fully hereinafter specified.

The driving devices which particularly embody the features of the present invention comprise a minimum number of parts and are so disposed with relation to the driving shaft 5 that it is readily possible to have a united operation of the ice breaker and the can 8 and dasher 10, or an independent operation of such parts; and a further feature of the invention is the location of the ice breaker and the tub or receptacle 7 adjacent to each other for convenience in supplying the said tub or receptacle with the broken ice and also to provide an organization of parts which will contribute to the expeditious and effective operation of freezing ice cream or other substance or material that may be placed in the can 8. The driving devices include, of course, the driving shaft 5; and on the projected portion of the said shaft are two loose pulleys or band wheels 13 and 14 and an intermediate fast pulley 15, the pulley 15 being caused to rotate at all times with the shaft 5. The width of the pulley 13 is such as to permit a driving belt 16 of a corresponding width to occupy the same solely, or the belt 16 may be shifted inwardly over the pulley 13 and on the pulley 15 and thus obtain an operation of the ice breaker. The belt 16 may also be shifted completely over on the pulleys 14 and 15 and clear the pulley 13; and in this latter position of the belt both the ice breaker organization and the can and dasher will be operated. The hub of the pulley 14 carries a pinion 17 at its inner extremity and is held in continual mesh with an intermediate motion transferring pinion 18 supported from the upper portion of one of the uprights 2.

On the top of the uprights 2 a bearing

frame 19 is secured and is projected at one extremity beyond one of the said uprights. In this bearing frame a power transmitting shaft 20 is disposed and has on one extremity a pinion 21 which is held in continual mesh with the pinion 18. On the extremity of the shaft 20 opposite that carrying the pinion 21 a beveled pinion 22 is secured, (see Fig. 2) this beveled pinion meshing with reversely disposed upper and lower beveled pinions 23 and 24. A coupling stem or shaft 25 passes through the pinions 23 and 24, the pinion 23 being secured to, and movable with, said coupling shaft and the pinion 24 being loose on the same shaft. The pinions 23 and 24 are held by a supporting member 26 connected to or integrally formed with the bearing frame 19; and in the said supporting member an adjusting cap is located and comprises a lower socket member or collar 27 having an inwardly projecting stud 28 which continually engages a circumferential groove 29 formed in the upper extremity of the shaft 25. This cap also comprises an upper slotted member 30 which is engaged by a pin 31 of an eccentric cam 32 fulcrumed as at 33 to the upper portion of the supporting member 26 and also provided with an operating handle or grip 34. By raising and lowering the cam 32 the coupling shaft 25 will be correspondingly moved through the medium of the stud or pin 28 engaging the groove 29. The lower end of the shaft 25, as at 35, is squared or formed angular in cross-section to removably fit in the socket at the upper end of the dasher shaft 11. When the coupling shaft 25 is elevated the range of movement permitted is such as to disengage the said shaft from the dasher shaft without in the least modifying the relationship of the pinions 22 and 24, but separates the pinions 23 and 22. The pinion 24 has its hub 36 in the form of an elongated sleeve carrying at its lower extremity an integral disk 37 from which depend opposed legs 38, the latter being two in number and preferably in diametrical relation. Fixed on the tubular head or boss 12 of the lid or cover 9 is an actuating device 39 having opposite shouldered projections 40 with a concentric edge wall 41 leading thereto and arranged in reverse positions to guide the legs 38 into contact with the shouldered projections 40. The upper end of the dasher shaft 11 has free rotation in the tubular head or boss 12, and the legs 38 carried by the organization of the pinion 24, as explained, are long enough to permit the application and removal of the actuating device 39 and the lid or cover 9; and when it is desired to separate the lid or cover from the operating mechanism it will be necessary to first uncouple the shaft 25 from the dasher shaft, the shaft 25 being maintained in uncoupled position by the upward throw of the cam 32.

It will be observed that the head 12 of the lid or cover 9 projects such distance upwardly with respect to the upper edge of the tub or receptacle 7 that there will be no difficulty in assembling or dissociating the tub or receptacle and the can or lid or cover therefor with respect to the operating mechanism just explained.

Another advantage of the foregoing construction is, that after the coupling shaft 25 and its upper pinion 23 are elevated or vertically shifted to disengage the said shaft from the dasher shaft, the can 10 through the medium of the cover 9 may be further rotated in the refrigerating material contained in the tub or receptacle 7. In making ice cream or analogous substances where prolonged freezing is desirable, it is frequently found beneficial to rotate the can or receptacle containing ice cream or other like material within the tub or receptacle and the refrigerating material without rotating the dasher or stirrer. The continuation of the rotation of the can 10 in the present construction is permitted by the pinion 24 remaining in mesh with the pinion 22 and the engagement of the depending means 38 with the shouldered coupling device 39 on the can cover.

A novel means has also been devised for shifting the belt 16, and consists of a slide or shifting bar 42 having notches 43 in the lower edge thereof to engage one of a set of guides for holding the same and maintain a fixed adjustment thereof. One end of the slide or shifting bar 42 has a grip or handle 44, and at opposite extremities are pins or analogous devices 45 which may be set as desired in the length of the bar to engage the belt 16. It is advantageous to provide means for sustaining the shifting bar 42 in operative relation to the pulleys 13, 14 and 15 and the belt 16; and it may be found necessary at times to change the position of the said bar or to modify the range of adjusting operation thereof with relation to the belt 16.

To avoid the necessity of boring or aperturing the uprights 2, and to make it possible to apply the sustaining means for the bar 42 at different points or elevations as may be found necessary, two guides 46 are used and each comprises a main body 47 having a vertical slot 48 in the upper portion of the center thereof and an angular flange 49 at one side edge. At the lower extremity of each guide near the edge opposite that having the flange 49, a guard 50 projects from the body 47; and between this guard and the flange an opening 51 is bored or otherwise formed in the body 47 below the lower terminal of the slot 48. In applying these guides the flanges 49 are brought to bear closely against the inner portions of the uprights, as indicated by dotted lines in Fig. 1, and the guards 50 thereby disposed outwardly, the two guides being connected by a rod or elongated bolt 52 which

extends through the openings 51, the guards 50 serving to hold the guides 46 in place by coöperating with the adjacent portions of the rod 52. The notches 43 of the bar 42 receive the lower wall of the slot 48 nearest the pulleys 13, 14 and 15, the said slot being long enough to permit the bar to be disengaged therefrom in making a change in the adjustment or during the operation of shifting the belt 16 from one position to another. While this belt shifting means is preferred, it will be understood that other devices for this purpose may be employed, but whatever form of slide or belt shifting means may be used, the advantage of the guides 46, which are practically clips, should be considered in view of the fact that in their application it is unnecessary to perforate or otherwise mutilate the uprights 2.

As a convenient means for limiting the operation of the slide bar 42 in opposite directions and to determine the adjustment of the belt 16, stop-pins 53 are provided and fixed in the bar to contact with opposite sides of the guide 46 nearest the pulleys 13, 14 and 15.

From the foregoing the operation will be readily understood, and, briefly, it will be seen that if the belt 16 is shifted to the position shown by dotted lines in Fig. 1, or so that it will engage the intermediate pulley 15 fast to the shaft 5, the ice breaking mechanism alone will be operated. If the belt is thrown inward to engage both the pulleys 14 and 15, both the ice breaking mechanism and the can 8 and dasher 10 will be operated. If the belt is pulled fully in to engage the pulley 14 solely, then the can 8 and the dasher 10 will be alone operated. The advantage of having the ice breaker and the can 8 and dasher 10 simultaneously operated resides in the convenience of supplying the tub or receptacle 7 with broken or crushed ice from the ice breaker at intervals during the refrigerating operation and without requiring conveyance of the ice from a distance to the tub or receptacle.

As hereinbefore indicated, the tub or receptacle 7 and the can 8 with its dasher 10 may be used for freezing other substances or materials aside from the production of ice cream, for which the entire apparatus has been specially devised.

When it is desired to have the ice breaker and refrigerating can and dasher remain inactive, the belt 16 is shifted so as to solely occupy the pulley 13. This will permit the prime power source to remain uninterrupted in its operation in view of the fact that the pulley 13 runs loose on the driving shaft 5, but under these conditions the belt will always be ready for immediate disposition with respect to the pulleys 14 and 15 through the actuation of the slide bar 42, and, as hereinbefore specified, this provision will be found exceptionally convenient in stopping and starting the mechanism.

Having thus fully described the invention, what is claimed as new is:

1. In a driving mechanism of the class specified, the combination of a driving shaft having an ice breaker thereon, a plurality of pulleys on the shaft, one of the pulleys being loose on the shaft and having a gear element rotatable therewith, a power transmitting shaft geared to the loose pulley, a rotatable refrigerating can and dasher, and a coupling shaft between the power transmitting shaft and the dasher and can, the coupling shaft being movable to disconnect the same from the dasher and provided with means for separating it from the can.

2. In a mechanism of the class specified, the combination of a driving shaft having an ice breaker thereon, a rotatable refrigerating can and dasher, a power transmitting shaft independent of the ice breaker shaft, a coupling shaft movably mounted between the power transmitting shaft and the can and dasher and provided with means for rotating the said can and dasher in reverse directions, pulleys on the driving shaft, one of the pulleys being loose, gear devices between the loose pulley and power transmitting shaft, and shiftable means engaging the pulleys and controlling the united operation of the ice breaker and can and dasher or the individual operation of the said can and dasher and ice breaker.

3. In a mechanism of the class specified, the combination of a driving shaft having an ice breaker thereon, rotatable refrigerating devices consisting of a can and dasher therein, elements on the driving shaft for operating the ice breaker and refrigerating devices, a power transmitting shaft geared to one of said elements, a rotatable coupling shaft interposed between the power transmitting shaft and the refrigerating devices, and means engaging the elements of the driving shaft for unitedly or independently operating the ice breaker and refrigerating devices.

4. In a mechanism of the class specified, the combination with a driving shaft having two loose and one fast pulley thereon, an ice breaker secured to and operative by the driving shaft, a power transmitting shaft geared to one of the loose pulleys, an actuating device shiftable on the pulleys, reversely rotatable refrigerating devices consisting of a can and dasher, a rotatable coupling shaft geared to the power transmitting shaft, and means engaging the coupling shaft for shifting the latter and also for operatively connecting it to the can.

5. In a mechanism of the class specified, the combination of a driving shaft, a power transmitting shaft operatively connected to the driving shaft and having a beveled pinion on one end, a rotatable can provided

with a cover having an opening through the center thereof and a shouldered actuating device connected to and located above the center of the can cover around the opening in the latter, a rotatable dasher within the can, the can being rotated through the medium of the cover, a receptacle in which the can is rotatably disposed, a vertical coupling shaft interposed between the power transmitting shaft and can cover and dasher, the lower end of the coupling shaft being projectable into the opening in the can cover to separably engage the upper end of the dasher, reversely arranged beveled pinions mounted on the coupling shaft and normally in mesh with the pinion on the adjacent end of the power transmitting shaft, the coupling shaft and the upper pinion thereon being unitedly and vertically movable to disengage the said shaft from the dasher and said upper pinion from the pinion on the power transmitting shaft, the lower pinion of the coupling shaft having an elongated sleeve directly and loosely fitted over the coupling shaft and provided with depending opposed legs at its lower extremity for engaging opposite portions of the shouldered actuating device of the can cover whereby the said cover and can may be rotated independently of the dasher in the can, and means for vertically shifting the said coupling shaft and its upper pinion, the lower pinion on the coupling shaft always remaining in mesh with the pinion on the power transmitting shaft.

6. In a mechanism of the class specified, the combination of a driving shaft having an ice breaker thereon, two loose and an intermediate fast pulley on the said shaft, the one loose pulley having a gear device, a power transmitting shaft having gear connections with the gear device of the one loose pulley, rotatable refrigerating devices consisting of a can and a dasher in the latter, a shiftable coupling shaft interposed between the power transmitting shaft and the can and dasher and geared to the said power transmitting shaft, and a belt shiftably engaging the said pulleys to independently or unitedly operate the ice breaker and the said refrigerating devices.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANKLIN P. MILLER.

Witnesses:
ANNA MAY GILLIN,
WILLIAM G. BROKAW.