Oct. 24, 1933. C. A. FRICK 1,932,268

BEVERAGE COOLING REFRIGERATOR

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Fig. 1.

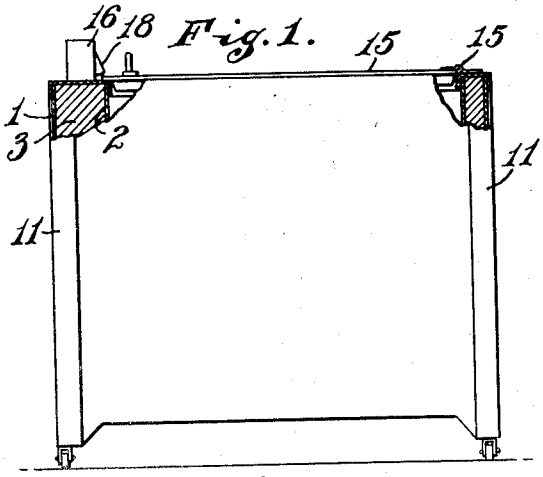


Fig. 2.

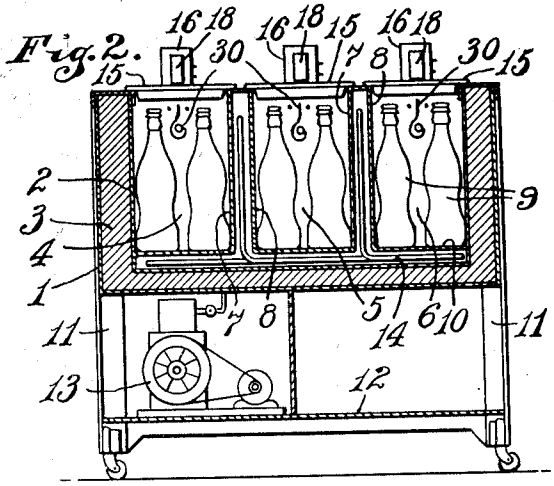


Fig. 3.

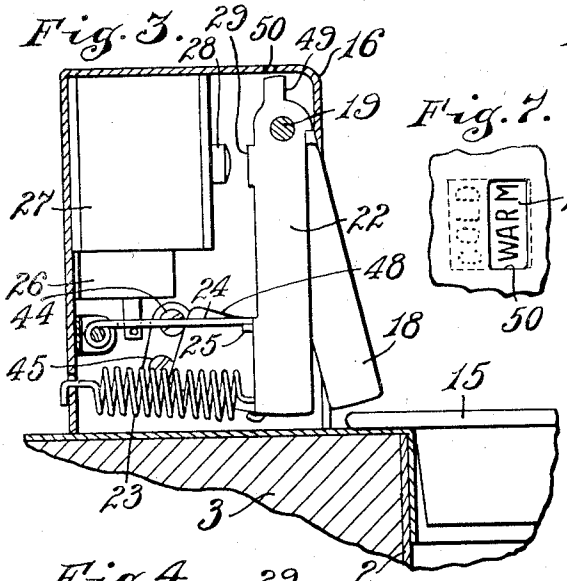


Fig. 7.

Fig. 5.

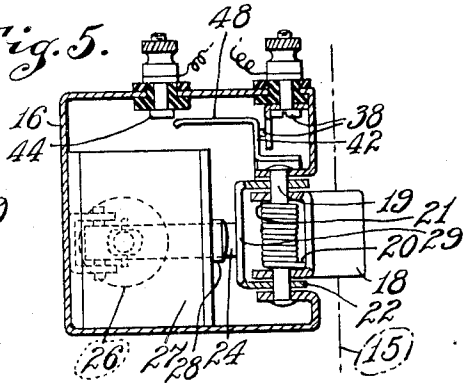


Fig. 8.

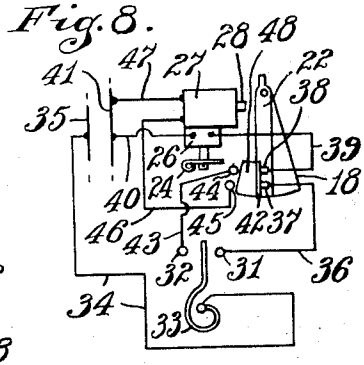


Fig. 4.

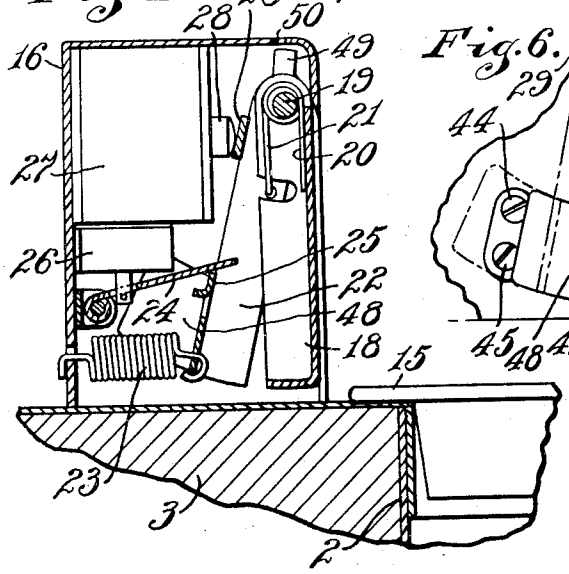
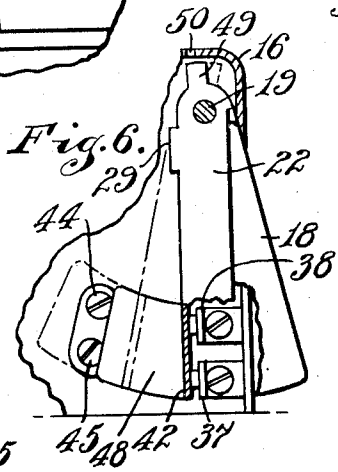


Fig. 6.



INVENTOR.
Chester A. Frick,

BY

Hood & Hahn.

ATTORNEYS

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Fig. 9.

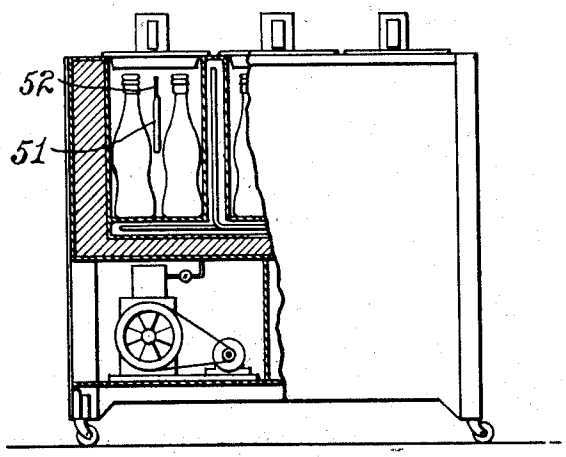
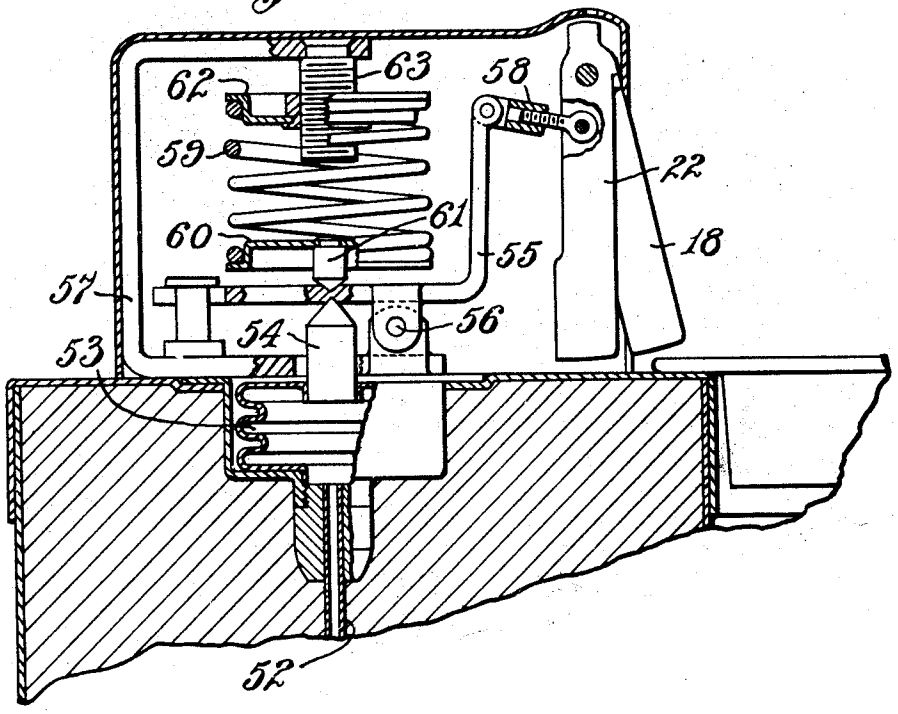


Fig. 10.



INVENTOR.
Chester A. Frick,

BY
Hood + Hahn,
ATTORNEYS

Patented Oct. 24, 1933

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UNITED STATES PATENT OFFICE

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BEVERAGE COOLING REFRIGERATOR

Chester A. Frick, Muncie, Ind., assignor to Glascock Brothers Mfg. Co., Muncie, Ind., a corporation of Indiana

Application February 17, 1932. Serial No. 593,514

8 Claims. (Cl. 62—1)

My invention relates to bottled beverage dispensing refrigerators and is particularly adapted for this class of refrigerators wherein the bottled beverages are cooled by mechanical refrigeration. It will be understood, however, that while my invention is particularly designed for use in connection with mechanically refrigerated coolers, other types of refrigeration may be used if desired.

I have found from practical experience that the present commercial type of mechanically refrigerated dispensing coolers, particularly adapted for cooling bottled beverages, has a limited capacity, unless of course, the mechanical refrigerating medium is of such capacity as to be almost prohibitive in cost of operation. In the present type of cooler wherein chilled bottles are removed and warm bottles inserted, when the demand is excessive the mechanical refrigerating unit must be so designed as to have excessive capacity for a short period of time and during the periods where the demand is relatively light the mechanical refrigerating unit is practically inoperative. This means that a large refrigerating unit must be provided for use at comparatively short intervals.

It is one of the objects of my invention to provide a cooler wherein a relatively small capacity refrigerating unit may be employed and operated more continuously, at the same time insuring a proper cooling of the bottled beverage before it is dispensed.

For the purpose of disclosing my invention I have illustrated one embodiment thereof in the accompanying drawings in which Fig. 1 is a side elevation of a beverage-cooling refrigerator embodying my invention; Fig. 2 is a transverse sectional view; Fig. 3 is a side elevation, the cover being shown in section, of a thermostatically-controlled lock for the cooler compartments; Fig. 4 is a similar view showing the lock in unlatched position; Fig. 5 is a transverse sectional detail view showing more fully certain of the electrical contacts for the lock; Fig. 6 is a detail view also showing certain of the electrical contacts of the lock; Fig. 7 is a top plan detail view showing the indicating mechanism; Fig. 8 is a diagrammatic view of the circuit connections; Fig. 9 is an elevation partially in section showing a modified form of my invention; and Fig. 10 is an enlarged sectional view of a modified form of lock.

In the embodiment of the invention illustrated the refrigerator may be of any type but is illustrated as comprising an outer casing 1 which may be formed of sheet metal, and an inner casing or tub 2, preferably formed of sheet metal and forming a receptacle. Between the two casings I preferably introduce any suitable heat-insulating material 3. The inner receptacle 2 is divided into compartments 4, 5 and 6 by suitable division plates which are arranged in spaced apart pairs 7 and 8. The beverage bottles 9 are supported slightly above the bottom of the receptacle by means of bottom plates 10. The unit as a whole is mounted on any suitable legs as 11 and a bottom plate 12 provides a support for a mechanical refrigerating unit 13 which may be of any of the well-known commercial types.

The space between the bottom of the receptacle 2 and the bottom supports 10 and the spaces between the compartment spacers 7 and 8 are adapted to contain suitable cooling coils 14 connected with the cooling unit 13.

Each of the compartments 4, 5 and 6 has a top closure member 15 preferably hinged at 15 and adapted to be raised at its free end. Each of these cover members 15 is provided with a locking mechanism designated as 16, the lock being so arranged that so long as the temperature of the compartment is above a suitable temperature for chilling the bottled beverages in the compartment the lock will prevent the opening of the compartment. To this end the lock 16 is provided with a latch member 18 adapted, when in latching position, to be projected above the edge of the top 15. This latch member is pivotally mounted on a rod 19 extending between the side walls of the casing of the lock and is normally biased towards latching position by means of a coil spring wrapped around the rod 19 and having one end 20 bearing on the latch member 18 and the other end 21 bearing on a pivoted projecting member 22. This projecting member is likewise pivoted on the rod 19 and the coil spring is so arranged as to tend to split the lower ends of the latch 18 and projecting member 22. The projecting member 22 is biased towards retractive position by means of a coiled spring 23 one end of which is connected to the casing the lock and the other end of which is connected to the member 22. This member 22 is maintained in its projected position by a stop arm 24 pivotally supported at one end on the lock casing and adapted to drop, by gravity, in front of a stop bar 25 on the member 22.

When the member 22 is in its projected position (see Fig. 3) the latch member 18 projects above the edge of the cover 15, thereby preventing the opening of the cover, although under abnormal circumstances, if the operator desires, he may press on the latch member 18 to retract the same

against the action of the coil spring to retract the latch member and permit the opening of the cover member. Furthermore, by this arrangement, with the lock in locking position, and the cover member raised, when the cover is dropped it becomes automatically latched.

For releasing the latch I provide an electromagnet or solenoid, whichever may be desirable, 26 which, when energized, will raise the stop arm 24 out of engagement with the stop bar 25, permitting the projecting member 22 to be retracted under the influence of the coil spring 23 and thereby retracting the latch member 18 to permit the opening of the cover 15. For projecting the projecting member 22, when it is desired to prevent the opening of the cover 15 I provide a solenoid 27, the core 28 of which, when projected by the energization of the winding of the solenoid will engage a plate 29 on the projecting member 22 and move the projecting member into its projected position and at the same time in a position to permit the stop member 24 to drop in front of the plate 25, holding the projecting member 22 in its projected position.

It will be understood that a separate lock is provided for each of the compartments 4, 5 and 6. For controlling the lock I provide a thermostat 30 conveniently arranged in the compartment and subject to the temperature thereof. This thermostat has a cold contact 31 and a hot contact 32. The thermostatic member 33, which may also be a contact member, is connected by a conductor 34 with one side 35 of the current supply line. The cold contact 31 is connected by a conductor 36 with a stationary contact 37. A second stationary contact 38 is connected by conductor 39 with one terminal of the electromagnet 26. The opposite terminal of this winding is connected by conductor 40 with the opposite side 41 of the supply line. For bridging the contacts 37 and 38, under certain predetermined conditions, I provide a conductor plate 42 mounted on the projecting member 22.

The hot contact 32 of the thermostat is connected by a conductor 43 with a contact 44 and a second contact 45 is connected by a conductor 46 with one terminal of the winding of solenoid 27, the opposite terminal being connected by conductor 47 with the supply conductor 41. The two contacts 44 and 45 are adapted to be bridged, under certain predetermined conditions, by an extension 48 of the plate 42.

The above construction and arrangement of parts provides means for preventing access to any one of the compartments 4, 5 or 6 so long as the temperature in said compartments is above a predetermined temperature for chilling the bottled beverages contained in the compartment to a satisfactory point. When, however, the temperature of the compartment and the contents thereof is lowered to the predetermined point the cover will be unlocked so that access can be obtained thereto and the contents dispensed.

In operation we will assume that the parts are in the position illustrated in Fig. 3 with the thermostat in the position illustrated in Fig. 8.

When the temperature of the compartment falls to the predetermined point, so that bottles may be dispensed therefrom the thermostat 33 will have moved to contact 31, thus closing the circuit through contacts 37 and 38 to electromagnet 26. The energization of this electromagnet will raise the stop arm 24 permitting the projecting member 22 to be retracted under the influence of the coil spring 23 and thus retracting the latch 18 so that the cover 15 may be opened. As soon as the projecting member 22 is moved to its retracted position the bridging member 42 moves off of contacts 37 and 38, opening the circuit of the electromagnet 26 so that this solenoid will not continue to heat up through continual passage of current therethrough.

Assume that sufficient cooled bottles have been removed from the compartment and warm bottles substituted therefor, until the temperature of the compartment has been raised above the predetermined cooling temperature. Under these circumstances the thermostatic member 33 will move into contact with the hot contact 32, thereby establishing circuit through the contacts 44 and 45, across the bridging plate 48, it being remembered that this bridge plate has been moved to bridging position, and through the solenoid 27. This solenoid being energized, will project its core 28 to move the projecting member 22 into its projected position, thereby throwing the latch 18 into latching position. The final position of the projecting member 22 is such that the bridging member 48 will have moved off the contacts 44 and 45 before the stop member 24 drops in position, thus opening the circuit of the solenoid 27. There is sufficient inertia in the solenoid core 28 in its projecting movement to cause this action. The latch is now in latching position and will remain so until the temperature has again dropped to the satisfactory point.

As an additional precaution against removing bottles from a compartment which has not been sufficiently chilled, I provide an extension 49 having the words "Cold" and "Warm" thereon and in such a position that when the latch is in a position to permit the removal of bottles from the compartment the word "Cold" will be displayed through an opening 50 in the casing of the latch and when the latch is closed the word "Warm" will be displayed.

It is thus seen that by the provision of a plurality of compartments certain of these compartments may be cooling the beverages while service is made from one compartment, those compartments which are not ready for use being latched against mistaken dispensing therefrom. As soon, however, as the compartment is ready for dispensing purposes the latch will be unlocked, permitting dispensing therefrom and the warmer compartment will be closed pending the proper chilling of the bottles therein.

By this arrangement a smaller refrigerating unit may be used as it may be operating to cool the bottles in certain of the compartments pending the opening thereof for dispensing and there will not be the necessity for imposing an extremely heavy load on the refrigerating apparatus for the purpose of chilling one compartment from which bottles are being constantly removed.

In order to assist in the cooling of the bottles the compartments may be suitably filled with a cooling liquid such as water or the like.

In the structure illustrated in Figs. 9 and 10, I dispense with the electromagnet operating means and control the lock directly from the thermostat. In this structure the projecting member 22 and the latch member 18 are of the same construction as illustrated in connection with Figs. 1 to 8.

Within the compartment, the opening of which is to be controlled, I preferably arrange a thermostatic tube 51 which may be filled with any suitable fluid or gas expansible and contractible

under the influence of heat or cold. This tube is connected by a tubular conduit 52 with an expansible member 53 of any of the well known commercial types, one of which is sold under the trade name of "Sylphon". This expansible member is somewhat of the bellows type and has secured to the top thereof a pin 54 adapted to be raised by the expansion of the sylphon. An operating arm 55 is pivoted at 56 on a suitable base member 57 and has one end thereof connected by an adjustable connection 58 with the projecting member 22. On the opposite side of the pivot point 56, the pin 54 bears in opposition to a coiled spring 59, provided at its lower end with a head 60 having a pin member 61 engaging the arm 55 on the side opposite the pin 54. The upper end of this spring bears on an adjustable stop 62 mounted on a threaded stem 63, in turn supported on the base member 57.

The operation of the device is obvious. When the temperature in the compartment to be cooled is lowered to the desired predetermined point the bellows or expansible member 53 will contract permitting the spring 59 to operate the arm 55 to retract the projecting member 22. This withdraws the latch member 18 from latching position so that the compartment may be opened. As when the temperature in the compartment rises above the predetermined desired point, the expansion of the fluid or gas in the thermostatic member 51, the tube 52 and the bellows 53 operating the arm 55 to project the member 22 so that the latch member will again be projected in latching position.

I claim as my invention:

1. In a dispensing refrigerator, the combination with a receptacle having a cooling compartment, refrigerating means for cooling the contents of said compartment, a closure for said compartment, a lock for preventing the opening of said closure and thermostatic means subject to the temperature conditions of the compartment for controlling the operation of said lock to permit the opening of said closure when temperature of the compartment reaches a predetermined point.

2. In a dispensing refrigerator, the combination with a receptacle having a compartment, of means for refrigerating said compartment, a closure for said compartment, a lock for said closure, electromagnetic means for rendering said lock inoperative and thermostatic means subject to the temperature of the compartment for causing the operation of said electromagnetic means when the temperature of the compartment reaches a predetermined low point.

3. In a dispensing refrigerator, the combination with a receptacle having a compartment, of refrigerating means for said compartment, a closure for said compartment, a lock for said closure, means for operating said lock to prevent the opening of said closure under certain predetermined temperature conditions in said compartment and for operating said lock to permit the opening of said closure member under certain predetermined temperature conditions in the compartment and thermostatic means subject to temperature conditions in the compartment for controlling said lock-operating means.

4. In a dispensing refrigerator, the combination with a receptacle having a refrigerating compartment, of refrigerating means for said compartment, a closure for said compartment, a lock for preventing the opening of said closure, electromagnetic means for rendering said lock operative, electromagnetic means for rendering said lock inoperative and a thermostat subject to temperature conditions of said compartment for controlling the operation of said electromagnetic means.

5. In a dispensing refrigerator, the combination with a receptacle having a plurality of compartments, refrigerating means for said compartments, a separate closure member for each of said compartments, a lock for each of said closure members for preventing the opening thereof and a thermostat in each of said compartments controlling the lock of the closure member of its compartment.

6. In a dispensing refrigerator, the combination with a receptacle having a refrigerating compartment therein, refrigerating means for said compartment, a closure member for said compartment, a one-way lock for said closure member and a thermostat subject to the temperature conditions of said compartment for controlling the operation of said lock.

7. In a dispensing refrigerator, the combination with a receptacle having a compartment therein, of refrigerating means for said compartment, a closure member for said compartment, a one-way lock for preventing the opening of said closure member, means for moving said lock to inoperative position, means for moving said lock to operative position and a thermostat subject to the temperature conditions of said compartment which in one position causes the operation of said means for rendering the lock inoperative and in another position causes the operation of said means for rendering the lock operative.

8. In a dispensing refrigerator, the combination with a receptacle having a refrigerating compartment therein, of means for refrigerating said compartment, a closure member for said compartment, a latch for said compartment comprising a spring-projected latch member, a movable abutment for the projecting spring of said latch member, means for projecting and retracting said movable abutment and a thermostat subject to the temperature conditions of said compartment for controlling the operation of said means.

CHESTER A. FRICK.