Nov. 7, 1950 H. W. WHITMORE 2,529,439

BOTTLE COOLER

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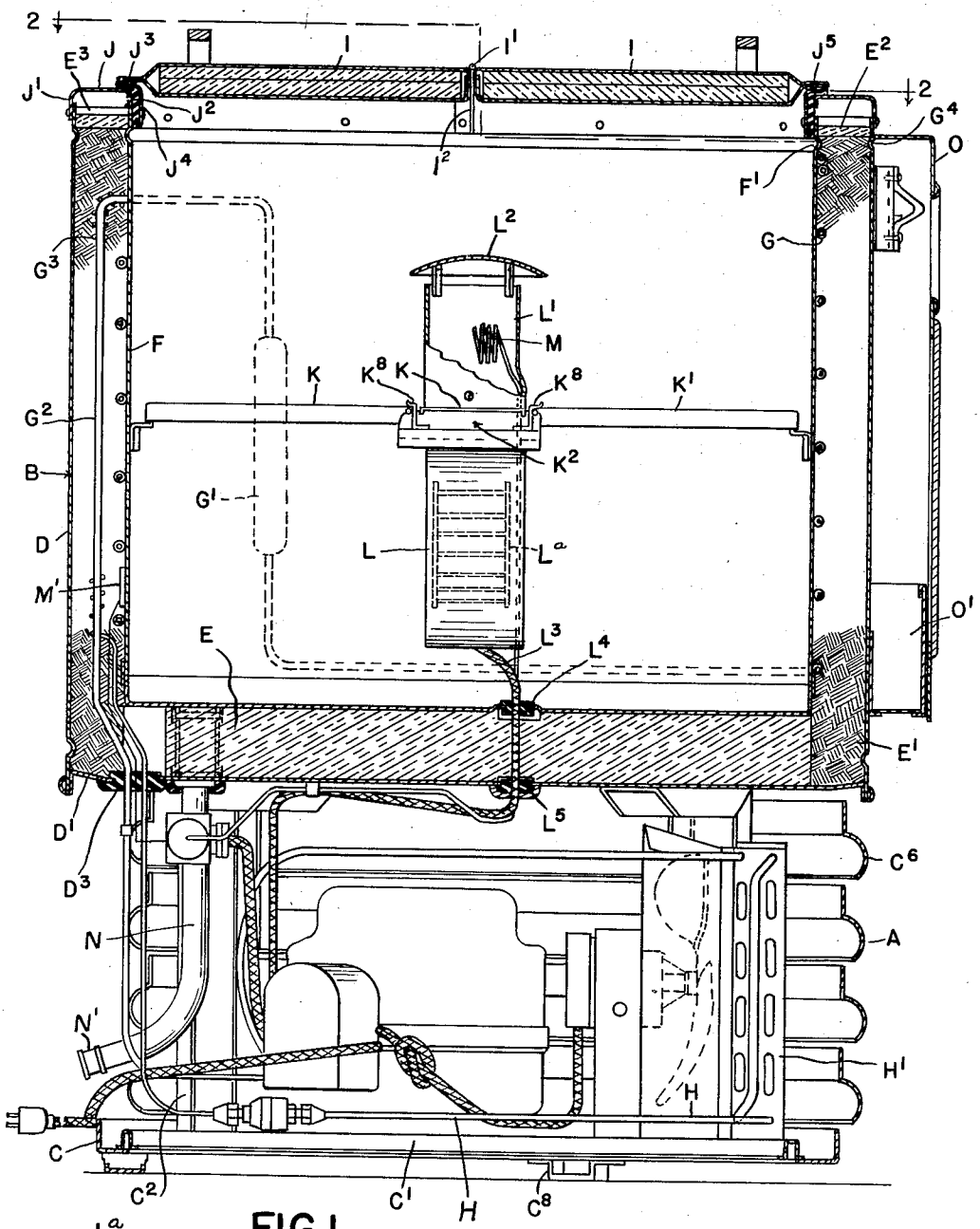

FIG. 1.

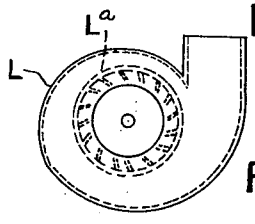

FIG. 8.

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FIG.2.

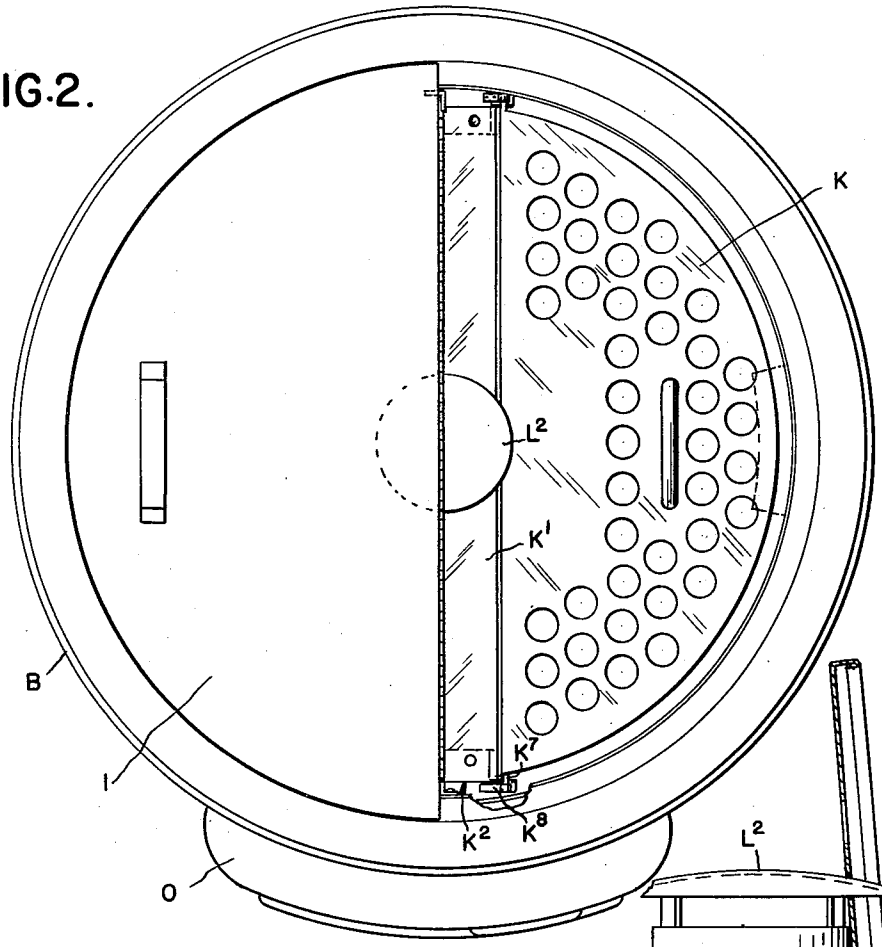
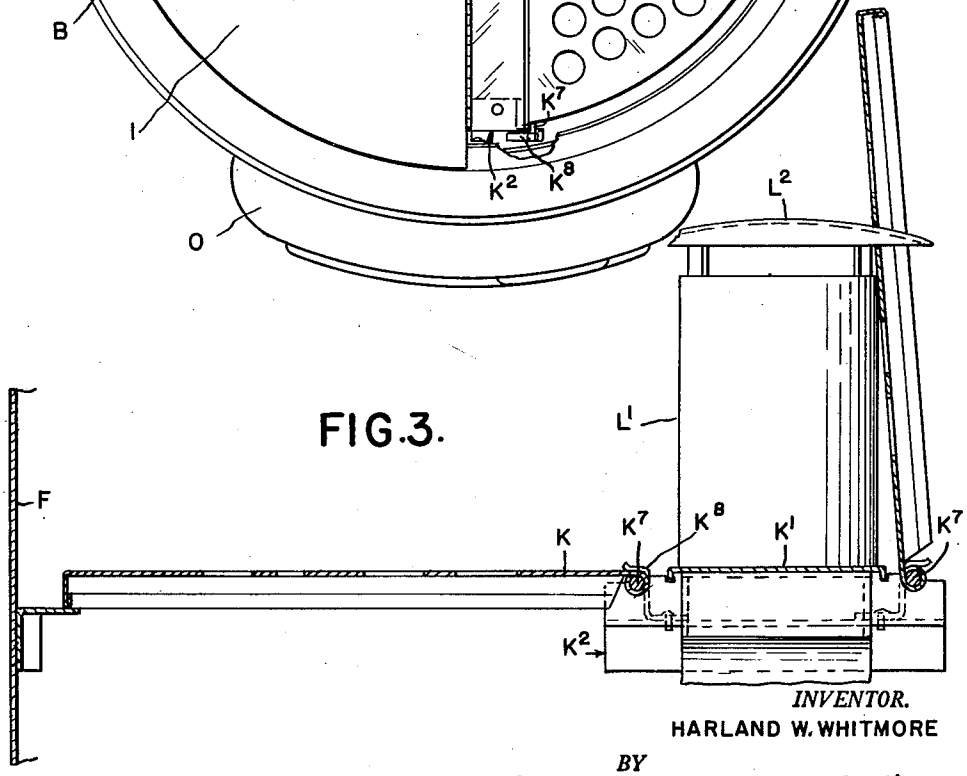


FIG.3.



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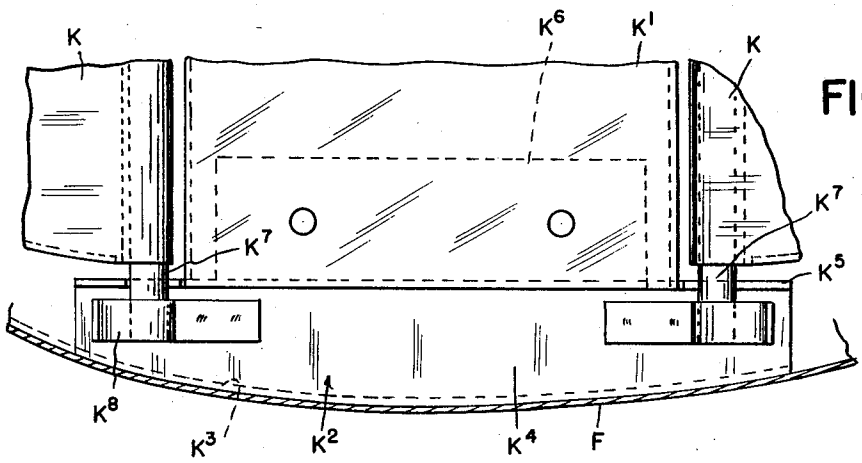

FIG.4.

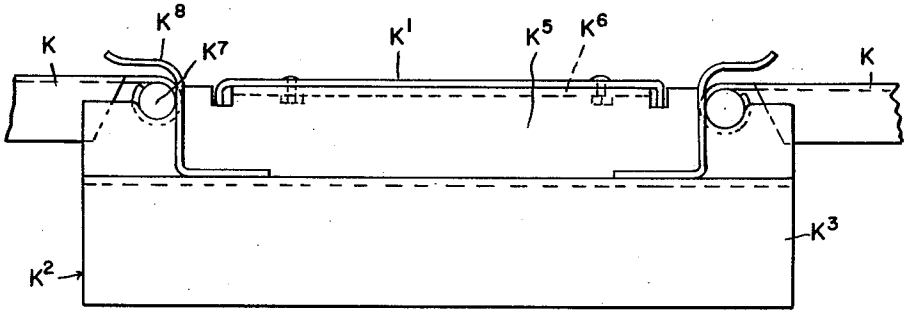

FIG.5.

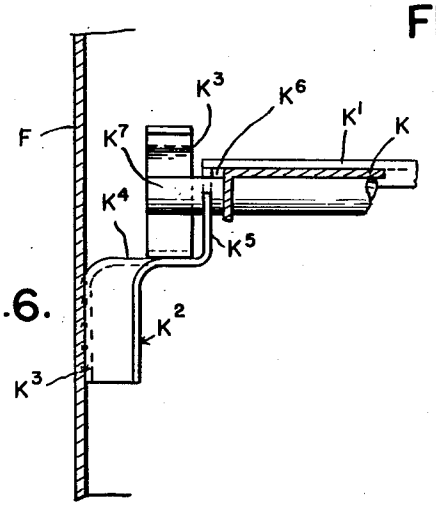

FIG.6.

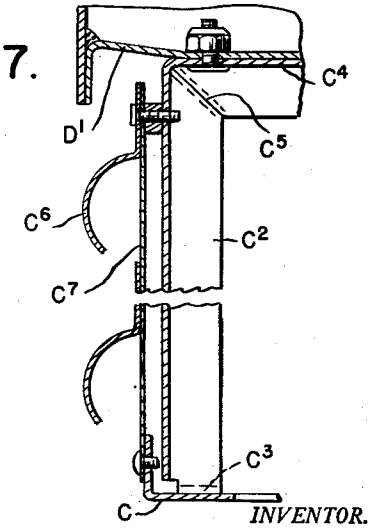

FIG.7.

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2,529,439

BOTTLE COOLER

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Application June 28, 1948, Serial No. 35,598

10 Claims. (Cl. 62—102)

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The invention relates to apparatus for the cooling of bottles and has for its object the obtaining of a construction in which the cooled bottles are readily accessible and easily removable from the cooler.

It is a further object to obtain a construction in which separate portions of the container are used, respectively, for the cooling of bottles after loading and for the storage of the cooled bottles for dispensing.

It is a further object to provide means for circulating the air within the cooling chamber to maintain a substantially uniform temperature in different portions thereof and for more rapidly absorbing heat from the bottles when first loaded.

It is a further object to provide means for the storage of the bottles in a plurality of tiers and for providing ready access to the lower as well as to the upper tiers.

With these and other advantageous features in view the invention consists in the construction as hereinafter set forth.

In the drawings:

Fig. 1 is a vertical central section partly in elevation through my improved cooler;

Fig. 2 is a plan view partly in horizontal section substantially on line 2—2, Fig. 1;

Fig. 3 is a vertical section corresponding to a portion of Fig. 1 showing one of the shelves in raised position;

Fig. 4 is an enlarged horizontal section illustrating the support for the stationary shelf section and the pivotal connection for the hinged shelf sections;

Fig. 5 is a side elevation of Fig. 4;

Fig. 6 is a vertical section showing the elements of Fig. 4 and Fig. 5; and

Fig. 7 is a vertical section through a portion of the base section.

Fig. 8 is a side elevation of the blower.

While the instant invention relates more particularly to certain features of the cooler as above set forth, I shall briefly describe the complete apparatus. Generally the apparatus comprises a base section A which contains all of the mechanism, and a cabinet section B supported on the base section. The base section includes a base ring C of angle cross-section having a platform C′ extending diametrically thereacross on which are mounted the motor, compressor, condenser and other elements of the operating mechanism. Rising from the ring C are posts C^2 which, as shown, are of channel cross-section having flanges C^3 extending laterally from opposite sides and secured to the ring. At its upper end each post has a laterally inwardly extending portion C^4 formed from the web of the channel, the sides being cut away to form a mitre joint as indicated at C^5. Surrounding the posts, with the exception of the portion at the rear end of the platform, are ring

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sections C^6 which are so fashioned as to form louvers for the free admission of air and at the same time concealing the mechanism. These louver rings are attached to a plurality of bars C^7 secured to and rising from the base ring C. The base ring is also provided with a plurality of feet C^8 spaced therearound and raising the ring slightly above the floor.

The cabinet section B comprises an outer cylindrical casing D having a bottom portion D′ which rests upon and is secured to the laterally extending portion C^4 of the posts C^2. Within the outer casing and resting upon the bottom D′ is a thermal insulating slab E. F is an inner cylindrical casing seated upon the pad E and having its cylindrical wall concentric with and spaced from the wall of the outer casing D. The casing F has helically wrapped thereabout a tube G forming the evaporator, which tube is preferably soldered or otherwise held in heat conducting contact with a wall of said casing F. The lower end of this helical tube is connected with an accumulator G′ which extends vertically adjacent to the wall of the casing F and the upper end of the accumulator is connected to a suction tube G^2 which is return bent to extend downward into the base section through a sealing grummet D^3 in the bottom D′ of the outer casing. The upper end of the helical tube G is connected to a cipallary tube G^3 which is wound around the suction tube G^2 and preferably soldered thereto, its lower end portion passing through the grummet D^3 and being connected to the outlet fluid conduit H from the condenser H′. The space between the concentric walls of the inner casing F and outer casing D is filled with thermo-insulating material E′ which extends up to near the top. Beads F′ and G^4 form ledges on which is supported an annular thermo-insulator slab E^2 which is just below the top of said casings and is sealed thereto by mastic E^3.

The top of the inner casing F is closed by a pair of lids I, which are mounted in a ring structure J. The latter has a depending flange J′ secured to the upper end portion of the casing D. There is also a ring section J^2 preferably formed of rubber, which overlaps the casing F and is of angle cross-section with its horizontal flange centrally split part way therethrough to receive a flange J^3 of a metallic ring J^4 which lines the rubber ring J^2. Thus the rubber ring J^2 forms thermal insulation between the casing F and the ring J. The upper face J^5 of the ring J^2 forms a resilient seat for the lids I. These lids are of semicircular form and their inner straight edges are connected by a hinge member I′ which at its opposite ends is pivotally supported on upwardly extending bracket members I^2 secured to the ring J^4 on diametrically opposite sides thereof. The arrangement is such that either or both of the

lids I can be turned upward into vertical position, thereby providing access to the chamber within the inner casing F.

The height of the inner casing F is sufficient to receive a plurality of tiers of bottles and as shown there are two tiers. The upper tier is supported by hinged shelf sections K which also are substantially semi-cylindrical but with a narrow stationary shelf section K' therebetween. The shelf K' is supported upon brackets K^2 secured to the casing F, which brackets have a segmental flange K^3 fitting the casing, a horizontal flange K^4, an inner vertical flange K^5 and a horizontal flange K^6 together forming a substantially Z-shaped cross-section. The shelf K' is directly attached to the flange K^6. The pivot pins K^7 of the shelves K engage bearings in the flange K^5, and clip members K^8 serve to hold the pivots normally in engagement with said bearings.

The shelf K' is centrally cut away for the passage of a blower casing member L, which latter is rigidly secured to and supported by said shelf member. A rotary fan L^a is arranged within the casing L and is driven by a motor mounted on the casing so as to withdraw air from the space below the shelves and discharge it upward. A stack member L' extends above the shelf K' and has at its upper end a cap member L^2 which deflects the blown air laterally, or toward the surrounding wall of the casing F, and also in a downwardly direction. The conductor cable L^3 for the fan motor extends therefrom to pass downward through sealing grummets L^4 and L^5, which are in alignment with each other, respectively, in the bottom of the inner casing F and bottom D' of the outer casing. This cable is then connected preferably in multiple with the motor for the compresser so that, as hereinafter explained, both motors will operate at the same time or remain stationary.

With the construction as above described the bottles to be cooled may be stored within the casing F, one tier directly resting upon the bottom of said casing and a second tier resting upon the shelves K and K'. As both the shelves K and lids I are semi-circular, one lid section and one shelf section can be turned up into vertical position for the loading of one-half of the bottom tier and after return of the shelf section for loading the corresponding half of the upper tier. The other half of the casing may be loaded at a different time and thus one-half may contain cooled bottles, while in the other half the bottles are being cooled. For this reason there are always cool bottles for dispensing. When the motor for the refrigerating apparatus in the base compartment is in operation the cylindrical wall of the inner casing F will be cooled to some predetermined low temperature by control means which is not a part of the instant invention. This, however, would not sufficiently cool all of the stored bottles and, therefore, the air within the casing is circulated. The direction of the current is first into the casing L centrally thereof, then upward through the stack L' and laterally radially outward and inclining downward by the deflection of the cap L^2 towards the cooled wall of the casing. This downward inclination of the air current is important as it avoids any tendency to blow the cold air out of the top of the casing when the lid is open. The shelves K are perforated for the free circulation of air therethrough, as well as through the annular space surrounding the periphery of the shelves. The lids I are, however, substantially air tight so that

there is only internal circulation of the air. The bottles will be sufficiently spaced for passage of air therebetween so that the temperature of air surrounding all of the bottles is substantially the same. It is desirable that the temperature within the casing should never drop low enough to freeze the content of the bottles or, on the other hand, to rise above a predetermined point. This may be accomplished by control means not a part of the instant invention, a thermostatic element M within the stack being effective to de-energize the motors at a predetermined minimum temperature of the air within the stack, while another thermostatic element such as a bulb M' adjacent to the cooled wall of the casing F is effective to energize the motors at a predetermined maximum temperature of said wall. This minimum temperature is something above the freezing point of water so that the wall will be automatically defrosted during the portion of each cycle in which the motors are not in operation. The condensation is drained out from the casing F through a conduit N, which extends downward through the bottoms of both inner and outer casings to a point outside of the louvers where it is provided with a removable cap N'.

When bottles are introduced into or removed from the cabinet one of the closed lids may be raised to upright position, and if access to the lower tier is required the corresponding semi-circular shelf can be also raised. The hinge axis of said shelf is out beyond the radius of said stack but not beyond that of said cap. Therefore, the shelf is provided with an aperture to receive the projecting portion of the cap so that the shelf will rest against said stack in stable upright position.

Where the cooler is used for the retail dispensing of the contents of the bottles, there is preferably provided an auxiliary casing O attached to the front wall of the casing D and having near its upper end an opening for access to a bottle cap remover. The caps thus removed will drop down within the casing O into a removable container O' at the lower end of said casing. This may be withdrawn and emptied from time to time.

What I claim as my invention is:

1. In a refrigerator a top opening cylindrical cabinet, a plurality of shelves together extending across substantially the entire area of and dividing the space within said cabinet into upper and lower storage compartments, said shelves including a narrow central stationary shelf extending diametrically across the cabinet, and a pair of substantially semi-circular shelves on opposite sides of said stationary shelf adapted to swing upward to a position above and over the latter within the space of the upper compartment.

2. In a refrigerator a top opening cylindrical cabinet, a plurality of shelves for dividing the space within said cabinet into upper and lower storage chambers and including a narrow central stationary shelf and substantially semi-circular shelves on opposite sides thereof mounted to be movable from horizontal to upright positions, and air circulating means mounted on said stationary shelf to depend therefrom into the lower compartment.

3. In a refrigerator a top opening cylindrical cabinet, a plurality of shelves for dividing the space within said cabinet into upper and lower storage chambers and including a narrow central stationary shelf and substantially semi-circular shelves on opposite sides thereof mounted to be movable from horizontal to upright positions, and

a blower mounted on said stationary shelf to depend therefrom into the lower chamber said blower having a stack extending centrally upward into the upper compartment and a deflector for directing the air from said stack radially outward.

4. In a refrigerator a top opening cylindrical cabinet having inner and outer casings and thermal insulating means therebetween, refrigerating means for the cylindrical wall of the inner casing surrounding the storage space therewithin, a plurality of shelves dividing the space within said cabinet into upper and lower storage compartments including a narrow central stationary shelf extending diametrically across the cabinet and a pair of substantially semi-circular hinged shelves on opposite sides of said stationary shelf movable from horizontal to upright positions, all of said shelves being spaced from the surrounding wall of the inner casing to form an unobstructed passage for downward movement of cooled air adjacent to said wall, and a central stack for upward movement of air.

5. In a refrigerator a top opening cylindrical cabinet having inner and outer casings and thermal insulating means therebetween, refrigerating means for the cylindrical wall of the inner casing surrounding the storage space therewithin, a plurality of shelves dividing the space within said cabinet into upper and lower storage compartments including a narrow central stationary shelf extending diametrically across the cabinet and a pair of substantially semi-circular hinged shelves on opposite sides of said stationary shelf movable from horizontal to upright positions, all of said shelves being spaced from the surrounding wall of the inner casing to form an unobstructed passage for downward movement of cooled air adjacent to said wall, an air circulating means for directing air upward at the center of the chamber and thence radially outward towards the side wall.

6. In a refrigerator a top opening cylindrical cabinet having inner and outer casings and thermal insulating means therebetween, refrigerating means for the cylindrical wall of the inner casing surrounding the storage space therewithin, a plurality of shelves dividing the space within said cabinet into upper and lower storage compartments including a narrow central stationary shelf extending diametrically across the cabinet and a pair of substantially semi-circular hinged shelves on opposite sides of said stationary shelf movable from horizontal to upright positions, all of said shelves being spaced from the surrounding wall of the inner casing to form an unobstructed passage for downward movement of cooled air adjacent to said wall, a blower mounted on said stationary shelf to depend therefrom into the lower compartment, a stack extending upward from said blower into the upper compartment, and a deflector for directing the air from said stack radially outward.

7. In a refrigerator a top opening cylindrical cabinet having inner and outer casings and thermal insulating means therebetween, refrigerating means for the cylindrical wall of the inner casing surrounding the storage space therewithin, a plurality of shelves dividing the space within said cabinet into upper and lower storage compartments including a narrow central stationary shelf extending diametrically across the cabinet and a pair of substantially semi-circular

hinged shelves on opposite sides of said stationary shelf movable from horizontal to upright positions, all of said shelves being spaced from the surrounding wall of the inner casing to form an unobstructed passage for downward movement of cooled air adjacent to said wall, a blower mounted on said stationary shelf to depend therefrom into the lower compartment, a stack extending upward from said blower into the upper compartment, a deflector for directing the air from said stack radially outward, and a top closure for said cabinet having hinged semi-circular sections in substantial registration with the corresponding sections of said shelf.

8. In a refrigerator a top opening cylindrical cabinet, a plurality of shelves for dividing the space within said cabinet into upper and lower storage chambers and including a central stationary shelf and substantially semi-circular shelves on opposite sides thereof mounted to be movable from horizontal to upright positions, a blower mounted on said stationary shelf to depend therefrom into the lower chamber, a stack extending upward from said blower through said stationary shelf being of a diameter less than the width of the latter, and a cap at the upper end of said stack of greater diameter for deflecting the upward air current radially, each of said semi-circular shelves being apertured to clear said cap and to rest against said stack in stable upright position.

9. In a refrigerator, a top opening cylindrical cabinet, a movable lid for opening and closing said cabinet, means for refrigerating the inner cylindrical wall of the cabinet surrounding the storage space therewithin and means for circulating air within the cabinet including means for directing an air current centrally upward, and means for deflecting said upward current radially outward in a downwardly inclined direction against the refrigerated wall and into the down current created by said wall in the air adjacent thereto, thereby avoiding blowing cold air out of the cabinet when the lid is open.

10. In a refrigerator, a top opening cylindrical cabinet, a lid for opening and closing said cabinet, means for refrigerating the inner cylindrical wall of said cabinet surrounding the storage space therewithin, a blower within said cabinet having a central upwardly extending stack, and a conical cap above the upper end of said stack for directing the air radially outward in a downwardly inclined direction against the refrigerated wall of the cabinet into the down current created thereby to cool said air and to drop it downward thereby avoiding blowing cold air out of the cabinet when the lid is open.

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