

Nov. 10, 1959

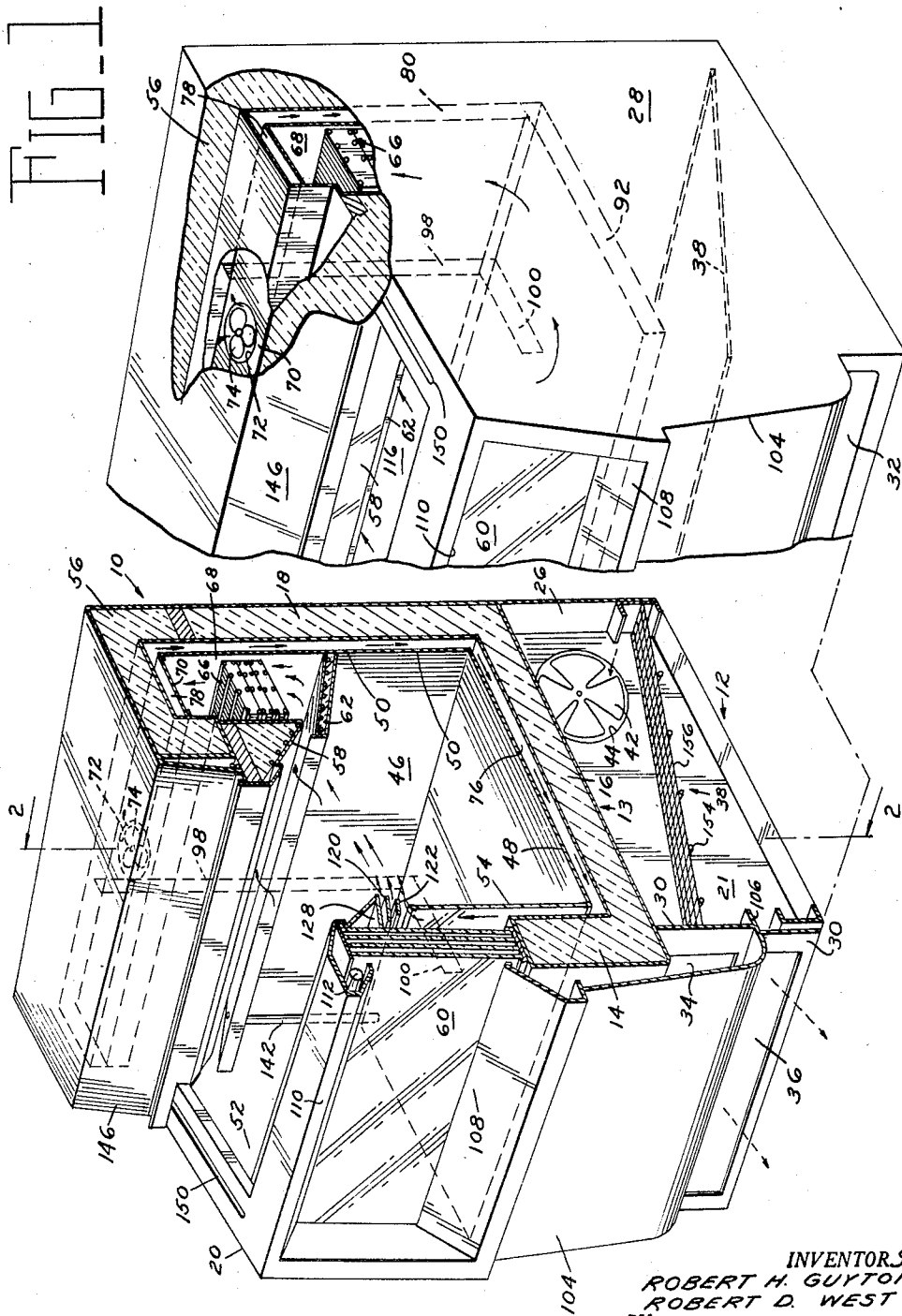
R. H. GUYTON ET AL

2,911,799

REFRIGERATED FOOD DISPLAY CABINET

Filed Dec. 30, 1954

3 Sheets-Sheet 1



INVENTORS
ROBERT H. GUYTON
ROBERT D. WEST
BY

Barney, Kinsley, Laughlin & Raines
ATTORNEYS

Nov. 10, 1959

R. H. GUYTON ET AL

2,911,799

REFRIGERATED FOOD DISPLAY CABINET

Filed Dec. 30, 1954

3 Sheets-Sheet 2

FIG. 2

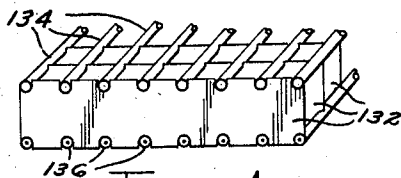
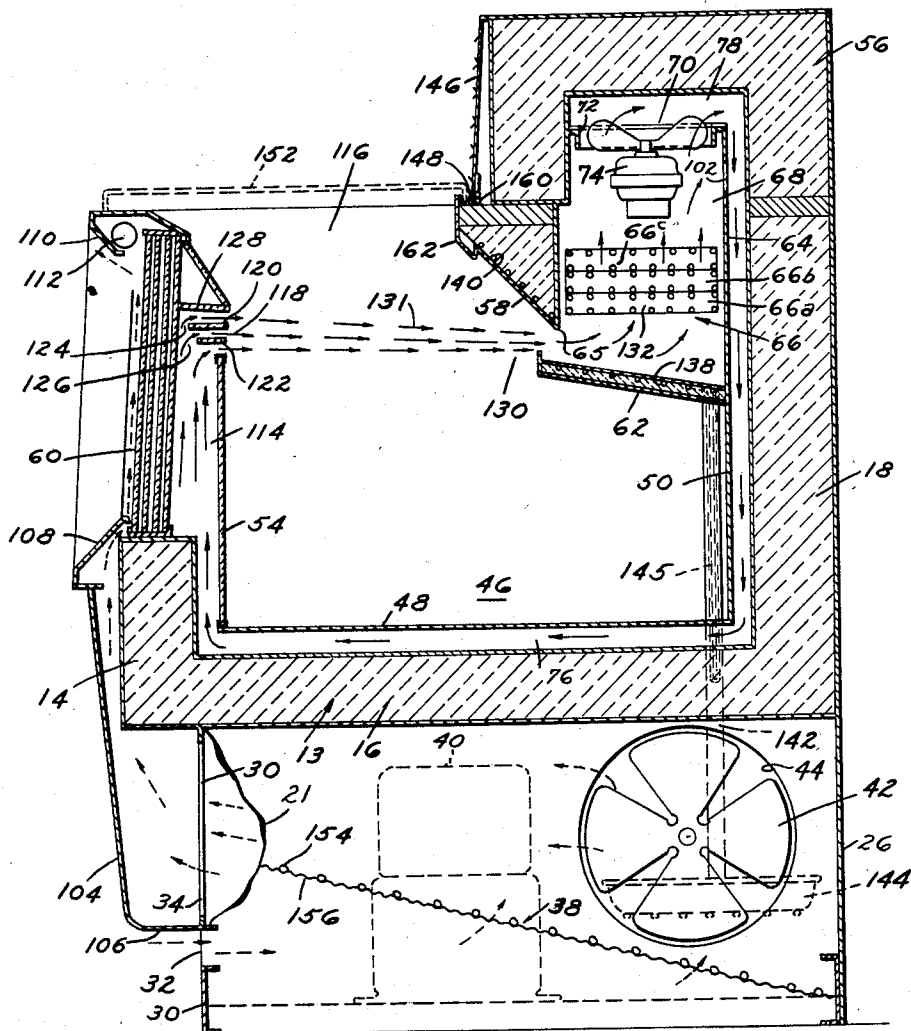


FIG. 4

INVENTORS
ROBERT H. GUYTON
ROBERT D. WEST
BY

Barnes, Kissick, Laughlin & Laird

ATTORNEYS

Nov. 10, 1959

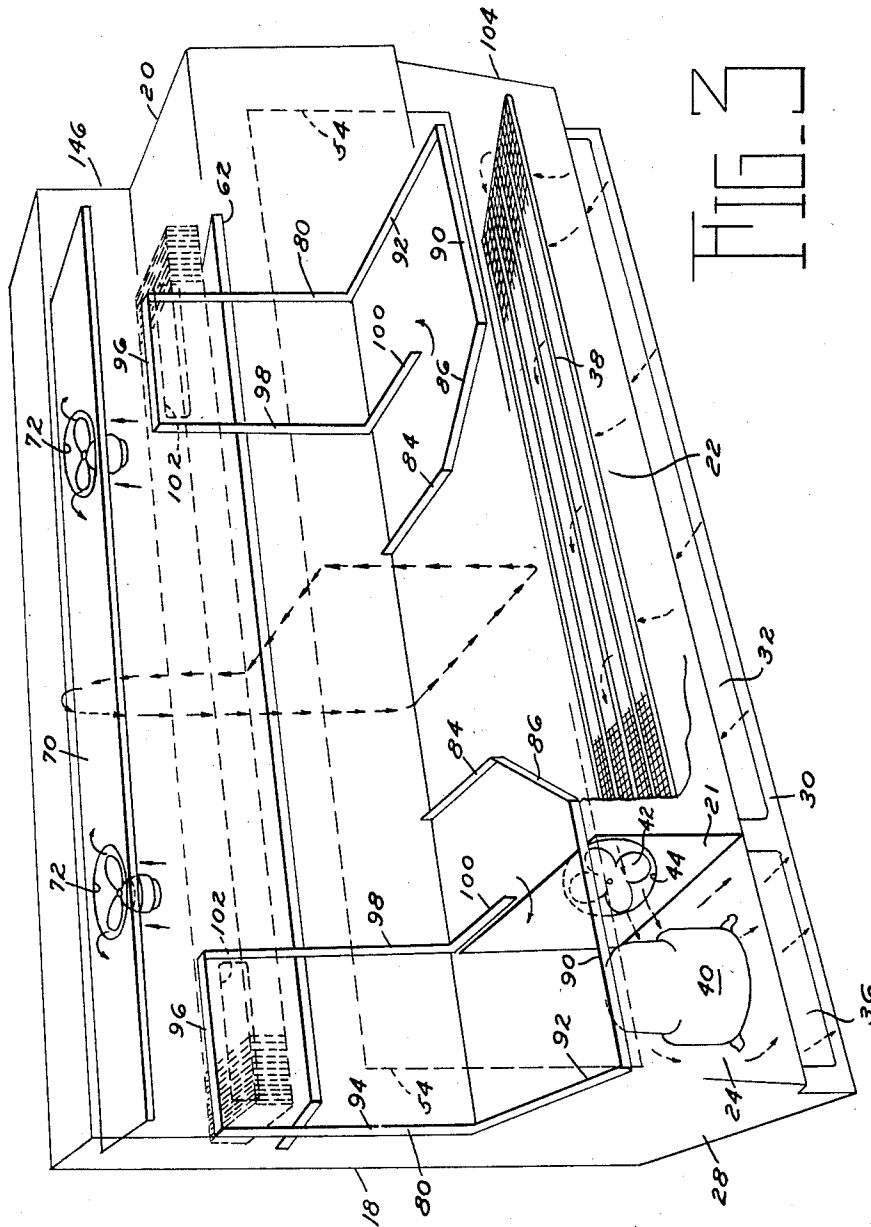
R. H. GUYTON ET AL

2,911,799

REFRIGERATED FOOD DISPLAY CABINET

Filed Dec. 30, 1954

3 Sheets-Sheet 3



INVENTORS
ROBERT H. GUYTON
ROBERT D. WEST
BY

Barney, Kisselle, Laughlin & Laird
ATTORNEYS

1

2,911,799

REFRIGERATED FOOD DISPLAY CABINET

Robert H. Guyton, Lima, Ohio, and Robert D. West, Manitowoc, Wis., assignors to Manitowoc Equipment Works, a division of The Manitowoc Company, Inc., Manitowoc, Wis., a corporation of Wisconsin

Application December 30, 1954, Serial No. 478,705

16 Claims. (Cl. 62—248)

This invention relates to a refrigerated food storage cabinet and more particularly to a refrigerated food display cabinet of the open top type.

It is an object of this invention to provide a cabinet of this character which is designed to operate with a very high degree of efficiency.

A further object of the invention resides in the provision of a refrigerated cabinet of the type above referred to which is arranged to be automatically defrosted periodically in a minimum of time.

The invention also contemplates a refrigerated food storage cabinet of the above described type which is designed to require very little maintenance.

In the drawings:

Fig. 1 is a perspective view of the food storage cabinet of this invention with parts broken away and shown in section to illustrate the construction thereof.

Fig. 2 is a sectional view along the line 2—2 in Fig. 1.

Fig. 3 is a generally diagrammatic view of the cabinet in perspective showing primarily the air passageways therethrough.

Fig. 4 is a fragmentary detail view of one of the passes of the evaporator.

Referring to the drawings, the cabinet which is generally designated 10 includes a base 12 on which the insulated box structure 13 is supported. The structure 13 includes a front wall 14, a bottom wall 16, a rear wall 18 and end walls 20. These walls generally comprise inner and outer panels having insulation therebetween. Insulated box structure 13 is spaced above the floor surface to provide therebelow a space at the bottom of cabinet 10 which is divided by a partition 21 into a compartment 22 and a compartment 24. These compartments are closed along their rear side by a panel 26 and at each end by a panel 28. A panel 30 is also provided along the front sides of these compartments. An air inlet opening 32 extends along the lower portion of panel 30 substantially throughout the extent of compartment 22. At the portion of panel 30 which extends across the front of compartment 24, there is provided a pair of vertically spaced, horizontally extending openings 34 and 36. A condenser 38 is housed within compartment 22, and a motor compressor unit 40 is mounted in compartment 24. A fan 42 is mounted within an opening 44 in partition 21 for drawing cooling air over the condenser through air inlet 32 into the compressor compartment 24 and out of this compartment through the outlets 34 and 36.

Within the insulated box structure 13, there is mounted a receptacle providing a food compartment 46. The receptacle is provided with a bottom wall 48, a rear wall 50, end walls 52 and a front wall 54. Front wall 54 comprises a glass panel extending the length of food compartment 46. Along the rear upper side of the insulated box structure 13, there is arranged an inverted U-shaped insulated wall 56; and an insulated and inclined baffle wall 58 extends along the front free edge of wall 56 over the food storage compartment 46.

2

The front wall 14 of box structure 13 is much shorter in height than rear wall 18, and a series of insulatively spaced plate glass panels 60 are supported at the upper edge of this front wall. Panels 60, like panel 54, extend substantially throughout the length of the cabinet and provide a viewing aperture at the front of the cabinet for the food storage compartment 46.

On the back wall 50 of food compartment 46, there is arranged generally at the level of the upper edge of glass panel 54 an inclined shelf or drain pan 62. Drain pan 62 inclines downwardly toward the back and extends forwardly beyond the lower edge 65 of baffle wall 58. Drain pan 62 extends substantially throughout the length of the food storage compartment 46. Above the drain pan 62 and between baffle wall 58 and the upward extension 64 of the rear wall 50 of compartment 46, there is arranged a horizontally extending evaporator 66. Above the evaporator 66, there is provided a plenum chamber 68, the upper end of which is closed by a top panel 70 provided with two spaced apertures 72 in each of which is mounted a fan 74.

It will be observed that the walls of food compartment 46 are spaced from the front, bottom and rear walls of the box structure 13 to provide an air duct 76 therebetween which communicates with the space 78 above the top panel 70 of plenum chamber 68. Within this air duct 76, there is arranged two series of baffles or partitions for causing the air to flow through duct 76 in a particular manner. These baffles or partitions are generally designated 80, and each of the baffles 80 has a portion 84 extending forwardly from the rear wall 18 between walls 16 and 48. The partition portions 84 are spaced from opposite ends of the cabinet a distance corresponding approximately to one-third the length of the cabinet. At about the mid-line of the cabinet in a direction from front to back, partitions 84 turn outwardly as at 86 towards the end of the cabinet; and the outwardly turned portions 86 are bent to extend axially towards the opposite ends of the cabinet as at 90 along a line spaced inwardly from the front wall 14 of the insulated structure 16. Adjacent each end of the cabinet, the partition portions 90 extend in a direction rearwardly as at 92, then upwardly as at 94 to a line approximately level with the top side of evaporator 66. At this point, the partitions extend axially as at 96, then vertically downwardly as at 98 between walls 18 and 50 with its upward extension 64 and then forwardly as at 100 between walls 16 and 14 to a point approximately half way between the front and rear sides of food compartment 46. The upward extension 64 of rear wall 50 is provided with a pair of air openings 102.

Along the lower front of the cabinet, there is provided a panel 104 which is spaced forwardly of the panel 30 and the front wall 14 of the insulated box structure 13. Along its lower edge, panel 104 is turned inwardly as at 106 and connects with panel 30 along a line generally corresponding to the upper edge of opening 32 of condenser compartment 22 and between air outlet openings 34 and 36 at compartment 24. Along its upper edge, panel 104 is connected with a trim panel 108, the upper edge of which is spaced forwardly of the front glass panel 60 to permit air to flow along the inside of panel 104 and upwardly across the frontmost glass panels 60 of the viewing window. Along the upper front edge of the glass panels 60, there is provided another trim panel 110 behind which is housed a lamp 112. Vertical side trim panels 113 are also spaced forwardly of front glass panel 60 and the space behind these panels also communicates with the space behind panel 104.

The space 114 between the front glass wall 54 of food storage compartment 46 and the glass panels 60 communicates with the space 116 just above the open top

of compartment 46 through an orifice 118 which extends lengthwise substantially throughout the length of compartment 46. Orifice 118 is divided into three horizontally extending portions by baffles 120 and 122. Baffle 122, it will be noted, is narrower in a direction from front to back than baffle 120. Thus, the size of the opening 124 between the rear edge of baffle 120 and the innermost glass panel 60 is less than the opening 126 between the inner edge of baffle 118 and the innermost glass panel 60. The baffles 118 and 120 together with the uppermost baffle 128 are arranged to direct the air flowing upwardly through space 114 rearwardly across the open top 130 of food storage compartment 46 to the bottom of evaporator 66. The flow of air along this path as indicated by arrows 131 is assisted by the inclined baffle wall 58 and drain pan 62.

Evaporator 66 is of the finned tube type having a plurality of vertically spaced passes 66a, 66b and 66c. Each pass comprises a series of upright parallel spaced fins 132 with a refrigerant conduit 134 secured to the upper edges of these fins and a heating coil 136 secured to the lower edges of these fins. The heating coil 136 is an electrical resistance wire insulatively enclosed within a sheath. Evaporator 66 is generally of the open type which permits the air to flow upwardly through the three passes 66a, 66b and 66c thereof. A heating coil 138 is also mounted in drain pan 62 and another heating coil 140 is mounted on the inner or rear face of inclined baffle wall 58. At each of the opposite ends of drain pan 62, there is provided a drain pipe 142 both of which discharge into an evaporator pan 144 in compressor compartment 24. A heating coil 145 is arranged in drain pipe 142. Along the front of the U-shaped insulated wall member 56, there is arranged a panel 146 provided with suitable means for mounting signs or other indicia thereon. The lower edge of panel 146 terminates in drain channel 148 communicating at each end with drip troughs 150 on the refrigerator cabinet. Drain channel 148 is arranged to receive one edge of a cover 152 which may be positioned over the open top of the cabinet at night when it is not in use.

The refrigerating system of this cabinet is of the type which operates intermittently or continuously and includes a timing mechanism which shuts down the refrigerating cycle to provide a defrost cycle at regular intervals of operation. The timing mechanism is adjustable to vary the duration of the refrigerating cycle according to the conditions under which the display cabinet is used. For example, under some conditions, it will be necessary to defrost the cabinet only once every twenty-four hours; and under such conditions, the timer could be accordingly adjusted to produce such cycle of operation.

During the refrigerating cycle, fan 42 and the fans 74 operate continuously. Referring first to the action of fan 42, it will be observed that this fan causes a large volume of air to be drawn into condenser compartment 38 through inlet opening 32. Opening 32 is relatively large; and thus, the velocity of the air through opening 32 is relatively low. The low velocity of the condenser cooling air reduces the tendency of this air to pick up dust, lint, dirt, etc. which, in conventional arrangements, tends to clog the condenser. The condenser 33 comprises a refrigerant cooling conduit 154 arranged in serpentine fashion in a single plane and secured to wires or open mesh material 156. The condenser inclines downwardly in a direction from front to back and extends substantially throughout chamber 122. Thus, the condenser is cooled in an efficient manner by the air drawn in through inlet opening 32; and in addition, the arrangement is such that the condenser can be quickly and easily cleaned if necessary by merely manipulating a brush through opening 32 across the lower face of the condenser. Fan 42 draws all the air admitted to compartment 22 through inlet 32 into compressor compart-

ment 24. A portion of this air is discharged outwardly through the outlet 36 while another portion is discharged from compartment 24 into the chamber defined by panel 104 through outlet opening 34. The air directed through opening 34 flows lengthwise of panel 104 and upwardly across the foremost glass panel 60 to maintain this panel free of fog. Since the air for cooling the condenser is admitted and discharged at the front of the cabinet, it will be appreciated that cabinet 10 may be positioned with its back side against a wall or other structure.

The operation of evaporator fans 74 causes air to be drawn from plenum chamber 68 upwardly through fan openings 72 and into the space 78 above the top panel 70 of the plenum chamber. From the space 78, the air is caused to flow downwardly in air duct 76 between the vertical runs 98 of the baffles or partitions which separate the food storage compartment 46 from the insulated box-like structure 13. Adjacent the lower rear edge of the food storage compartment 46, this air stream is divided into three portions. One portion flows forwardly between bottom walls 48 and 16, between the baffle portions 84 and between the baffle portions 86. At the front of the food storage compartment, this air flows upwardly and also axially towards the opposite ends of the cabinet between the runs 90 and the front wall 14 of structure 13. All of this air is directed upwardly into the space 114 between the glass panel 54 and the food storage compartment and the innermost glass panel 60 of the cabinet viewing window. At the upper end of the space 114, the cooling air is directed outwardly across the open top 130 of the food storage compartment through the elongated orifice 118. It will be observed that baffles 128, 120 and 122 divide this air horizontally into three stratified levels or streams. Because of the respective sizes of baffles 120 and 122, the lowermost air streams, that is, the stream flowing outwardly through the upper edge of panel 154 and baffle 122, will have the highest velocity; and the air stream flowing outwardly between baffles 120 and 128 will have the lowest velocity. These three air streams are directed between the slightly inclined baffles 128, 120 and 122 across the open top of compartment 46 where the food products are stored and into the space between drain pan 62 and the bottom of the evaporator. The air passing over the open top 130 of the food storage compartment absorbs the radiant heat from the food products in the storage compartment.

The provision of means for causing this air to flow into stratified streams of progressively decreasing velocity in an upward direction is very important. The relatively high velocity of the lowermost air stream carries the radiant heat from the food products rapidly into the evaporator. The uppermost low velocity stream causes a minimum of turbulence with the surrounding room air and thus picks up a minimum of moisture from the surrounding atmosphere. The middle stream of intermediate velocity acts as a buffer between the upper and lower air streams. The baffles 128, 120 and 122 also impart a direction flow to the air; that is, they tend to cause the air to flow in a straight path to the evaporator rather than with a turbulent action. The directional flow of the air together with the relatively low velocity of the uppermost air stream minimizes the aspiration of room air into the evaporator. Since the room air is at a higher temperature and more humid, a minimum aspiration of this room air into the air stream flowing through the evaporator reduces the load on the evaporator.

Referring again to Fig. 2, it will be noted that a portion of the air flowing downwardly along the rear wall 50 of the food storage compartment is directed forwardly between the two bottom walls 48 and 16 in a path between the baffle portions 84 and 100 adjacent each end of the cabinet. This air is caused to flow forwardly between these bottom walls and then back and upwardly between the baffle portions 94 and 98. This air is discharged through the openings 102 back into the evapora-

5

tor at a level above the bottom pass 66a thereof. This air stream is designed to absorb the heat loss occurring through the walls of the food storage compartment. Since this air has simply been raised in temperature and has not been exposed to surrounding room air which is much higher in humidity, it is introduced back into the evaporator at a level above the level at which ice and frost is accumulated. The evaporator is designed so that the lower pass thereof is flooded and has sufficient refrigerating capacity to condense out substantially all the moisture in the air flowing upwardly through the bottom of the evaporator. Therefore, substantially all the air flowing through the upper passes of the evaporator is relatively dry; and the upper passes of the evaporator are designed primarily for lowering the temperature of this air. It will also be noted that the return of the bypassed air to the evaporator at a level above the bottom pass 66a avoids turbulence with the other air stream flowing in a direction from front to back into the space between drain pan 62 and evaporator 66 which would otherwise occur if the bypassed air were introduced into the evaporator at the lower end thereof. Thus, this arrangement very effectively confines the formation of frost to the coils on the lower pass of the evaporator. In this connection, it may be explained that the defrosting cycle is preferably timed to occur when the frost accumulation approaches the upper portion of the lower pass of the evaporator. By limiting the frost accumulation to the lower pass of the evaporator, the efficiency of the system is increased and the defrosting can be accomplished easily and in a minimum interval of time.

As explained above, the timer in the refrigerating system is set so that the defrosting cycle is started when the frost accumulation approaches the upper portion of the lower pass of the evaporator. During the defrost cycle, the operation of the fans and the motor compressor unit are discontinued and the heating coils 136 in the evaporator, 140 in the inclined baffle 58, 138 in the drain pan 62 and 145 in the drain pipe 142 are energized. Thus, the frost on the lower pass of the evaporator is loosened and drops onto the drain pan 62 where it is melted by coil 138 and flows down to the evaporating pan 144 through drain pipe 142. Heating coil 146 in drain pipe 142 prevents the formation of ice and thereby clogging the pipe 142. At the same time, the frost accumulating on the inclined baffle 58 is also loosened. Baffle 58 is so inclined and the heat produced by coil 140 is controlled such that this sheet of frost slides downwardly and drops off the lower end 65 of the baffle onto the drain pan 62. Thus, all the water resulting from the melting of this frost is discharged into the evaporating pan 144; and since this pan is located in a relatively warm air stream, the water therein is gradually evaporated. A continuously energized heating coil 160 extends along and in the wall of drain channel 148. This latter coil prevents the formation of frost along drain channel 148 and the trim bracket 162.

Thus, it will be seen that we have provided a food storage display cabinet of novel construction. The evaporator coil is located above the product, and the heat load of the cabinet and the product is absorbed by forced air streams which are caused to travel predetermined paths so as to reduce the load on the compressor to a minimum. The front of the food storage compartment, the portion that is visible through the glass panel 60, is prevented from absorbing heat by the blanket of cold air flowing upwardly therealong. The flow of air through the evaporator coil is in an upward direction; and with the exception of the heating coil 145 in drain pipe 142, all of the heating surfaces required for the defrost cycle are located above the product. The heat that can be absorbed by the product during the defrost cycle is limited to the normal heat loss of the cabinet and the radiant heat loss through the open top of the food storage compartment.

6

One of the reasons why the refrigerating cabinets of this invention are efficient in operation may be attributed to the particular manner in which the refrigerated air is circulated. It will be observed that this air is at its coldest temperature when it leaves the evaporator and it is raised to a progressively increasing temperature along its path of travel down the back, cross the bottom, up the front and over the open top of the food storage compartment. Thus, the air flow is controlled such that it is exposed to a progressively increasing temperature along its path of travel; and when it reaches its maximum temperature, it is caused to flow directly back into the evaporator. It will be noted also that the humidity pick-up of this air follows generally the same pattern. The maximum moisture is picked up by this refrigerant air as it flows over the open top of the food storage compartment. Immediately after flowing over the open top of the food storage compartment, this air is directed immediately into the evaporator. Therefore, the tendency to form frost on inaccessible surfaces or surfaces that are not heated is eliminated. As a matter of fact, the frost accumulates substantially entirely at a level above the product. Thus, the heating cables may be located entirely above the product; and during defrosting, very little heat employed for melting the frost is absorbed by the product.

We claim:

1. A refrigerated food display cabinet having a food storage compartment open at the top, an evaporator above the product level of said compartment and extending substantially throughout the length of said compartment, said evaporator being of the type which permits air to flow upwardly therethrough and having a plurality of vertically spaced passes, means for drawing air upwardly through said evaporator and passageway means for directing a portion of said air across said open top to the bottom pass of said evaporator and another portion of said air around the walls of said compartment out of communication with the surrounding room air and back into the evaporator at a level above said bottom pass thereof.

2. A refrigerated food display cabinet having a food storage compartment open at the top, an evaporator at the rear side of said food storage compartment disposed above the product level of said compartment, said evaporator being of the type permitting air to flow upwardly therethrough and comprising a plurality of vertically spaced generally horizontally extending passes, means above the evaporator defining a generally enclosed air chamber into which air directed upwardly through the evaporator passes, at least two air passageways communicating with said air chamber, one of said passageways being arranged to direct a stream of air from said air chamber across said open top from the front of the cabinet towards the back and towards the bottom pass of the evaporator and the other passageway being arranged to direct a stream of air from said air chamber adjacent wall portions of the food storage compartment generally out of communication with the surrounding room air and back into the evaporator at a level above said bottom pass.

3. A refrigerated food display cabinet having a food storage compartment open at the top, a chamber above said compartment at the rear side thereof and extending substantially throughout the length of said compartment, an evaporator in said chamber, said evaporator being of the type which permits air to flow upwardly therethrough and having a plurality of vertically spaced passes, said chamber having an air inlet adjacent the bottom pass of the evaporator, means for drawing air upwardly through said evaporator and directing a portion of said air across said open top in a direction from front to back through said air inlet and to the bottom pass of said evaporator, said means including a horizontally elongated orifice

aligned substantially horizontally with said air inlet and arranged to stratify the air into a plurality of vertically spaced, horizontally extending layers.

4. The refrigerated food display cabinet as called for in claim 3 wherein the means for stratifying said air is such that the uppermost layer of air has a velocity substantially lower than the lowermost layer.

5. A refrigerated food display cabinet having a food storage compartment open at the top, an evaporator above said compartment and extending substantially throughout the length of said compartment, said evaporator being of the type which permits air to flow upwardly therethrough and having a plurality of vertically spaced passes, means for drawing air upwardly through said evaporator and directing a portion of said air across said open top to the bottom pass of said evaporator and another portion of said air around the walls of said compartment out of communication with the surrounding room air and back into the evaporator at a level above said bottom pass thereof, the refrigerating effect of said last mentioned portion of said air being sufficient to absorb the heat loss through the portion of the walls of said compartment with which said last mentioned portion of air comes into contact.

6. A refrigerated food display cabinet having a food storage compartment at the upper portion thereof and having a generally enclosed air space extending substantially throughout the length of the cabinet at the lower portion thereof, a partition dividing said air space into a compressor compartment and a condenser compartment, said condenser compartment having a relatively large air inlet opening at the front of said cabinet which extends substantially throughout the length of said compartment, said partition having an opening therethrough for directing air from said condenser compartment into said compressor compartment, a condenser in said condenser compartment, said condenser being disposed in generally a single plane and being generally co-extensive with the cross sectional area of said condenser compartment, a compressor in said compressor compartment, said compressor compartment having an air outlet opening at the front of said cabinet and fan means for drawing air into said condenser compartment through said inlet opening, through the condenser, to the compressor compartment and outwardly at the front of the cabinet through said air outlet opening.

7. A refrigerated food display cabinet as called for in claim 6 wherein said condenser is disposed in said condenser compartment in the path of travel of the air from said inlet opening to the opening in said partition.

8. A refrigerated food display cabinet as called for in claim 6 wherein said condenser is horizontally inclined in a direction from front to back in said condenser compartment.

9. A refrigerated food display cabinet as called for in claim 5 wherein said air inlet opening is of such size that air is drawn into said compartment through said opening at a relatively low velocity.

10. A refrigerated food display cabinet as called for in claim 6 wherein said compressor compartment is provided with a second outlet opening at the front side of said cabinet, said cabinet having a glass panel at the front face thereof for viewing the products in said food storage compartment and means for directing air from said second outlet opening across the outer face of said glass panel to prevent fogging thereof.

11. A refrigerated food display cabinet as called for in claim 5 wherein said compressor compartment is provided with a second air outlet opening at the front of said cabinet, said second air outlet opening being disposed above the first mentioned outlet opening in said compressor compartment, said cabinet having a glass panel extending lengthwise of the cabinet at the front side thereof for viewing the products in said food storage compartment and a trim panel around said glass panel

forming an air passageway from said second outlet opening in said compressor compartment to adjacent the edge portions of said glass panel whereby air from said compressor compartment is discharged through said first mentioned outlet opening therein and the air pressure in said compressor compartment is also relieved by reason of the discharge of air through said second outlet opening and across the outer face of said glass panel.

12. A refrigerated food display cabinet having a food storage compartment open at the top, an evaporator above the product level of said compartment and extending substantially throughout the length of said compartment, said evaporator being of the type which permits air to flow upwardly therethrough and having a plurality of vertically spaced passes, means for drawing air upwardly through said evaporator and directing a portion of said air upwardly through said evaporator downwardly at the rear of the rear wall of said compartment, forwardly below the bottom wall of said compartment, upwardly in front of the front wall of said compartment and then rearwardly across said open top to the bottom pass of said evaporator and another portion of said air around the walls of said compartment out of communication with the surrounding room air and back into the evaporator at a level above said bottom pass thereof.

13. A refrigerated food display cabinet having a food storage compartment open at the top, said cabinet having an evaporator chamber disposed above the product level of said compartment, an evaporator disposed in said evaporator compartment, said evaporator being of the type which permits air to flow upwardly therethrough and being generally coextensive with said evaporator compartment in a horizontal plane, means forming a passageway for refrigerated air extending from the upper end of said chamber downwardly along the rear side of said compartment, forwardly beneath said compartment, upwardly along the front side of said compartment, and then rearwardly over said open top to said chamber below said evaporator and means for directing a stream of air upwardly through said evaporator and then through said passageway back to said chamber below the evaporator.

14. A refrigerated food display cabinet as called for in claim 7 including an evaporator in said cabinet disposed above said generally enclosed air space, a drain pipe extending downwardly from said evaporator into said condenser compartment, a drain pan in said condenser compartment located in the path of travel of said air on the downstream side of said condenser, said drain pipe discharging into said drain pan.

15. A refrigerated food display cabinet having a food storage compartment open at the top, a chamber above said compartment at the rear side thereof and extending substantially throughout the length of said compartment, an evaporator in said chamber, said evaporator being of the type which permits air to flow upwardly therethrough and having a plurality of vertically spaced passes, said chamber having an air inlet adjacent the bottom pass of the evaporator, means for drawing air upwardly through said evaporator and directing a portion of said air across said open top in a direction from front to back through said air inlet and to the bottom pass of said evaporator, said means including a horizontally elongated orifice aligned substantially horizontally with said air inlet.

16. A refrigerated food display cabinet having a food storage compartment open at the top, an evaporator compartment extending above the product level of said food storage compartment and extending substantially throughout the length of said food storage compartment, an evaporator extending throughout the length of said evaporator compartment, said evaporator being of the type which permits air to flow upwardly therethrough, said evaporator compartment being open along the lower end thereof, means for drawing air upwardly through said evaporator compartment and passageway means for directing a portion of said air across said open top and up-

wardly through the open bottom end of said evaporator compartment to the bottom of the evaporator and another portion of said air around the walls of said food storage compartment out of communication with the surrounding room air and back into the evaporator chamber at a level adjacent the upper end of the evaporator. 5

References Cited in the file of this patent

UNITED STATES PATENTS

2,196,291	Clancy	Apr. 9, 1940	10
2,458,589	Groat	Jan. 11, 1949	

MacMaster	Jan. 10, 1950
MacMaster	Jan. 10, 1950
Hanson	Feb. 20, 1951
Brinkoeter	Mar. 30, 1954
Swanson	Apr. 19, 1955
Swanson	Dec. 6, 1955
Jenson	Aug. 21, 1956