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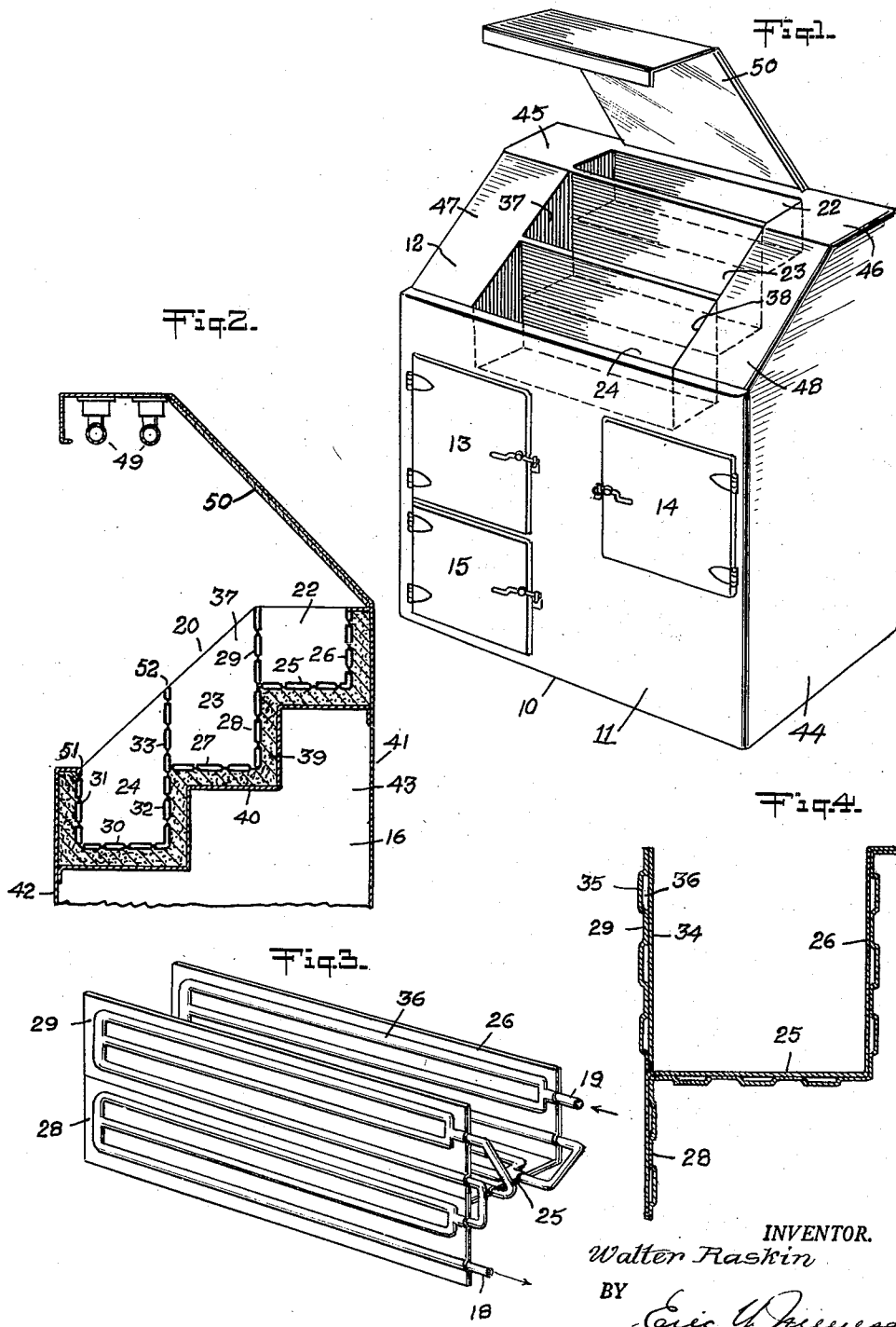
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2,428,243

REFRIGERATOR DISPLAY AND STORAGE FIXTURE

Filed Sept. 22, 1944

3 Sheets-Sheet 1



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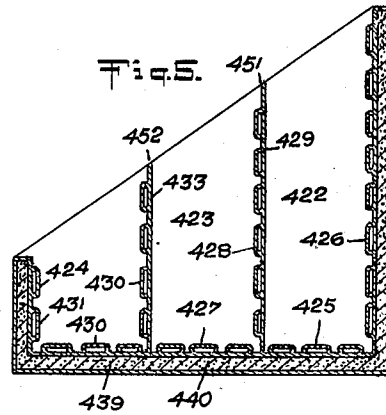
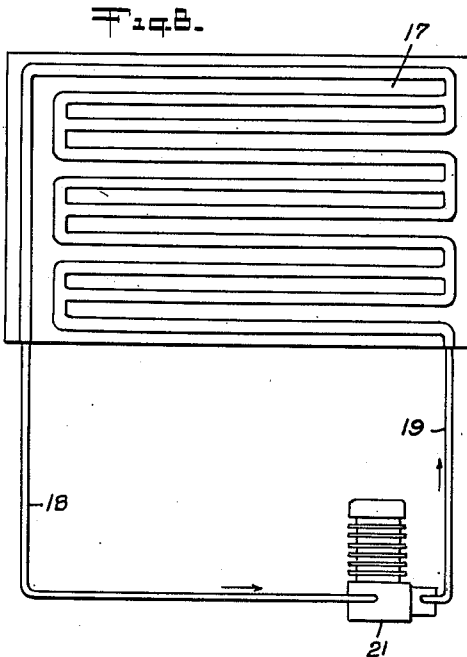
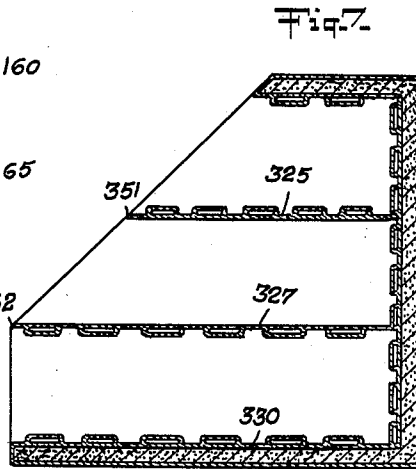
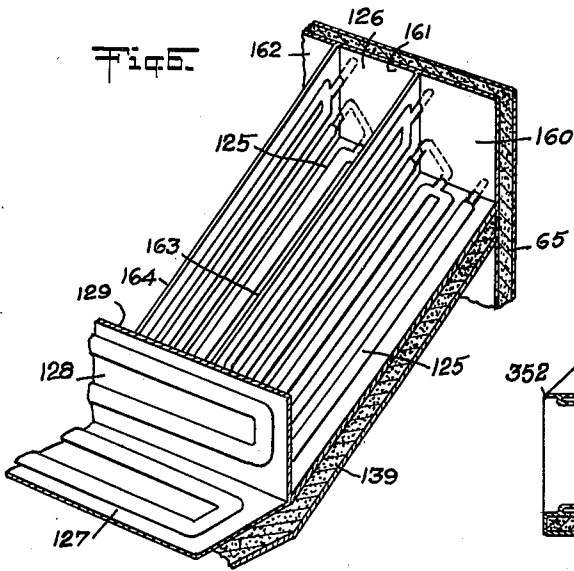
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REFRIGERATOR DISPLAY AND STORAGE FIXTURE

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3 Sheets-Sheet 2



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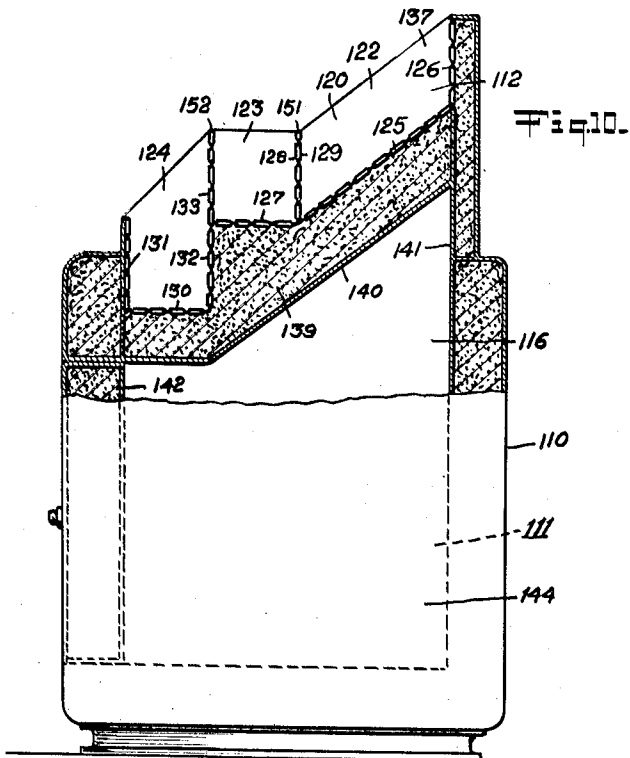
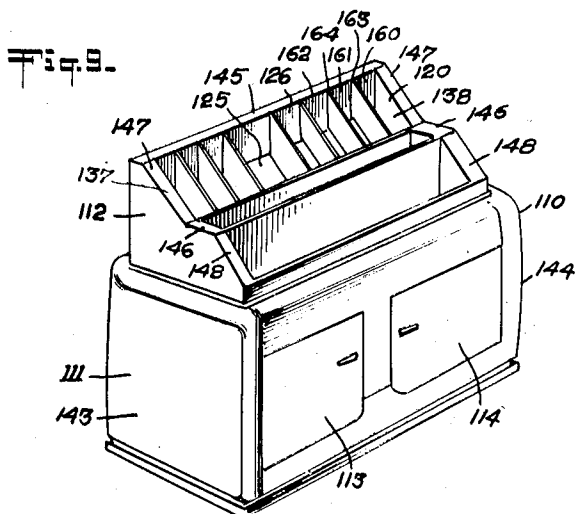
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REFRIGERATOR DISPLAY AND STORAGE FIXTURE

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3 Sheets-Sheet 3



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REFRIGERATOR DISPLAY AND STORAGE FIXTURE

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6 Claims. (Cl. 62-89.5)

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This invention relates generally to the refrigeration art and more particularly to a refrigerated cabinet for the storage and display of frozen foods.

While frozen foods have become definitely accepted as articles of commerce and they enjoy a wide sale and use, considerable difficulty has been encountered in the retail merchandising thereof. This is so, because the average customer prefers to select an article of food which is in view and attractively and appetizingly displayed. In accordance with previous methods the frozen foods in packaged form were kept in deep refrigerated wells, of a size and shape comparable to those in which ice cream and similar products have been kept. This has meant that the consumer has had to select the particular product desired from a printed list of names of products without actually seeing the particular food. This may be contrasted on the other hand with the sale and display of fresh fruits, vegetables and meats which are arrayed in an attractive and appetizing manner.

It is therefore among the principal objects of the present invention to provide novel and useful frozen food display cabinets which are adapted to clearly and visibly present to the prospective purchaser the frozen foods in a desirable manner.

It is another object herein to provide means for adequate refrigeration of the perishable foods being shown, that no spoilage or deterioration may occur during the period while the foods are on display.

Another object of the present invention lies in the provision of structure wherein air at reduced temperatures is caused to flow over and about the refrigerated foods in the separate display compartments.

A feature of the present invention lies in the fact that the chilled air is used over and over and it flows from one chamber to another resulting in economies in operation.

Another object herein lies in the provision of frozen food display cabinet constructions wherein the display compartments are physically associated with the storage chambers which at a refrigerated temperature maintain a reservoir or reserve of food which may be used to replace the food sold from or removed from the display compartments.

Another object herein lies in the provision of refrigerated display compartments in stepped physical relation so that a maximum display area is obtained which may be illuminated at high intensity to promote proper visibility of the products. This visibility not only attracts the prospective purchasers to the display but also aids them in the examination and selection of the goods.

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Another object herein lies in the simplicity of construction of the device so that the same may be readily cleaned and maintained in a sanitary condition.

5 Simplicity of construction of the present device also contributes to fool proof operation, low maintenance cost, and low initial manufacturing costs so that devices of the present character may have a wide sale and use, in fact wherever frozen
10 foods are sold.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claims.

15 In the drawings in which similar reference characters designate corresponding parts throughout the views of each embodiment;

20 Figure 1 is a front perspective view of a frozen food storage and display cabinet constituting a first embodiment of the invention.

Figure 2 is a fragmentary vertical sectional view of Figure 1.

25 Figure 3 is an enlarged detail view in perspective of a portion of the display compartment walls showing the fabrication and distribution of the evaporator coils for heat exchanger action.

Figure 4 is an enlarged fragmentary vertical sectional view of the uppermost display compartment seen in Figure 2.

30 Figure 5 is a fragmentary vertical sectional view showing an alternative form of the construction of the display compartments shown in Figure 2.

35 Figure 6 is a fragmentary view in perspective showing the altered form of the display compartments of the second embodiment of the invention.

Figure 7 is a fragmentary view in vertical section showing a third embodiment of the invention comprising an altered form of the display compartments.

Figure 8 is a schematic diagram of the refrigerating system utilized in connection with all of the embodiments described.

45 Figure 9 is a front view in perspective showing the second embodiment of the invention.

Figure 10 is an enlarged elevational view partly in vertical section as seen from the right side of Figure 9.

50 Turning now to the first embodiment of the invention and particularly Figures 1 to 4, inclusive, and Figure 8, the frozen food display and storage cabinet, as a unit, is indicated by reference character 10 and includes generally a storage portion 11 and a display portion 12. The general outlines of the cabinet 10 at the base thereof are preferably rectangular so as to occupy the least amount of usable space in the location where it is used. The storage portion 11 may have a plurality of
60 doors 13-15 inclusive which open into a cham-

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ber 16 which may be refrigerated in any well-known manner and the refrigeration therefore is not illustrated in detail in the drawings. Preferably the chamber 16 contains at least a portion of the heat exchanger or evaporator coil 17 and other portions of the exchange 17 may be so distributed as to form wall portions of the display compartments generally indicated by reference character 20 in the display portion 12. In the schematic diagram on Figure 8 reference characters 18 and 19 designate conduits leading to and from the refrigerator compressor 21. As will be understood by those skilled in the art to which the present invention relates any form of refrigerating device may be used and refrigeration may be produced in the storage portion 11 and display portion 12 either by the evaporation of a liquid refrigerant in the heat exchanger coils (indicated schematically as 17), or the compressor 21 may be in a form of a pump circulating refrigerated brine or other refrigerant fluid through the exchanger 17.

As best seen in Figures 1 and 2 the display compartments 20 in the display portion 12 are plural in number and may include a top compartment 22, an intermediate compartment 23 and a bottom compartment 24. The compartments 22, 23 and 24 are disposed in downwardly stepped arrangement extending forwardly of the device 10. While there have been shown a top, bottom, and one intermediate compartments, any number of intermediate compartments may be interposed between the top and bottom compartments. This will be affected by the size of the device 10 and by the sizes of the products which are placed in the compartments. The top compartment 22 has a bottom wall 25 and a rear wall 26; the intermediate compartment has a bottom wall 27 and a rear wall 28, the upper portion 29 of which forms the front wall of the compartment 22. The bottom compartment has a bottom wall 30, a front wall 31, and a rear wall 32 the upper portion 33 of which forms the front wall for the intermediate compartment 23.

The walls and wall portions 25-33 inclusive are preferably of uniform construction so that a detailed description of the wall portion 29 will suffice for all. As seen in the upper left hand portion of Figure 4 the wall portion 29 is composed of a plurality of wall forming laminations 34 and 35. The lamination 35 is embossed to form refrigerant conveying channels generally indicated by reference character 36. The hermetic interengagement of the opposed inner surfaces of the laminations 34 and 35 produces these liquid and/or gas tight channels 36. By virtue of the thinness of the laminations 35 and 36 the heat exchanger action of the walls and wall portions 25-33 is enhanced so that reduced temperatures in the display compartments 20 may be quickly reached and substantially maintained even under adverse high temperature weather conditions. The display compartments 20 may have common end walls 37 and 38 and the outer (concealed) surfaces thereof may be provided with suitable insulation material similar to the insulation material 39 which is supported below the lower surfaces of the bottom walls 25, 27 and 30 by the retainer 40. The retainer 40 preferably extends between the rear cabinet wall 41 and the front cabinet wall 42. The retainer 40 is of irregular shape adapted to conform to the inner or lower surfaces of the compartments 22, 23 and 24, all as best seen in Figure 2 of the accompanying drawings. The insulating material disposed

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outwardly of the end walls 37 and 38 is disposed between the end cabinet walls 43 and 44 and below the top panels 45 and 46 and the angular panels 47 and 48. The panels 45-48 inclusive not only serve to position and confine the insulating material thereunder but also act as surfaces which may carry suitable advertising, product describing, or price indicia.

Disposed above the compartments 20 is a source of illumination 49 which preferably takes the form of an incandescent lamp or a fluorescent tube. The latter is preferable since the light to heat ratio is better.

Angularly disposed and extending above the display compartments is a reflector 50 which serves the double purpose of reflecting some of the light from the source 49 into the compartments, and also casting a reflected image of the contents of the compartments for the prospective purchaser to see, obviating the necessity for leaning or bending to look into the compartments.

The operation of the device is substantially as follows. With refrigerant passing through the hollow walls 25-23 heat is absorbed from the compartments 22, 23 and 24. It will be noted that the compartments 20 are completely open at the top thereof thus the refrigerated air within the compartments spills over and being heavier moves downwardly. Refrigerated air from the compartment 22 flows, therefore, over the upper edge or spillway 51 into the compartment 23 and this refrigerated air together with that in the compartment 23 overflows the spillway 52 into the compartment 24. Thus there will be a variation in temperature (assuming all other basic factors such as refrigerated wall area, distribution of linear channel 36, and temperature of refrigerant, to be equal) between the several compartments. Compartment 24 will be colder than compartment 23 and compartment 23 will be colder than compartment 22. Products may therefore be distributed among the several compartments 20 in accordance with their optimum storing temperature.

Turning now to a consideration of Figure 5 for the purpose of avoiding unnecessary repetition parts corresponding to those of the first embodiment are given the same reference characters with the addition of the prefix 4. This variation in form differs from the first embodiment previously described in that the compartments 422, 423 and 424 have bottom walls at the same level. It will be noted, however, that the spillways 451 and 452 are downwardly stepped and movement of refrigerated air as previously described will occur.

The movement of refrigerated air from one compartment to another is particularly effective for the desired purpose since it forms a blanketing current which isolates the most exposed (farthest removed from the refrigerated walls of the compartments) parts or portions of the product within the compartments from the outer warm air normally surrounding the device 10 and tending to enter in under the canopy formed by the supporting means for the source of illumination and the reflector. As seen in Figure 5 the rearmost compartments 423 and 422 may also be utilized effectively to contain relatively larger food products so that the visible area is most effectively used from a display standpoint.

Turning now to the second embodiment illustrated in Figures 6, 9 and 10 for the purpose of avoiding needless repetition, parts corresponding to those of the first embodiment are given the

same reference characters with the addition of the prefix 1.

The compartments generally indicated by reference characters 122 are rotated through 90° with respect to those illustrated in connection with the first embodiment. Thus the compartments 160, 161 and 162 and the others corresponding thereto extend at an angle downwardly from the rear of the device to the front of the device. The slanting bottom walls 125 as well as the end or dividing walls 163 and 164 and others corresponding thereto are provided with self-contained heat exchanger means.

This angular arrangement of the compartments 122 (160, 161 and 162, and others corresponding thereto) permits more satisfactory disposition of the goods to be displayed (not shown) so that said goods are tilted up for a more clear view by the prospective purchaser. Long articles fit into these compartments well, such as fowl and corn and the like. The angular tilt of the compartments 122, also facilitates neat stacking and provides good visibility.

This third embodiment of the invention is illustrated in Figure 7 and here again for the purpose of avoiding needless repetition parts corresponding to those of the first embodiment are given the same reference characters with the addition of the prefix 3. It will be seen in this form of invention that spillover lips 351 and 352 are provided but that these occur at the forward edge of the bottom walls 325 and 327.

The form shown in Figure 7 is particularly useful for the refrigerated display of relatively bulky articles which are to be removed by a forward movement horizontally of the device.

It may thus be seen that a novel and useful refrigerated display cabinet has been disclosed in which the commodities are properly stored and maintained in a refrigerated condition with relatively full visibility. Convenient placement and removal of the products are assured and the merchandise is attractively presented. Common refrigerated walls service plural compartments and convection spillover effects of cold air are utilized to chill the most exposed, and therefore likely to be warmed, product portions.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A refrigerated display case open at the top and having heat insulated walls, said case comprising a plurality of tiered compartments, said compartments being formed by a plurality of refrigerated spaced partition members extending longitudinally of the display case, the upper edge of each of said partition members extending above the upper edge of the next adjacent one, whereby the cold air will flow by gravity from one compartment to another.

2. A refrigerated display case open at the top and having heat insulated walls, said case comprising a plurality of tiered compartments, said compartments being formed by a plurality of refrigerated spaced partition members extending longitudinally of the display case, the upper edge of each of said partition members extending above the upper edge of the next adjacent one, whereby the cold air will flow by gravity from one compartment to another, a refrigerated rear

wall for the uppermost of said compartments and a refrigerated front wall for the lowermost of said compartments.

3. A refrigerated display case open at the top and having heat insulated walls, said case comprising a plurality of tiered compartments, said compartments being formed by a plurality of refrigerated spaced partition members extending longitudinally of the display case, the upper edge of each of said partition members extending above the upper edge of the next adjacent one, whereby the cold air will flow by gravity from one compartment to another, a refrigerated bottom wall for each of said compartments, a refrigerated rear wall for the uppermost of said compartments and a refrigerated front wall for the lowermost of said compartments.

4. A refrigerated display case open at the top and having heat insulated walls, said case comprising a plurality of tiered compartments, said compartments being formed by a plurality of refrigerated spaced partition members extending longitudinally of the display case, the upper edge of each of said partition members extending above the upper edge of the next adjacent one, whereby the cold air will flow by gravity from one compartment to another, a plurality of spaced refrigerated partitions extending transversely across the uppermost of said compartments for subdividing said compartments into a plurality of smaller compartments.

5. A refrigerated display cabinet having a storage portion and display case superimposed upon said storage portion, said case being open at the top and having insulated walls, said case comprising a plurality of tiered compartments, said compartments being formed by a plurality of refrigerated spaced partition members extending longitudinally of the display case, the upper edge of each of said partition members extending above the upper edge of the next adjacent one, whereby the cold air will flow by gravity from one compartment to another.

6. A refrigerated display cabinet having a storage portion and display case superimposed upon said storage portion, said case being open at the top and having insulated walls, said case comprising a plurality of tiered compartments, said compartments being formed by a plurality of refrigerated spaced partition members extending longitudinally of the display case, the upper edge of each of said partition members extending above the upper edge of the next adjacent one, whereby the cold air will flow by gravity from one compartment to another, a plurality of spaced refrigerated partitions extending transversely across the uppermost of said compartments for subdividing said compartments into a plurality of smaller compartments.

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