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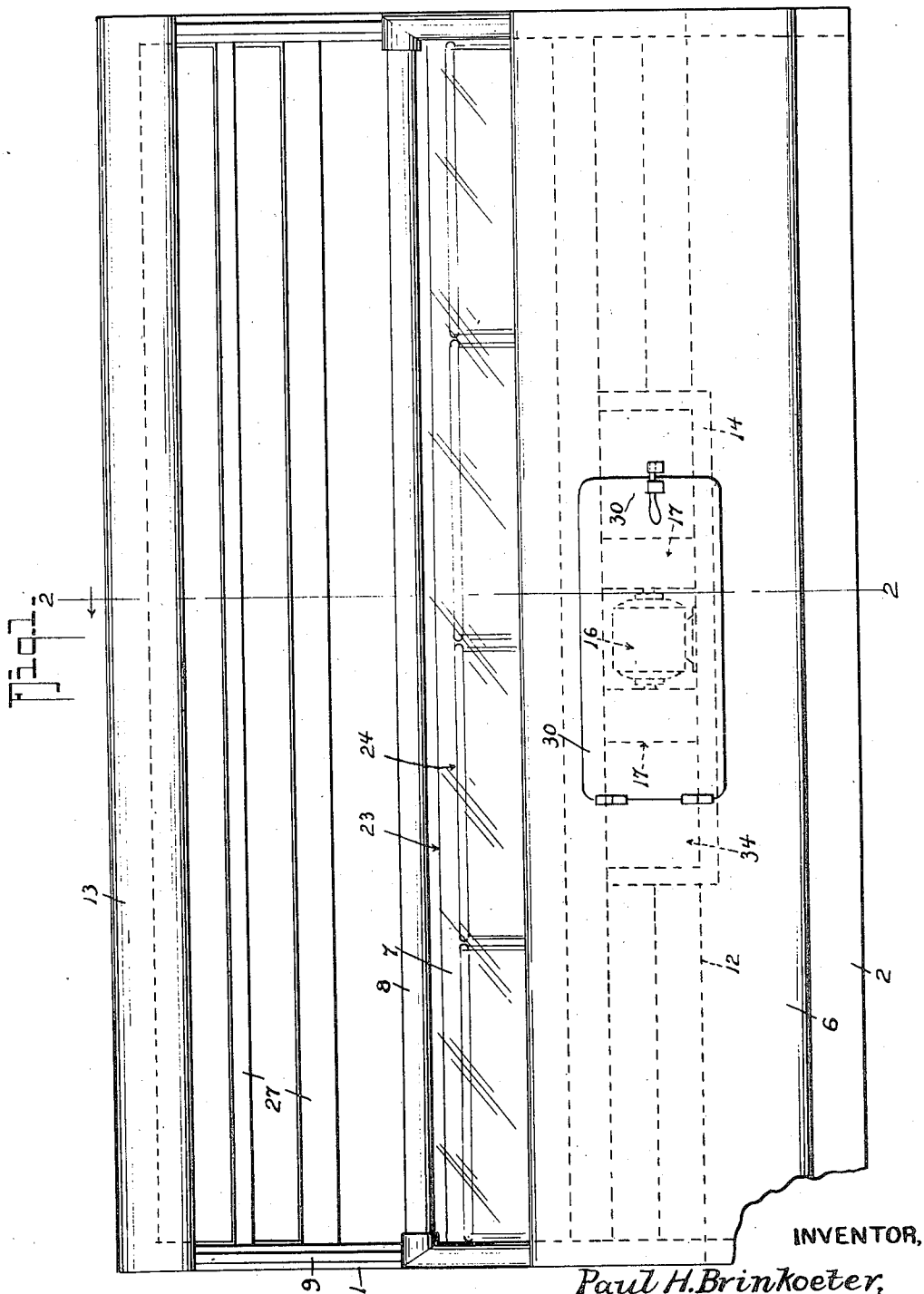
P. H. BRINKOETER

2,421,314

OPEN TOP REFRIGERATED DISPLAY CASE

Filed Nov. 21, 1945

3 Sheets-Sheet 1



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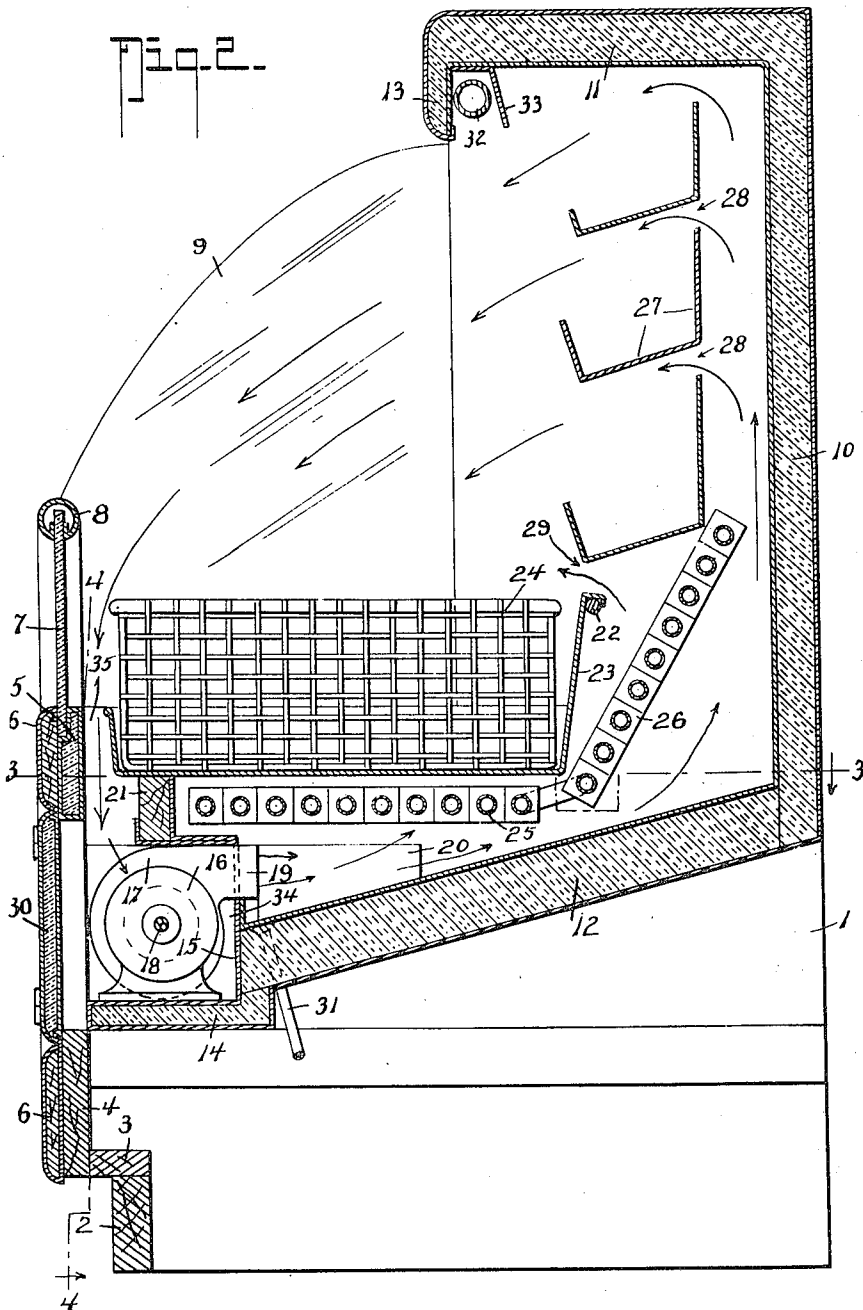
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3 Sheets-Sheet 2



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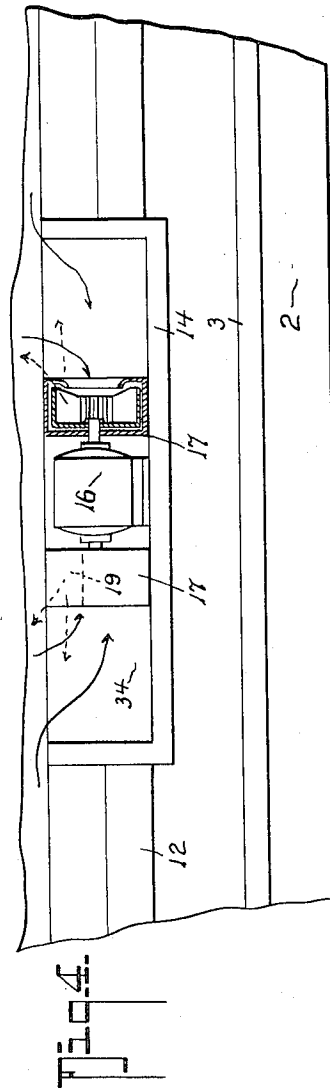
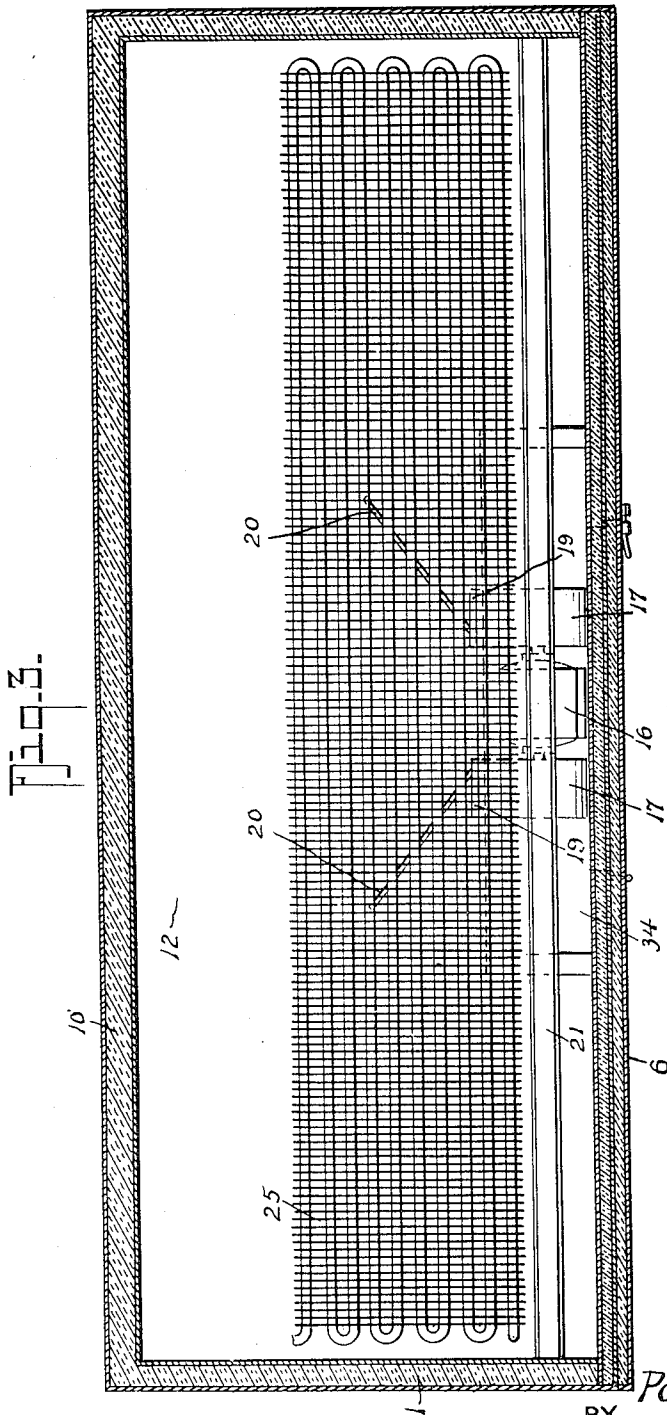
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3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

2,421,314

## OPEN TOP REFRIGERATED DISPLAY CASE

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to Ed. Friedrich, Inc., San Antonio, Tex., a corporation of Texas

Application November 21, 1945, Serial No. 629,970

10 Claims. (Cl. 62—89.5)

1

My invention relates to display cases for perishable food stuffs, such as, fruits, vegetables, etc., and it particularly has for its objects:

1. To provide a display case, of the character stated, with a positive circulation of air.

2. To provide a display case wherein food-receiving shelves can be located at higher positions, providing more display area, larger capacity for goods.

3. To provide a cabinet of the character stated which is not only pleasing to the eye but is one in which the food can be more artistically displayed than heretofore.

4. To provide a cabinet in which circulated cold air is controlled by outlets above each shelf and the lower display baskets.

5. To provide a cabinet in which the cold air enters the open display portion of the cabinet at a higher position, causing it to drop over all items displayed, then to return to the coil chamber at the lowest part of the display section.

6. To provide a cabinet in which the lower pans or baskets are located immediately above a refrigerating coil, whereby the pan and baskets will definitely be cooled to a lower temperature than normal circulation would provide.

7. To provide a cabinet whose cooling coils are located in such positions that they serve a dual purpose of cooling the air blown through or over the coils and cooling by direct action on the goods held in close proximity to the coils.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends invention further resides in the novel details of construction, combination and arrangement of parts which will be hereinafter first fully described and will then be specifically pointed out in the appended claims, reference being had to the accompanying drawings in which:

Fig. 1 is a front elevation of a cabinet according to my invention.

Fig. 2 is a cross section of the cabinet on the line 2—2 of Fig. 1.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2.

Fig. 4 is a detail view taken on the line 4—4 of Fig. 2, one fan being shown in section.

In the drawings in which like numerals and letters of reference indicate like parts in all the figures, 1 represents the side walls of the cabinet, the portion of which above the bottom walls 12, 14 is insulated as indicated in Fig. 2.

2, 3 and 4 are longitudinal front base strips and 5 is the insulated front wall which extends

2

above the strip 4 and has a door opening to a motor and fan chamber 34, the opening normally being closed by an insulated service door 30. The front of the cabinet has a porcelain trim 6 which extends from the horizontal base strip 3 a height somewhat under one-half the height of the cabinet, a plate glass wall 7 being projected upwardly from the trim 6 and provided with a metal hand rail 8. Plate glass end walls 9 are also provided through which the contents of the cabinet may be seen. The bottom 14 of the fan or blower chamber 34 is insulated also.

12 designates the bottom wall of the food chamber which inclines upwardly-rearwardly from the front wall 5, 6 to the rear insulated back wall 10. At the top of wall 10 is an insulated canopy 11 having a downwardly extended lip 13 behind which is located a suitable illuminant (fluorescent tube, for example), and its shield 33.

15 designates metal sheathing over the insulation of the various walls.

A suitable electric motor 16 has its shaft 18 connected to two fans or blowers 17 which fans or blowers receive air from the return duct or passage 35 that extends along the upper part of the front wall 5, 6 and force the air out via nozzles or outlets 19 against the spreaders or deflectors 20, along the bottom wall 12 and up along the back wall 10, from whence it passes through the passages 28 above the back walls of the pans 27, a portion of the air passing through the heat-exchanger 26 and out through passage 29.

A strip or beam 21 extends over the chamber 34 and is spaced inward of the front wall to form therewith the return passage 35 above referred to.

A metal pan 23 extends lengthwise of the cabinet. Its front and side walls being shallow while its rear wall is deep and terminates at its upper edge in a hook-like portion to hook over a rod or rail 22. Thus the front of the pan is supported on the beam 21 and the rear is suspended from the rod, making the pan easily removable. One or more wire baskets 24 are set in the pan 23 to contain food stuffs.

A horizontally disposed heat-exchanger 25 lies below and in close proximity to the pan 23 and above the fan outlets 19 and air spreads 20, as best shown in Fig. 2.

Water of condensation is drained away to a suitable place (not shown) via a drain pipe 31.

The arrows in Fig. 2 indicate the air currents circulated by the fans or blowers 17.

The shelves 27 having vertical back walls and forwardly-downwardly inclined bottoms serve to provide a vertical back air duct and downwardly-

forwardly directed air baffles, thus ensuring an effective circulation of chilled air over and about the food stuffs contained in the baskets 24 and on the shelves 27.

The space below the bottom wall 12 may be used to house the refrigerating machinery (not shown) that passes refrigerant through the heat-exchangers 25 and 26, but as such machinery is per se no part of the present invention (any well known makes may be used) it is thought unnecessary to illustrate the same.

From the foregoing description taken in connection with the accompanying drawings it is thought the construction, operation and advantages of the invention will be clear to those skilled in the art, it being understood that changes in the details of construction may readily be made without departing from the spirit of the invention and within the scope of the appended claims.

#### What I claim is:

1. In a refrigerated display case of the class described, insulated bottom, side, back and front walls, the back and side walls extending a substantial distance above the front wall and the bottom wall inclining rearwardly-upwardly from the front wall; a canopy extending forwardly from the upper end of said back wall a distance substantially less than the depth of the cabinet between said front and back walls to leave an opening between said front wall and the front of the canopy; food shelves having rear walls spaced from said back wall and spaced one above another to provide air circulating passages; a pan located above but adjacent the fore part of said bottom wall; a heat-exchange unit beneath and in close proximity to said pan; and means creating a forced air circulation from the fore portion of and along said bottom wall, up said back wall and downwardly over said shelves and pan to and down said front wall, all within the cabinet.

2. In a refrigerated display case of the class described, insulated bottom, side, back and front walls, the back and side walls extending a substantial distance above the front wall and the bottom wall inclining rearwardly-upwardly from the front wall; a canopy extending forwardly from the upper end of said back wall a distance substantially less than the depth of the cabinet between said front and back walls to leave an opening between said front wall and the front of the canopy; food shelves having rear walls spaced from said back wall and spaced one above another to provide air circulating passages; a pan located above but adjacent the fore part of said bottom wall; a heat-exchange unit beneath and in close proximity to said pan; a combined fan and motor chamber adjacent said front wall and said bottom wall; a motor and fan assembly in said chamber for receiving air from along said front wall and forcing air along said bottom wall, up said back wall and through said air circulating passages; and said food shelves including means to deflect the air downwardly-forwardly over said pan toward said front wall back to said motor and fan assembly.

3. In a display case of the class described, a cabinet having a low front wall, a high back wall, side walls, and a bottom wall, a top wall extending forwardly from said back wall a predetermined distance, a plurality of pans located beneath said top wall, one above another and spaced apart to form air passages and having rear walls spaced from said back wall to form with said back and said side walls a vertical air

passage, a pan located over the bottom wall and in front of and below said plurality of pans and spaced from the front wall and from the bottom wall a distance sufficient to provide front and bottom air passages; a heat-exchange unit mounted in said bottom air passage and located in proximity to the bottom of said last named pan, a motor-fan assembly for causing air to circulate down said front air passage, across the bottom of the cabinet, in part over said heat-exchange unit, up said vertical air passage, forwardly through the air passages between said plurality of pans and downwardly-forwardly toward said front air passage for purposes described.

4. In a display case of the class described, a cabinet having a low front wall, a high back wall, side walls, and a bottom wall, a top wall extending forwardly from said back wall a predetermined distance, a plurality of pans located beneath said top wall, one above another and spaced apart to form air passages and having rear walls spaced from said back wall to form with said back and said side walls a vertical air passage, a pan located over the bottom wall and in front of and below said plurality of pans and spaced from the front wall and from the bottom wall a distance sufficient to provide front and bottom air passages; a heat-exchange unit mounted in said bottom air passage and located in proximity to the bottom of said last named pan, a motor-fan assembly for causing air to circulate down said front air passage across the bottom of the cabinet, in part over said heat-exchange unit, up said vertical air passage, forwardly through the air passages between said plurality of pans and downwardly-forwardly toward said front air passage, said front wall being composed in part of a heat-insulated structure and in part of a transparent structure and said side walls being each composed in part of a heat-insulated structure and in part of a transparent structure.

5. In a display case of the class described, a cabinet having a low front wall, a high back wall, side walls, and a bottom wall, a top wall extending forwardly from said back wall a predetermined distance, a plurality of pans located beneath said top wall, one above another and spaced apart to form air passages and having rear walls spaced from said back wall to form with said back and said side walls a vertical air passage, a pan located over the bottom wall and in front of and below said plurality of pans and spaced from the front wall and from the bottom wall a distance sufficient to provide front and bottom air passages; a heat-exchange unit mounted in said bottom air passage and located in proximity to the bottom of said last named pan, a motor-fan assembly for causing air to circulate down said front air passage across the bottom of the cabinet, in part over said heat-exchange unit, up said vertical air passage, forwardly through the air passages between said plurality of pans and downwardly-forwardly toward said front air passage, and wire baskets in the second named pan, the front and side transparent portions of the front and side walls extending above said baskets.

6. In a display case of the class described, a cabinet having a low front wall, a high back wall, side walls, and a bottom wall, a top wall extending forwardly from said back wall a predetermined distance, a plurality of pans located beneath said top wall, one above another and spaced apart to form air passages and having rear walls

5

spaced from said back wall to form with said back and said side walls a vertical air passage, a pan located over the bottom wall and in front of and below said plurality of pans and spaced from the front wall and from the bottom wall a distance sufficient to provide front and bottom air passages; a heat-exchange unit mounted in said bottom air passage and located in proximity to the bottom of said last named pan, a motor-fan assembly for causing air to circulate down said front air passage across the bottom of the cabinet, in part over said heat-exchange unit, up said vertical air passage, forwardly through the air passages between said plurality of pans and downwardly-forwardly toward said front air passage, said front wall being composed in part of a heat-insulated structure and in part of a transparent structure and said side walls being each composed in part of a heat-insulated structure and in part of a transparent structure, and wire baskets in the second named pan, the front and side transparent portions of the front and side walls extending above said baskets.

7. In an open-top refrigerated display case; a heat-insulated front wall; a heat-insulated back wall of substantially greater height than said front wall; a heat-insulated bottom wall extending downwardly-forwardly from said back wall to said front wall; a canopy extending forwardly from said back wall; heat-insulated side walls extending at the level of the insulated front wall and the depth of the canopy; a transparent front wall along the top of the insulated front wall; transparent side walls connected to said insulated side walls and lying forward of and below the canopy; a pan located within the case spaced from the insulated front wall to leave a return-air passage and spaced from said back wall and from said bottom wall; a heat-exchange unit beneath said pan; a heat-exchange unit in back of said pan; at least one shelf beneath said canopy and above said pan and spaced from said back wall; and means in said case for causing a circulation of air from said return-air passage over said heat-exchange units, up along said back wall and forwardly-downwardly over said shelf and said pan back to said return-air passage.

8. In an open-top refrigerated display case having a low front wall and a high back and side walls and a bottom wall, the improvement which comprises a motor-fan compartment on the case adjacent said front wall, said front wall having a door opening to said compartment; a door normally closing said opening; a motor-fan assembly in said compartment with provisions for di-

6

recting a stream of air rearwardly over said bottom wall; a beam across said case above said compartment and spaced inward from said front wall to provide a return-air passage; a pan, the front part of which rests on said beam and is spaced from said front wall; means removably supporting the rear part of said pan in place; a heat-exchanger below said pan; a second heat-exchanger in back of said pan; said heat-exchangers being located in the air stream; food holding shelves, one above another in the case above said second heat-exchanger and spaced from the back wall of the cabinet and having provisions for deflecting the air stream forwardly-downwardly toward said return-air passage.

9. In a refrigerated open display case having a bottom wall, a front wall, a back wall of greater height than said front wall, a canopy extending forwardly from said back wall, and side walls, the improvement which includes a pan mounted in said case above said bottom wall and adjacent said front wall but spaced from the front and back walls; a heat-exchanger located beneath and in proximity to the bottom of said pan; a second heat-exchanger in back of said pan; at least one pan-like foodshelf located above said second heat-exchanger, said shelf having a high back, a low front and a downwardly-forwardly inclined bottom; and means causing a forced air circulation rearwardly from said front wall, over said bottom and upwardly to the rear of said pan and said shelf and in contact with said heat-exchangers, then forwardly-downwardly over said shelf and said pan back to said front wall.

10. The case of claim 9 wherein said means causing forced circulation of air comprises a motor-fan assembly located in a chamber adjacent said bottom and front walls and below the level of said heat-exchangers and having provision for receiving air from adjacent said front wall and expelling it below the first mentioned heat-exchanger and means for spreading the air laterally as it is expelled from a fan.

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