

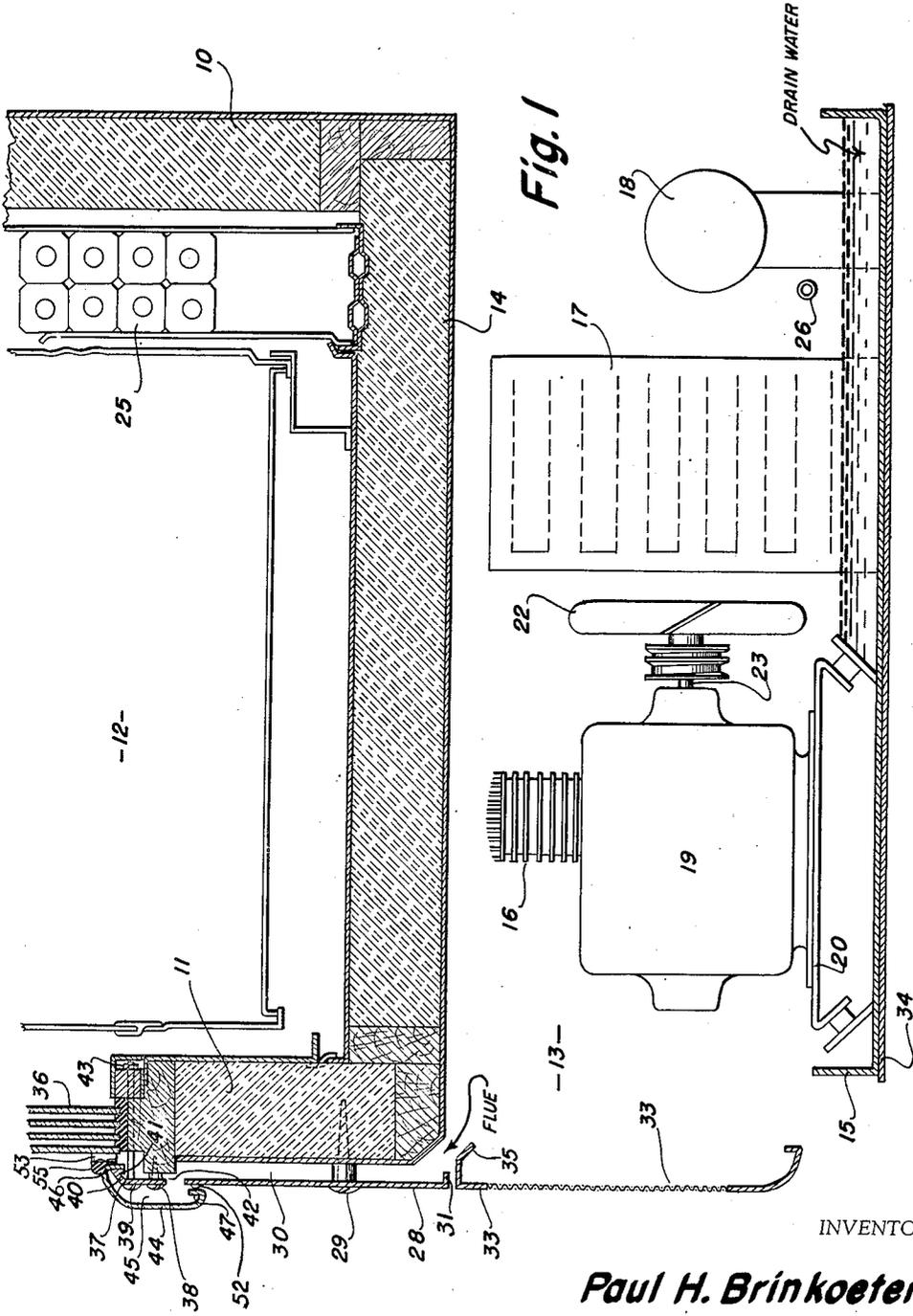
March 30, 1954

P. H. BRINKOETER  
OPEN FRONT REFRIGERATOR HAVING  
CONDENSATION PREVENTING MEANS

2,673,455

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3 Sheets-Sheet 1



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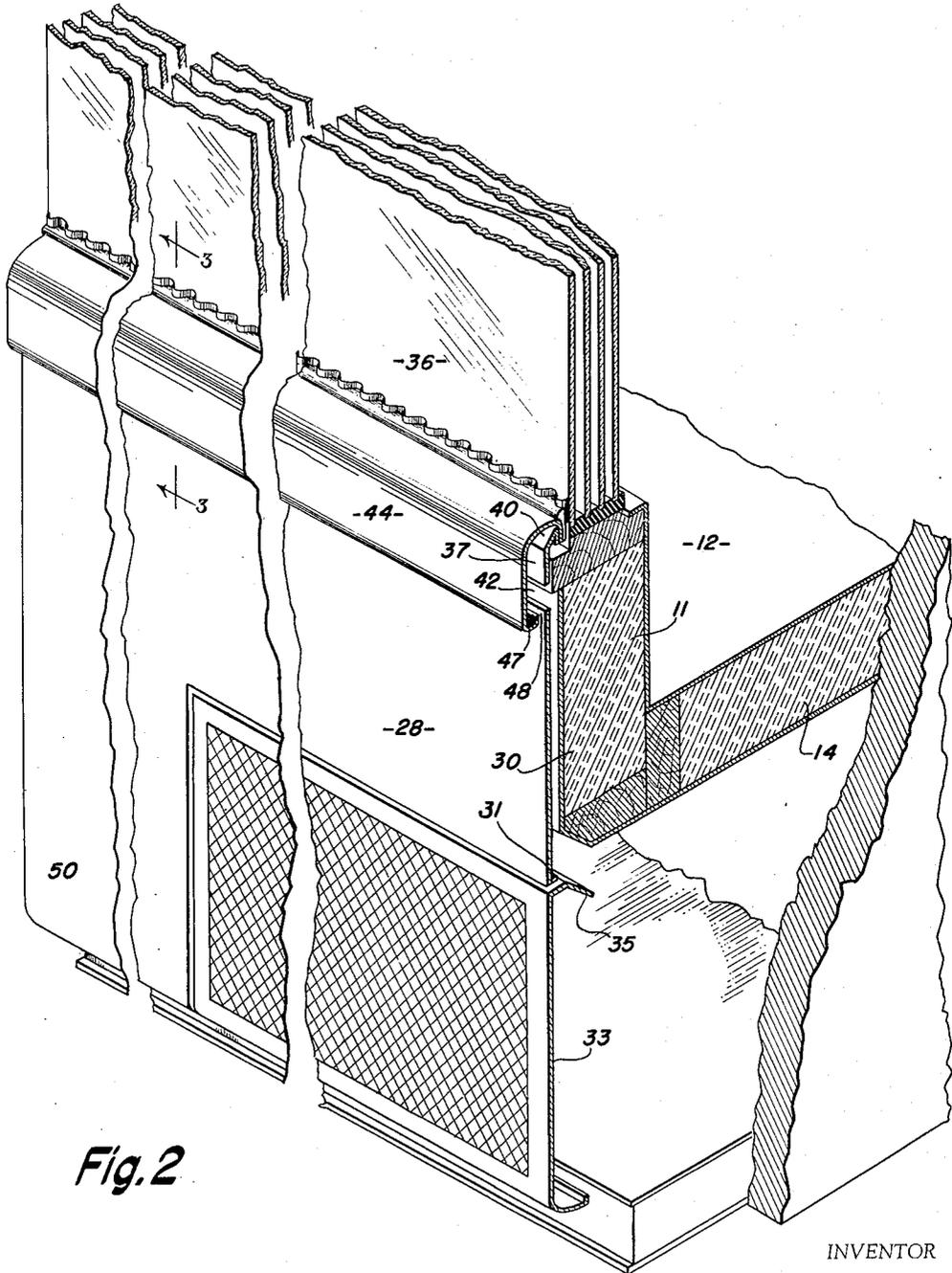


Fig. 2

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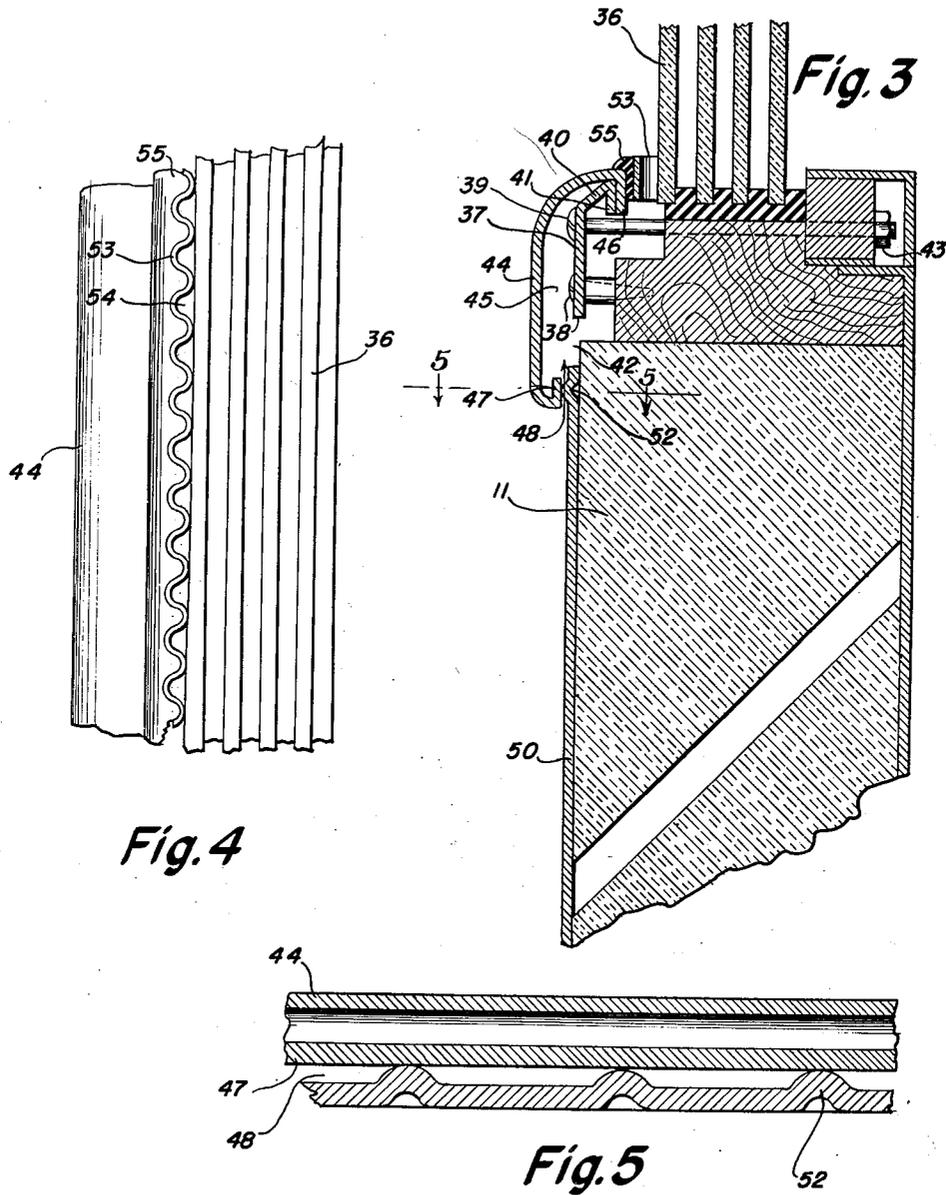


Fig. 3

Fig. 4

Fig. 5

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# UNITED STATES PATENT OFFICE

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## OPEN FRONT REFRIGERATOR HAVING CONDENSATION PREVENTING MEANS

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5 Claims. (Cl. 62—89.5)

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This invention relates to an improvement in open front refrigerators, and particularly to that type where the vegetables, meats, fruits and the like are maintained at the proper temperature by the circulation of refrigerated air.

The present invention consists in providing a flue in communication with the motor compartment for conducting warm air along the front of the refrigerator and directing the warm air against the thermo pane glass panel and front panels of the refrigerator to eliminate and remove any moisture or condensate that may collect on the panels.

A further feature is to evaporate the moisture from the refrigerator by conducting it to a receptacle in the motor compartment which has a finned condenser mounted therein, so that air drawn into and over the condenser, motor and compressor, will cause an evaporation of the moisture or water in the pan. This is further accomplished by the finned hot condenser which due to the direct contact with the water by the coils and fins thereof will evaporate the moisture, and also increase the efficiency of the condenser.

The invention consists of certain novel features of construction and combinations of parts which will be hereinafter described and set forth in the claims.

In the accompanying drawings:

Figure 1 is a vertical cross-sectional view of the refrigerator, with some parts broken away to show the food compartment and motor compartment;

Figure 2 is a detail view in perspective illustrating the warm air duct and flue leading from the motor compartment;

Figure 3 is a detail view in cross-section showing position of longitudinal air duct with respect to front panel of refrigerator;

Figure 4 is an enlarged detail view in top plan of air duct and glass panel;

Figure 5 is a detail view in section taken on line 5—5 of Figure 3.

The drawings disclose an open front food display case, wherein 10 represents the back wall and 11 the front wall. As shown in Figure 1, a food compartment 12 is provided between the front and back walls, and beneath the food compartment and at one end of the display case or refrigerator is a motor compartment 13, the mo-

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tor compartment being separated from the food compartment 12 by an insulated ceiling or partition 14. The motor compartment is preferably open at both ends, and located therein is a pan or base 15 which is integrally connected to a compressor 16. The pan or base 15 supports a finned coil condenser 17 and a receiver 18 for receiving the liquid refrigerant from the condenser. An electric motor 19 is resiliently supported in the pan 15 by a platform 20 above the bottom of the pan, and is suitably connected to the compressor 16 for operating the same. A suction fan 22 is mounted on the motor shaft 23 for drawing air through the condenser from the rear end of the motor compartment 13. The pan 15 receives the condensate and water from the refrigerating coils 25 of the refrigerator by a drain pipe 26. The pan 15 may rest directly on the floor of the room, or on slides or skids 34 so that the motor, compressor condenser unit may slide in and out of the motor compartment for servicing.

The front wall 11 of the refrigerator has a panel 28 connected thereto and in spaced relation by means of fastening such as screws 29 to provide a hot or warm air flue 30, and is comparable in length to the front opening of the motor compartment. The lower edge of the panel 28 extends below the ceiling or partition 14 and is provided with an inwardly extending flange 31 for directing the air from the motor compartment into the flue 30. Supported beneath the panel 28 and across the front opening of the motor compartment is a perforated plate or grill 33 which will allow warm air to be discharged into the room. An inturned flange 35 is provided along the upper edge of the grill 33 for directing warm air of the motor compartment 13 to the flue 30.

Mounted on the upper surface of the front wall 11 is a multi-thermo-pane glass panel 36 which extends the length of the front wall. Disposed in spaced relation to the front wall 11 is a deflector plate 37 and is connected thereto by screws 38 and bolts 39. This plate 37 extends lengthwise of the glass panel 36 and the upper portion is bent or curved toward the panel 36, as at 40, and is provided with a down turned flange 41. The plate 37 is spaced above the flue panel 28, and this space forms a passage 42 for the warm air. The plate 37 and flue panel 28 are in sub-

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stantial vertical alignment, and as the plate 37 is spaced from the front wall the warm air flue 30 is continued and discharges against the glass pane 36.

A channel shaped front rail 44 extends lengthwise of the refrigerator and forms a warm air duct 45, which has communication with the flue 30 by the passage 42. The rail 44 is provided with inturned flanges 46 and 47 along the edges thereof, and the upper flange 46 has engagement with the outer surface of the flange 41 of the plate 37 for supporting the rail 44 in position. The lower inturned flange 47 has engagement with the flue panel 28, and front panels 50 of the front wall beyond the motor compartment. The flue panel 28 and front panel 50 of the refrigerator are provided adjacent their upper edges with dimples or bulges 52, with which the lower flange 47 of the rail 44 engage to provide outlet passages 48 between the panels and rail for the warm air to escape and be directed downwardly on the panels to remove and collect any condensate or moisture on the panels.

A corrugation strip of metal 53 is positioned between the glass panel 36 and the flanges 41 and 46 of the plate 37 and rail 44 providing vertical passages 54 through which the warm air from flue 30 will be projected against the glass panel to eliminate and remove any condensate from the glass panel. A suitable rubber or other packing 55 is applied to the exterior surface of the corrugated strip 53 and which engages the outer surface of the rail 44 to form a seal therebetween.

From the foregoing it will be seen that in this system the moisture flows from the refrigerator by drain pipe 26 into a pan 15 located within the motor compartment 13. The pan 15 is preferably the base for the compressor and the condenser 17 which is a finned coil is supported in the pan and the water surrounds it so that there is direct contact with the finned coils and the water. The refrigerant delivered to the condenser is hot and therefore there will be an evaporation of the water by the hot condenser, and at the same time the efficiency of the condenser will be increased by cooling it with water evaporation. The pan 15, motor 19, condenser 17, and compressor 16 are as a unit removable from the motor compartment, and can be installed without plumbing and either placed on the floor or skids 34.

During the operation of compressor 16 the motor 19 will drive the fan 22, and air will be drawn into the motor compartment and over the motor, compressor and condenser units for cooling the unit, and at the same time assisting in evaporating the water in the pan 15. The air in passing over and through the unit will be warmed or heated and forced by the fan through the grill 33 and up through the flue 30 where it will be discharged into the longitudinal air duct 45. The warm air in the duct 45 will be distributed to the corrugated strip 53 and then directed over the surface of the glass panel 36 to remove any moisture or condensate thereon, likewise the air will be conducted through the passages 48, provided between the rail 44 and panel 28, and rail 44 and panels 50 by the dimples 52 on the panel 28, so that any condensate on the panels 28 and 50 will be evaporated.

It will be observed that when bolt 39 is tightened by nut 43, it draws plate 37 and rail 44 toward thermopane panel 36 and brings rubber pad 55 against corrugated strip 53, which in turn

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is tightened against glass panel 36 and thereby holding all of these parts tightly to the case.

What I claim is:

1. A refrigerator comprising a food compartment and a motor compartment, said motor compartment having a compressor-condenser unit therein, said food compartment having a paneled front wall, a glass panel mounted on and extending lengthwise of said front wall, a longitudinal air duct mounted on said front wall and having communication with said glass panel for directing air onto said glass panel, a flue panel supported in spaced relation to said front wall to provide a warm air flue therebetween, said flue having communication with said air duct and said motor compartment, means for drawing air over said unit of said motor compartment for warming the air and delivering said warm air to said flue and air duct, and means for maintaining said air duct in spaced relation to said flue panel and said front wall panel for the passage of warm air from said air duct over said last mentioned panels.

2. A refrigerator comprising a food compartment and a motor compartment, a compressor-condenser unit in said motor compartment, said food compartment having a front wall, a glass panel mounted on said front wall, a plate supported in spaced relation to the outer surface of said front wall and extending lengthwise of said front wall and glass panel, an air duct extending lengthwise of said front wall and supported by said plate, a strip carried by said plate provided with passages through which air from said air duct is delivered onto said glass panel, a flue on said outer surface of said front wall having communication with said air duct and said motor compartment, means for directing air over said unit for heating the air and delivering said heated air to said flue and air duct, and means for maintaining said air duct in spaced relation to the outer surfaces of said front wall and flue to provide a passage therebetween for delivering warm air over the outer surfaces of said front wall and flue.

3. A refrigerator comprising a food compartment and a motor compartment, said motor compartment having a compressor-condenser unit therein, said food compartment having a front wall, a thermo glass panel mounted on said front wall and extending lengthwise of said food compartment, a plate arranged in spaced relation to the outer surface of said front wall to provide an air passage along the lower outer surface of said glass panel, a longitudinal air duct supported by said plate, a flue for conducting warm air from said motor compartment to said air duct, and means for adjustably connecting said plate to said front wall for drawing and retaining said plate and said air duct toward and in spaced relation to said glass panel.

4. A refrigerator comprising a food compartment and a motor compartment, said motor compartment having a compressor-condenser unit therein, said food compartment having a front wall, a thermo glass panel mounted on said front wall and extending lengthwise of said food compartment, a plate arranged in spaced relation to the outer surface of said front wall to provide an air passage along the lower outer surface of said glass panel, a longitudinal air duct supported by said plate, a corrugated strip located adjacent said glass panel, packing interposed between said plate and said strip, a flue for conducting warm air from said motor com-

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partment to said air duct, and means connecting said plate to said front wall for holding said air duct, packing and strip on said front wall.

5. A refrigerator comprising a food compartment having a front wall, a glass panel mounted on said front wall and extending lengthwise of said food compartment, a plate mounted on said front wall and arranged in spaced relation to said front wall and said glass panel, a channel shaped front rail supported by said plate and extending lengthwise of said front wall to provide a warm air duct, a strip interposed between said plate and said glass panel having a passage therethrough for conducting air from said air

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duct to said glass panel, and means connected to said plate for urging said plate toward said front wall to hold said front rail air duct and said strip against said front wall.

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