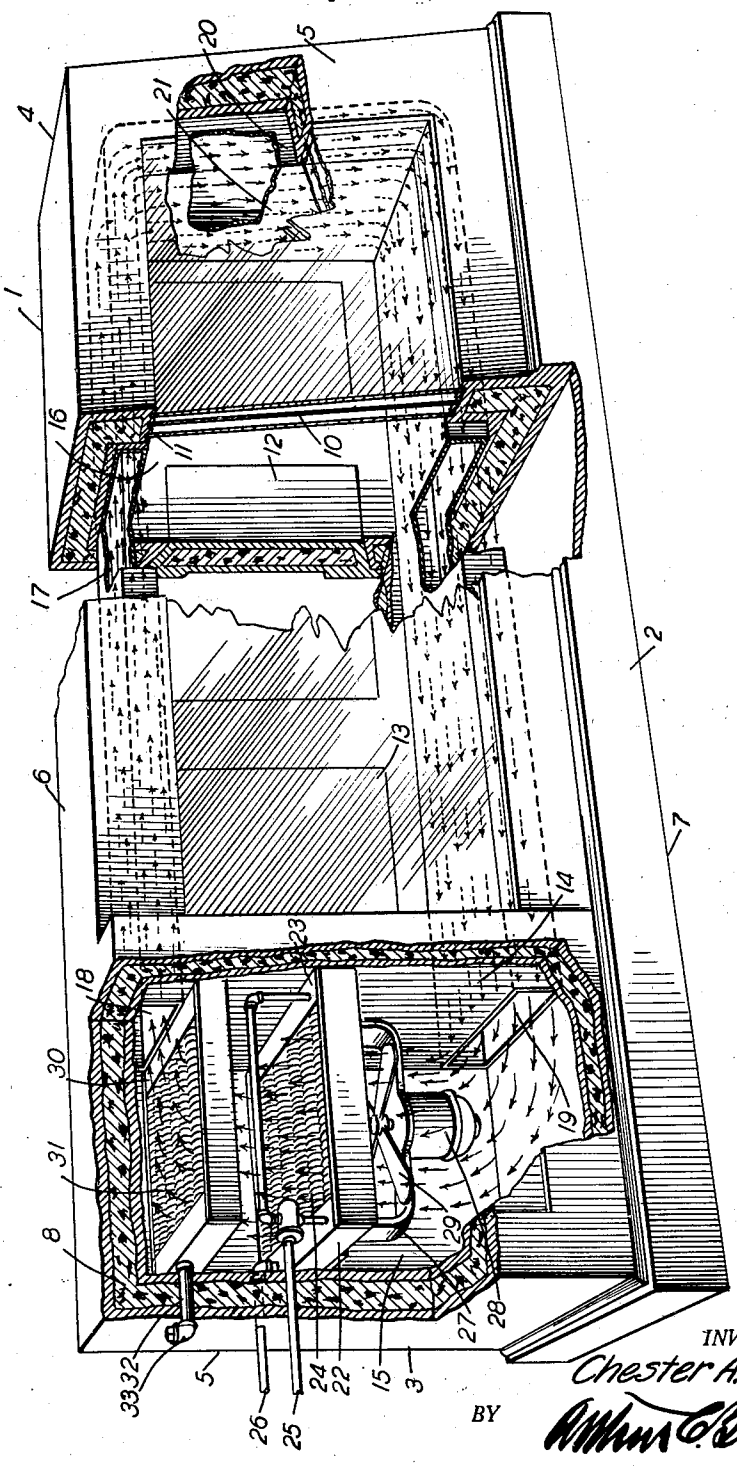
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REFRIGERATED CABINET

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REFRIGERATED CABINET

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1 Claim. (Cl. 62—89.5)

My invention relates to refrigerating apparatus and more particularly to refrigerated cabinets having display spaces wherein food may be held under cool conditions for dispensing or display.

In cases employed in retail stores and like situations for display of merchandise, for example food, refrigerating units or portions thereof are contained in the space provided for the food, or refrigerated air is circulated through the food-containing space, whereby opening of the case to remove or introduce food results in movement of inlet warm air over the refrigerating unit and immediate effect of drafts on the unit to cause an excessive loss of refrigerating capacity. Furthermore, the air cooled by passage over refrigerating means such as ice or coils has opportunity for direct contact with the food, and relatively large variations in the temperature of air contacting the food are possible, both these and other results having possible detrimental effects on the food.

The principal objects of my invention therefore are to effect cooling of a food containing compartment in a cabinet without bringing about contact of a refrigerated column of air with the food, to permit the opening of a food containing compartment without interfering with atmospheric and temperature conditions of the refrigerating unit, and to circulate a column of cooled air around a food-containing chamber in a closed circuit.

In accomplishing these and other objects of my invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein the single figure is a perspective view of a refrigerated cabinet constructed in accordance with my invention, partly broken away to better disclose construction and enclosed elements, refrigerant conduits being shown fragmentarily.

Referring in detail to the drawing:

1 designates a cabinet supported on a base 2 and comprising end walls 3 and 4, side walls 5 and top and bottom walls 6 and 7 formed of any suitable material and preferably comprising plates or panels spaced by insulating material 8.

The side walls are respectively a front and back wall, and are provided with openings filled respectively with spaced glass panes 10, mounted in grooves in plates 11 connecting the edges of the spaced plates to form the inner periphery of the front wall opening and panels 12 in the back wall including a suitable door 13 which may be opened for access to the interior of the cabinet.

The cabinet is divided by a relatively thin partition 14 preferably of heat-conductive material adjacent one end thereof to define a refrigerating or cooling chamber 15 and a food-containing or storage compartment 16 occupying the greater portion of the cabinet, and with which the door and panes are releated.

Extending along the top, right end and bottom of the cabinet in the figure is a conduit or duct 17 having an inlet end 18 located at the upper edge of the partition in communication with the refrigerating chamber, and an outlet end 19 located at the lower edge of the partition in communication with the lower end of the refrigerating chamber, whereby air refrigerated and impelled, as presently described, may move through the top portion of the duct longitudinally to the outer end of the cabinet, then downwardly therealong and across the bottom of the food compartment back to the refrigerating chamber.

The duct preferably comprises a casing rectangular in cross section, seated in the upper, end and bottom portions of the food compartment, including side walls 20 overlying the inner faces of the compartment side walls, and an inner wall 21 substantially registering with the edges of the glass-closed opening on the front wall, whereby said wall 21 forms the inner wall of the food compartment along the top, right end, and bottom thereof, and serves as a partition to separate the food spaced from the current of air. The duct is preferably formed of metal to facilitate transfer of heat between air moving in the duct and air contained in the food compartment.

Mounted in the refrigerating chamber is a refrigerating unit illustrated as including a rectangular horizontal frame 22 substantially filling the compartment and including headers 23 and spaced fin-covered pipes 24 comprising a coil or evaporator which may be supplied with a suitable expansible refrigerant from a machine not shown through an inlet 25 fixed in the end wall 3 of the cabinet and provided with an outlet 26 also fixed in said wall for movement of used refrigerant from the coil back to the machine. Supported by the frame is a depending bracket 27 on which is mounted a fan motor 28 energized by a suitable electric circuit not shown, and a fan 29 adapted to move air upwardly through the chamber and through the evaporator for circulation through the duct.

I further preferably mount a second frame 30 above the refrigerating unit to support a supple-

mental cooling medium, comprising preferably a hold-over device including a series of tubes 31 provided with fins and spaced sufficiently to permit air to move through the frame. An inlet or supply pipe 32 has an outer end 33 located in the end wall 3 whereby brine or like material may be supplied to the supplemental unit for exchanging heat with air passing through the frame and storing refrigeration to cool the current of air when operation of the refrigerating unit is suspended.

In operating a refrigerated cabinet constructed as described, the fan will set up flow of air through the refrigerating unit or evaporator and impell air through the top portion of the duct and through the communicating duct portions, incidentally drawing air from the lower duct portion into the refrigerating chamber, thus effecting circulation of cooled air over the outer surface of the food compartment without causing said air to enter the compartment, or affecting or being affected by the atmospheric conditions in the compartment otherwise than to exchange heat with the air in the compartment.

Not only is communication between air in the food compartment and the current of refrigerating air avoided, but there is no communication between the refrigerating compartment and either the food compartment or outside atmosphere, the atmospheric conditions except as to heat being maintained unaffected by exterior influences in the refrigerating chamber.

The circulation of refrigerated air is thus effected through a closed system, separated by insulating walls from outsinde air and by heat conductive walls from the space comprising the food compartment.

Any suitable refrigerating means may be employed for cooling the air passing through the refrigerating unit, and the coils and liquid refrigerant adapted to evaporate to effect lowering of temperature of the unit are preferably employed so that the refrigerating chamber need not be opened frequently for removal of the refrigerant as would be the case if ice were used.

A hold-over device or reservoir such as illustrated and described is further preferably employed which may be supplied with brine, alcohol or a like agent through the inlet pipe and thus avoid frequent opening of the refrigerating compartment. When the machine is running the body of liquid in the reservoir will be cooled and when the machine supplying refrigerant is shut down the heat taken out of the refrigerator case by the air moving through the duct will be imparted to the reservoir until the food compartment becomes sufficiently warm to require resumption of operation of the machine, whereupon the heat will be taken out of the reservoir by the column of air moving therethrough.

It is apparent that automatic means operating thermostatically may be employed for suspending and setting up operation of the refrigerant-supplying machine responsively to changes in temperature in the food compartment.

What I claim and desire to secure by Letters Patent is:

A refrigerator cabinet including an interior chamber and a vertical partition dividing the chamber into separate air cooling and storage compartments, an air duct leading continuously from the upper portion of the cooling compartment through the top, opposite end and bottom walls of the cabinet back to the lower portion of the cooling compartment, a refrigerating unit extending transversely through the cooling compartment between the ends of the duct, and a fan located in the cooling compartment below the refrigerating unit for drawing air from the duct and impelling the air through the refrigerating unit back into the duct.

CHESTER A. BAKER.