May 17, 1949. H. S. CHILDERS 2,470,547

REFRIGERATOR HAVING CONDENSATE DISPOSAL MEANS

Filed June 30, 1945 2 Sheets-Sheet 1

Fig. 1.

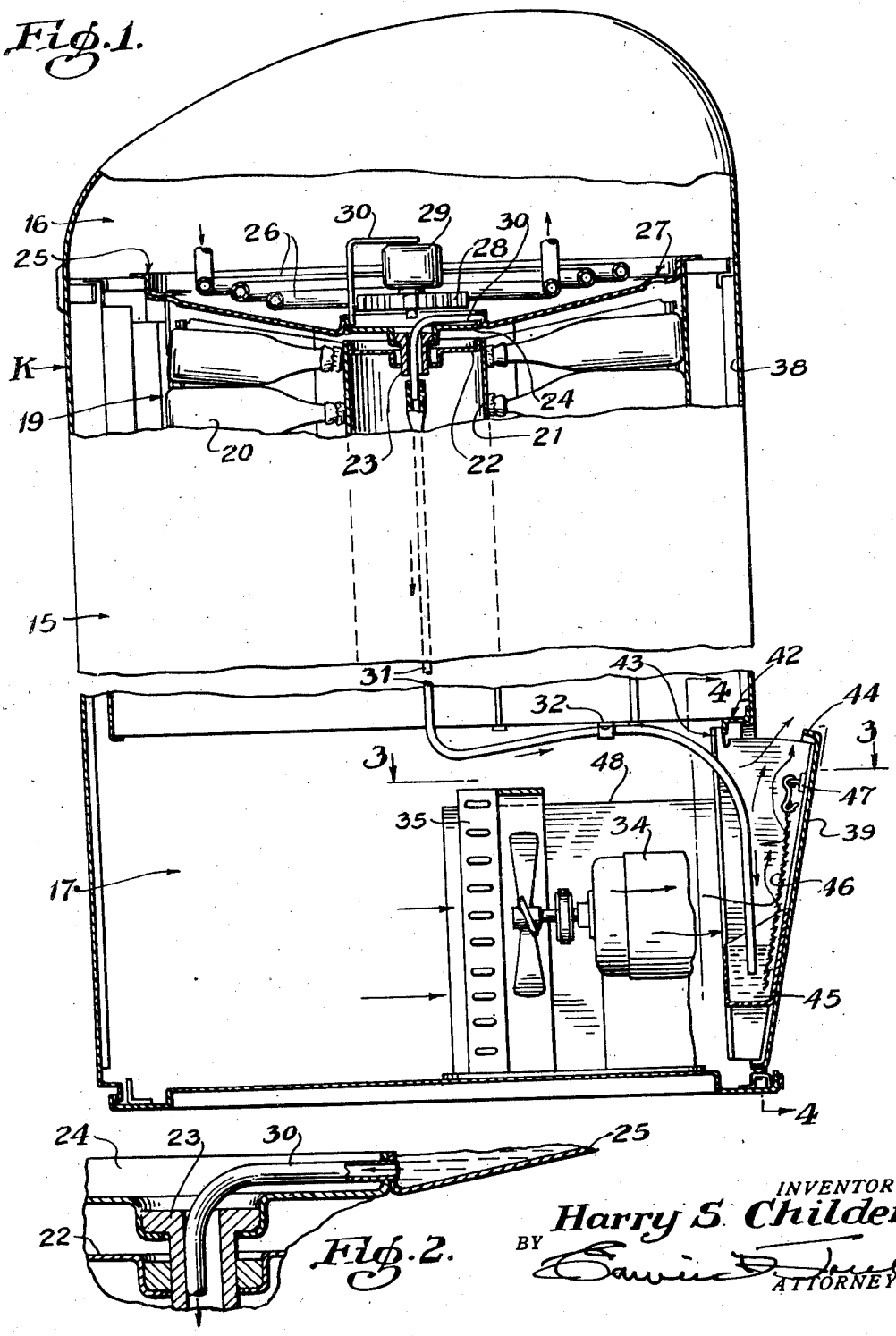


Fig. 2.

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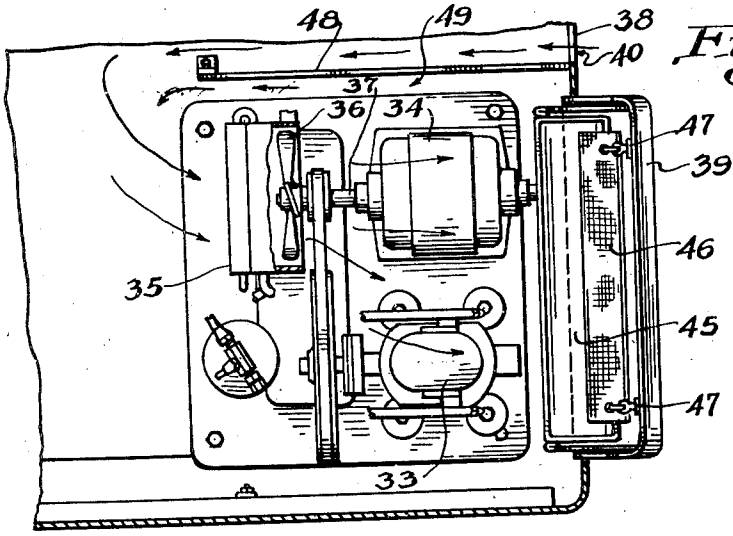


Fig. 3.

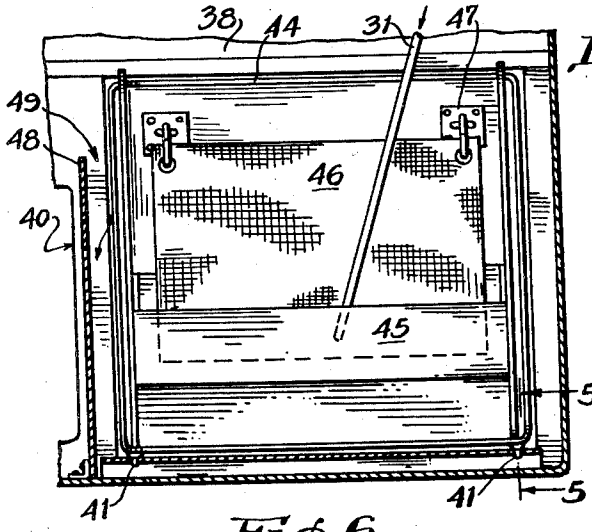


Fig. 4.

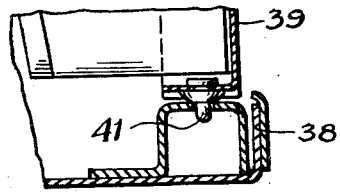
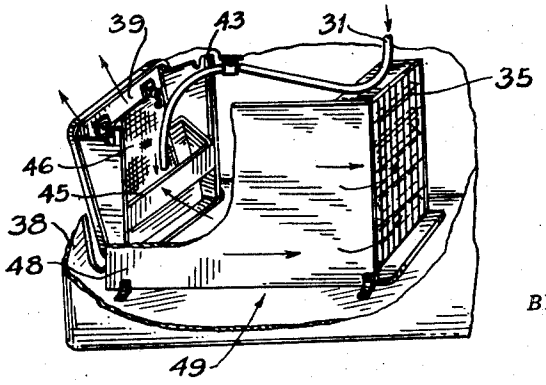


Fig. 5.

Fig. 6.



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REFRIGERATOR HAVING CONDENSATE DISPOSAL MEANS

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Application June 30, 1945, Serial No. 602,441

8 Claims. (Cl. 62—103)

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My invention relates to electrical refrigerating apparatus particularly adapted, although not necessarily, for use in automatic bottle vending machines for maintaining the contents of the bottles chilled for palatable consumption as vended.

In such refrigerating apparatus as heretofore proposed there is provided a receptacle into which is drained the water or condensate from the cooling coil resultant of the defrosting operation. This requires frequent emptying of the receptacle to prevent its contents from running over, and this occurs much too frequently in the commercial use of automatic bottle vending machines equipped with such refrigerating apparatus, and thus it becomes a nuisance.

It is a purpose of my invention to eliminate this nuisance by providing a disposal system for the condensate which effects the complete evaporation of the condensate.

It is also a purpose of my invention to provide a condensate disposal system particularly adapted, although not necessarily, for use in a refrigerating apparatus designed for a bottle vending machine of the character embodied in my Patent No. 2,290,275, issued July 21, 1942.

Another purpose of my invention is the provision of a condensate disposal system which embodies a condensate evaporating means that is entirely automatic in its operation, and is so associated with a refrigerating apparatus that it utilizes the fan for cooling the condenser coil thereof to effect the evaporation.

I will describe only one form of condensate disposal system embodying my invention as applied to one form of refrigerating apparatus and both in association with one form of bottle vending machine, and will then point out the novel features thereof in claims.

In the accompanying drawings:

Fig. 1 is a view showing in vertical section and partly in elevation a bottle vending machine, including one form of refrigerating apparatus, and one form of condensate disposal system applied thereto.

Fig. 2 is an enlarged fragmentary vertical section of the condensate collecting pan and how the conducting pipe is associated therewith.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a perspective view on a reduced scale

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showing parts of the refrigerating apparatus and condensate disposal system, and how the air is circulated to effect evaporation of the condensate.

Similar reference characters refer to similar parts in each of the several views.

My invention in its present embodiment is shown associated with a bottle vending machine of the character disclosed in my patent hereinbefore referred to, and wherein a cabinet K is interiorly divided into a middle compartment 15, an upper compartment 16, and a lower compartment 17. Within the compartment 15 is a carriage 19 for beverage containing bottles 20, the bottles being arranged radially in the carriage, and adapted by suitable mechanism to be discharged from the cabinet in keeping with the machine disclosed in my aforesaid patent.

The carriage 19 includes a central structure 21 of skeleton form which includes an upper disc 22 into which extends a tubular fitting 23 which is stationary, while secured to this fitting is a disc 24 which forms a hub for supporting the inner periphery of an annular and dished pan 25. This pan 25 is likewise stationary and defines the bottom of the upper compartment 16. Within this pan is the cooling or refrigerating coil 26 of the refrigerating apparatus, and the pan is designed to collect the condensate emanating from the surfaces of the coil 26. This pan may be perforated as indicated at 27 to allow circulation of cold air downwardly around the bottles in the carriage 19. To produce a forced circulation of such air, a fan 28 is fixed on the shaft of an electric motor 29 supported on a bracket 30 secured to the disc 24.

As best shown in Fig. 2 the condensate collected in the pan 25 can drain therefrom through a pipe 30 which extends through the disc 22 and outwardly through the fitting 23, where it is connected to a hose 31 which extends downwardly through the structure 21, then laterally at the bottom of the carriage 19, a bracket 32 holding the hose in this position, and finally downwardly into a receptacle which will be later described.

In the lower compartment 17 of the cabinet are arranged the other elements of the refrigerating apparatus for circulating a refrigerant through the cooling coil 26. As best shown in Figs. 1 and 3, such elements of the apparatus are arranged adjacent one side wall of the cabinet, and they include a compressor 33 operated by an electric motor 34, and a condenser 35 of coil form. In addition to the condenser a fan 36 is fixed to the shaft 37 of the motor 34 for creating circulation of air between and around the coils of the

condenser, in the direction of the fan, as indicated by the arrows in Fig. 1. Of course, it will be understood that the condenser through suitable pipes is connected to the compressor 33 and to the cooling coil 26, so that the compressed and cooled refrigerant is circulated through the coil 26.

The back wall 38 of the cabinet at the rear of the lower compartment 17 is closed for a major portion of its length by a door 39 to leave an opening 40 at one edge of the door, as best seen in Fig. 3. As best shown in Fig. 5 the door is, by means of hinges 41, mounted to occupy a closed position, and an open position in which it is disposed at substantially a 45 degree angle, as illustrated in Fig. 1. The open position of the door is defined by stops 42 on the wall 38 engaging projections 43 on the door. These stops also operate with lips 44 on the upper edge of the door to releasably retain the door in closed position.

The door 39 has formed on its inner side a trough 45 which constitutes a receptacle for the reception of condensate from the discharge end of the hose 31, the hose extending into the trough as illustrated in Fig. 1. Also extending into the trough is a sheet 46 of absorbent or wick-like material suspended from a bracket 47. The character of this material 46 is such that through capillary attraction the condensate in the trough is caused to saturate the sheet and this spreads the condensate over a relatively large area to facilitate evaporation thereof.

As best shown in Figs. 3 and 4, a partition 48 is secured in upright position to the bottom wall of the cabinet to extend inwardly from the opening 40 and thereby partition the condenser 35 and adjacent elements of the refrigerator apparatus from the adjacent side wall of the cabinet all in a manner to define a passageway 49 leading inwardly from the opening 40 to the inner side of the condenser 35. It is through this passageway that air under the action of the fan 36 is circulated into the compartment 17 and then outwardly therefrom through the condenser 35, and above the door 39 when the latter is in open position.

In operation, the motor 34 when energized functions to actuate the compressor 33 to place the refrigerant under pressure and to deliver it to the condenser 35 for subsequent delivery to the cooling coil 26. Thus the cooling coil functions to lower the temperature of air within the cabinet and, through operation of the motor 29, the fan 28 is actuated to circulate the cold air downwardly about the bottles 29 to reduce the beverages therein to a palatable drinking temperature. Upon defrosting the condensate from the coil 26 is collected in the pan 25 and through the pipe 30 and the hose 31, is conducted to the trough 45. Simultaneously with operation of the motor 34 the fan 36 is actuated to create a circulation of air inwardly through the opening 40, through the passageway 49, outwardly through the condenser 35, and then exteriorly of the cabinet between the upper edge of the door 39 and the wall 38, when the door is in open position. Thus the opening between the wall 35 and the door 39 constitutes an air outlet opening.

During passage of the air from the condenser to the door it impinges against the sheet 46 so that the condensate absorbed by the latter from the accumulation in the trough is evaporated. The surface area of the sheet and the rate of air flow thereagainst is such that the evaporation process prevents the condensate in the trough from overflowing. Manifestly, by this automatic evaporation of the condensate manual emptying of the trough to prevent overflow thereof is eliminated. That my invention is particularly applicable to the refrigerating apparatus of automatic bottle vending machines, wherein the apparatus is provided with means which operates automatically to defrost the cooling coil at the required intervals, and as these defrosting operations are frequent there is relatively rapid accumulation of the condensate which necessitates frequent emptying of any receptacle receiving the condensate not provided with my invention.

Although I have herein shown and described only one system of disposing of the condensate of a refrigerating apparatus, embodying my inevntion, it is to be understood that various changes and modifications may be made therein without departing from the spirit of my invention and the spirit and scope of the appended claims.

I claim:

1. In combination: a cabinet having a compartment therein, having an air inlet opening and an air outlet opening; an electrical refrigerating apparatus having a cooling coil in said cabinet above said compartment, a condensate collecting pan for said coil; a fan for circulating air from said inlet opening outwardly of said outlet opening; and a disposal system for the condensate collected in said pan, comprising a door in said air outlet opening having a receptacle thereon, means for conducting condensate from said pan to said receptacle and a wick-like material on said door, in the path of air leaving said outlet opening, and so extending into said receptacle as to have contact with the condensate in said receptacle.

2. In combination: a cabinet having a compartment therein having an air inlet opening and an air outlet opening; an electrical refrigerating apparatus having a cooling coil in said cabinet, a condensate collecting pan for said coil, a fan for circulating air from said inlet opening outward of said outlet opening; and a disposal system for the condensate collected in said pan, comprising a receptacle in said outlet opening, means for conducting condensate from said pan to said receptacle, and a wick-like material in the path of air leaving said outlet opening and so extending into said receptacle as to have contact with the condensate in said receptacle.

3. A condensate disposal system for refrigerating apparatus having a compartment with an inlet opening and an air outlet opening, a fan for circulating air from the air inlet opening to the outlet opening, and a cooling coil; said system including a door for the air outlet opening, a receptacle on said door, means for collecting and conducting condensate from the coil to said receptacle, and means on said door disposed in the path of air leaving the outlet opening, for absorbing condensate deposited into said receptacle.

4. In combination: a cabinet having a compartment therein provided with an air inlet and an air outlet; a door for said air outlet mounted on said cabinet to be movable to an open position; a trough on the inner side of said door for the reception of a condensate; an absorbent material supported on said door above said trough and extending into the latter to have contact with and thus absorb the condensate therein; and means for circulating air inwardly of said compartment through said inlet and outwardly of

said compartment through said outlet so that when said door is open air will flow against said material before leaving said outlet to evaporate the condensate thereon.

5. In combination with a refrigeration apparatus having a cooling means therein and a compartment having an air inlet opening and an air outlet opening through which compartment air is circulated; a condensate disposal system comprising a reservoir mounted in the refrigeration apparatus adjacent the air outlet of the compartment, means for collecting condensate from the cooling means and conveying said condensate to the reservoir, and capillary attraction means for the condensate positioned in the reservoir and upwardly extended therefrom adjacent the air outlet in the path of the air circulated through the compartment.

6. In combination with a refrigeration apparatus having a cooling means therein and an air passage through which air is circulated; a condensate disposal system comprising a reservoir mounted adjacent the air passage of the apparatus, means for collecting condensate from the cooling means and conveying said condensate to the reservoir, and wick means positioned in the reservoir and extended therefrom into the air passage and positioned in the passage for movement of air thereacross as the air is circulated through the passage.

7. In combination with an air conduit, a door pivotally mounted in the conduit for pivotal movement between a position in closing relation

to the conduit and an open position, a fluid reservoir mounted on the door, and a wick borne by the door and extended into the reservoir, said wick being disposed in the path of air through the conduit when the door is in open position.

8. In combination with a refrigeration apparatus having a cabinet housing a cooling coil and having a compartment in the cabinet with an air inlet opening and an air outlet opening, means for circulating air from the air inlet opening to the air outlet opening, a door mounted in the outlet opening for pivotal movement between a position in closing relation to said outlet opening and an open position, a fluid reservoir mounted on the door, means for collecting condensate from the cooling coil and conveying said condensate to the reservoir, and a wick borne by the door and extended into the reservoir, said wick being disposed for movement of air thereacross as said air is circulated from the air inlet opening to the air outlet opening.

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