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Irwin

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[54] **SAFETY CONDENSATE OVERFLOW SYSTEM**

[75] Inventor: **John W. Irwin**, Trenton, N.J.

[73] Assignee: **General Electric Company**, Louisville, Ky.

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[52] **U.S. Cl.** **62/290**; 62/286; 62/288; 62/291; 62/285

[51] **Int. Cl.²** **F25D 21/14**

[58] **Field of Search** 62/289, 290, 288, 286, 62/291, 285

[56] **References Cited**

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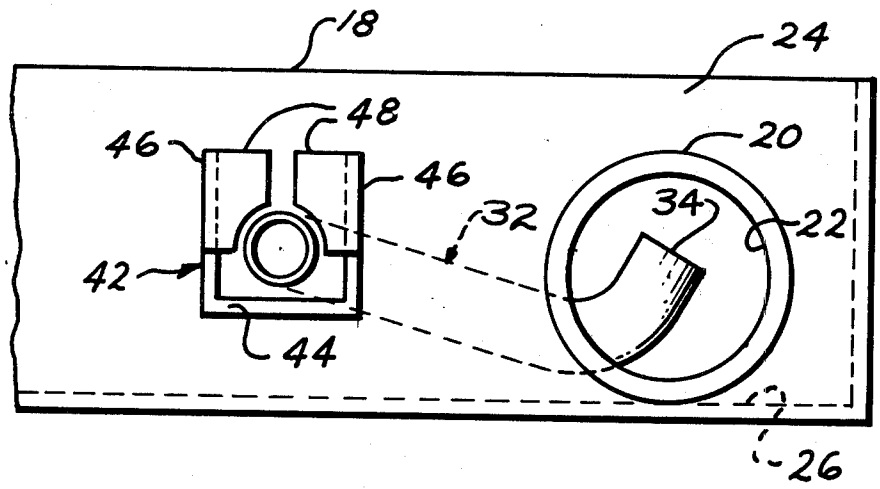
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Primary Examiner—William J. Wye

[57] **ABSTRACT**

The present invention provides a drain system for a central air conditioning system wherein a refrigeration system evaporator is mounted over a drain pan and is arranged in a cabinet. The pan collects the condensate from the evaporator and is provided with primary drain passageway for normal draining operation of the pan and a secondary drain passageway operable in the event the primary drain passageway is blocked for carrying the condensate away from the cabinet interior. A safety drain is provided in the secondary drain passageway that will automatically allow evacuation of condensate from the drain pan in the event both primary and secondary drain passageways are blocked.

4 Claims, 3 Drawing Figures



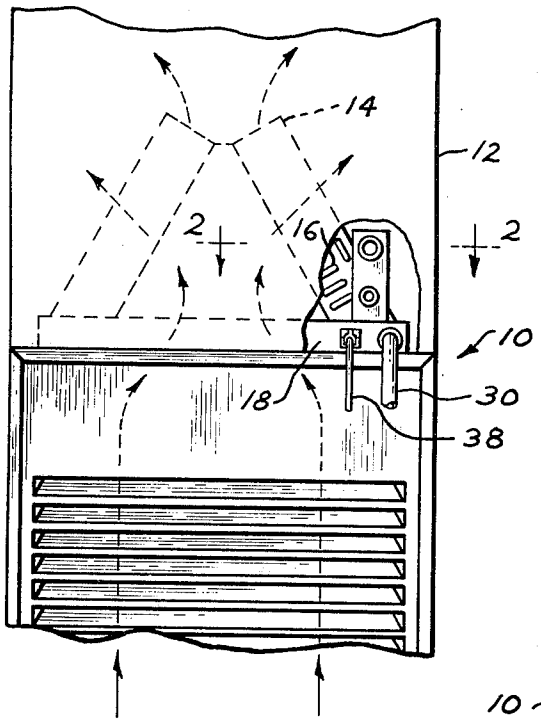


FIG. 1

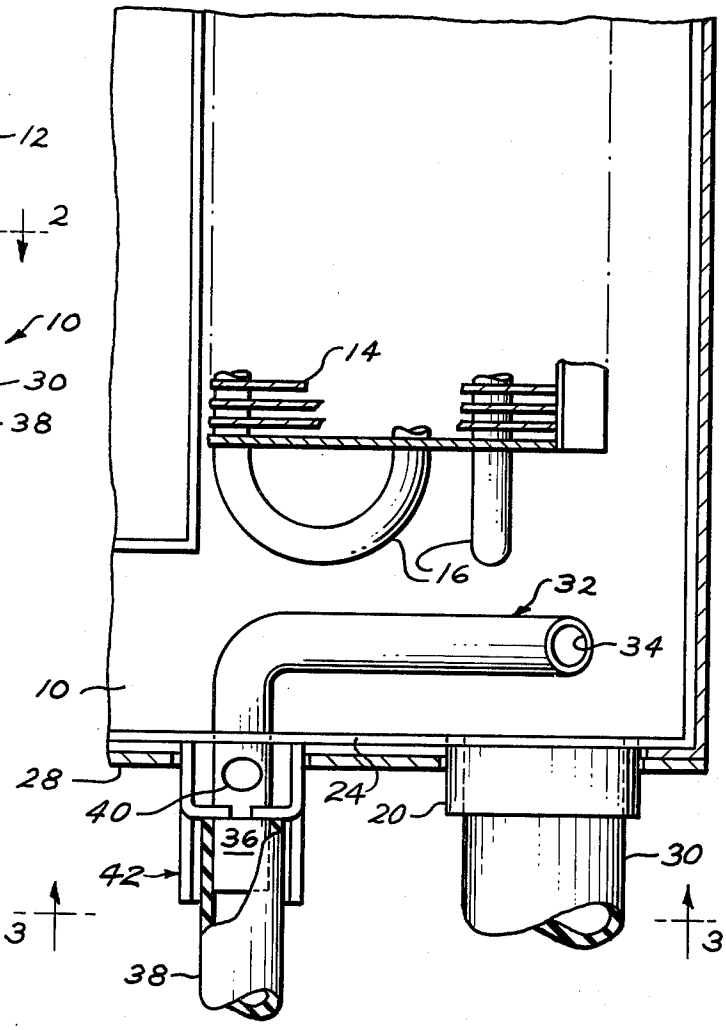


FIG. 2

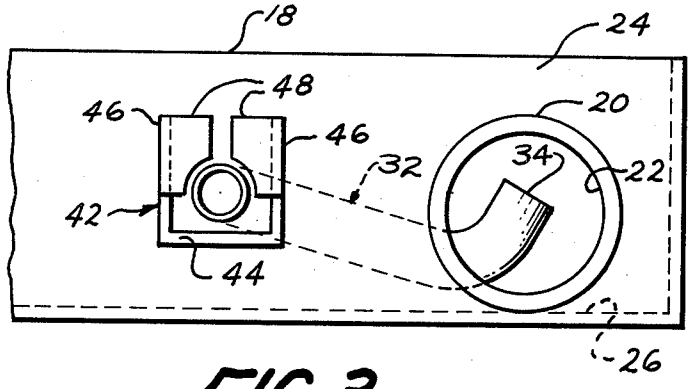


FIG. 3

SAFETY CONDENSATE OVERFLOW SYSTEM

BACKGROUND OF THE INVENTION

In a centralized air conditioning system the evaporator coil is customarily mounted in a cabinet which also contains a blower for moving air through the evaporator and into the area to be cooled. A drain pan is usually located below the evaporator in a manner that collects condensate therefrom. It is important that the condensate collected in the pan be drained out of the cabinet so that it does not come into contact with electrically operable components in the cabinet. It has been common practice therefore to provide the pan with a primary drain means that effectively directs the condensate out of the cabinet and which is usually adapted to be suitably connected to a drain system. Provisions have also been made available in air conditioning equipment for a secondary drain to direct condensate from the cabinet interior in the event the primary drain becomes ineffective in carrying away condensate. In many installations both primary and secondary drain means are connected to a drain system of the structure to be conditioned by conduits that are arranged outside of the cabinet at the time the air conditioning system is installed. In the event both of these conduits become clogged or pinched condensate would then back up into the pan and would overflow into the cabinet interior wherein it may come into contact with one of the electrically operable components causing a hazardous condition.

SUMMARY OF THE INVENTION

An air conditioning apparatus having a cabinet including a refrigeration evaporator arranged over a drain means. The drain means includes a base pan having a primary drain for carrying off condensate from the evaporator to a location exterior from the cabinet, and a secondary drain means for carrying off condensate in the event the primary drain is clogged. The secondary drain means includes a safety drain means which automatically carries off the condensate in the event both the primary and secondary drain outlets are clogged.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a partial elevational view of an air conditioning apparatus incorporating the present invention;

FIG. **2** is an enlarged view taken substantially along lines 2—2 of FIG. **1**; and

FIG. **3** is a side elevational view taken along lines 3—3 of FIG. **2.**

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **1**, there is shown a cabinet **10** which may be part of a hot air furnace or central air conditioner which includes a blower or air handling means (not shown) for moving air through the furnace in the direction indicated generally by the arrows. Located in a distribution plenum **12** is an "A"-coil or inverted V-shaped evaporator assembly or heat exchanger indicated generally at **14.**

The evaporator **14** is of conventional design and is formed from a series of flat, thin plates and has the usual refrigerant tubing **16** passing therethrough as part of the refrigerant system. Other conventional components such as a base pan **18** including a bottom wall **26**

and side walls **24** is provided wherein the lower edges of the evaporator and more specifically, the plates are located in the pan **18.** The base pan **18** is conveniently located so as to collect all of the condensate that may drip off the evaporator **14.**

Referring now to FIGS. **2** and **3,** a drain outlet **20** having an opening **22** is provided in one side wall **24** of the pan **18.** As shown in FIG. **3** the drain opening **22** is arranged adjacent the bottom wall **26** of the pan and extends beyond the outer wall **28** of the cabinet. The outlet **20** has connected thereto a drain conduit **30** for carrying the condensate away from the cabinet **10.** It should be clearly understood that the condensate collected in the pan **18** must be directed outside of the cabinet interior so that it does not come into contact with any of the electrical components of the system.

In accordance with the embodiment of the present invention shown, a secondary drain tube **32** is provided which as will hereafter be described in detail carries condensate water away from the base pan **18** and to the exterior of the cabinet **10** in the event the primary drain opening **22** or the conduit **30** becomes clogged. The secondary drain tube **32** has a portion arranged in the base pan including an inlet opening **34** and an outlet portion including an outlet opening **36** extending through the side wall **24** and projecting beyond the outer extremities of the cabinet. The tube **32** is conveniently secured to the wall **24.** The vertical position of the opening **34** as best seen in FIG. **3** is intermediate the lower portion of the opening **22** and the upper edge portion of the base pan wall **24.** Since the opening **34** must be effective to drain condensate out of the pan **18** when condensate reaches a predetermined level it is conveniently located adjacent the opening **22.** The exact vertical position of the opening **34** is determined by the air pressure and its effect on the condensate level in the general area of the drain opening which may be greater or less than the air pressure in other locations of the base pan **18.** In the event the conduit **30** is clogged or restricted the condensate water will enter the opening **34** at its set level and direct condensate water out of opening **36** and into a convenient conduit **38** which is arranged over the outlet portion of the tube **32.**

While the provision of a secondary drain system provides a measure of safety in that a drain for the condensate is provided in the event the primary drain is clogged, there is always the risk of both drains being rendered ineffective. Both conduits **30** and **38** are connected to their respective drains at the time the furnace is installed and are conveniently arranged outside of the cabinet **10.** This makes these vulnerable and as a result both may be damaged and pinched and as a result render the draining system inactive. It is also possible that while one drain may be pinched, the other may become clogged with debris or particles entering the conduits from the pan **18.** In any event the clogging of both the primary and secondary drain systems would permit condensate water to raise to a level above the walls **24** of the pan **18** and spill over into the interior of the cabinet where the water may come into contact with the electrical components and create a potential hazardous condition.

The present invention is directed particularly to the provision of a safety drain system in the secondary drain tube **32** that is effective in automatically directing condensate water out of the drain pan **18** and cabinet

10 in the event both the primary and secondary drain systems are rendered inoperative.

To this end a relief drain opening **40**, FIG. **2**, is provided in the secondary drain tube **32** portion extending outside of the pan **18**. The opening **40** is arranged in the upper portion of the exterior radial wall of the tube **32**. This upper location allows flow of water past opening **40** when the secondary drain system is operating normally without any obstruction to the flow therethrough. In operation when the primary drain **22** becomes inoperative as by clogging or by conduit **30** being pinched, water from the pan **18** is drained through the secondary tube **38** past the relief opening **40** and into conduit **38** which directs it into an appropriate drain system. In summary, in the event conduit **38** becomes pinched or clogged water will flow out of opening **40** and as a result does not back up in the pan **18** and overflow into the interior of the cabinet **10**.

Provision is also made by the present embodiment of the invention to insure that when water flows out of opening **40** it is directed away from the outer extremities of the cabinet **10**. Accordingly, a diverter means **42** is connected to the side wall **24** of the base pan **18**. The diverter is generally U-shaped and includes a bottom wall **44** located below the exterior portion of the safety drain tube **32**, and upwardly extending substantially parallel side wall portions **46** arranged on each side of the exterior portion of the safety drain tube **32**. As seen best in FIG. **2** the diverter **42** projects from the side wall **24** of base pan **18** to a position substantially past the opening **40** and outer extremities of the cabient **10** so that when water flows out of opening **40** it is received in the U-shaped diverter and carried away from cabinet **10** independent of the secondary drain system.

During the installation of the drain conduit **38** over the exterior end portion of the tube **32** it may inadvertently be positioned over the relief drain **40** and render the safety drain system inoperative. To guard against and prevent this inadvertent closing of the drain **40**, the end portion of each of the walls **46** is bent inwardly to form guard members **48** adjacent the upper half portion of the tube **32**. As seen in FIG. **3** the spacing of the guard member **48** relative to the tube **32** effectively acts as a stop to prevent the installation of conduit **38** to a position over the relief opening **40**.

While there has been shown and described a specific embodiment of the invention, it will be understood that it is not limited thereto and it is intended by the appended claims to cover all such modifications as fall within the true spirit and scope of this invention.

What is claimed is:

1. In an air conditioning apparatus having a cabinet including refrigeration system evaporator means arranged in said cabinet, and drain means positioned below said evaporator for receiving condensation from said evaporator, said drain means comprising:

a base pan arranged in said cabinet including side walls;

a primary drain means arranged in the lower portion of one of said side walls having one end communicating with said base pan and its other end adapted to project beyond the outer extremities of said cabinet for directing condensate out of said cabinet;

a secondary drain tube means having a continuous side wall including an inlet end disposed in said base pan between the lower end of said primary drain means and the upper extremities of said side walls and an outlet end disposed outside of said cabinet for directing condensate from said base pan to the exterior of said cabinet when the condensate in said pan reaches the predetermined level of said inlet; and

a safety drain means including a relief drain opening located in the upper half of said secondary tube means side wall in an area outside of said base pan providing an outlet for condensate entering said inlet from said base pan when said secondary drain outlet end is closed.

2. The invention of claim **1** wherein diverter means below said safety opening projecting from the outer surface of said base pan side wall to a position exterior of said cabinet for receiving condensate from said relief drain opening and diverting it away from said cabinet when said secondary drain outlet end is closed.

3. The invention of claim **2** wherein said diverter means includes a bottom wall arranged below said secondary drain tube and side walls projecting upwardly from said bottom wall along opposite sides of said drain tube means in the area of said relief drain opening.

4. The invention of claim **3** wherein the outlet end of said secondary drain tube is adapted to receive a flexible extension tube, and said diverter means side walls having portions bent toward each other to a position adjacent the upper portion of the peripheral wall of said secondary drain tube and downstream from said relief opening to prevent said flexible extension from being inserted to a position over said relief opening.

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