Dec. 27, 1949 H. P. PETERSON 2,492,397

DEFROSTER FOR EVAPORATORS

Filed Jan. 26, 1946

Fig. 1.

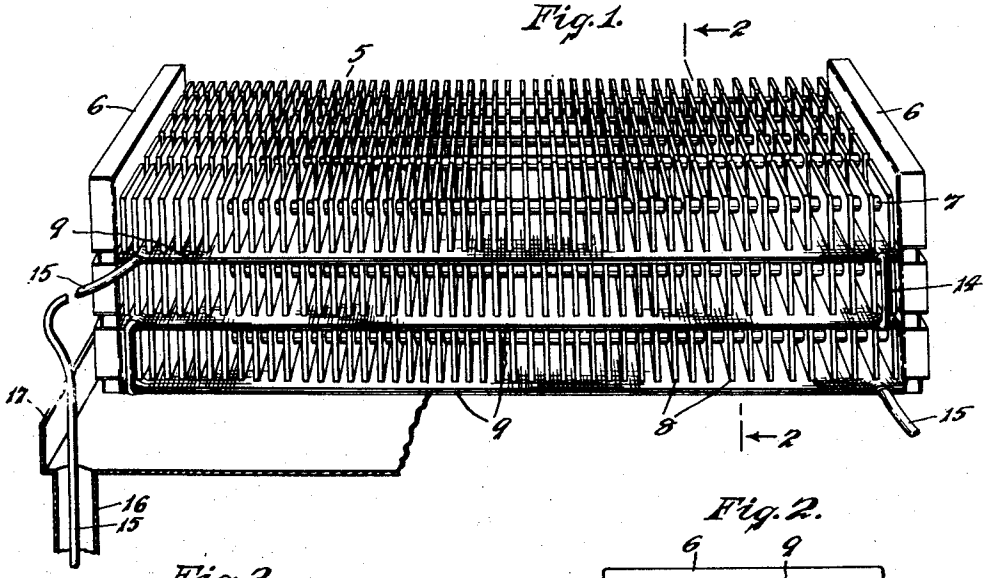


Fig. 2.

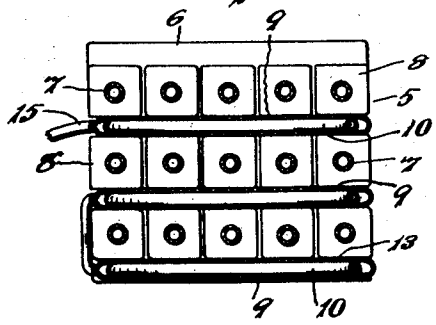
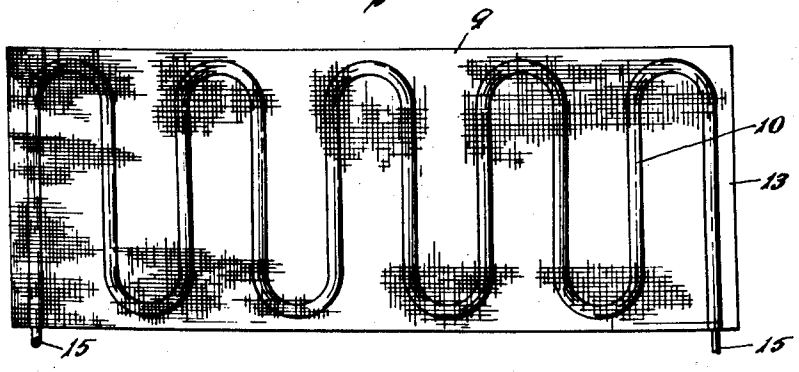


Fig. 3.

Fig. 4.



Inventor

HANS P. PETERSON.

By Louis V. Lucia

Attorney

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DEFROSTER FOR EVAPORATORS

Hans P. Peterson, Manchester, Conn., assignor to The Bush Manufacturing Company, Hartford, Conn.

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3 Claims. (Cl. 62—1)

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This invention relates to a defroster for evaporators such as used on refrigerating machinery, and more particularly for such evaporators as comprise a plurality of layers, or rows, of cooling coils which are commonly provided with radiating fins thereon.

Such evaporators, when used on refrigerating machinery, gather an accumulation of frost which, when permitted to remain on the coils, greatly impairs the operation of the cooling or refrigerating system unless the said frost is removed by a defrosting operation.

Heretofore, when defrosting evaporating coils by means of electrical energy, it has been common practice to: (*a*) totally enclose the evaporator in an insulating chamber containing electrical heating units; defrosting taking place when the heaters have reached the temperature of the chamber above freezing. Such units are both cumbersome and expensive to construct.

(*b*) To provide high intensity electric strip heaters under the evaporator coil, of which only a small percentage of their capacity is utilized in heating the coil and providing defrosting. The remainder of the heating capacity is spent for heating the refrigerated space and this is highly undesirable.

It is an object of this invention, therefore, to provide a novel means of defrosting evaporators through the application of low intensity electrical heat, with a minimum of wastage, by direct conduction to the evaporator coils and to the frost on said coils, rather than by convection which would cause wastage of heat between the heating elements and the frost on the evaporators.

A further object of this invention is to distribute electrical energy over the coils by the use of inexpensive electrical heating cable, such as commonly found on the market, thus providing a unit that is compact in spacing requirement and efficient in energy consumption.

It is a further object of this invention to provide a heating element which is so constructed that, when placed in position relatively to the coils of an evaporator, the said element will be in direct heat conducting relation to said coils and to the fins mounted thereon.

Further objects and advantages of this invention will be more clearly understood from the following description and from the accompanying drawings, in which—

Figure 1 is a perspective view of an evaporator coil showing my invention as applied thereto.

Figure 2 is an end view thereof, in vertical section on line 2—2 of Fig. 1.

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Figure 3 is a fragmental view in central vertical section showing a portion of a heating element embodying my invention.

Figure 4 is an elevational plan view of one of my novel defrosting units.

As shown in the drawings, the numeral 5 denotes an evaporator coil of common construction having a pair of headers 6—6 between which are extended cooling tubes 7 through which the refrigerant flows for cooling the said tubes. The fins 8 are provided on said tubes for radiation.

In the embodiment of my invention as shown, I provide defrosting means, preferably in the form of heating units 9, which may include an electric heating element of common form and preferably comprising a tube 10 having embedded therein a resistance element 11, in the form of a coil, which is supported axially in said tube by means of an insulating medium 12. The said tube is bent, as clearly illustrated in Fig. 2, and sandwiched between two sheets of meshed material 13—13, preferably a wire mesh. This retains the formation of the heating element and also permits the insertion of said element between the different layers of coils or tubes 7 in the evaporator unit.

As shown, one of said heating units may be placed between each coil, or layer, of tubes in the evaporator. As illustrated in Fig. 1, the evaporator is in such a position that the heating units are supported therein in a horizontal position.

The said heating units may be electrically connected in parallel, or in series as shown, by means of extensions 14; the terminal ends 15—15 of the heating units projecting from the ends of the outer units for connection to a suitable electric current supply.

If desired, one or both of the lead ends 15 may be extended through a drain pipe 16 of a drip pan 17, located under the evaporator to catch liquid dripping therefrom, so that the said drain pipe may be kept free of frost by the heat from the said heating elements as they are used for defrosting the evaporator.

In the use of my invention, electric current may be supplied to the heating elements by any suitable means and the supply of current may be automatically timed so that the evaporators will be defrosted at predetermined intervals without requiring further attention.

When the said heating units are disposed horizontally between the coils, as in the application shown in Fig. 1, the liquid from the melting frost may be precipitated through the meshed wire sheets 13—13 without obstruction from the said

heating units. Further, the mounting of the heating unit coils within the meshed material supports the said heating units while still permitting free circulation of air through the condenser.

It will be noted that, when the heating members are in operative position upon the coils or upon the fins on said coils, the wire mesh 9 is in direct contact with all of said coils or fins and this serves to provide for the direct conduction of heat from the heating elements to the said coils or fins. Also, when frost has accumulated upon the evaporator, the said heating members will become practically embedded in the front, thereby providing contact between the heating members and the frost which will result in a greater degree of efficiency from the defrosting operation.

Further, the said heating elements are preferably of a low intensity, thereby permitting a more even distribution of heat per square foot of evaporator surface area than would be provided with a high intensity unit wherein the surface area closest to the heating elements would attain a much higher heat than the area removed from the said elements.

While I have shown my invention as applied to an evaporator of one particular form, it is to be understood that the same may be applied to coolers and evaporators of different forms so as to cause defrosting thereof by direct heat conduction to the said coolers or evaporators without departing from the scope of my invention, as set forth in the appended claims.

I claim:

1. In an evaporator or cooling unit comprising a plurality of layers of coils or tubes, a heating member positioned adjacent to said layers for defrosting said unit; said heating member comprising a heating element supported by a sheet of pervious material and retained in position thereby between said layers.

2. In combination with an evaporator or cooling unit having a drip pan located below said unit, for collecting liquid dripping therefrom, and a drain pipe for said pan; heating means comprising a heating element distributed within said unit for melting an accumulation of frost thereon; the said heating element extending also through said drain pipe for keeping the same clear of frost.

3. In an evaporator or cooling unit comprising a plurality of layers of coils or tubes; a heating member positioned adjacent to said layers for defrosting said unit; said heating member comprising a heating element supported by a sheet of wire mesh and retained in position thereby between said layers.

HANS P. PETERSON.

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