Sept. 9, 1947. V. G. DREIER 2,427,200

SELF-DRAINING HEAT TRANSFER FINS

Filed June 29, 1944

Fig. 1.

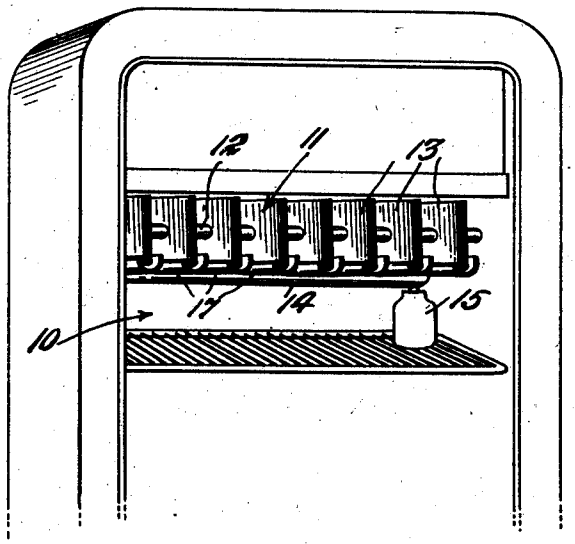


Fig. 2.

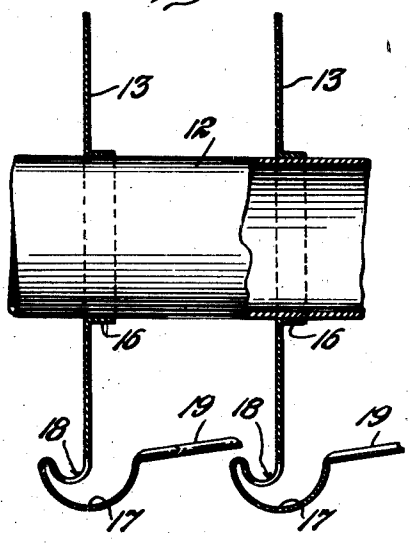


Fig. 4.

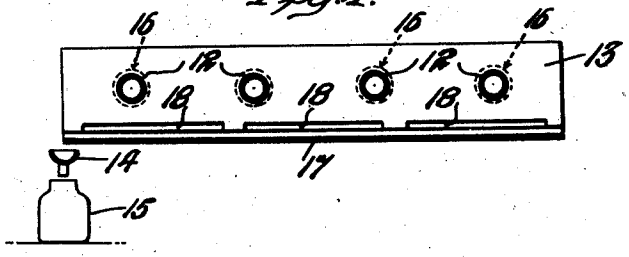


Fig. 3.

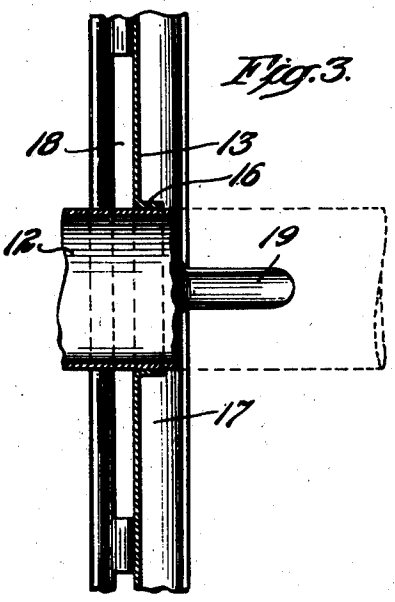
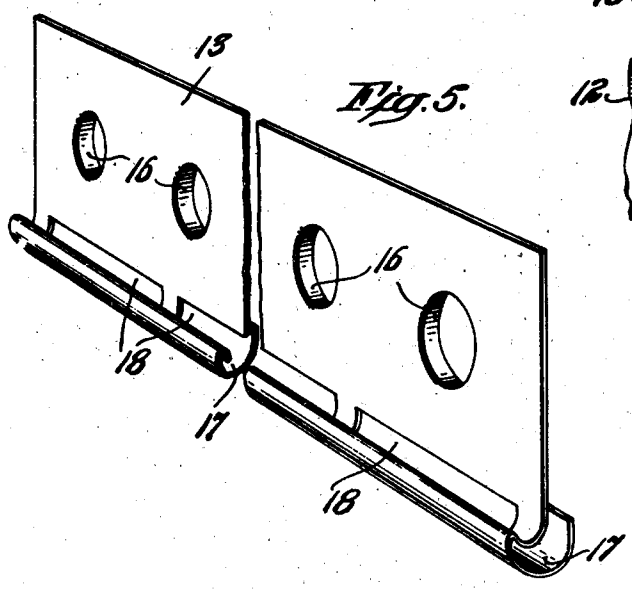


Fig. 5.



INVENTOR
Victor G. Dreier
BY
J. L. Kelly
ATTORNEY

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SELF-DRAINING HEAT TRANSFER FINS

Victor G. Dreier, Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware

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6 Claims. (Cl. 62—103)

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My invention relates to heat transfer fins and more particularly to selfdraining heat transfer fins to be used on evaporators in domestic refrigerating cabinets.

In domestic refrigerators relatively warm air circulating over the evaporator coils, particularly the high temperature section in the food storage compartment, causes moisture to be condensed from the air and deposited on the evaporator coils and on the heat transfer fins connected thereto. This condensed moisture trickles down over the surfaces of the fins and drips from the lower portion thereof. The moisture which collects on the evaporator coils is either congealed and adheres to the coils or it also drips from the coils, depending upon the temperature of the coils. Heretofore, drip pans have been placed directly under the entire evaporator in order to catch this condensed moisture and prevent it from dripping on to food in the storage compartment. This has not been a satisfactory arrangement, since it interferes with the free circulation of air over the evaporator coils and attached heat exchange fins, thereby lowering the efficiency of the refrigerator.

It is an object of my invention to provide self-draining heat transfer fins which not only collect and convey condensed moisture away from the fins themselves, but which also collect and convey any moisture that may drip from the evaporator coils.

These and other objects and advantages of my invention will become more apparent when considered in connection with the following description and accompanying drawing which form a part of this specification and in which:

Fig. 1 is a partial perspective view of a refrigerator cabinet showing my improved heat transfer fins connected to the high temperature evaporator;

Fig. 2 is a partial front elevation, partly in section, showing one form of my improved heat transfer fins;

Fig. 3 is a top plan view, partly in section, of the arrangement shown in Fig. 2;

Fig. 4 is a vertical sectional view of the evaporator shown in Fig. 1; and

Fig. 5 is a perspective view, partly in section, of one of my improved heat transfer fins.

Referring now to the drawing wherein like reference characters are used to designate like parts, the numeral 10 designates generally the food storage compartment of a domestic refrigerator with a high temperature evaporator section 11 located therein. This evaporator comprises a plurality of substantially horizontal conduits 12

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with heat transfer fins 13 attached thereto. A drain trough 14 extends beneath the bottom rear edges of the heat transfer fins 13 and conveys moisture that drips from said fins into a receptacle 15. This drain trough 14 may be supported in any suitable manner as by removably suspending it from the heat transfer fins.

The heat transfer fins 13 are formed of relatively flat sheet metal with sleeves 16 extending from the central longitudinal portion thereof. As shown in Figs. 2 and 3, these sleeves 16 fit around the conduits 12 in intimate heat exchange relation and may be welded or otherwise secured to said conduits. The lower portion of each of the heat transfer fins is provided with a trough 17 extending longitudinally beneath the bottom edge of the fin. As shown in Figs. 1 and 4, the heat transfer fins and attached troughs are slidably inclined downwardly from the front to the rear of the evaporator. Long slots or openings 18 are cut out of the lower portion of the fins to reduce heat transfer between the fins proper and the troughs 17, thereby eliminating the collection of condensed moisture on the outside of troughs 17. Trough-like tabs 19 are integrally attached to and extend transversely from the troughs 17 directly beneath the lower portion of the refrigerating conduits 12 and collect moisture that may drip from said conduits. For purposes of illustration, the spacing of the heat transfer fins and the size of the troughs are exaggerated in Fig. 1. In practice the fins are spaced closer and the troughs are smaller.

In operation, when relatively warm moist air circulates over the evaporator coils and through the heat transfer fins the moisture is condensed upon the evaporator coils and upon the fins, it trickles down over the fin surfaces and is collected in troughs 17 and from there it is conveyed to the common trough 14 which conveys it to the receptacle 15. Any moisture that collects on the evaporator coils 12 drips therefrom into the trough-like tabs 19 and is conveyed by these tabs into the troughs 17.

The general construction of self-draining heat transfer fins is described and claimed in a copending application of Alvin Brothers.

While I have illustrated and described but one specific embodiment of my invention, it obviously may take other forms and it has other uses. My self-draining heat transfer fins are adapted for use wherever moisture is apt to accumulate on the fins and/or on finned evaporator coils. My improved self-draining fins are particularly adapted for use on the sharp freezing or low

temperature section of an evaporator wherein condensed moisture accumulates and is congealed upon said evaporator and must be removed therefrom by periodic defrosting. My improved fins are particularly useful with automatic defrosters in which case instead of conveying the moisture to a receptacle as shown, it may be conveyed to the outside of the refrigerator cabinet and into a sink drain, for example. Therefore, my invention is limited only by the following claims.

I claim:

1. A self-draining heat transfer fin comprising a relatively flat sheet metal member formed with an integral drain trough directly under one edge thereof for collecting moisture that may drip from either side thereof, and said fin having elongated slots to provide openings between said one edge and said drain trough which substantially eliminate heat transfer between the heat transfer surfaces of the fin and the drain trough.

2. In a refrigerant evaporator, a plurality of refrigerant conduits, a plurality of heat transfer fins mounted on said conduits in intimate heat transfer relation therewith, each of said fins being formed of a relatively flat sheet which provides at least two heat transfer faces and with an integral trough formed along one edge of said sheet for collecting moisture that may form on either face of said sheet, and said fins each having elongated slots to provide openings between said heat transfer faces and said trough to reduce heat transfer therebetween.

3. In a cooling apparatus, a substantially horizontal conduit, a plurality of heat transfer fins projecting vertically therefrom, each of said fins being provided with a drain trough located directly therebeneath and a drain tab projecting from said drain trough directly beneath said horizontal conduit.

4. In a cooling apparatus, a cooling element, a plurality of heat transfer fins projecting from said cooling element, a drain trough located directly beneath each of said heat transfer fins, a drain tab projecting from each of said drain troughs directly beneath said cooling element, and a common collecting trough extending transversely beneath one end of each of said drain troughs.

5. In a refrigerator, an evaporator formed of a plurality of substantially horizontal conduits, a plurality of heat transfer fins attached to said horizontal conduits, each of said fins comprising a relatively flat vertically disposed sheet metal member, a trough located below said flat sheet metal member and integrally attached thereto by spaced connecting strips, tabs projecting transversely from said trough directly beneath said horizontal conduits, and a common drain trough located below one end of each of fin troughs.

6. In a refrigerator, a food storage compartment, an evaporator coil located in said food storage compartment, heat transfer fins arranged on said evaporator coil, said fins each comprising a vertically disposed sheet metal member, a trough arranged below said sheet metal member for receiving condensed moisture therefrom, and tabs projecting from said trough directly below said evaporator coil to receive condensed moisture from said coil and convey it to said trough.

VICTOR G. DREIER.

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The following references are of record in the file of this patent:

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