Dec. 27, 1955 W. J. HARBERS 2,728,204

COIL PAN CONSTRUCTION

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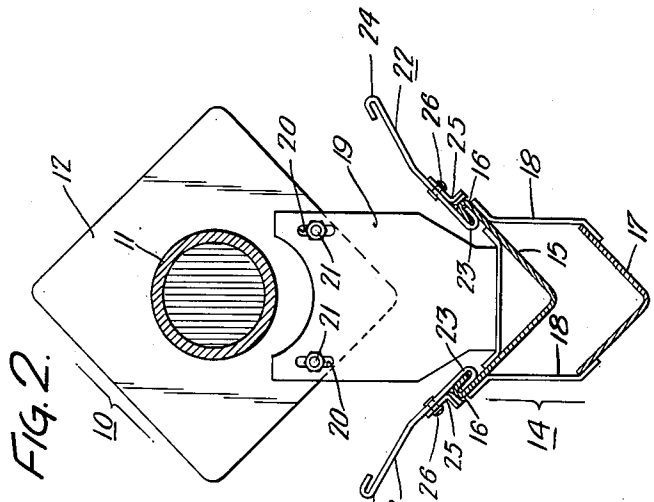


FIG. 2.

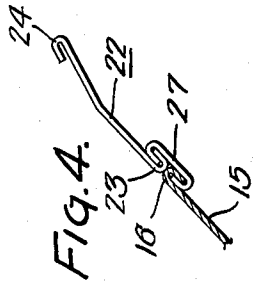


FIG. 4.

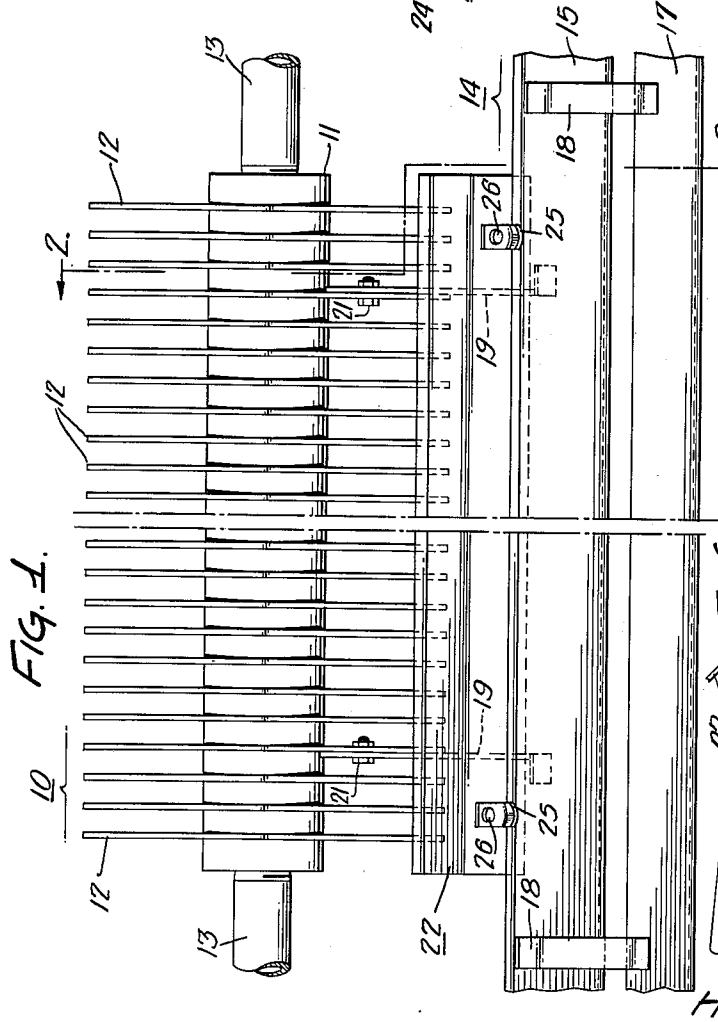


FIG. 1.

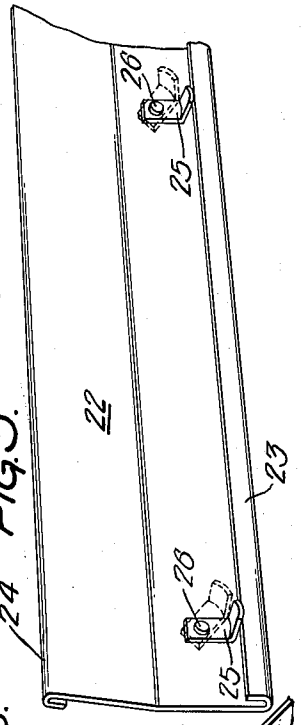


FIG. 3.

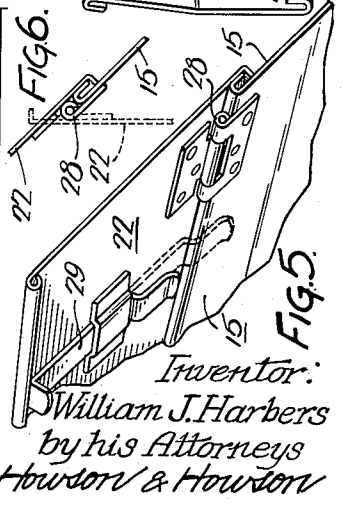


FIG. 6.

FIG. 5.

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COIL PAN CONSTRUCTION

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4 Claims. (Cl. 62—103)

This invention relates to new and useful improvements in drain pans used to catch condensate from the evaporator coils of an industrial or commercial refrigerating unit, which pans originally are relatively narrower than the evaporator coils. More particularly, the present invention relates to the wing members or extensions which are detachably or permanently mounted at opposite sides of the drain pans and generally extend laterally therebeyond approximately to the marginal extent of the overlying refrigeration coils, but further if desired, to catch condensate, or frost particles which may drop from the sides or edges of the fins of the evaporator coils.

When an industrial refrigerating system such as that used in a large meat packing plant is operating, condensate will form on the refrigerating coils and drip therefrom onto the meat hanging beneath them or other food products stored below, and thereby tend to cause contamination or do other harm. To eliminate this, condensate drain gutters are provided for catching and conducting away the drip from the refrigerating pipes or coils. These condensate drain gutters should be as narrow as possible in order not to interfere with the downward flow of cold air from the refrigerating coils. In some cases the condensate freezes and the frost accumulates to such an extent that during the defrosting period, instead of remelting and forming moisture which will flow to the lowermost corner of the finned evaporator coils and be caught by the condensate drain pans or gutters, the frost and ice on the portions of the fins which extend outwardly past the pans, tends to drop straight downward therefrom thus falling outside the pans and on to the food products stored below, or directly upon the floor. Means must be provided in these instances to collect the frost and condensate which normally would not be caught by the condensate drain gutters. However, this condition may only exist at certain points, for instance, in connection with those portions of the coils adjacent to an entrance to the refrigerator. To this end, readily attachable extensions or wings are provided which may be secured to the condensate drain gutters where desired or necessary, to catch the pieces of frost and ice, and the condensate which drop from the evaporator coils.

With the foregoing in mind the principal object of the present invention is to provide a novel construction arrangement for collecting condensate from refrigerating coils wherein the usual relatively narrow condensate drain gutters are used when the coils are operating under ordinary circumstances and extensions are provided which may be secured to the pans when and where the coils are operating under unusual circumstances.

Another object of the present invention is to provide a novel coil condensate drain gutter construction which will provide a minimum restriction to the downward flow of cold air from the refrigerating coils by only widening the original narrow coil gutters where absolutely necessary or desired.

A further object of the present invention is to provide a

novel construction of condensate drain gutters having the features and characteristics set forth, which is relatively inexpensive to manufacture and maintain due to being able to make convenient standard lengths and is entirely efficient and effective in operation and use.

These and other objects of the invention and the various features and details of the construction and operation thereof are hereinafter fully set forth and described with reference to the accompanying drawings in which:

Fig. 1 is a side elevational view of a portion of a cooling coil having the condensate drain pans made in accordance with the present invention attached thereto;

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1 showing the method of attaching the condensate drain pans to the cooling coils and also one method of attaching the extensions to the condensate pans;

Fig. 3 is a perspective view of a portion of a typical extension for the condensate drain pans;

Fig. 4 is a fragmentary sectional view illustrating a modified method of securing the extensions to the condensate drain pans;

Fig. 5 is a perspective view showing a hinged connection which may be used for securing the extensions to the condensate drain pans; and

Fig. 6 is a fragmentary side elevational view illustrating the hinged connection.

Referring now more particularly to the drawing, reference numeral 10 designates generally a cooling pipe or coil comprising one or more central pipe members 11 having a plurality of fins 12 attached thereto. The cooling coil 10 is of the type usually used in industrial or other class of refrigerating units and is made in convenient lengths. The cooling coils 10 are connected together by connecting pipes or nipples 13 and are arranged in convenient rows usually just beneath the ceiling. The food in the refrigerated room is usually contained in the space beneath these cooling coils.

Positioned directly beneath the cooling coils 10 is a condensate drain gutter 14 which is constructed in accordance with the present invention. The condensate drain gutter 14 comprises a generally V-shaped upper gutter member 15 of a width narrower than the coil 10, and a lower gutter member 17. The upper gutter member 15 has its outer edges bent to form a U-shaped or channel portion 16 along each side thereof as shown in Fig. 2 to stiffen it and also provide means for securing thereto wing members as more fully described hereinafter, and the lower gutter member 17 is suspended from the upper gutter member 15 and is usually but not necessarily narrower than the upper gutter member 15. The purpose of the lower gutter member 17 is to catch any condensate which may form on the lower surface of the upper gutter member 15.

Means are provided to fasten the two condensate drain gutter members 15 and 17 together. In the present instance this is accomplished by means consisting of bracket members 18 which are secured to the lower surface of the upper gutter member 15 and the lower surface of the lower gutter member 17 as shown in Fig. 2. These bracket members 18 may be secured to the gutter members 15 and 17, for example, by spot welding or some other suitable method.

The condensate drain gutter members 15 and 17 are made in sections lengthwise permitting their joining together so that they extend continuously throughout the entire length of the cooling coils 10 and their piping connections, and they are positioned at a slight slope so that any condensate which is collected in the drain pans may be drained off at one end.

Means are provided to adjustably fasten the condensate drain gutters 14 to the cooling coils. In the present instance this consists of bracket members 19 secured in-

teriorly of the upper condensate drain gutter member **15**, for example, by spot-welding as shown in the drawing, or by hooking the bracket under the turned edge of the upper gutter member **15**. The bracket member **19** extends upward from the drain pan and has its upper end adjustably fastened to one of the coil fins **12**. To this end each bracket member **19** in the upper portion thereof is provided with elongated slots **20** which are adapted to receive bolts **21** that pass through openings in the coil fins **12**. By virtue of the elongated slots **20** in the bracket member **19** the condensate drain gutter **14** may be variously positioned and sloped with respect to the cooling coils **10**.

The principal feature of the present invention is the provision of wing members **22** which are adapted to be separately attached either removably or permanently to the upper condensate drain pan **15** to catch any ice or frost particles which might fall from the coil fins **12** of the cooling coils before completely melting into water. As shown in Figs. 2 and 3, the wing members **22** have their outer edges bent to form a U-shaped section or channel **23** and **24** along their lower and upper edges respectively. The lower U-shaped or channel section **23** is constructed for interlocking engagement with the U-shaped section or channel **16** at the edges of the upper condensate drain pan **15**.

Clips **25** pivotally mounted to the wing members **22**, as shown at **26**, are provided to hold the wing members **22** in engagement with the condensate drain pan **15**. It will be observed, however, that any form of interlocking edge or other fastening method may be provided to hold the wing members **22** and the condensate drain gutter or pan **15** in engagement with each other. For example, generally C-shaped clamps **27**, as illustrated in Fig. 4, may be used to hold the wing members in engagement with the condensate drain pan.

The U-shaped or channel section **24** in the upper edge of the wing members is provided if it is desired to stiffen the wing members or in case a further extension of the condensate drain pan **14** is desired. If a further extension is necessary, a second pair of wing members (not shown) may be provided. This second pair of wing members would be secured to the first pair of wing members **22** in a manner similar to that mentioned above.

Fig. 5 illustrates a further modification of the present invention wherein a hinge **28** interconnects the wing member **22** with the condensate drain pan **15**. The hinge **28** may be secured to the condensate drain pan **15** and wing member **22** in any desired manner, for example, by bolts or spot-welding so that the wing member may be folded downwardly and outwardly with respect to the pan **15**. By this construction, the wing member may be used when desired or necessary and when not in use it will not interfere with the flow of cold air. A clip or bolt member **29** interconnects the wing member with the condensate drain pan and maintains the wing member in its extended position.

The wing members **22** are made in standard lengths equal to the lengths of the cooling pipes or refrigerating coils **10** and are positioned so that the ends of the wing members coincide with the ends of the cooling pipes or refrigerating coils. By positioning the wing members in the above-mentioned manner there is a space provided between the ends of one pair of wing members and the beginning of the next set in that row which allows the cold air flowing downward from the cooling coils to escape from the wing members and cool the food stored below the cooling coils, with less resistance to the flow of cold air than if the entire length of the coil pans were made as wide as the projected pan width with the wings attached.

The various embodiments herein described have been presented merely for the purpose of illustration, it being apparent that they are subject to modification and change without departing from the spirit of the invention. For

example, the finned refrigerating coil **10** can contain one pipe or tube as shown or a greater number. Also the fins and pipe or pipes can be round or any other shape that can be so positioned to cause condensate to run into the lowermost point of the fins and pipe or pipes so that a relatively narrow drip pan can be used. Also, the condensate drip pan **14** may be made with two or more superimposed sections, with one or more of the sections insulated or made of insulating material, if found desirable. In addition, pan **14** can be of single construction, either solid or divided. The condensate drain pan **14** can be made of semi-circular, rectangular or other convenient section instead of the V-type section shown, and the hangers **19** can be of different shape and/or construction if so desired. In addition, louvers or perforations may be provided in the wings to further permit flow of cold air. Also the wing member **22** can be made to extend out to a width more or less than the projected transverse width of the cooling coils **10** above and can be made shorter or longer than the actual length of the cooling coil sections **10** above so long as sufficient space is left for the cold air to pass down between the ends of adjacent pairs of wing members **22**.

From the foregoing it will be observed that the present invention provides a novel method of construction for condensate drain pans which will catch any condensate or ice and frost particles which fall from the cooling coils and that also provides a minimum amount of resistance to the downward flow of cold air therefrom.

While certain embodiments of the present invention have been illustrated and described herein, it is not intended to limit the invention to such disclosures, and changes and modifications may be incorporated and embodied therein within the scope of the following claims.

I claim:

1. In refrigerating apparatus the combination comprising a cooling coil unit having condensation surfaces sloping downwardly toward a central liquid collection area, upper and lower condensate drain pans of generally V-shaped cross section underlying said cooling coil unit, said upper drain pan having a transverse projected width greater than the transverse projected width of said lower drain pan and less than the transverse projected width of said cooling coil unit, means to hold said upper and lower condensate drain pans in spaced parallel relationship with each other and with the cooling coil unit, and wing members removably mounted at respectively opposite side edges of said upper condensate drain pan extending outwardly therefrom to about the full width of said cooling coil unit.

2. In refrigerating apparatus the combination comprising a cooling coil unit having condensation surfaces sloping downwardly toward a central liquid collection area, upper and lower condensate drain pans of generally V-shaped cross section underlying said cooling coil unit, said upper drain pan having a transverse projected width greater than the transverse projected width of said lower drain pan and less than the transverse projected width of said cooling coil unit, means to hold said upper and lower condensate drain pans in spaced parallel relationship with each other and with said cooling coil unit, a pair of wing members removably mounted at respectively opposite side edges of said upper condensate drain pan extending outwardly therefrom to about the full width of said cooling coil unit, interlocking edge portions on the wing members and the upper condensate drain pan, and means to hold said wing members into engagement with said upper condensate drain pan.

3. In refrigerating apparatus the combination comprising a cooling coil unit having condensation surfaces sloping downwardly toward a central liquid collection area, upper and lower condensate drain pans of generally V-shaped cross section underlying said cooling coil unit, said upper drain pan having a transverse projected width greater than the transverse projected width

of said lower drain pan and less than the transverse projected width of said cooling coil unit, means to hold said upper and lower condensate drain pans in spaced parallel relationship with each other, adjustable means to secure said condensate drain pans in the desired spaced relationship with said cooling coil unit, a pair of wing members removably mounted at respectively opposite side edges of said upper condensate drain pan extending outwardly therefrom to about the full width of said cooling coil unit, the edge portions of said wing members and the upper condensate drain pan being bent over in opposite directions to each other to allow the wing members and the upper condensate pan to be interlocked with each other, and clips rotatably secured to the wing members to hold said wing members into engagement with said upper condensate drain pan.

4. In refrigerating apparatus the combination comprising a cooling coil unit having condensation surfaces sloping downwardly toward a central liquid collection area, upper and lower condensate drain pans of generally V-shaped cross section underlying said cooling coil unit, said upper drain pan having a transverse projected width greater than the transverse projected width of said lower drain pan and less than the transverse

projected width of said cooling coil unit, means to hold said upper and lower condensate drain pans in spaced parallel relationship with each other, adjustable means to secure said condensate drain pans in the desired spaced relationship with said cooling coil unit, a pair of wing members removably mounted at respectively opposite side edges of said upper condensate drain pan extending outwardly therefrom to about the full width of said cooling coil unit, the edge portions of said wing members and the upper condensate drain pan being bent over in opposite directions to each other to allow the wing members and the upper condensate drain pan to be interlocked with each other, and clips in engagement with the wing members to hold said wing members in the extended position on said upper condensate drain pan.

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