March 12, 1940. W. R. RAMSAUR 2,193,696

DISTRIBUTOR HEAD FOR EVAPORATORS

Filed Aug. 23, 1937

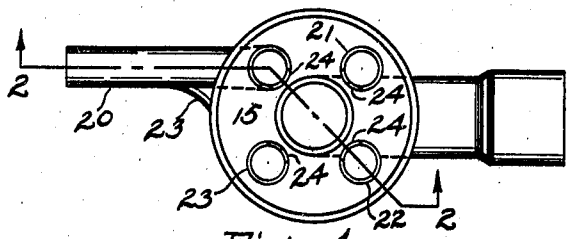


Fig. 1

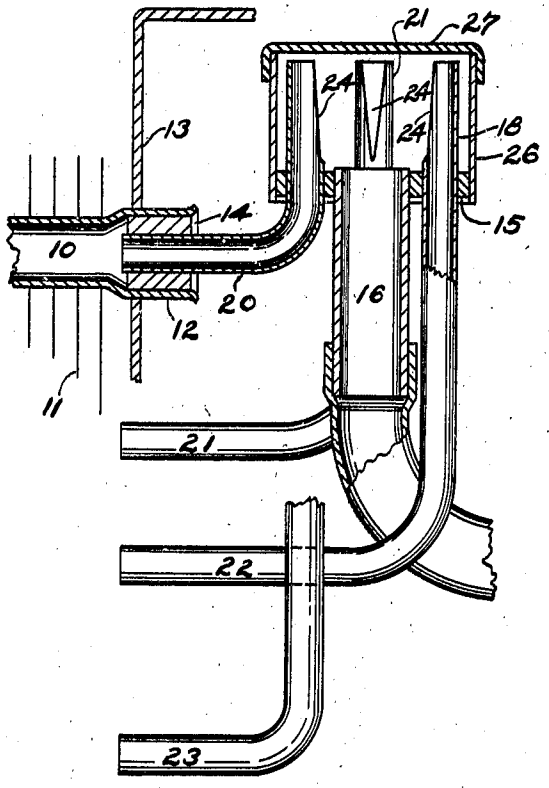


Fig. 2

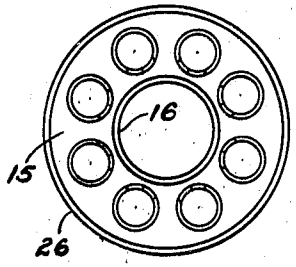


Fig. 3

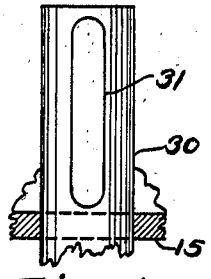


Fig. 4

INVENTOR
WALTER R. RAMSAUR
By A. S. Kroth
Attorney

Patented Mar. 12, 1940 2,193,696

UNITED STATES PATENT OFFICE

2,193,696

DISTRIBUTOR HEAD FOR EVAPORATORS

Walter R. Ramsaur, Racine, Wis., assignor to Young Radiator Company, Racine, Wis.

Application August 23, 1937, Serial No. 160,404

3 Claims. (Cl. 62—126)

Modern evaporators may be made in from two to eight or more separate sections. It is desirable to distribute the refrigerant equally into each section. This is difficult to accomplish because of the nature of refrigerants. They are not always in a complete liquid state when they reach the distributor head, the pressure varies considerably and is frequently controlled by valves operating on the on-and-off principle and when otherwise controlled the pressure and supply is erratic and uncertain.

The principal object of the present invention is to provide a head which will distribute the refrigerant and the gases equally to the individual evaporator sections.

Another object of the present invention is to provide a simple and light distributor head which may be manufactured at low cost.

To these and other useful ends my invention consists of parts, combinations of parts or their equivalents, and mode of operation as hereinafter described and claimed and shown in the accompanying drawing in which:

Fig. 1 is a top view of my distributor head having the cap of the chamber removed thus to disclose the interior.

Fig. 2 is a vertical transverse section of my invention taken on line 2—2 of Figure 1.

Fig. 3 is a view similar to Figure 1 showing the head only and having eight outlets instead of four.

Fig. 4 illustrates a modification showing a fraction of an outlet tube and chamber.

As thus illustrated a fraction of an evaporator core is shown. Numeral 10 designates the inlet end of one of the evaporator sections having thereon a number of spaced fins 11. The ends of the individual tubes are expanded as at 12 whereby the various coils of a section may be connected together by suitable tube loops as is the custom in evaporators of this class.

I prefer to mount the ends of the various tubes on header plates 13 preferably as illustrated. I provide a sleeve 14 with which to make the tube connections from the distributor head. The inlet end of each individual section of an evaporator is provided with a connection of this kind.

My distributor head comprises a chamber having a bottom head 15 into the center of which the inlet tube 16 is secured as illustrated. In Figures 1 and 2 I illustrate a distributor head equipped for a four section evaporator. The head illustrated in Figures 1 and 2 is therefore provided with four outlet tubes numbered 20, 21, 22 and 23, each being secured to the bottom head 15, their upper ends protruding through this member as illustrated in Figure 2. Tube 20 is preferably secured to the top section of the evaporator as illustrated, each of the other tubes forming a connection to its individual evaporator section as fractionally illustrated.

The protruding end of each outlet tube is provided with preferably a V shaped cut-away portion 24. These portions are preferably positioned on the side of the tube facing the center of the header. I provide a housing member 26 having a cap 27, thus forming an inclosure for the protruding tube ends, the tubes being preferably spaced around the inlet tube as illustrated in Figures 1 and 3.

It will be seen that the refrigerant will enter at the bottom of the chamber and accumulate in the chamber overflowing into openings 24.

The object of the present invention is to equally distribute the refrigerant to the various coils; thus the cut-away portions being similar in shape and position, the refrigerant will be caused to flow into the outlet tubes in equal volume regardless of its height in the chamber; and since there is always more or less gas present in the refrigerant, the height of the refrigerant will depend upon the volume entering the chamber, which will be controlled by gravity, the surplus gas escaping with the liquid refrigerant.

Opening 24 in the side of the tube will preferably have an area equal to the area of the tube and will therefore deliver the maximum amount of refrigerant to its respective tube before the level in the chamber reaches the top of the tube.

Thus it will be seen that I have provided a distributing head which will operate successfully on various quantities of refrigerant and accompanying gas, delivering to each evaporator coil an equal quantity. Clearly my distributor head may be adapted to accommodate any number of outlet tubes. In Figure 3 I illustrate the head having eight outlets.

In Figure 4 I illustrate a modification wherein tube 30 is provided with a cut-away portion 31 having parallel sides and extending from near the bottom of the chamber to near the top of the tube. Thus as the refrigerant level rises in the chamber, the quantity of refrigerant passing into the tube will gradually increase as in the design illustrated in Figure 2.

A distinct advantage of the present invention is that valves may be placed in the outlets, whereby one or more of the evaporator sections may be cut out and the remaining sections will each

continue to receive equal quantities of refrigerant.

Obviously various changes in details may be made without departing from the spirit and scope of the invention as recited in the appended claims.

Having thus shown and described my invention, I claim:

1. A distributor head for evaporators comprising a chamber having a horizontally positioned bottom head, a refrigerant inlet in said head, outlet tubes in said head being positioned adjacent said inlet, said outlet tubes extending a distance into said chamber and having therein vertically positioned cut-away portions extending from adjacent said head to the top of the tubes, whereby the entering refrigerant may flow equally into said openings in quantities measured by the height of the refrigerant in said chamber.

2. A distributor head for evaporators comprising a chamber having a horizontally positioned bottom head, a refrigerant inlet in said head, refrigerant outlet tubes in said head, said outlet tubes extending a distance into said chamber, the extended end of each tube having a V shaped slit in its side and parallel to the tube, the bottoms of the slits being adjacent said head and on the same horizontal plane whereby the entering refrigerant may flow equally into said outlets, the volume thus flowing depending upon the height of the refrigerant in said chamber.

3. A distributor head for evaporators, comprising a chamber having a centrally positioned inlet in its bottom, outlet tubes in the bottom of said chamber and extending a distance into said chamber and being positioned in spaced relation around said inlet and the same distance therefrom, vertically positioned openings in said extended ends and extending from adjacent said bottom to adjacent the top, whereby the refrigerant may accumulate in said chamber and flow equally into each said outlets.

WALTER R. RAMSAUR.