Oct. 18, 1938. H. J. KRACKOWIZER 2,133,354

CONDENSATION COLLECTOR

Filed Aug. 5, 1935

Fig. 1.

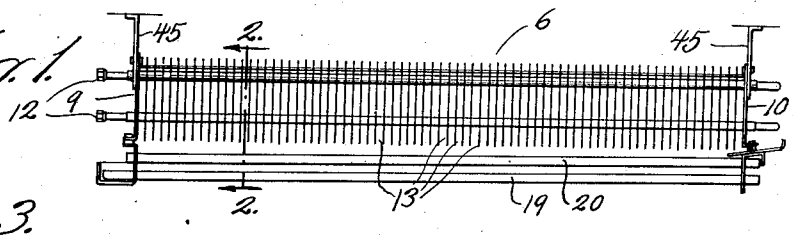


Fig. 3.

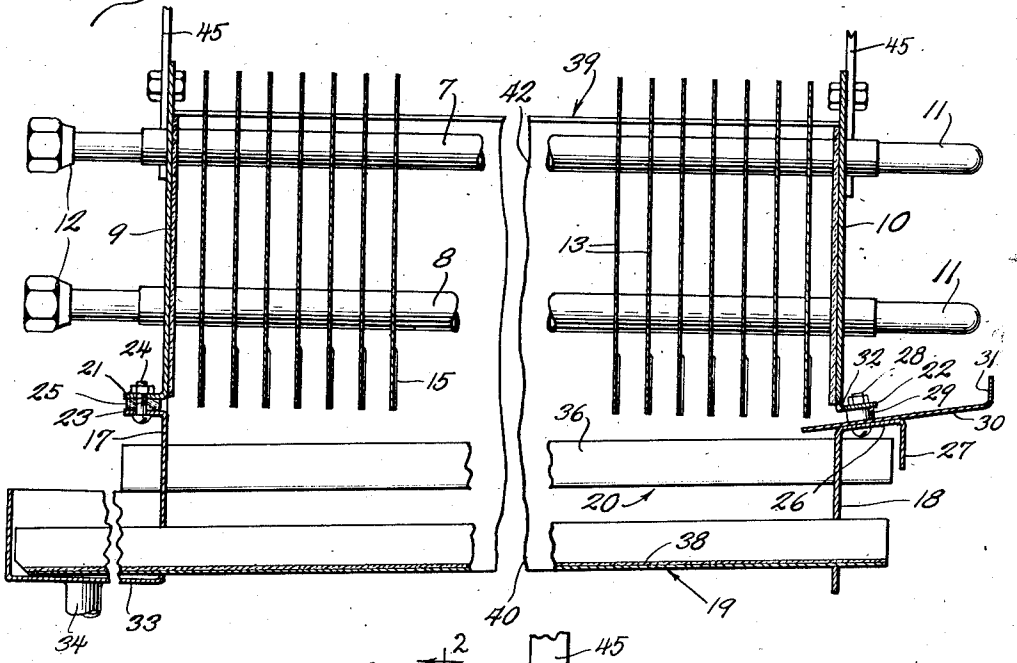


Fig. 2.

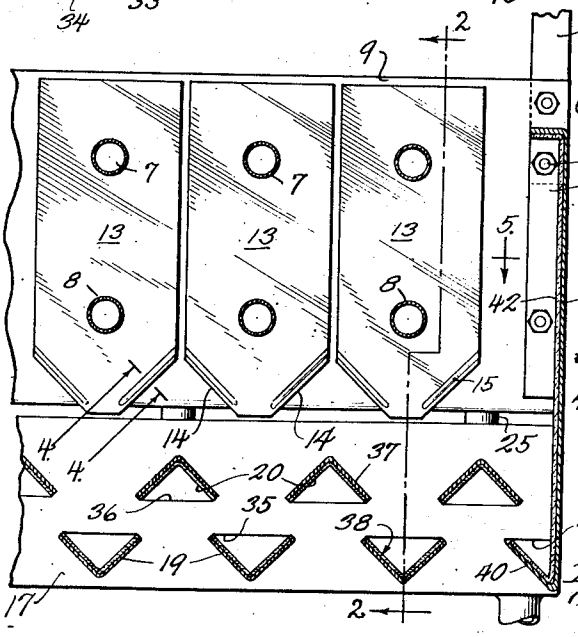


Fig. 4.

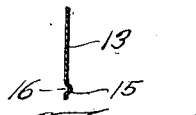


Fig. 5.

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2,133,354

CONDENSATION COLLECTOR

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Application August 5, 1935, Serial No. 34,745

2 Claims. (Cl. 62—103)

My invention relates to refrigerating equipment and has reference more particularly to facilities for collecting and disposing of moisture that accumulates on the surfaces of the cooling unit.

In refrigerating systems it is a common practice to provide coils or the like within the compartment that is to be cooled and to circulate a cooling medium or refrigerant through said coils to cool the air in the compartment, such coils usually being provided with plates or fins thereon to increase the cooling surfaces to which the air is exposed. As the compartment air circulates and re-circulates through the zone of the coils and plates or fins and heat is absorbed thereby from the air, condensation occurs and causes accumulation on the coils and plates or fins of moisture which should be collected and drained away. The facilities for collecting and draining away the moisture must, however, be arranged so as to permit free circulation of air through the cooling zone of coil and plates or fins and these facilities must themselves be immune to condensation and collection of moisture on any surfaces thereof that do not drain into the regular moisture collecting and discharge channels. Moreover the moisture collecting and draining facilities must be arranged so as to be readily and conveniently cleaned.

The principal objects of my invention are to provide improved moisture collecting and draining facilities for cooling coils of refrigerating systems and the like; to arrange the moisture collecting and draining facilities so that air may circulate freely therethrough; to construct the moisture collecting and draining facilities so that they may be incorporated as a part of the cooling unit; to insure drainage of all moisture collecting surfaces into the regular channels that are provided therefor; to permit the moisture collecting facilities to be readily and conveniently cleaned; to construct said facilities in sections which are individually removable for cleaning; to design said facilities so as to employ standard materials which are readily available and do not require special or expensive equipment; and in general to provide simple, inexpensive, convenient and effective moisture collecting and draining facilities for refrigeration coils and the like, these and other objects being accomplished with the illustrative embodiment of my invention as described hereinafter and shown in the accompanying drawing, in which

Fig. 1 is a side view of a refrigerator coil with my moisture collecting and draining facilities combined therewith in a unit, the side plate of the unit being removed;

Fig. 2 is an enlarged, fragmentary, transverse, sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a longitudinal sectional view of the unit taken on the line 3—3 of Fig. 2 with parts broken away;

Fig. 4 is a section through the lower margin of a heat absorption plate of the cooling element taken on the line 4—4 of Fig. 2; and

Fig. 5 is a fragmentary sectional view on the line 5—5 of Fig. 2 showing the manner of attaching the side plates to the unit.

The refrigerating coil which is indicated as a whole at 6 comprises a plurality of parallel tubes arranged in laterally spaced pairs each of which said pairs comprises an upper tube 7 and a lower tube 8. These tubes are mounted in and project through end plates 9 and 10 and are connected in series by return bands 11 at their ends beyond the respective end plates 9 and 10 and the end pipes of the series are provided with coupling fittings 12 for connection with the source from which the cooling medium is supplied to and circulated through the connected series of pipes 7 and 8. Each pair of pipes 7 and 8 extends through a separate series of thin radiating plates 13 which are arranged in spaced relation between the end plates 9 and 10 and securely fixed on the pipes 7 and 8 in a manner to insure good conductivity.

When the refrigerant is circulated through the series of pipes 7 and 8, these pipes as well as the radiating plates 13 are cooled and serve to cool the air which circulates between the plates 13 and in contact with these plates and the pipes 7 and 8 and as the air is cooled condensation occurs and moisture accumulates on the plates 13 and pipes 7 and 8 which said moisture must be collected and drained away. For this purpose the plates 13 are formed at the bottom with oppositely inclined edges 14 which taper to the middle and the plate is stamped along these edges to provide a bead or rib 15 on one side and a groove 16 on the other side to direct the moisture that accumulates on the plate downwardly to a central point at the bottom of the plate where it drops or discharges therefrom into the moisture collecting and draining facilities.

These moisture collecting and draining facilities are made up as a unit for attachment to the cooling unit and comprise end plate members 17 and 18 which support a series of trough members 19 which are laterally spaced and arranged so that there is a trough member 19 directly un-

der the center of each series of plates 13 as shown in Fig. 2 in a position to receive therein the moisture discharge from the central lower end portions of the plates 13 of the respective series and at an elevation above the troughs 19 are inverted trough like deflectors 20 which bridge the spaces between the troughs 19 and have oppositely inclined top surfaces that divert any moisture that may drop thereon into the troughs 19 at the sides of the respective deflector 20. Thus it will be seen that any moisture that drops from the cooling unit is deposited in the troughs 19 and at the same time the troughs 19 and deflectors 20 are spaced apart so that air may pass freely therebetween and the moisture collecting facilities accordingly do not interfere with free circulation of air through the cooling unit.

For attaching the end plate members 17 and 18 of the moisture collecting unit to the cooling unit the end plates 9 and 10 of the latter unit are provided along their lower edges with outturned flanges 21 and 22 respectively and the end plate member 17 has a corresponding outturned flange 23 along the upper edge which is secured to the flange 21 by bolts 24, preferably with heat insulating washers 25 on the bolts so that the flanges 21 and 23 are not in direct contact with one another and the end plate member 18 has an out-turned flange 26, preferably at an inclination as shown in Fig. 3, and with the edge down-turned as at 27, and this flange 26 is secured to the flange 22, which is preferably at a like inclination, by the bolts 28 with insulating washers 29 between the flanges. A plate 30 with up-turned outer edge 31 is secured on the top face of the inclined flange 26 under the washers 29 so as to drain through the joint and this plate 30 extends outwardly under the connections 11 to receive any moisture dropping therefrom and to discharge such moisture onto the deflectors 20 and into troughs 19. Drain holes 32 may be provided, if desired, along the bend between the flange 22 and plate 10 to discharge any moisture pocketed on the flange onto the plate 30.

The troughs 19 are mounted in the end plate members 17 and 18 at a suitable inclination, as shown in Fig. 3, so as to drain to and discharge at the outer side of the plate member 17 into a gutter which is formed as a part of the plate member 17 and a spout 34 leads from this gutter to any desired point of discharge. An expansion valve, such as commonly used in refrigerating systems and which is not shown, is connected to the outer end of the upper coupling fitting 12 and as this expansion valve accumulates moisture, the gutter 33 not only extends outwardly under the fittings 12 but also under the expansion valve so that any condensation moisture dropping therefrom will fall into the gutter 33. Preferably the deflectors 20 are arranged at the same inclination as the troughs 19 and the troughs and deflectors are preferably of angle iron shape and are mounted in the end plate members by providing the latter with triangular openings 35 for the trough members 19 and inverted triangular openings 36 for the deflectors 20.

In order to prevent condensation of moisture at the bottom surfaces of the deflectors 20 and troughs 19 the top surfaces are coated with a layer of insulation, that for the deflectors being indicated at 37 and for the troughs at 38. Both the troughs 19 and deflectors 20 are individually removable, this being particularly important in the case of the trough members 19 to permit convenient and thorough cleaning and which are removed by first sliding the particular trough member 19 to the right, as viewed in Fig. 3, until the lower end clears the opening 35 in the plate member 17 after which that end of the trough is dropped down below the lower edge of the plate member 17 and the trough member is then slid to the left until it is withdrawn from the opening 35 of the plate member 18.

The combined cooling and moisture collector unit is closed at each side by a panel 39 which has an upwardly and inwardly inclined flange 40 along the lower edge forming a half trough to receive any deposit from the outer edge of the outer deflector 20 and this half trough is inclined like the troughs 19 and communicates through a notch 41 in the end plate member 17 so as to discharge into the gutter 33. These side plates are coated on their inner sides with insulation 42 which is continued up on the top surface of the flange 40 to provide an insulating lining for the half trough, and said plates 39 are mounted on the end plates 9 and 10 of the cooling unit by providing said plates 39 with inturned flanges 43 which are secured to the respective end plates 9 and 10 by the bolts 44.

This combined cooler and moisture collecting unit may be mounted in any convenient manner, as for example by hangers or brackets 45, which are attached to the end plates 9 and 10 for suspending the unit from the ceiling or from some overhead support.

While I have shown and described my invention in a preferred form, I am aware that various changes and modifications may be made without departing from the principles of my invention, the scope of which is to be determined by the appended claims.

I claim as my invention:

1. The combination with an air cooler of the class described of a collector mounted thereunder to receive condensation dropping from the cooler, said collector comprising end supports and laterally spaced trough like members removably mounted at their ends on said end supports and inverted trough like baffles over the spaces between the trough like members and mounted at their ends on said end supports and said members and baffles having a coating of heat insulating material on their upper surfaces.

2. The combination of an air cooler comprising refrigerant-circulating conduits, end plates for supporting said conduits in laterally spaced relation, a collector comprising laterally spaced trough members mounted under the cooler to receive condensation dropping therefrom, panels cooperating with said end plates to enclose the sides of the cooler and collector, and condensation collecting facilities carried by said panels at the inner side of lower portions thereof.

HERMANN J. KRACKOWIZER.