

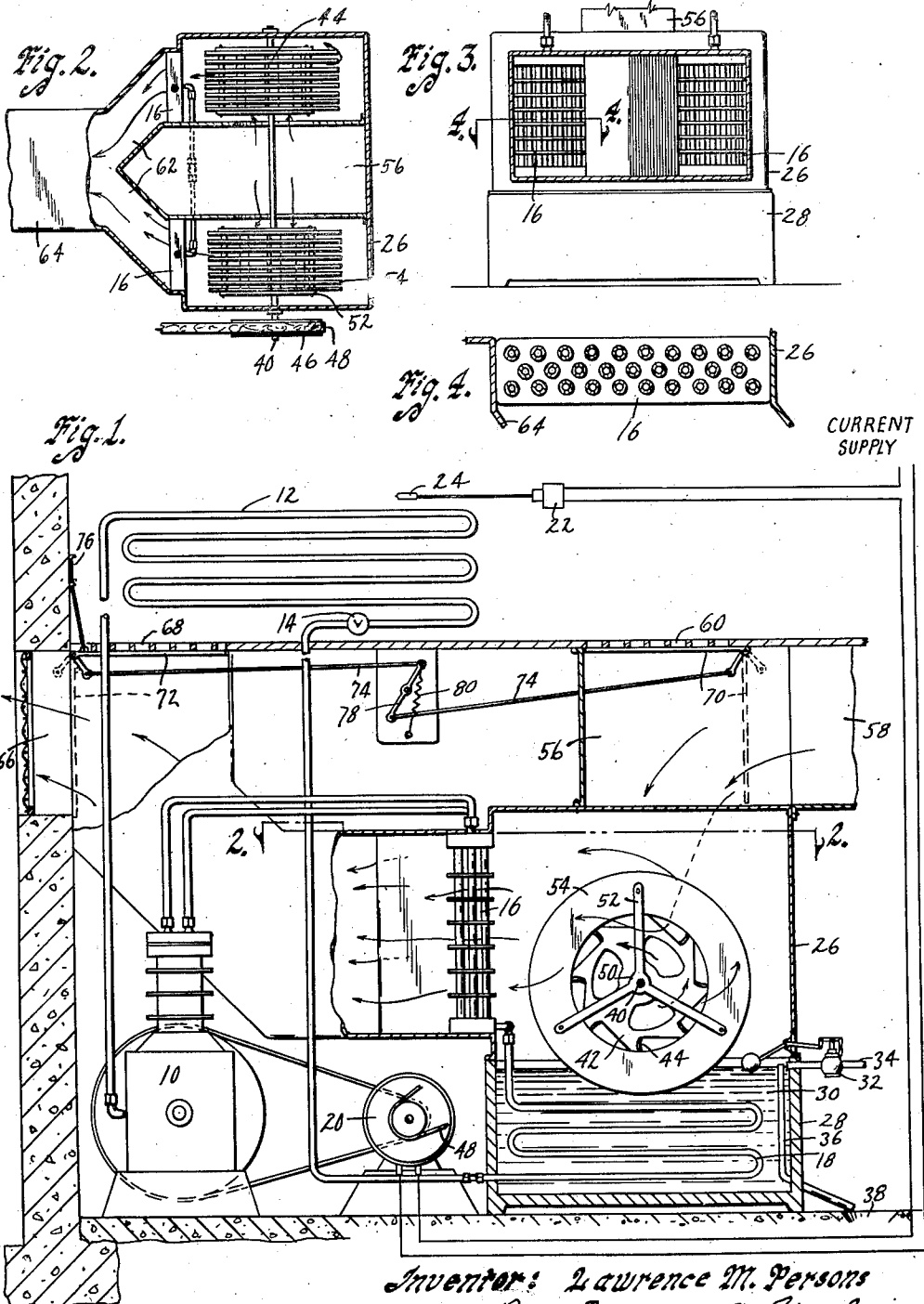
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MEANS FOR DISSIPATING HEAT FROM RADIATORS CONTAINING LIQUID

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MEANS FOR DISSIPATING HEAT FROM RADIATORS CONTAINING LIQUID

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1 Claim. (Cl. 257—36)

An object of my present invention is to provide means for more efficiently extracting heat from a refrigerant condenser or other fluid containing radiator than by the mere expedient of passing air or water thereover as is now commonly done.

Still a further object is to provide means for this purpose which effects a considerable economy in the use of water as compared with refrigeration systems having condenser coils immersed in water.

More particularly, it is my object to provide cooling means for a radiator or the like from which heat is to be dissipated comprising an apparatus including a tank having liquid therein and means for circulating air across the surface of the liquid to thereby cool the air before it is circulated past the device from which heat is to be dissipated, whereby to substantially increase dissipation as compared to dissipation effected by the mere passage of available atmospheric air across such radiator and to likewise increase the efficiency of such unit as compared with a unit of the type having the radiator immersed in water or other cooling liquid which must be constantly supplied to effect cooling, the water heated by the cooling operation being ordinarily wasted.

Still a further object is to provide a heat dissipating apparatus for refrigerant condensers and the like so associated with a room or other compartment that the dissipated heat can be circulated therethrough if desirable.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawing, in which:

Figure 1 is a semidiagrammatic view of my heat dissipating apparatus shown in connection with a mechanical refrigeration system.

Figure 2 is a horizontal sectional view of the apparatus as taken on the line 2—2 of Figure 1.

Figure 3 is a front elevation of the dissipating apparatus as taken on the line 3—3 of Figure 1 showing an outlet conduit in section; and

Figure 4 is a sectional view on the line 4—4 of Figure 3 showing a radiator on an enlarged scale.

On the accompanying drawing, I have shown a mechanical refrigerating system comprising in general a refrigerant condenser 10, a cooling or evaporating coil 12, an expansion valve 14, a pair of radiator or condenser coils 16 and a supplemental condenser coil 18. The refrigerant condenser 10 is driven by an electric motor or the

like 20 which is automatically controlled in the ordinary manner by an automatic switch 22 having a temperature responsive bulb 24 located in the refrigerator or other container for the cooling coil 12, which container is omitted from the drawing as it forms no part of my present invention.

In connection with the mechanical refrigerating system just described, I provide a cooling means for the coils 16 and 18 comprising a casing 26 having at the bottom thereof a tank 28. The tank is adapted to contain water 30 or other cooling fluid, the level of which can be controlled by a float valve 32 connected with a water supply pipe 34 and an overflow pipe 36 draining into a sewer or the like 38. Journaled with respect to the casing 26 is a shaft 40 having disks 42 secured thereto and provided with blower blades 44. Outside of the casing a pulley or the like 46 is secured to the shaft and belted as by a belt 48 to the motor 20 or any suitable source of power.

Loosely mounted on the shaft 40 are hubs 50 having arms 52 supporting a plurality of disks 54, for instance, as shown in my copending application Serial No. 718,537, filed April 2, 1934, which have their lower portions dipping into the water 30. They are slowly driven by friction between the shaft 40 and the hubs 50 or from suitable step-down gearing or belting.

An intake pipe 56 communicates with an outdoor intake 58 or an indoor intake 60 and with the casing 26. As shown in Figure 2, the air from the intake pipe 56 can enter inside the blower blades 44 and will be discharged through the radiator 16.

The air then flows through branch pipes 62 to an air outlet pipe 64 which communicates either with an outdoor outlet 66 or an indoor outlet 68.

Means is provided for selectively controlling the flow of air so that it comes in and discharges through the outlets 58 and 66 or 60 and 68. This may consist of dampers 70 and 72, connecting links 74 and a control rod 76. The links 74 are connected by a lever 78 to give the links the proper direction of movement and the dampers are held in either of two positions by an over-center spring 80 connected with the lever. Thus it will be obvious that in the full line position of Figure 1 the inlet 60 and the outlet 68 are closed, while in the dotted line position (obtained by pushing the control rod 76 downwardly) the inlet 58 and outlet 66 are closed.

The auxiliary condenser coil 18 is submerged in the water 30 as clearly shown in Figure 1. The cooling coil 12 is of course located in a

refrigerator such as shown in my copending application Serial No. 698,476, filed November 17, 1933.

Practical operation

5 In the operation of the invention described, the low pressure gas from the cooling coil 12 which contains the heat absorbed by the cooling coil is compressed by the compressor 10 and is changed to a high pressure liquid in the condenser 16 because of the heat being dissipated therefrom.

10 By providing the tank 28, the cooling water 30, the evaporator elements 54 and the blower 44, it is possible to cool the air coming into the casing 26 through the intake pipe 56 so that when it strikes the condenser or radiator 16 it dissipates the heat therefrom faster than if it were not so cooled. It is cooled because it evaporates the water from the surfaces of the disks 54 which, although it humidifies the air, it increases the efficiency because it is the temperature of the air that accomplishes heat dissipation from the radiator 16 regardless of the moisture content of the air. Thus the high pressure gas is more efficiently and quickly converted to a high pressure liquid in the radiator 16 than by other known methods.

25 What slight heat remains in the refrigerant condenser is effectively removed in the auxiliary coil 18 which traverses through the water 30 which in turn has been cooled because of evaporation cooling the disks 54 and the disks in turn cooling the water so that the air from the disks and the water are both below room temperature or whatever temperature at which they enter the casing 26 and the tank 28.

35 The high pressure liquid from the coil 18 flows through the expansion valve 14 in the ordinary manner which changes it to a low pressure liquid and which evaporates into a low pressure gas when traversing the coil 12 due to absorbing heat from the refrigerated space and the cycle from there on is repeated as described.

40 Instead of using a considerable quantity of water to keep the coils 16 and 18 cool in the ordinary manner as when they are submerged in the water, only a small quantity of water is used be-

cause only that which evaporates must be replaced from the supply pipe 34. The drain pipe 36 performs no function except to drain excess water if the valve 32 sticks. During normal operation, evaporation continually occurs instead of the air being dehumidified and thus raising the level of the water 30. I have found by actual tests that the system herein described has considerable efficiency over the system illustrated in my second mentioned copending application.

10 Although I have illustrated my cooling means in connection with the refrigerant condenser of a mechanical refrigerating system, it is obvious that it can be applied for cooling other types of condensers such as condensers for steam boiler water and other fluids. In short, it can be used in connection with any device from which heat is to be dissipated and can be operated more economically than merely blowing air over such a device or immersing it in running water.

20 Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claim, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within its scope.

I claim as my invention:

30 In combination with a radiator through which fluid flows, means for cooling such fluid by dissipating the heat from said radiator comprising a tank arranged to hold a cooling liquid, means for passing an air stream over the surface of such liquid to evaporate a portion thereof and thereby cool the air of said air stream, said radiator being disposed in the air stream so that the cooled air may dissipate the heat therefrom, wet surface means for increasing the surface area of the liquid exposed to the evaporating action of the air, said wet surface means comprising a disk having portions successively movable into and out of such liquid and air stream and a conduit of heat conducting material immersed in the liquid of said tank and connected with the outlet end of said radiator.

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