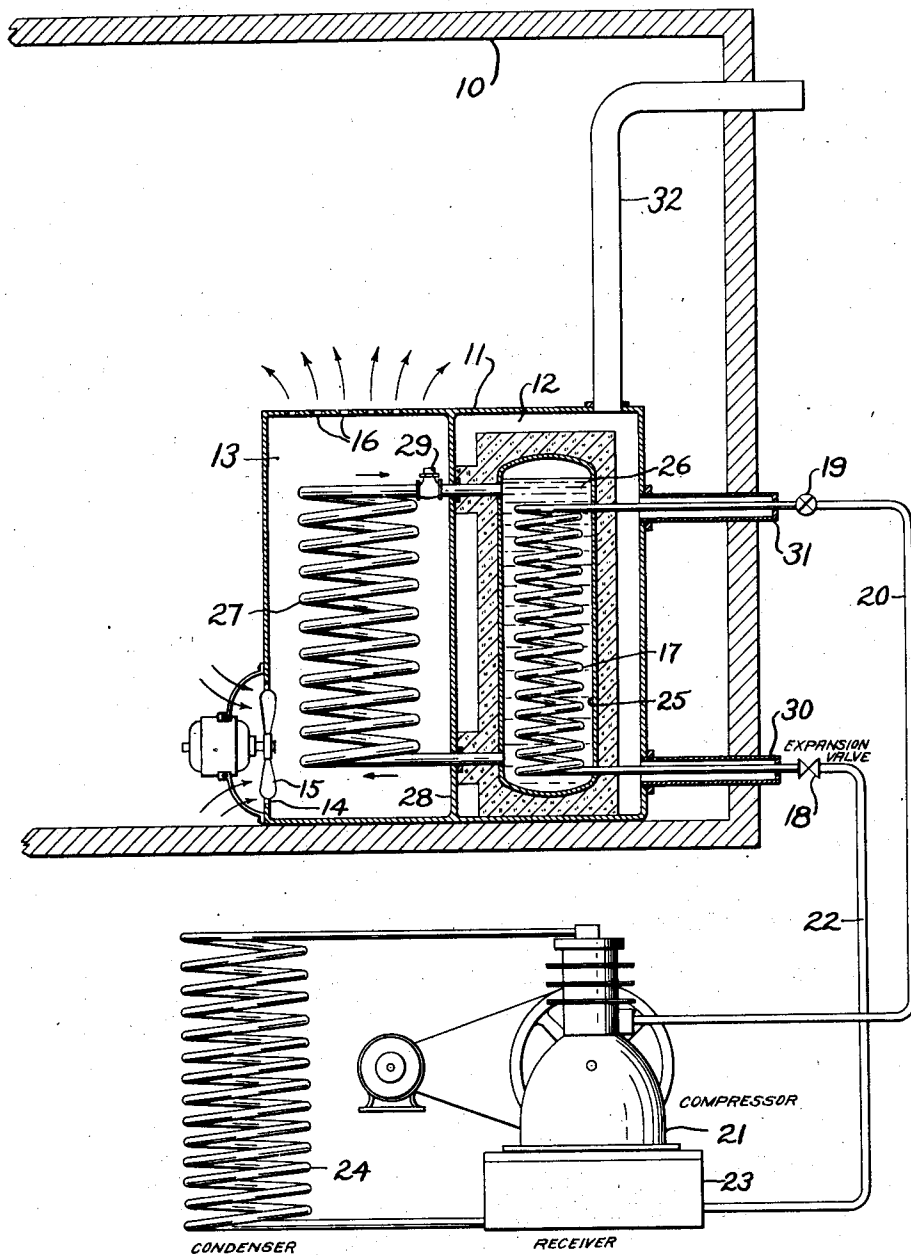


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AIR CONDITIONING SYSTEM

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AIR CONDITIONING SYSTEM

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6 Claims. (Cl. 62—1)

This invention relates to air conditioning and more particularly to refrigeration of air circulated in living quarters.

Regulations controlling the application of various types of equipment have been effected in order to prevent bodily injury. With regard to refrigeration, these regulations require that the part of the refrigerating mechanism containing a toxic or inflammable refrigerant for cooling air in air conditioning systems, shall not be located within the path of the air to be cooled and otherwise conditioned.

The present invention is designed to provide an air conditioning system having means for circulating air and for reducing the temperature of the same. It is a particular object of the invention to provide not only means for preventing contact of refrigerant and air during normal circulation of the air but to prevent any contact of the refrigerant and air under abnormal conditions, as for example, due to a leak in vessel in which the refrigerant is circulated.

In accomplishing said objects, the cooling unit of a refrigerating system is located in a closed chamber having communication with a secondary coil over which air to be cooled is circulated. The chamber in which the refrigerant containing parts of the system are located is vented to the atmosphere in order that any leakage of refrigerant may escape without being discharged into the room in which the device is located.

Other objects and advantages will be apparent from the following description taken in connection with the accompanying drawing, wherein,

The figure is a diagrammatic view with parts in section illustrating one application of the invention.

Referring to the drawing, a room 10 is adapted to be provided with air at a desired temperature for comfort to persons therein. In order to provide means for lowering the temperature of air in the room 10 a casing 11 is provided for the reception of cooling mechanism. The casing 11 has compartments 12 and 13, in the first of which is contained the primary cooling unit of a refrigerating system, through which a refrigerant is circulated, and in the second of which is contained a secondary system refrigerated by the primary system. The compartment 12 is sealed with regard to the room 10 in which it is located while the compartment 13 is provided with an air inlet 14 through which air is adapted to be blown into the chamber 13 by a motor driven fan 15, such air being discharged from the cabinet through discharge orifices 16.

The primary cooling unit may be of any desired construction, as for example, a double pipe type or a tank and coil type, the latter being shown in the present illustration. The primary evaporator or cooling unit consists of a coil 17 into the bottom of which refrigerant is admitted through an expansion valve 18 and from the top of which refrigerant is discharged past a stop valve 19 into suction line 20 which connects with a compressor 21 of conventional construction. Liquid refrigerant is supplied to the expansion valve 18 through a pipe 22 from a receiver 23 supplied with refrigerant from a condenser 24 into which the compressor discharges the compressed refrigerant vapor.

The evaporator coil 17 is located within an insulated tank 25 and this tank is substantially filled with brine 26 in which the coil 17 is submerged. A secondary cooling coil 27 is located in a compartment 13 so that air circulated by the fan 15 through the compartment will pass thereover and be cooled. The lower end of this secondary coil extends through partition 28 between the compartments 12 and 13 and communicates with the interior of the insulated tank 25 near its bottom for receiving the cooled brine from the lower portion of said tank. The upper end of the coil extends through the partition 28 and communicates with the interior of the tank near the top for discharging the warmer brine from the upper portion of the secondary coil. The upper portion of the secondary coil is also preferably provided with a brine filling connection 29.

The inlet and discharge connections to the primary cooling coil 17 are provided with housings in the form of sleeves 30 and 31 which enclose these connections and prevent any communication between the primary coil and the interior of the room 10.

The upper portion of the chamber 12 is vented to the atmosphere by means of pipe 32 so that if refrigerant should escape from the primary coil and get through the insulated tank, it could pass directly to the atmosphere.

With a system such as that described above, refrigerant vapor will be compressed by the compressor 21 and discharged into the condenser 24 from which the liquid refrigerant will flow into the receiver 23. From the receiver 23 liquid refrigerant will flow through the pipe 22 to the expansion valve where it will expand into the cooling coil 17 and the vapor will be withdrawn from the cooling coil through suction line 20 and taken back to the compressor. The cooling effect of the cooling coil will reduce the tempera-

ture or remove heat from the brine 26 in which the cooling unit is submerged. This brine circulates through the secondary cooling coil 27 and air within the room 10 blown over such coil by the motor driven fan 15 will be cooled. If any leak in the primary cooling coil 17 should occur between the points where it has its inlet and outlet connections extending through the wall of the room, such leakage would be discharged to the atmosphere outside of the room by means of the vent pipe 32.

It will be apparent to those skilled in the art that various other changes may be made in the construction and arrangement without departing from the spirit of the invention, and therefore the invention is not limited to that which is described in the specification and shown in the drawing, but only as indicated in the appended claims.

20 What is claimed is:

1. In combination, walls defining a space to be cooled, a casing in said space to be cooled having separate chambers, a primary cooling unit in one of said chambers, connections to said primary cooling unit extending beyond the confines of said walls, said primary cooling unit and connections forming part of a refrigerating system, an insulated container for said primary cooling unit, a pipe venting the chamber in which said primary cooling unit is contained to the exterior of the space to be cooled, a secondary cooling unit located in another chamber of said casing and having communication with the insulated container whereby circulation therethrough can be accomplished, and means for circulating air to be cooled over said secondary cooling unit.

2. In combination, a room to be cooled, a cooling unit in said room, an insulated container enclosing said cooling unit, a secondary cooling unit communicating with said container, a circulating cooling agent partially filling said container and secondary cooling unit, a casing en-

closing said cooling units and separating the primary cooling unit from the secondary cooling unit, means for circulating air from the room into the casing over said secondary cooling unit and a pipe venting the primary cooling coil to the exterior of the room to be cooled. 80

3. In combination, a room to be cooled, a primary cooling coil in said room, a secondary cooling coil in said room, means for supplying refrigerant to said primary cooling coil, means for circulating air within the room over said secondary cooling coil and a casing about said primary cooling coil sealing the primary cooling coil from the air within the room, said last mentioned casing having a pipe venting the same to the exterior of the room to be cooled. 90

4. An air conditioning system comprising a primary cooling coil, a secondary cooling coil constructed to be refrigerated by said primary coil, a casing for the primary coil, a pipe venting said casing to the exterior of the room to be cooled and means for circulating air to be cooled over said secondary coil. 95

5. In an air conditioning system, a casing having a closed compartment through which air cannot circulate and a second compartment provided with means to permit air to circulate there-through, a primary cooling unit in said closed compartment, a secondary cooling unit in the second compartment, said secondary cooling unit being refrigerated from the primary cooling unit, and a pipe forming a vent from the first compartment to the exterior of the room to be cooled. 100

6. A room to be cooled, a cooling unit in said room, a vented casing surrounding said cooling unit, one or more connections to said cooling unit, and housing means for said connections sealed to the room to be cooled and opening to said vented casing and to the air exteriorly of the room to be cooled. 105

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