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A. Y. DODGE
AIR CONDITIONING SYSTEM

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2 Sheets-Sheet 1

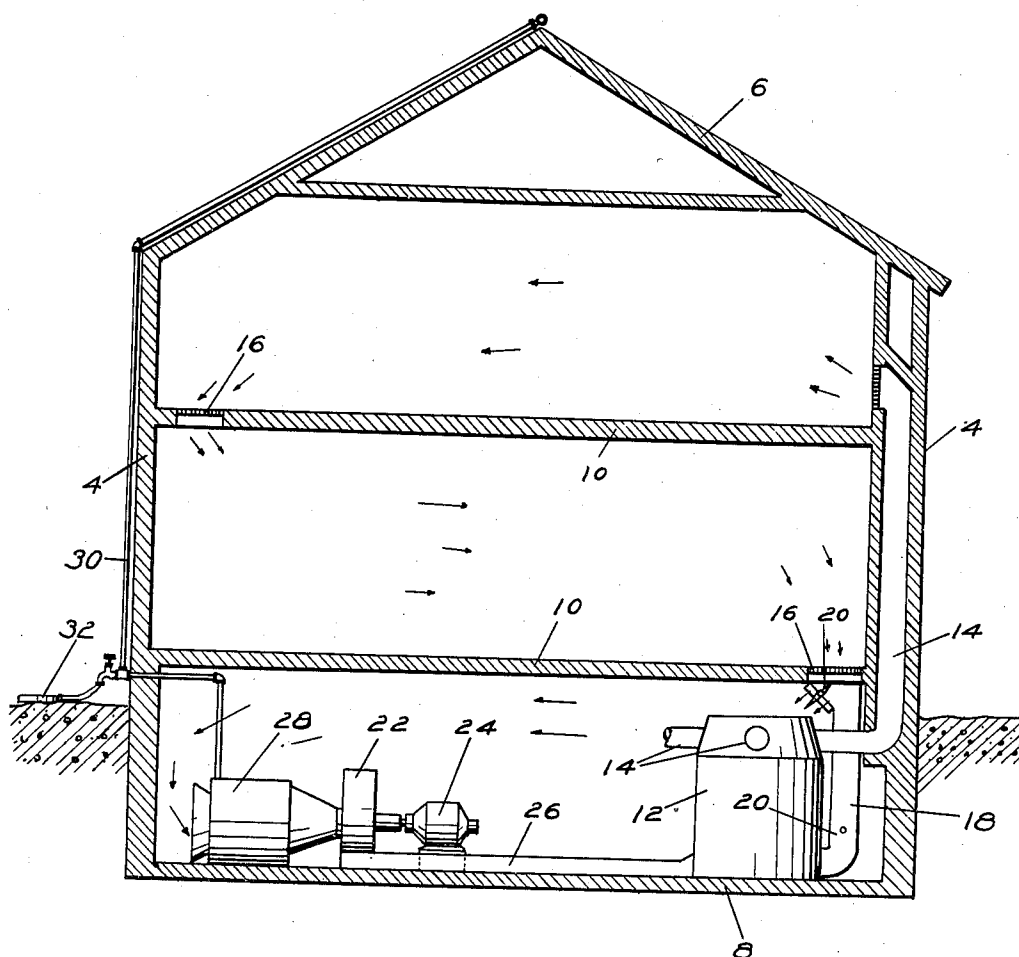


Fig. 1

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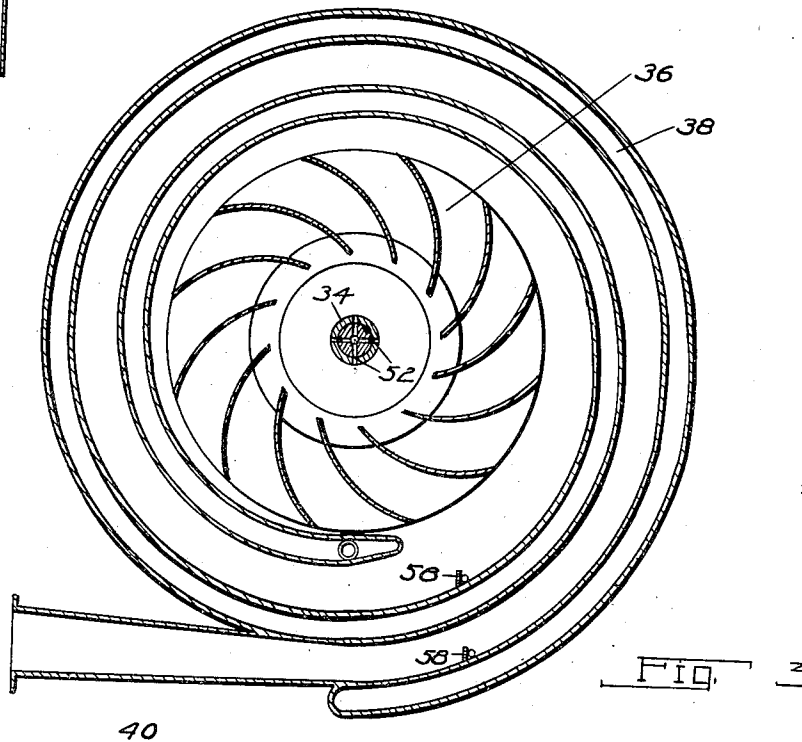
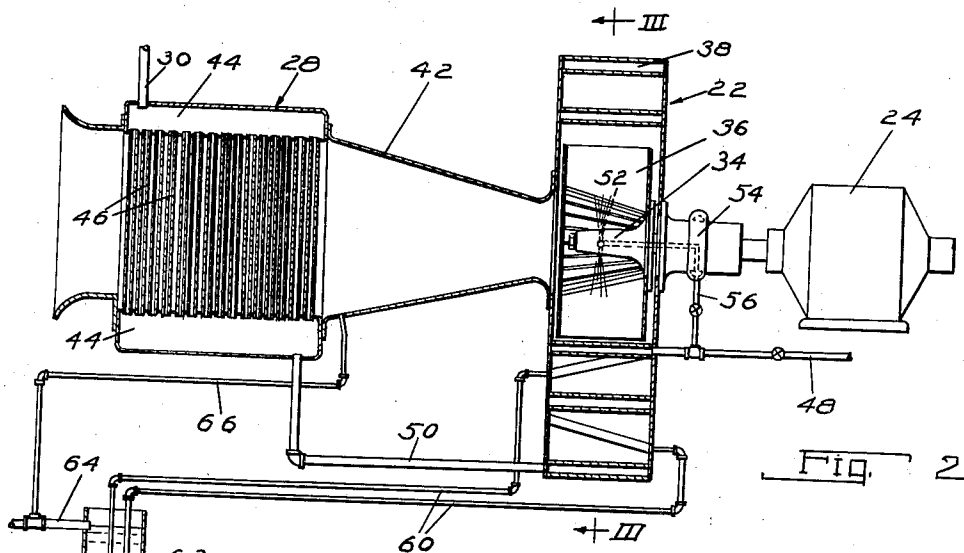
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AIR CONDITIONING SYSTEM

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5 Claims. (Cl. 261-11)

This invention relates to air conditioning systems and more particularly to cooling and dehumidifying systems.

The invention may be applied to dwelling houses or office or factory buildings and preferably utilizes the usual water supply to effect cooling and dehumidification, although this may be augmented or replaced if desired by refrigeration.

In nature precipitation of moisture from air is caused by temperature and pressure changes accompanied by atmospheric disturbance and once precipitation is started it encourages more precipitation.

According to the present invention these conditions are simulated in a single unit which will produce changes in temperature and pressure as well as disturbance of the air. The effect may be increased further by spraying water through the air to encourage precipitation of moisture therefrom.

A unit embodying the invention may include a centrifugal fan or blower to circulate the air and to effect pressure change and disturbance thereof. The blower is preferably encased in a spiral cooled casing so that the air will be subjected to centrifugal force during its entire movement through the casing and will be cooled thereby. Since water vapor and moist air are both heavier than dry air they will be thrown out against the cooled spiral surface to condense the moisture in the air. In order to increase the precipitation or condensation water may be sprayed out through the blower shaft into the stream of air. Such sprayed water as well as the condensate is collected on the spiral wall and removed through any suitable drain.

According to another feature of the invention a radiator unit may be provided in the blower inlet and connected to the jacketed wall portion of the blower to receive water or other heat transfer medium therefrom. Where water is employed the radiator unit is preferably connected to a discharge pipe terminating adjacent the roof of the building to spray water thereover.

Other objects, advantages and novel features of the invention including novel subcombinations and desirable particular constructions will be apparent from the following description of the embodiment illustrated in the accompanying drawings, in which:

Figure 1 is a diagrammatic view of a building provided with an air conditioning system embodying the invention;

Figure 2 is a central section of the air conditioning unit shown in Figure 1; and

Figure 3 is a section on the line III-III of Figure 2.

The building illustrated in Figure 1 includes side walls 4, a roof 6 and a floor 8 lying below the ground surface to form a basement. A plurality of horizontal floors 10 are provided to divide the building into a plurality of stories, the lower floor 10 forming a ceiling for the basement and separating the basement from the remainder of the building.

As shown, a hot air heating furnace 12 of a conventional type is provided in the basement and is connected to the various rooms of the building by means of a duct system indicated generally at 14. Air from the building returns to the basement through a series of registers 16, the lowermost of which may communicate directly with the basement space or with the furnace through a pipe 18, depending on the setting of dampers 20.

Air is cooled and circulated through the building by means of a novel centrifugal blower 22 driven by a motor 24 and having its outlet connected to the furnace 12 by a pipe 26. The blower inlet opens into the basement space and is preferably provided with a radiator unit 28 through which cooling medium is circulated to precool air entering the blower. When water is used as the cooling medium the radiator unit is preferably connected to a discharge pipe 30 which terminates adjacent the roof 6 to spray water thereover. If desired, the pipe 30 may be provided with a tap for connection to a sprinkler or the like as indicated at 32.

The blower and radiator unit are illustrated in detail in Figures 2 and 3, from which it will be seen that the blower is provided with a central shaft 34 driven by the motor 24 and carrying an impeller member 36 formed with a plurality of spaced generally radial blades. A spiral jacketed wall 38 surrounds the impeller member 36 and is shown as making two complete turns, although it could be formed to make more or less turns as desired. The wall 38 provides a tangential outlet 40 which is connected to the pipe 26 and an inlet cone 42 is provided connecting the blower inlet to the radiator unit 28. The radiator unit as shown includes a pair of spaced headers 44 connected by a plurality of tubes or the like 46, the upper header being connected to the discharge pipe 30.

A suitable cooling medium, preferably water from the usual supply source, is supplied through

a pipe 48 which is connected to the inner end of the spiral wall 38 and flows outwardly there-through to cool the wall and consequently the air circulated by the blower. Water from the outer end of the jacketed wall may be conducted by a pipe 50 to the lower header 44 from which it will flow through the pipes 46 and upper header 44 to the discharge pipe 30.

According to a further feature of the invention, the shaft 34 is drilled to provide a plurality of radial spray openings 52 to which water is supplied through a slip ring 54 connected to the pipe 48 by a branch pipe 56. Water sprayed out through the openings 52 passes through the air circulated by the blower to cool the air and to facilitate condensation of moisture carried thereby, this effect being increased by contact of the air with the cooled wall 38. The spray water and condensate will be thrown out against the wall 38 and will be collected between said wall and baffles 58 secured thereto. The water collected behind the baffles 58 is conducted away by drain pipes 60 opening into a trap 62 to prevent blowing of air through the drain pipes and from the trap is carried off by a suitable drain 64. The drain 64 is preferably connected to the inlet cone 42 by a pipe 66 so that any moisture condensed in the radiator unit will also be carried off.

The system as described takes in air from the basement, thereby taking advantage of the natural cooling effect of the basement, and subsequently cools and dehumidifies the air by passing it through the radiator unit and over the wall 38 and by spraying water therethrough from the openings 52. After being cooled the air is positively circulated through the building through the usual ducts provided for hot air heating, fresh air being added to the recirculated air in any desired manner.

In case it is desired to increase the humidity of the air the spray could be operated without circulating any cooling medium through the wall 38 or the radiator unit, or if desired a heating medium could be circulated therethrough.

While only one embodiment of the invention has been shown and described it will be understood that many changes might be made therein and it is not intended to limit the scope of the invention to the form shown or otherwise than by the terms of the appended claims.

What is claimed is:

1. An air conditioning system for a building having a basement and a system of ducts con-

necting the basement to points within the building comprising a centrifugal blower in the basement having an inlet opening communicating therewith, and an outlet opening communicating with said duct system, means for circulating water in heat transferring relationship to the blower walls, a radiator unit connected to receive water from said means and lying in the blower inlet, and a discharge pipe connected to said unit to spray water over the roof of the building.

2. An air conditioning system for a building having a basement, a duct system for conducting air from the basement to a point within the building and a return system for conducting air from the building to the basement comprising a centrifugal blower in the basement having an outlet connected to said duct system and an inlet arranged to receive air entering the basement through the return system, a portion of the walls of said blower being jacketed for circulation of water, means for spraying water through said blower, a radiator unit in the blower inlet connected to said jacketed portion to receive water therefrom, and a discharge pipe connected to said unit and terminating adjacent the roof of the building to discharge water thereon.

3. In an air conditioning system, a centrifugal blower having a spiral jacketed wall portion for circulation of a cooling liquid, a rotor in said casing to circulate air in contact with said wall portion, and a radiator unit in the blower inlet and connected to said jacketed portion to receive cooling liquid therefrom.

4. In an air conditioning system, a centrifugal blower having a rotary driving shaft and a jacketed wall portion for the circulation of a heat transfer medium, means for spraying water through said driving shaft and through air circulated by the blower, and a radiator unit in the blower inlet connected to said jacketed portion to receive heat transfer medium therefrom.

5. In an air conditioning system, a centrifugal blower having a rotary driving shaft and a spiral jacketed wall portion for the circulation of a heat transfer medium, means for spraying water through said driving shaft and through air circulated by the blower, means connected to said spiral wall portion to collect and remove from the blower said sprayed water and condensate from the air, and a radiator unit in the blower inlet connected to said jacketed portion to receive heat transfer medium therefrom.

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