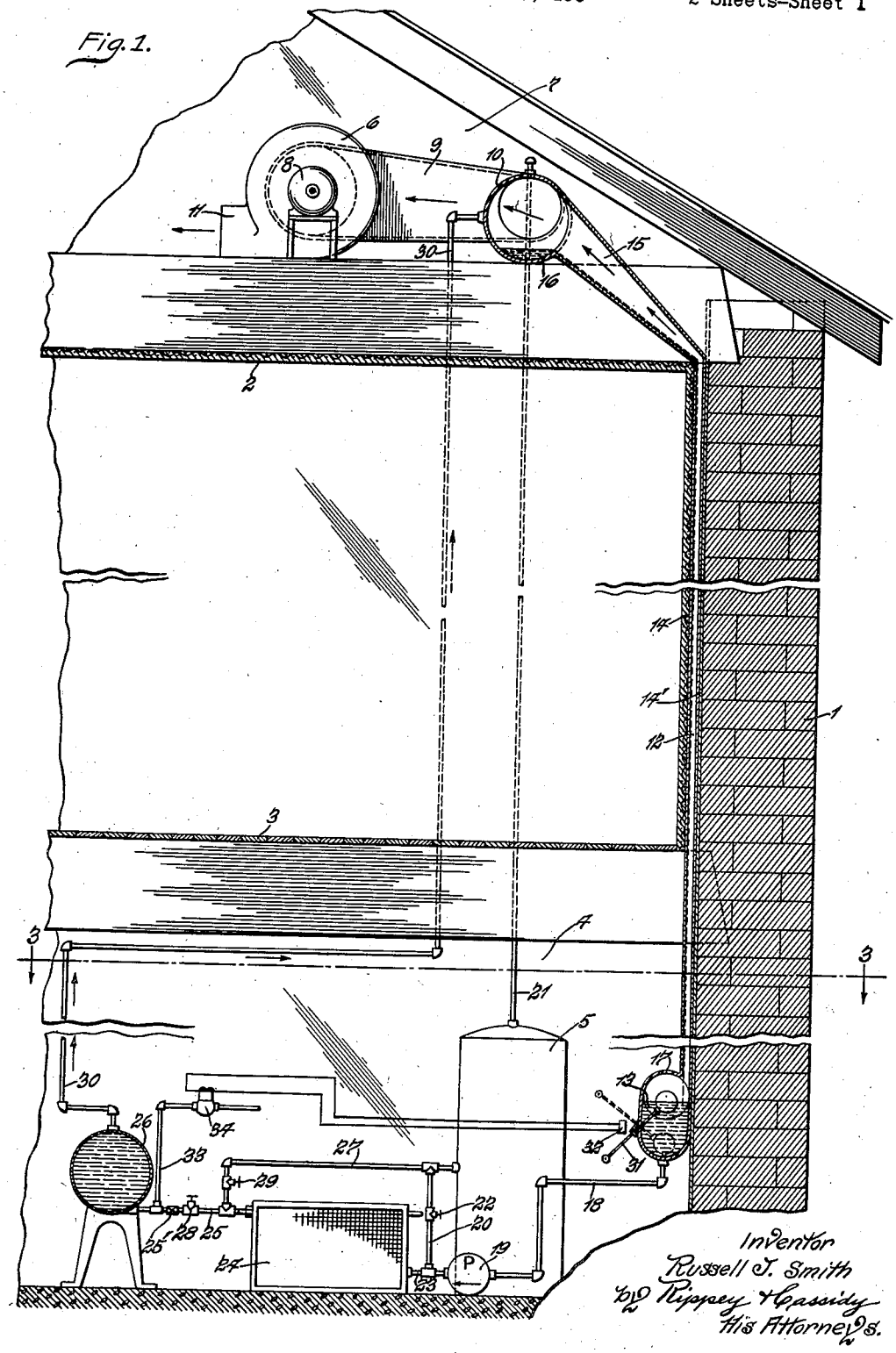
Jan. 23, 1940. R. J. SMITH 2,187,954

AIR CONDITIONER

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Fig. 1.



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Fig. 2.

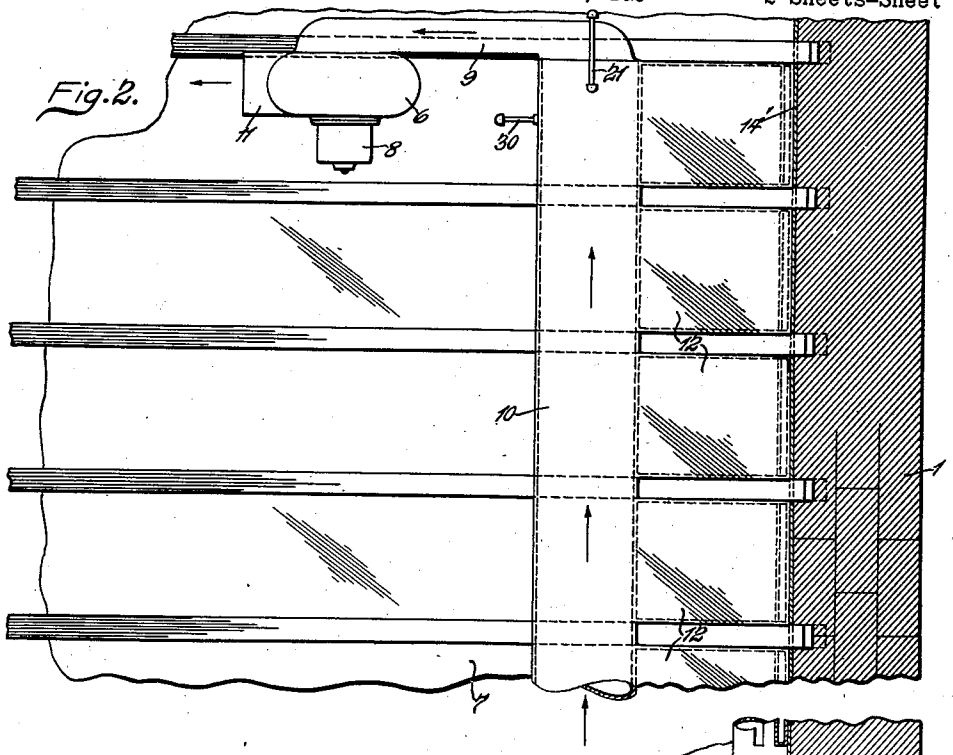
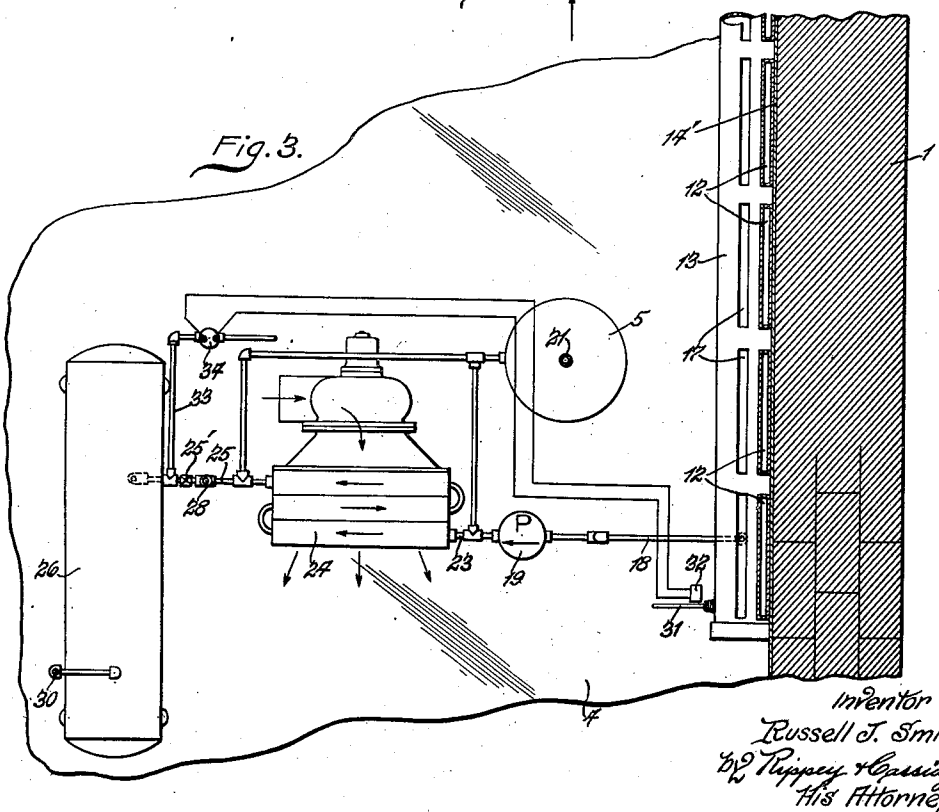


Fig. 3.



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AIR CONDITIONER

Russell J. Smith, Richmond Heights, Mo.

Application December 13, 1937, Serial No. 179,475

3 Claims. (Cl. 261—11)

This invention relates to air conditioners for use within residences and other buildings.

An object of the invention is to provide an improved device or system for conditioning or regulating the condition of air within buildings by controlling or regulating the temperature and humidity of the air within desirable limits.

Other objects and advantages of the invention will be apparent from the following description, reference being made to the annexed drawings, in which—

Fig. 1 is a view partly in section illustrating an embodiment of the invention within a building.

Fig. 2 is a plan view of a part of the invention showing the device for causing circulation of the air within and through the building.

Fig. 3 is a horizontal sectional view approximately on the line 3—3 of Fig. 1.

The embodiment of the invention shown is within a building having walls 1, a ceiling 2, a floor 3, and a room, space, or basement 4. A boiler or water heater 5 is located in the room, space, or basement 4.

A blower 6 is cooperatively included in the invention. As shown, the blower is mounted in a space, room, or attic 7, and is operated by a motor 8 to impel air through a passage 9 communicating with a manifold 10, and to expel the air through an outlet 11. The manifold 10 is connected by numerous passages 12 with a receptacle 13 located within the room, space, or basement 4. These passages 12 are concealed within the walls 1 by the inner wall surfaces 14 and are insulated from said walls by insulation 14'. Said passages 12 are relatively narrow and elongated, as should be understood by reference to Figs. 2 and 3, and the upper portions 15 of said passages flare or widen considerably toward the manifold 10 in a relationship in which the lower portion of the manifold 10 is below said passages, so that said manifold will receive and retain a quantity of water or other fluid 16 but will permit the fluid, as it rises in the manifold, to overflow into the widened portions 15 of the passages 12, and to pass downwardly along the walls of said passages into the receptacle 13. The receptacle 13 is provided in its upper side with slots or openings 17 through which air may enter said receptacle to be impelled upwardly through the passages 12 and into the manifold 10 and thence through the passage 9.

A pipe 18 has one end opening into the receptacle 13, and the opposite end opening into one side of a pump 19. A pipe 20 opens from the opposite side of the pump 19 and into the boiler 5, from which a pipe 21 forms a passage opening into the manifold 10. The pipe 20 is equipped with a valve 22 by which said pipe 20 may be opened and closed.

A branch pipe 23 opens from the pipe 20 into one end of a suitable heat exchanger 24 of known construction and adaptation. The pipe 23 is between the pump 19 and the valve 22 so that, even when the valve 22 is closed, the pump 19 may pump water into and through the heat exchanger 24 from which a pipe 25 forms a passage into the main water supply tank 26. The heat exchanger 24 functions to cool the water in warm weather. This tank 26 may be a source of supply of either well water or ice water, or other water or water cooled mechanically or otherwise. A branch pipe 27 opens into the pipe 20 between the valve 22 and the boiler 5, and also opens into the pipe 25 between the heat exchanger 24 and a valve 28 in said pipe 25, which is operative to open and close said pipe 25. The pipe 27 contains a valve 29 which may be opened and closed, and a check valve 25' in the pipe 25 prevents flow of fluid from the tank 26 toward the heat exchanger 24 and the pipe 27.

As shown (Fig. 1), the pipe 25 opens into the lower part of the tank 26. A pipe 30 opening into the upper part of the tank 26 constitutes a passage therefrom to the manifold 10 into which the upper end of said pipe 30 opens.

In warm weather, the valves 22 and 29 are kept closed and the valve 28 is kept open. The pump 19 will pump water or other fluid from the receptacle 13 through the pipe 18 and thence through the pipe 23 into and through the heat exchanger 24, and thence through the pipe 25 into the tank 26. From the tank 26 the water is forced through the pipe 30 into the manifold 10, from which portions of the water overflow into the widened parts 15 of the passages 12, and thence through said passages 12 into the receptacle 13. The blower 6 being in operation draws air through the openings 17 and thence through the passages 12, where the air is intimately contacted with the downflowing water, and thence through the widened parts 15 of said passages 12 into the manifold 10. The air movement above referred to, being at considerable velocity, causes agitation of the water surfaces, and evaporation of certain amounts of this water up to the maximum humidity capacity of the air. This evaporation process will extract its required heat of evaporation largely from the film of water flowing down through the passages 12, resulting in a definite lowering of the temperature of this water film. The tendency

will then be for this water film to extract heat from the wall surfaces 14, thus lowering the temperature of the adjacent rooms formed by these walls.

In cool weather, the valve 22 is kept open and the valves 28 and 29 are kept closed. Both the blower 6 and the pump 19, or either of them, will be started and stopped intermittently as desired, under control of the known thermostatic device. Operation of the pump will draw water from the receptacle 13 through the pipe 18 and discharge said water through the pipe 20 into the boiler 5, and thence through the pipe 21 into the manifold 16. The boiler will keep the water warm, and this warm water is intermittently discharged into the manifold 10 as desired. From the manifold 10 a portion of the warm water overflows into the passages 15, 12, and is thereby returned to the receptacle 13. Operation of the blower 6 draws air through the openings 17 into the receptacle 13 and thence through the passages 12, 15 into the manifold 10. During movement of the air through the passages 12, 15, the air is intimately contacted with the warm water flowing downwardly through said passages, and is thereby warmed and humidified before it enters the manifold 10. From the manifold 10, the blower 6 draws the warm air through the passage 9 and discharges said warm air through the outlet 11 leading to the desired points of distribution of humidified air within the living zone.

New water may be supplied to the tank 26 from a water system, well or other source of supply through a pipe 33 arranged to conduct water from such source of supply into the pipe 25 between the check valve 25' and the tank 26. Flow of water through the pipe 33 may be controlled by an electrically, mechanically or manually operated valve 34. If electrically or mechanically operated, said valve 34 may be opened and closed by the known float device 31 in the receptacle 13 arranged to operate a switch 32 controlling the supply of electrical energy to a control device 35 for said valve 34. This equipment is known and is only conventionally shown since the details thereof are not specifically claimed. A known humidostat device (not shown) may be used to operate the blower 6 in cool weather.

From the foregoing, it should be apparent that my invention is of a highly simplified nature, may be assembled at comparatively low cost, and is efficient in operation both in warm weather and in cool weather. The invention may be varied within equivalent limits without departure from the nature and principle thereof, as defined by the appended claims.

I claim:

1. An air conditioner comprising a manifold arranged to contain air and water, means forming a combined air inlet and water outlet passage for admitting air into and conducting water from said manifold, a water supply tank, a pipe for conducting water from said tank into said manifold and opening into said manifold substantially above the level of the water therein, a receptacle arranged to receive water from said passage and to admit air into said passage, a pump for receiving water from said receptacle and forcing said water into said tank and thence through said pipe into said manifold, means for admitting water to said tank from an exterior source of supply, and mechanism operated by the water in said receptacle controlling said last named admission of water into said tank.

2. An air conditioner comprising a manifold arranged to contain air and water, a water supply tank opening into said manifold for supplying water thereto, means forming a passage opening into said manifold substantially above the bottom thereof for admitting air into said manifold and conducting water therefrom, a receptacle for receiving water from said passage, a device for tempering the water, a pump receiving water from said receptacle and pumping said water into said manifold, means for admitting water to said tank from an exterior source of supply, and mechanism operated by the water in said receptacle controlling said last named admission of water into said tank.

3. An air conditioner comprising a manifold arranged to contain air and water, walls forming a passage that is oblong in cross section, being wide in one direction and narrow in the transverse direction, and opening into said manifold substantially above the bottom thereof for admitting air into said manifold and conducting water therefrom along one of said walls, a receptacle for receiving water flowing from said manifold through said passage along one of said walls and leaving said passage open for the movement of air therethrough into said manifold, means forming a passage for conducting water into said manifold, a pump arranged to receive water from said receptacle and to force said water through said last named passage into said manifold, a pipe for admitting water into said last named passage from a source of supply, and a device operated by the water in said receptacle controlling the admission of water from said source of supply into said last named passage.

RUSSELL J. SMITH.