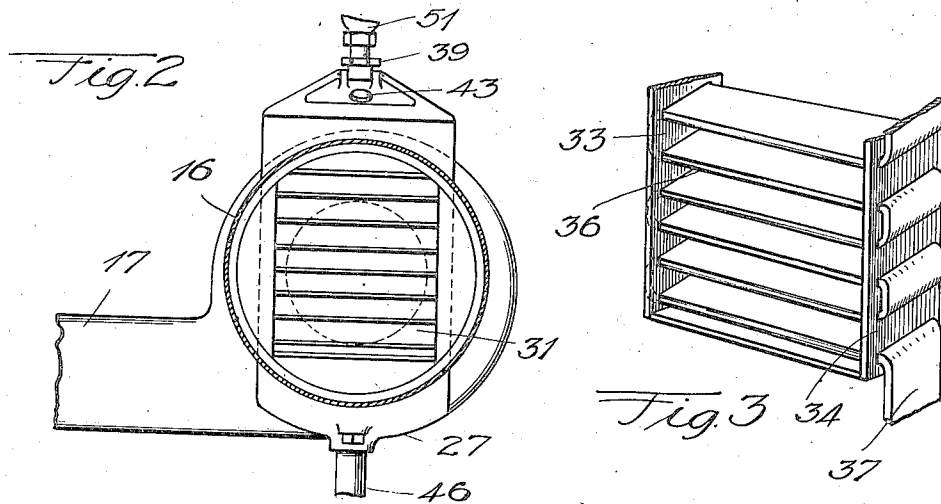
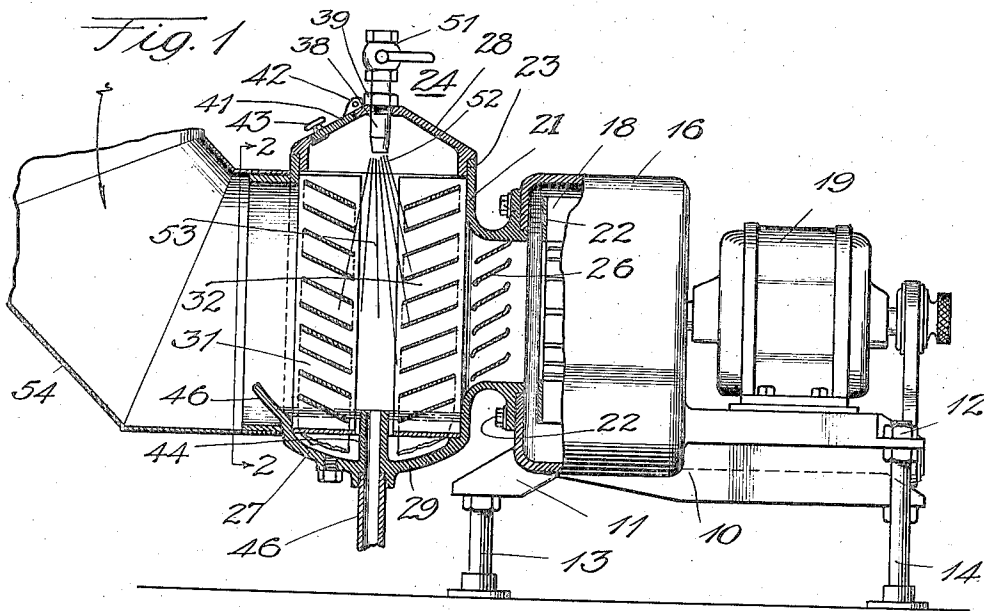


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A. THOUSAND
AIR CONDITIONING DEVICE

1,973,233

Filed July 28, 1933



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UNITED STATES PATENT OFFICE

1,973,233

AIR CONDITIONING DEVICE

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Application July 28, 1933, Serial No. 682,621

5 Claims. (Cl. 261-103)

My invention relates to air conditioning systems and has particular relation to a humidifying device for such systems.

It is well known in the heating art that if the air in the enclosure which is to be heated is well laden with moisture; i. e., is high in humidity, lower heater temperatures may be employed and heating of the enclosure to a temperature which feels comfortable to the occupants may be accomplished with less fuel and consequently at lower cost.

It is also generally accepted that air of a relatively high humidity is more desirable from the standpoint of health. It is well known too that moist air supplies the necessary moisture to prevent furniture and other articles from "drying out".

It is also desirable that the air which circulates through a house or the like should be washed to prevent the collection of soot and dirt on the walls and articles of furniture.

It has been proposed to provide a motor-driven blower and to wash the air before or after it passes through the blower. Such devices are usually complicated and expensive to install and operate.

It is accordingly a primary object of my invention to provide a new and novel humidifying means for air conditioning.

A more specific object of my invention is to provide a humidifying means which may be either attached to the blower unit of a burner, such as a fluid fuel burner, or which may be used as a separate unit.

Another object of my invention is to provide an air conditioning system of the above character which is simple and effective and which is inexpensive to build, install, operate and maintain.

Another object of my invention is to provide a device which not only humidifies the air of an enclosure but which also washes the air to remove soot and other impurities.

Another object of my invention is to provide a device of the above character which may be attached to fluid fuel burners which have already been installed.

Other and further features and objects of my invention will be more apparent to those skilled in the art upon a consideration of the accompanying drawing and following specification, wherein is disclosed an exemplary embodiment of the invention, with the understanding, however, that such changes may be made therein as fall

within the scope of the appended claims without departing from the spirit of the invention.

In said drawing:

Figure 1 is an end view partly in elevation and partly in section of a device constructed according to one embodiment of my invention.

Figure 2 is a view in side elevation of the device shown in Figure 1 and taken along the line 2-2 of Figure 1, and

Figure 3 is a view in perspective of one of the racks used for furnishing moisture to the air.

Referring to the drawing, there is shown at 10, generally, a rectangular base or base plate having lugs 11 and 12 thereon to which supporting standards 13 and 14 are attached for supporting the base with reference to the floor or other foundation upon which the air conditioning device is mounted.

A fan or blower housing 16, of the usual type used for centrifugal blowers, is mounted upon the base 10, and a blast conduit 17 extends forwardly from the blower housing to conduct air into a furnace. While the air is passing through the blast conduit it may be mixed, if desired, with atomized fluid fuel by means of any desired mixing device as described in my co-pending application filed July 28, 1933, Serial Number 682,622. We are not here concerned with the specific means by which fuel is mixed with the air and the device may be used purely as an air circulating means.

A blower fan 18 is rotatably mounted within the housing 16 and is adapted to be driven by means of the motor 19, which motor is mounted on the base plate 10, in accordance with the usual practice. Air drawn in through the air inlet and the humidifying device, hereinafter described, enters at the side of the blower, passes into the central portion of the fan, and is driven outwardly by the fan blades and discharged through the conduit 17.

A pipe-like bracket 21 is adapted to be bolted to the housing 16 by means of bolts 22 and is provided with an outwardly-flaring flange 23 to permit the humidifying unit, indicated generally at 24, to be fastened to the bracket. A plurality of vanes 26 are located in horizontally-extending, superposed relation within the bracket 21 and these vanes are preferably inclined upwardly toward the blower in order to separate out particles of dirt, soot, water and the like, from the air stream.

The humidifying unit 24 is comprised of a rectangular housing 27 with the upper wall 28 sloping upwardly toward the center of the hous-

ing and the lower wall 29 sloping downwardly toward the center of the housing.

A pair of racks 31 and 32 are provided and these racks are comprised of end pieces 33 and 34 joined by vanes 36. These vanes also slope from one side to the other and openings are provided in the end walls or end plates 33 and 34 in order that a continuous strip of absorbent material 37 may be laced back and forth through these openings in such a manner that the horizontal portions of the strip rest on the vanes 36. There are two racks of the above description and these racks are placed inside of the housing 27 in such a manner that the vanes of both racks slope downwardly toward the center of the housing.

A spray nozzle 38, that is, a nozzle with a fine discharge opening at its lower end, is threaded into the center of the top wall 28 and is locked thereto by means of a nut 39.

A cover plate 41 is provided at one side of the top wall 28 and the plate is hinged as indicated at 42 in order that it may be turned upwardly to permit inspection, cleaning, and adjustment of the nozzle 38. The cover plate is adapted to be fastened in place by means of the thumb latch 43.

The lower wall 29 is provided with an upwardly extending conduit 44 at its central portion and with a flange 46 at its outermost edge in order that water may be trapped inside the lower part of the housing. The conduit 44 projects upwardly sufficiently that the lower ends of the strips 37 are immersed in the water and since the strip 37 is of a porous material, water is conducted upwardly by the strips through capillary action even if water is not being discharged from the nozzle 38.

When the water level in the lower part of the housing 24 rises above the top of the conduit 44, it is discharged from the housing through the channel of the conduit 44 and through a discharge pipe 46 which may be so arranged and connected with other pipes as to carry the water away to a drain.

A valve 51 is provided in the pipe-line leading to the nozzle 38 and this valve is preferably adapted to be electro-magnetically operated in order that when the motor 19 is energized the valve 51 is opened to permit water to flow into the humidifier, but when the motor 19 is not energized the valve 51 is closed to stop the flow of water. The valve 51 is of any desired construction and need not be further considered in the present application. Of course, means may be provided for manually opening and closing the valve to flush the humidifying device to clean it.

It is apparent that there is no necessity of furnishing water in any great quantity to the humidifier unless the blower is being operated and consequently this valve and valve actuating mechanism is preferably employed.

In operation, when the motor 19 is energized the valve 51 is opened and a fine spray of water, as indicated at 52, is discharged from the nozzle 38 into the interior of the housing 24. This fine spray passes down through the central opening 53 between the racks and also strikes the porous strips 37 on the racks. The fan 18 is rotated by the motor 19 and draws air in through the inlet 54. The air passes over the plates or vanes 36 of the outermost rack, through the space 53, and over the plates 36 of the innermost rack. The air, in striking the vanes and passing through the fine mist of water, picks up a relatively

large volume of water vapor and thus its humidity is increased. It is usually considered that air has been "humidified" when it has had its humidity increased and the word is used in this sense throughout this specification. The humidified air passes over the vanes 26 and into the blower and is discharged from the blower into the conduit 17.

It is apparent that if this humidified air is mixed with atomized fluid fuel, a much better combustible mixture is provided than if dry air is used, and I may use my humidifying device for this purpose by placing a fluid fuel supply means in the conduit 17 and inserting the end of the conduit in a furnace.

If, on the other hand, the device is used solely as a humidifying agent for providing moisture, the conduit 17 is connected with the air circulating system of a furnace usually by connecting the conduit 17 with the hot air chamber of the furnace.

In my co-pending application, hereinbefore mentioned I have described a device and a system for dividing out some of the air in conduit 17 and conducting it to the air circulating system of a heating system.

It is apparent that with my humidifying system I can not only provide air of high humidity for more efficient combustion for a fluid fuel burner, but also may provide a forced circulation system and a humidifying device for raising the humidity of the air circulated in such a system.

Although I have described a specific embodiment of my invention, it is apparent that modifications may be made by those skilled in the art. Such modifications may be made without departing from the spirit and scope of my invention as set forth in the appended claims.

I claim as my invention:

1. In a humidifying device, a box-like housing, a spray nozzle in the upper wall of the housing, an over-flow conduit in the lower wall of the housing projecting above the lower wall thereof to cause water to collect in the lower part of the housing, a pair of racks, one on each side of the transverse central plane of the housing, and porous strips supported by the racks and having their lower ends disposed below the level of the upper end of the over-flow conduit so that the strips are moistened by the water from the nozzle and from the water which collects in the lower part of the housing.

2. In a humidifying device, a housing, a spray nozzle near the central portion of the housing, a pair of racks having horizontally extending vanes, one rack on each side of the space into which the spray nozzle discharges, porous material on the vanes, a discharge pipe in the bottom of the housing projecting into the space in which the spray nozzle discharges, and another set of vanes disposed to one side of the first-named pair of racks and having the vanes also sloping downwardly toward the center of the housing.

3. In a humidifying device, racks comprised of a pair of vertically extending end members and a plurality of horizontally extending sloping members connecting the end members, the end members having openings thereto just above the junction of the horizontally extending members and the end members, and a strip of porous material threaded through the end members and back and forth over the horizontally extending sloping members.

4. In a humidifying device, a plurality of parallel-disposed stacked supporting members and a

strip of porous material threaded back and forth over the supporting members with the strip extending the length of one supporting member passing from the end of the first supporting member to the same end of the next adjacent member, back along the adjacent member to the opposite end thereof, from this opposite end to the same end of the next adjacent member, back along this member and back and forth along the remaining members in the same manner.

5. In a humidifying device, a strip of porous material, and a plurality of superposed vanes with the porous strip threaded back and forth over the vanes in continuous relation whereby moisture deposited on the strip at any point will be carried to all of the vanes.

ADOLPH THOUSAND.

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10	85
15	90
20	95
25	100
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35	110
40	115
45	120
50	125
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60	135
65	140
70	145
75	150