

March 31, 1936.

R. P. WHITMER ET AL
AIR CONDITIONING APPARATUS

2,035,628

Filed Oct. 25, 1933

3 Sheets-Sheet 1

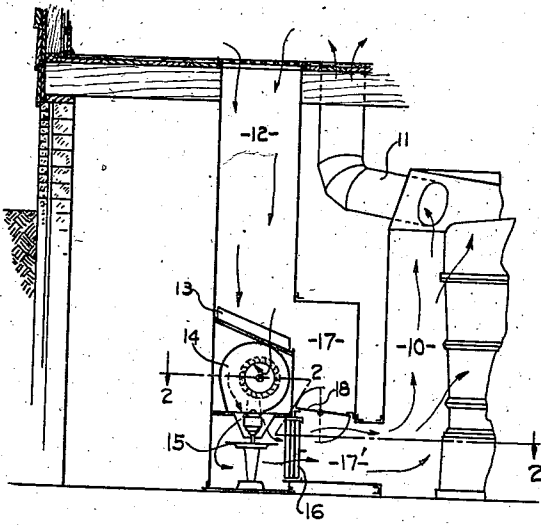


FIG. 1-

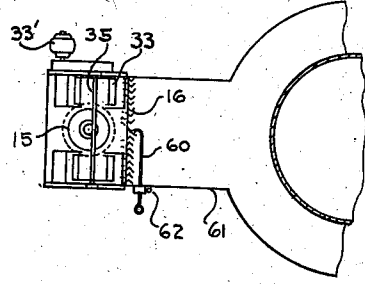


FIG. 2-

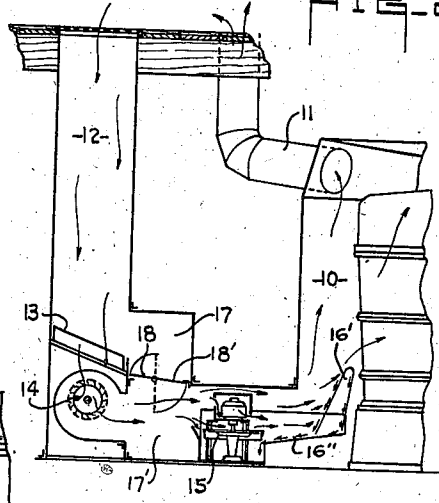


FIG. 3-

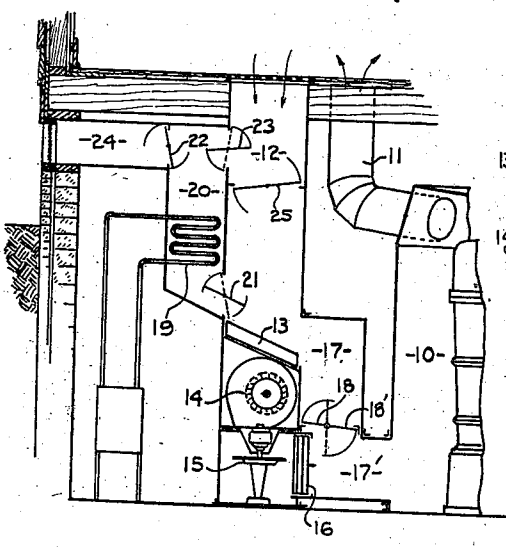


FIG. 4-

INVENTOR
Robert P. Whitmer
William G. Macy
PER Jeff & Jeff
ATTYS.

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3 Sheets-Sheet 2

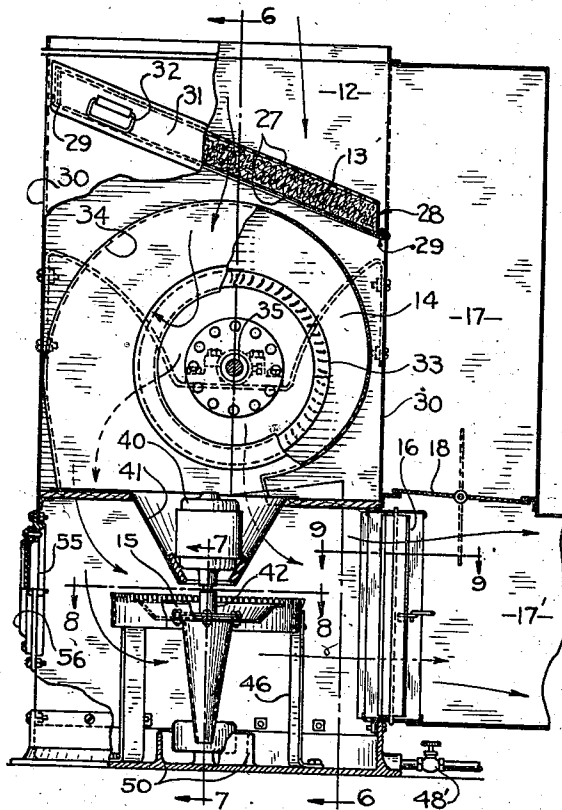


FIG. 5-

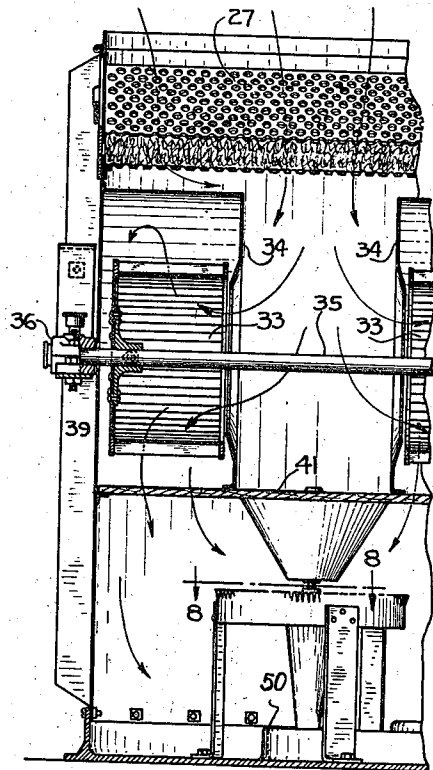


FIG. 6-

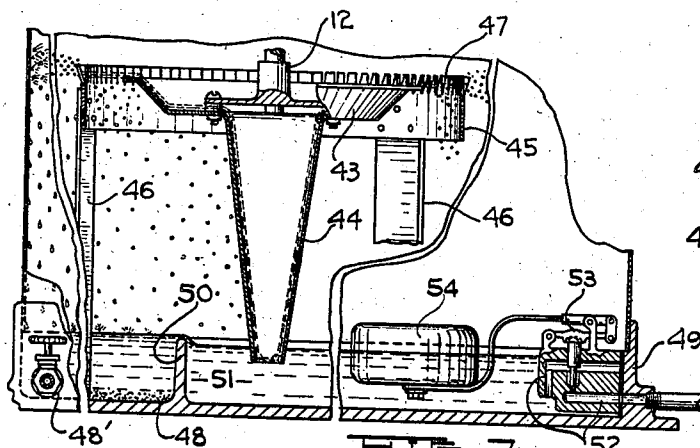


FIG. 7-

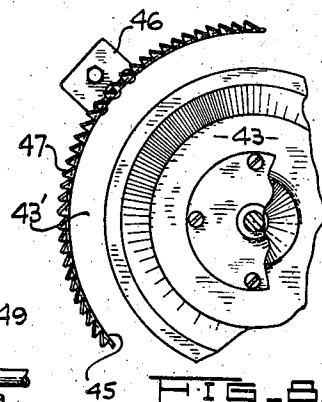


FIG. 8-

INVENTORS
Robert P. Whitmer
William J. Macey
Left & Left
ATTY'S.

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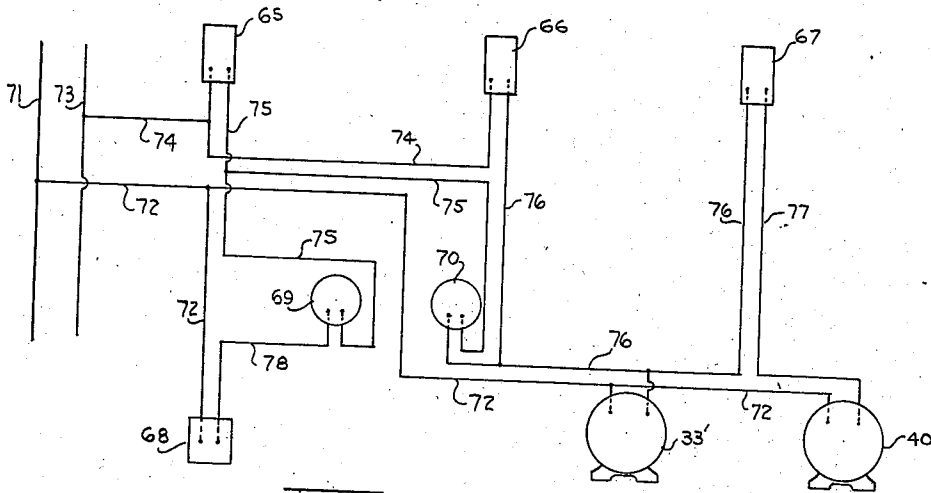


FIG. 11-

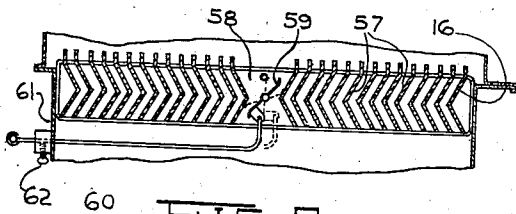


FIG. 9-

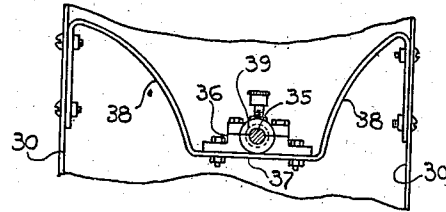


FIG. 12-

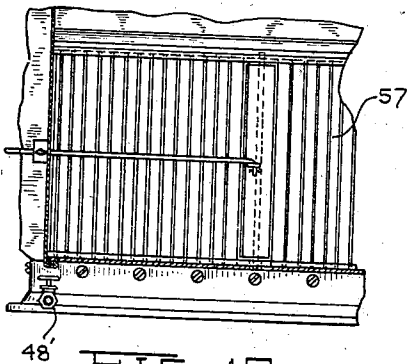


FIG. 10-

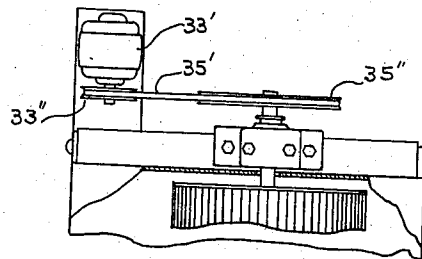


FIG. 13-

INVENTOR
Robert P. Whitmer
William H. Macy
PER
Leff & Leff
ATTY'S

UNITED STATES PATENT OFFICE

2,035,628

AIR CONDITIONING APPARATUS

Robert P. Whitmer and William G. Macy,
Bloomington, Ill.

Application October 25, 1933, Serial No. 695,104

7 Claims. (Cl. 261—91)

This invention relates to air conditioning apparatus and more particularly to that type usually associated with heating apparatus.

The invention has for one of its objects the provision of air conditioning devices adapted to be used in connection with heating apparatus.

A further object is to provide means whereby air is circulated through a heating device and portions of a building heated thereby.

A still further object is to provide means for filtering and washing the circulated air to render the same clean and wholesome.

Another object is to provide means whereby moisture is supplied to the air in a controlled manner to the end that healthful conditions of humidity are maintained.

Still another object is to provide means whereby the air is circulated, filtered, washed and humidified by mechanism which is automatically controlled.

Yet another object lies in means for circulating air over a heated surface and into a building by means of air forcing mechanism, combined with means for circulating the air by gravity when the air forcing mechanism is not in use.

An additional object is to provide means whereby air circulated and filtered by the apparatus may be cooled and circulated through a building.

A further additional object is to provide an apparatus of the class described in combination with control means whereby the several elements of the system are automatically controlled to circulate in a dwelling or the like, air which has been properly cleaned, heated and humidified.

Other objects will appear in the following description and accompanying drawings in which—

Fig. 1 is a side elevational, sectional view of the air circulating system with associated mechanism and ducts;

Fig. 2 is a detail view taken from line 2—2 in Fig. 1, showing parts to be referred to;

Fig. 3 is a view showing approximately the same mechanism as Fig. 1, with cooling elements and draft control means to be referred to;

Fig. 4 is a view showing a variation in arrangement of elements shown in Fig. 1, which will be described;

Fig. 5 is a side elevational view showing details of the assembly to be described;

Fig. 6 is an end elevational fragmented view taken from line 6—6 in Fig. 5;

Fig. 7 is a sectional elevational view of washer mechanism taken from line 7—7 in Fig. 5;

Fig. 8 is a fragmented plan view of washer mechanism taken from line 8—8 in Fig. 6;

Fig. 9 is a sectional plan view of baffle mechanism to be described, taken from line 9—9 in Fig. 5;

Fig. 10 is a fragmented elevational view of the same;

Fig. 11 is a diagrammatic view showing electrical control circuits to be described;

Fig. 12 is a view showing details of blower bearing support to be described; and

Fig. 13 is a view showing details of motor drive arrangement to be referred to.

Fig. 1 discloses our air conditioning apparatus as generally comprising a system of ducts which include the heating chamber of a warm air furnace or other heating device such as 10, an outlet duct 11 and a return duct 12. Arrows indicate the direction of air flow therethrough.

Disposed within the duct system as disclosed in Fig. 1, is a filter 13, a blower 14, a centrifugal spray atomizer 15, and a special baffle device 16. Also included in the duct system is a by-pass duct 17 and an associated gate 18 leading to a lower duct 17'.

The rotor of the blower is driven by a motor 33' customarily secured to the floor adjacent the blower housing and having driving connection comprising pulleys 33'' and 35'' and belt 35' substantially as disclosed in Fig. 13.

The spray atomizer mechanism is driven by a motor 40 as will be later explained.

Fig. 3 discloses an arrangement generally similar to that shown in Fig. 1 with the addition of a heat absorbing element 19 which will not be described herein further than to say that it may be of any suitable type.

The element 19 is disposed within a duct 20, the lower portion of which leads through a gate 21 into duct 12 and the upper end of which leads through gates 22 and 23 into ducts 24 and 12 respectively. Duct 24 leads to the outside of the building. A gate 25 is disposed within duct 12. The function of the parts noted will be explained later.

Fig. 4 shows a variation in arrangement of parts and structure noted in Fig. 1, in which the spray mechanism 15 and a special baffle 16' are disposed adjacent the bottom of chamber 10 and connected by duct 17' to the housing of blower 14, which latter is seen disposed adjacent the floor of the building. In this arrangement the baffle means comprises a deflecting trough member 16'' extending from the spray mechanism housing to a point within duct 10 adjacent the heating surfaces of the furnace. Secured to the outer extremity of the trough is a screen mem-

ber or baffle 16' extending outwardly therefrom a suitable distance adjacent the heating surfaces substantially as shown. The baffle is composed of screen or perforated material and is adapted to permit incoming air to circulate there-
 5 through to a certain extent while at the same time acting as a deflector whereby the main stream of air projected into chamber 10 is deflected upwardly as indicated by the large arrows. The function of baffles 16 and 16' will be explained later.

Arrows indicate the flow of air through the system which is obviously similar to that shown in Fig. 1, with the exception that air flowing through the spray mechanism 15 passes there-
 15 through in a substantially horizontal line, whereas in the arrangement shown in Fig. 1, it passes into the spray mechanism in a vertical line. Further, when air is routed to flow through ducts 12, 17 and gate 18 by gravity, as noted in connection with Fig. 1, it, in the Fig. 4 arrangement, also passes the spray mechanism 15 and baffle 16', whereas in the Fig. 1 arrangement the latter are by-passed. During such passage of
 20 air the spray mechanism may or may not be active.

It will be quite apparent that an outside duct such as 24 in Fig. 3, together with gates such as 23 and 25, may be applied to the arrangement
 30 shown in Figs. 1 and 4.

The simpler form of duct and gate arrangement is shown in Fig. 1, wherein with blower 14 running and gate 18 closed, air may be drawn into duct 12, through filter 13 and forced through
 35 spray mechanism 15, baffles 16, through chamber 10 and into the area to be heated through duct 11. With blower 14 stationary and gate 18 open, as indicated by dotted lines, air may flow by gravity downwardly through ducts 12, 17, and
 40 17', thence through chamber 10 and duct 11 as already noted.

The arrangement shown in Fig. 3 provides detail control of the several ducts wherein gate 21 may be closed to prevent circulation through
 45 duct 20 and cooling element 19 and gate 25 opened, whereupon gates 22 and 23 may be set to admit any desired proportion of outside air to mix with that returning through duct 12, or gates 22 and 23 may be closed with gate 25 opened whereby the circulation will be the same as with
 50 the arrangement of Fig. 1.

With gates 21 open, gates 22 and 25 closed and gate 23 open, all of the air returning through duct 12 may be routed through the cooling element 19. With suitable adjustment of gates 25 and 21 and gate 23 open, a given portion of the return air may be routed through the cooling
 55 element while the remaining portion passes directly to the blower through duct 12. Admixture of outside air may obviously be accomplished by suitable adjustment of gate 22 relative to the other gates. It is apparent that many combinations are available to suit conditions of practical use.

Referring to Figs. 5 and 6, it will be noted that filter 13 comprises a frame including perforated plates 27 spaced apart by comparatively narrow side members 28, the whole secured into a unit having an open area which is filled with
 70 suitable filtering material such as steel wool felt. The filter is so dimensioned as to substantially cover the open area of the upper portion of blower housing 30 and is slidably mounted therein in an angular relation by means of supporting strips 29 secured to the housing walls 30. The filter

frame is provided with a front plate 31 carrying handles 32. A suitably formed slot in housing 30 provides a means whereby the filter is conveniently placed in or removed from the housing for cleaning. When the filter is in the housing,
 5 the front plate 31 becomes an effective cover for the slot.

Below the filter is disposed the blower 14 preferably of the multi-vane type comprising one, or two, rotors 33 disposed centrally or at either
 10 side of housing 30 and surrounded by sub-housings 34 which are secured within housing 30.

Rotors 33 are secured to a shaft 35 which is supported at either end by bearings 36.

Bearings 36 are supported in a resilient manner by means of spring strips fashioned into a
 15 cradle-like form, as shown in Fig. 12, having a central flat portion 37 and upwardly and outwardly extending curved portions 38 terminating in suitably fashioned ends adapted to be attached to the frame portions of housing 30 substantially
 20 as shown. By this means the weight of the revolving element of the blower is resiliently supported directly upon the framework of the blower housing.

The openings 39 where shaft 35 passes through the housing walls are purposely proportioned to provide clearance about the shaft and by this means the shaft, supported by the resiliently
 25 mounted bearings is free to gyrate about its true center without contact with the housing walls whereby vibration and noise in the structure is avoided.

For illustration, the blower mechanism is shown in Fig. 6 as comprising dual rotors mounted upon
 35 the shaft 35, with arrows indicating a flow of air into the central portion of the rotors and outwardly through the bottom of the housings 34. Obviously, other arrangements of rotors are capable of producing a similar result and we there-
 40 fore do not wish to be limited to the particular arrangement shown.

Disposed below the blower and adapted to receive air therefrom is a chamber containing the centrifugal spray mechanism generally design-
 45 ated 15. This mechanism comprises a motor 40, securely mounted in a depressed portion of a horizontal housing partition 41 and having its shaft extending downwardly to securely support a flanged hub member 42.

To the flanged portion of hub 42 is secured, in a spaced manner, Fig. 7, a dished disk member 43 having its peripheral portion raised somewhat above the central area and the central portion
 50 fashioned, as at 44, to form a hollow cone with its smaller end extending downwardly to a point near the floor of the housing.

Surrounding disk 43 and spaced somewhat therefrom, as at 43', Fig. 8, is a ring member 45 supported from the floor of the housing by legs
 60 46. The upper edge of ring 45, in plane with the periphery of disk 43, is fashioned into a series of upstanding angularly disposed vanes 47, the function of which will be explained shortly.

Fig. 7 illustrates that the floor of the housing comprises a pan 48 having upstanding walls 49 thereabout to adapt the pan to contain water. A waste cock 48' provides controlled drainage
 65 from the pan.

As indicated in Figs. 6 and 7, an upstanding partition 50 extends from the right hand wall 49, Fig. 7, to a point somewhat beyond the center of the pan and return to form an elongated separate basin 51 within the pan.

Through the right hand wall 49, Fig. 7, there 75

extends a duct 52, controlled by a conventional valve mechanism 53, which latter is controlled by a float 54. The function of this mechanism is obviously to maintain the water level in basin 51 at a predetermined height.

Fig. 5 indicates that the chamber of spray mechanism 15 has an opening 55 in its left hand wall, giving access to the interior of the chamber, the opening being provided with a suitable cover 56, as shown.

The right hand side of the chamber opens into duct 17' and in this opening is disposed the baffle mechanism 16.

As indicated in Figs. 9 and 10, this baffle mechanism comprises a series of vertically disposed angulated plates 57 spaced apart in parallel manner and arranged in plural groups. Fig. 9 indicates that the plates are so formed and disposed relative to each other that air passing between them must follow a tortuous course whereby contact of all portions of the air with the surface of the plates is promoted.

In the central portion of the baffle mechanism, between the groups noted, is an open area 58 within which is disposed a pivotally mounted gate member 59. A connecting rod 60, pivotally connected with member 59 leads to the exterior of the casing wall 61 whereby the gate may be manipulated to open or close the area 58 as desired. A clamping screw 62 is adapted to lock the rod in any adjusted position.

The gates 22, 23, 21, and 25 have already been noted. They are herein shown in a diagrammatic manner. Since they are of conventional form and their function and operation are obvious, they will not be described further than to say that they are manually operable to control the flow of air through associated ducts.

Gate 18, also, shown diagrammatically, is pivotally mounted between ducts 17 and 17'. The pivots upon which the gate operates are disposed off center of the gate member as indicated in Figs. 1 and 3, by reason of which one side of the gate, designated 18', is longer and somewhat heavier than the other. By reason of this unbalanced condition, the gate tends to remain in the vertical position shown in dotted lines. As already noted, when the gate is open, an open passage is provided through ducts 12, 17, 17', 10, and 11, whereby air circulated by gravity may move freely through the system.

When the air is being circulated by blower 14, it is desired that gate 18 be closed to prevent circulation through duct 17, therefore when the blower is running, the gate is adapted to be automatically closed and retained in closed position by the following means.

With the gate open, when the blower is started, air is forced through baffle 16, where it impinges the longer portion 18' of the gate, forcing it to swing upwardly toward a horizontal, or closed, position. Operation of the blower creates a slight negative pressure within ducts 12 and 17 which co-operates with the plus pressure in duct 17' to finally close and hold the gate in horizontal position until such time as blower operation is discontinued, when the gate will again swing to open position. In this manner flow of air by blower through filter, spray and baffle system or by gravity through duct 17 is automatically provided for.

Operation of the filter is thought obvious. The blower is obviously driven by motor 33' through belt 35' over pulleys 33'' and 35'' as best shown in Fig. 13.

Operation of the centrifugal spray mechanism may be explained as follows:

The float 54 and valve mechanism 53 are adapted to control the flow of water from an outside source through duct 52 to maintain the water level in basin 51 somewhat below the partition 50 but sufficiently high to cover the lower edge of cone 44 as shown in Fig. 7.

Motor 40 is adapted to rotate disk 43 together with cone 44 at a relatively high speed whereupon water from basin 51 is centrifugally elevated adjacent the inner wall of the cone and caused to flow through the opening between the disk and flange of hub 42, outwardly across disk 43 to be violently projected across the space 43' into contact with the deflecting vanes 47 of ring 45. The result of the action described is rapid and thorough disintegration of water whereby a fine mist is produced within the chamber and a substantially continuous sheet or screen of finely divided water, extending over all of the open area between the periphery of disk 43 and the walls of the chamber is maintained.

It will be clear that air projected from the blower into the spray chamber cannot pass therethrough without intimate contact with the water screen, whereby any dust or other extraneous matter escaping through filter 13 is dissolved or entrained with the water and removed from the air.

The non-vaporized water projected from disk 43 finds its way to the pan 48 where it accumulates until its level rises above the basin partition 50 when it overflows into the basin. Since the area of pan 48 is substantially large and movement of water into and out of it is comparatively slow the pan becomes, in effect, a settling pond where entrained dirt settles to the bottom.

By means of the above described process, water may continuously be drawn from basin 51, sprayed by disk 43, returned to pan 48, settled and the clean portion thereof returned to basin 51 for recirculation.

By means of the settling process, the water is continuously cleaned and clean water exclusively is permitted to enter basin 51 and spray system.

The co-operative action of disk 43 and deflecting vanes 47 to produce a vaporous atomization of water has already been noted. With this in mind, it will be clear that the spray mechanism has a double function, to provide an air washing screen of water and to reduce a portion of the sprayed water to a substantially vaporous state, whereby it is readily dissolved in the air. Thus air passing through the spray chamber is thoroughly washed and humidified.

Due to the fact that a certain amount of water is continuously dissolved and carried out of the chamber by the air, a replenishing supply is necessary and this is provided through duct 52, as already noted. It is to be noted that fresh water supplied through duct 52 is not permitted to mix with processed water in pan 48 except as a result of overflow noted. By means of waste cock 48 processed water may be drained off as desired and by this means recirculation of processed water and the relative proportion of fresh water used may be controlled.

As already noted, the baffle mechanism 15 is so disposed that air passing through the spray chamber must pass through the baffle.

Air passing the water spray at relatively high

velocity will normally entrain a certain amount of undissolved water in the form of more or less finely divided particles, and this water laden air in passing through the tortuous passages between the baffle plates is forced to impinge the plates, whereby the water particles are forced into contact with the plates to collect thereon and drain back to the pan 48. Thus excess water is separated from the air.

In practical operation of heating devices of the class described, atmospheric conditions are sometimes such that the amount of water normally dissolved in the air as it passes through the spray chamber is not such as to maintain the desired humidity condition in the area being heated. In such a case it is necessary to promote vaporization of additional water in the air and for this purpose the gate 59 is provided.

It will be noted that with gate 59 closed as shown in dotted outline in Fig. 9, all of the air passing the baffle will be forced to contact with plates 57 and by this means substantially all of the entrained, undissolved water will be separated.

Obviously, with the gate open, a certain amount of non-separated air and water mixture will be admitted to the heating duct 10. Upon contact with the heating surfaces of duct 10, or the hot air therein, the undissolved particles of water will be vaporized, whereupon solution will quickly take place. By this means humidification, beyond the range normally provided by simple circulation of air in the presence of the water spray, may be accomplished.

By means of adjustment of the gate, the amount of moisture, beyond the normal amount as above noted, may be controlled.

Referring particularly to the arrangement shown in Fig. 4, we find the baffle 16 replaced by the trough 16' and screen 16' whereby the air stream, carrying entrained water as described, impinges the screen 16' and is thereby deflected upwardly to substantially follow the line of large arrows. Contact between the air and screen 16' obviously brings about separation of the less subdivided water from the air, which water drains downwardly over the surface of the screen to trough 16' and is thereby conducted to the spray mechanism as already noted.

The finely divided water remaining with the air stream, upon coming into the presence of the heated surfaces in duct 10, is thus quickly and completely vaporized, the action being similar to that described in connection with baffle 16.

The foregoing has described the structure and function of the several elements of our air conditioning apparatus.

For conditions of practical use, it is necessary that means for automatically controlling the several elements be included in order that their operation may be properly co-ordinated to bring about the result for which the apparatus is intended.

Our invention therefore includes control means as follows:

Fig. 11 diagrammatically discloses the control elements and associated circuits wherein 65 designates a room thermostat, sensitive to temperature and disposed in the area to be heated, 66 a manual switch disposed in any convenient location, 67 a humidistat sensitive to moisture conditions and disposed in the area heated, 68 a draft or other control apparatus associated with the heating element, 69 a high limit control switch sensitive to temperature within the heat-

ing element and disposed adjacent thereto and 70 a control switch sensitive to temperatures within the heating ducts and also disposed adjacent thereto. 33' and 40 respectively designate the blower and spray atomizer motors already noted. Since the above mentioned devices are of conventional form and manufacture, they will not be described in detail.

The control devices designated 68 and 69 do not form a necessary part of our invention and will therefore not be described further than to say that the switch 69 is operable to automatically operate the drafts or other controls of a furnace in such a manner that the heat of the furnace shall not progress above or below predetermined limits, thus assuring maintenance of suitable minimum heat and at the same time providing against danger from overheating.

The remaining devices are connected to control the blower and spray atomizer motors as will be explained.

Before proceeding further, it may be noted that control switch 70 is sensitive to temperatures within the furnace casing, as already noted and is adapted to control associated circuits in such a manner that the circuits are thrown out of action when the furnace temperature is below a predetermined point and to maintain the circuits active when the temperature is above a predetermined low point. Its function in co-operation with the several circuits will be explained in more detail later.

Line 72 forms a return line leading from motors 33' and 40 and control device 68 to the supply line 71.

Supply line 73 has connection through line 74 with thermostat 65 and manual switch 66. The opposite terminal of thermostat 65 has connection through line 75 with limit switches 69 and 70. The opposite terminal of manual switch 66 has connection, through line 76, with motor 33'. The opposite terminal of humidistat 67 connects through line 77 to motor 40. Line 78 connects switch 69 with control 68.

For the purpose of illustration, it is assumed that switch 69 is set to operate the heat control member 68 to build up the fire when the temperature in the furnace reaches a low limit of 175° and to reverse the action, to dampen the fire, when the temperature reaches a high limit of 200°, also that switch 70 is set to open the circuit of lines 75—76 when the furnace temperature is below 90°, to retain it open until the temperature reaches 150°, thereupon to close the circuit and retain it closed at any higher temperature and through descending progress until the temperature again reaches 90°, and repeat.

We may now assume that the furnace fire is in dormant or "stand-by" condition with furnace temperature at, for example, 150°. If, now, the room temperature falls below the predetermined minimum, for example, 70°, thermostat 65 will close the circuit 74—75 to cut in switches 69 and 70, whereupon switch 69, since the furnace temperature is below 175°, will close circuit 72—78 to actuate control 68 to build up the fire, while switch 70, since the furnace temperature is above 90°, will transmit current to motor 33' to operate the blower and thus set up operation of the air circulating system already described.

While the system is in operation, that is, while the room temperature remains below 70° and thermostat 65 remains closed, if it should so hap-

pen that the fire did not maintain the furnace temperature at sufficient height to heat the circulated air above 90°, switch 70 will open and break the blower motor circuit 75-76. The switch will remain in this position until the fire has built up sufficiently to raise the temperature above 150°, whereupon the motor will resume operation. During this time switch 69 has operated independently to control the fire as already explained. In this manner the blower is prevented from circulating other than properly heated air in the building.

It has been noted that line 76 not only connects with motor 33' but also with humidistat 67 which is effective to connect lines 76 and 77 and thus transmit current to motor 40 to operate the spray mechanism as already explained.

Obviously, since the circuit of line 76 includes thermostat 65 and switch 70, humidistat 67 is not effective to place motor 40 in operation unless current is being delivered to motor 33'. Thus the spray mechanism cannot operate unless the blower is in operation. As will be apparent, when the blower is in operation, the spray mechanism is independently operable as controlled by humidistat 67.

It is assumed that the humidistat is disposed adjacent the thermostat and that air moved by the blower circulates in contact with the humidistat as well as the thermostat.

Assuming the blower to be in operation as already noted if the air contains moisture below, for example, 45 per cent, the humidistat will close circuit 76-77 to start the spray mechanism with the result already explained. When the humidity reaches a predetermined point the humidistat opens the circuit to discontinue operation of the spray. Thus humidification is controlled independently of the heating means but dependently upon the operation thereof.

During periods when sufficient humidification can only be provided by opening gate 59, as already explained, humidistat 67 remains effective to control the moisture content of the air in the usual manner. By this means the opening 58 becomes a means for making up a deficiency in moisture, while at the same time being incapable of bringing about an excess thereof.

Manual switch 66 is provided for convenience when it is desired to operate the blower without reference to the automatic control apparatus.

The foregoing will illustrate the means by which our air conditioning system automatically provides properly cleaned, heated and humidified air for dwellings and the like.

What we claim is:

1. An air conditioning apparatus having in combination a heater, a blower, a centrifugal spray mechanism, separate driving means for the blower and spray mechanism, automatic control means for the blower drive means and automatic control means for the spray mechanism drive means, the first mentioned control means being effective to control operation of the second named drive means and automatic switch means adapted to control the first and second named drive means.

2. An air conditioning apparatus including a heater, a blower, a water spray mechanism embodying rotating and co-operative stationary water disintegrating elements, a baffle mechanism embodying movable and stationary water collecting elements, and a duct system adapted to conduct air through the aforementioned mechanisms.

3. An air conditioning apparatus including a

heater, a blower, a spray mechanism embodying rotating and co-operative stationary water disintegrating elements, separate drive means for the blower and spray mechanisms, separate automatic control means for said drive means, baffle mechanism embodying stationary and movable water collecting elements and a duct system connecting the aforementioned mechanisms and adapted to conduct air therethrough.

4. An air conditioning apparatus having in combination a heater, a blower, a spray mechanism, a baffle mechanism having stationary water collecting elements and a movable gate mechanism, a duct system connecting and adapted to conduct air driven by the blower successively through the blower, the spray mechanism, the baffle and heater, the spray mechanism adapted to spray and disintegrate water in the presence of the air whereby extraneous matter in the air is entrained in the water and a portion of the water is dissolved and/or entrained in the air to humidify the same within the range of natural evaporation, the baffle mechanism being adapted when said gate is closed, to separate substantially all of the undissolved water from the air, the gate adapted, when open, to permit passage through the baffle mechanism of a predetermined amount of undissolved entrained water into the heater, whereby the water will be vaporized and readily dissolved in the air, to the end that the air may be humidified in a controlled manner, beyond the range provided by natural evaporation in the spray mechanism, and means for separating entrained dirt from the sprayed water.

5. An air conditioning apparatus including a blower, a spray mechanism, a baffle mechanism, a heater, a filter, a by-pass mechanism and a duct system including a return duct adapted to conduct air through the several mechanisms, separate drive means for the blower and spray mechanism, separate automatic control means therefor, the blower and by-pass mechanisms adapted to act co-operatively in such a manner that when the blower is running air is circulated successively through the spray mechanism, baffle mechanisms, heater, return duct, filter and blower and when the blower is stationary air is circulated by gravity successively through the by-pass, heater and return duct.

6. An air conditioning apparatus including a housing, a return duct in the upper end thereof, a side duct secured thereto and communicating with said return duct, a removable filter disposed in the upper portion of the housing in an angular relation therewith, a blower disposed below the filter having its cover portion secured to one side of the housing, separate drive means therefor, a lateral partition in said housing forming a lower chamber therein, the exhaust opening of said blower cover communicating with said lower chamber, a spray mechanism disposed in the lower chamber, the same having moving and co-operative stationary water disintegrating elements, separate driving means therefor, a baffle mechanism having moving and co-operative stationary water collecting elements, the baffle mechanism disposed in one side of said lower chamber and forming a baffled passage therefrom and an exhaust duct disposed externally of the baffle, the aforementioned side duct adapted to conduct air from a point in the return duct outside of said filter to said exhaust duct having automatic gate means disposed therein, the above described mechanisms adapted to operate in such a manner that air may be forced successively

through the return duct and side duct to the exhaust duct, the said automatic gate means adapted, when air is being forced in the first mentioned manner, to remain closed to close the side duct and when flowing in the second mentioned manner to remain open to permit such flow.

7. An air conditioning apparatus including a blower, a filter, a cooling element, a duct system including an intake adapted to receive air from the interior of a building, an intake adapted to receive air from the exterior of the building and an exhaust duct adapted to conduct air into the building, gate mechanisms associated with said ducts adapted to be adjusted in such a man-

ner that air may be forced by the blower successively through the exhaust duct, the first named intake, the filter and blower, or through the second named intake successively through the cooling element, filter, blower and exhaust duct, or successively through the first named intake, the cooling element, filter, blower and exhaust duct or in predetermined proportion through the first and second named intakes and in predetermined proportions successively through the filter, blower and exhaust duct and/or successively through the cooling element, filter, blower and exhaust duct.

ROBERT P. WHITMER.
WILLIAM G. MACY.