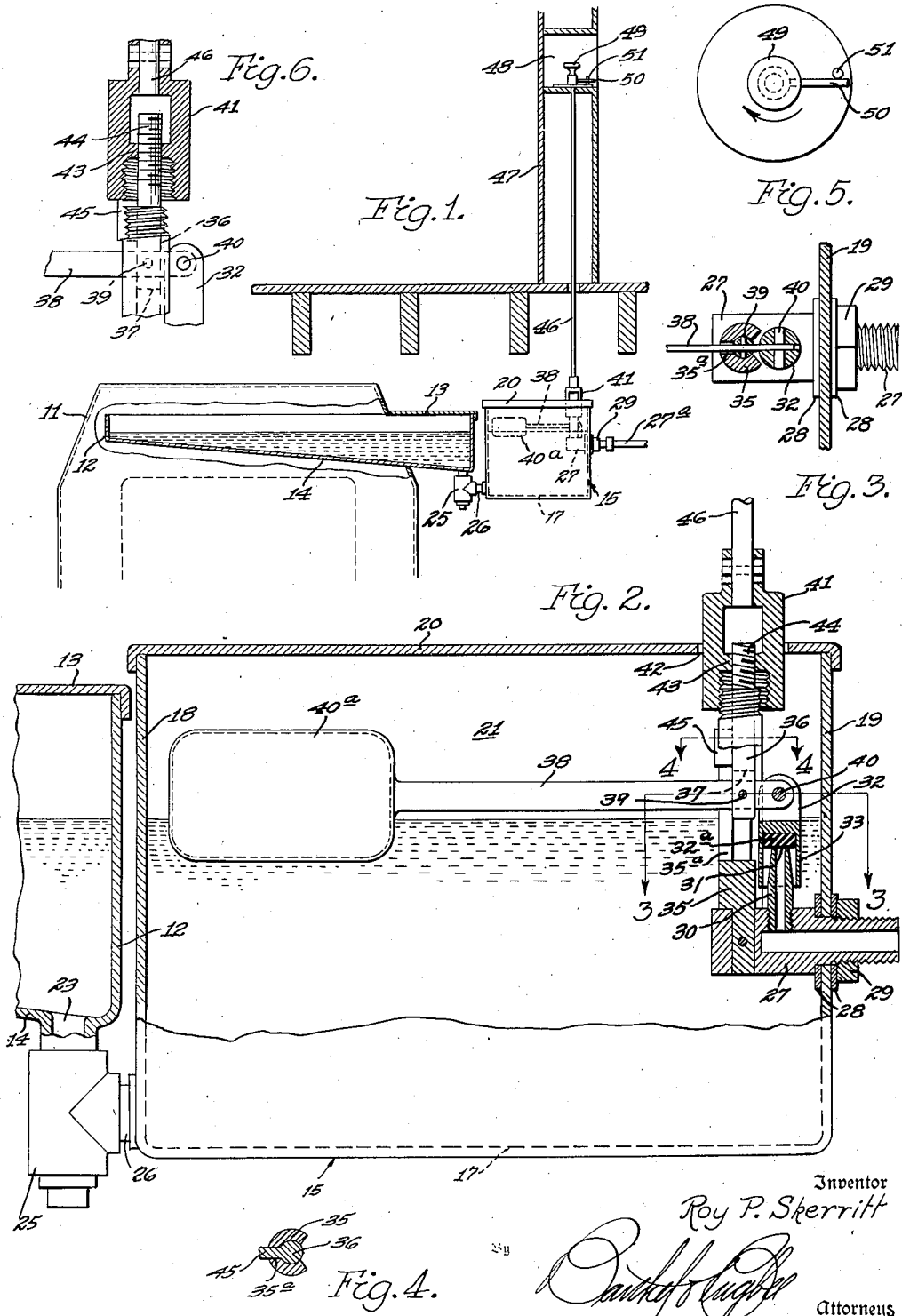


Aug. 11, 1942.

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HUMIDIFYING APPARATUS

2,292,407

Filed May 2, 1940



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UNITED STATES PATENT OFFICE

2,292,407

HUMIDIFYING APPARATUS

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Application May 2, 1940, Serial No. 332,897

2 Claims. (Cl. 137-139)

This invention relates generally to air conditioning apparatus and more particularly to humidifying apparatus and controls therefor.

It is an object of the present invention to provide a new and improved humidifying apparatus which is inexpensive both as to its initial cost and its cost of operation.

Another object of the invention is to provide a new and improved humidifying apparatus including a novel gravity feed control means having a remote control to change the quantity of moisture entrained by air.

Another object of the invention is to provide a new and improved liquid level control device having novel means for changing the liquid level.

Other objects of the invention will become apparent from the following description taken in connection with the accompanying drawing in which:

Figure 1 is a view partly in elevation and partly in section of the humidifying apparatus and control device therefor;

Fig. 2 is a view shown in longitudinal cross section of a liquid level control device of the humidifying apparatus;

Fig. 3 is a view shown in cross section, taken along the line and in the direction of the arrows 3-3 of Fig. 2;

Fig. 4 is a view shown in cross section, taken along the line and in the direction of the arrows 4-4 of Fig. 2;

Fig. 5 is a top plan view of a remote control for regulating the control of the humidifying apparatus; and

Fig. 6 is a detail view partly in cross section, illustrating how certain of the control device parts are assembled.

Referring to the drawing by characters of reference, the present air conditioning or humidifying apparatus includes any suitable type of hot air furnace having a bonnet 11 from which air delivery ducts (not shown) lead to outlets in the rooms of a house or building to be air conditioned. Within the furnace bonnet 11 there is provided an open top receptacle 12 for water which in the form of vapor is entrained by the heated air passing through the bonnet 11. The receptacle 12 projects externally of the furnace through the side wall thereof, and this external portion of the receptacle is preferably closed by a cover 13 which may be secured in place by screws or any other suitable means.

As shown, the bottom wall, as at 14, of the receptacle 12 is angularly disposed, slanting downwardly toward the external portion of the

receptacle. This angularly disposed bottom wall 14 provides for changing or regulating water surface area exposed to the air passing through the bonnet 11, the water surface area exposed depending upon the quantity or level of the water in the receptacle. As illustrated in Fig. 1, the level of the water is such that the maximum surface area thereof is exposed but, as will later be seen, the level of the water may be lowered and maintained at a level below the high end of the inclined bottom wall 14, thus correspondingly decreasing the water surface area exposed to the air passing through the bonnet 11.

A liquid level control device, designated in general by the numeral 15, is provided for controlling supply of water to the receptacle 12 to maintain, within limits, any desired liquid level in the receptacle. The control device 15 includes a casing having a bottom wall 17, end walls 18 and 19, and a top wall or removable cover 20, these walls, together with side walls, defining a liquid level chamber 21. The casing bottom wall 17 is arranged below the receptacle bottom wall 14, and in the casing end wall 18 is provided an outlet conduit 26 which is connected to an inlet 23 in the receptacle bottom wall 14 by a suitable fitting 25, which also serve to mount or secure the control device on the outer end of the water receptacle 12.

Extending through the casing end wall 19, an inlet fitting 27 is externally threaded for attachment to one end of a water supply conduit 27a which may lead from any suitable source of water supply. Gaskets or washers 28 are provided on the fitting 27 and abut opposite sides of the casing end wall 19, the washers 28 being held under compression by a nut 29 which is screw-threaded onto the outer end of the fitting 27 to insure a leak-proof connection between the fitting and the casing end wall. Within the chamber 21 a vertically extending, open ended, tubular member 30 is provided and has its lower end screwthreaded into the side wall of the fitting 27 in communication therewith, the upper end of the tubular member 30 providing an inlet port 31 for said chamber having a seat which is controlled by a valve member 32. In the present instance, the valve member 32 is provided with a tubular, or recessed, lower end portion 33 which freely fits over the upper end of the tubular member 30, and secured within the valve member 32, against the recessed wall thereof, is a compressible valve face member or seat 32a for cooperation with the inlet port 31.

Rigidly secured to the inlet fitting 27 in close

proximity to the valve member 32, there is an upstanding tubular guide member 35 in which a supporting member in the form of a rod or stem 36 is slidably received and guided. The stem 36 is provided adjacent its lower end with a transverse aperture 37 to receive a lever 38 which is pivotally connected to the stem 36 by a pin 39. The lever 38 extends through the aperture 37 transversely thereof and adjacent one end is pivotally connected by a pin 40 to the upper end of the valve member 32. Rigidly secured to the other or free end of the lever 38 there is a float 40a which operates in response to changes in liquid level in the chamber 21 to actuate the valve member 32 to maintain a predetermined, substantially constant liquid level in the chamber 21 and consequently maintain a predetermined quantity of water in the receptacle 12.

In order to provide for control or change of water surface area exposed in the receptacle 12, the liquid level control device is made adjustable to raise and/or lower the liquid level, which is accomplished by raising and/or lowering the fulcrum of the float lever 38. To this end, an adjustment member 41, of general tubular form, is provided for moving the support or pin 39 vertically to move the lever fulcrum to any desired position between predetermined limits. The adjustment member 41 extends through an aperture 42 provided in the casing cover 20 and is provided with an internal transverse wall 43 to which is threadedly connected the threaded upper end 44 of stem 36, the adjustment member 41 also being internally threaded to receive an upper, externally threaded end portion of the tubular guide member 35. The guide member 35 is provided with oppositely disposed, vertically extending slots 35a in its side wall to receive the lever 38, and the stem 36 is provided with a laterally extending abutment 45 which positions in one of the slots and serves as a stop member to prevent rotation of the stem 36 or to limit movement of the stem to rectilinear movement. This stop member 45 also serves to aid in properly assembling the parts, as illustrated in Fig. 6. For example, in assembling the parts the adjustment member 41 is screwthreaded onto the upper end 44 of the stem 36 until the lower end of the adjustment member 41 seats against the stop 45 after which the adjustment member 41 is screwthreaded onto the upper end of the tubular guide member 35 until the valve face member 32a is seated. The upper end of the guide tube 35 and the upper end 44 of the stem 36 are provided, one with a right hand thread and the other with a left hand thread, and the thread on the upper end of the tube 35 has a greater pitch than the thread on the upper end of the stem 36. A shaft 46 is secured adjacent its lower end with a slight play connection to the adjustment member 41 and may extend upwardly within a hollow internal wall 47 of a house or building, the wall 47 having a recess 48 wherein a manually operable control 49 is provided and secured to the shaft 46 for adjusting the liquid level control device 15. The remote control member 49 may be in the form of a knob which may be provided with a laterally extending arm 50 for abutment with a pin 51 to limit rotation of the knob in opposite directions.

In operation, the float 40a, operating in response to slight changes in liquid level in the chamber 21, actuates the inlet controlling valve member 32 to maintain a substantially constant liquid level in the chamber 21, the liquid level

maintained depending upon the adjustment of the lever fulcrum. Since the chamber 21 is in open communication with the receptacle 12, a substantially constant liquid level will be maintained in the receptacle, for as the water vapor is driven off by the heat of the furnace and entrained by heated air enroute to the room or rooms of the building, additional water is added to the receptacle under control of the liquid level device 15. If for any reason it is desired to decrease supply of moisture to the air, it is only necessary to lower the fulcrum of the float lever 38, which is conveniently accomplished, in the present instance, by the manually operable remote control 49. By rotating the knob 49 in one direction the adjustment member 41 is moved downwardly which moves the stem 36 downwardly, thus lowering the fulcrum of the float lever 38, after which a lower liquid level will be maintained in the chamber 21 and consequently in the receptacle 12. By reason of the inclined bottom wall 14 of the receptacle, it will be seen that the water surface area exposed to the air passing through the furnace bonnet 11 can be varied, as desired, and thus the amount of moisture added to the air may be regulated accordingly.

While I have shown and described my invention in detail it is to be understood that the same is to be limited only by the appended claims for many changes may be made without departing from the spirit and scope of the invention.

What I claim is:

1. In combination, an elongated member provided at its upper end with an external thread of predetermined axial extent and internally with a bore extending axially from said end downwardly beyond the lower terminus of said thread, said member being formed below said terminus with a slotted keyway leading into said bore and extending therealong, another elongated member provided at its upper end with an external thread of predetermined axial extent and of lead opposite that of said first thread, said second member being adapted for residence within and movement along said bore and for arrangement of the upper terminus of said second thread above the upper terminus of said first thread, said second member being formed below the lower terminus of said second thread with a key extending laterally therefrom through said keyway, a rotatable actuating member for said second member and provided with a pair of internal threads one of which is operatively engageable with said first thread and the other of which is operatively engageable with said second thread, and a lever extending through said keyway below said key into operative engagement with said second member for being moved responsive to movement of the latter.

2. In combination with means providing a fluid inlet, an elongated member provided at its upper end with an external thread of predetermined axial extent and internally with a bore extending axially from said end downwardly beyond the lower terminus of said thread, said member being formed below said terminus with a slotted keyway leading into said bore and extending therealong, another elongated member provided at its upper end with an external thread of predetermined axial extent and of lead opposite that of said first thread, said second member being adapted for residence within and movement along said bore and for arrangement of the upper terminus of said second thread above

the upper terminus of said first thread, said second member being formed below the lower terminus of said second thread with a key extending laterally therefrom through said keyway, a rotatable actuating member for said second member and provided with a pair of internal threads one of which is operatively engageable with said first thread and the other of which is operatively en-

5 gageable with said second thread, a lever extending through said keyway below said key into operative engagement with said second member for being moved responsive to movement of the latter, and a valve carried by said lever and movable therewith for controlling the inlet.

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