April 7, 1942. W. J. WOOLLEY 2,278,755

HUMIDIFIER

Filed June 23, 1939

Fig. 1.

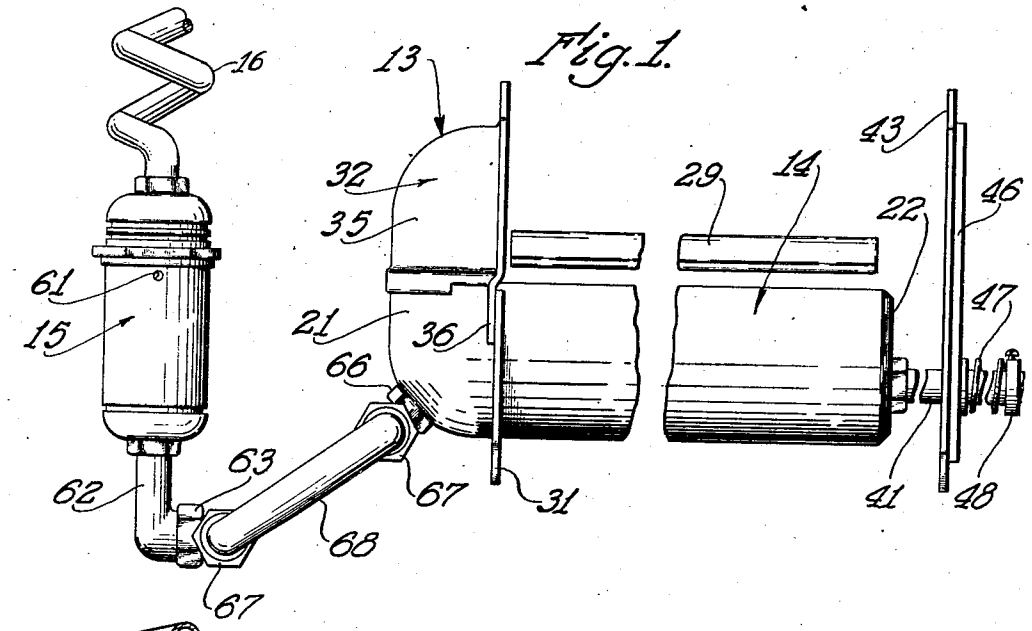


Fig. 2.

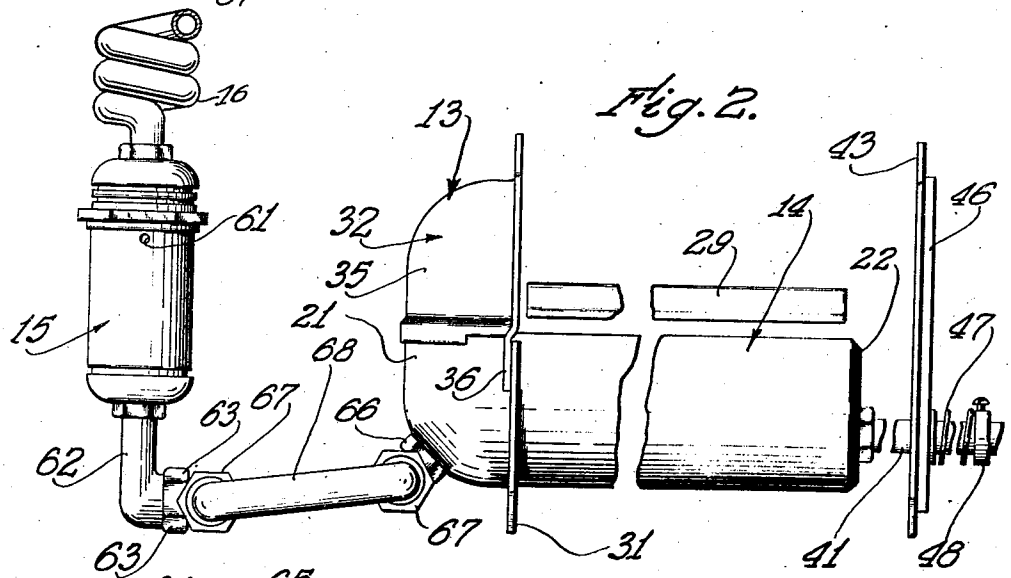
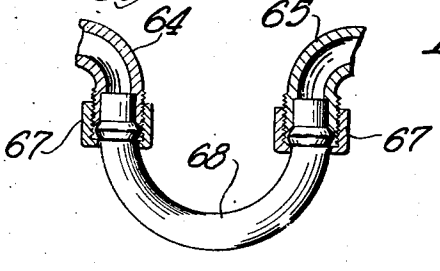


Fig. 3.



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HUMIDIFIER

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2 Claims. (Cl. 126—113)

This invention relates in general to automatic humidifiers, and more particularly to such devices which are adapted for use in hot air furnaces, such as that disclosed in my application Serial No. 158,962, filed August 13, 1937, and issued April 18, 1939, as Patent No. 2,155,070.

A principal object of the invention is the provision in an automatic humidifier, having a water evaporation pan and a separate automatic water feeding unit, of improved means for adjustably mounting the latter on the pan.

Another important object of the invention is the provision in an automatic humidifier of means for supplying water thereto and maintaining the volume of water substantially constant, the latter means being adjustable to compensate for variations in the pressure of the water supplied thereto.

A further important object of the invention is the provision of an automatic humidifier for hot air furnaces having adjustable means for varying the evaporation surface area of water, and separate means adjustable to maintain the water to be evaporated at a substantially constant level.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

In the drawing,

Figure 1 is a side elevational view of an automatic humidifier embodying the features of the invention with parts broken away;

Fig. 2 is a view similar to Fig. 1 showing the water feeding unit mounted in a different position relative to the evaporation pan than is shown in Fig. 1; and

Fig. 3 is a detail longitudinal section of the adjustable connection between the feeding unit and the pan.

Referring more particularly to the drawing, reference numeral 13 indicates in general an automatic humidifying device comprising a water evaporation pan 14 and an automatic feeding device 15 for supplying water thereto. The pan 14 is adapted to be mounted within the usual dome or hood portion of a hot air furnace of any desired type in the manner indicated in my prior U. S. Letters Patent No. 2,155,070, issued April 18, 1939.

The water pan 14 is preferably stamped from sheet bronze, and is provided with front and rear end plates 21 and 22, respectively, which are made of brass or any other desired material, and are secured to the body portion of the pan in any suitable manner. A pair of curved, longitudinally disposed wing members 29 are hingedly secured to the main body portion of the pan 14 to facilitate swinging or folding thereof to an inner or inoperative position (not shown) in which position the wings 29 are disposed within the pan 14. Such pivotal mounting of the wings 29 upon the pan 14 thus permits insertion and withdrawal of the pan into and out of the hood of the furnace through a suitable aperture provided therein which is of only slightly greater dimensions than the outer dimensions of the pan. In their normal or outer position, as shown in the drawing, the wings 29 extend laterally from the pan 14 in spaced relationship thereto to guide the upwardly flowing currents of warm air generated by the furnace inwardly and downwardly into contact with the surface of the water in the pan 14.

When the pan 14 is mounted in the hood of the furnace, the aperture through which it is inserted is sealed or closed off by a lower bonnet plate 31 and an upper bonnet hood member 32. The bonnet plate 31 is substantially U-shaped so as to closely conform to the outer surface of the pan 14 adjacent the junction between the forward end 21 thereof and the main body portion of the pan. The upper leg portions of the bonnet plate 41 are provided with suitable slots through which bolts or other desired holding means are adapted to extend to secure the plate to the side wall of the furnace hood. The bonnet hood 32 is provided with a centrally disposed, outwardly extending dome portion 35 which is adapted to engage the upper edge of the end wall 21 of the pan 14. The bonnet hood 32 is also provided with a pair of downwardly extending leg portions 36 which are bent forwardly out of the plane of the marginal portion thereof and are adapted to overlap the upper leg portions of the plate 31. The plate 31 and hood 32 thus constitute adjustable means for effectively sealing the relatively small aperture in the wall of the furnace hood through which the pan 14 has been inserted, regardless of the particular slope of this wall of the furnace hood.

An overflow pipe and rigid supporting brace 41 is sucured in any suitable manner to the rear end plate 22 of the pan 14 to provide a leak-proof joint therebetween, and is of sufficient length to extend outwardly through and beyond the wall of the furnace dome. A plate 43 is adapted to be secured in any suitable manner to the outer sur-

face of the wall of the furnace dome through which the pipe 41 extends. An adjustable cover plate 46 is slidably mounted upon the overflow pipe 41, and is adapted to be resiliently held against the outer surface of the plate 43 by a spring 47 surrounding the pipe 41 and retained at its outer end by an adjustable collar 48. The plate 46 is provided with an inwardly extending, annular flange (not shown) surrounding the pipe 41 and in sliding engagement therewith which is adapted to engage a selected one of suitable enlarged portions of a slot provided in the plate 43. With this arrangement, sliding of the plate 46 outwardly on the pipe 41 relative to the plate 43 and against the tension of the spring 47 will permit vertical movement of the pipe 41 relative to the furnace dome. The pipe 41 will be retained in any one of a plurality of selective positions by the engagement of the flange on the plate 46 with one of the enlarged portions of the slot in the plate 43, the spring 47 functioning to resiliently retain the plate 46 in contact with the plate 43.

It will thus be seen that the water pan 14 may be readily mounted within the dome of a hot air furnace of any particular construction, the adjustable bonnet plates 31, 32 and the adjustable cover plates 43, 46 compensating for variations in slope of the side walls of the furnace dome. The pan 14 having been inserted in the furnace dome, the wings 29 are swung to their outward or operative position, as shown in the drawing. The rising warm air currents within the furnace will then be guided by these wings 29 over and into contact with the surface of the water in the evaporation pan 14. By adjusting the vertical position of the pipe 41 in the manner above described, the vertical position of the rear end of the pan 14 may be selectively changed to vary the evaporation surface area of the water in the pan. The construction and operation of the parts above enumerated are more patricularly described in my prior patent referred to hereinbefore, wherein the same reference numerals indicate identical parts to those hereinbefore described.

The automatic water feeding unit 15 is substantially identical in internal construction to that disclosed in my U. S. Letters Patent No. 2,079,098, issued May 4, 1937, and is provided with inlet and outlet compartments therein with a float controlled valve communicating therebetween. A supply tube 16 having a coil portion to lend vertical flexibility thereto is connected at its lower end in any suitable manner to the upper end of the unit 15 to communicate with the inlet compartment therein, and is connected at its upper end in any desired manner to a suitable water supply. The main casing of the unit 15 is provided with a suitable vent hole 61 communicating with the outlet chamber therein. At its lower end, the unit 15 is provided with a pipe or L-connection 62 which is secured thereto in any suitable manner at its upper end and communicates with the outlet chamber therein. The lower end of the pipe 62 is rigidly connected by a union 63 to one end of an elbow 64. A similar elbow 65 is rigidly connected at one end by a union 66 to the front wall 21 of the pan 14. The free ends of the elbows 64, 65 are adjustably connected by unions 67 to the opposite ends of a substantially U-shaped pipe or conduit 68 (Fig. 3).

The automatic water feeding unit 15 is thus adjustably mounted upon and supported by the evaporation pan 14. By loosening the unions 67, the vertical position of the unit 15 may be varied as desired relative to the pan 14. Subsequent tightening of the unions 67 will then insure the rigid retention of the unit 15 in any selected vertical adjusted position relative to the pan 14. Two possible positions to which the automatic water feeding unit 15 may be adjusted relative to the evaporation pan 14 are shown in Figs. 1 and 2, respectively. Since the unit 15 is in direct communication with the pan 14, the water level in the outlet chamber therein will be the same as that obtaining in the pan 14. The float valve provided in the unit 15 will thus function to automatically maintain the water within the pan 14 at a substantially constant level. This water level may be selectively adjusted to any desired point by varying the vertical position of the unit 15 relative to the pan 14.

The adjustable connections between the unit 15 and pan 14 may also be employed to compensate for variations in the pressure of the water supplied to the unit 15 by the pipe 16. This feature is of material importance because the water pressure in various localities may vary between relatively wide limits. When a low water pressure obtains, the reaction of the float valve within the feeder unit 15 will be relatively rapid in comparison to the rate of flow of water therethrough, so that the resulting water level in the pan 14 will be substantially below that normally obtaining with a higher water pressure and with the unit 15 being mounted in the same position relative to the pan 14. Conversely, with the unit 15 and the pan 14 mounted in the same relative positions, a higher pressure of the water supplied by the pipe 16 will result in a slower reaction of the float valve in the feeder unit 15 relative to the rate of flow of water therethrough and a relatively higher water level in the pan 14. Consequently, by properly adjusting the connections 67, 68, the feeder unit 15 may be so positioned relative to the evaporation pan 14 as to maintain the water level in the latter substantially constant, regardless of the particular water pressure obtaining in the supply pipe 16.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. An automatic humidifier comprising a water evaporation pan having inlet means in the lower portion thereof, a vertically movable supply conduit connected to a source of water supply, and adjustable means for selectively maintaining the level of the water in said pan, comprising a float valve mounted laterally of said pan, said valve having a casing forming a float chamber, an inlet end connected to said conduit and an outlet end, a rigid tube intermediate said valve and said pan, and pivot joint means connecting the ends of said tube with said outlet end of said valve and said inlet means of said pan whereby to allow substantially vertical adjustment of said float chamber relative to said pan for altering the height of the water level in said pan.

2. An automatic humidifier comprising a water evaporation pan having inlet means in the

lower portion thereof, a vertically movable supply conduit connected to a source of water supply, and adjustable means for selectively maintaining the level of the water in said pan, comprising a float valve mounted laterally of said pan, said valve having a casing forming a float chamber, an inlet end connected to said conduit and an outlet end, a rigid tube intermediate said valve and said pan, and pivot joint means connecting the ends of said tube with said outlet end of said valve and said inlet means of said pan whereby to allow substantially vertical adjustment of said float chamber relative to said pan for altering the height of the water level in said pan, said inlet means including a pipe rigidly supported on said pan and having one end in communication with the interior of said pan, the other end of said pipe extending substantially horizontally, the outlet end of said float valve including a second pipe having one end rigidly affixed to said casing and communicating with said float chamber, the other end of said second pipe extending substantially parallel with said other end of the first-mentioned pipe, said tube being substantially U-shaped in plan view, the ends of said tube being rotatively engaged, respectively, with said other ends of said pipes, and lock-nut means engaging the ends of said pipes and tubes, respectively, for selectively holding the same in adjusted position.

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