Oct. 2, 1951 E. W. BOTTUM 2,569,512

AIR HUMIDIFIER AND MOUNTING MEANS THEREFOR FOR APPLICATION TO DUCT WALLS

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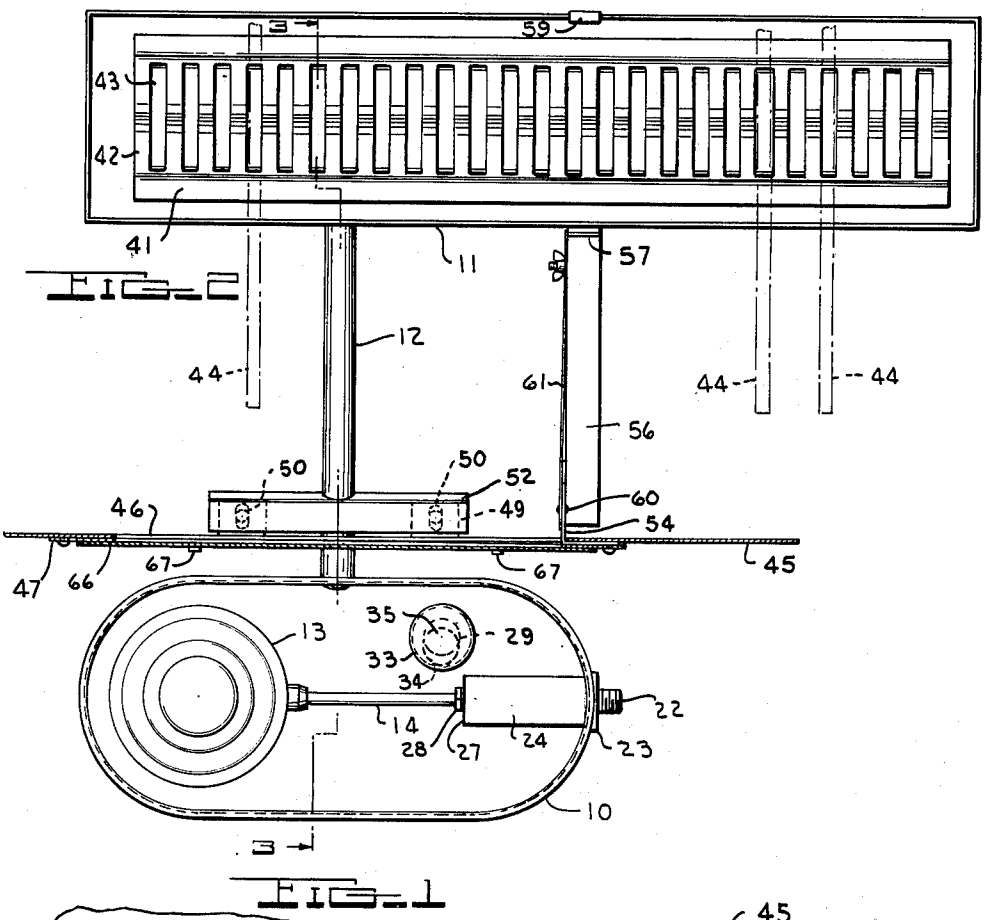

FIG. 2

FIG. 1

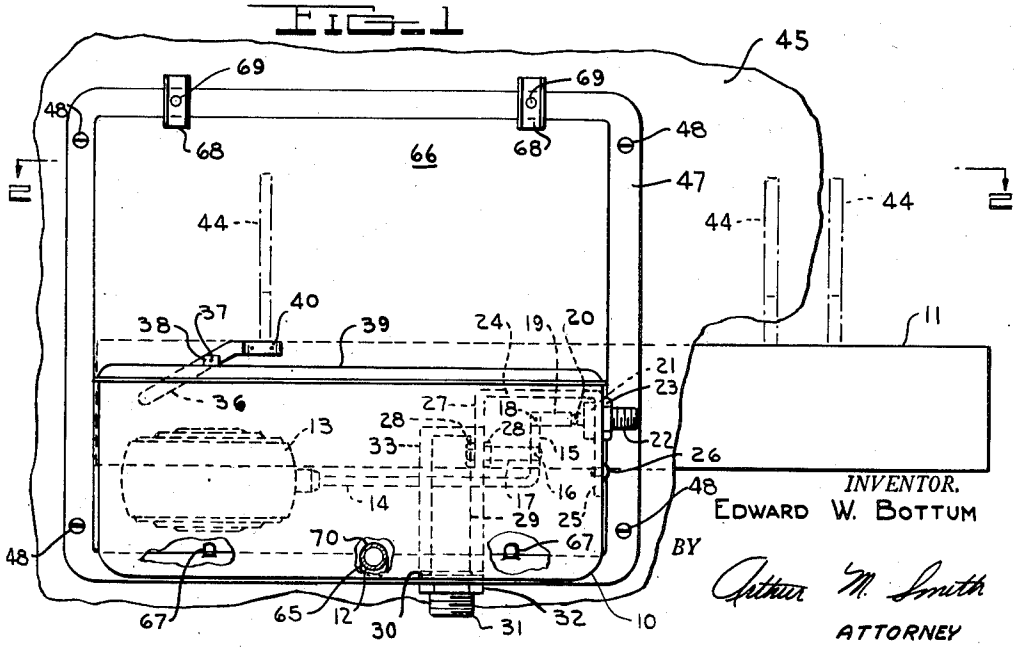

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FIG. 3

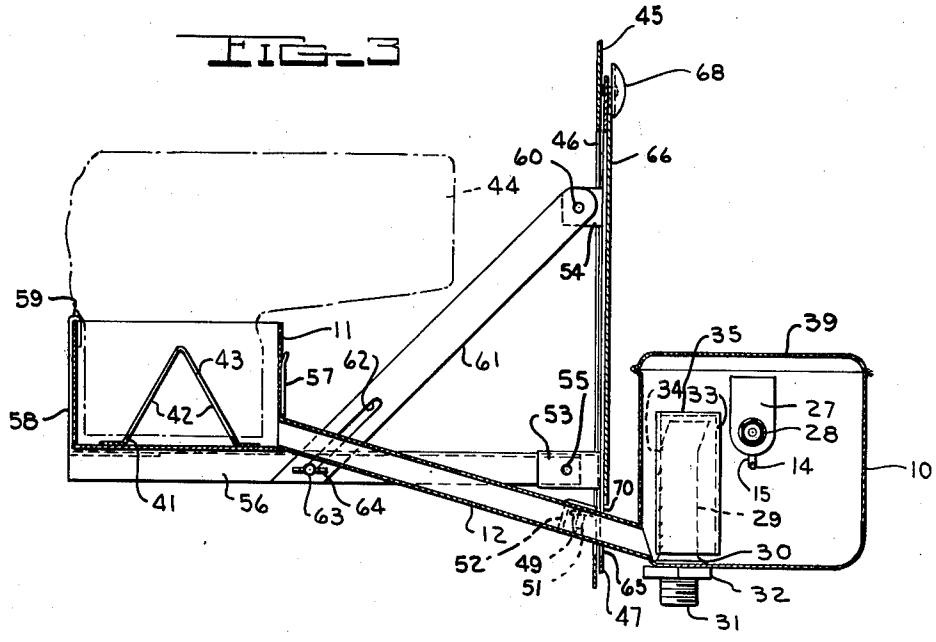

FIG. 4

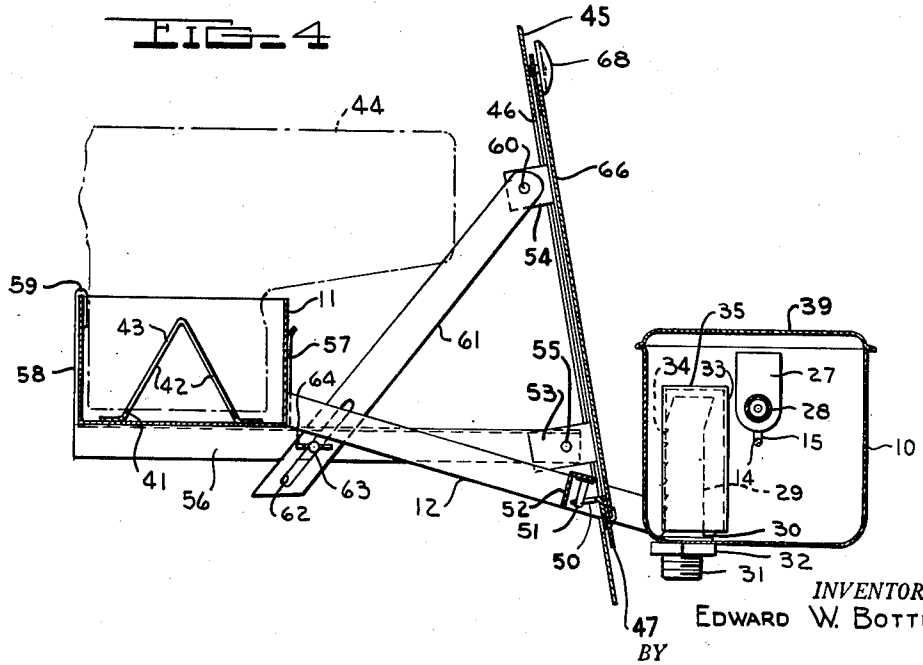

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FIG. 5

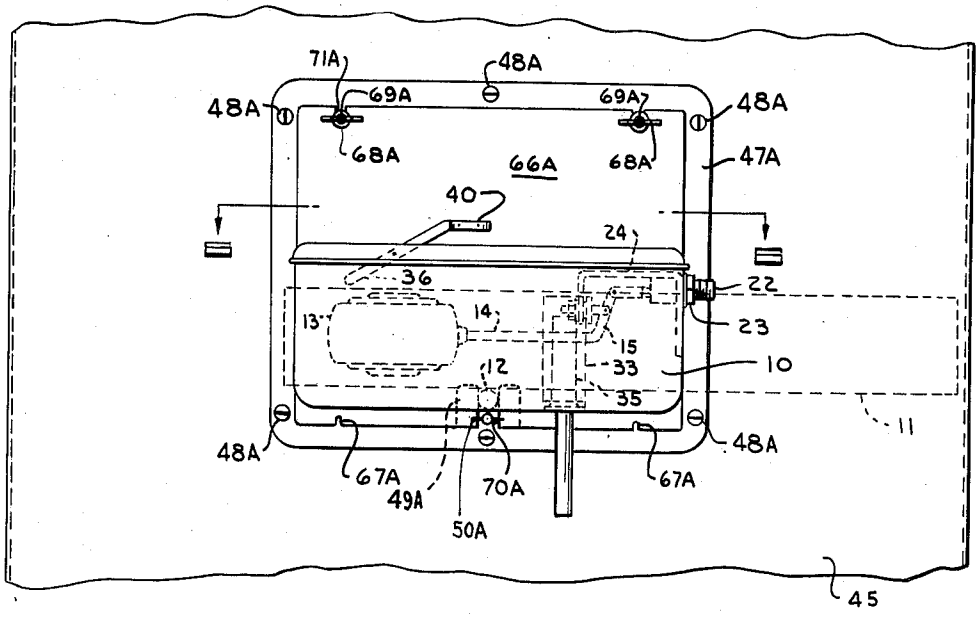

FIG. 6

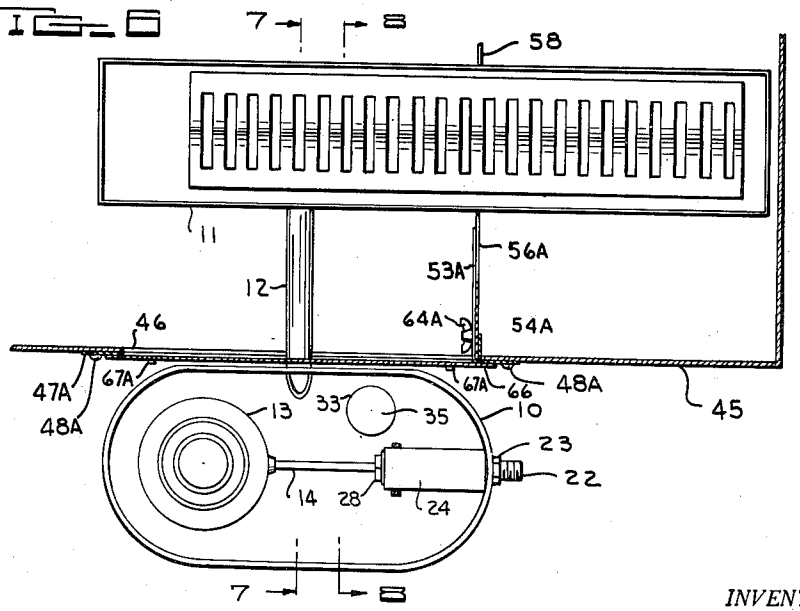

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FIG. 7

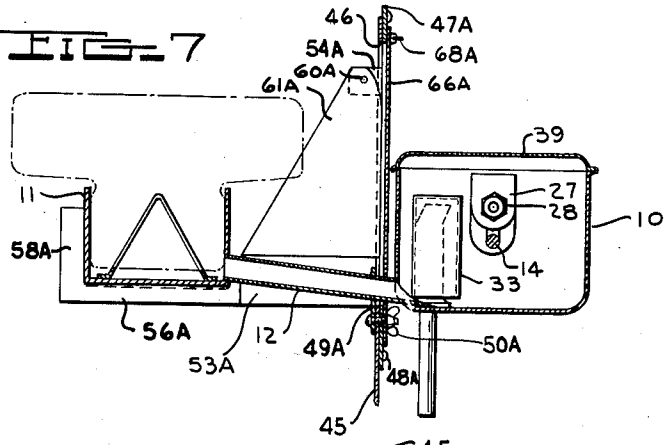


FIG. 8

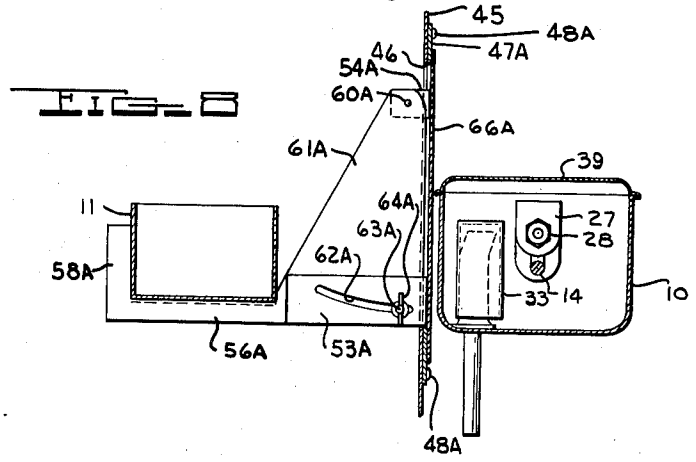
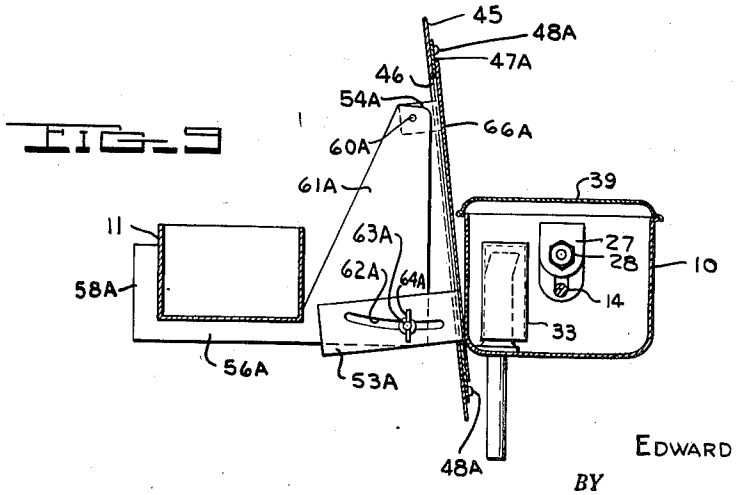


FIG. 9



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Patented Oct. 2, 1951

2,569,512

UNITED STATES PATENT OFFICE

2,569,512

AIR HUMIDIFIER AND MOUNTING MEANS THEREFOR FOR APPLICATION TO DUCT WALLS

Edward W. Bottum, Detroit, Mich., assignor to Skuttle Manufacturing Company, Detroit, Mich., a corporation of Michigan

Application September 25, 1947, Serial No. 776,081

3 Claims. (Cl. 126—113)

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The present invention relates to improvements in an air humidifier whereby the evaporator pan and float tank may be conveniently mounted to the sidewall of an air duct, such as for example the air duct within or leading from an air heating furnace.

Prior to the present invention, considerable difficulty and expense have been encountered in installing air humidifiers as an accessory to conventional domestic hot air furnaces and the like, and in servicing such humidifiers and their associated float tanks after installation. In order to support the humidifier equipment adequately within the air heating chamber, it has been frequently necessary to support the humidifier equipment from opposite sides of the air heating duct. As a result, openings to receive supporting projections or other suitable brackets provided by the humidifier equipment were required on opposite sides of the air heating chamber. The lack of standardization of furnace heating equipment usually necessitated on-the-job improvision and custom fitting in order to provide an adequately secure mounting for the humidifier equipment. The conventional practice of custom fitting has appreciably added to the installed cost of air humidifiers and has been a major obstacle to the universal acceptance of such equipment, in spite of the extensive advertising and favorable publicity of recent years concerning the benefits to health and comfort made possible by properly humidified air.

An additional difficulty experienced with conventional humidifier mountings is that, once installed, the humidifier equipment may not be readily removed from the furnace equipment for servicing or repairs. It is important to the proper functioning of humidifiers that the evaporator pan be cleaned, flushed, and drained at frequent intervals to remove accumulated precipitate and concentrations of dissolved matter which result after prolonged evaporation.

Since the humidifier equipment is frequently inaccessible and its removal frequently difficult with conventional mountings, proper cleaning of the humidifier equipment is not convenient and is rarely done. The evaporating elements soon become clogged with precipitate, a scum forms over the water surface, the evaporating efficiency of the humidifier drops sharply, and corrosive chemical and electrolytical actions deteriorate the humidifier equipment, necessitating early repairs particularly to valve jets and the water level regulating apparatus. The customer becomes dissatisfied with his equipment and sales of otherwise meritorious equipment become difficult.

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Accordingly, an important object of the present invention is to provide an improved air humidifier and standardized mounting therefor which may be economically manufactured by mass production methods, yet which will provide adjustability for mounting within the air duct of essentially any conventional type of air heating furnace and with the minimum of modification thereto.

Another object of the present invention is to provide such an air humidifier which may be readily installed within and removed from the air heating equipment to facilitate servicing and repairs, and wherein the float tank is disposed relative to its associated evaporator pan to be readily accessible for cleaning and to permit the simultaneous flushing, draining, and refilling of the evaporator pan and float tank.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

Fig. 1 is a front elevation with portions broken away of a humidifier employing the mounting of the present invention and shown mounted to a fragmentary portion of the sidewall of an air duct.

Fig. 2 is a fragmentary horizontal section taken in the direction of the arrows essentially along the line 2—2 of Fig. 1, showing the float tank with the cover removed.

Fig. 3 is a fragmentary vertical section taken in the direction of the arrows essentially along the broken line 3—3 of Fig. 2.

Fig. 4 is essentially the same view as Fig. 3, but showing the water conduit and pivotal mounting therefor in elevation, the humidifier mounting being in the adjusted position for an inclined wall portion of the air duct.

Fig. 5 is a fragmentary front elevation showing a humidifier employing another embodiment of the mounting of the present invention and mounted to a fragmentary portion of the side wall of an air duct.

Fig. 6 is a fragmentary horizontal section taken in the direction of the arrows essentially along the line 6—6 of Fig. 5, showing the float tank with the cover removed.

Fig. 7 is a fragmentary vertical section through the duct connecting the float tank and

evaporator pan and taken in the direction of the arrows essentially along the line 7—7 of Fig. 6.

Fig. 8 is a fragmentary vertical section taken in the direction of the arrows essentially along the line 8—8 of Fig. 6.

Fig. 9 is essentially the same view as Fig. 8, the humidifier mounting being in the adjusted position for an inclined wall portion of the air duct.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

A particular embodiment of the present invention is shown by way of example in Figs. 1 through 4 wherein a float tank 10 is connected to an evaporator pan 11 by the water conduit 12. Although many conventional water level regulating means may be employed with the present invention for maintaining the water level within the evaporator pan essentially constant regardless of varying rates of evaporation, the preferred float-operated water level regulating apparatus described herein is particularly convenient for use in combination with other features of the present invention and is therefore described in detail below.

Referring particularly to Figs. 1 and 2, the float 13, adapted to float on the surface of the water within the float tank 10, is connected to one end of the essentially horizontally extending float arm 14. An upward extension 15 of the float arm 14 is pivotally secured at 16 to the horizontal and longitudinally movable pivot supporting shaft 17. The upper end of the arm 15 is pivotally secured at 18 to the horizontally movable plunger 19 which is movable to the left or right in Fig. 1 for opening or closing the orifice of the water inlet jet 20 upon the falling or rising of the float 13. The water inlet jet 20 provides the enlarged collar 21 and communicates with the threaded inlet duct 22 which extends through the side of the float tank 10 and is secured thereto at a watertight seal by the nut 23. The inlet duct 22 is suitably connected to a source of water.

A U-bracket 24 provides the vertical depending arm 25 which is secured to the inside of the float tank 10 by the screw 26 and also by the body portion of the duct 22 which extends through an opening provided therefore in the arm 25. The other vertical depending arm 27 of the U-bracket 24 provides an opening near its lower extremity within which is secured the left end of the longitudinally movable pivot supporting shaft 17, which latter is preferably threaded and is adjustably secured in position to the bracket 27 by the adjusting nuts 28 screw-threaded thereon on opposite sides of the bracket 27. Horizontal adjustment of the pivot 16 perpendicularly to its pivot axis is accomplished by selectively loosening one nut 28 and tightening the other. Thus the level at which the float 13 must be raised to close the orifice of the jet 20 by the plunger 19 may be predetermined.

To facilitate closure of the orifice of the jet 20 by the plunger 19, the jet contacting end of the plunger 19 preferably comprises a rubber or rubber-like material. Under ordinary operating conditions, the minimum water level which buoys the float 13 sufficiently to close the orifice of the jet 20 will be the normal operating water level of the evaporator pan 11. Whenever evaporation or other causes slightly lower the water level below the aforesaid operating level, the orifice of the jet 20 will open until the water level again rises to the operating level.

A feature of the present invention largely responsible for its utility and commercial success is the automatic siphoning mechanism which permits automatic or semi-automatic flushing, draining, and refilling of the float tank 10 and associated evaporator pan 11. The siphon mechanism comprises the siphon discharge tube 29 which projects vertically upward through the bottom of the float tank 10 and provides an inlet opening at its upper end above the normal operating water level. The annular flange 30 of the discharge duct 29 rests on the bottom of the float tank 10. A threaded portion 31 of the duct 29 extends through the base of the float tank 10 to which it is secured at a leakproof seal by the nut 32 and is adapted for connection with a drain or sewer line. In order to assure an essentially standard siphoning action under various conditions of installation, a drain tube (not shown) of uniform length for all installations is preferably secured at one end below the tank 10 at 31 and has its other end inserted into the drain or sewer line, either loosely or spaced therefrom to permit the entry of air into the drain or sewer line, so that the length of the latter will have no effect upon the siphoning action.

The siphon discharge tube 29 is essentially enclosed within the cylindrical siphon chamber 33 which is secured eccentrically to the tube 29 as by welding or soldering along the line 34. The top 35 of the cylindrical siphon chamber 33 is closed, but the bottom thereof, spaced slightly from the bottom of the float tank 10, is open to permit a free flow of water, sludge, and other suspended materials into the chamber 33 during the siphoning action. It is to be noted in Figs. 3 and 4 that the upper portion of the discharge duct 29 is bent away from the weld line 34 so as to position the inlet opening or top of the duct 29 essentially concentrically within the cylindrical siphon chamber 33. Also, the inlet opening of the duct 29 is preferably horizontal.

Although the evaporating equipment described herein may be substituted for various other well known types of evaporating equipment, the preferred evaporator equipment utilized with the present invention comprises the rack 41 within the evaporator pan 11 and having the plurality of inverted V-brackets 42 spaced by the slots 43. The slots 43 are provided for the plurality of vertical, spaced porous capillary plates 44 which serve as evaporator elements. The lower portions of the capillary plates 44 extend below the water level within the evaporator pan 11. The upper portions of the plates 44 fan out as shown in Figs. 3 and 4 and draw water from the lower portion of the evaporator pan 11 by capillary action, thereby materially increasing the effective evaporating capacity of the humidifier.

In a relatively short time and as a result of ormal evaporation from the pan 11, the salts and other minor impurities found in most water will accumulate and form a sludge or precipitate within the evaporator pan 11 and to lesser extent within the float control tank 10. Frequently

a surface scum will form over the water. Also the continuous trickle of incoming water through the jet 20, replacing the water lost by evaporation, usually leaves a corrosive precipitate around the orifice of the jet 20 and the plunger 19. These accumulated impurities, if not cleaned from the humidifier equipment, eventually clog the capillary pores of the evaporator elements 44 and set up corrosive or electrolytical and chemical actions which destroy the humidifier equipment, causing particular damage and impairment to the efficient operation of the inlet valve fitting and water level regulating mechanism.

In order to avoid the difficulties arising from accumulated water impurities after prolonged evaporation, frequent cleaning of the humidifier equipment, usually by flushing, draining, and refilling thereof, is necessary. As will be clearly observed below, a significant achievement of the present invention has been to provide a mounting for the humidifier apparatus whereby accessibility of the latter for cleaning is readily achieved.

The semi-automatic flushing, draining, and refilling of the float tank 10 and evaporator pan 11 are initiated by means of the pivotally mounted float depressing lever 36, pivotally secured at 37 to the pivot bracket 38 which is provided by the removable cover 39. The lever 36 passes through a movement limiting slot, not shown, in the cover 39 to prevent pivotal movement of the lever 36 in either direction beyond desired limits. The upper portion of the lever 36 provides the weighted handle 40 secured to the shaft 36 at an angle so as to locate the center of gravity of the combined lever 36 and handle 40 off the longitudinal axis of the lever 36. The lower portion of the lever 36 is positoned immediately over the float 13 so as to contact and depress the float 13 against the buoyancy of the water at the normal operating level within the tank 10 when the lever 36 is raised essentially vertically upon raising the handle 40. Thus the plunger 19 is moved to the left and the orifice of the jet 20 is opened to permit water to flow into the tank 10 through the inlet duct 22. Friction contact between the float 13 and the lower end of the lever 36 holds the latter in the vertical float depressing position until after commencement of the siphoning action, as described below.

As the water rises within the float tank 10 and associated evaporator tank 11, both tanks are flushed and accumulated surface scum and sludge below the water surface are dislodged and broken. The water level will continue to rise until the level thereof within the siphon chamber 33 stands appreciably above the horizontal inlet opening at the top of the discharge duct 29. In this connection, it is to be observed that the said inlet opening of the duct 29 is preferably horizontal and spaced concentrically within the chamber 33 so that the surface tension of the water rising in the chamber 33 will restrain the water from overflowing into the duct 29 until the pressure of the rising water above the duct 29 becomes sufficient to break the water surface tension. At that time a momentary flood of the dammed water into the siphon tube 29 exceeds the capacity thereof and initiates the siphoning action. Once started, the siphoning action sweeps the accumulated water impurities from the pan 11 and tank 10 with a rush of water from the pan 11 and tank 10 into the bottom opening of the siphon chamber 33 and out the discharge duct 29. The siphoning continues until the water level within the tank 10 falls below the bottom opening of the siphon chamber 33 and allows air into the siphon chamber 33 to break the siphoning action. As the water level drops in the tank 10, the float 13 is also lowered. The friction contact between the float 13 and the lever 36 is released, and the weighted lever 40 returns the lever 36 to its initial raised position, Fig. 1.

Upon completion of the siphoning action, the float 13 will be near the bottom of the tank 10 and the orifice of the jet 20 will be essentially wide open, permitting a maximum flow of inrushing water which strikes against the end of the plunger 19 and rebounds in a strong spray to clean the ends of the plunger 19 and the jet 20 from accumulated sludge or precipitate which would otherwise set up corrosive chemical and electrolytic actions and in time destroy the valve mechanism.

In order to expedite the evaporation from the evaporating elements 44, it is conventional to install the evaporator pan 11 within the furnace air heating chamber or a warm air duct leading therefrom. Conventional installations are custom fitted to various types of air heating equipment and consequently involve difficulty and expense out of proportion to the initial cost of the humidifier equipment. Furthermore, after the installation, the custom fitted humidifier equipment is necessarily frequently inaccessible for cleaning and servicing, with the result of frequent expensive repairs and improper functioning of the humidifier equipment.

The above difficulties and objections frequently encountered with conventional humidifiers have been met in the present invention by the novel arrangement of the equipment wherein all installation accessories, brackets, supports, and the like, are factory-built and supplied with the humidifier equipment as a complete assembly. In the preferred embodiment shown in Figs. 1 through 4, a supporting means for the entire humidifier assembly is secured to a flat outside portion of the air duct 45 and around an opening 46 cut therein sufficiently large to permit passage of the evaporator pan 11.

Inasmuch as the present invention is adapted for use with practically any conventional air heating chamber or air duct, the latter is not described in detail and only a fragmentary side portion 45 thereof is shown in the present drawings. The supporting means for the humidifier assembly comprises the rectangular frame 47 which fits around the opening 46 and is secured to the air duct 45 by screws 48. Although a flat portion of the sidewalls of the air duct 45 is shown, where it becomes convenient to mount the humidifier assembly to a curved or angular portion of the duct 45, the frame 47 may be correspondingly curved or angular.

Along the horizontal base of the frame 47 are secured the plurality of brackets 49 which project into the air duct 45 and provide the elongated pivot holes 50 for the downward projecting pins 51 provided by the angle bracket 52. The angle bracket 52 is rigidly secured transversely to the water conduit 12 near the attachment thereof to the float tank 10 and, in the present illustration, provides two depending pivot pins 51 which are pivotally mounted in two corresponding elongated pivot holes 50.

Also secured to the frame 47, along the right edge thereof, Fig. 1, are the lower bracket 53 and the upper bracket 54 which project through the opening 46 into the air duct 45. The lower

bracket 53 is pivotally secured at 55 to the bracket arm 56 which extends essentially horizontally into the duct 45 and provides a support for the evaporator pan 11. Projected upward from the bracket 56 on opposite sides of the evaporator pan 11 are the brackets 57 and 58, the latter being bent over the upper edge of the pan 11 to complete the hook 59 for securely holding the pan 11 in position.

The upper bracket 54 provides the pivot 60 for the inclined adjustable bracket arm 61 which provides the longitudinal slot 62 for moving along the threaded studs 63 which project horizontally from the supporting arm 56, Figs. 2 and 3. By virtue of the adjusting slot 62, and the pivotal mounting of the arm 61, it is apparent that the float tank 10 and evaporator pan 11 may be mounted horizontally to the sidewall of the duct 45 regardless of its angle of inclination, as shown in Fig. 4. The arm 61 is securely held in its adjusted position relative to the arm 56 by the wing nut 64 which is screwed tightly on the threaded stud 63 to clamp the arms 56 and 61 together. The feature of adjustability provided by the mounting of the present invention, whereby the tank 10 and pan 11 may be mounted horizontally regardless of the angle of inclination of the side wall of the air duct 45, is an important feature even with normally vertical air duct sidewalls. This is true because the weight of the humidifier assembly supported by the duct 45 usually causes the latter to sag. By virtue of the adjustability of the arm 61 relative to the arm 56, compensation for sagging of the duct 45 is achieved and the humidifier assembly may be installed horizontally.

The tank 10 and pan 11 are preferably constructed of relatively rigid material, such as sheet copper for example. The conduit 12 is preferably a rigid tube, such as a copper tube, and provides a rigid supporting connection between the pan 11 and tank 10 as well as a water conduit therebetween. The conduit 12 is also preferably secured to the evaporator pan 11 near the bottom thereof so as to permit its complete draining during the aforementioned siphoning action. The conduit 12 inclines downward from its connection with the pan 11 to its connection near the bottom of the float tank 10, Figs. 3 and 4. Thus the warm water within the evaporator pan 11 will not tend to flow downward through the duct 12 into the float tank 10, and the concentrated water impurities accumulated in the pan 11 after prolonged evaporation of water therefrom will to a large extent be prevented from entering the float tank 10 except during the siphoning process.

The opening within the frame 47 is closed by the movable plate 66 which rests at its bottom on the upturned lugs 67 projecting outward from the lower portion of the frame 47. The upper portion of the plate 66 is held securely against the frame 47 by the latches 68 pivotally secured at 69 to the frame 47. The conduit 12 passes through the duct 45 at the upward opening notch 65 within the lower portion of the frame 47 and the supplementary downward opening notch 70 within the lower portion of the plate 66.

A significant advantage of the present mounting and humidifier arrangement is that the float tank 10 may be conveniently located outside of the air duct 45 to permit its ready accessibility for flushing and cleaning of the humidifier equipment. The mounting utilized in the present invention is particularly advantageous in combination with the specific arrangement of the preferred water level regulating mechanism and siphoning mechanism employed herein which includes the apparatus for flushing, draining, and refilling of the tank 10 and pan 11. Inasmuch as this latter apparatus is located within the float tank 10, the advantage of the accessibility of the tank 10 on the outside of the air duct 45 is immediately apparent.

Installation of the present invention simply requires the cutting of the single hole 46, of sufficient size to permit passage of the evaporator pan 11, within the sidewall of the air heating chamber or duct 45. Screw holes are drilled around the periphery of the opening 46 in alignment with the preformed screw holes in the frame 47 for the screws 48, and the frame 47 is secured in position around the opening 46 with the brackets 57 and 61 projected into the duct 45. The longitudinal evaporator pan 11 is then turned endwise and angularly to the face of the duct 45 so that the right end of the pan 11, Fig. 2, is inserted into the opening 46.

It is noted in Fig. 2 that the connection of the duct 12 to the pan 11 is off center so that the larger portion of the pan 11 may be inserted into the opening 46 and moved to the extreme right thereof. The left end of the pan 11 may then be passed through the opening 46. The backside of the pan 11 is then engaged under the hook 59 and the assembly of the tank 10 and pan 11 is lowered horizontally into position with the pan 11 supported by the bracket 56 between the bracket arms 57 and 58, with the conduit 12 within the notch 65, and with the pins 51 within the elongated pivot holes 50 therefore. The clamping wing nut 64 is then tightened, the removable plate 66 is placed over the opening 46 and engaged with the supporting lugs 67, and the pivotal latches 68 are pivoted to their vertical positions, Fig. 1, to lock the cover plate 66 in position. The assembly is completed by connecting the water inlet duct 22 with a source of water and by connecting the siphon outlet 31 to a drain or sewer.

Access to the evaporating pan 11 for removal or replacement of the evaporating elements 44, or for other reasons, is permitted merely by turning the latches 68 and removing the cover plate 66. It is not necessary to remove the frame 47 from its screw-threaded attachment with the air duct 45. Flushing, draining, and refilling of the evaporator pan 11 and float tank 10 may be semi-automatically accomplished without disturbing the mounting or the evaporating elements merely by lifting the weighted lever 40 to the float depressing position to permit a partial flooding of the tank 10 and to set in operation the above described siphoning action.

In the embodiment shown, the evaporator pan 11 extends essentially longitudinally of the side wall 45 and perpendicularly to the conduit 12. This arrangement is usually preferred where the depth of the duct 45 is shallow. For installations within a duct 45 of suitable depth, the longitudinal axis of the pan 11 may be conveniently extended, from the attachment of the pan 11 to the conduit 12, perpendicularly to the plane of the sidewall of the duct 45. The advantage of this latter arrangement is that the narrow longitudinal axis of the pan 11 may then be passed directly through the opening 46, perpendicularly to the plane thereof, without the requirement of turning the humidifier assembly, as above described, during installation.

A modified embodiment of the present invention is shown in Figs. 5 through 9 wherein a float tank 10 is also connected to an evaporator pan 11 by the water conduit 12. The preferred embodiment of the float tank 10 with the same water level regulating mechanism, siphoning apparatus, and evaporating elements as described in connection with Figs. 1 through 4 are employed with the mounting shown in Figs. 5 through 9. However, it is to be observed that other conventional humidifier evaporators and means for regulating the water level thereof may be satisfactorily employed with the latter embodiment.

Similar to the mounting described in Figs. 1 through 4, the mounting described in the Figs. 5 through 9 includes a frame 47A which is adapted to be secured to the air duct 45 around the opening 46 thereof by the screws 48A. The conduit 12 is supported near its connection with float tank 10 by the reinforcing bracket 49A, to which the conduit 12 is preferably welded and which is secured to the lower portion of the frame 47A in parallelism therewith by means of the wing nut clamping assembly 50A. Projected into the duct 45 from the lower right hand side portion of the frame 47A to which it is secured is the slotted bracket 53A, Fig. 6, which provides the arcuate movement limiting slot 62A.

The horizontal and inwardly projecting arm 56A, which supports the evaporator pan 11, completes an integral right angle bracket with the upright triangular bracket portion 61A, pivotally secured at 60A to the upper bracket 54A which in turn is secured to the right hand portion of the frame 47A similarly to the bracket 54 previously described. The extreme leftward end of the supporting bracket arm 56A, Figs. 7, 8, and 9, provides the upright bracket extension 58A which facilitates the support and alignment of the evaporator pan 11. The threaded stud 63A projects perpendicularly from near the right angle corner juncture of the integral right angle bracket 56A—61A and projects through the arcuate slot 62A to permit clamping of the bracket 53A and the integral bracket 56A—61A securely together in their properly adjusted position by means of the wing nut 64A. Similar to the plate 66, the plate 66A rests on the upturned lugs 67A, provided by the lower portion of the frame 47A, and covers the opening 46. The plate 66A provides the upward opening recesses 71A for the bolts 69A. The plate 66A is secured to the frame 47 upon tightening the wing nuts 68A which screw on the bolts 69A. The downward opening slot 70A in the plate 66A is provided to permit passage of the conduit 12.

The humidifier equipment including the apparatus within the float tank 10 and evaporator pan 11 are essentially identical with that described in connection with Figs. 1 through 4, so that the above remarks relating to the advantages of this type of mounting, with the float tank outside of the air duct 45, also pertain to the modified apparatus shown in Figs. 5 through 9. The obvious installation of the latter apparatus is essentially similar to that previously described, although certain simplifications have been introduced to eliminate the above described pivot 55, the bracket 52 and the pins 51.

In the present embodiment, loosening of the wing nut 64A permits the right angle bracket combination 56A—61A to hang vertically from the pivot 60A and with the evaporator pan 11 at its normal horizontal position, regardless of the angle of the sidewall of the air duct 45. Clamping of the wing nut 64A securely holds the bracket 56A—61A in its adjusted position relative to the bracket 53A provided by the frame 47A. The present arrangement permits access to the evaporating equipment within the duct 45 upon removing the removable plate 66A and also supports the float tank 10 in a conveniently accessible position outside of the duct 45 so that periodic flushing, draining, and refilling of the float tank 10 and the associated evaporator pan 11 may be accomplished without disturbing the evaporating equipment.

By the present invention, applicant has provided novel and desirable improvements in a humidifier and a factory produced mounting therefor whereby the humidifier may be economically mounted to the usual air duct or air heating chamber with a minimum of labor and on-the-job cutting or modification of the said chamber, and whereby ready accessibility to both the humidifier evaporator equipment and float tank is afforded to facilitate repairs, servicing, and the periodic cleaning of the humidifier evaporator equipment with the minimum of effort.

I claim:

1. In a humidifier assembly having an evaporator pan and a water level regulating means and being adapted for adjustable mounting on a single wall of the air duct of an air heating furnace, the combination of a humidifier assembly supporting means attachable to the wall of the air duct, a support for supporting the evaporator pan within the air duct, said support being solely supported by said humidifier supporting means and pivotal relative thereto to adjust said humidifier supporting means relative to the evaporator pan, and means engaging said support and said humidifier supporting means for clamping the latter in any of its adjusted positions.

2. The combination in a humidifier assembly as claimed in claim 1 and being further characterized in that said water level regulating means includes a float control water level regulating means provided within a float tank, a water conduit is provided between said float tank and said evaporator pan for maintaining the water level within said evaporator pan at the water level within said float tank, and a float tank supporting means are provided for adjustably supporting said float tank from said humidifier assembly supporting means.

3. The combination in a humidifier as claimed in claim 2 and being further characterized in that said evaporator pan support comprises a pivotal bracket arm pivotally connected at one end to said assembly supporting means and providing a support for said evaporator pan at the other end, and said clamping means including means for clamping said pivotal bracket arm in a fixed position.

EDWARD W. BOTTUM.

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