Aug. 30, 1949. J. W. GALLOWAY 2,480,641

FURNACE HUMIDIFIER INSTALLATION

Filed April 10, 1946 2 Sheets-Sheet 1

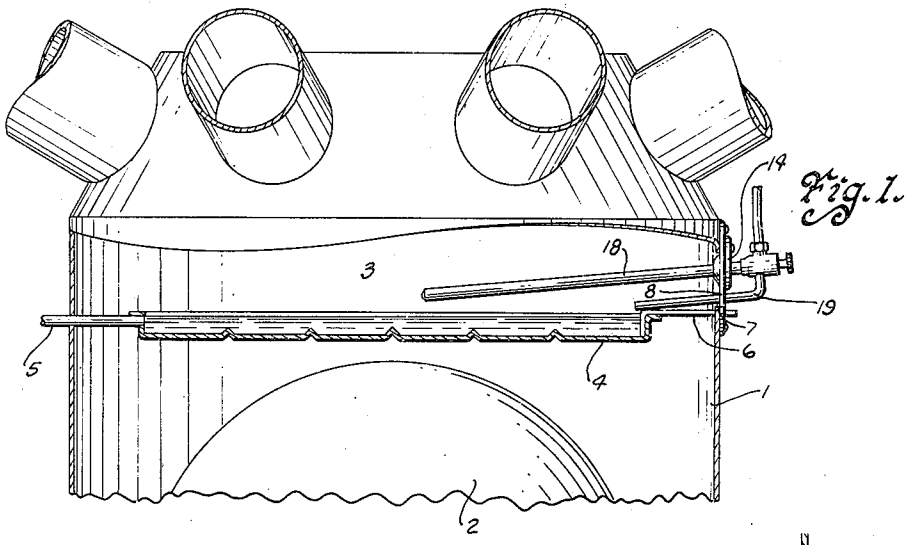


Fig. 1.

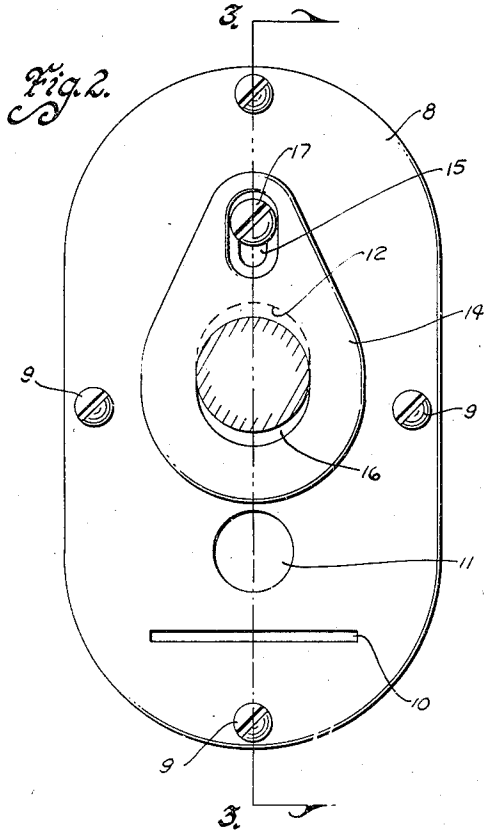


Fig. 2.

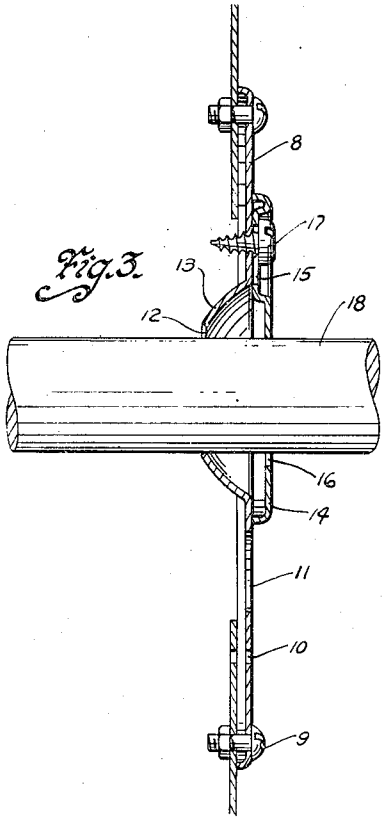


Fig. 3.

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Fig. 4.

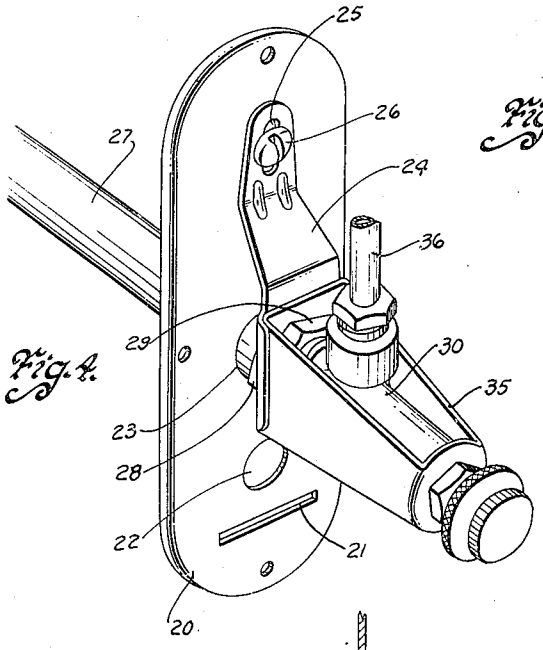


Fig. 5.

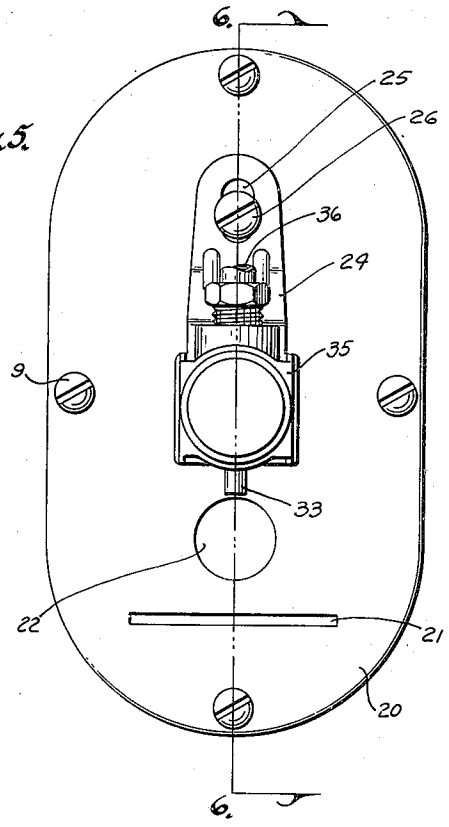
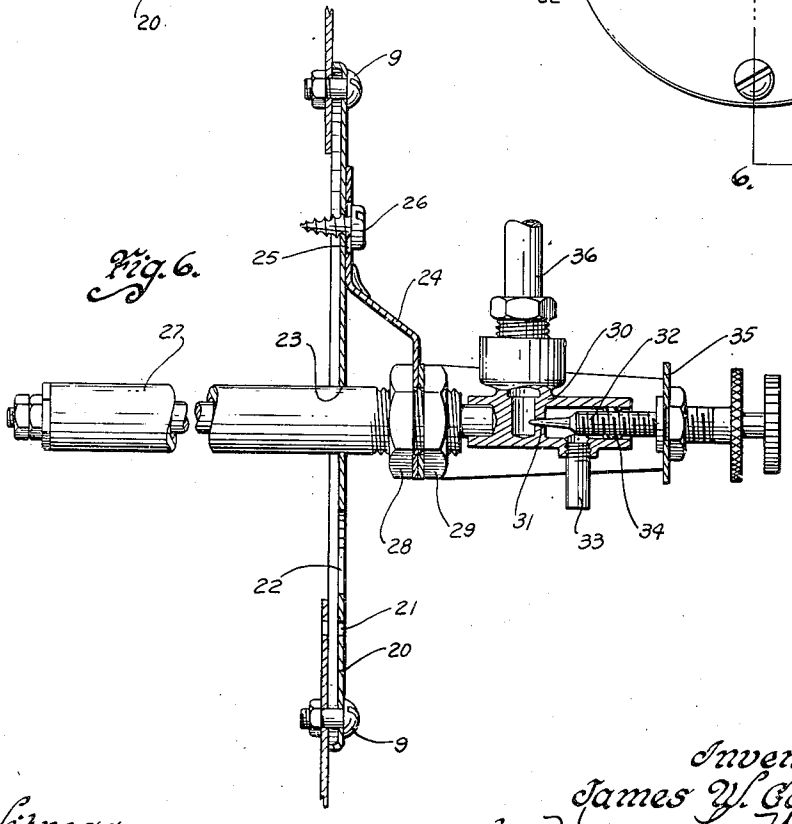


Fig. 6.



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FURNACE HUMIDIFIER INSTALLATION

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6 Claims. (Cl. 126—113)

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The present invention relates to improvements in furnace humidifier installations and more particularly to an improved means for mounting a thermostat and water conduit into a hot air distribution chamber in a furnace.

In hot air furnace construction, side walls of the furnaces may be vertical or they may slope somewhat so that hot air furnace construction is not standardized. Water must be conveyed to a pan within a hot air distribution chamber where it is vaporized and goes into the distribution system with the hot air. It is also necessary to have a thermostat within the hot air distribution chamber which controls a valve by the thermostat expanding and contracting to allow more water to enter as the heat in the hot air distribution chamber increases or less water if the temperature decreases.

It is an object of the invention among others to provide an improved means for mounting in a furnace a humidifier installation; an improved mounting for a humidifier installation in a furnace that is adaptable to any shaped furnace wall; an improved mounting for a humidifier installation that gives a more rigid support for the installation; an improved mounting for a humidifier installation that is easily mounted in a furnace and removed therefrom requiring no special skill to accomplish this operation; an improved mounting for a humidifier installation that is simple and economical in construction and durable and long lasting and an improved mounting for a humidifier installation that is easy of adjustment.

In carrying out the objects of the invention there is provided generally a jacketed hot air distribution chamber in a hot air furnace which furnace has an aperture in the wall thereof. A plate is secured across the furnace wall aperture which plate has a relatively small aperture in its lower part and a larger aperture or apertures thereabove, the material of said plate defining said apertures to provide seat portions. An open pan is placed in the furnace hot air distribution chamber which has an inwardly removable bracket member seated in the small aperture in the plate to support the pan. A thermostat extends into the hot air chamber of the furnace through one of the larger apertures in the plate and is supported on the seat portion of said aperture. A second plate member is attached to the first plate and has an aperture therethrough with the material of said second plate defining said aperture to provide a seat portion. The thermostat extends through the aperture in the second plate

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and is supported on the seat portion on the second plate and the said seat portions on the first and second plates supporting the thermostat being spaced apart to provide a two point support for the thermostat. A water delivery conduit leads to the pan in the furnace chamber and is carried by the thermostat. The water delivery conduit passing through one of the enlarged openings in the first plate is supported on the seat portion of said aperture. The second plate member may be adjustably attached to the first plate member and one means of accomplishing this result is to have a slot in the second plate through which attaching means pass to connect the first and second plate together. The adjustment can occur by movement of the second plate within the confines of the slot when the attaching means is loosened.

One species of the invention shows one of the enlarged openings in the first plate as a dished portion of the plate to be in a different vertical plane than the other openings. The thermostat passes through the opening in the dished portion of the first plate and is supported on the seat portion of said aperture and the seat portion of the aperture in the second plate and said seat portions are spaced apart by the dished portion in the first plate.

In another species, the second plate member is in the form of a spring finger attached to the first plate with the second plate having a slot through which an attaching means passes. The second plate is rigidly attached to the thermostat instead of the thermostat just passing through an aperture in the second plate.

With the foregoing and other objects in view, the invention will be more fully described hereinafter and will be particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views:

Figure 1 is a view, partly in elevation and partly broken away, fragmentally, of the upper part of a hot air furnace showing a thermostat and water conduit connected into the furnace.

Figure 2 is an end elevation of an improved coupling member with a thermostat shown in section.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a perspective view of a different improved type of coupling member and humidifier assembly.

Figure 5 is an end elevational view of the im-

proved type of coupling member and humidifier assembly shown in Figure 4.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

An outer casing of a hot air furnace is represented at 1 containing the usual firebox crown 2. Just above the crown 2 and defined by the outer casing of the furnace is a hot air distribution chamber 3 in which is mounted an evaporation open top elongated pan 4. The pan 4 is supported centrally, diametrically and horizontally and has connected into one end an overflow pipe 5 which delivers any overflow of water outside the casing of the furnace and also serves the purpose of supporting one end of the pan 4. The other end of said pan 4 is supported by a bracket 6. The furnace casing has an aperture 7 therein which aperture is closed by fastening a face plate 8 by means of attaching means 9 unto the furnace casing 1. Plate 8 has a relatively small elongated aperture 10 in its lower part with the material of said plate defining said aperture providing a seat portion to receive and support the bracket 6 which bracket is inwardly removable from aperture 10 to allow assembly and disassembly of the pan 4 to and from the furnace. Overflow pipe 5 is slidable in its opening in the furnace casing hence the pan 4 can be moved back and forth in the furnace to allow for assembly or disassembly of the pan 4. The plate 8 has apertures 11 and 12 above the aperture 10 with aperture 12 occurring in a dished portion 13 in plate 8 with the material of said plate defining said aperture providing a seat portion which seat portion lies in a different vertical plane than the seat portions of the first and second apertures. A second plate member 14 having a slot 15 and an aperture 16 is attached to the first plate 8 by attaching means 17 passing through the slotted portion 15 and into the first plate 8. The second plate 14 is vertically adjustable on the first plate 8 and the amount of adjustment is limited by the length of slot 15. Attaching means 17 is loosened in adjusting the second plate on the first plate to allow relative movement between the two plates after which it is tightened to hold the plates 8 and 14 in adjusted position.

A thermostat 18 extends into the furnace chamber 3 through the plates 8 and 14 and has connected therewith a water conduit 19 that extends through plate 8 and discharges into pan 4. The thermostat 18 rests on the seat portions defining apertures 16 and 12 in the second and first plates 16 and 8 to provide a two point support for the thermostat 18 since apertures 12 and 16 are spaced apart in view of the dished portion 13 of plate 8.

In Figures 4, 5 and 6 a different species of the invention is shown, with a first plate 20 to be attached across an aperture in a furnace wall. A relatively small elongated aperture 21 is provided in plate 20 to receive the bracket from a pan in the furnace chamber, as in Figures 1, 2 and 3, with a second aperture 22 to receive a water conduit and a third aperture 23 to receive a thermostat. It is noted that the third aperture 23 does not occur in a dished portion of plate 20 as in the previously described species but is flush with the plate. A second plate member 24 having a slot 25 in its upper end is adjustably attached to the first plate by attaching means 26. The second plate 24 is bent so as to have its lower portion off-set and in effect is in the form of a spring finger. The lower offset portion of the second plate 24 has an opening there through, and a thermostat 27 passes through the opening in the second plate and is rigidly attached to the second plate 24 by clamping nuts 28 and 29 carried by the thermostat 27. In mounting the thermostat 27 in a furnace chamber, the thermostat 27 has the second plate mounted thereon first after which the thermostat 27 is passed through opening 23 in the first plate 20. When the thermostat has been properly adjusted vertically in the furnace chamber, attaching means 26 is tightened and the thermostat is in place in the furnace chamber. It is noted that this species also provides a two point support for the thermostat and allows the same adjusting features as the previous species.

Figure 6 shows in section a valve member 30 mounted on the end of thermostat 27. The valve 30 has a water inlet pipe 36 connected thereto, an opening 31 in the valve, a needle 32 controlling the opening 31 and an outlet pipe 33 leaving the valve 30 and emptying into the pan within the furnace. The needle 32 is rotatably mounted on a bracket 35 attached to thermostat 27 and surrounding valve 30 for adjusting needle 32 in opening 31. Needle 32 is threaded into a gasket 34 in valve member 30 which gasket provides a seal around the needle. As the thermostat expands and contracts, it moves valve 30 away or towards needle 32 to open or restrict further the opening 31 to control the flow of water to outlet 33. The gasket 34 has a sliding fit with valve 30 and still maintains the seal even though allowing movement of the valve 30 with relation to the needle.

While the invention has been described in connection with several specific embodiments, it is to be understood that the words which have been used are words of description rather than limitation, and that practice of the invention within the scope of the appended claims may be resorted to without departing from the true scope of the invention in all its aspects.

I claim:

1. In a hot air furnace, an outer casing means defining a hot air distribution chamber in the furnace with an aperture in the casing means leading to the hot air distribution chamber, a plate having a relatively small aperture in its lower part and a larger aperture thereabove, the material of said plate defining said apertures providing seat portions and the plate being secured across the furnace wall aperture, an open pan in said furnace chamber supported by a bracket member slidably seated in the small aperture in the plate, a thermostat extending into the hot air distribution chamber through the larger aperture and supported on the seat portion of said larger aperture, a second plate member attached to the first plate having an aperture therethrough aligned with and spaced from the larger aperture in the first plate, the material of said second plate defining said aperture providing a second seat portion, said thermostat extending through the apertures in the first and second plate members and supported on the spaced apart seats in the first and second plate members, a valve associated with the thermostat and connected to a pipe emptying into the pan and said thermostat controlling flow through said valve to regulate flow of water through the valve to the pipe emptying into the pan.

2. In a hot air furnace, an outer casing means defining a hot air distribution chamber in the furnace with an aperture in the casing means leading to the hot air distribution chamber, a plate having a relatively small aperture in its lower part and larger apertures thereabove, the material of said plate defining said apertures pro-

viding seat portions and the plate being secured across the furnace wall aperture, an open pan in said furnace chamber supported by a bracket member slidably seated in the small aperture in the plate, a thermostat extending into the hot air distribution chamber through one of the larger apertures and supported on the seat portion of the said larger aperture, a second plate having an aperture therethrough spaced from the larger aperture in the first plate and attached to the first plate, the material of said second plate defining said aperture providing a second seat portion, said thermostat extending through the second plate aperture which aperture aligns with the larger aperture in the first plate through which the thermostat passes with the thermostat supported on the spaced apart seats in the first and second plate members, a valve associated with the thermostat and connected to a pipe emptying into the pan, said thermostat controlling said valve to regulate flow of water through the valve to the pipe emptying into the pan and said pipe passing through the other large aperture in the first plate to the pan and supported on said aperture seat.

3. In a hot air furnace, an outer casing means defining a hot air distribution chamber in the furnace with an aperture in the casing means leading to the hot air distribution chamber, a plate having a relatively small aperture in its lower part and larger apertures thereabove, the material of said plate defining said apertures providing seat portions and the plate being secured across the furnace wall aperture, an open pan in said furnace chamber supported by a bracket member slidably seated in the small aperture in the plate, a thermostat extending into the hot air distribution chamber through one of the larger apertures and supported on the seat portion of the said larger aperture, a second plate having an aperture therethrough spaced from the larger aperture in the first plate and adjustably attached to the first plate, the material of said second plate defining said aperture providing a second seat portion, said thermostat extending through the second plate aperture which aperture aligns with the larger aperture in the first plate through which the thermostat passes, said thermostat supported on the spaced apart seats in the first and second plate members with the seat in the second plate member vertically adjustable with relation to the seat in the first plate, a valve associated with the thermostat, said thermostat controlling said valve to regulate flow of water through the valve to a pipe attached to the valve emptying into the pan and said pipe passing through the other large aperture in the first plate to the pan and supported on said aperture seat.

4. In a hot air furnace, an outer casing means defining a hot air distribution chamber in the furnace with an aperture in the casing means leading to the hot air distribution chamber, a plate having a relatively small aperture in its lower part and larger apertures thereabove, the material of said plate defining said apertures providing seat portions and the plate being secured across the furnace wall aperture, an open pan in said furnace chamber supported by a bracket member slidably seated in the small aperture in the plate, a thermostat extending into the hot air distribution chamber through one of the larger apertures and supported on the seat portion of the said larger aperture, a second plate having a slot therein, an attaching member through the slot in the second plate and into an opening in the first plate and tightening means to secure the members together, said second plate having an aperture therethrough spaced from the larger aperture in the first plate with the material of the second plate defining the aperture providing a seat portion, said thermostat extending through the second plate aperture which aperture aligns with the larger aperture in the first plate through which the thermostat passes, said thermostat supported on the spaced apart seats in the first and second plate members with the seat in the second plate member vertically adjustable with relation to the seat in the first plate, said second plate being adjustable vertically on the attaching member when the tightening means is loosened by movement of the second plate vertically on the attaching member, said vertical movement limited by the length of the slot, a valve associated with the thermostat, said thermostat controlling said valve to regulate flow of water through the valve to a pipe attached to the valve and emptying into the pan and said pipe passing through the other large aperture in the first plate to the pan and supported on the aperture seat.

5. In a hot air furnace, an outer casing means defining a hot air distribution chamber in the furnace with an aperture in the casing, means leading to the hot air distribution chamber, a plate having a relatively small aperture in its lower part, a second opening above the relatively small aperture and a third opening in the plate in a dished portion of the plate to lie in a different vertical plane than the first and second openings, the material of the plate defining the said apertures providing seat portions and the plate being secured across the furnace wall apertures, an open pan in said furnace chamber supported by a bracket member slidably seated in the small aperture in the plate, a thermostat extending into the hot air distribution chamber through the third of the apertures in the plate and supported on said seat, a second plate having a slot therein, an attaching member passing through the slot in the second plate and into an opening in the first plate and tightening means to secure the first and second plates together, said second plate having an aperture therethrough spaced from the larger aperture in the first plate with the material of the second plate defining the aperture providing a seat portion, said thermostat extending through the second plate aperture which aperture aligns with the third of the apertures in the first plate, said thermostat having a two point support on the spaced apart seats in the first and second plate members with the seat in the second plate member vertically adjustable with relation to the seat in the first plate, said second plate being adjustable vertically on the attaching member when the tightening means is loosened by movement of the second plate vertically on the attaching member, said vertical movement limited by the length of the slot, a valve associated with the thermostat, said thermostat controlling said valve to regulate flow of water through the valve to a pipe attached to the valve and emptying into the pan and said pipe passing through the second aperture in the first plate to the pan and supported on the seat.

6. In a hot air furnace, an outer casing means defining a hot air distribution chamber in the furnace with an aperture in the casing means leading to the hot air distribution chamber, a plate having a relatively small aperture in its lower part and larger apertures thereabove, the material of said plate defining said apertures providing seat portions and the plate being secured across the furnace wall aperture, an open pan in

said furnace chamber supported by a bracket member slidably seated in the small aperture in the plate, a thermostat extending into the hot air distribution chamber through one of the larger apertures and supported on the seat portion of the said larger aperture, a second plate member in the form of a spring finger attached to the first plate having a slot therein, an attaching member passing through the slot in the second plate and into an opening in the first plate and tightening means on the attaching member to secure the first and second plates together, said second plate having an aperture therethrough spaced from the larger aperture in the first plate with the material of the second plate defining the aperture providing a seat portion, said thermostat extending through the second plate aperture which aperture aligns with the longer aperture in the first plate through which the thermostat passes, said thermostat supported on the spaced apart seats in the first and second plate members with the seat in the second plate member vertically adjustable with relation to the seat in the first plate, said second plate being adjustable vertically on the attaching member when the tightening means is loosened by movement of the second plate vertically on the attaching member, said vertical movement limited by the length of the slot, a valve associated with the thermostat, said thermostat controlling said valve to regulate flow of water through the valve to a pipe attached to the valve and emptying into the pan and said pipe passing through the other large aperture in the first plate to the pan and supported on the aperture seat.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,837,213	Galloway	Dec. 22, 1931