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HUMIDIFIER FOR AIR HEATING FURNACES

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This invention relates to a humidifier and more particularly to a humidifier constituting an attachment for a hot air furnace, it being one object of the invention to provide a humidifier which may be very easily applied to a hot air furnace of conventional construction, either as an accessory for a furnace already in use, or to a new furnace during manufacture thereof.

Another object of the invention is to provide a humidifier wherein a pan is so supported in the furnace over the fire pot thereof that it may be very easily inserted or withdrawn when cleaning or replacements are necessary.

Another object of the invention is to provide the humidifier with a support for the pan consisting of rods upon which the pan rests and means carried by the rod for limiting movement of the pan along the rods in one direction beyond a position in which an overflow pipe of the pan will be disposed in position for water to drip into a drain pipe extending out of the furnace and into a sewer.

Another object of the invention is to so arrange the feed pipe and the drain pipe that portions thereof outside the furnace will have breaks permitting an attendant to observe flow of water and thus determine whether correct flow of water has been provided.

Another object of the invention is to permit the pan to be freely removed from its supporting rods, the pan being entirely free from the feed pipe and the drain pipe so that there will be no joints between the pipes and the pan which would be liable to become corroded and difficult to release when removal of the pan is necessary.

Another object of the invention is to provide a humidifier wherein the water pan may be formed of heat resisting glass or other suitable composition and thus prevented from becoming affected by rush or long exposure to heat.

The invention is illustrated in the accompanying drawings wherein:

Figure 1 is a view partially in elevation and partially in section showing the improved humidifier installed in a hot air furnace.

Figure 2 is a sectional view taken transversely through the furnace along line 2—2 of Figure 1 and showing the humidifier in top plan.

Figure 3 is a sectional view taken transversely through the water pan along the line 3—3 of Figure 1.

Figure 4 is a fragmentary view in elevation taken along line 4—4 of Figure 1.

This improved humidifier is intended for use in connection with a hot air furnace which may be heated by coal, gas or oil. The furnace which is indicated in general by the numeral 1 is of conventional formation and has the usual outer jacket 2 in which is a fire pot or box 3. The usual bonnet 4 is provided at the top of the shell 2 and from this bonnet extends the air pipes 5 for conducting hot air to rooms to be heated.

The water pan 6 of the humidifier is supported in the furnace over the fire pot 3 and rests upon rods 7 which extend transversely through the furnace in upwardly spaced relation to the fire pot and have their ends mounted through opposite side portions of the shell or jacket 2. The pan is freely removable from the rods and in order that the pan may be inserted into the furnace or removed therefrom, the jacket 2 is formed at one side with an opening which is normally closed by a closure plate or door 8. This door has slots 9 leading from its lower edge to accommodate headed pins 11 carried by the jacket and a handle 12 is provided in order that the door may be conveniently applied or lifted out of place. Sleeves 13 fit about the rods 7 and carry a cross bar or rod 14 which is fixed to the sleeves and has end portions bent to form arms 15 which extend along opposite sides of the pan when the pan is resting upon the rods 7 and in its proper position upon the rods.

Referring to Figure 2, it will be seen that when the door 8 is removed and the pan thrust into the furnace, it may be shoved along the rods 7 until it engages the cross bar or rod 14 and is held against further movement along the rods in this direction. The arms 15 prevent the pan from sliding transversely on the rods. It will thus be seen that the rod 14 and its arms 15 form a forked abutment member for correctly positioning the pan upon the supporting rods. Pins or set screws 16 which pass through the sleeves 13 hold the abutment member in fixed position upon the rods. The pan is preferably formed of Pyrex glass or similar heat resisting plastic material so that it will not rust or otherwise deteriorate when exposed to heat for a long length of time, and at one end the pan carries an overflow pipe 17 formed of the same material as the pan 6 having its outer end turned downwardly to form a spout 18 so that water overflowing from the pan may drip from the pipe without having a tendency to run along the pipe towards the pen.

Water is supplied to the pan from a suitable source by way of a pipe 19 having a manually operated valve 20 therein so that flow of water from the feed pipe may be controlled. At its lower end, the pipe 19 is threaded into a coupling or
nipple carried by a ring or open bracket 22 carried by the upturned outer end of a delivery pipe 23 which extends through a sleeve 24 into the furnace. A funnel-shaped mouth 25 is provided upon the upturned end of pipe 23 so that water dripping from the nozzle 21 will enter the pipe and at its lower end, the pipe is bent downwardly to form a nozzle 26 disposed over the pan midway the width thereof so that water will drip directly into the pan as it flows from the delivery pipe. At the opposite side of the furnace from pipe 23 is an outlet pipe 27 which passes through the sleeve below rod 7 and has its inner end turned upwardly and provided with a funnel shaped throat 29 disposed under the nozzle 16 of pipe 17 when the pan is resting upon the rods in the position shown in figures 1 and 2. Any water overflowing from the pan through the overflow pipe 17 drips into pipe 27 through which it flows and through the downturned outer end thereof into the coupling or nipple 30 with which the outer end of the outlet pipe is connected. This nipple is carried by an open bracket 31 carried by the body of which is a mouth 32 of a drain pipe 33 which extends vertically and passes through a suitable number of brackets 34 carried by the furnace. The drain pipe may be any length necessary to reach a sewer pipe of the building in which the furnace is located. When this humidifier is in use, it is installed as shown in figures 1 and 2 and the pan filled with water, the valve 20 then being adjusted so that water will drip from the nipple 21, the pan thus kept filled with the necessary amount of water. Heat from the fire pot 3 causes water in the pan to evaporate and supply the necessary moisture to air flowing from the furnace through the air pipes 5. It is preferred to have flow of water from pipe 49 so regulated that the pan will be continuously kept filled and overflow through pipe 17 to such an extent that it drips from nipple 30 into drain pipe 33 at about the same speed that the water drips from the nipple 21. Therefore, an attendant may note the water dripping from the two nipples and determine whether the correct flow of water is taking place, the valve 20 being adjusted then if necessary. By opening the door 9, the attendant may look into the furnace and see the pan, and if necessary, remove the pan through opening 6, clean it, and replace the pan upon the rods 7. Such a plan will be pushed until its movement thereon is stopped by contact with the cross rod 14. Since the pan is entirely free from the pipes 23 and 27, there will be no joints to unscrew when the pan is to be removed.

Having thus described the invention, what is claimed is:

1. A humidifying apparatus for a furnace including a jacket, a fire pot in said jacket, and a bonnet at the top of said jacket having outlets for hot air, said humidifier comprising a support in the jacket including supporting rods extending horizontally in a common plane over the fire pot in spaced parallel relation to each other, a water pan resting upon said rods and movable longitudinally thereof, an abutment carried by said rods, said abutment extending horizontally over said rods in crossed relation thereto and having a pair of arms extending longitudinally of the rods in outwardly spaced relation thereto, the free ends of said arms being bent to form terminal portions extending outwardly from the supporting rods in diverging relation thereto, a water pan inserted into the furnace through said opening and resting upon said rods, said pan being freely movable along said supporting thereof and having arms extending outwardly beyond its normal position by engagement with the rod between the arms thereof and held against transverse movement by the said arms, a water pipe having a valve, an inlet pipe extending through said jacket with its outer end disposed in position to receive water from the water pipe and its inner end terminating over said pan, an overflow pipe for said pan, an outlet pipe extending through said jacket with its inner end disposed in position for receiving water from said overflowing pipe, and a drain pipe for receiving water from the outer end of the outlet pipe.

2. A humidifier for a hot air furnace including a jacket, a fire pot in said jacket and a bonnet at the top of said jacket having outlets for hot air, said humidifier comprising a support in the jacket including supporting rods extending horizontally over the fire pot in transversely spaced parallel relation to each other and in a common plane, a water pan resting upon said rods and shiftable along the same, an abutment over said rods extending longitudinally of the rods toward said jacket and disposed in outwardly and transversely spaced relation to said rods, said jacket being formed with an opening for insertion of the pan, means for delivering water to said pan including a pipe passing through the jacket and a pipe communicating with the outer end of the first pipe and controlled by a manually operated valve, there being space between said pipes whereby flow of water from the valve controlled pipe to the other may be observed, and means for conducting water from said pan including an outlet pipe passing through the jacket with its inner end in position to receive water from the overflow pipe and a drain pipe disposed in position to receive water from the outer end of the outlet pipe and spaced therefrom whereby flow of water from the outlet pipe may be observed.

3. A humidifier for a hot air furnace including a jacket, a fire pot in said jacket, and a bonnet at the top of said jacket having outlets for hot air, said humidifier comprising a support in the jacket including supporting rods extending horizontally in a common plane over the fire pot in spaced parallel relation to each other, a water pan resting upon said rods and shiftable longitudinally thereof, an abutment carried by said rods, said abutment extending horizontally over said rods in crossed relation thereto and having a pair of arms extending longitudinally of the rods in outwardly spaced relation thereto, the free ends of said arms being bent to form guide portions extending outwardly from said arms in diverging relation thereto for engagement with the sides of said pan for guiding the pan into position between the arms for engagement with the abutment and its arms to hold the pan in predetermined position upon the supporting rods, an outlet pipe extending over said abutment, said jacket being formed with an opening for insertion and removal of the pan, valve controlled means for delivering water to said pan, and means for receiving water from the overflow pipe extending externally of said jacket.

4. A humidifying apparatus for a furnace including a jacket, a fire pot in said jacket and a
bonnet carried by said jacket and having outlets for air heated by the furnace, said apparatus comprising parallel supporting rods extending transversely through the furnace in spaced parallel relation to each other and in a common plane above the fire pot with their ends supported by the jacket, said jacket being formed with an opening above said rods, a door movable into and out of closing relation to said opening, sleeves mounted upon said rods, a cross rod carried by said sleeves, said cross rod extending horizontally over said supporting rods in crossed relation thereto and having portions bent to form a pair of arms disposed outwardly of the supporting rods and extending longitudinally of the said rods, the free ends of said arms extending outwardly from the supporting rods in diverging relation thereto, a water pan inserted into the furnace through said opening and resting upon said supporting rods, said pan being freely movable along said supporting rods and limited in its inward movement by engagement with said cross rod and transverse movement of said pan being limited by engagement of the sides of said pan with said longitudinally extending arms, means for supplying water to said pan in regulated quantities, and means for receiving water from said pan extending externally of said jacket.

5. In an apparatus of the character described, supporting rods disposed horizontally in transversely spaced relation to each other and in a common plane, sleeves carried by said supporting rods and shiftable along the same to adjusted positions, an abutment consisting of a rod extending horizontally over the supporting rods transversely thereof and fixed to said sleeves, said abutment rod having end portions bent to form arms extending longitudinally of the supporting rods away from the sleeves in outwardly spaced and substantially parallel relation to the supporting rods, and a pan resting upon the supporting rods and having a portion disposed between the arms and at one end engaged with the abutment rod whereby the pan is held against movement transversely of the supporting rods and against sliding movement along the supporting rods in one direction.

6. In an apparatus of the character described, a support adapted to be mounted horizontally in a furnace over a fire pot thereof, an abutment carried by said support and having a cross bar extending horizontally over the support in crossed relation thereto and arms extending from the cross bar longitudinally of the support in outwardly spaced relation thereto, said abutment being shiftable along the support to adjusted positions thereon, and a pan resting upon said support and slidably along the same to adjusted positions and having an end portion disposed between the arms to prevent transverse movement of the pan upon the support and an end in engagement with the cross bar to limit movement of the pan along the support in one direction.

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