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T. C. GREGG
SPACE HEATER FOR DWELLINGS INCORPORATING
THE DOMESTIC HOT WATER SYSTEM
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2,707,746

FIG - 3

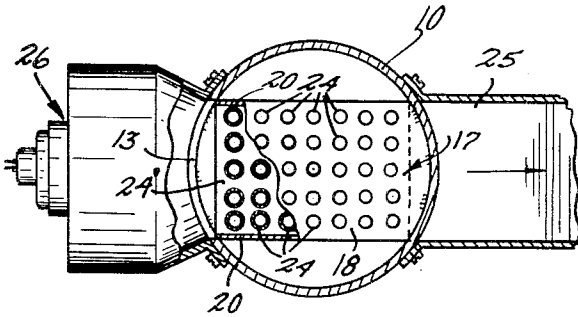


FIG - 1

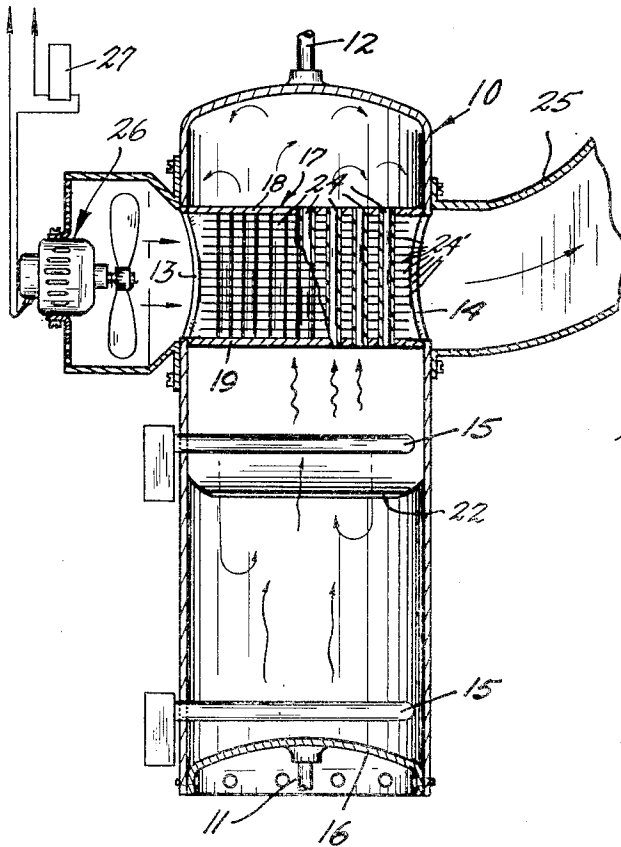
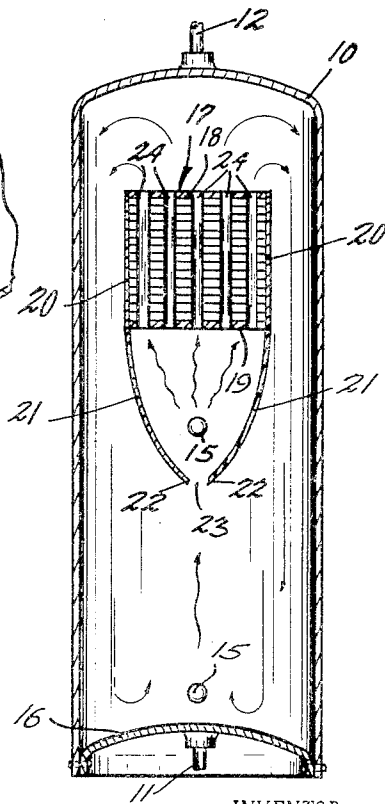


FIG - 2



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1

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SPACE HEATER FOR DWELLINGS INCORPORATING THE DOMESTIC HOT WATER SYSTEM

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4 Claims. (Cl. 219—39)

This invention is a space heater for dwellings.

One object of the invention lies in the provision of a space heater which is incorporated in the domestic hot water system and therefore one which provides means for heating a dwelling without necessitating the use of a separate heating plant.

Another object of the invention lies in the provision of a combined hot water tank forming a part of the domestic hot water system and a heat transfer radiator constructed and arranged to effectively transfer the heat from said hot water tank to the space being heated.

Another object of the invention lies in the provision of a heat transfer radiator incorporated in a domestic hot water system tank and including means insuring proper circulatory flow of the heated fluid through the radiator.

Another object of the invention lies in the provision of a space heater for dwellings which is very efficient and enables one to employ substantially all of the heat created for the purpose of heating the desired space, thus precluding payment for heat lost as through a chimney flue.

Another object of the invention lies in the provision of a space heater incorporated in the tank of a domestic hot water system which is very inexpensive to install and maintain and therefore very desirable from a commercial standpoint.

These and other objects of the invention will become apparent during the course of the following description.

In the accompanying drawings wherein like numerals are employed to designate like parts:

Figure 1 is a vertical cross section taken through the hot water tank of a domestic hot water system and including the heat transfer mechanism of the present invention;

Figure 2 is a vertical cross section taken at 90 degrees from that of Figure 1;

Figure 3 is a horizontal cross section taken above the heat transfer radiator and having parts broken away for convenience of illustration.

Referring now more particularly to the drawings, it will be understood that the tank 10 may be of any desired construction and is incorporated in the domestic hot water system of a house and has the usual cold water inlet pipe 11 and the hot water outlet pipe 12 which leads to the hot water faucets throughout the dwelling. It also should be understood that the primary object of this invention is to avoid the necessity of separate plumbing systems and heating devices and therefore the invention is incorporated in the domestic hot water system of the dwelling.

The tank 10 is provided with diametrically opposed air ingress opening 13 and air egress opening 14. Immediately below the openings 13 and 14 the tank is provided with the conventional two electrically operated immersion type heaters 15. It is obvious that the heaters are disposed one adjacent to the bottom 16 of the tank which is riveted or otherwise removably secured therein and the other at substantially midway the height of the tank while the openings 13 and 14 are disposed above these heaters

2

and upon the same diametrically disposed vertical plane.

Within the tank 10 I provide a heat transfer radiator 17 which initially comprises an open ended rectangular or square box or tube having upper and lower walls 18 and 19 and side walls 20. The end edges of the walls 18, 19, and 20 are shaped to fit the inside face of the tank 10 and the side walls 20 are provided with depending extensions forming baffles 21 which as indicated in Figure 2 are vertically arcuate and terminate with their lower edges 22 in near spaced relation to provide a restricted aperture or port 23 through which the water must enter to circulate upwardly through the radiator 17 thus controlling the flow of circulatory fluid therethrough.

The heat transfer radiator 17 incorporates a bank of vertically extending thin wall tubes 24 which extend through the upper and lower walls 18 and 19 and are hermetically sealed thereto, thus the fluid may circulate upwardly through the tubes 24 and return to the tank from their open upper ends without actually entering the air passage defined by the walls 18, 19, and 20.

The tubes are provided with a plurality of horizontally extending heat transfer fins 24' which enhance the ability of the tubes to transfer the heat from the water to the air in a conventional manner. It will be noted that the upper one of the heating elements 15 is disposed intermediate the baffles 21 and vertically above the restricted port 23 while the lower element 15 is disposed diametrically across the inlet of pipe 11, therefore the cold water temperature is raised somewhat by the lower element 15 causing it to slowly rise and the upper element 15 being confined intermediate the baffles 21, rapidly increases the temperature of the water confined intermediate the baffles 21 creating a natural circulatory pressure wherein the hot water endeavors to rise through the tubes 24 and return to the tank at the upper end after having been cooled somewhat by the air passing through the ingress opening 13 and out the egress opening 14 into the air conductors 25 which may discharge at any predetermined location or plurality of locations.

Obviously, a natural circulatory air system could be employed if desired, however, I propose to include an electric motor driven fan 26 which has incorporated in its electric circuit a thermostat 27 so that the heat within the tank 10 may be transferred to the air, driven by the fan 26 blown into the room until the thermostat 27 reaches a predetermined setting whereupon the fan will be turned off and the water temperature of the tank 10 may rise to that desired for domestic use.

The removable bottom 16 of the tank is provided for means of access to insert the heat transfer radiator into the tank where it can be welded or otherwise hermetically sealed about the openings 13 and 14 and then the bottom 16 may be applied.

I have employed this heating principle in my home for a year's time and I find that the heating elements 15 are sufficient for maintaining the room temperature at the desired approximate 72 degrees F. as well as to provide ample hot water for all domestic uses including washing clothes and baths.

Having thus described my invention, I claim:

1. A space heater for a dwelling having a domestic hot water system including a hot water tank, comprising in combination, a heat transfer radiator incorporated within said tank for receiving and effectively circulating the heated water; downwardly converging baffles secured at the lateral edges of said radiator and terminating in a lower restricted part at their lower edges; a heating element disposed between said baffles; an electrically operated fan having a thermostatically controlled power circuit and disposed to blow air through said radiator, whereby heat is transferred from the water to the air;

3

and hot air conductors for conveying the heated air for said radiator to predetermined locations for discharge.

2. A space heater for a dwelling having a domestic hot water system including a hot water tank comprising in combination a heat transfer radiator incorporated in said tank for receiving and effectively circulating the heated water; said radiator longitudinally extending diametrically through said tank and having air ingress and egress openings at opposed ends and spaced from the sides of the tank laterally of the longitudinal dimension of said radiator; an electrically operated fan disposed to blow air into said radiator through said ingress opening, said radiator having longitudinally extending downwardly converging baffles terminating in near spaced relation to each other at their lower edges and defining a restricted port and secured along the lateral edges of said radiator at their upper ends; and immersion type electric heating elements in said tank extending diametrically thereof parallel with said radiator, one disposed intermediate said depending baffles and the other spaced from the bottom of said tank.

3. In a space heater including a water tank containing a heat transfer radiator extending diametrically there-through and having thin wall open tubes communicating with the interior of said tank and air ingress and egress openings communicating outwardly of said tank for passage of air to carry away heat transferred from the water in said tank, spaced horizontally parallel baffles depending from the longitudinal side edges of said radiator at an inward incline and terminating at their lower edges in near spaced relation and defining a restricted port; and

4

means for effecting circulation of the water which comprises disposing intermediate said baffle plates and vertically above said restricted aperture a heating element, whereby the water heated by said element is confined for circulatory movement upwardly through said tubes.

4. A heat transfer radiator for application in a water tank comprising an initially open ended metal box having its ends shaped to be hermetically secured to the inner side faces of said tank with the box extending diametrically of the tank and having its open ends communicating with ingress and egress openings formed in the tank walls; a plurality of vertically extending thin wall tubes having their ends extending through the upper and lower walls of said box and hermetically sealed therein for effectively circulating heated water in said tank; a plurality of thin horizontally extending fins carried by said tubes and effectively increasing the heat transfer ability of the tubes; and downwardly converging baffles depending from the side walls of said box and terminating with their lower edges in near spaced relation and defining a constricted aperture, whereby the circulatory flow of liquid is controlled to insure adequate heating thereof by a heating element disposed intermediate said baffles to insure circulation.

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