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OIL-BURNING ROOM HEATER

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FIG. 1

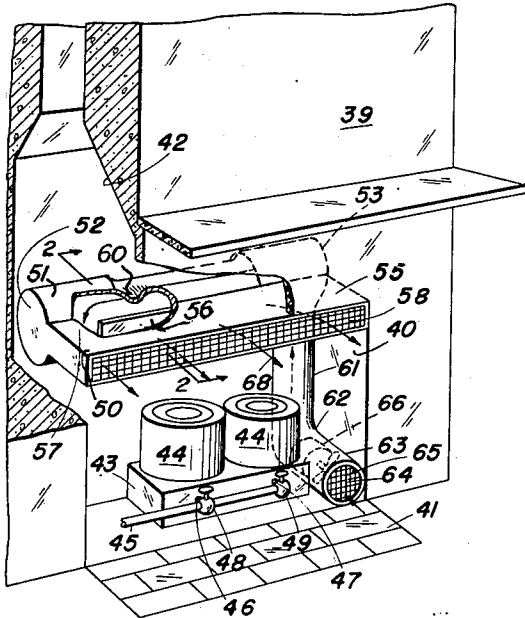
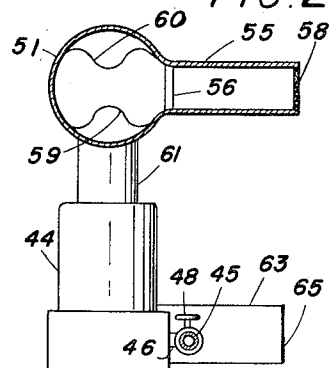


FIG. 2



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OIL-BURNING ROOM HEATER

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2 Claims. (Cl. 126—121)

The present invention relates to heating apparatus, more particularly to an oil burning room heater.

In the interest of personal comfort many forms of heating devices have been developed in order to adequately heat dwellings. The nature of these various heating devices is to a great extent dependent on the climate where the dwelling is situated. In the colder climates, it is desirable to have a permanently installed heating system, which is in constant operation during the colder months of the year. However, in the warmer climates it is necessary that the heating device be of a temporary nature as it is used only on those occasional days when the temperature is sufficiently low that some heating is necessary to maintain comfortable conditions in the dwelling. These temporary heaters are usually positioned in a single room and no attempt is made to heat the entire dwelling but rather a particular room or section of the house. It is desirable that these temporary heaters be small, compact, efficient and economical to operate. They are further characterized by having a minimum of connections which may be readily dismantled when it is desired to discontinue use of the room heating device.

The present trend in these room heaters is to oil burning devices. In addition, increasing use is being made of gas as a heating medium. The conventional room heater comprises a plurality of oil burners which are enclosed within an inner shell. The inner shell is in turn mounted in an outer casing which is attractively styled.

The oil burner heater heats its surroundings by radiating heat from the shell which in turn is heated by the burning of oil in the burner. In addition, there is some heating by convection as the natural air currents within the room contact the shell.

While this arrangement is in most instances adequate, it is not particularly efficient or economical. Since the burners are usually positioned within the center of the shell, there is a loss of heat between the hot portions of the flames generated by the burners and the surrounding shell. This in turn results in less heat to be transmitted to the air which comes in contact with the shell. A considerable quantity of this lost heat escapes with the combustion gases through the flue. In most instances no provision is made for any utilization of the heat carried off with the combustion gases. The waste of heat through these avenues consequently results in an uneconomical operation of the room heater.

The present invention discloses an oil burning room heater which eliminates the above disadvantages. This room heater essentially comprises a plurality of conventional wick oil burners positioned in a casing or the like. A heat exchanger in the form of a conduit is positioned in heat relationship to the oil burners. Means is provided in the heat exchanger to entrap the gases of combustion so as to utilize a considerable portion of the heat of these gases. Inlet means to the heat exchanger is positioned below the combustion area of the burners. Consequently, no CO₂ or other gases of combustion are

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introduced through the conduit to be circulated throughout the room; only clean room air is passed through the conduit and heated for subsequent circulation into the room.

5 This heating device is readily installed in a conventional fireplace. With this installation heating of the room is achieved without the heating device itself occupying any space within the room.

10 It is pointed out that a forced draft to circulate the air through the heat exchanger of these installations may be used. However, a forced draft is in most instances unnecessary as the natural circulation of air currents within the room is adequate to insure proper heating.

15 It is, therefore, the principal object of this invention to provide an oil burning room heater which may be positioned within a fireplace located in a room which is to be heated.

It is, therefore, the principal object of this invention to provide a novel and improved form of a room heater.

20 It is another object of this invention to provide an oil burning room heater wherein the heated air is not contacted by the combustion gases.

25 It is an additional object of this invention to provide an oil burning room heater which may be installed inside or outside of the room to be heated.

It is still an additional object of this invention to provide an efficient and economical oil burning room heater.

30 It is yet another object of this invention to provide an improved method of heating air which is to be circulated within a room.

Other objects and advantages of this invention will become apparent upon reference to the following description when taken in conjunction with the accompanying drawings wherein:

35 Figure 1 is a perspective view illustrating the room heater of this invention installed in a fireplace with a portion of the fireplace broken away to clarify this illustration; and

40 Figure 2 is a sectional view taken along the lines 2—2 of Figure 1.

Proceeding now to the drawings, more particularly to Figure 1, wherein like reference symbols indicate the same parts in various views, there is illustrated therein a heating device of this invention installed in a conventional fireplace located in the room which is to be heated. The wall of the room is indicated at 39 with a fireplace 40 built therein. The fireplace 40 has a hearth 41 and has a conventional flue 42 extending upwardly from the top wall of the fireplace. Situated on the bottom of the fireplace is a supporting base 43 upon which are mounted two conventional wick-type oil burners 44. The oil burners 44 are supplied from a main fuel line 45 having branches 46 and 47 which lead to the individual burners. Each of the branches 46 and 47 has an individual control valve 48 and 49 respectively located therein. In addition, a constant level float valve may be provided in the main fuel line.

There is a heat exchanger 50 spaced above the oil burners 44. The heat exchanger 50 comprises a horizontally extending cylindrical tubular conduit 51. The conduit 51 has closed ends 52 and 53. There is a longitudinally extending slot 54 in the side wall of the conduit directed to the front part of the fireplace. A rectangularly shaped conduit 55 having a cross-section similar to the outline of the slot 54 is attached to the cylindrical conduit 51 about the edges of the longitudinal slot 54. A baffle 56 is placed within the longitudinally extending slot so as to leave an opening 57 adjacent one end of the slot. A suitable screen or filter 58 is provided over the outer end of the flattened conduit 55. The cylindrical conduit 51 has a longitudinally extending depression or pocket 59 on the downward face thereof, which depression is il-

illustrated in detail in the sectional view of Figure 2. The upper wall portion of the cylindrical conduit 51 is also inwardly pressed and has an upper depression or pocket 60 therein, which may be filled.

Room air is admitted to the heat-exchanger 51 through an inlet conduit 61 approximately 4 inches in diameter which communicates with the cylindrical conduit adjacent the closed end 53 thereof. The inlet conduit 61 comprises a vertical portion which extends downwardly to the vicinity of the floor of the fireplace, and then bends at a right angle 62 to provide a horizontal portion 63 which extends outwardly of the fireplace to the wall 39. A suitable screen or air filter 64 is provided at the open end 65 of the horizontal portion of the inlet conduit. Means for producing a forced draft may be provided in the inlet conduit, such as an electric fan 66 in the horizontal portion 63.

As indicated previously, room air enters through the open end 65 of the inlet conduit. This entry of air is due to the natural flow of air currents within the room. However, if desired, a suitable forced draft means, such as a fan, may be mounted in the inlet conduit. The room air flows upwardly through the inlet conduit 61, and enters the heat exchanger 50. It has been found that the most efficient use of heat from the oil burners 44 in the heat exchanger 50 will be obtained if the heat exchanger is positioned at the tip of the blue portion of the flames generated by the oil burner. Specifically, the bottom flat portion of the heat exchanger is at the tip of the blue portion of the flame. With this construction, most of the combustion gases of the flame will be entrapped within the pocket 59. The entrapment of these gases will enable the greater portion of the heat carried therein to be transmitted to heat exchanger 50 to be subsequently conducted therethrough to heat the room air passing through the air exchanger. Combustion gases entrapped within the pocket are subsequently displaced by additional combustion gases with the result that the displaced gases flow around the periphery of the heat exchanger. The displaced combustion gases then escape through the flue 42.

The room air is heated as it passes through the cylindrical portion 51 of the heat exchanger 50. The heated air then flows through to the opening 57 which is adjacent the end 52 of the cylindrical conduit, into the flattened conduit 55. The air is free to flow throughout the entire volume thereof and consequently warm air will be distributed through the room throughout the entire length of the outlet opening 57. The flow of warm air into the room is indicated by the arrows 68.

Thus it can be seen that an oil burner room heater is provided which efficiently heats room air through the use of a heat exchanger. It is pointed out that since the room air is conducted through the heat exchanger, the combustion gases from the oil burner do not at any time contact the room air. Consequently, when the air is discharged into the room there will be no odor or CO₂ accompanying the circulated air. Further assurance that the circulated air will be odorless and clean is provided by positioning the opening of the inlet conduit proximate to the floor of the room. Consequently, only clean room air is admitted into the heat exchanger. Efficient utilization of fuel oil results from the use of this room heater since heat is acquired by the heat exchanger not only from heat radiated from the oil burners but also by absorbing heat from the combustion gases prior to their escape through the flue. This considerably diminishes heat losses through the flue.

This oil burner heater is simple and inexpensive in construction since conventional components may be employed throughout. The construction of the heat exchanger and the inlet and outlet conduits may be made of conventional conduit material. Hence, the heat exchanger struc-

ture entails a nominal additional expense which is compensated by the increased efficiency obtainable from this room heater.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions, and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

What is claimed is:

1. In a hot air heating device, a fireplace comprising top, side, bottom and rear walls, the front thereof being open, a plurality of circular, wick-type oil burners mounted on the bottom of said fireplace and adjacent and parallel to said rear wall, a horizontally extending cylindrical conduit vertically above said burners, said cylindrical conduit having a diameter substantially equal to the diameter of said burners, means closing both ends of said cylindrical conduit, a vertical inlet conduit communicating with the wall of said cylindrical conduit adjacent one end thereof and having its inlet opening below the wick level of said burners and forwardly thereof, a forwardly extending rectangular conduit having a width coextensive with the length of said cylindrical conduit and having the forward end thereof open and positioned along the upper front edge of said fireplace, the rear end of said rectangular conduit being attached to the wall of said cylindrical conduit, there being means defining an opening substantially equal to the height of said rectangular conduit adjacent said other end of said cylindrical conduit to provide communication between said cylindrical and rectangular conduits, the bottom of said cylindrical conduit being formed with a longitudinally extending depression terminating short of each end of said conduit.

2. In a hot air heating device, a fireplace comprising top, side, bottom and rear walls, the front thereof being open, a plurality of circular, wick-type oil burners mounted on the bottom of said fireplace and adjacent and parallel to said rear wall, a horizontally extending cylindrical conduit vertically above said burners, means closing both ends of said cylindrical conduit, and a vertical inlet conduit communicating with the wall of said cylindrical conduit adjacent one end thereof and having its inlet opening below the wick level of said burners and forwardly thereof, a horizontally disposed rectangular conduit having a width coextensive with the length of said cylindrical conduit and having one end thereof open and positioned along the upper front edge of said fireplace, said rectangular conduit extending from said cylindrical conduit to distribute heated air over a wide area at the level of the cylindrical conduit which acts as a heat exchanger, the other end of said rectangular conduit being attached to the wall of said cylindrical conduit, there being means defining an opening adjacent the other end of said cylindrical conduit registering with said other end of said rectangular conduit, the bottom of said cylindrical conduit being formed with a longitudinally extending depression terminating short of each end of said cylindrical conduit.

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