

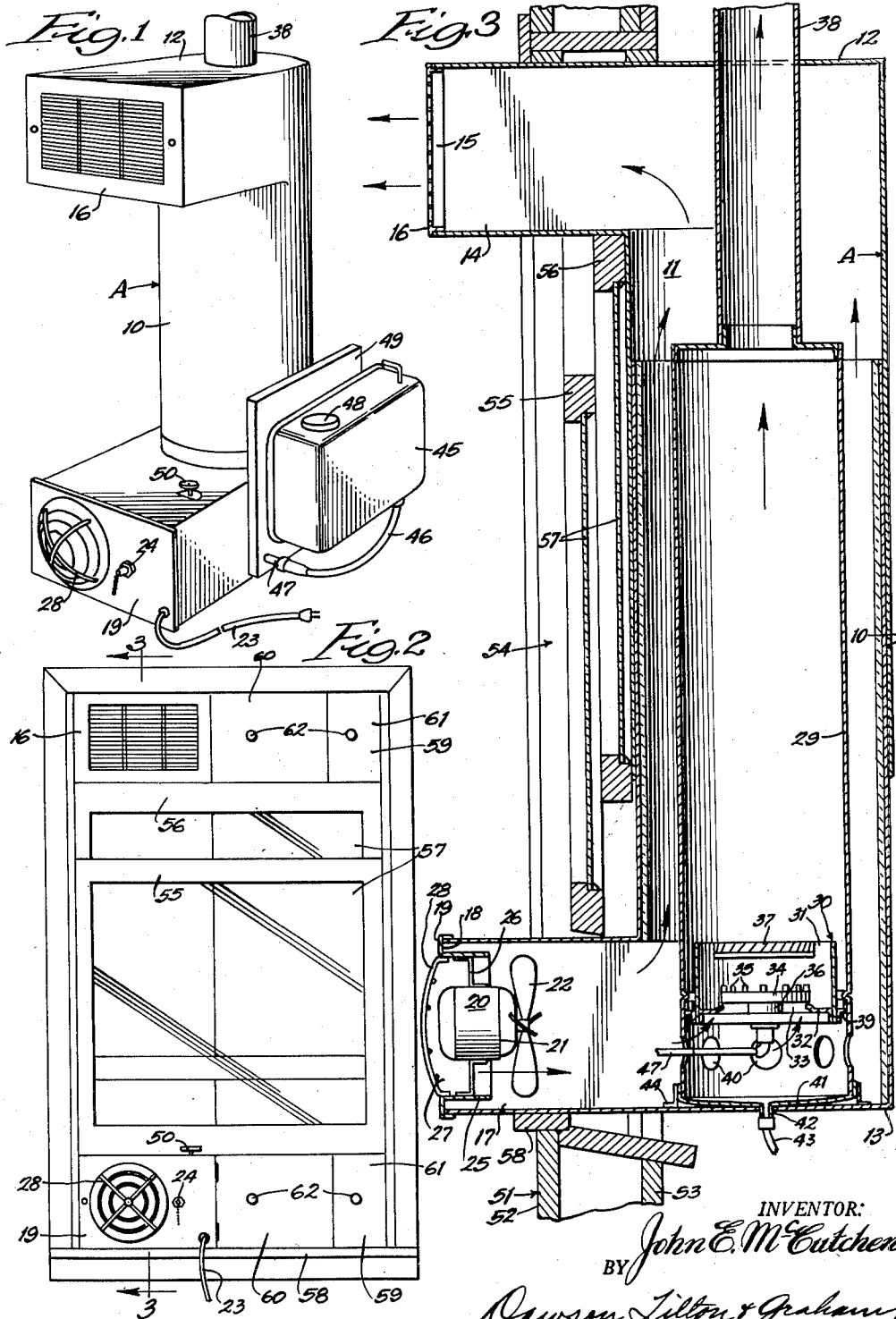
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WINDOW-SUPPORTED HOT AIR HEATER

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WINDOW-SUPPORTED HOT AIR HEATER

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This invention relates to a space heater and, more particularly, to a window heater adapted to be mounted in a window space of an exterior room wall with portions thereof extending through the window while the body of the heater is supported on the outside of the window.

In some areas in the South, notably Florida, many houses are constructed with no adequate provision for heating. Many of these houses are built with insufficient room to accommodate a space heating stove or furnace and in most cases these houses do not have a chimney or flue to which a space heater might readily be connected so that the combustion gases could be carried to the outside of the house. Usually these houses are entirely dependent on electric energy for heating when, during unseasonably cold spells, heating of the house becomes necessary. Frequently intolerable loads are placed on the electric power facilities in such southern areas with the result that power lines are seriously damaged and often the wiring within the house is not designed to adequately carry heating loads. Frequently large areas are blacked out because of the damage done by overloads to the power distribution systems, and this necessitates expensive repairs and during the periods when power is not being supplied, heat cannot be provided in the houses and the persons therein must suffer the discomfort of the cold.

There has long been a need for a space heater particularly suitable for use in southern areas such as those described, that is not dependent upon electric power as a source for the production of heat, and wherein the heater can be mounted on the outside of a house so that the combustion or waste products can be carried directly to the atmosphere and without necessitating the provision of flues or chimneys, etc. in the houses themselves. A space heater that can be suitably mounted on the outside of the house would further eliminate overcrowding of the houses that are not designed to have space heaters mounted therein.

It is accordingly an object of this invention to provide a space heater mountable in a window space provided by an exterior building wall so that the heater structure is on the outside of the window and ducts extend there-through and communicate with the interior of the building. Another object of the invention is to provide in such a heater a casing providing a heating chamber therein and wherein the casing has telescoping portions so that the heater is readily adapted to the size of a given window. Still another object is the provision in such a heater of a burner adapted to burn liquid fuels and that is equipped with a drip pan having a drain communicating directly with the outside and to waste, while the burner is also equipped with a flue that communicates with the atmosphere on the outside of the house. A further object of the invention is to provide a window heater as described having a casing providing a heating chamber therein, and mounted within the heating chamber is a burner having air supply openings communicating with the heating chamber, a blower being provided in an inlet

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duct extending through the window for providing both the heating chamber and the burner with air. Yet a further object is to provide in a room having an exterior wall equipped with a window providing vertically adjustable sashes, a heater providing a casing with telescoping sections each equipped with a duct, the casing being mounted on the outside of the window while the ducts extend there-through and communicate with the room; adjustable closure panels being provided to seal off the window openings not occupied by the ducts. Additional objects and advantages will appear as the specification proceeds.

An embodiment of the invention is illustrated in the accompanying drawing, in which—

Fig. 1 is a perspective view of my window heater; Fig. 2 is a front view in elevation of a window space having the heater mounted therein; and Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

The window heater is designated generally with the letter A and includes a casing 10 providing a heating chamber 11 therein. Preferably, the casing 10 is formed in two parts, an upper casing portion 12 and a lower casing portion 13. The inner ends of the casing sections 12 and 13 are telescopically engaged and in the specific illustration given, the upper casing portion 12 has a slightly greater diameter than the tubular casing portion 13 and therefore telescopically receives the lower casing portion therein.

Each of the casing portions 12 and 13 is provided with a laterally-extending duct. The casing portion 12 is provided with an outlet duct 14 that is adapted to extend through a window space, as illustrated and as will be described subsequently. If desired, the inner end of the duct 14 providing an outlet port 15 may be equipped with a louvered closure member 16 that may be conventional in all respects and will therefore not be further described. Similarly, the lower casing portion 13 is equipped with a laterally-extending inlet duct 17 providing an inlet port 18 at its inner end. The inlet port 18 may be closed by a closure panel or plate 19 that has rigidly mounted thereon a blower 20. In the illustration, the blower 20 comprises an electric motor 21 having fan blades 22 mounted on the motor shaft. A suitable cable 23 extending through an aperture in the closure panel 19 is adapted to connect the motor 21 to a suitable source of power. Desirably, a switch 24 is provided so that control of the motor is available on the closure panel 19. To provide a mounting for the motor 21, the panel 19 is equipped with inwardly-extending flanges 25 having rigidly secured thereto brackets 26 that carry the motor. The panel 19 also provides an inlet 27 that may be enclosed by a grille 28. Preferably, the closure panel 19 is readily removed from the inner end of the duct 17 since access must be provided to the interior of the chamber 11 for lighting the burner, etc. therein, and that will now be described.

Mounted within the casing 10 and substantially centrally aligned within the heating chamber 11 provided thereby is a tubular shell or heat exchanger 29 that is elongated and extends substantially throughout the length of the chamber 11. Mounted within the lower end of the heat exchanger 29 is a fuel burner 30 that is preferably designed to burn liquid fuels. Any burner 30 may be provided, but I prefer to use a burner that is equipped with a cylindrical outer shell 31 having rigidly secured to the bottom end thereof an air baffle 32. The air baffle 32 provides centrally an annular opening 33 through which air may flow to provide the oxygen necessary for combustion of the fuel. Extending through the annular opening 33 is a wickholder 34 equipped with a plurality of fibrous wicks 35 having inner ends that extend into a reservoir cup 36. The cup 36 communicates with a supply tube 47 that is connected to a source of liquid fuel. Also

within the tubular casing 31 is a retarder or flame spreader 37 that retards the rate of flow of combustion gases and thereby insures a greater heat exchange. At its upper end, the heat exchanger 29 is equipped with a flue or stack 38 that extends outwardly through the upper end of the casing portion 12. The products of combustion are discharged directly to atmosphere through the flue 38.

Adjacent the burner 30 the heat exchanger 29 is provided with inwardly-extending brackets 39 that serve as a mounting means for the fuel burner 30. Below the burner 30 the shell or heat exchanger 29 is provided with a plurality of openings 40 therethrough that permit supply air to enter into the interior of the combustion chamber and to flow upwardly about the wicks 35. At its lower end, the exchanger 29 is equipped with a drip pan 41 that has centrally a drain port 42 connected to a drain tube 43 that may lead to waste. Any liquid fuel overflowing the burner 30 is caught by the drip pan 41 and carried therefrom by the tube 43 to a suitable disposal. The drip pan 41 is equipped with an upwardly-extending annular flange that is adapted to telescopically receive the lower end of the heat exchanger 29. The drip pan may be secured rigidly to the heat exchanger by tack-welding or riveting, etc. Preferably, an annular generally L-shaped support member 44 rigidly secured to the lower casing portion 13 and to the heat exchanger 29 and drip pan 41 rigidly holds the heat exchanger and members carried thereby centrally within the casing 10.

As previously stated, the fuel burner 30 may be a conventional burner and may be supplied with fuel by any conventional and well-known means. As can be seen best in Fig. 1, I prefer to provide with the space heater A a storage tank 45 that can be connected to the burner by means of the conduit 46 that communicates with the interior of the tank 45 and which, at its other end, may be connected to the tube 47. The tank 45 is provided with the usual cap-equipped closure 48 and may be mounted upon a support plate 49 rigidly secured to the outside of the casing 10. Preferably, a valve is provided in the supply tube 47 so that the quantity of fuel flowing to the burner 30 may be readily regulated. Since such valves are old and well-known in the art no illustration and description thereof is included in this specification. It is noted, however, that in both Figs. 1 and 2 a control knob 50 is provided for opening and closing a valve connected therewith. It is to be understood, however, that any of the well-known means for supplying fuel to the burner 30 may be provided. The storage tank 45 may be eliminated and the burner connected directly to permanent storage tanks, either of the gravity feed type or those equipped with pumps.

The space heater 10 is particularly adapted for mounting in a window space provided by an outside room wall, and in the illustrations in Figs. 2 and 3 the heater is shown mounted in a window space. In Fig. 3, the wall is designated generally with the numeral 51 and may include an inner wall portion 52 and outer wall portion 53 that are in spaced relation and provide the usual wall space therebetween. The window provided in the wall 51 is designated with the numeral 54. In this case the window 54 has a pair of vertically-movable and adjustable sashes 55 and 56. The usual glass panes 57 may be mounted in each of the window sashes. Preferably, the inlet duct 17 and outlet duct 14 are rectangular so that they may be snugly abutted on the outer sides by the window frame and on the inner sides by the window sashes 55 and 56.

The lower inlet duct 17 rests upon the window ledge 58, and any desired means may be employed to mount and support the heater in the position illustrated. If desired, brackets may be secured to the casing 10 and to the outer wall panel 53. Since normally the windows in which the heater will be mounted are somewhat wider than are the ducts 14 and 17, it is desirable to fill the

space that would remain open because of the inability to close completely the window sashes 55 and 56 when the ducts extend through the window. I provide adjustable closure panels 59 for this purpose. Preferably, the panels 59 have the same height or vertical dimension as the ducts 14 and 17 and are longitudinally adjustable so that they can readily accommodate windows of various sizes. If desired, the closure panels 59 may be of two-piece construction as illustrated in Fig. 2, and the two pieces 60 and 61 are telescopically engaged and may be extended or contracted as required. Knobs 62 are provided for convenient manipulation of the panels 59.

Operation

To install the heater 10 the upper window sash 56 is lowered, while the lower window sash 55 is raised. Suitable spaces are thus provided through which the ducts 14 and 17 may extend. Since windows vary considerably in size, the casing portions 12 and 13 are made telescoping and the longitudinal dimension of the heater may therefore be readily adjusted to accommodate any particular window. After the height of the casing 10 is determined and the ducts are extended through the window openings, the casing is secured in the appropriate position with the lower surface of duct 17 resting upon the window ledge 58, while the upper edge of the duct 14 is brought into abutting relation with the upper edge of the window. The sashes 56 and 55 are then moved in the appropriate direction to bring them into abutting engagement with the inner surfaces of the ducts 14 and 17. Preferably, sealing gaskets are provided about the peripheral surfaces of the ducts so that a tight sealing engagement of the sashes with the ducts and of the window frame with the ducts may be attained.

If the window is greater in width than is each of the ducts 14 and 17, the panels 59 are placed in the position shown in Fig. 2 and are manipulated until the space is entirely filled. If desired, gaskets may be employed about the periphery of the panels 59.

After the heater is installed and an appropriate supply of fuel is provided for the burner 30, the control knob is adjusted to provide fuel to the wicks 35. The cover plate 19 is then removed from the inner end of the duct 17 and the burner 30 is ignited. The panel 19 is then replaced and the blower 20 started. The blower 20 draws air inwardly from a room space and forces it both upwardly within the heating chamber 11 and about the heat exchanger 29 where it is heated and then directs it outwardly through the outlet duct 14. At the same time, a portion of the air provided by the blower 20 flows through the apertures 40 in the side wall of the heat exchanger 29 and flows upwardly through the annular opening 33 provided by the air baffle 32, and mixes with the fuel vapors provided by the wicks 35. The combustion gases flow upwardly through the heat exchanger 29 and thereby heat the same, and then continue upwardly through the flue 38 and outwardly therefrom to the atmosphere. In the event there is an overflow of liquid fuel from the burner 30, it is caught by the drip pan 41 and is carried to waste by the tube 43.

While in the foregoing specification an embodiment of the invention has been set out in considerable detail for purposes of illustration, it will be apparent to those skilled in the art that considerable change in these details may be made without departing from the spirit of the invention.

I claim:

1. In a room equipped with an exterior wall having a window frame and opening therein, a casing providing a heater chamber therein and equipped with a forwardly-extending inlet duct and, spaced therefrom, a forwardly-extending outlet duct, said casing being positioned on the outside of said window frame with said ducts extending inwardly through said window opening and communicating with the room, and a flue-equipped heater

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mounted within said chamber and with the flue extending outwardly slidably through a wall of said casing and on the outside of said window frame, said casing having longitudinally extensible and contractable telescoping sections and said flue being substantially parallel to the longitudinal axis of movement thereof and to the plane of said window frame.

2. The structure of claim 1, in which said inlet duct is equipped with a blower mounted upon a removable panel closing the inlet duct, said panel having an opening therethrough providing an air inlet.

3. In combination with a window in an exterior wall of a room and with sash members slidably mounted in the frame of the window for closing and opening the window, a casing having an air-heating chamber therein, said casing having a forwardly-extending inlet duct at the bottom thereof and a forwardly-extending outlet duct at the top thereof, said sash members being raised at the bottom and lowered at the top to receive said inlet and outlet ducts and to abut the same, said casing portion providing the inlet duct resting upon the bottom of the window frame for supporting said space heater casing and said outlet duct engaging the top portion of the window frame, whereby said casing is maintained in position by said window frame with the heating chamber outside the window, and a flue-equipped heater mounted in said heater casing and having the flue thereof extending out-

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wardly through a wall of said casing outside the window.

4. The structure of claim 3, in which said heating chamber casing is formed of two telescoping parts for increasing or decreasing the distance between the inlet and the outlet.

5. The structure of claim 3, in which the inlet and outlet members are provided with extensible closure panels for closing the window area extending laterally thereof.

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