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SPACE HEATER

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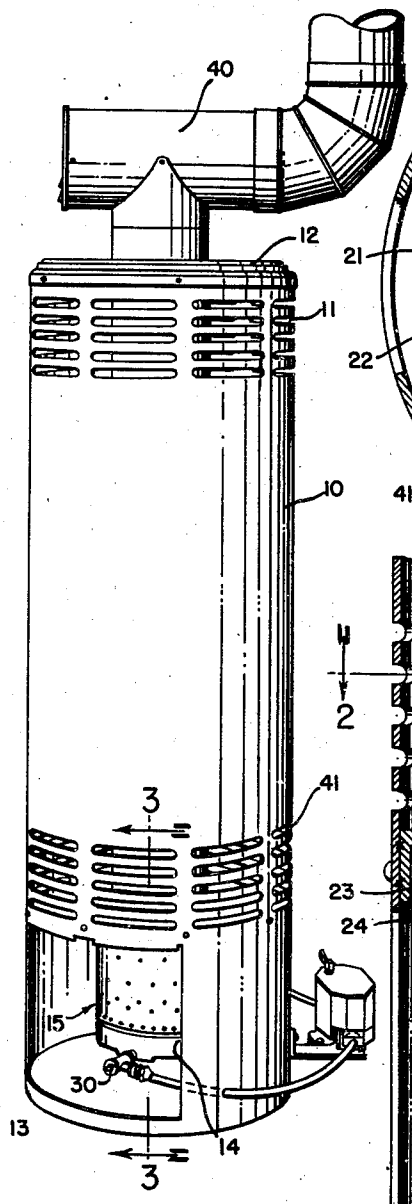


FIG. 1.

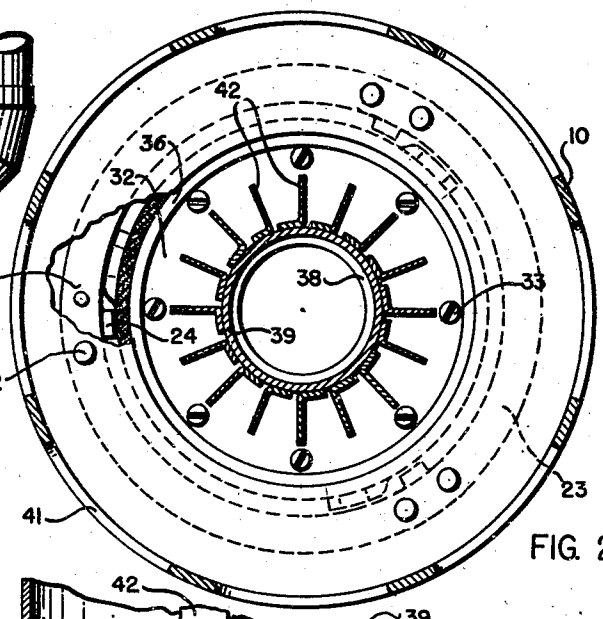


FIG. 2.

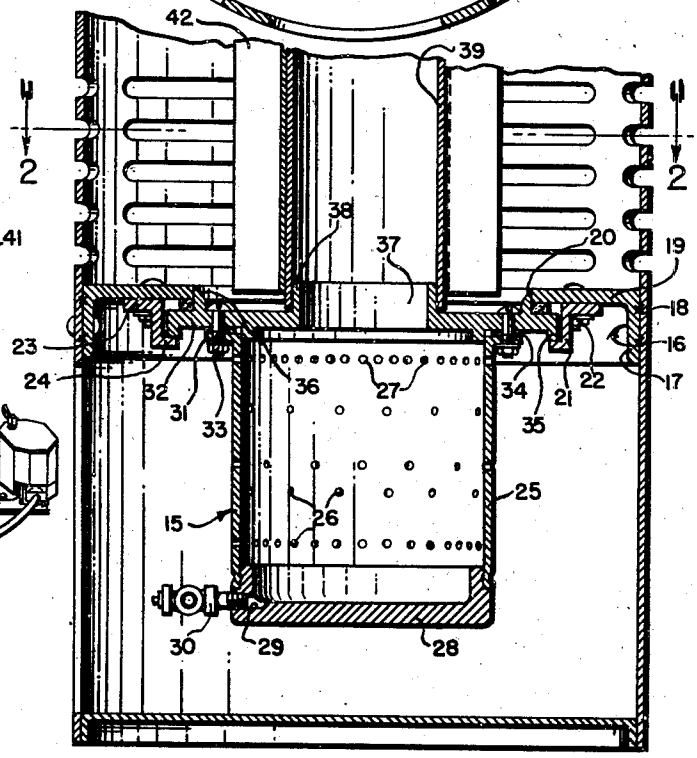


FIG. 3.

INVENTOR
ALLEN P. LIVAR

BY Harris Lind Pate & Harris

ATTORNEYS

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SPACE HEATER

Allen P. Livar, Dayton, Ohio, assignor to Chrysler Corporation, Highland Park, Mich., a corporation of Delaware

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2 Claims. (Cl. 126—94)

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This invention relates to an improved space heater.

More particularly the invention pertains to improvements in a heater of this kind which is adapted to burn liquid fuel.

One of the main objects of the invention is the provision of a space heater of simple and economical construction which has efficient heat transfer characteristics.

Another object of the invention is to provide a single unitary member of uniform cross-section in a heater of this kind which extends substantially straight and vertically the main length of the unit and which serves to provide a combustion space, extended heat transfer surface, and an outlet flue for products of combustion.

Another object of the invention is to provide on the wall portions of the foregoing member which surround the combustion space therein, a plurality of heat radiating fins that serve to increase the heat transfer surface of the device and to prevent overheating of the sheet metal of which it is formed.

A further object of the invention is to provide in a space heater having a gravity air feed, liquid fuel burning unit, a vertically extending combustion space which is laterally confined substantially to the lateral dimensions of the flame and fuel mixture outlet of such unit in order to improve the draft and heat transfer characteristics of the heater.

An additional object of the invention is the provision in a device of this kind of an improved mounting for a liquid fuel burning pot and connection between the latter and the conduit which serves to provide a combustion space, heat transfer element and flue passage.

An illustrative embodiment is shown in the acompanying drawing, in which:

Fig. 1 is a side elevational view of a space heater embodying the invention.

Fig. 2 is a horizontal sectional view taken on line 2—2 of Fig. 3.

Fig. 3 is an enlarged, fragmentary, sectional view taken on the line 3—3 of Fig. 1.

In the form of the invention illustrated in the drawing the improved space heater comprises an outer casing or shell 10 of cylindrical shape which preferably has a continuous sheet metal wall structure. The entire heater, as well as the casing 10, is of substantially greater length than cross-sectional dimensions. Formed in the upper end portion of the sheel 10 are heated air outlet openings 11. The upper end of the shell 10 is provided with a top wall 12 having a central

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opening therein. A relatively large opening 14 is formed in one side of the casing 10 adjacent the lower end portion thereof for accommodating installation and removal of a pot burner, generally designated by the numeral 15, hereinafter more specifically defined.

Provided in the interior of the casing 10 immediately above the upper extremity of the opening 14 is a mounting bracket, generally designated by the numeral 16, having a peripheral flange 17 which is adapted to be welded, riveted, or otherwise secured at 18 to the side wall structure of the casing. The bracket 16 has a horizontal flange 19 in which is provided a central circular opening 20. A mounting ring 21 is detachably suspended from the lower side of the horizontal flange 19 by bolts 22. The mounting ring 21 has an upper outwardly extending horizontal flange 23 provided with apertures for receiving the bolts 22 and a lower inwardly extending flange 24 for providing a seat on which the burner pot unit 15 is mounted.

The burner pot unit 15 comprises a cylindrical body portion 25 having a metal wall structure provided with primary air inlet openings 26 and secondary air inlet openings 27, and a lower bottom section 28 provided with a passage 29 to which a fuel supply 30 is connected. The main body portion 25 of the burner pot has an open upper extremity and is provided with an outwardly extending flange 31. Extending across the open upper extremity of the main body portion 25 of the pot is a flame plate 32 having portions which lie over and extend beyond the flange 31 of the pot. The flange 31 of the pot is detachably connected by bolts 33 to the flame plate 32, a suitable gasket 34 being disposed between the flange 31 and flame plate 32 to produce a sealed connection therebetween. Formed on the periphery of the flame plate 32 is a downwardly extending flange 35 which seats upon the flange 24 of the mounting ring 21. The flame plate 32 is preferably piloted into a central position with respect to the opening 20 of the horizontal flange 19 by an upwardly extending cylindrical flange 36 formed integral with the flame plate 32. The flame plate 32 has a central circular opening 37 which is surrounded by a cylindrical flange or tube section 38 that extends upwardly into the opening 20 of the horizontal flange 19.

A cylindrical conduit 39 is fitted in telescoping relationship on the cylindrical tubular section 38 of the flame plate 32 and extends upwardly from the latter throughout the main length of the casing 10 and through the opening in the top wall

12 thereof. The external end portion of the cylindrical tube 39 may be connected, in a conventional manner, with a pipe 40 leading to a chimney flue, not shown.

The side wall of the casing 10 is provided with a plurality of air inlet openings 41 at a location immediately above the flange 19 of the mounting bracket 16 through which air is admitted to the interior of the casing 10, heated therein and ultimately discharged through the heated air outlet openings 11. When combustion takes place in the pot burner unit 15, in accordance with conventional pot burner operation, a flame and fuel mixture passes through the opening 37 in the flame plate and combustion continues in the space at the lower end portion of the tube 39. In order to prevent overheating at this location the tube 39 is provided with a pluraltiy of outwardly extending radial vanes 42. These vanes also serve to efficiently transmit heat to the air being circulated between the side wall of the casing and the tube 39. The vanes 42 are extended along the tube 39 only throughout that portion thereof at which combustion takes place. By confining the vanes to the portion of the tube 39 in which combustion occurs, the temperature differential between the exterior and the interior of the tube 39 above the portion thereof in which combustion takes place is maintained at a suitable value for efficient heat transfer purposes. The wall structure of the tube 39 presents an extended heat transfer surface and the tube also serves as a flue to conduct away from the pot burner unit products of combustion which result from burning of fuel therein.

The pot burner unit may be conveniently removed from the heater through the opening 14 by removing the bolts 22 which secure the mounting ring 21 to the mounting bracket 16, and the flame plate 32 may be readily removed from the main body portion 25 of the pot by removing the bolts 33, thus accommodating convenient disassembly of the unit for cleaning and repair purposes. The internal diameter of the tube 39 is but slightly larger than the opening 37 in the flame plate and therefore the combustion space does not significantly exceed, in transverse dimensions, the transverse dimensions of the flame and fuel mixture outlet. The combustion space is accordingly elongated and in direct vertical alignment with those portions of the tube 39 which serve as flue and heat transfer surface. As a result of this construction there is an unobstructed flow of fuel mixture and products of combustion from the fuel burning pot to the outlet end of the tube 39.

Although but one specific embodiment of the invention has herein been shown and described, it will be understood that various changes in the size, shape and arrangement of parts may be made without departing from the spirit of the invention.

I claim:

1. A space heater comprising an elongated cylindrical casing having a continuous sheet metal wall provided at its upper end portion with a heated air outlet and with an air inlet at a location spaced upwardly from its lower extremity, a flange extending inwardly from said sheet metal wall at a location between said air inlet and said lower extremity of said casing, a substantially cylindrical fluid fuel burning pot disposed centrally of said casing and suspended from said flange in the space between the latter and said lower extremity and including a flame plate at its upper end having a circular flame outlet opening and a surrounding tubular boss extending upwardly therefrom, said flame plate having a marginal portion extending laterally beyond the side wall of said pot and beneath the innermost portions of said flange and having an upstanding ridge engageable with an edge portion of said flange for piloting said flame plate into a predetermined position with respect to the latter, a cylindrical sheet metal tubular member telescoping said tubular boss and extending upwardly substantially centrally of said casing and through the upper extremity of the latter, and a plurality of heat transfer vanes secured to and extending along the outer surface of said tubular member at the lower end portion thereof.

2. A space heater comprising an elongated cylindrical casing having a continuous sheet metal wall provided at its upper end portion with a heated air outlet and with an air inlet at a location spaced upwardly from its lower extremity, an annular flange extending inwardly and transversely from said sheet metal casing having a central circular opening therethrough, a fluid fuel burning pot suspended from said flange including a cylindrical main body portion having an open upper end and a flame plate extending across said open end and beyond said main body portion and beneath said annular flange, said flame plate having a central flame outlet opening and surrounding tube section extending upwardly therefrom, a ridge on said flame plate engageable with said annular flange for positioning said tube section concentric with respect to the central opening of the latter, means for detachably attaching the open end part of said body portion to said flame plate in sealed relation, means on said flange for clampingly engaging said extended portion of said flame plate in sealed relation with said flange in order to suspend said pot from the latter, and a cylindrical sheet metal member telescoping said tube section and extending therefrom through the upper end of said casing.

ALLEN P. LIVAR.