Feb. 28, 1967 C. H. MYERS 3,306,335

GAS SPACE HEATER

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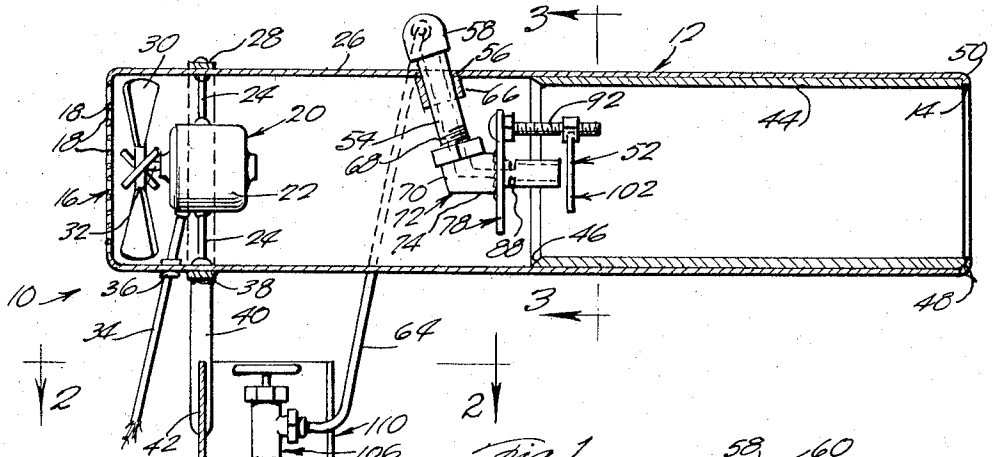
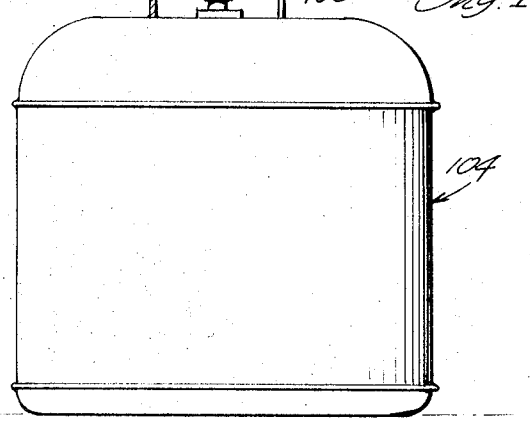


Fig. 1



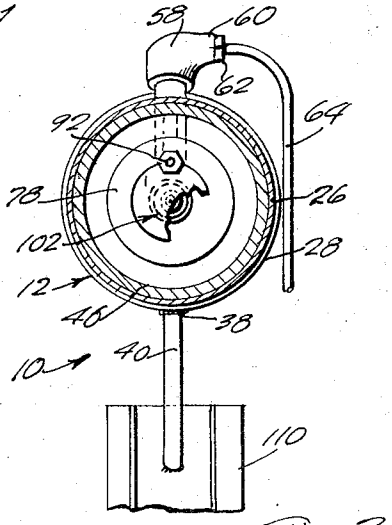


Fig. 3

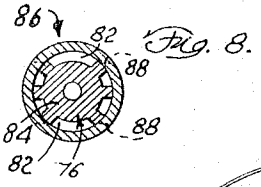


Fig. 8.

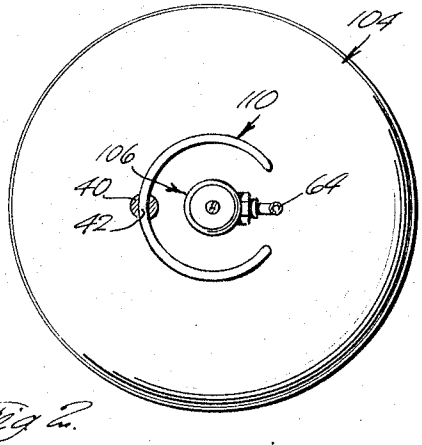


Fig. 2.

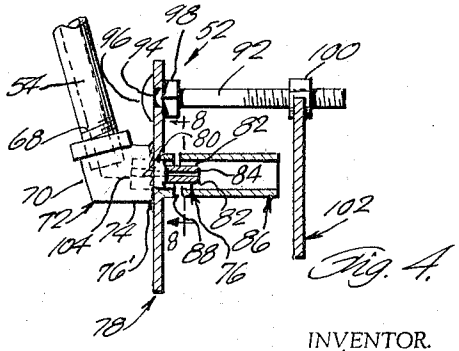


Fig. 4.

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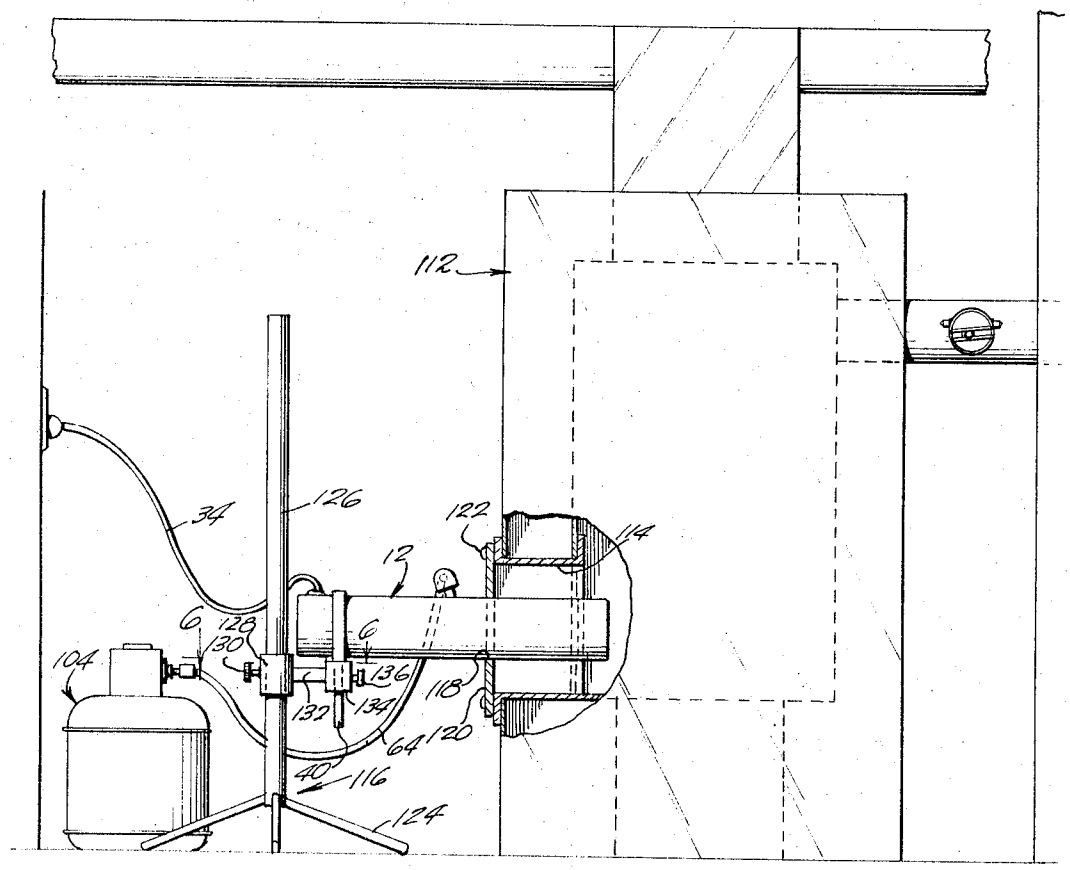


Fig. 5.

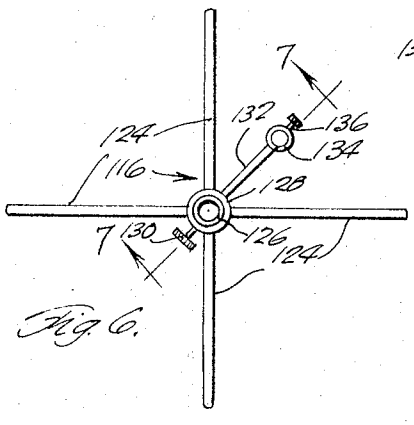


Fig. 6.

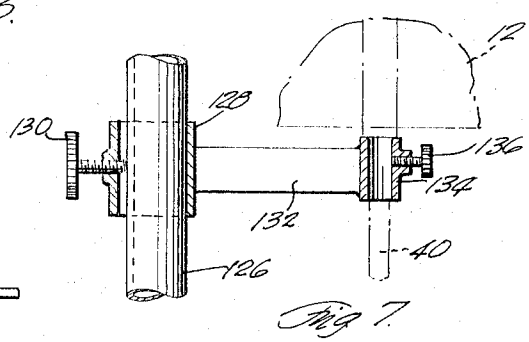


Fig. 7.

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GAS SPACE HEATER

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7 Claims. (Cl. 158—7)

This invention relates to a gas-burning space heater.

The primary object of the invention is the provision of an efficient, versatile, and easily portable device of the kind indicated which comprises an assembly composed of a burner, a fuel tank, and means supporting the burner, relative to the tank or to a furnace, for direct space-heating or indirect space-heating, as in the case of a furnace whose burner has been removed or has been rendered inoperative.

Another important object of the inventon is the provision of a device of the character indicated above, wherein the burner comprises an elongated tube having a fan-forced suction air intake, a gas burner intermediate the ends of the burner tube, and an insulated combustion chamber extending from the burner to an open end of the tube, whereby a forced mixture of air and fuel gas is economically and efficiently obtained and burned.

In the drawings:

FIGURE 1 is a side elevation, partly in vertical longitudinal section, of a device of the invention;

FIGURE 2 is a horizontal section taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a vertical transverse section taken on the line 3—3 of FIGURE 1;

FIGURE 4 is a fragmentary vertical longitudinal section taken through the burner assembly;

FIGURE 5 is a side elevation, partly in section, showing the said device used as the heat source for a furnace;

FIGURE 6 is a horizontal section taken on the line 6—6 of FIGURE 5;

FIGURE 7 is a fragmentary vertical section taken on the line 7—7 of FIGURE 6; and

FIGURE 8 is a vertical section taken on the line 8—8 of FIGURE 4.

Referring in detail to the drawings, and first to FIGURES 1 to 4, the illustrated space heater assembly **10**, comprises a normally horizontal, longitudinally elongated metal tubular housing **12**, having an open forward end **14**, and a rear end wall **16** which is formed with perforations **18**.

An electric air suction device **20** is concentrically mounted within the housing **12**, adjacent to its rear end, and can comprise a motor **22**, substantially smaller in diameter than the housing **12**, and fixed in concentrically spaced relation thereto, by means of radial arms **24**, the arms **24** being fixed to the motor **22**, at one end, and, at their other ends, extended through the sidewall **26** of the housing and fixed to a band **28** which is securely circumposed on the housing **12**. A suction fan **30** is located close to the perforated rear end wall **16** and is carried by the rearwardly extending shaft **32** of the motor. A suitable motor energizing cord **34** is connected to the motor **22** and extends through a grommet **36**, through the housing sidewall.

The band **28** has fixed to its underside, as indicated at **38**, a perpendicular downwardly extending housing supporting rod **40**, which is formed with a vertical slot **42**, in its lower end, for a purpose hereinafter disclosed.

The interior of the housing **12** has welded thereon a liner **44**, of heavy gague steel, which extends from the forward end **14** of the housing, to a point approximately midway between the ends of the housing, the rear end of the liner **44** being beveled, as indicated at **46**. The

forward end of the liner **44** is rounded, as indicated at **48**, and is conformably and retainably engaged by an arcuate annular flange **50**, on the forward end of the housing.

A burner assembly **52**, for such as propane gas, comprises a forwardly and downwardly angled tube **54**, which extends down through an opening **56**, provided in the top of the housing sidewall **26**, and has, on its upper end, above the housing **12**, an elbow fitting **58**, which has a lateral reduced diameter arm **60**, to which is connected, as indicated at **62**, a relatively small diameter hose **64**. A sleeve **66**, fixed to and surrounding the tube **54**, is suitably fixed, at its upper end, to the top of the sidewall **26** of the housing **12**.

The lower end of the burner assembly tube **54**, is threaded as indicated at **68**, into the upper end of the upwardly and rearwardly angled arm **70**, of an angle fitting **72**. The fitting **72** has a horizontal arm **74** which terminates in a concentric reduced diameter jet **76**, of relatively short length. The shoulder defined at the forward end of the horizontal arm **74**, is fixed as by means of welding **76**, to the rear side of a concentric vertical air baffle disc **78**. The disc **78** is formed with a central opening **80**, through which the arm jet **76** extends.

The arm portion **76** is formed with circumferentially spaced longitudinal grooves **82**, which extend to the forward end **84** of the jet **76**. A tubular open-ended concentric nozzle **86**, longer than the jet **76**, is welded thereon, and is formed, in its sidewall, adjacent to the disc **78**, with circumferential slots **88**, which communicate with the grooves **82**, the rear end of the nozzle being abutted with the adjacent side of the disc **78**. In an operating example, the nozzle **86** is about ¼" in diameter, and its outer end is spaced at about ⅜" from the flame spreader disc **102**.

The disc **78** is substantially smaller in diameter than the housing **12** and is concentrically spaced from the housing sidewall **26**, at a location adjacent to but spaced rearwardly from the rear end **46** of the liner **44**.

A horizontal longitudinal strut **92**, preferably in the form of a bolt, extends forwardly from the upper part of the disc **78**, through an opening **94** formed therein, with its head **96** engaged with the rear side of the disc, and with a lock nut **98**, on the bolt bearing against the forward side of the disc. The strut **92** reaches forwardly beyond the rear end **46** of the liner **44**, and at its forward end, is threaded through a nut **100**, fixed centrally on the upper end of a circular flame spreader disc **102**. The disc **102** is, as shown in FIGURES 1, 3 and 4, smaller in diameter than the air baffle disc **78**.

As shown in FIGURE 4, the angle fitting **72** is formed, in its arms **70** and **74**, with a continuous gas passage **104**, of relatively small diameter, which opens to the forward end of the reduced diameter jet **76**.

In operation, with the fan of the suction device **20** in operation, and gas being fed under pressure to the burner assembly, outside air is drawn into the burner housing, through the perforations of the rear end wall **16** of the housing **12**, passes forwardly around the burner assembly. As this air passes the air baffle disc **78**, it is caused to speed up through the venturi space, defined between the edge of the disc **78** and the sidewall **26** of the housing **12**, and passes out through the open forward end of the housing.

Part of the accelerated air stream passes through the holes **88** in the nozzle **86**, passes forwardly between the sidewall of the nozzle and the grooves **82**, and mixes with the gas emerging from the forward end of the relatively small diameter passage **104** and mixes with the air. The gas-air mixture having been ignited, in any suitable manner, as by the introduction of a lighter,

through the forward end of the housing, the resultant flame strikes the flame baffle disc, so as to thereby be concentrated, and passes forwardly, in the space between the disc **102** and the liner **44**, the combustion of the gas-air mixture being substantially completed within the forward part of the housing **12**.

The space heater assembly **10** further comprises a cylindrical propane gas tank **104**, having a central upstanding valved fitting **106**, on its top, the fitting **106** having a lateral arm **108**, to which the hose **69** is connected. The fitting **105** is spacedly surrounded by an upstanding three-quarter circular shield **110**. The slot **42** of the rod **40** is adapted to be engaged over the upper edge of the shield **110** for supporting the housing **12** across the top of the tank **104**, as shown in FIGURE 1.

Where, as shown in FIGURES 5 to 7, the space heater assembly **10**, is to be utilized as the heating means for a furnace **112**, having a lateral opening **114**, the housing **12** is supported on a stand **116**, on a level to extend into the furnace, through its opening **114**, concentrically with this opening and through the central opening **118** formed in a vertical closure plate **120**, which is adapted to be bolted, as indicated at **122**, across the opening **114**.

The stand **116** comprises circumferentially spaced, downwardly and outwardly angled legs **124**, which, at their upper ends, are fixed to the lower end of a standard **126**. A vertically adjustable sleeve bracket **128** is circumposed on the standard **126**, and is adapted to be secured in adjusted position, by means of a handle-equipped set screw **130**. The bracket **128** has a lateral arm **132** having a vertical sleeve **134**, on its outer end, adapted to receive the rod **40** of the housing **12**, which is held relative to the sleeve **134** by a set screw **136**.

The tank **104** as indicated in FIGURE 5, may be located at any suitable place, relative to the housing, and a suitably long hose **64** provided to reach thereto. Or the source of gas under pressure may be located out of the area of the furnace **112**, and its hose **34**, connected to any suitable gas outlet.

What is claimed is:

1. A gas space heater, comprising a tubular housing having an open forward end and a perforated rear end, a gas burner assembly mounted on the housing and having a longitudinal tubular nozzle concentrically spaced in the housing, the forward end of the nozzle being longitudinally spaced from the forward end of the housing, and a suction device mounted within the housing between the burner assembly and the perforated rear end of the housing said nozzle having a closed rear end and an open forward end, a reduced diameter jet concentrically spaced within said nozzle, the side wall of the nozzle being formed with openings spaced rearwardly from the forward end of the jet.

2. A gas space heater according to claim **1**, wherein an air baffle smaller in diameter than the housing surrounds the said nozzle behind said nozzle openings.

3. A gas space heater according to claim **1**, wherein an air baffle smaller in diameter than the housing surrounds the said nozzle at the rear end thereof, and a flame baffle smaller in diameter than the air baffle and concentrically spaced from the sidewall of the housing, said flame baffle being near to and spaced forwardly from the forward end of the nozzle.

4. A gas space heater according to claim **1**, in combination with a furnace having a lateral opening, a plate closing said opening, said plate being formed with a central opening of the diameter of the housing, said housing extending through the plate opening into the interior of the furnace, and means supporting the housing relative to the furnace, said housing having a downwardly extending support rod, said means comprising a stand having an upright standard, a set-screw equipped sleeve bracket circumposed on the standard, said bracket having a lateral arm carrying a set-screw equipped sleeve through which said support rod is engaged.

5. A gas space heater comprising a normally horizontal, longitudinally elongated tubular housing having an open forward end and a perforated rear end, a suction device supported within the housing and facing its perforated rear end, a heat resistant liner secured within said housing and extending from the forward end of the housing to a point intermediate the ends of the housing, a burner assembly comprising a jet, formed with external longitudinal grooves, a tubular nozzle spacedly surrounding said jet and extending forwardly therefrom, the side wall of the nozzle being formed with openings spaced rearwardly from the forward end of the jet, a circular air baffle surrounding said nozzle and concentrically spaced from the housing sidewall, the openings of the nozzle being at the forward side of said air baffle said jet being formed with a relatively small diameter passage opening to the forward end of said jet, the forward end of the jet being spaced rearwardly from the forward end of the nozzle.

6. A space heater according to claim **5**, wherein a flame baffle smaller in diameter than the air baffle is supported in front of the forward end of the nozzle.

7. A space heater according to claim **5**, wherein a flame baffle smaller in diameter than the air baffle is supported in front of the forward end of the nozzle, said flame baffle being larger in diameter than and concentric with respect to the nozzle.

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