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VAPORIZING-TYPE LIQUID FUEL BURNER

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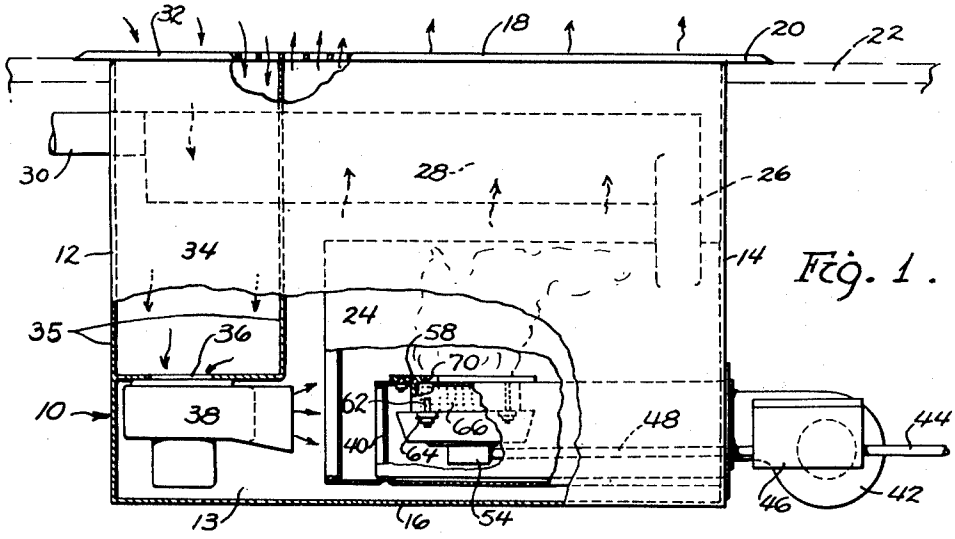


Fig. 1.

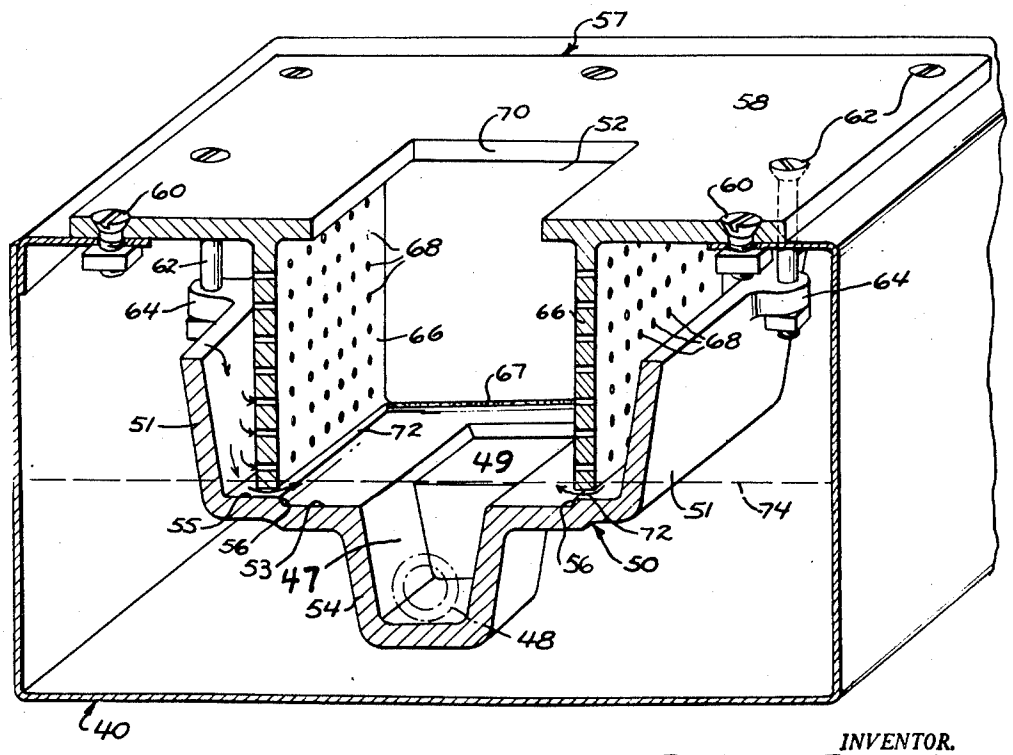


Fig. 2.

INVENTOR.
Peter Fournier
BY
McCrady & Wilson
ATTORNEYS

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VAPORIZING-TYPE LIQUID FUEL BURNER

Peter Fournier, Trenton, Mich.

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8 Claims. (Cl. 158—91)

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This invention relates to an oil burning furnace of the type equipped with vaporizing pot-type burner.

An object of the invention is to provide a heating apparatus of improved design and simplified construction, economical and dependable in operation.

A further object of the invention is to provide a heating apparatus wherein liquid fuel is completely burned, so that the formation of soot and offensive gases is kept to a minimum.

A further object of the invention is to provide an oil burning furnace wherein the oil is vaporized and supplied with air in such manner as to facilitate the complete combustion thereof.

Further objects and advantages of the invention will be apparent from the following description, taken in connection with the appended drawing, in which:

Figure 1 is a view in side elevation, with parts broken away, of an apparatus embodying the invention; and

Figure 2 is an axonometric view in section of the burner proper.

It is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

The apparatus shown in Figure 1 comprises a casing or bonnet comprising a forward wall 12, side walls 13, a rear wall 14, and a lower wall or floor 16. The upper wall of the casing is formed by a register 18, of usual construction, and having overlapping edges 20 which rest upon the floor 22 of the building, so that the heater depends therefrom into the basement or other space below the floor.

Within the casing is mounted a stove 24, of rectangular cross section, and connected by means of a conduit 26 to a heat exchanger 28, the heat exchanger being in turn connected to a vent 30 which leads to a stack or other exit for flue gases.

Cold air from the space being heated enters the casing through a portion 32 of the register 18, passing thence over one end of the heat exchanger 28, into a cold air chamber 34 formed by sheet metal walls 35. Thence the cold air passes through an opening 36 to the inlet of a blower 38, mounted beneath the chamber 34. The outlet of the blower discharges adjacent the stove 24, so that the air from the blower flows around the stove and past the other end of the heat exchanger 28, and thence upwardly through the register 18.

Within the stove 24 is mounted a burner casing 40, which is supplied with combustion air by a low pressure blower 42, of usual construction, mounted outside of the casing. Liquid fuel is supplied to the burner through a conduit 44, which is connected to a control box 46, of known construction, which controls the pressure and rate of flow of the fuel, and the level at which it is maintained in the burner. From the control box 46 fuel flows through a conduit 48 to the burner.

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The burner comprises a firepot 50, which may be formed of cast iron or the like, and which includes lateral walls 51 and a horizontal floor 53, having a sump 54 formed as a depressed portion therein. The sump comprises a central well 47 which receives the liquid fuel from the conduit 48, and two end pans 49 which are formed as depressed portions of the floor 53.

The periphery of the floor 53 is preferably slightly raised as indicated at 55, being separated from the central portion of the floor by a shoulder 56. The combustion chamber of the burner is formed by a member 57 which comprises a horizontal plate 58 secured in an aperture in the upper wall of the casing 40 by means of machine screws 60, while bolts or machine screws 62 extend through the plate 58 and are secured in apertured ears 64 in the firepot 50 to thereby adjustably suspend the firepot from the plate 58.

Formed integral with the plate 58 are two depending vertical plates 66, and forward and rear walls 52. The end walls 52 are in air-tight relation to the floor 53, being fitted thereto or sealed by means of a calking composition, as indicated at 67. The plates 66 are formed with a plurality of spaced apertures or tuyères 68, designed to permit passage of combustion air from the exterior of the plates 66 to the interior thereof. In the plate 58, intermediate the burner plates 66, is formed an opening 70, for the escape of combustion gases.

Each of the plates 66 is spaced from the portion 55 of the floor 53 to provide a horizontal slot 72 for the passage of air inwardly of the burner. The control box 46 is so constructed, in the known manner, that the fuel is maintained at the static level indicated by the line 74 in Figure 2, slightly above the lower edges of the plate 66, so that air forced through the slots 72 will depress the level of the fuel lying adjacent thereto, and will pass horizontally over the surface of the fuel, thereby facilitating good combustion of the fuel. At low-fire the fuel level will be slightly lower than at high-fire, and the combustion air will be supplied at a lower pressure, as is known in the art.

In the operation of the apparatus, the blowers 42 and 38 are put into operation, and the flame is ignited within the firebox in the known manner. Fuel flows through the conduits 44 and 48 to the well 47, its level being maintained ap-

proximately at the point indicated at 74. Air from the combustion blower 42 passes into the casing 40 and thence over the edges of the walls 51, thence downwardly and through the slots 72, passing across the surface of the fuel in the form of flame. Combustion air is thus supplied in ample quantity to the burner at the particular location where carbon deposits tend to form. Combustion air also and simultaneously flows inwardly through the apertures 68 to support and complete the combustion of the fuel, thereby bringing about a more complete combustion than is usual in this type of burner. From the firepot, the flue gases will pass through the opening 70, and thence through the conduit 26 and heat exchanger 28 to the vent 30. Meanwhile, cold air is drawn downwardly from the space being heated and through the cold air chamber 34, and is forced by blower 38 into the main portion of the casing 10, passing over the stove 24 and past the heat exchanger 28 and thence upwardly through the register 18. The air will be heated during its passage, both by the heat exchanger and by the stove itself.

Although the invention has been described with reference to a particular embodiment thereof, it may be embodied in other forms within the skill of artisans in this art, and is not limited except in accordance with the terms of the following claims.

I claim:

1. Heating apparatus comprising a burner including a receptacle for liquid fuel, means for maintaining the fuel in said receptacle at a predetermined static level, said burner also comprising perforate plates extending downwardly into said receptacle to a point below said fuel level and terminating in spaced relation to the bottom wall of said receptacle to provide horizontal slots between the plates and the bottom wall of the receptacle, and means for supplying air under pressure to the perforations of said plates and to said slots.

2. A burner for liquid fuel comprising a fuel receptacle having a bottom member formed with a horizontal surface, a sump therein having means for admitting fuel to the receptacle, and a second horizontal surface surrounding the first named horizontal surface at a slightly higher level, means for maintaining the static level of fuel above the level of the second horizontal surface, means forming two opposed horizontal slots for admission of combustion air at a level slightly below said static level, means for supplying such combustion air under pressure, and means forming a plurality of opposed air-admitting ports at levels above said static level.

3. The invention defined in claim 2, wherein the slot-forming means and the last mentioned means comprise a horizontal plate, means for suspending said receptacle from said plate, and a pair of opposed parallel air-admitting plates terminating adjacent one of said horizontal surfaces to form said slots.

4. A burner for liquid fuel comprising a member formed with a horizontal surface, a sump therein having means for admitting the fuel, means for maintaining the static level of fuel above the level of said horizontal surface and for retaining said fuel on said surface, a support member, a plurality of walls extending downwardly from said support member and terminating in lower edges at a level below said static level, a portion of said lower edges being spaced from said horizontal surface to form a slot for admission of combustion air at a level slightly below said static level, means for supplying such combustion air under pressure, said walls being provided with a plurality of air-admitting ports above said static level.

5. A burner for liquid fuel comprising a member formed with a sump and a horizontal surface surrounding the sump, means for admitting fuel to the sump and for maintaining the static level thereof above said horizontal surface and for retaining said fuel on said surface, a support member above the sump, walls extending downwardly from the support member and terminating in lower edges below said static level, at least a portion of said lower edges being spaced from said horizontal surface to form a slot for admission of combustion air below said static level, means for supplying such combustion air under pressure, said walls being provided with ports for admission of combustion air above said static level.

6. A burner for liquid fuel comprising a firepot having a bottom member formed with a sump, a substantially horizontal surface surrounding the sump flush with the top thereof, a second substantially horizontal surface surrounding said first named horizontal surface at a slightly higher level, a downwardly extending apertured plate having its lower edge spaced from said second horizontal surface to form a slot for admission of combustion air to the firepot, means for maintaining fuel at a static level slightly above said lower edge, and means for maintaining a differential of air pressures at opposite sides of said slot to cause combustion air to depress the fuel and pass beneath said lower edge.

7. A burner for liquid fuel comprising a firepot having a bottom member formed with two concentric horizontal surfaces at different levels, a sump in the lower of said surfaces, means for admitting fuel to said sump and maintaining the static level thereof above the level of the higher of said surfaces, means forming a horizontal slot for admitting combustion air at a level slightly below said last mentioned level, and means for supplying combustion air to said slot under pressure.

8. A burner for liquid fuel comprising a firepot including a fuel receptacle, a sump therein having means for admitting fuel to the receptacle, means for maintaining fuel in the receptacle at a predetermined static level, means forming an air passage including a portion directed downwardly to the surface of the fuel in said receptacle and a portion formed as a submerged slot slightly below said level for admitting combustion air to said firepot, and means for maintaining a differential of air pressure across said slot of sufficient magnitude to depress the level of the adjacent fuel and pass air through the slot.

PETER FOURNIER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
70,117	Post et al.	Oct. 22, 1867
1,912,713	Kresky	June 6, 1933
2,007,822	Young	July 9, 1935
2,184,967	Winter	Dec. 26, 1939
2,391,585	Miller	Dec. 25, 1945