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HEATING APPLIANCE

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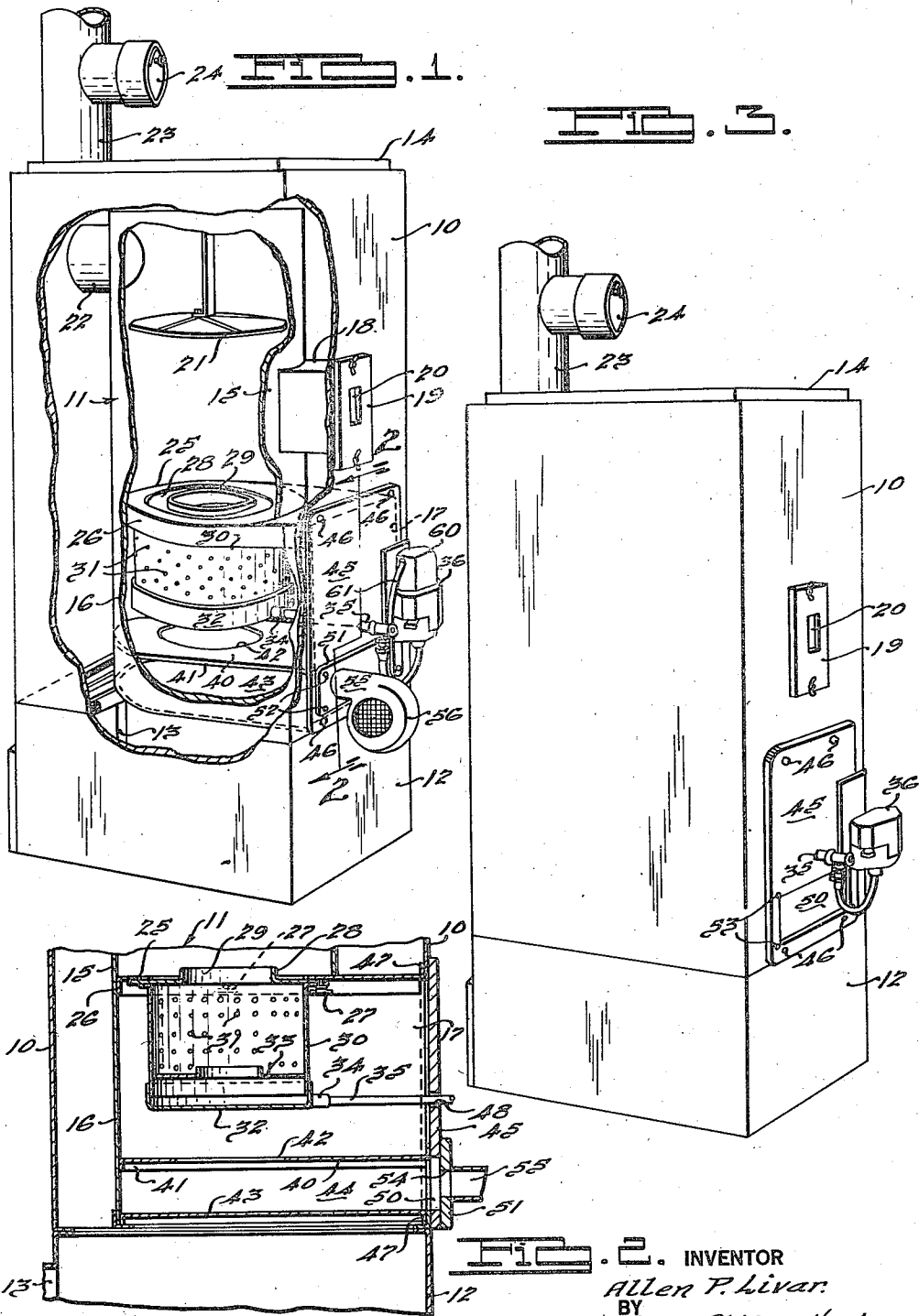


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HEATING APPLIANCE

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2 Claims. (Cl. 158—4)

My present invention relates to heating appliances, having particular regard to the construction of a heating appliance whereby the appliance may be converted from natural draft combustion to forced draft combustion without change other than to add the forced draft blower.

The present invention is particularly concerned with the type of burner comprising a perforated receptacle in which liquid fuel is vaporized by the retained heat of previously burned fuel and the vapors are mixed with combustion supporting air entering the receptacle through the perforations in the receptacle. The invention may be embodied in a furnace or some other type of heating appliance, such as a boiler, space heater, water heater, or the like.

The invention will be more fully understood by reference to the following specification taken in connection with the accompanying drawing wherein like numerals refer to like parts throughout.

In the drawing,

Fig. 1 discloses a warm air furnace with parts broken away to show the interior construction, the furnace being provided with forced draft producing means;

Fig. 2 is a sectional view taken substantially along line 2—2 of Fig. 1 showing details of the construction; and,

Fig. 3 is a perspective view of the same furnace adapted for natural draft combustion.

The furnace comprises a jacket 10 enclosing and supporting a heat chamber 11, the jacket 10 being adapted to rest upon a lower air collector box 12 having an opening 13 for the admission of air to be heated. The air rising upwardly about the walls of the heat chamber 11 is heated and ejected through the exit opening surrounded by the duct connector flange 14.

The heat chamber may have any convenient shape, as illustrated the chamber comprising an upper drum-shaped portion 15 and a lower portion 16 having a lateral extension therefrom terminating in an access opening 17 which matches an opening through a side wall of the jacket 10. The upper portion 15 may have an extension 18 leading to an opening in the jacket 10 and across which may be placed an inspection door 19 having a glass panel 20 therein through which the flame may be examined. The upper portion is provided with a flame spreading baffle 21 and is connected to a flue connector 22 leading to the flue 23. The flue is preferably provided with an adjustable draft regulating device 24. Other types of fire chambers may be pro-

vided, the one illustrated being fairly efficient and easily assembled.

The fire chamber is divided into the upper and lower portions by a horizontal baffle 25 extending across the fire chamber at the upper edge of the access opening 17. The baffle is preferably provided with a flange 26 by means of which the baffle may be welded into the drum. The baffle extends forward to the opening 17 to provide the top wall of the access opening extension from the fire chamber body.

An oil burner of the fuel vaporizing type is suspended from the baffle 25, preferably by means of wing-nut fasteners 27 easily reached through the access opening 17. The burner preferably comprises a combustion ring 28, forming in effect an extension of baffle 25, and provided with a centralized opening 29 through which the flame may enter the upper portion of the fire chamber. The side wall 30 of the burner is preferably cylindrical in shape and is attached to the combustion ring 28, the side walls being provided with a plurality of rows of combustion supporting air admitting perforations 31. The bottom of the burner is preferably provided by means of a dish-shaped stamping 32 permanently connected to the side wall 30. A pilot ring 33 for the purpose of supporting a pilot flame may be mounted in the burner. Fuel may be admitted to the interior of the burner through a spud 34 extending from the bottom 32 and into which is threaded a supply tube 35 leading to a fuel metering device 36. Details of the burner receptacle and of the fuel metering device are not essential to the present invention, there being many such devices well-known to those skilled in the art. The lower portion 16 of the fire chamber is divided horizontally by a lower baffle 40 extending to the access opening 17. This baffle is preferably formed with a flange 41 which may be welded to the wall of the fire chamber and is provided with a large opening 42 preferably centrally located beneath the bottom 32 of the burner receptacle.

The bottom of the fire chamber is also preferably provided by welding a flanged plate 43 to the lower edge of the fire chamber. The space 44 between the lower baffle 40 and the bottom plate 43 provides an air inlet passage from which air escapes through opening 42 to cool the bottom of the burner receptacle and to enter the perforations 31 to support combustion.

The access opening 17 is closed by a removable cover plate 45 which may be attached by bolts 46 preferably passing through the jacket 10 and flanged edges 47 on the access opening exten-

sion. The cover plate is provided with a small opening 48 through which the supply tube 35 passes, the supply tube being rotatable therein so that it may be unscrewed from the spud 34 to permit removal of the cover plate. The cover plate is provided with an air inlet opening 50 of substantially the same dimensions as the cross-section through the air inlet passage 44.

As seen in Fig. 3 the air inlet opening 50 may be left open so as to provide means for air to be drawn into the space 44 due to the chimney effect of the heating appliance. As seen in Figs. 1 and 2, the air inlet opening 50 may be closed by a removable blower mounting plate 51 retained by bolts 52 passing through threaded holes 53 in the cover plate 45. The blower mounting plate is provided with an inlet opening 54 which communicates with the outlet 55 of a forced draft blower 56 mounted upon the plate 51.

As is well known to those skilled in the art the amount of fuel consumed in a burner receptacle of a certain size has a substantially constant maximum, and the fire chamber associated therewith must be of a certain size in relation to its heat transmission factor in order to support this maximum combustion. The purpose of the present invention is to provide the same type of heating appliance either with or without forced draft, either type of combustion having certain advantages. Accordingly, the air inlet opening 50 is large enough to admit all the air required to support the maximum combustion permissible in the given size of receptacle under natural draft, and the forced draft blower is proportioned to supply all the air required to support substantially the same amount of combustion under forced draft. Accordingly, the factory may fabricate and the dealers may stock a number of the heating appliances and a lesser number of the blower mounting plates and attached blowers so as to be able instantly to fill orders for heating appliances having either natural or forced draft.

The baffle 40 is not absolutely necessary for natural draft combustion but is preferable since it is desirable to evenly distribute the air around the sides of the receptacle under natural draft. With the higher temperatures generated by forced draft it becomes extremely advisable, first, to distribute the air evenly around the burner receptacle and, second, to direct a cooling airstream against the bottom of the receptacle.

In Fig. 1 I have illustrated a blower control device 60 connected to the blower motor (not shown) through cable 61. Many such devices are known whereby the action of the metering device to control high or pilot flame fuel flow is coordinated with the starting and stopping of the blower motor. In Fig. 3 this device has been removed as it is not necessary for natural draft.

Having illustrated and described a preferred embodiment of my present invention, it should be apparent to those skilled in the art that the same permits of various modifications in arrangement and detail. All such modifications as come within the scope of the following claims are considered a part of my invention.

I claim:

1. A heating appliance including an exterior jacket, a heat chamber forming member within said jacket and so spaced therefrom as to accommodate circulation of air to be heated there-

between, an upper horizontally disposed baffle extending across the chamber formed by said member and dividing the same into upper and lower sections, a perforated oil-vaporizing burner receptacle in said chamber lower section supported in suspended relation from said baffle, said baffle having an opening through which flame from said burner receptacle can enter the upper section of said chamber, said jacket and said member each having an opening therein arranged in registering relation and of such size and shape relative to said burner receptacle as to readily accommodate passage of the latter therethrough, a lower horizontally disposed baffle extending across the chamber at a level so spaced beneath said burner receptacle and above the bottom of the chamber as to form an air receiving compartment intermediate said receptacle and said bottom, said compartment registering with a portion of said registering openings, a portion of said upper baffle extending between said member and jacket adjacent said registering openings forming a closed partition between said chamber lower section and the space between said jacket and member, and a cover plate for the opening in said jacket having an air admitting opening therein so aligned with said compartment as to present a direct and substantially uninterrupted air-flow path into said compartment, said lower baffle having an opening for the passage therethrough of air from said compartment to said burner receptacle to support combustion of the fuel, said appliance having an opening for admitting air to be heated to the space between said member and said jacket.

2. A heating appliance including an exterior jacket having an opening therein, a heat chamber forming member within said jacket and so spaced therefrom as to accommodate circulation of air to be heated therebetween, an upper horizontally disposed baffle extending across said member dividing said chamber into upper and lower sections, a perforated oil-vaporizing burner receptacle in said chamber lower section supported in suspended relation from said baffle, a wall portion of said member adjacent said jacket opening terminating at said baffle to provide an opening registering with said baffle opening, said registering openings being of such size and shape relative to said receptacle as to readily accommodate passage of the latter therethrough, said baffle extending between said terminating wall portion and the adjacent wall portion of said jacket to thereby form a closed partition between said chamber lower section and the air circulating space between said jacket and member, a lower horizontally disposed baffle extending across said chamber lower section between said member and jacket and secured thereto and forming an air receiving compartment intermediate said receptacle and the bottom of said chamber, said compartment registering with at least a portion of said registering openings, and a cover plate for the opening in said jacket having an air admitting opening aligned with said compartment, said lower baffle having an opening for admitting combustion supporting air to said receptacle, said appliance having an opening for admitting air to be heated to the space between said jacket and member.

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