Feb. 24, 1925. 1,527,233

F. L. STAFFORD

OIL FURNACE

Filed Aug. 14, 1923 2 Sheets-Sheet 1

Fig. 1.

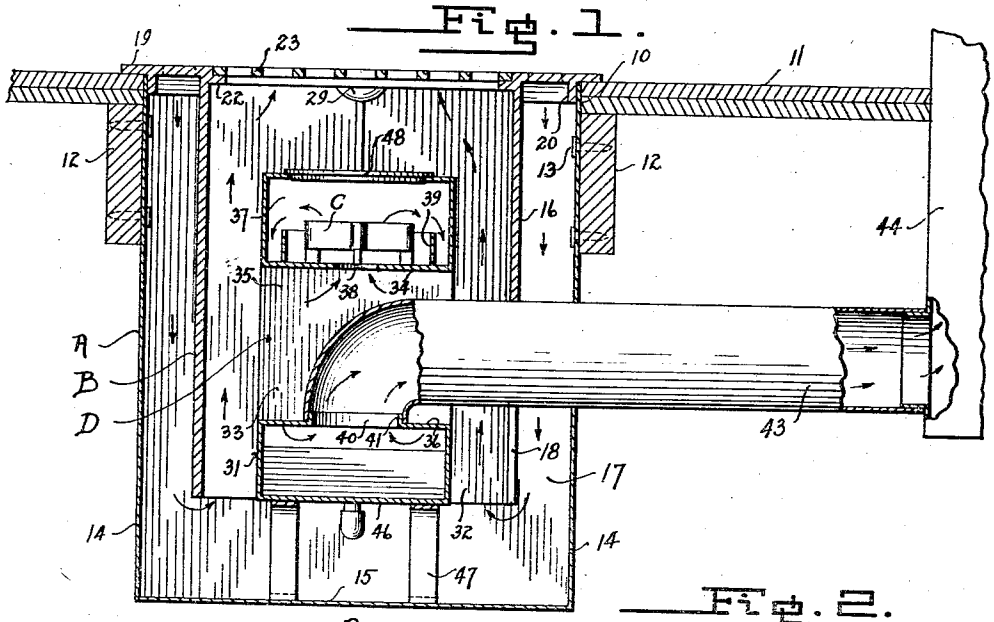

Fig. 2.

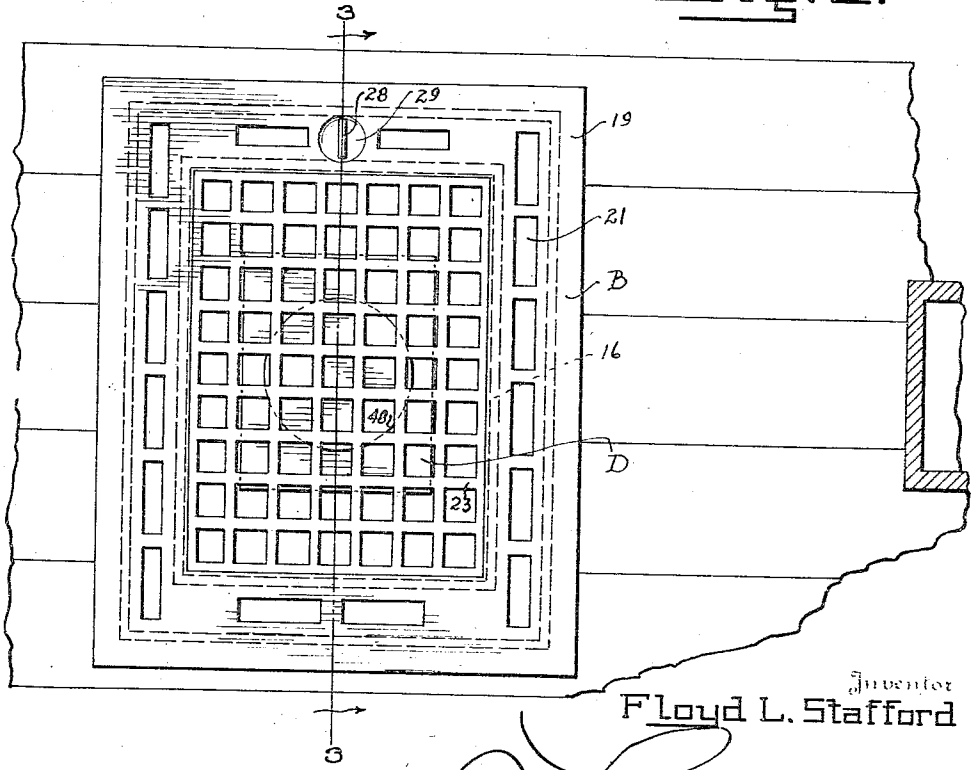

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Fig. 3.

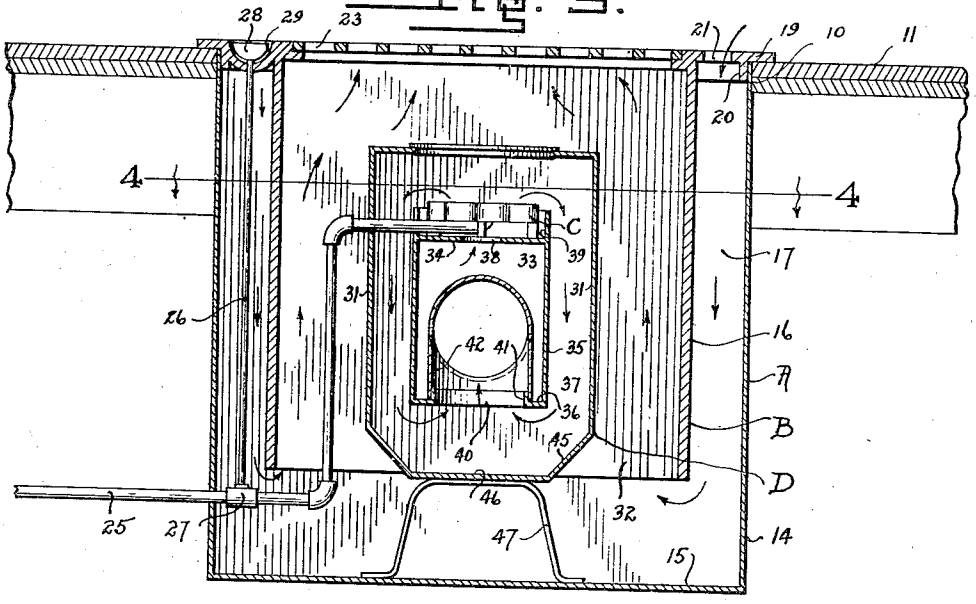
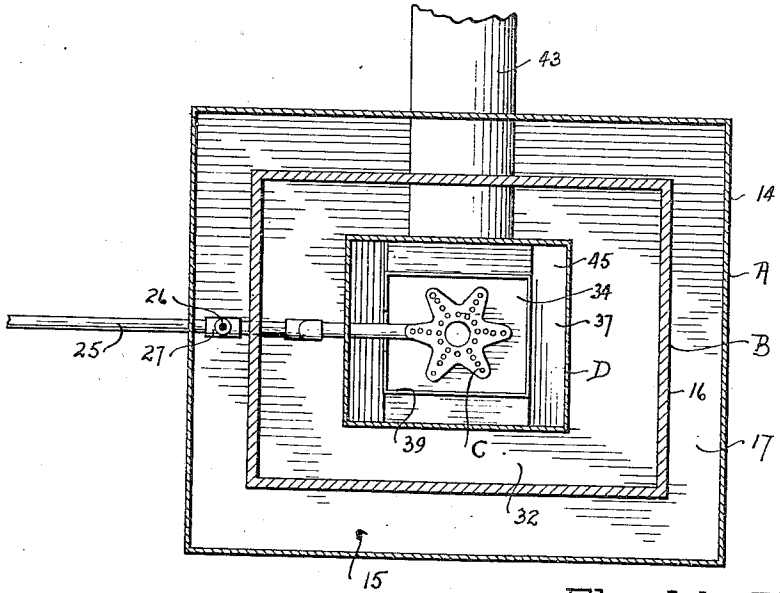


Fig. 4.



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Patented Feb. 24, 1925. 1,527,233

UNITED STATES PATENT OFFICE.

FLOYD L. STAFFORD, OF REPUBLIC, KANSAS.

OIL FURNACE.

Application filed August 14, 1923. Serial No. 657,319.

To all whom it may concern:

Be it known that I, FLOYD L. STAFFORD, a citizen of the United States, residing at Republic, in the county of Republic and State of Kansas, have invented certain new and useful Improvements in Oil Furnaces, of which the following is a specification.

This invention relates to oil furnaces, and the principal objects of the invention are to provide furnaces or stoves which may be cheaply and conveniently installed in buildings, being susceptible of installation in buildings wherein no cellars or basements are provided, and which are so constructed as to heat buildings in a minimum amount of time and insure a uniform distribution of heat.

Other objects and advantages will be apparent throughout the course of the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawings:

Figure 1 is a view partly in section and partly in elevation showing the improved furnace installed in a floor of a building.

Figure 2 is a plan view thereof.

Figure 3 is a vertical section taken on the line 3—3 of Figure 2.

Figure 4 is a transverse section taken on the line 4—4 of Figure 3.

In the drawings, wherein for the purpose of illustration is shown but the preferred form of the invention, the letter A indicates an exterior casing or housing; B, an interior casing; C, a burner; and D, a burner housing.

The housing A is inserted or fitted in an opening 10 cut in a floor 11, and may be secured to the horizontally disposed joists or sills 12 by suitable fastening elements such as nails 13 driven thru the side walls 14 thereof. The top of these walls 14 preferably terminates flush with the top surface of the floor 11 and is open, the opposite end providing a bottom 15.

Disposed within the housing A is the inner casing B, the side wall 16 thereof being in spaced relation to the side walls 14 of the housing A, thereby providing a cold air inlet or flue 17; the walls 16 terminating short of the bottom 15 so that the flue 17 may have communication with the interior of the casing B. One of the side walls 16 may be provided with a slot 18 in the one end thereof and for a purpose to be subsequently set forth. This casing B preferably is open at both ends, the top of the side walls 16 being provided with an outwardly extending marginal flange 19 which extends slightly beyond the margin of the opening 10 and rests upon the floor 11. A downturned flange 20 may be formed near the outer edge of the flange 19 which will aid in centering the casing B and hold the walls 16 in spaced relation to the walls 14. The flange 19 may be provided with a plurality of spaced perforations or openings 21 extending therearound for the admission of air to the cold air flue 17. Interiorly of the casing B and adjacent the top thereof is formed an inwardly extending marginal flange 22 upon which may be removably positioned a register grating 23 of any approved design. If desired, the register grating 23 may be hingedly secured (not shown) upon the flange 22 so that it may be swung open when access to the interior of the casing B is desired.

The burner C, which may be of any approved shape and size, is disposed within the casing B and preferably equi-distant from the side walls 16. A fuel supply line 25 is connected to the burner C by means of pipe lengths and joints, the fuel supply being controlled by an operating rod 26 connected to a suitable valve 27 situated in the pipe line 25. As a means for operating the rod 26 a handle 28 may be attached to the upper end thereof and disposed in a pocket 29 formed in the flange 19 of the casing B so as to not project beyond the top surface of said flange.

The burner C is supported within the housing D, the housing D preferably being disposed, within the casing B so that the side walls 31 thereof will be in spaced relation to the walls 16 of the casing B, thereby providing a flue 32 thru which the air entering downwardly thru the cold air flue 17, due to convection, will pass upwardly and become heated as it contacts with the burner housing D. A circulating flue 33 is formed thru the burner housing D, defining a transversely extending passageway, thru which air entering the warm air flue 32 may circulate and become more highly heated. This circulating flue

33 is formed by providing the transversely extending top wall 34, side walls 35, and bottom wall 36, said walls being secured to the side walls 31 at their opposite ends, but the inner surfaces of said top, side and bottom walls being in spaced relation to the side walls 31 of the burner housing D, thereby providing an annular chamber 37 within said housing. The top wall 34, which is adapted to support a burner C, is provided with an opening 38 through which air entering the circulating flue 33 may be admitted to the chamber 37 for the purpose of supplying oxygen to the burner C. A flange 39, secured to the top wall 34, may surround the burner C so that air entering the opening 38 must pass upwardly and become mixed with the fuel. The bottom wall 36 of the circulating flue 33 is also provided with an opening 40, around which may be formed an annular flange 41 for receiving the elbow 42 of a draft pipe 43, thereby providing an escape flue for the products of combustion. It will be apparent that as the cooler air enters the opening 38 in the bottom wall 34, the air in the top of the annular chamber 37, being warmer and consequently less dense, will be drawn around the chamber 37 to the base of the burner housing C, due to the suction or drafts caused by the products of combustion escaping thru the pipe 43, thereby highly heating all portions of the housing D so that air filling the inner casing B, due to radiation, will be immediately heated and caused by convection currents to ascend and pass outwardly of the casing B thru the register 23 for the purpose of heating a building. This pipe 43 is preferably horizontally disposed and passes thru the slot 18 in the casing B and thru a suitable opening in the housing A, it being spaced from the floor 11 so that the liability of fire from the heated pipe will be eliminated being secured in any suitable manner to a chimney 44 thru which the products of combustion may escape exteriorly of the building. The burner housing D may have a portion of the side walls 31 thereof inwardly inclined as at 45 and extend in converging relation into the bottom 46 of the housing D, thereby providing a means for deflecting the heated air in its passage around the annular chamber 37 and causing the products of combustion to pass upwardly and into the pipe or exhaust flue 43.

The burner housing C may be supported within the casing B in any suitable manner, preferably by legs or brackets 47, and is held thereby spaced from the bottom 15 of the housing A so that air may circulate therebetween and become heated.

A detachable lid or cover 48 may be positioned upon the burner housing D in order that access to the burner C may be had.

From the foregoing description, it can be seen that a heater has been provided which is extremely simple in construction, and easy and cheap to install in the floor of a building, yet having a high degree of efficiency and insuring a uniform distribution of heat throughout the building. By constructing the burner housing D as above described, it can be seen that an increased amount of radiating surface has been provided which will quickly heat the convection current passing thru the device and heat a building in a minimum amount of time.

Changes in details may be made to the form of invention herein shown and described, without departing from the spirit of the invention or scope of the claims.

I claim:

1. A heating furnace comprising an outer housing open at its upper end and having a bottom closing its lower end, a casing in said housing terminating short of the bottom of said housing and open at its upper and lower ends and supported in spaced relation to the walls of said housing for permitting air to pass downwardly between the housing and casing, a heater, a heater housing in said casing in spaced relation to the walls thereof and having side walls and a top and bottom and having an air inlet beneath the heater and adjacent its lower end provided with an outlet for products of combustion, a tortuous passage being provided between the inlet and outlet whereby products of combustion from the heater may pass upwardly towards the top of the heater housing and then downwardly towards the outlet, and a draft pipe leading from the outlet opening and extending through the casing and outer housing.

2. A heating furnace comprising a housing open at its upper end, a casing in said housing in spaced relation to the walls and bottom and providing an outer compartment and an inner compartment communicating with the outer compartment at its lower end, a burner housing in said casing having a transveresly extending flue opening through opposite sides of the burner housing and providing an annular chamber in the burner housing about the flue, a burner resting upon said flue within the burner housing, said flue having an upper wall provided with an opening beneath the burner for supplying oxygen to the burner and a lower wall provided with a draft opening, a draft pipe leading from the draft opening through said flue and through an open end of the flue and through the casing and housing, and means for supplying fuel to said burner.

FLOYD L. STAFFORD.