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CABINET TYPE OIL BURNING HEATER

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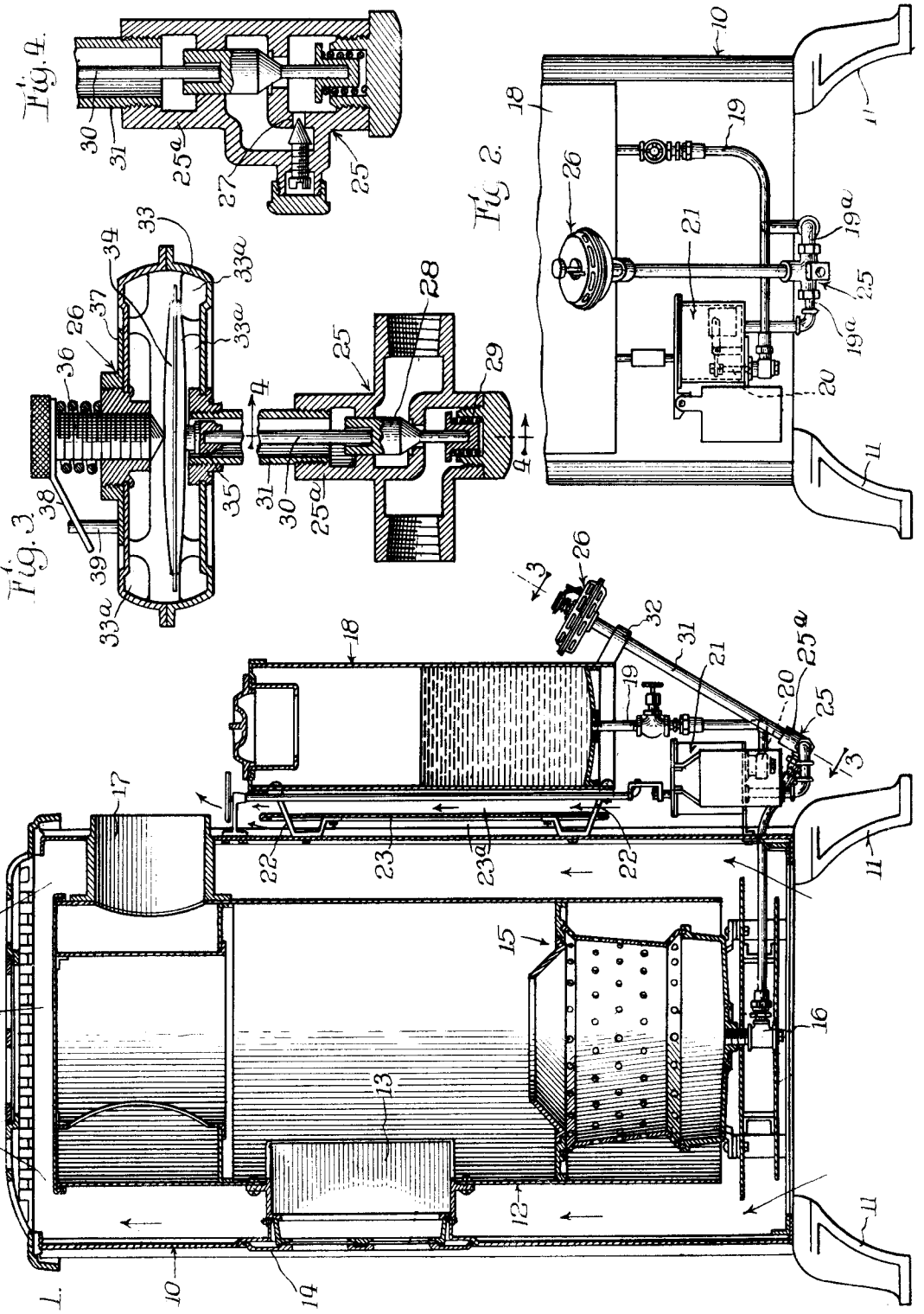

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CABINET TYPE OIL BURNING HEATER

Application filed December 24, 1931. Serial No. 582,952.

The invention relates generally to oil burning heaters and more particularly to such heaters of the cabinet or circulating type adapted to be located in one of the living rooms of a dwelling for heating the same.

Such heaters are intended, and are ordinarily used to replace the common type of heating stove, and are sold in assembled form so as to permit installation by the purchaser. Complicated assembling or installing operations are, therefore, objectionable in this type of heater.

With this situation in mind, an important object of the present invention is to provide a heater of this character which is thermostatically controlled and in which the thermostatic control means is embodied as a permanently assembled part thereof in such a relation as to produce a unitary heater of economical construction operable to maintain the room temperature within a relatively small range of variation.

Another object is to provide a heater having an improved and simplified thermostatic valve actuator for controlling the fuel supply.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing which illustrates a preferred embodiment of the invention and in which:

Figure 1 is a vertical sectional view taken through a heater embodying the features of the invention.

Fig. 2 is a fragmental rear view of the heater shown in Fig. 1.

Fig. 3 is an enlarged sectional view of the thermostatically operated valve and its actuator, taken along the line 3—3 of Fig. 1.

Fig. 4 is a sectional view of the thermally controlled valve taken along the line 4—4 of Fig. 3.

In the drawing the invention is illustrated as embodied in a circulating heater having an upstanding ornamental casing or cabinet 10 supported by legs 11 and serving as a concealing housing for a combustion chamber 12. The combustion chamber 12 is spaced from the sides of the cabinet 10 to provide for circulation of air upwardly through the cabinet as indicated by the arrows, and access to the chamber is provided by a horizontal extension 13 of the combustion chamber opening through the forward side of the cabinet 10 and normally closed by a door 14. Within the combustion chamber 12 is an oil burner 15 such as that disclosed and claimed in my copending application Serial No. 501,554, filed December 11, 1930. Said burner is of the apertured bowl type adapted to burn oil supplied through the bottom of the bowl by an inlet pipe 16. The products of combustion are conducted from the upper end of the combustion chamber 12 through a flue 17 of conventional construction adapted for connection with a chimney in the usual manner.

Fuel is supplied to the burner from a storage tank 18 permanently supported on the rear side of the cabinet 10. The fuel supply connection comprises a pipe 19 leading from the tank 18 to the inlet pipe 16 of the burner, and to insure uniformity in the operation of the burner, a valve 20 is provided in the pipe 19 aranged to be actuated by a conventional float control device designated generally by the reference numeral 21 so as to govern the level of the fuel in the bowl of the burner 15.

In the present instance, the tank 18 is supported in spaced relation to the cabinet 10 by means of brackets 22, with a division wall 23 located midway between the tank and cabinet, forming two air passages 23^a through which air may circulate so as to dissipate the heat.

In order that the room temperature may be controlled automatically, the heater is

provided with thermally responsive means operable to control the flow of oil to the burner, and in the preferred embodiment this means is mounted in fixed relation to the other elements of the heater so as to produce a unitary heater which may be installed easily by the purchaser.

The temperature of the room as a whole is maintained within a reasonably small range by locating the thermally responsive means so as to be shielded from the direct radiation of the burner while located in the path of the air which circulates upwardly about the cabinet. This end is preferably attained by positioning the thermally responsive means on the opposite side of the fuel tank 18 from the cabinet 10 so that the fuel tank insulating means, the two walls of the tank, and the fuel or dead air space in the tank all serve to shield the thermally responsive means from the direct radiated heat of the burner.

In the form shown, the automatic thermal control of the heater is obtained through the provision of a valve 25, located in the fuel supply pipe 19 between the float controlled valve 20 and the burner 15, and carrying in directly connected relation thereto a thermally responsive device 26 supported behind the fuel tank 18. Since the valve 25 is positioned between the float controlled valve 20 and the burner, it is subjected to a uniform fuel pressure at all times and its controlling action is uniform. A minimum flame is maintained in the burner, even though the thermostatically operated valve 25 is completely closed, through the medium of an adjustable by-pass opening 27 formed in the casing of the valve 25.

As shown in Figs. 3 and 4, the valve 25 has a reciprocable valve member 28, urged toward its open position by a spring 29. The casing of the valve 25 is of a generally T-shaped formation and is adapted to be mounted with the alined portions connected to two horizontal sections 19^a of the fuel supply connection 19, with a projecting portion 25^a extending in an upward and rearward direction as shown in Fig. 1. The valve member 28 is reciprocable in the extending portion 25^a of the valve casing and is controlled by a rod 30 housed within a supporting tube 31 which is screw threaded at its opposite ends into the portion 25^a and the control device 26 respectively. Thus the valve fitting 25 serves as a support for the thermal actuating device 26, and is assisted in this function by a strap 32 (Fig. 1) secured to the lower edge of the fuel tank 18 and embracing the tube 31. The length of the tube 31 is such that the thermal device 26 is supported a short distance above the lower edge of the tank 18, rearwardly thereof, and in spaced relation to the sides thereof so as to be insulated from the intense direct heat of the burner.

The thermal actuating device 26 in the present instance comprises a sectional relatively flat housing 33, the lower section of which is screw threaded onto the tube 31, with an expansible, fluid containing diaphragm 34 located within the housing. The diaphragm, when expanded by warm air flowing through openings 33^a in the housing, expands so that its opposite sides contact with a head 35 on the rod 30 and an adjustable abutment formed by a screw 36 threaded through the upper wall of the housing 33. This action forces the rod 30 downwardly to close the valve 28 against the action of the spring 29.

The temperature of operation of the valve 28 may be varied by adjustment of the screw 36, and this adjustment is facilitated by the provision of an adjustable dial plate 37 mounted on the upper surface of the housing 33. The dial plate 37 preferably cooperates with a pointer 38 carried on the screw 36, and the rotation of the screw is limited by a stop pin 39 upstanding from the plate 37 and in the path of the pointer 38.

From the foregoing it will be apparent that the invention provides a thoroughly practical thermostatically controlled heater of the cabinet type, which by reason of the permanent installation of the thermally responsive device, is adapted for installation by the purchaser.

It will also be seen that the location of the thermostatic device behind the fuel tank utilizes the tank insulating means as well as the insulating properties of the fuel tank to prevent heating of the thermostat by the intense direct heat of the burner, whereby to render the thermostat responsive to the room temperature and provide for maintaining this temperature within a reasonably small range of variation.

I claim as my invention:

1. A unitary heater of the character described comprising an oil burner, a combustion chamber for said burner, an air circulating casing surrounding and supporting said combustion chamber, an oil supply tank carried by a side wall of said casing, heat-insulating means on one side of said tank between said tank and said casing, a fuel supply connection between said tank and said burner, a valve in said connection, a thermally responsive element supported on the other side of said tank in spaced relation to the top, bottom and side edges of the tank, and means forming a direct operating connection between said thermal element and said valve.

2. A unitary heater of the character described comprising an oil burner, a combustion chamber for said burner, an air circulating casing surrounding said combustion

chamber, an oil supply tank mounted on the heater adjacent to a side wall of said casing, heat insulating means between said tank and said casing, a fuel supply connection between said tank and said burner, a valve in said connection, a thermally responsive element supported on the other side of said tank so as to be separated from said casing by said tank, and means forming a direct operating connection between said thermal element and said valve.

3. In an oil burning heater, the combination of an oil burner, a casing forming a combustion chamber for said burner, means supporting said casing, a fuel supply tank for said heater carried by said supporting means at one side of said casing and in insulated relation thereto, a fuel supply pipe connecting said tank with said burner, a valve in said pipe, a thermostatic element supported on one side of said tank with said tank lying between said element and said casing, and mechanical valve-operating means acting between said element and said valve.

4. A cabinet type oil burning heater comprising a cabinet, a combustion chamber therein, an oil burner in said chamber, a fuel supply tank supported on said cabinet, a fuel supply connection between said tank and said burner including a float control device and a valve controlled thereby, a thermostatic element supported so that said fuel tank lies between said element and said cabinet, and a valve controlled by said element and located in said fuel supply connection between said float controlled valve and said burner.

5. An oil burning heater comprising a burner, a combustion chamber therefor, a fuel supply tank supported at one side of said chamber in insulated relation thereto, a fuel supply connection between said tank and said burner including a horizontal pipe section beneath said tank, a T-shaped valve fitting having its alined portions connected in said horizontal pipe section and its projecting portion extending in an upward direction, a tube connected to said projecting portion of the fitting and extending upwardly past the lower edge of the fuel tank on the side opposite from said combustion chamber, means connected to said tank and supporting said tube adjacent its upper end, a thermally responsive device carried on the upper end of said tube, a valve member in said fitting, and means housed in said tube forming an operating connection between said device and said member.

6. A cabinet type oil burning heater comprising, in combination, an oil burner, a casing forming a combustion chamber for said burner, a cabinet surrounding said casing in spaced relation thereto and having air-circulating openings formed therein, a fuel supply tank supported at one side of said cabinet, a fuel supply pipe connecting said tank with said burner, a valve in said pipe, a thermostatic element mounted at one side of said tank with said tank lying in a heat-insulating relation between said element and said cabinet, and mechanical valve-operating means acting between said element and said valve.

In testimony whereof, I have hereunto affixed my signature.

GEORGE E. PICKUP.