

UNITED STATES PATENT OFFICE

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EMERGENCY FLOAT CONTROL FOR OIL HEATERS

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The present invention relates to an emergency control for liquid fuel burners, and particularly those assemblies which incorporate float devices for normally regulating the supply of fuel to the burner.

The primary object of the invention is to provide an emergency control which is ordinarily inoperative but becomes active in the event the float control fails; also to prevent interference with the maintenance of a uniform supply of fuel to a pilot flame.

It sometimes happens that the normal operation of a fuel control assembly is interfered with by the flame becoming extinguished or the burner becoming flooded with a supply of fuel in excess of the combustion capacity, due to the failure of the float control over the valve by reason of the float becoming logged or the valve mechanism sticking; also the small orifice designed to maintain a constant feed to the pilot not infrequently becomes clogged by a particle of sediment or by a gummy deposit.

By my invention, upon the failure of the float to function to close the valve, in the event the flame becomes extinguished or the burner flooded, thermostatic means come into operation to close the valve and stop further supply of oil; and the pilot orifice is kept open by means of a thermostat under variations in temperature.

As illustrative of the invention, I have in the accompanying drawings and in the description predicated thereon set forth a preferred and modified embodiment of the same. In the drawings,

Fig. 1 is a longitudinal section through the control mechanism illustrating a preferred embodiment of the invention, and

Fig. 2 is a similar view of a modification.

With particular reference to Fig. 1 of the drawings, an oil burner is represented at 11 comprising a bowl with its walls apertured at 12. 13 represents an oil supply pipe leading from an elevated tank, not shown, into a float chamber 14 through a port 15 controlled by a needle valve 16 having its stem provided with a collar at 17 beneath which is positioned the spring 17^a and above which engages loosely the bifurcated end 18 of a

lever pivoted at 19. To the other end of the lever is attached a float 20 by means of which the level of oil within the chamber 14 is determined. A supplemental chamber 21 is separated from the float chamber 14 by a partition comprising a horizontal wall 22 and a vertical wall 23. The horizontal wall of this partition is provided with a jet port 24 controlled by a needle valve 25 upwardly urged by a spring 25^a which valve may be manually or thermostatically controlled as desired, but preferably by thermostat as indicated diagrammatically, the thermostat 26 subject to an area 27 heated by the burner 11, and connected by the arm 28 with the stem 25^a of the valve 25. An outlet port 29 leads to the passage 30 whereby the oil from the float chamber is passed to the burner 11. The float chamber is vented at 31.

Independently of the provision for passing the normal quantity of oil for combustion purposes from the float chamber to the burner through the port 24 controlled by the valve 25, there is an open by-pass orifice 32 through the wall 22 by means of which a small quantity of oil may pass at all times to supply a pilot flame in the bottom of the burner. By reason of the small size of this orifice it has a tendency to clog by the collection therein of sediment or the forming of a gummy deposit upon its wall. In order to keep the passage free, I provide an agitator in the form of a non-corrodible wire 33 hanging freely in the orifice. This agitator may be suspended as shown upon a tilting member 34 resting upon the spring 34^a to permit of its vertical movement within the orifice.

The bi-metallic thermostat 35 secured at 36 adjacent the burner has an extension arm 37 with its free end overlying the upper end of the valve stem 16.

Under normal operation of the burner, it will be readily understood that the float 20 through its connections with the valve 16 maintains within the float chamber a substantially constant level whereby the amount of oil fed to the burner may be accurately defined by the selection of the valve port jet 24 subject to the ultimate control of the thermostat 26 connected with the point of con-

sumption of heat from the burner, such as a water heater 27, a room, etc.

Variations of temperature of the area subject to heat of the burner, under normal conditions of operation, are such as to maintain the free end of the thermostat arm 28 in continual movement through a wide range whereby the agitator wire 33 is moved up and down within the orifice 32 to keep the same free from obstruction.

In the event the burner 11 should become flooded or the flame extinguished, a lowering of the temperature at the burner will cause such a decided flexing of the thermostat 35 as to press the arm 37 upon the top of the valve 16 and close the same without regard to oil level maintained by the float 20 or the rate of flow for which the valve jet 24 is designed or the valve 25 controlled by the thermostat 26. In other words, the action of the thermostat 35 is dominating, and even though a lowering of temperature at the burner or the area heated, would ordinarily call for the supplying of more fuel through the valve 25, the abnormal lowering of temperature due to flooding or extinguishing of the flame will immediately through the action of the arm 37 of the thermostat 35 close the valve 16 against the admission of additional oil to the float chamber and consequently past the valve 25 to the burner. This condition will prevail until the fuel in the burner is reignited or the flooded oil is diminished to a point where the normal heat at the burner is restored, whereupon the valve 16 is relieved from domination by the thermostat 35 and its control again taken over by the float 20 and the other thermostat.

The effect upon the thermostat 35 of gradual cooling of the burner due to flooding or extinguishing of the flame at the burner is accentuated by overflow of oil from the float chamber 14 into the tubular thermostat housing 38, which cool oil contacts with the thermostat 32 and instantaneously causes the same to respond.

Referring now to Fig. 2 of the drawings, the construction is substantially the same as that in Fig. 1. Here, however, the vertical partition wall 23 of Fig. 1 is omitted and instead of the fuel passing upwardly through the port 24 controlled by the valve 25 it passes downwardly through said port into the supplemental chamber 39 whence it flows into the passage 30 leading to the burner. The operation is essentially the same. Herein, however, the one arm 37 of the thermostat 35 is extended above and beyond the valve 16 to a point above the valve 25 as shown at 37^a, and the tilting support 34 is attached by a spring 40 to the float chamber wall instead of being pivoted as in Fig. 1. The one arm 37 acts upon both valves 16 and 25. This does not materially affect the functioning as

will be apparent from a comparison of the two figures of the drawings.

I claim:

1. An emergency control for liquid fuel burners comprising, in combination with the burner, a fuel supply, a float chamber traversed by the fuel, a valve therein normally actuated by the float to close at a predetermined level of the fuel in the chamber, a thermostat subject to the heat of the burner and so disposed with reference to said valve as to close the same when the temperature drops below a predetermined minimum regardless of the normal float control.

2. An emergency control for liquid fuel burners comprising, in combination with the burner, a fuel supply, a float chamber traversed by the fuel, a valve therein of the needle type closing in opposition to flow and normally actuated by the float to close at a predetermined level of the fuel in the chamber, a bi-metallic thermostat subject to the heat of the burner and so disposed with reference to the valve as to bear upon and close the same when the temperature drops below a predetermined minimum, said thermostat being sufficiently strong to dominate the normal functioning of the float control.

3. An emergency control for liquid fuel burners comprising, in combination with the burner, a fuel supply, a float chamber traversed by the fuel, a valve therein normally actuated by the float to close at a predetermined level of the fuel in the chamber, a thermostat subject to the heat of the burner and so disposed with reference to the valve as to close the same when the temperature drops below a predetermined minimum regardless of the normal float control, the thermostat so located as to be contacted and chilled by the overflow fuel from the float chamber upon flooding of the latter.

4. An emergency control for liquid fuel burners comprising, in combination with the burner, a fuel supply, a float chamber traversed by the fuel, a valve therein normally actuated by the float to close at a predetermined level of the fuel in the chamber, a thermostat subject to the heat of the burner and so disposed with reference to the valve as to close the same when the temperature drops below a predetermined minimum regardless of the normal float control, a pilot supply by-pass, and a thermostatically actuated agitator within the by-pass, the agitator so disposed with reference to the thermostat as to be actuated by variations in temperature to maintain the by-pass open.

5. An emergency control for liquid fuel burners comprising, in combination with the burner, a fuel supply, a float chamber traversed by the fuel, a valve therein normally actuated by the float to close at a predetermined level of the fuel in the chamber, a thermostat subject to the heat of the burner and

so disposed with reference to the valve as to close the same when the temperature drops below a predetermined minimum regardless of the normal float control, a pilot supply by-pass, an agitator within the by-pass, and a thermostat subject to heat generated by the burner, the agitator so disposed with reference to the thermostat as to be actuated by variations in temperature to maintain the by-pass open. 70

6. The combination with a fluid fuel burner, a fuel supply passage to the burner, a valve controlling said supply passage, a normally open by-pass to supply a pilot flame, an agitator within the by-pass, and movable means so disposed with reference to the valve that movement thereof is transmitted to the agitator to maintain the by-pass free of obstruction. 75

7. The combination with a fluid fuel burner, a fuel supply passage to the burner, a valve controlling said supply passage, a normally open by-pass to supply a pilot flame, an agitator wire axially disposed within the by-pass, and movable means comprising a thermostat subject to variations in heat generated by the burner and so disposed with reference to the agitator that movement thereof due to changes in temperature during normal operation of the burner is transmitted to the agitator to maintain the by-pass free of obstruction. 80

11. An emergency control for liquid fuel burners comprising, in combination with a burner, a heated body, a fuel supply, a float chamber, a float-controlled inlet valve to said chamber from the fuel supply, an exit valve from said chamber to the burner, a thermostat normally actuated by changes in temperature of the body heated by the burner to open the exit valve to supply more fuel from the chamber as the temperature falls, and another thermostat subject to the heat of the burner and so disposed with reference to the float-controlled inlet valve as to close the same when the temperature in the burner drops below a predetermined minimum and shut off the supply of fuel to the burner by way of the float chamber regardless of the temperature of the heated body. 85

In testimony whereof I have hereunto subscribed my name. 90

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8. An emergency control for liquid fuel burners comprising, in combination with a burner, a fuel supply thereto, a float chamber traversed by the fuel, an inlet valve thereto normally actuated by the float to close at a predetermined level of the fuel in the chamber, an outlet valve therefrom, a thermostat subject to the heat of the burner and so disposed with reference to the two valves as to close the same when the temperature drops below a predetermined minimum regardless of the normal float control. 100

9. An emergency control for liquid fuel burners comprising, in combination with a burner, a fuel supply thereto, a float chamber traversed by the fuel, an inlet valve thereto normally actuated by the float to close at a predetermined level of the fuel in the chamber, an outlet valve therefrom normally actuated by changes in temperature of a body heated by the burner, a thermostat subject to the heat of the burner and so disposed with reference to the two valves as to close the same when the temperature drops below a predetermined minimum regardless of the normal float control and of the temperature of the heated body. 105

10. An emergency control for liquid fuel burners comprising, in combination with a burner, a heated body, a fuel supply, a chamber, an inlet valve to said chamber from the fuel supply, an exit valve from said chamber to the burner, thermostatic means normally 110

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