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CONTROL FOR HEATING UNIT

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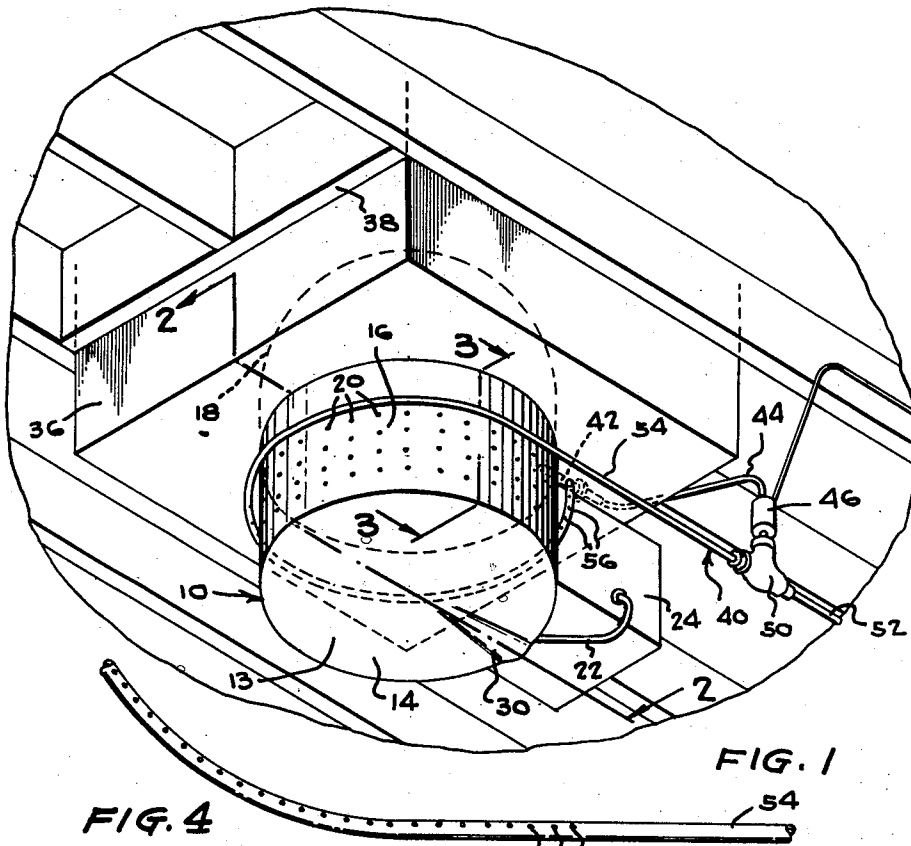


FIG. 4

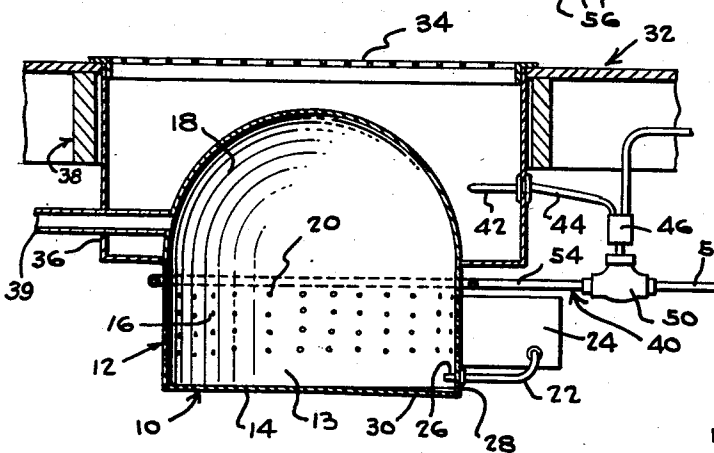


FIG. 2

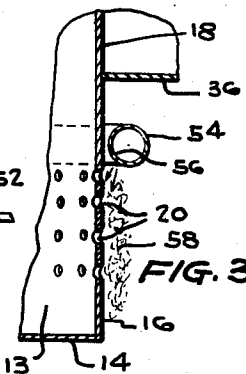


FIG. 3

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CONTROL FOR HEATING UNIT

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2 Claims. (Cl. 158—42.4)

The present invention relates to control for heating units, and more particularly to a device utilized to automatically control the combustion of fuel within the firepot of a space heater, or the like.

A primary object is the provision of a safety control of the class described above having a novel and improved construction over previously known devices of this general purpose.

It is a further object of this invention to supply a safety control for a heating unit which is so constructed and assembled as to substantially eliminate any risk of an uncontrolled fire or explosion.

Another object is the provision in a space heater of thermally controlled means for cutting off the combustion supporting media of the heater to prevent the overheating thereof.

A still further object is to provide a control for a heating unit, the control means comprising a vaporous substance or compound.

Another object resides in the provision of control means of this general type, the means comprising a substantially fluid substance or compound for substantially enveloping the firepot of a space heater.

Among the further objects and advantages of the present invention is the provision of a control of the class described supra, the control being non-complex in construction and assembly, inexpensive to manufacture, and durable in use.

Other and further objects and advantages will become more readily apparent from a consideration of the following specification when read in conjunction with the annexed drawing, in which:

Figure 1 is a perspective view of a space heater mounted beneath a floor or the like, and employing a firepot control means constructed and assembled in accordance with the teachings of this invention;

Figure 2 is a detail cross sectional view of the heater assembly, control means, and automatic valve control assembly, taken substantially along the section line 2—2 of Figure 1, looking in the direction of the arrows;

Figure 3 is an enlarged, fragmentary detail cross sectional view taken substantially along the section line 3—3 of Figure 1, looking in the direction of the arrows; and

Figure 4 is an enlarged fragmentary section of the water conduit forming a part of a control means assembly of this device.

Referring now to the drawing in more exact detail, reference numeral 10 is applied generally to denote a space heater employing a control assembly within the scope of the present invention. The heater 10 comprises a main body portion 12 which includes a firepot portion 13 having a substantially discoidal base 14 and an integrally formed, upright, annular side wall 16. The main body portion 12 also has a dome-shaped combustion chamber 18 secured to, or formed integrally with, the side wall 16 of the firepot 13. As seen in the drawing,

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the side wall 16 of the firepot 11 is provided with a plurality of air supply openings 20 formed therein to permit the entrance of air or other combustion supporting media into the firepot. Fuel is supplied into the firepot 13 by a conduit 22 leading from a fuel source 24 and terminating within the firepot at a nozzle 26, and the fuel is ignited by the contact thereof with a conventional electrical starter unit 28 set in a depressed portion 30 of the base 14.

The environment of the space heater 10 in this illustration consists of the floor 32 of a building having a heat distributing grating 34 therein and the heater 10 is secured in a plenum chamber 36 which is secured to the floor joist 38 subjacent the aforesaid grating. As seen in Figures 1 and 2, the openings 20 in the side 16 of the firebox are outside of the chamber 36 in order that air may be readily drawn therethrough, and that the combustion chamber 18 is vented to the atmosphere through a flue pipe 39 or by any other means conventional in this art.

Proceeding now to describe the control means assembly 40 which forms a primary means of accomplishing the objectives of this invention, it will be seen that a temperature responsive switch or thermostatic control 42 is secured within the plenum chamber 36 at a point in proximity to the combustion chamber 18. The switch 42 is connected by leads 44 in an electric circuit including a solenoid 46 and a source of E.M.F. The solenoid 46 is adapted to actuate a normally closed valve 50 connected with one end of a water source 52. The discharge side of the valve 50 is connected with a pipe 54 having one or more convolutions therein surrounding the periphery of the side wall 16 of the firepot subjacent the chamber 36. As best seen in Figure 4, the pipe 54 is provided with a plurality of longitudinally spaced apertures 56 disposed at an angle of substantially 45 degrees relative to the side wall 16 of the firepot 13.

In operation, the fuel supply conduit 22 is activated by any conventional control (not shown) and fuel is directed through the nozzle 26 onto the starter unit 28 whereby the fuel is ignited. The air to support the flame is drawn into the firepot through the openings 20 formed in the side wall 16. When the combustion chamber 18 surpasses a predetermined maximum optimum operating temperature, the thermostatic control 42 is activated which in turn energizes the solenoid circuit thereby causing the control valve 50 to move to its open position. Water under pressure in the source 52 now flows through the pipe 54 and is sprayed out through the apertures 56 formed therein. The radiant heat of the firepot converts the spray of water into a steam barrier 58 completely encompassing the side 16 thereof and effectively barring the entrance of further air or combustion supporting media into the firepot and thereby extinguishing the flame at the nozzle 26. The flow of fuel from the conduit 22 is automatically cut off by conventional means sensitive to the lack of fire in the firepot and resultant flooding thereof.

When the unit 10 has cooled to a predetermined low temperature, the thermostatic control switch 42 is automatically opened to energize the circuit to the solenoid thus closing the valve 50 and shutting off the water supplied therethrough to the pipe 54. The steam barrier is accordingly dissipated and the fuel and air in the firepot are re-ignited by the ignition unit 28.

Although this illustration and description have dealt with this invention as applied to a space heater, it will be understood that this setting has been supplied as illustrative of a large group of applications of the invention. Therefore, this invention should be limited only by the scope of the appended claims.

What is claimed is:

1. In a space heater having a perforate intermediate annular side wall and a bottom wall defining a fire pot, a combustion chamber for said fire pot comprising a dome-shaped top wall, said perforations admitting a combustion supporting medium into said fire pot, means for excluding the combustion supporting medium from within said fire pot, said means comprising an automatically operated control for directing a water spray toward and against the exterior side of said annular side wall for the conversion of said water by conducted heat into steam to effect envelopment of said side wall and to prevent entry of said combustion supporting medium into said fire pot, and means venting said combustion chamber to the atmosphere.

2. In a space heater having a main body portion including a dome shaped combustion chamber and subjacent fire pot including a bottom wall and a side wall having a plurality of supply openings formed therein, a thermostat adjacent said combustion chamber, said thermostat being connected in an electrical circuit including a solenoid operable valve normally closed and connected with a water supply source under pressure,

said solenoid operable valve being remotely positioned relative to said combustion chamber, a convoluted tubular pipe connected with the discharge side of said valve and positioned around the upper end of said side wall, said pipe having a plurality of perforations disposed at substantially a 45 degree angle relative to said side wall of said fire pot, said thermostat being responsive to a temperature in said combustion chamber above a predetermined value thereof to energize said circuit and said solenoid to open said valve and to permit water to flow through said convoluted pipe and out of said apertures for impingement against said side wall of said fire pot whereby said water is converted to steam to completely envelop said side wall to exclude air from entering the openings formed therein, and means for venting the combustion chamber to the atmosphere.

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