

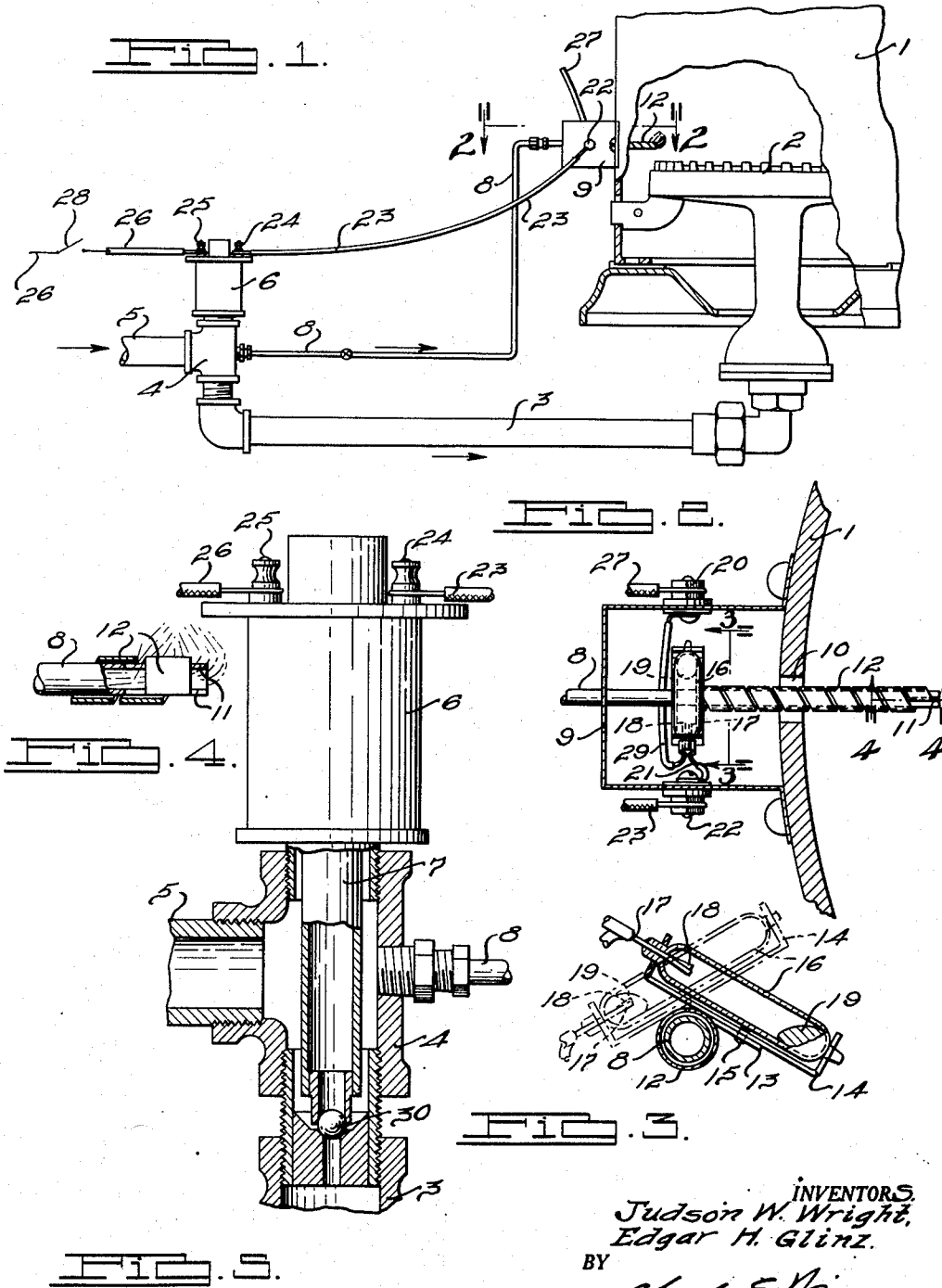
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THERMOSTATIC SWITCH

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THERMOSTATIC SWITCH

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This invention relates to thermostatic switches and the object of the invention is to provide a thermostatic switch operating in conjunction with a pilot light whereby the pilot light maintains the switch in the closed position and should the pilot light go out the switch will automatically turn to the open position.

Another object of the invention is to provide a thermostatic switch connected in a circuit for a solenoid operated valve in which the circuit when closed maintains the valve open but upon failure of the pilot light, the switch will turn to the open position to break the circuit to the valve and shut off the gas supply.

A further object of the invention is to provide a thermostatic switch comprising a pilot light conduit having a sheet metal thermostatic member secured in the discharge end of the conduit and positioned thereover, the free end of the thermostatic element providing a support for a mercury switch whereby when the thermostatic element is cold the switch is turned to break the circuit and when the thermostatic element is warm the switch is turned to close the circuit.

Another object of the invention is to provide a thermostatic switch in which the flame from the pilot tube maintains the switch in a closed position but upon failure of the flame the switch will automatically turn to the open position.

These objects and the several novel features of the invention are hereinafter more fully described and claimed and the preferred form of construction by which these objects are attained is shown in the accompanying drawing in which—

Fig. 1 is a view of a heater including a burner and solenoid valve and showing my improved thermostatic switch mounted on the wall of the heater.

Fig. 2 is an enlarged section taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 2.

Fig. 4 is an enlarged section taken on line 4—4 of Fig. 2.

Fig. 5 is an enlarged view of the solenoid valve partially in section to show the connections thereto.

A housing 1 of a water heater is shown more particularly in Fig. 1 and a gas burner 2 is mounted in this heater housing. This burner is connected by means of a pipe 3 with a solenoid operated valve 4 to which a supply pipe 5 is connected. In this structure as shown in Fig. 5, a solenoid 6 is provided having a movable core

member 7 provided with a ball 30 held in the lower end thereof. When the solenoid 6 is energized, the member 7 is raised to lift the ball 30 off from its seat and allow flow from the pipe 5 through the valve and through the pipe 3 to the burner 2. When the solenoid 6 is not energized, the core member 7 will fall by gravity to position the ball 30 on its seat and shut off the supply of gas to the burner.

A pilot tube 8 is connected into the wall of the valve member 4 ahead of the ball 30 and this pilot tube 8 extends through a U-shaped bracket 9 secured to the wall 1 of the heater, as shown in Fig. 2. This wall of the heater is provided with an opening 10 through which the end of the pilot tube extends into position over the burner 2, as shown in Fig. 1. This pilot tube 8 is provided with a slot 11 cut into the end thereof, as shown in Figs. 2 and 3, and a spiral thermostatic metal member 12 is positioned over the tube and is provided with an end extending through the slot 11 in the end of the tube and the ends of the tube are pinched together to anchor the end of the thermostatic member 12 therein. The opposite end 13 of the thermostatic metal member 12 extends outwardly, as shown in Fig. 3, and is secured to a flat U-shaped bracket 14 by means of the rivet 15. A vacuum tube 16 is mounted in the bracket 14 and is made from glass with the terminals 17 and 18 embedded into the glass and extending into the interior of the tube. A globule of mercury 19 is provided in the vacuum tube 16 and when in the position shown in full lines in Fig. 3 the mercury is away from the terminals 17 and 18 and when turned to the position shown in dotted lines the mercury connects the two terminals to allow electricity to flow therebetween. The terminal 18 is connected by means of a wire 29 to a contact member 20 which is insulated from the bracket 9 while the terminal 17 is connected by means of a wire 21 to the contact member 22 which is also insulated from the bracket 9.

A wire 23 is connected to the contact member 22 and leads to a contact terminal 24 on the solenoid 6 and the contact 25 on the solenoid is connected by means of a wire 26 to a source of electric current. A wire 27 is connected to the electrical contact member 20 and for the purposes of this invention may lead back to the source of electric energy so that the wires 26 and 27 represent the opposite sides of an electrical circuit. A manual switch 28 is provided in the line 26 so that it is necessary to close this switch in order to operate the solenoid valve. The gas supply to

the tube 8 is constant and the gas discharges from the slotted end 11 and may be lighted to produce a small pilot flame as indicated in Figs. 1 and 4. In this connection it will be noted that the slot 11 in the lower side of the tube 8 admits air to mix with the gas in the end of the tube and provide a small blue pilot flame as shown in Fig. 4. This flame heats the anchored end of the thermostatic member 12 and tends to cause this spiral thermostatic member to unwrap slightly which turns the bracket 14 and tube 16 to the position shown in dotted lines in Fig. 3 to close the circuit between the contacts 17 and 18. At this time, should the manual switch 28 be closed, current will flow through the solenoid 6 thus raising the member 7 and lifting the ball 30 from its seat and allowing the gas to flow through the pipe 3 to the burner 2 where it is ignited by the pilot flame.

When the switch 28 is again opened, the member 7 will fall by gravity to close the valve and shut off the gas supply to the burner, but the pilot will continue to burn as before. However, should the pilot go out, the thermostatic member 12 will cool off and turn the tube 16 to the position shown in full lines in Fig. 3 preventing electrical contact between the terminals 17 and 18 and should the switch 28 be closed at this time nothing will happen as the circuit is broken within the tube 16 and consequently the solenoid will not be energized to open the valve. The gas, of course, will continue to pass from the end of the pilot tube but in such a small quantity that it is not dangerous and will discharge to the usual flue for the gas heater. To re-establish operation, it is only necessary to light the gas passing from the end of the pilot tube, at which time, the tube 16 will turn to the position shown in dotted lines in Fig. 3 closing the terminals 17 and 18 so that subsequent closing of the switch 28 will energize the solenoid and open the valve to allow gas flow to the burner, at which point, the gas will be again ignited by the pilot light.

From the foregoing description it becomes evident that the device is simple and efficient in operation, provides maximum safety and also provides a burner which may be controlled from a distance by means of an electric switch and provides a device which accomplishes the objects described.

Having thus fully described our invention, its utility and mode of operation, what we claim and desire to secure by Letters Patent of the United States is—

1. In a thermostatic switch, a pilot tube having a diametric slot cut in the end, means for supplying gas to the pilot tube, a thermostatic member wound spirally about the pilot tube, the end of the thermostatic member extending through the diametric slot and the ends of the pilot tube being pinched together to secure the end of the thermostatic member in the slot, the arrangement allowing gas to pass about the anchored end of the thermostatic member and the slot allowing air to mix with the gas to directly heat the thermostat at one end and a mercury switch mounted directly on and turnable to the open or closed position by rotative movement of the thermostatic member.

2. In a thermostatic switch, a pilot tube having a slot in the end, means for supplying gas thereto, a thermostatic member wound spirally about the pilot tube, one end of the thermostatic member being anchored in the slot of the tube for direct heating thereof by the pilot light, a mercury switch mounted on the opposite end of the thermostatic member at a distance from the end of the tube, the mercury switch being turned to one position when the thermostatic member is cold and to another position when warm and the pilot when lighted maintaining the thermostatic member warm.

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