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FUEL VALVE CONTROL FOR GAS BURNERS

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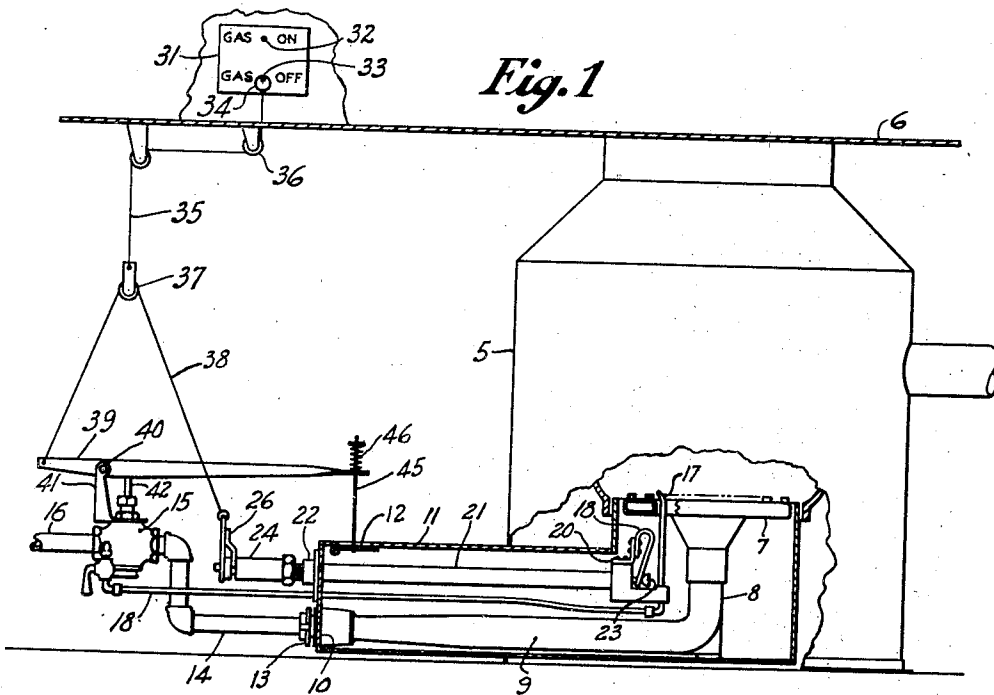


Fig. 1

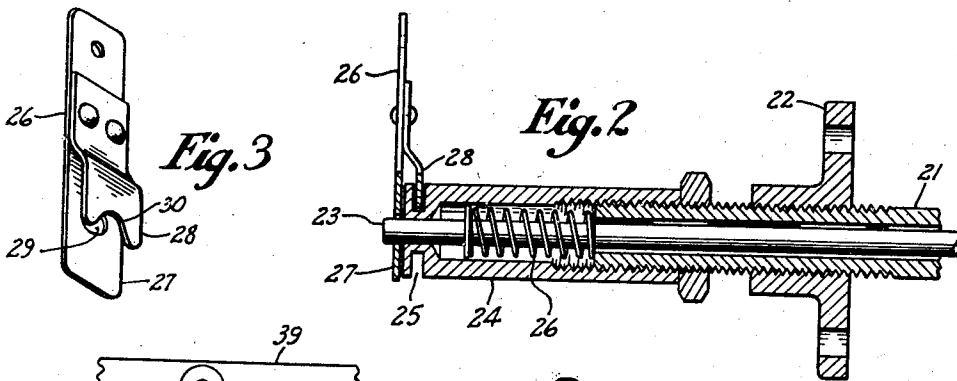


Fig. 3

Fig. 2

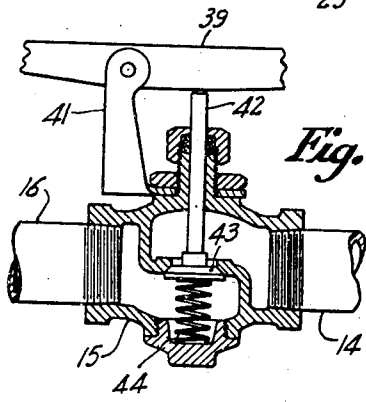


Fig. 4

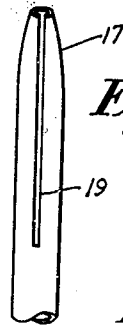


Fig. 5

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FUEL VALVE CONTROL FOR GAS BURNERS

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2 Claims. (Cl. 158—117.1)

This invention relates to apparatus for controlling the operation of a fuel valve for a burner in such a way that the fuel valve cannot be opened from a remote point in case the pilot for the burner is not lit; and has for its object to provide a control apparatus that shall have special utility in connection with domestic gas burning apparatus such as gas fired furnaces and water heaters which are usually located in the basement and the fuel valve for which is manually operated from a room above.

Referring to the drawing wherein the preferred form of the invention is shown,—

Fig. 1 is a more or less diagrammatic representation of a domestic heating plant embodying a warm air furnace fired by a gas burner and showing the present invention applied thereto;

Fig. 2 is a sectional view on a larger scale of a feature of the invention shown in Fig. 1;

Fig. 3 is a perspective view of an element shown in Fig. 2;

Fig. 4 is a sectional view on a larger scale of the fuel valve shown in Fig. 1, and

Fig. 5 is a fragmentary elevation of the pilot.

For the purpose of showing the application of the invention, there is shown a warm air furnace 5 such as is ordinarily located in the basement of a house and which delivers the warm air through a register in the first floor 6 of the house. The furnace is fired by any preferred type of gas burner 7 shown as mounted on an upwardly-turned end 8 of a fuel supply conduit 9 which extends horizontally out of the furnace through the front end 10 of a casing 11 which extends into the furnace through what is ordinarily the ash pit door opening in a coal fired furnace. This casing is provided with a damper 12 which when the burner is operating is open to admit secondary air thereto. The outer end of the conduit 9 is open to the atmosphere and has associated therewith a shutter 13 for controlling the inflow of primary air for mixing with the gas which is delivered to the conduit by the pipe 14 when the fuel control valve 15 is open; the main gas supply line being indicated at 16. Associated with the burner 7 is a pilot 17 to which gas is supplied by a pipe 18 leading from the inlet side of the main valve 15. The construction thus far described is well known in the art.

Associated with the pilot 17 is a thermostat 18 which when the pilot is lit will be heated by flames issuing from the side of the pilot as through a series of small ports or a slot 19 which extends downwardly from the tip of the pilot in such a

way that the flame from the tip of the pilot will ignite the gas issuing from the said slot or ports. The thermostat may be of any preferred construction and as shown may be considered as comprising a bi-metal strip which at one end is secured to a bracket 20, the other end being free. The bracket 20 is part of supporting arm or tube 21 which extends through a supporting bracket 22 secured to the casing wall 10.

Housed by the tube 21 is a rod 23 which at one end is connected to the free end of the thermostat 18 for movement therewith. Adjustably mounted on the outer end of the tube 21 is a tubular body 24 having a peripheral groove 25 adjacent its outer end. Housed in the body 24 is a light spring 56 which surrounds the rod 23 and tends to move the latter toward the left as viewed in Fig. 2, the purpose of the spring being merely to take up any slack in the connection between the rod and thermostat. The body 24 is so adjusted on the tube 21 that when the thermostat 18 is in normally heated condition the rod 23 will extend beyond the outer end of the body as shown in Figs. 1 and 2.

Normally interlocked with the body 24 and rod 23 is a latch element or member 26 comprising two parallelly-extending and laterally-spaced flat arms 27 and 28 of unequal length. The longer arm 27 is provided with a hole 29 to receive the rod 23 and the arm 28 has an arcuate reentrant portion 30 to permit it to make a good seat in the body groove 25. When the parts 23, 24 and 26 are interengaged as in Fig. 2, it will be readily appreciated that the member 26 cannot be detached from the support 24,—and this is the normal position of the parts when the thermostat is kept in a heated condition by the flames issuing from the side of the pilot 17. On the other hand, when the pilot goes out the thermostat will cool off and pull the rod toward the right a sufficient distance to disengage the latter from the arm 27 with the result that the latch member 26 will no longer be anchored with respect to the body 24.

The latch member 26 forms part of a mechanism for manually operating the fuel valve 15 from a remote point as from a wall bracket 31 in the room above the floor 6. The said bracket may be considered as having two pins or hooks 32 and 33 in vertically spaced relation. These pins serve as anchorages for a ring 34 at the upper end of a cable 35 trained over pulleys 36 secured beneath the floor 6 and having at its lower end a pulley 37. Trained over the pulley 37 is a cable 38 which at one end is secured to the latch ele-

ment 26 and at its other end to one end of a lever 39. This lever is pivotally mounted as at 40 on a bracket 41 supported by the valve casing 15. The lever 39 is arranged directly over a valve stem 5 42 which when depressed will open the valve 43 against the tension of the spring 44.

It will, of course, be readily appreciated that as long as the latch member 26 is anchored with respect to the body 24, upward pull on the cable 10 35 will be transmitted to the lever 39 through the cable 38 and thus open the gas valve whereas if the member 26 is not anchored to the said body, upward pull on the cable 35 will be ineffective to open said valve.

15 It is desirable that the secondary air damper 12 be opened and closed as the gas valve is opened and closed and to this end the lever 39 is extended sufficiently to permit a connection 45 from the damper to be secured to the lever arm. A light 20 spring 46 insures that the damper when closed will not prevent the lever from moving to a position where the valve 43 is fully closed under the influence of the valve spring 44.

What I claim is:

25 1. In combination, a burner, a fuel supply valve for the burner, means for normally holding said valve closed, means for opening the valve, said last-named means including a cable which requires to be taut to hold the valve open, means

for holding one end of the cable comprising a rod, a barrel having a circumferential groove, a member having a part disposed in said groove and having a hole wherethrough said rod extends, said member being secured to one end of said cable and being releasable from said barrel when the rod is withdrawn from said hole, and a thermostat for withdrawing the rod from said hole when the temperature of the thermostat falls below a predetermined degree.

2. In apparatus of the class described, the combination of a fuel supply valve biased to closed position, means for opening said valve and comprising a support and a member which requires to be anchored to said support, means for releasably anchoring said member to said support and comprising two fingers on said member one of which is impositively anchored to said support, a rod which is movable with respect to said support, and which in one position holds the other 20 of said fingers when the first mentioned finger is anchored to the body as said, and a heat responsive device arranged to move said rod away from said one position whereby said member will be released from said support when the temperature of said device falls below a predetermined degree.

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