Jan. 5, 1926. 1,568,620

W. E. POTTEIGER

AUTOMATIC IGNITION DEVICE FOR GAS BURNERS

Filed July 5, 1923

Fig. 1.

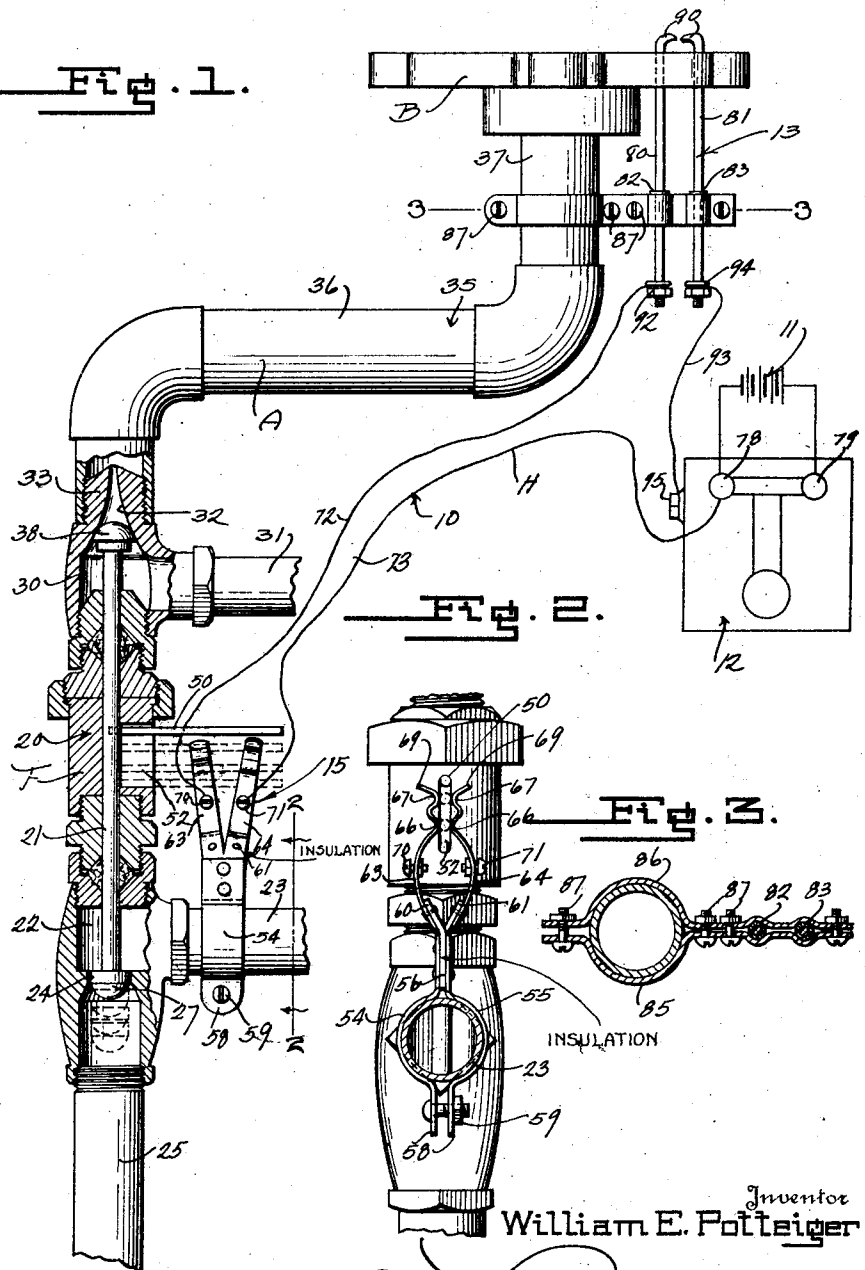


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC IGNITION DEVICE FOR GAS BURNERS.

Application filed July 5, 1923. Serial No. 649,737.

To all whom it may concern:

Be it known that I, WILLIAM E. POTTEIGER, a citizen of the United States, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Ignition Devices for Gas Burners, of which the following is a specification.

This invention relates to improvements in means for automatically igniting gas burners.

The primary object of this invention is the provision of an ignition device, adapted for use in connection with a gas burner for the automatic ignition of gas when released through the burner; the improved automatic ignition device embodying a switch therein which is adapted for operation in connection with a fuel regulating valve.

A further object of this invention is the provision of an ignition device automatically operable in connection with a gas burner, embodying a switch mechanism in circuit therewith adapted to be controlled by the movable valve parts of an automatic gas regulator, such as is set forth in my copending application, Serial No. 629,654, filed April 3, 1923.

Other objects and advantages of this invention will be apparent during the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views.

Figure 1 is a view, partly in section, showing cooperating features of the gas burner and an automatic gas regulator such as set forth in my co-pending application above referred to, the improved ignition device being shown as used in connection with the burner and automatic gas regulating valve.

Figure 2 is a cross sectional view, taken substantially on the line 2—2 of Figure 1, showing improved switch features of the automatic ignition device, as used in connection with the parts of my improved automatic gas regulating valve above referred to.

Figure 3 is a transverse cross sectional view, taken substantially on the line 3—3 of Figure 1.

In the drawings, wherein for the purpose of illustration is shown but the preferred embodiment of this invention, the letter A may generally designate apparatus adapted to convey fuel, such as gas, and may include a burner arrangement B, and automatic gas regulator F, such as is set forth in my copending application above referred to. In connection with the burner B and gas regulator F, an ignition device H may be employed which includes a circuit 10; storage battery or like exciter 11; intensifying coil 12; sparking means 13; and switch device 15.

Referring to the automatic gas regulator F, the same includes a housing structure 20, longitudinally through which a valve stem 21 reciprocates. The lower end of the housing 20 has a chamber 22 therein, and the chamber 22 has a laterally extending conduit 23 connected therewith through which water flows into the chamber 22. A restricted valve seat 24 is provided below the chamber 22, and on the other side of which a conduit 25 is connected to the housing structure 20. The conduit 25 leads to a spigot or boiler, and the water which flows through the conduit 23 into the chamber 22 and thence into the conduit 25 is under pressure. The lower end of the valve stem 21 is provided with a head 27 thereon which is adapted for cooperation within the seat 24, although the same is of less diameter than the diameter of the seat 24 to provide a slight clearance therebetween. At the upper end of the housing 20, a chamber 30 is provided, which is adapted to receive a supply of gas from a gas conduit 31. The chamber 30 provides a restricted seat 32 through the nozzle portion 33 thereof.

The burner B may be of any approved type, and is connected, as by means of an L-fitting 35 to the nozzle 33, the L-fitting 35 including a horizontal portion 36, and the vertical portion 37 upon which the burner B is directly mounted, although the fitting 36 may be of any shape, as the same is primarily adapted to provide a conduit for the transmission of fuel or gas from the nozzle 33 to the burner B.

The automatic gas regulator F, as to operation, is well set forth in my copending application, above referred to. The primary principle of operation, however, is that when the water is flowing thru the conduit 23 into the conduit 25, the force of the flow of the same will act upon the head 27 to pull the valve stem 21 downwardly, unseating the valve head 38 on the upper end of the valve stem 21 from the gas nozzle seat 32, thus permitting the gas to flow thru the conduit

31 and then upwardly through the fitting 35 into the burner B. When the water is shut off from flow through the conduit 25, the gas being under pressure greater than atmospheric pressure, such pressure will act upon the valve head 38 to send the valve stem 21 upwardly to close the nozzle 33 so that gas cannot escape therethrough.

Referring to the switch means 15, a metal arm 50 is preferably affixed to the valve stem 21, and extends radially thru a slot 52, in the housing 20, said arm 50 extending for its major length beyond the exterior surface of the housing 20, substantially as is illustrated in Figure 1 of the drawing. When the valve head 38 is closed within its seat 32, the rod 50 is uppermost within its slot 52, so that as the valve rod 21 moves downwardly within the housing 20, the contact arm 50 may likewise move downwardly in the slot 52 into the position indicated by the dotted lines in Figure 1 of the drawing. This arm 50 constitutes a movable contact for the switch structure 15. Segments 54 and 55 of a clamping ring are connected about the water inlet conduit 23, at their upper ends being connected by an insulation spacing piece 56, and at their lower ends depending and providing apertured ears 58 adapted to receive an adjusting screw or bolt 59 therethrough, whereby the segments 54 and 55 may be the more securely attached to the conduit 23. A portion 60 of the insulation strip 56 is upwardly inclined to one side and a second portion 61 is upwardly inclined to the opposite side of the normal plane of the strip 56. These insulation portions 60 and 61 respectively support resilient contact arms 63 and 64 respectively which are arcuate, and at their upper ends are urged into the plane defined by the slot 52. At the upper end of each arm 63 and 64, a pair of crimps or bowed portions 66 and 67 are provided, and the extreme upper ends of said arms 63 and 64 are relatively outturned, as at 69. The arms 63 and 64 in their bowed portions immediately above the insulation attaching portions 60 and 61 are respectively provided with terminal screws 70 and 71 which are adapted to respectively receive wires 72 and 73 of the circuit 10 thereon.

The coil 12 has the battery 11 connected onto contacts 78 and 79 thereof and the wires 73 are preferably connected to terminal 78 so that current may flow through the wire 73 into the switch structure 15.

Referring to the sparking structure 13, a pair of elongated electrodes 80 and 81 are preferably provided as a part thereof, which may be supported in insulation sleeves 82 and 83 respectively. A pair of clamping arms 85 and 86 are provided, which are detachably secured about the upstanding conduit portion 37, as by screws or bolts 87, and radially outstand from the vertical portion 37 of the fitting 35 to detachably support the insulation sleeves 82 and 83 therein. The electrodes 80 and 81 are thus vertically carried by the clamping arms 85 and 86 attached to the fitting portion 37, and at their upper ends are relatively inturned, as at 90, immediately over the burner B. The electrode 80 at its lower end is provided with clamping nuts 92 adapted to have the wire 72 of the circuit 10 secured thereto. A wire 93 is preferably attached as by terminal nuts 94 to the lower end of the other electrode 81; said wire 93 being attached also to a terminal 95 of the intensifying coil 12.

Referring to the operation of this invention, when the water is inactive within the conduit 23, the pressure within the gas main being greater than atmospheric pressure will maintain the valve stem 21 uppermost to seat the valve head 38 in its seat 32, and in accordance with a specific description of the improved automatic gas regulator set forth in my co-pending application above referred to. In this position, the switch 15 will, of course, be open, as the arm 50 is elevated above the contact arms 63 and 64 and the circuit 10 is consequently broken. However, upon opening of a stop cock to permit flow of water through the conduit 25, the water will flow through the conduit 23 into the chamber 22 and act upon the head 27 to move the stem 21 downwardly and open the valve structure within the automatic gas regulator. This opening of the valve structure will of course draw the valve stem 21 downwardly until the metal contact arm 50 moves into engagement with the two uppermost crimps or bowed portions 67 of the contact arms 63 and 64. This completes the circuit through the storage battery coil and causes an intense spark to jump between the contact points 90 of the electrodes 80 and 81. As the valve in the automatic gas regulator F opens, the fuel or gas flows upwardly thru the fitting 35 into the burner B. If the gas has already reached the burner B, incident to sufficient pressure, the first spark jumping between the points 90 will ignite the same. However, as the rushing water further opens the valve structure in the automatic gas regulator F, the radially extending arm 50 will descend until the same again bridges the contacts 63 and 64 as by engaging the lower bowed portions 66 thereof, causing a second spark to jump between the electrodes 90, and at which time, of course, the gas is emanating from the burner B, and will be ignited. As the contact 50 further descends, the circuit 10 is broken, although the purpose of the same has been served, as the gas is ignited. When the water is stopped from flowing through the conduit 23, the valve mechanism in the automatic

gas regulator F will elevate to shut off flow of gas to the burner B.

From the foregoing description of this invention, it is apparent that an automatic ignition device for gas burners has been provided, which will not only do away with the ordinary pilot light provided for gas burners, but which is more economical in operation than the ordinary pilot light and which is absolute in operation.

Various changes in the shape, size and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of this invention or the scope of the claim.

I claim:

In an apparatus of the character described, a conduit, a valve for controlling passage of fluid through said conduit and including a body portion having a longitudinally extending slot and a valve stem sliding longitudinally in the body portion, a burner and electrically operated igniting means including a circuit, sparking means in the circuit adjacent said burner and a switch comprising clamping arms, a strip of insulation secured between the upper end portions of said clamping arms, means for drawing the clamping arms into binding engagement with a support adjacent said valve, said strips of insulation extending above said clamping arms and having fingers extending in diverging relation to each other and upon opposite sides of said clamping arms, resilient contact strips secured to said fingers and extending upwardly therefrom, said strips having portions bowed outwardly in opposite directions and at the upper ends of the bowed portions having upwardly extending crimped end portions, terminals carried by the bowed portions, and a bridging rod extending from said valve stem through said slot and positioned above the crimped portions of the contact strips when the valve is closed and moving downwardly between the crimped portions to a point between the bowed portions when the valve is opened and engaging with crimped portions while passing between the same to complete the circuit and permit operation of the sparking means.

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