Nov. 8, 1932. F. A. GAUGER 1,886,876

SAFETY PILOT LIGHT

Filed Dec. 22, 1927

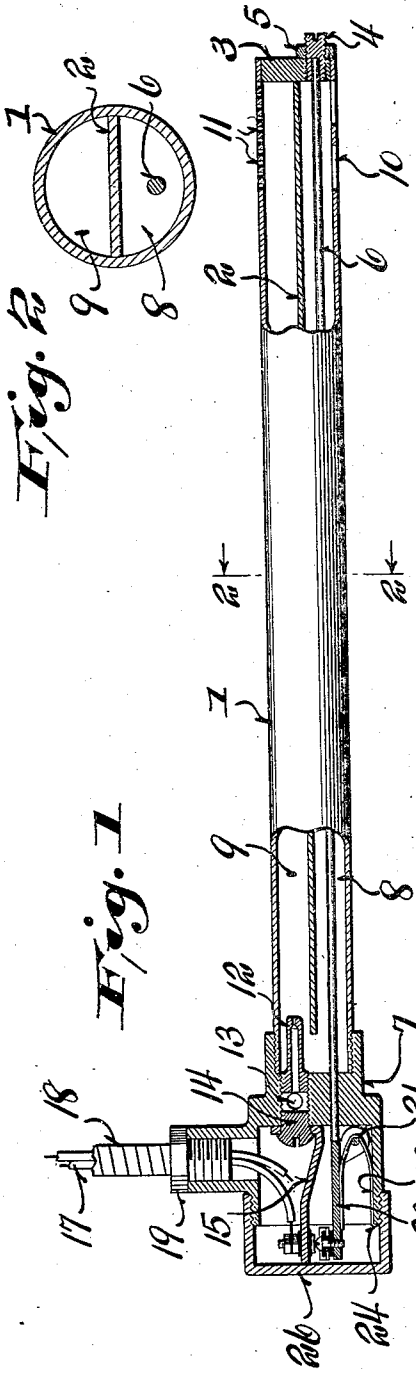


Fig. 1

Fig. 2

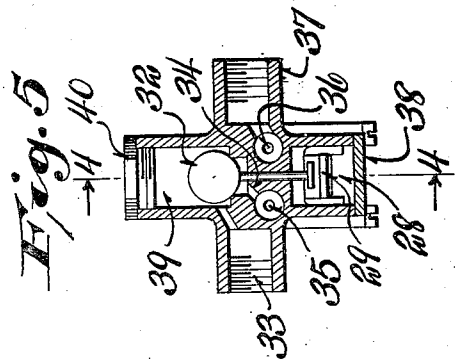


Fig. 5

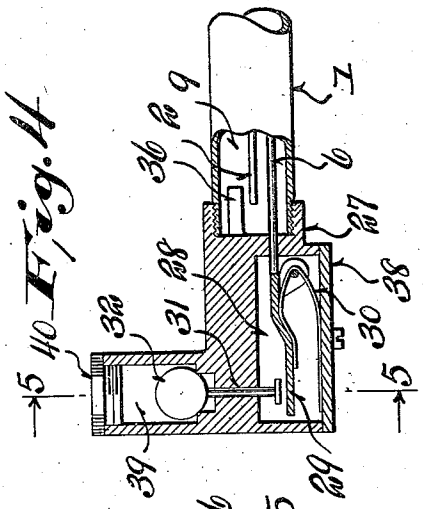


Fig. 4

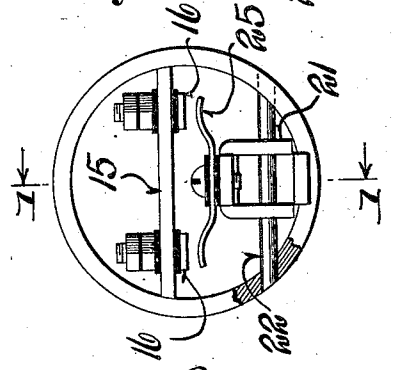


Fig. 3

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UNITED STATES PATENT OFFICE

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SAFETY PILOT LIGHT

Application filed December 22, 1927. Serial No. 241,826.

This invention relates to a safety pilot light.

Objects of this invention are to provide a novel pilot light such, for instance, as one adapted for burners, which is so constructed that it will render a control device inoperative when the pilot light is extinguished and will hold the control device in operative position when the pilot light is lighted so that there is no danger of the accidental turning on of the fuel when there is no burning pilot.

Further objects are to provide a safety pilot light which is a unitary structure and which may, therefore, be removed and positioned as a unit, which is fool-proof, which is self-contained, which is waterproof, and in which the parts may be readily reached for repair or adjustment.

Further objects are to provide a pilot light which is so constructed that it is impossible to blow out the pilot light by the concussion or explosion of an adjacent burner, but which is so constructed that the pressure is equalized in the tube of the pilot light and consequently in which there is no fluctuation of the flame even when there is an explosion due to the operation of the burner as, for instance, when the burner is ignited or extinguished.

Further objects are to provide a safety pilot light in which a Bunsen burner effect is produced to thereby have a smokeless blue flame for the pilot light, and in which two tubes or equivalent construction are employed, with a gas supply nozzle in one of the tubes and with the other tube supplying the air at the base of the tube, the tubes having open ends located in approximately the same zone, so that variation in pressure at the burning flame will not produce a blast of air in either direction through the tubes.

Further objects are to provide a very simple construction which is easily made, and which consists of few parts.

Embodiments of the invention are shown in the accompanying drawing in which:

Figure 1 is a view of one form of the device with parts broken away and in section;

Figure 2 is an enlarged transverse sectional view on the line 2—2 of Figure 1;

Figure 3 is a rear end view of the structure shown in Figure 1 with the end cap removed, such view being partly in section and enlarged;

Figure 4 is a sectional view showing the rear end of the modified form of pilot light, such view corresponding to a section on the line 4—4 of Figure 5;

Figure 5 is a sectional view on the line 5—5 of Figure 4.

Referring to the form of the invention shown in Figures 1, 2, and 3, it will be seen that the pilot light consists of a tubular main member 1 which consists in effect of two tubes, as it is divided along an approximately diametrical line by means of a partition 2 extending lengthwise thereof. The outer end of the tube is closed by means of an end plug or member 3 which is provided with an adjusting screw 4 threaded therethrough and locked in place by means of a lock nut 5. The inner end of the screw 4 is socketed and receives the rod 6. Preferably, the rod 6 is relatively non-expanding and will hereinafter be referred to as the non-expanding rod while the tube 1 lengthens with increase in temperature. The net result is that the rod is drawn outwardly with reference to the head 7 which is preferably screwed or otherwise rigidly secured to the rear end of the tube 1.

It will be seen from the structure thus far described that the apparatus constitutes in effect a U-shaped tube having an inlet air supply passageway 8 and a mixture passageway 9. The air passageway 8 is provided with a plurality of apertures 10 adjacent the outer end of the structure and the fuel passageway 9 is provided with a plurality of apertures 11 in the same zone as the apertures 10.

The head 7 is hollow and is provided with a fuel supply nozzle 12 projecting outwardly in line with the passage 9. This nozzle is supplied in any suitable manner as by means of the port 13. The rear end of the aperture into which the nozzle 12 is threaded is closed by means of a screw 14. This screw may also hold a stationary contact carrying plate 15, as shown in Figure 1. This contact plate carries a pair of contacts 16 (see

Figure 3). The contacts 16 are connected to a pair of conductors 17 which are housed in a flexible cable 18 provided with a fitting 19 secured in the head 7. The head 7 also carries a small lever consisting of a metal plate 20 provided with pivotally mounted arms 21. Preferably, the arms 21 are carried by a pin 22 passing transversely through the head, as shown most clearly in Figure 3. A spring 23 passes around the pivot pin 22 and bears against the head at one side and against the lever or plate 20 at the other. Preferably, this spring is provided with a downturned portion 24 engaging over the edge of the head to prevent the spring from slipping inwardly, the spring being prevented from slipping outwardly by means of the pin 22.

The end of the rod 6 bears or abuts against the end of the plate or lever 20 so that if the rod moves inwardly, that is, to the left with reference to Figure 1, it will rock the lever 20 away from the plate 15.

The lever 20 carries a U-shaped contact spring member 25 adapted to engage the stationary contacts 16. The movable or U-shaped spring member 21 is rocked upwardly into engagement with the contact 16 whenever the pilot light is in operation. It will be seen that the pilot light furnishes heat which expands the tube 1 and the lengthening of this tube draws the rod 6 to the right, as viewed in Figure 1, and allows closing of the switch. Thus, the control member is held in operative position while the pilot light is in operation. If, however, for any reason the pilot light should be extinguished, the contracting tube 1 will force the non-expanding rod 6 inwardly and thus open the switch, or, in other words, move the controlling device into inoperative position.

The head 7 is externally threaded and receives the internally threaded closure cap 26. It is apparent that this closure cap may be very readily removed to give access to the switch parts for renewal, adjustment, or repair, without disturbing the pilot.

Further, it is apparent that the device may be set for operation at any desired temperature, corresponding to the particular conditions under which it operates by adjusting the screw 4. The lock nut 5 is subsequently tightened to hold the screw in its adjusted position.

The same inventive idea is illustrated in Figures 4 and 5 in which a valve is employed for the control device and is adapted to control any suitable diaphragm or similar type of pressure actuated main valve, such valve being of well-known construction.

The construction illustrated in Figures 4 and 5 is similar to that previously described in reference to the tube 1, the partition 2, and the rod 6. However, the head 27 is of slightly different construction. It is provided with a hollow interior 28 within which a pivotally mounted lever 29 is positioned in a manner similar to the lever 20. It is urged upwardly as viewed in Figure 4 by means of the spring 30. It is in abutting relation also to the rod 6, as previously described. This lever 29 is adapted to press a rod or plunger 31 inwardly and to thus unseat the ball valve or other type of valve 32. The valve 32, as may be seen from Figure 5, seats in such a manner as to interrupt communication between the inlet 33 and the port 34. The port 34 leads to a discharge nozzle 35 which is adapted to discharge into the space 9. The pilot nozzle is indicated by the reference character 36 in Figures 4 and 5, and is in communication with the pilot supply pipe 37.

The hollow compartment 28 of the head 27 may be closed by a plate 38 held in place by means of screws, as indicated in Figure 5.

It is apparent that as long as the pilot light is in operation, that the lever 29 will remain in its uppermost position and will hold the valve 32 open, thus permitting discharge of any pressure gas from the diaphragm valve heretofore mentioned and not shown.

This valve 32 is thus a controlling device similar in function to the switch mechanism previously described in connection with Figure 1. It is so constructed that it cuts off discharge from the passageway 33 to the nozzle 35 when the pilot light is out of operation.

The compartment 39 within which the valve 32 is mounted may be closed by means of a plug 40, as shown in Figures 4 and 5. It is apparent from the description and drawing that a novel form of pilot light has been disclosed, which is so constructed that any variation of pressure due to explosion or concussion of the main burner with which it may be associated, will not affect the free burning or continuous operation of the pilot light and cannot blow it out. Both of the openings 10 and 11 are in the same zone and consequently are subjected to the same pressure. Obviously, therefore, a change of pressure at this point will not affect the free flow of air through the pipe or tubular portion 8 and the flow of combustible mixture through the pipe or tubular portion 9. Instead, the operation of the safety pilot light is wholly independent of any variation in gas pressure.

Further, it will be seen that the pilot burner is a safety device which permits a control device to operate when the pilot burner is burning, but which prevents the control device from operating when the pilot burner is not burning.

Further, it is to be noted that the device is self-contained and is of unitary construction, so that it may be inserted or removed as required. It is to be noted also that the device is substantially fool-proof and is of rugged and reliable construction, as all of its parts

are enclosed in the body of the device and are thus protected from damage.

It will be seen also that the device has a very few number of parts and may be easily produced.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

I claim:

1. A safety pilot burner for use with a main burner, said safety pilot burner comprising a tubular body portion having a longitudinally extending partition dividing said body portion into an air inlet portion and a mixing portion communicating at one end and having an air inlet opening and a mixture outlet opening adjacent the other end and in approximately the same zone as said air inlet opening, a fuel nozzle opening into said mixing portion, means for operating a fuel control for the main burner, and thermostatic means carried by said body portion for controlling said first mentioned means, said tubular body portion forming a part of said thermostatic means.

2. A safety pilot burner comprising a tubular member, means separating said tubular member into two compartments, one of which constitutes an air supply compartment and is provided with an air inlet opening at one end thereof and the other of which constitutes a mixing compartment and is provided with a mixture outlet located adjacent the air inlet, means for supplying fuel to the mixing compartment, a rod within and connected to said tubular member, said rod and said tubular member having different co-efficients of expansion, a casing, said casing being connected to said tubular member at the end opposite said air inlet opening, and electrical contacts carried within said casing, one of said contacts being movable and being controlled by said rod.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

FRANK A. GAUGER.