

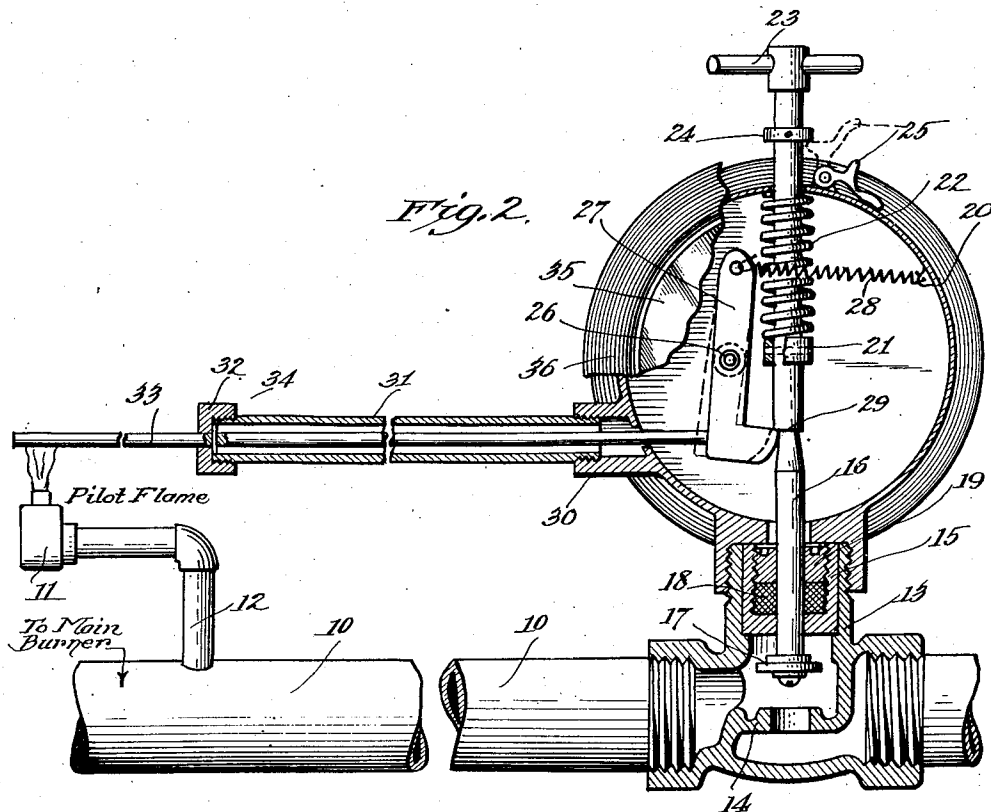
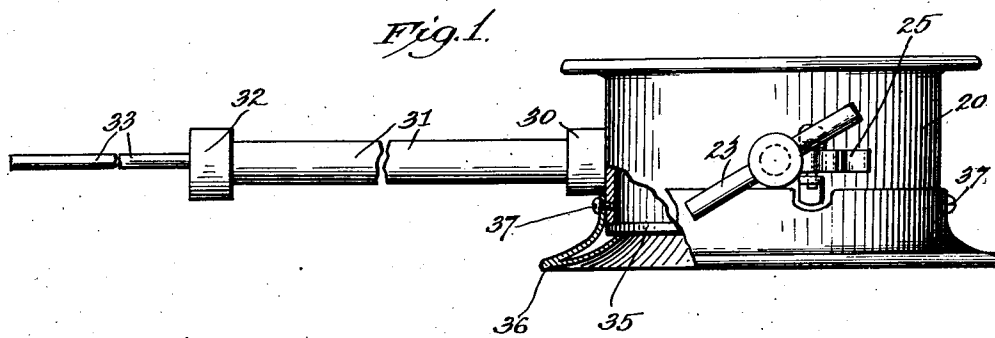
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AUTOMATIC GAS SHUT-OFF

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC GAS SHUT-OFF.

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This invention relates to improvements in automatic gas or fuel shut-offs.

An object of this invention is to provide an automatic fuel shut-off for a burner having a pilot light, which is so constructed that if the pilot light for the burner should ever go out for any reason, the gas supply to the pilot light and burner will be automatically shut off. It will be readily appreciated that in types of water heaters, furnaces and the like, which are either automatically operated, or are operated by means of a remote control, the pilot light of the burner sometimes blows out. Consequently, when the furnace is started up with the presumption that the pilot light is still burning, the fuel is not ignited at the burner and fills the heater, which not infrequently results in explosions and fire hazards. By the improved automatic shut-off, if the pilot light goes out, the supply of fuel to the burner and pilot light is automatically cut off, so that if the heater is caused to be operated on the presumption that the pilot light is still burning, no fuel will be discharged from the burner.

Another object of this invention is to combine with a water heater, a furnace or the like, having a main burner controlled from a distance and a pilot light constantly burning, a self-closing valve controlling the full supply, a pilot adapted to burn constantly, and means whereby the self-closing valve is held open while the pilot is burning and allowed to close when the pilot goes out.

With the foregoing and other objects in view which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a top plan view, parts being broken away, of the improved automatic gas shut-off, and

Fig. 2 is a front elevation of the improved gas shut-off, parts being broken away and shown in section.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the fuel pipe leading to a main burner is illustrated at 10, and the pipe leading to the pilot light 11 is indicated at 12. The pilot light 11 receives its fuel from the main fuel pipe 10.

The automatic gas or fuel shut-off consists of a valve mounted in the main fuel pipe 10, which valve may be of conventional construction, but for purposes of illustration is shown as consisting of a body in the form of a T 13, in which a valve seat 14 is provided. The aligned arms of the T are connected to sections of the main fuel pipe 10 and in the vertical stem of the T 13 there is positioned a stuffing box 15, through which the stem 16 extends. The stem 16 carries a closure 17 adapted to seat upon the seat 14. Within the stuffing box there is positioned packing 18 which is compressed about the stem 16 by a gland 19, so as to prevent leakage of fuel about the stem 16. A suitable housing 20 is mounted upon the vertical stem of the T 13, and the stem 16 of the valve extends upwardly through this housing. On the stem there is positioned a collar 21 and a coil spring 22 is compressed between the collar 21 and the top of the housing so as to urge the valve stem 16 and the closure 17 carried thereby into closed position. The upper end of the valve stem 16 is provided with a handle 23 and beneath the handle there is positioned a collar 24. This collar is capable of being engaged by a catch or latch 25 pivoted on the housing 20 for a purpose hereinafter more fully described.

When the latch 25 engages upon the collar 24, the valve stem 16 is held in such a position that the valve will be open. In the housing there is provided a pintle 26 on which an L-shaped dog 27 is pivoted. The upper end of the dog 27 has connected to it a coil spring 28, which has its other end fastened within the housing 20. The lower end of the L-shaped dog 27 is engageable upon a shoulder 29 on the valve stem 16 provided by reducing the diameter of the valve stem. When the dog 27 engages the shoulder 29, the valve stem 16 is held in lifted position, whereby the valve is open. The spring 28, however, urges the dog 27 to pivot upon the pintle 26 so as to disengage the shoulder 29. On the side of the housing 20 there is a nipple 30, on which a suitable pipe section 31 is mounted. The end of the pipe section 31 is provided with a bonnet 32. A heat expansible rod 33 extends through the bonnet 32 through the pipe section 31 and has its end engageable upon the L-shaped dog 27. This rod is pro-

vided with a pin or shoulder 34, which engages upon the inside surface of the bonnet 32. The other end of the rod 33 extends over the pilot light 11. This rod is preferably formed of a material which may readily conduct heat, such as a heavy copper wire.

The operation of the device is as follows: Assuming the shut-off to be in the position shown in Fig. 2, wherein the valve is open and fuel can readily pass through the main supply pipe 10 to the burner and to the pilot flame, and assuming that the pilot flame is burning, the rod 33 has its end heated. Because of the conductivity of the rod, practically its complete length is heated and the rod is thus caused to be expanded. Such expansion maintains the dog 27 in engagement with the shoulder 29 against the action of the coil spring 28. Supposing now that the pilot flame should blow out, the rod 33 is no longer heated, but cools rather quickly and thus contracts. As the rod contracts, the spring 28 keeps the dog 27 in engagement with the end of the rod which is within the housing 20. Consequently, the lower end of the dog will slowly move from beneath the shoulder 29 and finally disengage it. This allows the coil spring 22 to force the valve seat 16 and the closure 17 downwardly into closed position, and fuel can no longer be supplied to the pilot light 11 and to the main burner. Consequently, if it is attempted to cause the burner to burn, no gas or fuel will be discharged therefrom.

After the pilot light has once blown out, it is necessary to reset the shut-off. The valve stem 16 is then lifted by means of the handle 23 against the action of the spring 22, and the catch 25 is swung into the dotted line position, wherein it engages the collar 24 to keep the valve stem 16 lifted. This permits fuel to be supplied to the pilot light, and the pilot light is then lighted. The rod 33 is again heated and is again expanded, causing the lower end of the dog 27 to move toward the valve stem against the action of the spring 28 and thus be positioned beneath the shoulder 29. When the dog 27 has been so moved, the latch 25 is swung from beneath the collar 24 into the full line position shown in Fig. 2. The automatic gas shut-off is then reset to keep the supply pipe 10 open until the pilot flame should again blow out.

On the forward side of the housing 20 there is preferably positioned a transparent glass panel 35, which is held in place by means of a bezel 36 mounted on the housing by means of screws 37. The transparent panel 35 permits the dog 27 to be readily seen therethrough so that one can be advised as to when the dog is positioned beneath the shoulder 29 in resetting the shut-

off before disengaging the latch 25 from beneath the collar 24.

From the above it will be readily appreciated that an improved automatic gas shut-off is provided which will positively prohibit the discharge of any fuel through the burner when the flame from its pilot light has blown out.

It will be understood that various changes in the detail of construction may be made without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In combination with a pilot light for a burner and a fuel pipe leading to the pilot light and burner, a valve in the fuel pipe having its closure provided with an extended stem, a housing through which said stem extends, spring means disposed within said housing urging said stem into closed position, a pivoted dog disposed within said housing engageable upon said stem for holding the stem in open position, spring means urging said dog to disengage from said stem, and a heat expansible rod adapted to be heated by the pilot light and engageable upon said dog so as to hold the dog in engagement with the stem, said housing carrying a catch engageable upon said stem and being provided with a window, whereby under normal conditions when the pilot light is burning, the rod will be heated thereby and caused to be expanded, thus maintaining the dog in engagement with said stem, but if the pilot light should go out, allowing the rod to cool and contract, the dog will disengage said stem, permitting the valve to be closed.

2. A gas burning apparatus having a fuel supply pipe, a self-closing valve in the fuel supply pipe, and means whereby the self-closing valve is held open while the pilot is burning and allowed to close when the pilot goes out, said self-closing valve having a reciprocating stem, a shoulder upon the stem, a handle for raising the stem and opening the valve, a spring for closing the valve, a dog pivotally mounted and adapted to engage the shoulder and hold the valve open, a spring for pulling the dog out of engagement with the shoulder and releasing the stem and allowing the valve to close, the heat expansion rod adapted to hold the dog to hold the stem and adapted to be heated by the pilot when the pilot is burning and adapted to contract and release the dog to allow the valve to close when the pilot goes out.

In testimony whereof I have signed my name to this specification.

ORLA J. DAVENPORT.