Dec. 3, 1935. J. DE PUDDICOMBE 2,022,846

SAFETY GAS AND FUEL VALVE

Filed Aug. 19, 1933

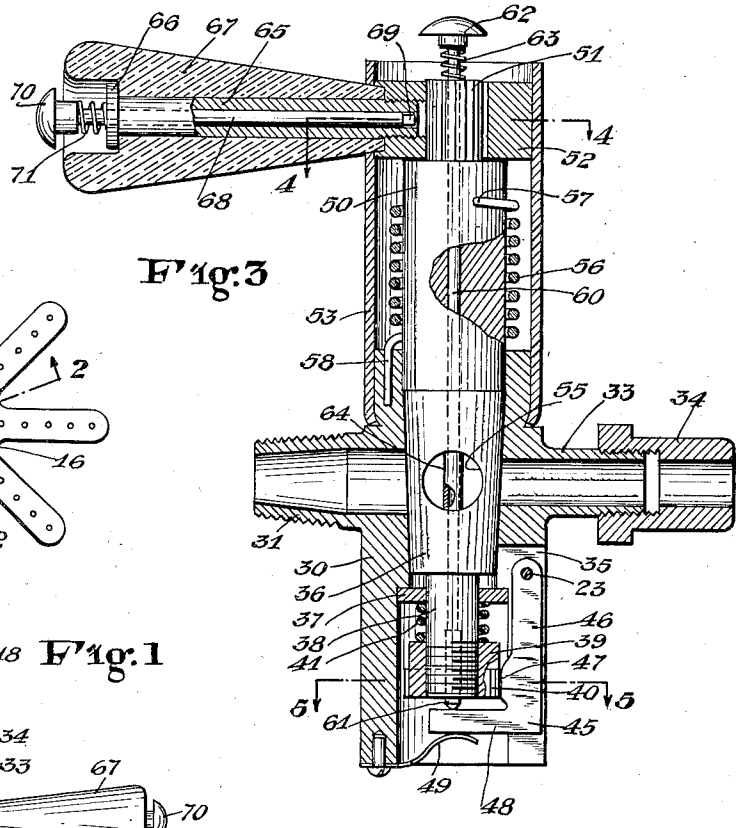


Fig. 3

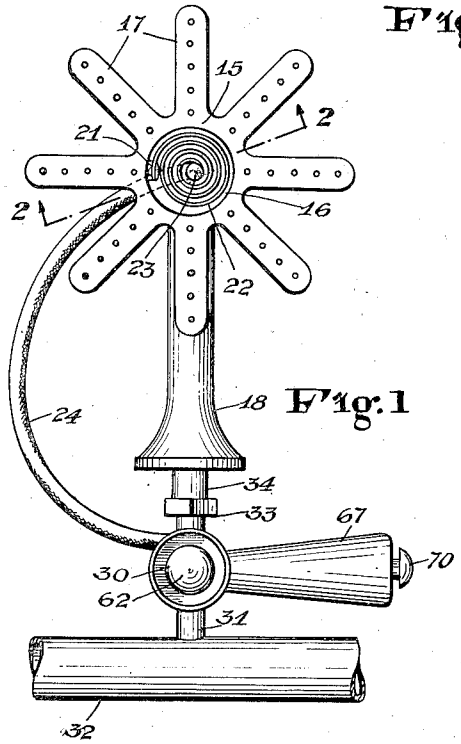


Fig. 1

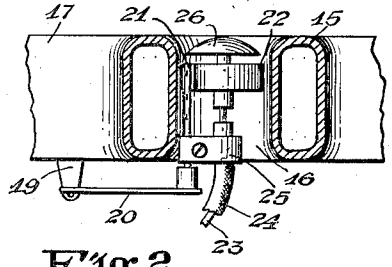


Fig. 2

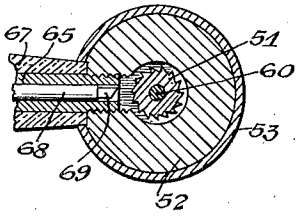


Fig. 4

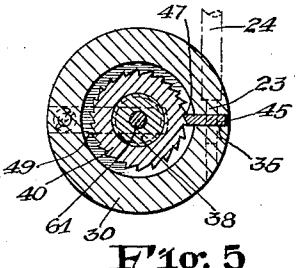


Fig. 5

INVENTOR.
JACK DE PUDDICOMBE

BY

Warren E. Willis.
ATTORNEY.

Patented Dec. 3, 1935 2,022,846

UNITED STATES PATENT OFFICE

2,022,846

SAFETY GAS AND FUEL VALVE

Jack de Puddicombe, New York, N. Y., assignor to Martin B. Colwin, New York, N. Y.

Application August 19, 1933, Serial No. 685,936

2 Claims. (Cl. 158—117.1)

This invention relates to improvements in safety valves for controlling gaseous and liquid fuels, and its leading object is to provide a valve which will close automatically within a short period after the burner flame has been extinguished.

Another object of the invention is the provision of a valve for gaseous and liquid burners, with a thermostatic control, which includes means for latching the valve against self closing action, operated by a flexible shaft, and so arranged that the valve will remain open while a flame temperature exists.

A further object of the invention is the provision of a safety valve with a handle which is normally disengaged from the valve plug, so that it cannot be accidentally operated to open the flow of the gaseous or liquid fuel.

A still further object of the invention is the provision of a safety valve with a handle and thermostatic release, so arranged that the release may be manually operated to close the valve, or to regulate the flow, and will operate when the flame is extinguished to release the valve plug, so that a spring will force the valve automatically to a closed position.

A still further object of the invention is the provision of a safety valve for gaseous and liquid burners, that can be manufactured at low cost, be practically fool proof, and which may be combined with any type of burner.

With the above and other objects in view the invention consists in certain new and useful constructions, combinations and arrangements of parts, described in the following specification, and illustrated in the accompanying drawing, in which:—

Figure 1 is a top plan view of an embodiment of the invention as connected to a conventional type of gas burner.

Figure 2 is a fragmentary sectional view taken on line 2—2 of Figure 1.

Figure 3 is a longitudinal sectional view of the valve, drawn to an enlarged scale.

Figure 4 is a fragmentary sectional view taken on line 4—4 of Figure 3.

Figure 5 is a transverse sectional view taken on line 5—5 of Figure 3.

In the drawing 15 designates a conventional type of gas burner ring having a central open space 16, a series of radial wings 17 provided with the usual perforations, and an inlet nozzle 18.

One of these wings has a lug 19 on its under side to which an arm 20 is secured, and on the inner end of the arm is fixed a rigid post 21 extending upwardly into the space 16, and to the upper end of the post is fixed the outer end of an ordinary bi-metallic, thermostatic coil 22.

The inner end of the coil 22 is fixed to the wire core 23 of a flexible cable 24, held by a clamp 25 to the lower part of the post 21, so that the coil is supported in free working relation to the wall of the space 16.

A shield 26 may be arranged to prevent drippings from clogging the coil 22 and interfering with its free action.

The other end of the core 23 extends to a valve housing 30 attached by its nipple 31 to a supply pipe 32, and delivering to the burner nozzle 18 through an outlet 33 provided with a tubular discharge spout 34, at the opposite side of the inlet nipple.

The housing 30 is generally cylindrical, open at both ends and has an elongated lengthwise recess or slot 35 in its lower portion below the outlet 33, and is drilled transversely to receive the ends of the cable 24 and its core 23.

A tapered valve plug 36 is fitted to a corresponding seat in the housing 30, below which the housing is counterbored from the bottom to provide a shoulder to receive a washer 37, through which a stem 38 of the valve plug passes to engage in the hub 39 of a ratchet wheel 40.

Encircling the stem 38 is a coiled compression spring 41 abutting the washer 37 and hub 39, acting to maintain the valve plug in its seat.

A lever 45, having a long arm 46 is firmly fixed on the wire core 23 to be moved by it in the slot 35 and is provided with a detent 47 to engage the teeth of the ratchet wheel 40; an extension 48 from the free end of the lever reaches past the center of the stem 38 and is held normally in a raised position by a light bow spring 49 fixed on the bottom of the housing 30.

The tapered portion of the valve plug 36 has an upper cylindrical body 50 terminating in a ratchet wheel 51, of reduced diameter freely revoluble within a collar 52 seated on a shoulder of the body 50, at the juncture of the ratchet wheel, the collar being fixed in the upper part of a tubular shell 53, mounted on the upper part of the housing 30.

The valve plug 36 has a transverse port 55 registering with the passages in the nipples 31 and 33, this port being normally turned to a closed position by a torsion spring 56 encircling the plug body 50, the upper end of the spring engaging a pin 57 set in the body and its lower end extending into a recess 58 in the housing 30.

All the elements of the valve plug are axially

bored to receive a rod 60 having its lower portion 61 adapted to contact the lever arm 48 when pressed downwardly and disengage the detent 47 from the ratchet wheel 40.

A push button 62 is fixed on the upper extending end of the rod 60, which is held in a raised position by an encircling compression spring 63 between the knob and upper end of the ratchet wheel 51.

In order to avoid leakage of gas where the rod 60 passes through the valve port 55, a sleeve 64 surrounds the rod, the ends of the sleeve being hermetically sealed in the bore of the port.

A tubular stud 65, passing through the casing shell 53, is fixed in the collar 52 and provided with a flanged head 66, and mounted on the stud is a manually operable handle 67, recessed at its outer end to receive the flange.

A rod 68 is limitedly slidable in the stud 65, its inner end having a bevelled terminal 69 to engage the teeth of the ratchet wheel 51, and at its outer is a knob 70 pressed outwardly by a spring 71 encircling the rod, between the knob and flange 66, within the handle recess.

To operate the safety valve, the handle 67 is grasped in the usual way, and the button 70 is pressed inwardly, so that the rod 68 will engage one of the teeth of the ratchet wheel 51. By turning the handle, with the button still pressed inwardly, the valve plug may be turned from closed to open position. At the same time the torsion spring 56 will be placed under tension. If the gas or other fuel discharging through the burner is ignited the thermostatic coil will expand under the flame temperature, thereby causing the flexible core 23 to swing the lever 45, so that the detent 47 will engage one of the ratchet teeth of the wheel 40, and thus hold the valve plug against turning under the closing action of the spring 56. So long as the flame temperature is present, the tooth of the release lever will be engaged with the wheel 40, and the closing spring will not be able to react to turn the valve plug to closing position. But should the flame be extinguished, the thermostatic coil will contract, and its flexible transmission shaft will cause the lever 45 to swing out of engagement with the wheel, thus releasing the spring, so that it will turn the valve plug to a closed position.

To regulate the amount of gas or other fuel fed to the flame, the button 62 is depressed, thus forcing the rod 60 against the horizontal arm 21 of the lever, and moving the detent 47 outwardly from the teeth of the ratchet wheel 40. When the button 62 is released the spring 56 will be prevented from closing the valve, due to the fact that the detent 47 will be again forced into engagement with the teeth of the ratchet wheel 40, thereby holding the valve plug against the turning effort of the closing spring.

It will be seen from the foregoing that it is impossible to operate the valve unless the end button 70 is pressed, to couple the handle directly to the valve plug. If this button is not pressed the handle will merely pivot on the upper end of the valve plug, without changing the position of the valve plug as, if the handle is accidentally engaged it will merely swing, without operating the valve. The button shifted rod 68 acts as a clutch to couple the handle to the valve plug. This clutch is self releasing, when pressure is removed from the handle, so that at all times the handle is normally disengaged from the valve plug.

When it is desired to quickly close the valve all that is necessary is to press on the central button 62, thus forcing the central rod 60 downwardly against the arm of the lever 45, thereby disengaging the detent 47 from the wheel 40, when the closing spring 56 turns the valve plug to closing position.

Should any of the working parts be broken, it will be impossible to turn on the gas or fuel, thus compelling the user to call a service man, properly equipped to restore the valve to working condition.

Having described my invention I claim as new:—

1. In a self closing gas valve, a body having opposed inlet and outlet openings, a plug rotatably mounted in said body and having a transverse port registrable with said inlet and outlet openings to control the passage of fluid therethrough a rod slidable axially in said plug passing through said port and extending therebeyond, sealing means extending transversely of said port and surrounding said rod to prevent leakage thereabout, a detent pivoted in said body and operative to normally retain said plug in adjusted position, said detent including means extending into the path of movement of said rod, a remote heat responsive device having a control connection with said detent to normally retain it in engaged position and release the same when said device reaches an abnormal temperature, and a spring associated with said plug to close the same upon release of said detent, whereby said rod is operable to release said detent notwithstanding the temperature condition of said heat responsive means.

2. In a self closing gas valve, a body having opposed inlet and outlet openings, a plug rotatably mounted in said body and having a transverse port registrable with said inlet and outlet openings to control the passage of fluid therethrough, a rod slidable axially in said plug passing through said port and extending therebeyond, sealing means extending transversely of said port and surrounding said rod to prevent leakage therearound, a detent pivoted in said body and operative to normally retain said plug in adjusted position, said detent including means extending into the path of movement of said rod, a remote heat responsive device having a control connection with said detent to normally retain it in engaged position and release the same when said device reaches an abnormal temperature, a spring associated with said plug to close the same upon release of said detent, whereby said rod is operable to release said detent notwithstanding the temperature condition of said heat responsive means, and manual means for depressing said rod, said rod when depressed operating to release said detent.

JACK DE PUDDICOMBE.