R. C. PATTON.

THERMALLY CONTROLLED VALVE.

APPLICATION FILED SEPT. 15, 1913.

1,129,597. Patented Feb. 23, 1915.

Fig. 1.

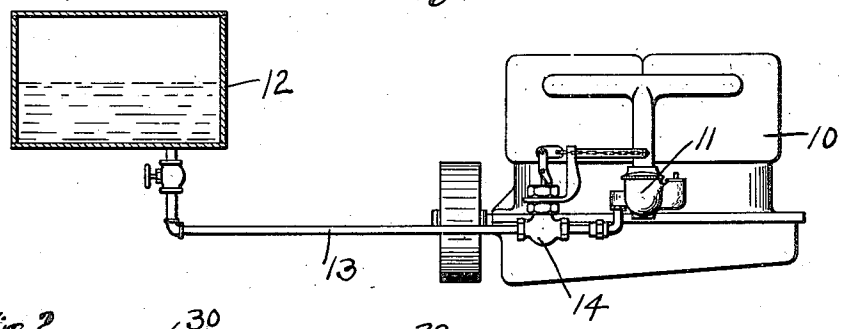
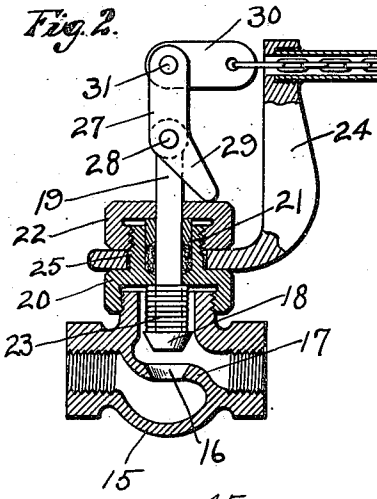


Fig. 2.



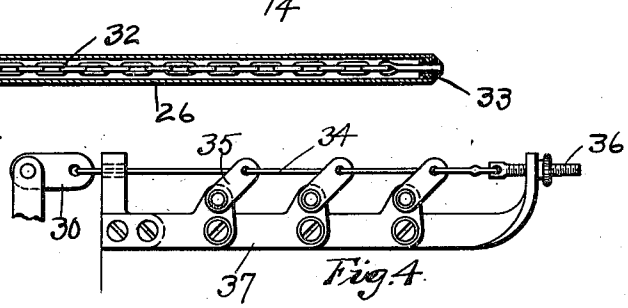


Fig. 4.

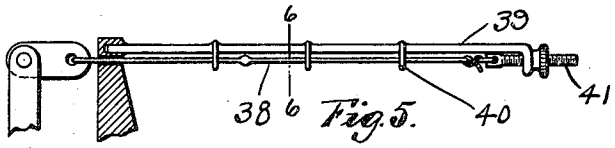


Fig. 5.

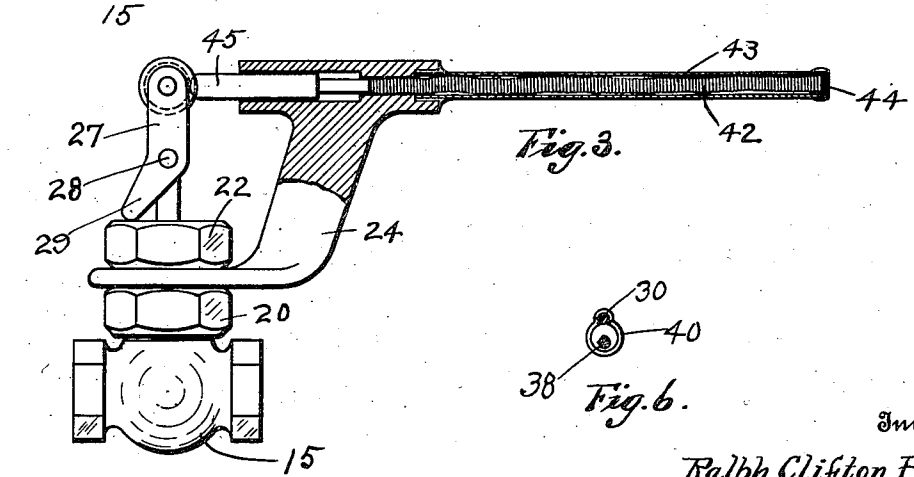


Fig. 3.

Fig. 6.

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THERMALLY-CONTROLLED VALVE.

1,129,597. Specification of Letters Patent. Patented Feb. 23, 1915.

Application filed September 15, 1913. Serial No. 789,798.

To all whom it may concern:

Be it known that I, RALPH CLIFTON PATTON, a citizen of the United States, and resident of the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Thermally-Controlled Valves, of which the following is a specification.

This invention relates to a thermally controlled valve, and has for its object to provide such a valve that is adapted to be connected in a line of pipe for conducting highly inflammable fluid, such as gasolene, illuminating gas, or the like, said valve comprising a body portion and a closure, the latter being arranged to be normally held in open position by a thermal element, such as solder, or a readily destructible cord or other suitable material.

A further object of the invention is to provide means for locating this thermal element to one side of the center line through the closure, or to extend the same off laterally therefrom to a point in proximity to the location of greatest fire hazard, as in the case of an internal combustion engine the thermal element is extended to a point adjacent the carbureter so that this element will be immediately affected by the heat to release the closure and permit it to automatically shut off the supply of fluid as soon as a fire occurs. Then again, by locating the thermal element some distance from the valve the latter may itself be set in the pipe a safe distance from the danger zone.

The invention further consists in the provision of a casing for inclosing and protecting the connecting member and to so construct this casing that it may be bent, twisted, adjusted or otherwise set relative to the valve body, into the most advantageous position to locate the fusible or thermal element in close proximity to the point of greatest danger from fire.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

Of the accompanying drawings: Figure 1— is a side elevation illustrating my improved valve as connected to the fuel supply pipe of an internal combustion engine and showing the thermal element as extending over and adjacent to the carbureter. Fig. 2— is a sectional view illustrating my improved thermally controlled valve. Fig. 3— illustrates a construction whereby the valve is held open by a pushing instead of a pulling strain. Fig. 4— is a view showing yieldable members for supporting the thermal element. Fig. 5— shows another form of arm for supporting the thermal element. Fig. 6— is a transverse section on line 6—6 of Fig. 5.

Referring to the drawing, 10 designates an engine of the internal combustion type, to which a carbureter 11 is attached, the fuel for which being conducted through the pipe 13 from the tank 12. In this supply pipe is shown one of my improved thermally controlled valves 14 having its thermal element extending laterally out over and adjacent to the carbureter.

My improved valve is preferably provided with a body portion 15, see Fig. 2, having an opening 16 through its seat 17 and a closure 18 in the shape of a tapering plug fixed to the end of the stem 19. This stem is supported by passing through the gland cap 20, stuffing box 21, and outer threaded cap or nut 22, and a spring 23 is coiled about the stem for forcing the closure 18 to its seat.

One of the essential features of my present invention is that the thermal element, which retains the valve closure normally in open position is arranged to extend or be supported to one side of the center line or axis of the closure and its stem. Therefore to accomplish this I have provided an outwardly extending yoke member 24, the inner end of which is turned at a right angle to the closure axis and provided with an opening 25 which fits down over the neck of the gland cap 20, and is bound and secured in any desired position about the stem by the nut 22. The outer end of this yoke is arranged to support a ductile or bendable tube 26, which may be made of copper, brass, or other suitable material. In order to hold the closure in its open position I have provided a pair of spaced apart cam arms 27 pivoted at 28 to the upper end of the closure stem, each having a finger 29 extending inwardly and at an angle therefrom with their ends adapted to rest upon the head or outer face of the nut 22, thereby serving the purpose of a cam. Between the outer ends of these arms a link 30 is pivoted at 31 and the opposite end of the link is connected, by means of a chain 32.

or other suitable flexible connector, through the tube 26 to the outer end thereof where the end of the chain is anchored by means of solder 33, or other fusible material adapted to fuse at a temperature slightly above normal. Another feature of my improved construction is that the position of this laterally extending member may be shifted or changed to extend in any desired direction relative to the valve body by simply loosening the nut 22, swinging the yoke 24 around on its bearing, and then setting up the nut again, or the ductile tube may be bent out of a straight line to carry the thermal element into the desired position.

Instead of employing a thermal element of solder or fusible material in the form illustrated in Fig. 2, as a means for retaining or anchoring the valve in its open position, in some cases I may employ a long strip of fuse 34, see Fig. 4, exposed throughout its length, which may be supported in the pivoted guides 35, one end being connected to the link 30 and the opposite end to the tension screw 36, the whole being supported on the adjustable arm 37.

Another form illustrated in Fig. 5 is that the thermal element may comprise a readily destructible or burnable cord 38, supported on the arm 39, and passing through eyes 40, the tension being obtained by means of the screw 41. Still another form, see Fig. 3, for retaining the valve in its open position is the arrangement of a spring 42 under compression in the tube 43 retained at one end by the thermal plug 44, while its opposite end presses, through the pin 45, against the cam arms 27 whose position is reversed to that illustrated in Fig. 2, whereby the pressure of the spring retains them in operative position to hold the valve open, so that when the thermal element 44 fuses, the spring will at once jump outward from this end quickly releasing the cam arms and permitting the valve closure to seat.

In the other three arrangements illustrated in Figs. 1, 2, 4 and 5 the valve is held open under tension of the connecting member, which when fused or destroyed releases the cam arms 27 permitting them to swing over under tension of the spring 23, and allow the closure to at once be seated, and effectually shut off the supply of fuel to the carbureter, hence the fire without fuel will soon burn out.

Another and important feature of my improved construction is that by extending the thermal element some distance from the valve, the latter may itself be set a safe distance from the carbureter, so that in case of fire the valve, which is relied upon to shut off the fuel supply, is effectually removed from the danger zone, thus reducing the fire hazard to the minimum.

I claim:

1. In an automatic shut-off valve a unitary structure consisting of a valve body and closure, a thermal element located to one side of the axis of said closure and remotely with respect to the valve body, a connector with which said thermal element cooperates to retain said closure normally in open position, and a member supported from the valve body for protecting said connector against injury.

2. In an automatic shut-off valve a unitary structure consisting of a valve body and closure, a thermal element, a flexible connector between said element and closure for controlling the latter, a member supported from the valve body and extending laterally relative to the axis of said closure for supporting said thermal element and connector, said member being adjustable relative to the valve body, and means for securing said member in adjusted position.

3. An automatic shut-off valve comprising a body portion and closure, a flexible member and thermal element for normally holding said closure in open position, a bendable tube for supporting said element to one side of the closure axis, and means whereby said tube may be rotated about said axis, whereby universal adjustment is provided.

4. An automatic shut-off valve comprising a body portion and closure, a flexible member and thermal element for normally holding said closure in open position, and a bendable laterally extending member for supporting said member and element.

5. An automatic shut-off valve comprising a body portion and closure, a flexible member and thermal element for normally holding said closure in open position, a support carried by said body portion, a laterally extending bendable member carried by said support for holding said flexible member and element, and means for adjusting said support.

In testimony whereof I affix my signature in presence of two witnesses.

RALPH CLIFTON PATTON.

Witnesses:
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