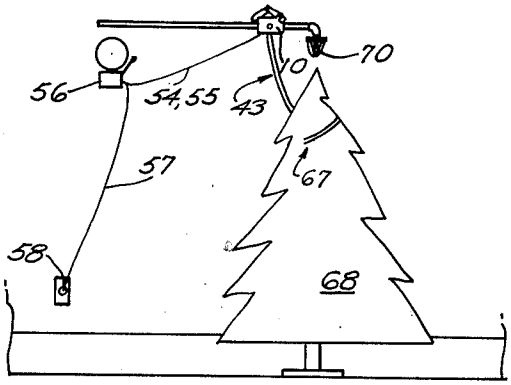
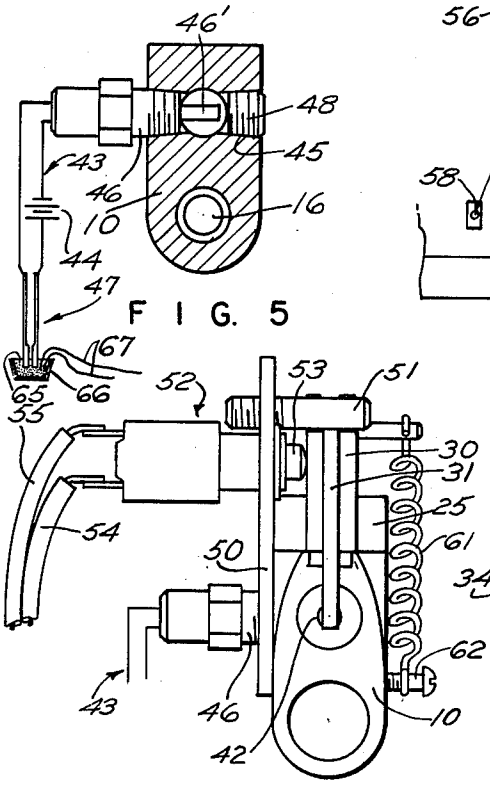
July 27, 1965 D. A. YOUNG 3,196,953

VALVE FOR FIRE EXTINGUISHING SYSTEM

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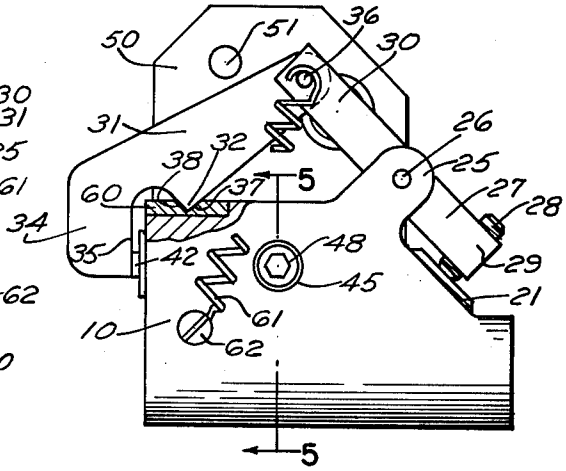


F I G. 1

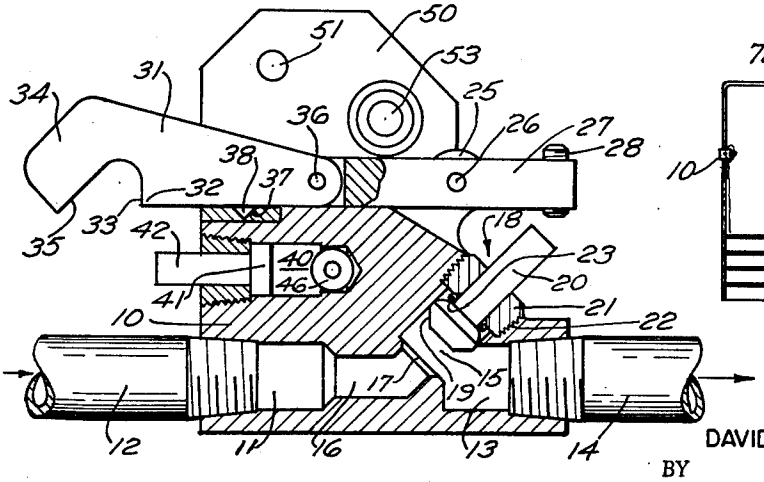


F I G. 5

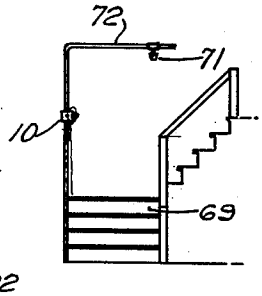
F I G. 3



F I G. 2



F I G. 4



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3,196,953
VALVE FOR FIRE EXTINGUISHING SYSTEM

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This invention relates to a fire extinguishing system.

An object of this invention is to provide an automatic operation for extinguishing a fire should it occur in some residence or other place.

Another object of the invention is to provide for extinguishing a fire by means of some fluid and controlling the operation of that fluid so that it may be automatically released to function should a fire occur.

Another object of the invention is to provide an alarm which will be operated at the same time that the automatic operation of the release of the extinguishing fluid occurs.

Another object of the invention is to provide a valve in a fluid pressure line which will be released to operate under the force of the fluid pressure in the fluid line upon the occurrence of a fire at some location.

Another object of the invention is to provide a fluid valve which may be installed in the line in which it is to be connected with a fuse for operating this valve installable in the valve after the valve is so installed, the insertion of the fuse being the last act in the completion of the installation.

Another object of the invention is to provide a valve which will withstand infinite pressures by reason of the support which it receives for the closing of the valve plug.

Another object of the invention is to provide a valve which will not leak under high pressures of the extinguishing fluid.

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.

In the accompanying drawings:

FIG. 1 is a schematic view illustrating a Christmas tree, a fire extinguishing fluid conduit in the position to extinguish a fire should it exist on the Christmas tree, a valve in the supply line of this fluid extinguishing liquid and an alarm actuated by the valve;

FIG. 2 is a side elevation of the valve;

FIG. 3 is an end view of the valve;

FIG. 4 is a sectional view through the valve showing the valve plug off its seat and permitting the flow of fluid through the valve;

FIG. 5 is a section on line 5—5 of FIG. 2; and

FIG. 6 is a schematic view of the use of the invention for the stairway in a building.

In proceeding with this invention, I have provided a valve body having a thru passage with a valve seat along this passage and a plug to engage the valve seat and close the passage. The stem of the plug extends outwardly from the body and is engaged by a lever so as to hold the plug in closed position on one side of the pivot, while the lever is supported on the other side of its pivot by an arm which holds the lever in a position to hold the valve plug on its seat against the pressure of the fluid tending to force the valve plug off its seat. I arrange to upset this condition by removing the supporting arm from its supporting position which permits the force of the fluid to push the valve plug from its seat and fluid to pass through the body of the valve. At the same time that this happens, some means may be actuated by this movement so as to cause an alarm to be sounded. The moving of the supporting arm from the lever may occur either by means of the igniting of some fuse by fire or by some explosive action.

With reference to the drawings, the valve body is designated generally **10** and comprises a solid block of material suitably bored to provide the desired passages therein. Thus I provide a bore at **11** for the reception of a supply conduit **12** to supply water under pressure to the valve body, while a bore from the opposite side of the body at **13** receives the discharge conduit **14** from the body. In order to provide a control for this conduit, there is a further passage at **15** at an angle to the straight line of the bores **11** and **13** and which is joined by a smaller bore **16** so that a valve seat **17** may be provided along this conduit for closure thereof by a valve plug which is designated generally **18** and which has a tapered conical portion **19** to engage the seat **17** in the body. A stem **20** extends from this plug through a suitable guide and closure **21** which may be screwed into an enlarged portion of the bore **22** in the body. A sliding seal for the stem in this closure may be had by the O ring **23**.

In order to hold this plug **18** on its seat, the body is provided with ears **25** extending therefrom in spaced relation so as to pivotally mount, by means of pivot pin **26** extending between the ears, a lever **27**. This lever **27** has a threaded member **28** extending through its end **29** at one side of the pivot to engage the stem **20** of the valve plug so that some adjustments may be provided. The length of the stem is such that when the lever is in substantially the position shown in FIG. 2, the member **28** will be substantially axially aligned with the stem. The portion **30** of this lever **27** on the other side of the pivot is supported so that it cannot swing about its pivot. This support comprises an arm **31** which is shaped as shown in FIGS. 2 and 4 to have a corner **32** providing a face **33** (see FIG. 4) at generally right angles to the general extent of the arm, while leaving a hook portion **34** with a face **35** for a function to be later described. This arm **31** is pivoted in a slot in the portion **30** of the lever **27** by a pivot pin **36**. There is a recess or notch **37** formed in the body to provide an abutment surface **38**, and the corner **32** of this arm **31** fits into this recess so that its surface or face **33** rests against the abutment **38**. The relationship of this abutment surface **38** to the lever **27** when in the position shown in FIG. 2 is such that the surface is substantially parallel with the extent of the lever arm, and as this surface is located at almost right angles to a line joining the pivot **36** and the surface **38**, it provides a support for the lever arm so that it cannot be dislodged so long as the supporting arm is in position such as shown in FIG. 2, and when the relationship is as shown in FIG. 2, the adjusting member **28** will be turned down until the valve plug is secure on its seat.

If it is desired that the valve plug be released from its seat, then some means must be provided for removing this supporting arm from its position such as shown in FIG. 2 and permitting it to swing to the position shown in FIG. 4. One means for doing this comprises the providing of a bore **40** in generally the direction of the extent of the fluid conduit through the valve body inwardly from one face thereof and locating in this bore **40** a piston **41** having a pin **42** extending therefrom so that it will engage the face **35** of the hook portion **34** of the arm **31** and then providing a means for moving this piston. In order to move this piston, I provide a through bore **45** at right angles to the bore **40** and insert a powder cartridge **46'** in a housing designated generally **46** which is connected to a thermostat **47** by wires **43** including some source of power **44**. A readily ignitable material **65** in a container **66** is located in proximity to the thermostat **47** to cause its instant operation. This material **65** may be ignited by any one of several fast acting fuses **67** located at strategic points where fire may occur, such for instance as at a Christmas tree **68** or in a stairway **69**, each protected by sprinklers **70, 71**. The pipe **72** leading to the

sprinkler 71 may be dry until the valve 10 operates, thus permitting such extent of line to be passed through sub-freezing temperatures should occasion require.

The powder cartridge 46' is of such a character that when thermostat contacts close, it will ignite and explode the powder which, in turn, through the compressed gas of the powder will force the piston 41 and its stem 42 outwardly to move the arm 31 from the abutment relationship of the face 33 and abutment surface 38. Arm 31 contacts pin 51 and swings lever 27 to free it from stem 20 so that the pressure of the fluid on the valve plug will force the valve plug outwardly from its seat so as to completely open the passage for flow of fluid through the valve body. A closure plug such as 48 may be inserted in the opposite side of the valve body so as to close this passage of the through bore 45 through the valve body. This also provides for the insertion of the powder cartridge in either side of the valve body or in both sides for dual protection as may be desirable from an installation standpoint.

A bracket 50 is secured to one side of the valve body and serves to support a pin 51 which will limit the movement of the arm 31 upwardly and also serve as a fulcrum point so as to tend to swing the pivot pin 36 downwardly as shown in FIGS. 2 and 4 as the arm 31 swings about its pivot.

This bracket 50 also serves as a support for a switch 52 which has a plunger 53 spring urged therefrom and in a position to engage the lever arm 27 so that the plunger cannot be moved to the full extent of its stroke when the lever 27 is in the position shown in FIG. 2. However, when this lever does move to the position shown in FIG. 4, then this plunger 53 may move outwardly under its spring pressure so as to close contacts connecting the leads 54 and 55 to some alarm device 56 which is powered from some suitable source through line 57, such as through a transformer and wall plug 58.

In addition to utilizing the discharge of an arm by means of a pin such as 42 in the above referred to arrangement, I may provide an insert 60 of a soft fusible metal located on the upper edge of the body into which insert the recess 37 is provided to form the abutment 38, and in this case should heating occur at the valve itself, the fusible metal will melt at a predetermined temperature so that the abutment surface 38 will be melted and under the influence of a spring 61 connected on pin 36 and also on some sort of an anchor 62, the spring being under tension will cause the arm 31 to be moved outwardly to permit actuation of the lever 27. In this case in order to refurnish the valve into operation, it will of course be necessary to replace the element 60 with a fresh element having the recess 38 therein.

I claim:

1. A quick operating valve for a fire extinguishing system comprising a valve body having a wall providing a through passage with a valve seat along said passage, a valve plug movable in said body to engage said seat and close said passage and with a stem extending outwardly through a wall thereof, a lever pivoted on said body externally of said wall and engaging said plug stem on one side of the pivot to hold it on its seat against the pressure of fluid in the passage tending to dislodge it from its seat, an abutment external of said wall and fixed relative to said body, an arm pivoted to said lever and extending generally at right angles to the lever and seating on said abutment for holding the lever in a position to hold the plug on its seat, and means to move said arm from said holding position to permit said lever to move and said plug to be dislodged from its seat.

2. A valve as in claim 1 wherein an abutment is formed in said body and said arm extends and is of such a length so as to be at generally right angles to a line between the pivot of the lever to said body and the pivot of the arm to the lever when the arm engages said abutment.

3. A valve as in claim 2 wherein said arm is moved from said abutment by said means.

4. A valve as in claim 2 wherein said abutment is fusible and said arm is moved by said means.

5. A valve as in claim 1 wherein the means to move the arm is responsive to heat.

6. A valve as in claim 1 wherein said body is provided with an enclosed chamber and the means to move the arm is contained within said chamber.

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