July 14, 1931. G. B. PICKOP 1,814,526

FUSIBLE LINK CONTROLLED VALVE

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Fig. 1.

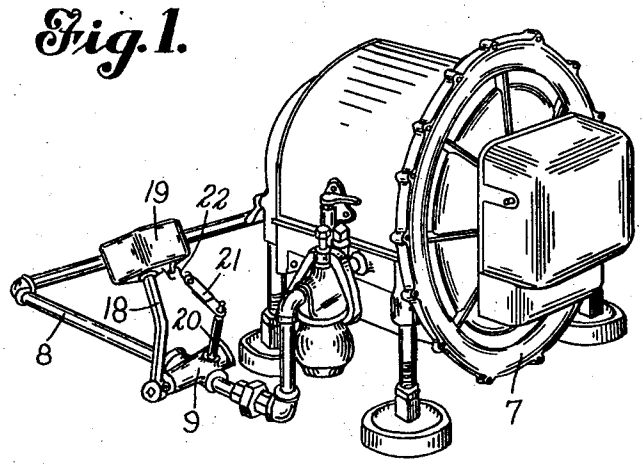
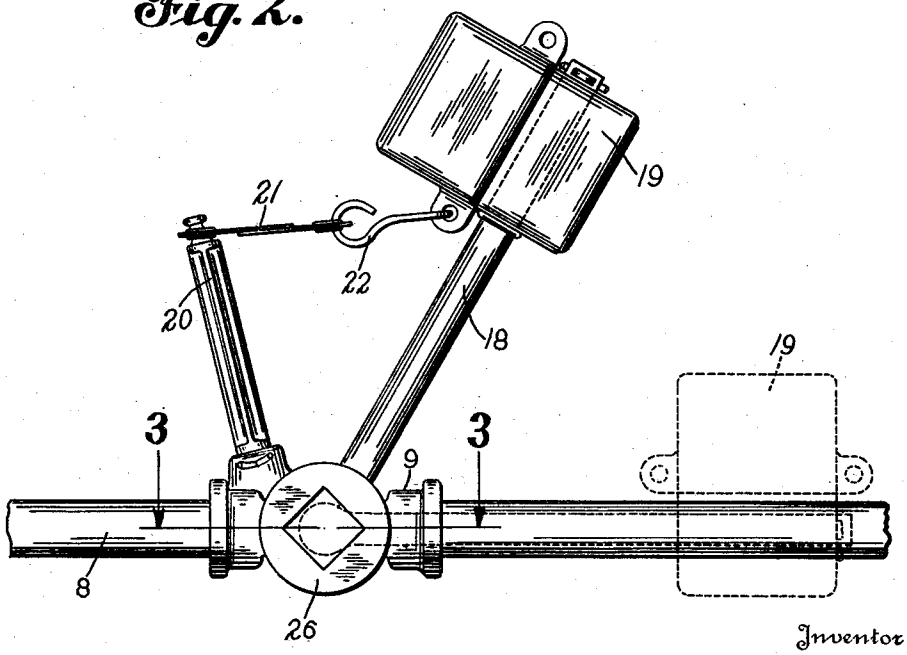


Fig. 2.



Inventor

George B. Pickop

By Rockwell & Bartholow

Attorneys

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Fig. 3.

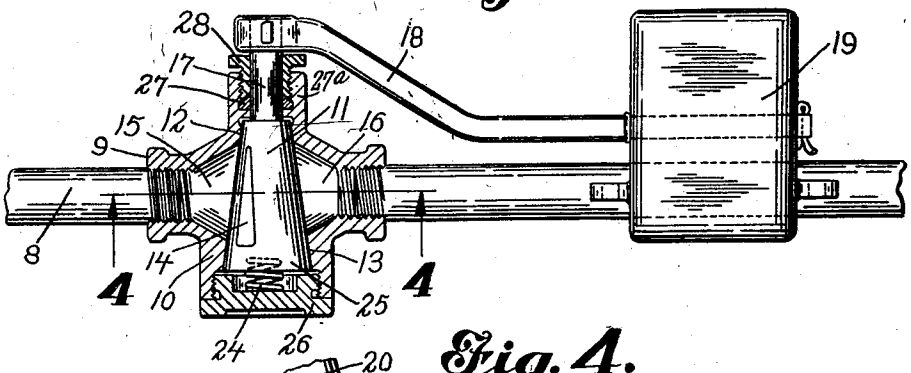


Fig. 4.

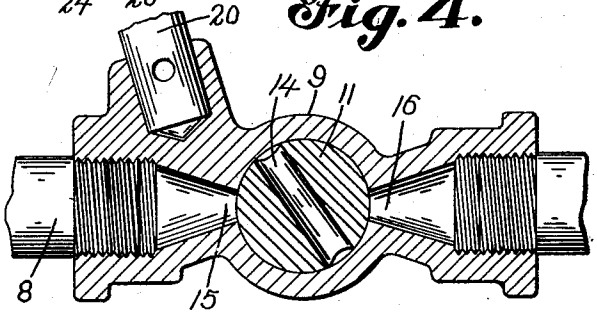


Fig. 5.

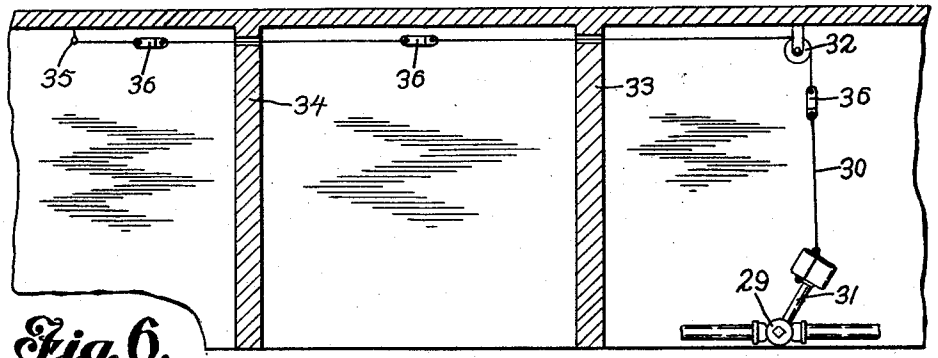
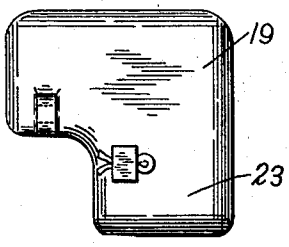


Fig. 6.



Inventor

George B. Pickop

By Rockwell & Bartholow

Attorneys

Patented July 14, 1931 1,814,526

UNITED STATES PATENT OFFICE

GEORGE B. PICKOP, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO MALLEABLE IRON FITTINGS COMPANY, OF BRANFORD, CONNECTICUT

FUSIBLE LINK CONTROLLED VALVE

Application filed January 30, 1928. Serial No. 250,705.

This invention relates to a fusible link-controlled valve, and more particularly to a valve and a valve mechanism which constantly urges the valve into closed position, the latter being held open by means which may be incapacitated by heat at a predetermined temperature, whereupon the valve mechanism closes the valve.

The fusible link-controlled valve of the present application is in general intended to control the flow of a combustible fluid, and is particularly useful in controlling the flow of fuel oils, or other fluids, to a burner. In fuel burners for heating systems, and for other purposes, the main supply tank for fuel oil is usually outside the building in which the burner is placed, and the oil is either pumped to the burner, or flows thereto by gravity. Within the burner there is usually a pilot light, which ignites the combustible mixture as it flows into the burner. It quite often happens that the pilot light fails to operate, and the fuel oil which is fed into the burner does not ignite but escapes onto the floors of the buildings around the burner where it creates a dangerous fire hazard. In case the oil which has escaped in this manner, or which accumulates around the burner from leakage, becomes accidentally ignited, and the oil continues to flow into the burner from the main supply tank, it is almost impossible or at least very difficult, to subdue the fire. Accordingly, it has been proposed, and often required by fire regulations, to provide means for shutting off the supply of fuel to the burner when a fire occurs in or around the room where the burner is placed, and particularly where the fire occurs from oil leaking from the burner or the fuel feeding mechanism. As a suitable means to this end, it has been proposed to use a fusible link connected to a shut-off valve the link holding the valve open under normal conditions, but permitting the valve to close if the temperature around the link rises sufficiently to fuse the link. The present invention pertains in general to a fusible link-controlled valve of this type.

The usual or most common form of fusible link-controlled valve comprises a rotatable valve having an arm or lever attached thereto, and a chain or other suitable flexible means having one end connected to the arm, the chain passing over a pulley, which is secured at an elevated position above the valve and being provided at its other end with a weight. A fusible link is connected to the arm and under ordinary temperature conditions holds the valve open against the action of the weight, but when the temperature around the valve rises sufficiently to fuse the link, the weight acting on the valve lever closes the valve and cuts off the flow of fuel into the building. It will be apparent, however, that this form of control requires that there be a suitable support for the pulley above the valve, and when in use is objectionable owing to the fact that the flexible connecting means between the lever and weight not only obstructs the room to a considerable extent, but also owing to its exposed position is very apt to become damaged and useless.

One of the objects of the present invention is to provide a fusible link-controlled valve which is simple in form and thus may be cheaply manufactured, and which is positive in its operation and not apt to become disarranged while in use.

Another object of the invention is to provide a fusible link-controlled valve which may be directly connected in a fuel line, and which requires no outside support or connections.

A further object of the invention is to provide a valve of the above type in which the mechanism for controlling the valve is entirely supported on the valve casing.

In order to ensure that the valve will be positively closed when the link is fused, the weight provided is usually very heavy, and a still further object of the invention is to provide means for taking up the energy of the weight when it swings the valve lever into closed position, without permitting undue shock to be communicated to the valve or surrounding structure.

An additional object of the invention is to provide for the remote controlling of a fuel shut-off valve, whereby the valve will be

closed when a fire occurs in an adjacent room or rooms.

To these and other ends, the invention consists in the novel features and combination of parts to be hereinafter described and claimed.

In the drawings,

Fig. 1 is a view showing a portion of a fuel burner having my improved fusible link-controlled valve used in connection therewith;

Fig. 2 is a view, in elevation, of my improved fusible link-controlled valve;

Fig. 3 is a sectional view along line 3—3 of Fig. 2;

Fig. 4 is a sectional view along line 4—4 of Fig. 3;

Fig. 5 is a view of another form of valve in which means is provided for controlling the closing of the valve from a remote position; and

Fig. 6 is a fragmentary view showing the weight used in connection with my valve.

Referring to the drawings in which I have illustrated my invention by showing some preferred embodiments thereof, the reference numeral 7 indicates in general a portion of an oil burner which may be of any usual or preferred type, and which will not therefore be described herein in detail, oil burner 7 having connected thereto fuel oil supply line 8, the flow of oil, or other fuel, therethrough being controlled by my improved form of fusible link-controlled valve 9.

Fusible link-controlled valve 9 comprises a valve casing 10 having mounted therein a conical or tapered valve 11 mounted in seats 12 and 13 disposed on opposite sides of the valve casing, valve 11 having an internal passage 14 adapted when the valve is in proper position to permit oil to flow from inlet passage 15 to outlet passage 16. Valve 11 is provided with a stem 17 extending through one side of casing 10, valve stem 17 having mounted on the outer end thereof lever 18, which in the open position of valve 11, as shown in Fig. 2, is inclined to the horizontal, lever 18 having on its outer end weight 19. Secured in any suitable manner in or on valve casing 10 is a substantially vertical post 20, post 20 being mounted, in the preferred embodiment shown herein, above inlet 15 and having connected to the upper end thereof a fusible link 21 which is also connected by means of hook 22 to weight 19. As shown in Fig. 6, weight 19 is substantially L-shaped in form and is provided with a downwardly extending offset portion 23, for a purpose to be hereinafter described.

In order to prevent leakage through or around valve 11, the latter is held in seats 12 and 13 by compression spring 24, having one end acting against the large end 25 of valve 11 and its other or outer end reacting against cap 26, which closes the end of casing 10. Packing 27 is provided in stuffing box 27ª around stem 17, and in cooperation with gland 28, prevents leakage of oil from occurring around stem 17.

In use, my improved form of fusible link-controlled valve may be mounted in the fuel supply line in a position closely adjacent the burner, or in such other position as may be desirable, and during normal conditions the valve 11 will be maintained in open position by link 21 which through the hook 22 holds lever 18 in an elevated position against the action of weight 19. When the temperature within the room or around the valve rises to a sufficient degree to incapacitate or melt the link 21, the lever 18 is released, whereupon under the action of weight 19 it descends, rotating valve 11 into the position shown in Fig. 4, whereupon the flow of fuel oil to the burner is cut off.

Under certain conditions it may be desirable to cut off the supply of fuel to a burner, etc., from a remote position as, for example, where the burner is in the basement of an apartment house wherein locker rooms are provided, in any one of which a fire may start.

In Fig. 5 I have shown a different type of control which is adapted for use under such conditions and in which the supply of fuel is cut off when a fire breaks out in any one of a number of rooms in the building in which the burner is placed. In this figure, the valve 29 is held in open position by a chain, or other flexible means, 30, engaging weighted valve lever 31, chain 30 passing over a pulley 32 and then through suitable openings in walls 33 and 34 into adjacent rooms of the building, the end of chain 30 being secured by suitable means, as, for example, screw eye 35. In each of the rooms illustrated, and it will be understood that there may be any number thereof, fusible links 36 are provided, any one of which upon being melted or incapacitated, releases the chain 30 and permits the weighted arm to descend, closing the valve 29.

It will be seen that in both of the forms illustrated the weighted levers are mounted directly on the valve casings, and in order that the weights may not strike on any parts of the valve mechanisms, or such other portions of the burner or fuel feeding mechanisms as may be closely adjacent the valves, it is proposed to mount the valves 10 in a position closely adjacent the floor of a room, the weights being provided with extensions, as for example, portion 23 of weight 19, which come into contact with the floor when the weights bring the valves into closed position.

In the event that the valve 9 is elevated above the floor at such a distance that the extension 23 does not come in contact with the floor, the overlying portion of the weight 19 will come in contact with the pipe 8 and ensure that the weighted lever 18 stops with the valve in closed position.

While I have described the link 21 as being made of a fusible material, it will be understood that any material which is adapted to be incapacitated by heat may be used to form link 21, and while I have shown and described a preferred embodiment of my invention, it is to be understood that the same is not to be limited to all the details shown but is capable of modification and variation within the spirit of the invention and the scope of the appended claims.

What I claim is:—

1. In a valve for a fuel feeding system or the like, a valve casing adapted to be mounted closely adjacent a floor, a valve within said casing, a weighted lever connected to said valve and urging the latter into closed position, a post extending upwardly from the casing, a fusible link connected to the post and lever to hold said valve in open position, and means extending from said lever adapted to engage the floor to prevent said lever or the weight thereon from coming into contact with the valve casing or adjacent portions of the fuel feeding system when the valve is closed by the weighted lever.

2. In a valve for a fuel feeding system or the like, a valve casing, a valve within said casing, a lever connected to said valve, a substantially L-shaped weight supported on said lever, a fusible link engaging said lever and holding the valve in open position, said lever and the weight thereon being adapted to close the valve upon the fusing of said link, one portion of said L-shaped weight adapted to extend below the fuel feeding system after the valve is closed and the other portion of said weight adapted to overlie a portion of the fuel feeding system.

3. In a valve for a fuel feeding system or the like, a valve casing adapted to be mounted closely adjacent a floor, a valve within said casing, a weighted lever connected to said valve and urging the latter into closed position, a fusible link normally holding said valve in open position, means on said lever which may contact with a part of the system upon the valve becoming fully closed, and means extending from said lever adapted to engage the floor to prevent said means from engaging the part of the system when the valve is closed by the lever.

In witness whereof, I have hereunto set my hand this 27th day of January, 1928.

GEORGE B. PICKOP.