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ALARM CONTROL FOR SPRINKLER SYSTEMS.

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1,181,352. Patented May 2, 1916.

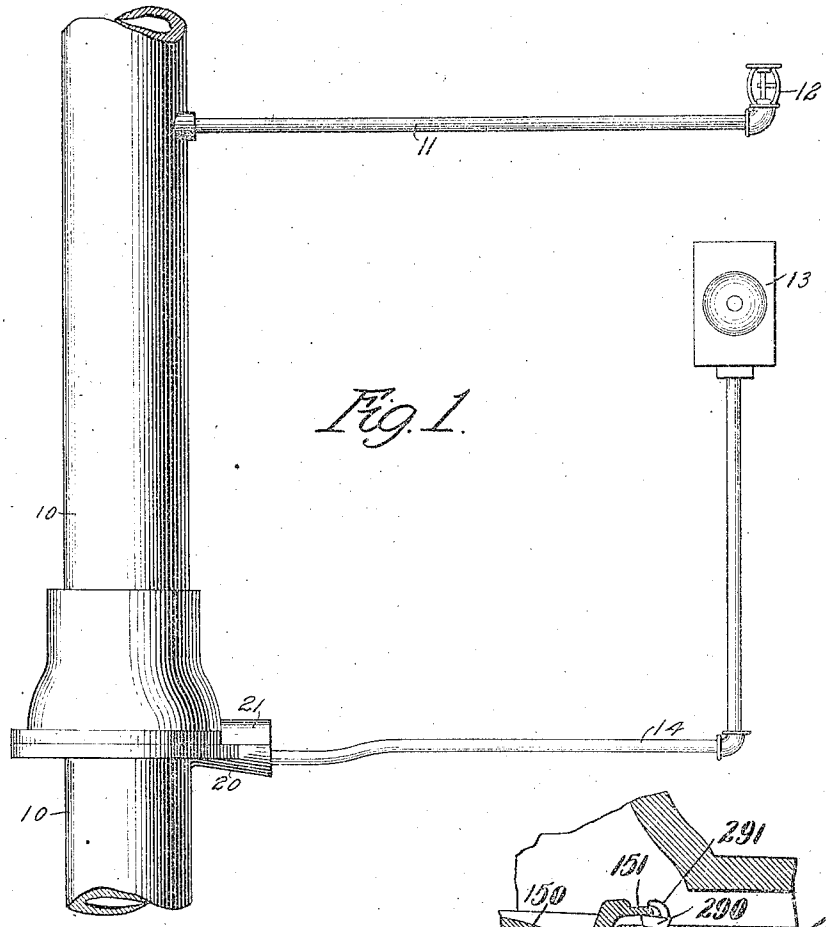


Fig. 1.

Fig. 3

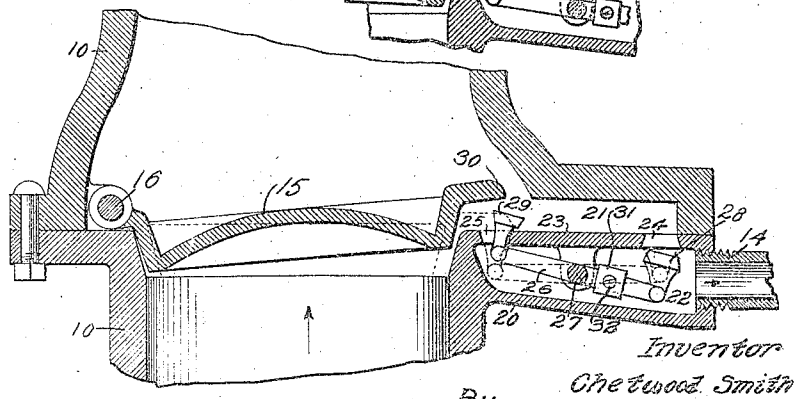


Fig. 2.

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UNITED STATES PATENT OFFICE.

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ALARM CONTROL FOR SPRINKLER SYSTEMS.

1,181,352. Specification of Letters Patent. Patented May 2, 1916.

Application filed August 6, 1915. Serial No. 44,103.

To all whom it may concern:

Be it known that I, CHETWOOD SMITH, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Alarm Control for Sprinkler Systems, of which the following is a specification.

This invention relates to an alarm control for a sprinkler system, and more particularly to an improved form of valve for controlling the flow through the alarm pipe.

It has been customary to supply water to the alarm pipe through an opening in the seat of the supply pipe check valve, the lifting of the valve uncovering the opening and permitting the water to flow into the alarm pipe. This arrangement has been generally satisfactory, but is not entirely dependable under certain extreme conditions, due largely to the slight differential effect caused by the difference of water pressures upon that portion of the check valve which closes the alarm pipe.

It is the object of my invention to provide a valve structure which shall be entirely free from any differential effect under all conditions, the alarm valve being balanced against pressure and the check valve, in the preferred form of my invention, being movable upwardly entirely independently of the alarm valve.

With this object in view, my invention relates to certain arrangements and combinations of parts which shall be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of my invention, and a modification thereof are shown in the drawings in which—

Figure 1 is a side elevation of a portion of a sprinkler system; Fig. 2 is a vertical sectional view through my improved valve structure, in its preferred form, and Fig. 3 is a detail view of a modification.

Referring to Fig. 1, I have indicated a sprinkler supply pipe 10 having one or more branch pipes 11 provided with the usual sprinkler heads 12. I have also indicated an alarm mechanism 13 of any usual form connected by a pipe 14 to the supply pipe 10. A check valve 15 is pivoted at 16 in the supply pipe 10, the valve being closed whenever there is no flow of water through the supply pipe. Whenever the pressure above the valve 15 is decreased, as by the opening of one of the sprinklers 12, the excessive pressure below the valve lifts the valve, thus permitting the necessary flow of water through the supply pipe to keep the sprinkler head in operation.

The alarm pipe 14 is connected to an extension 20 projecting laterally from the supply pipe 10. The extension 20 is divided into upper and lower chambers 21 and 22 by a partition 23 extending laterally therethrough and having valve openings 24 and 25 formed therein. The lower chamber 22 opens directly into the alarm pipe 14, while the upper chamber 21 communicates directly with the supply pipe above the check valve 15. The openings 24 and 25 are oppositely disposed and are normally closed by a double pressure balanced alarm valve comprising a valve lever 26 pivoted at 27 to the extension 20.

The valve lever 26 is provided at its opposite ends with oppositely disposed valve portions 28 and 29, the portion 28 entering the opening 24 from below the partition 23, and the portion 29 entering the opening 25 from above the partition 23. As the areas of the upper ends of the two valve members 28 and 29 are the same, and as the arms of the lever 26 are also equal, the valve is balanced against any and all pressures in the upper chamber 21. The check valve 15 is provided with an extension 30 which over-lies the valve portion 29, and normally closes the double valve, thus preventing any flow of water through the alarm pipe 14. A counter-weight 31 is adjustably secured by a screw 32 to the other arm of the valve lever 26, and serves to open the double valve whenever the check valve 15 is lifted and its weight is removed from the valve portion 29. As the valve is opened by the counter-weight 31, water is permitted to flow through both of the openings 24 and 25. A large valve opening is thus provided permitting the employment of an alarm pipe 14 of unusual size.

With this construction it will be seen that the absence of pressure in the chamber 22

below the alarm valve can have no differential effect upon the check valve 15, as the check valve is entirely free to swing upwardly independently of the movements of the alarm valve. Furthermore, it will be evident that a very light counter-weight 31 will be sufficient to open the alarm valve whenever the weight of the check valve 15 is removed, the balancing of the valve as to pressure thereon rendering it merely necessary to overcome the inertia of the valve, without regard to the water pressure. Substantially the same condition obtains as to the closing of the valve when the valve 15 descends and rests upon the valve portion 29. It is true that the flow of water through the openings 24 and 25 will cause some slight resistance to the closing of the valve, but this resistance is readily overcome by the weight of the valve 15 which, under ordinary conditions, will amount to some six or eight pounds.

In the modified form of Fig. 3 I have provided the valve 150 with an extension 151, adapted to engage an overhanging lug 291 on the balanced alarm valve member 290, the alarm valve being positively opened and closed by the check valve. The freedom of movement of the check valve is only slightly restricted by this arrangement owing to the entire absence of differential pressures on the alarm valve, and more positive action of the alarm valve is secured.

While I have described the valve in the supply pipe as a check valve, both in the description and in the claims, I do not wish to be limited thereby to a valve which entirely closes the supply pipe. The term "check valve" as herein used is intended to cover any form of valve in the supply pipe which will lift or open under excess of pressure below the valve and which by such movement will move the alarm valve or will release it for movement independently of the supply pipe valve.

While I have shown and described only two forms of my invention it will be evident that other forms of balanced valves may be readily substituted therein and such substitution I consider to be within the scope of my invention. Accordingly I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but

What I claim is:—

1. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, and an alarm valve balanced with respect to the fluid pressure exerted thereon and controlling the flow through said alarm pipe, said check valve being effective to close said alarm valve positively as the check valve moves to closed position.

2. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, and an alarm valve which controls the flow of water through said alarm pipe, said check valve opening to its full extent entirely independently of said alarm valve but being effective to close said alarm valve as it moves to closed position.

3. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, an alarm valve balanced with respect to the fluid pressure exerted thereon and controlling the flow through said alarm pipe, means independent of the check valve to open said alarm valve after the check valve is raised, and a controlling device effective to close the alarm valve when the check valve closes.

4. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, and an alarm valve balanced with respect to the fluid pressure exerted thereon and controlling the flow of water through said alarm pipe, said alarm valve being free to open after said check valve is opened and means being provided to close said alarm valve simultaneously with the closing of said check valve.

5. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, and an alarm valve balanced with respect to the fluid pressure exerted thereon and controlling the flow of water through said alarm pipe, said check valve having an extension engaging said alarm valve to close the latter when the check valve closes, and separate means being provided effective to open the alarm valve whenever the check valve is raised.

6. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, and an alarm valve which controls the flow of water through said alarm pipe, said check valve having an extension engaging said alarm valve to close the latter when the check valve closes, and said alarm valve being counter-weighted to open whenever said check valve is lifted to remove its weight from said alarm valve.

7. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, an alarm valve which controls the flow of water through said alarm pipe, and means to open and close said alarm valve, said alarm valve comprising a lever pivoted substantially centrally between its ends and having oppositely disposed valve portions at its ends.

8. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, and an alarm valve which controls the flow of water through said alarm pipe, said alarm valve comprising a lever pivoted centrally between its ends and having oppositely disposed valve portions at its ends,

and a counter-weight mounted on said lever to open the alarm valve when said valve is released by the check valve.

9. In a sprinkler system, a supply pipe, a check valve in said supply pipe, an alarm pipe, and an alarm valve which controls the flow of water through said alarm pipe, said alarm valve comprising a lever pivoted centrally between its ends and having oppositely disposed valve portions at its ends, a counter-weight to open said valve when free to move, and means to adjust said counter-weight.

In testimony whereof I have hereunto set my hand.

CHETWOOD SMITH.