April 25, 1933. F. G. CHAPIN 1,905,146

FLOW CONTROLLED SWITCH

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Fig. 1.

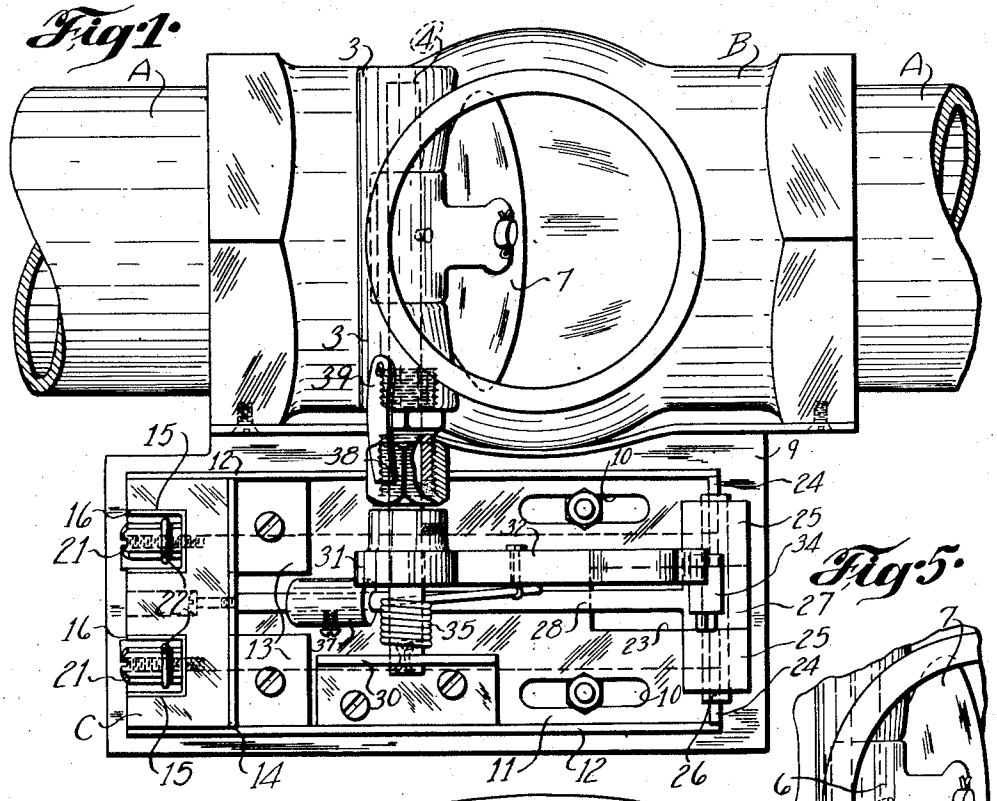


Fig. 5.

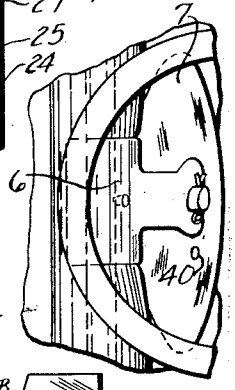


Fig. 2.

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Fig. 3.

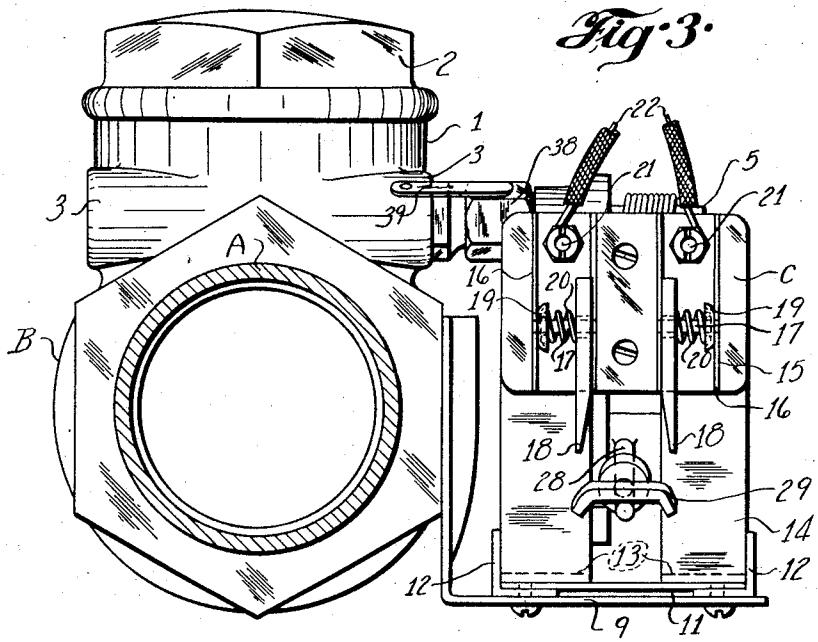
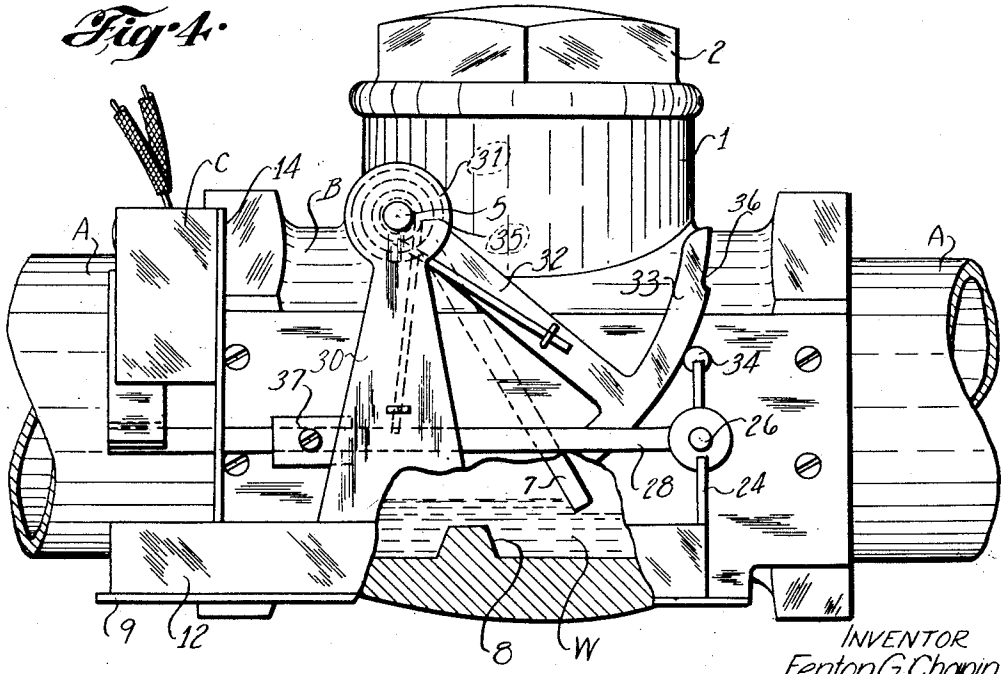


Fig. 4.



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FLOW CONTROLLED SWITCH

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Fig. 6.

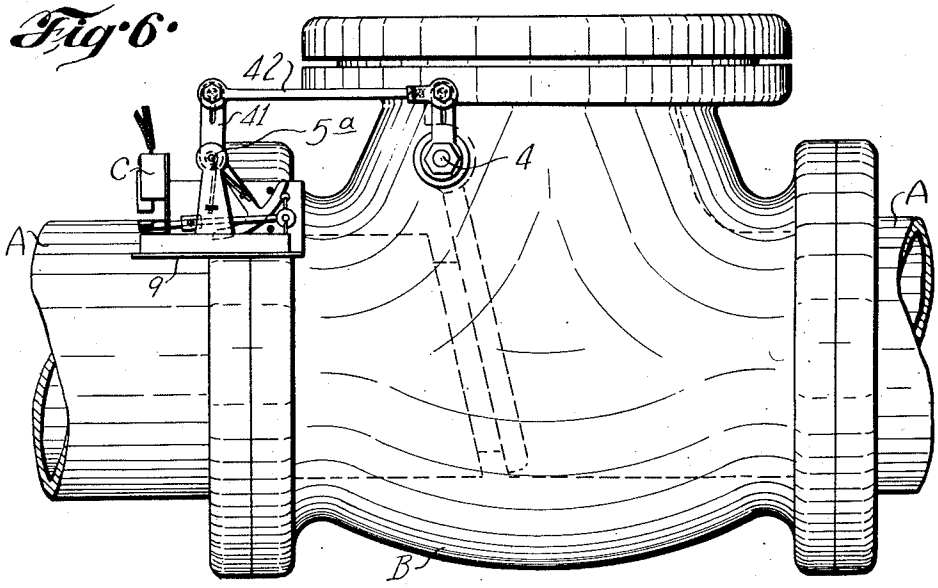
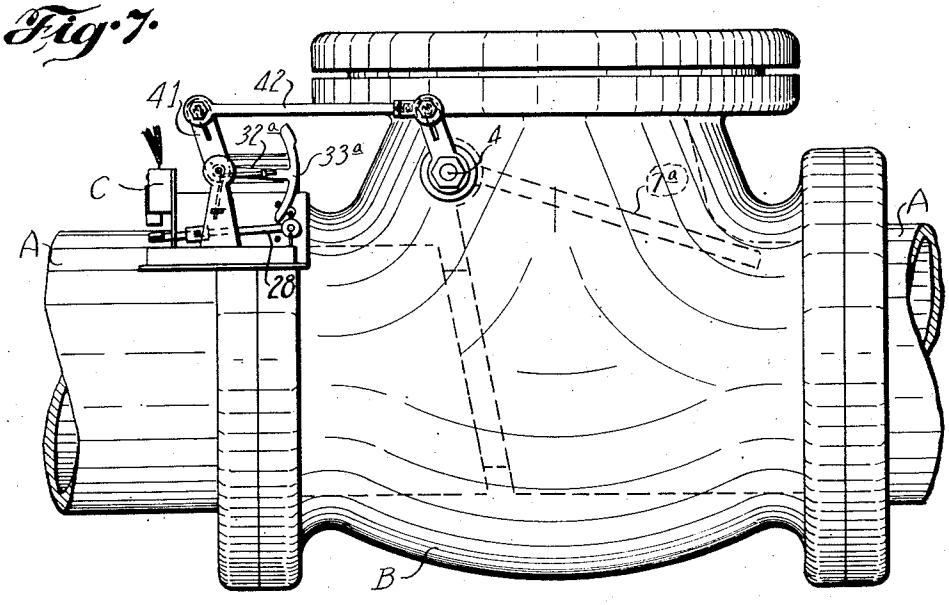


Fig. 7.



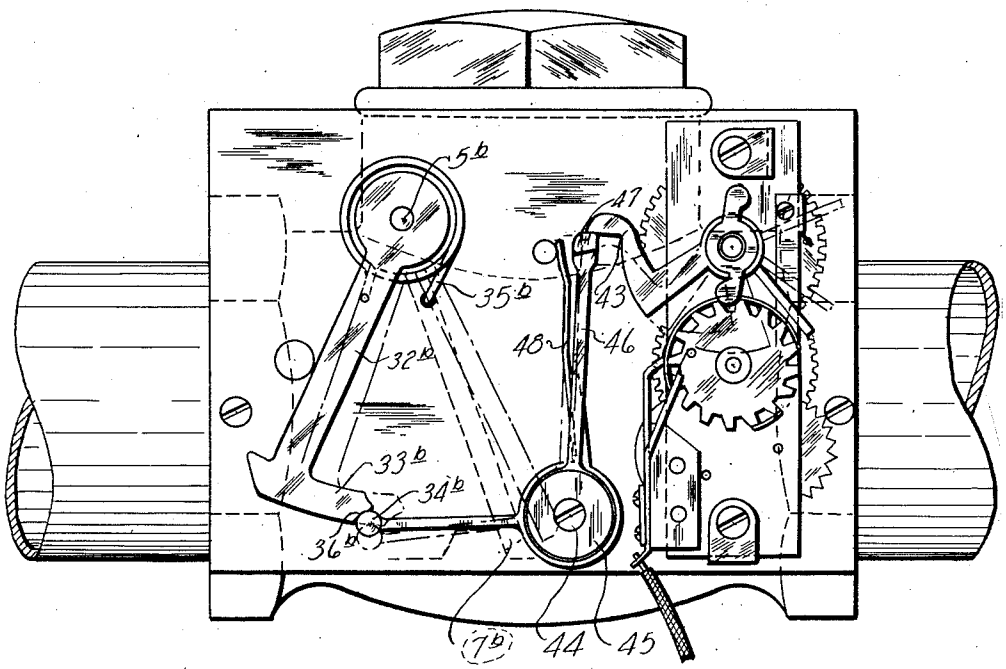
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Fig. 8.



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UNITED STATES PATENT OFFICE

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FLOW CONTROLLED SWITCH

Application filed December 8, 1930. Serial No. 500,893.

This invention relates generally to sprinkler systems and the like. More particularly, my invention relates to a certain new and useful improvement in means or mechanism for automatically effecting or giving an alarm on an actuation of the system and has for its chief object the provision of means of the type and for the purpose stated which is relatively simple in structure, which may be readily and economically installed in the system, and which is reliable and efficient in the performance of its intended functions.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts hereinafter described and pointed out in the claims.

In the accompanying drawings,—

Figure 1 is a plan view of a valve-actuated alarm-effecting mechanism embodying my invention, the cap of the valve-housing being removed;

Figures 2 and 3 are, respectively, side and end views of the mechanism, the switch thereof being open;

Figure 4 is a side elevational view, partly broken away and in section, of the mechanism, with the switch thereof closed;

Figure 5 is a detail fragmental view of the valve of the system; and

Figures 6, 7, and 8 are side elevational views of slightly modified valve-actuated alarm-effecting mechanism embodying my invention.

Referring now more in detail and by reference characters to the drawings, which illustrate practical embodiments of my invention, A designates a conduit or pipe forming part of any standard or approved type of fire-sprinkler apparatus or the like, and disposed in, and forming substantially a part of, the pipe A is a valve-housing B. The housing B is provided, in turn, with a lateral tubular extension or neck 1 adapted for closure by a cap 2, and formed on the housing B at approximately the base of the extension 1, are transversely disposed spaced bearings 3, supporting for rotary movement a shaft 4 having a suitably elongated extension 5 projecting exteriorly the housing B, for purposes presently appearing. Having an extension 6 fixed on the shaft 4 intermediate the bearings 3, is a valve 7 adapted normally, in the forms of the mechanisms illustrated in Figures 1, 2, 3, 4, 6, and 8, to engage the seat 8 in the housing B in fluid-flow checking position.

Suitably secured to and supported from a side of the valve-housing B, as shown, is a suitable bracket 9. Preferably resting on the base of the bracket 9, is a pair of angle-members 12, and having preferably an adjustable slot-and-screw connection, as at 10, with the angles 12 and bracket 9, is a plate-section 11. Fixed, as by means of angle extensions 13, to, and upstanding from, the plate 11 adjacent an end of the bracket 9 and in transverse relation to the housing B, is a wall 14, fixed upon a face of which is an insulation block C provided, as best seen in Figure 3, with a pair of suitably spaced vertically disposed surface recesses, as at 15, each of which recesses is preferably suitably provided with a metallic or conducting-lining 16.

Projecting transversely, and supported in aligning relation in the walls, of the lining-members 16, are stub-shafts 17, each supporting loosely a contact-member 18 and a spring-retainer 19. The contact-members 18 are preferably, as shown, in the form of suitable metallic-strip sections suitably elongated to depend for tilting movement below the block C and having their so depending lower end-portions oppositely beveled, for purposes also presently appearing, the members 18 being yielding maintained in electrically engaging relation with the respective lining-members 16 by means of coiled springs 20 interposed on the shafts 17 between the members 18 and the retainers 19, as best seen in Figure 3. Also mounted on, and electrically engaging with, the respective lining-members 16, are binding-posts or terminals 21 adapted for inclusion, as by leads or conductors 22, in any suitable alarm-circuit.

At its opposite end, the bracket-plate 11 is approximately longitudinally slotted or cut-away, as at 23, and formed with accordingly spaced upwardly presented flange-portions 24, each topped with a boss 25, which

latter are aligningly cored to accommodate a pin or shaft 26, upon which, intermediate the bosses 25, is pivotally mounted the hub-end 27 of a suitably elongated switch-lever or arm 28 provided at or adjacent its other or free end with a conducting bridge-piece 29 adapted, on swingable actuation of the switch-lever 28 as presently appearing, for connection or impinging electrical engagement with the spring-pressed or yielding contacts 18 for closing the alarm-circuit.

Also suitably fixed to, and upstanding from, the bracket-plate 11 intermediate the wall 14 and the plate-flanges 24, is a bearing 30 for the projecting shaft-extension 5, and suitably fixed on such shaft-portion 5, is the hub-end 31 of an arm 32 carrying at its outer or free end an arcuate cam-member 33 adapted for engagement with a rigid knobbed projection or short lever-arm 34 on the hub-end 27 of the switch-lever 28 for quickly rocking the lever 28, on opening actuation of the valve 7, for carrying the bridge-piece 29 into circuit closing engagement or connection with the contacts 18.

Coiled on the shaft-extension 5 and having end-engagement with the standard 30 and the cam-arm 32, as shown, is a spring 35 for yieldingly retaining the valve 7 in normal closed or seated position and also the switch-lever 28 in normal circuit-open position through engagement of the cam 33 at a surface-notch 36 with the lever-projection-34, the switch-lever 28 being preferably weighted, as at 37, for expediting return movement, after circuit-closing actuation, of the lever 28 to normal position.

Hence, in use and operation, on actuation of the sprinkler-system, the water or other fluid W thereof will, under its usual head or pressure, flow through the valve-housing B and rockably unseat the valve 7 against the tension of the spring 35, whereby and simultaneously the cam-arm 32 will be oscillated and, through engagement of the cam 33 with the lever-projection or short arm 34, quickly rock the lever-arm 28 into circuit-closing engagement at the bridge-piece 29 with the contacts 18, a suitable alarm, not shown either audible or visible, being thereby given either locally or remotely, as may be desired, the alarm circuit continuing closed until the valve 7 is permitted to return, under the pull of the spring 35, to normal closed position.

The mechanism, as I have stated, may be readily installed in the system and has been found exceedingly efficient in the performance of its intended functions. Preferably, as shown, the shaft-extension 5 is equipped with a suitable stuffing-box 38 to prevent leakage, which, in turn, is provided with a suitable retaining or locking member 39, and the valve 7 is preferably provided with one or more apertures or openings 40 for equalizing pressure on the opposite faces thereof within the sprinkler system.

As shown in Figure 6, the operating parts of the mechanism may, if desired, be located at a distance from the valve shaft 4, and to such end a cam-shaft 5*a*, taking the place of the shaft-extension 5, may be suitably mounted, as shown, for rotatory movement and connected for actuation by means of links 41 and a connecting-rod 42 with the rod 4, the remaining parts of the mechanism being substantially identical with like parts previously herein described.

And the mechanism may also be readily installed in an open or continuous flow system, wherein the valve 7*a* is adapted to close on a cessation of flow, as shown in Figure 7, the parts, to such end, being merely reversed, so that the cam arm 32*a* and its carried cam 33*a* will function to rock the switch-lever 28 to close the circuit when the valve 7*a* moves or swings to seated position and to open the circuit when the valve 7*a* swings to its normal unseated or open position.

The mechanism, as shown in Figure 8, may further be modified for co-operation with a clock-work type of alarm, of which, for present purposes, 43 is the trip-lever, and mounted for oscillation on a stub-shaft 44 suitably supported on the bracket 9*b*, is the hub-portion 45 of a lever 46 adapted for engagement at its free end, as at 47, with the trip-lever 43 for maintaining the same, under the tension of a suitable spring 48, in normal inoperative position. Suitably fixed to the projecting valve-shaft portion 5*b*, is a cam-arm 32*b* carrying at its free end a cam-member 33*b* adapted normally, the valve 7*b* being seated, to engage at a surface notch 36*b* with a knobbed extension or arm 34*b* of the relatively elongated lever 46, the valve 7*b* and its conjoined parts being yieldingly retained in normal position under the pull of a spring 35*b*. Hence, on the valve 7*b* being unseated, the arm 32*b* will be swung towards the lever 46 and its cam 33*b* shifted into depressing engagement with the lever-portion 34*b* and the lever 46 thereby quickly shifted out of retaining engagement with the lever 43, as indicated by the dot-and-dash lines, and the alarm mechanism hence released for actuation.

And it is to be understood that other changes and modifications in the form, construction, arrangement, and combination of the several parts of the mechanism may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In combination, a standard, a bracket, a tubular valve-housing, a shaft mounted transversely upon the housing for rotatory

movement, a valve fixed on the shaft for oscillation within the housing, an extension on the shaft supported by the standard, a lever pivotally mounted on the bracket for rocking movement, a lateral extension on the lever, an arm fixed at an end on the shaft-extension, an arcuate cam on the free end of the arm having both retaining and rocking engagement with the lever extension, and a spring coiled on the shaft-extension and having engagement with the standard and said arm for yieldingly retaining the valve and lever in normal position.

2. In combination, a standard, a bracket, a tubular valve-housing, a shaft mounted transversely upon the housing for rotatory movement, a valve fixed on the shaft for oscillation within the housing, an extension on the shaft supported by the standard, a lever pivotally mounted on the bracket for rocking movement, a lateral extension on the pivoted end of the lever, a pair of spaced members operatively disposed on the bracket with relation to the free end of the lever, a bridge-piece on the free end of the lever for connecting said members on rockable actuation of the lever, an arm fixed at an end on the shaft-extension, an arcuate cam on the free end of the arm having both retaining and rocking engagement with the lever-extension, and a spring coiled on the shaft-extension and having engagement with the standard and said arm for yieldingly retaining the valve and lever in normal position.

In testimony whereof, I have signed my name to this specification.

FENTON G. CHAPIN.