N. H. SUREN.

ALARM CONTROLLING MEANS FOR SPRINKLER SYSTEMS.

APPLICATION FILED JAN. 28, 1915.

1,204,327. Patented Nov. 7, 1916.

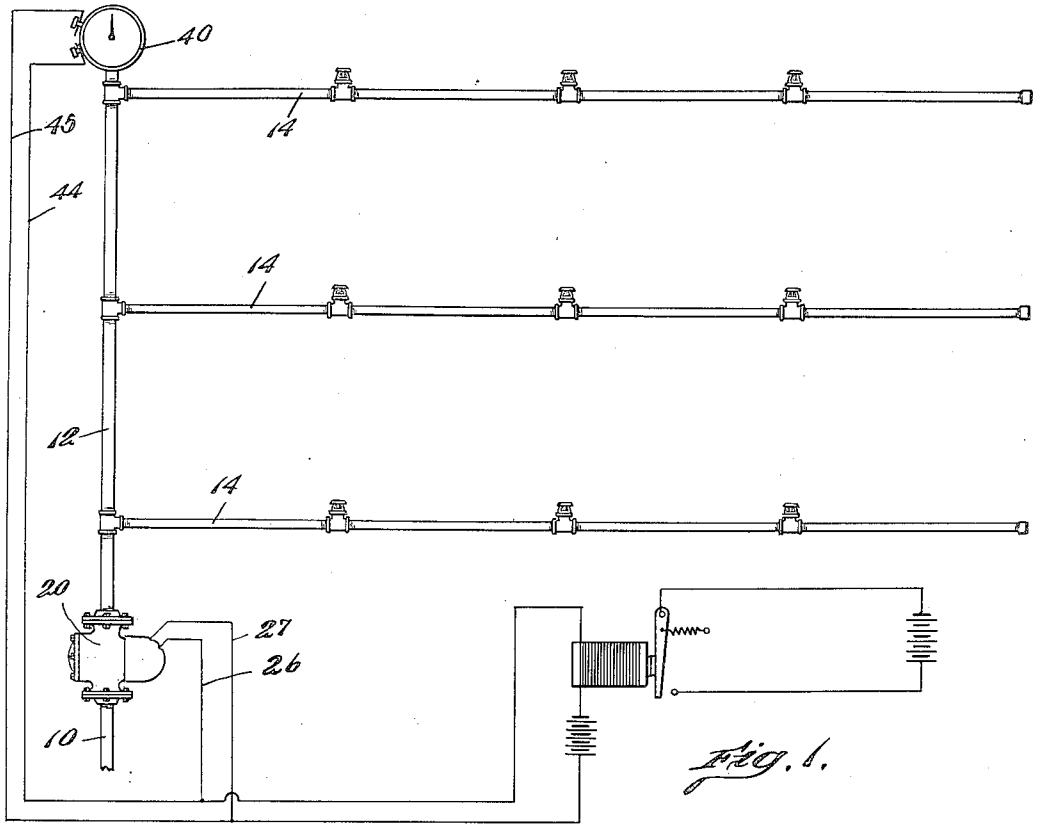


Fig. 1.

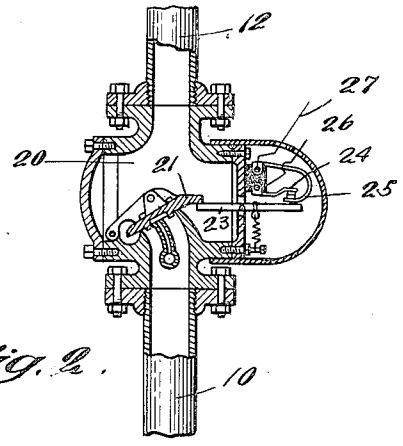


Fig. 2.

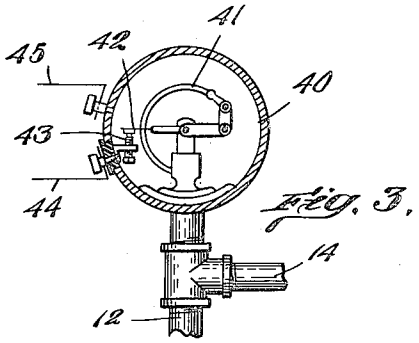


Fig. 3.

Witnesses:

H. B. Davis.

R. Connell.

Inventor:

Nathan H. Suren

by Wright & Harriman

Attys.

UNITED STATES PATENT OFFICE.

NATHAN H. SUREN, OF NEEDHAM, MASSACHUSETTS, ASSIGNOR TO GAMEWELL FIRE ALARM TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ALARM-CONTROLLING MEANS FOR SPRINKLER SYSTEMS.

1,204,327. Specification of Letters Patent. Patented Nov. 7, 1916.

Application filed January 23, 1915. Serial No. 4,925.

To all whom it may concern:

Be it known that I, NATHAN H. SUREN, a citizen of the United States, residing at Needham, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Alarm-Controlling Means for Sprinkler Systems, of which the following is a specification.

This invention relates to an improvement in alarm-controlling means designed to be used in connection with sprinkler-systems and the like.

The invention is designed primarily for indicating the flow of water as by sounding an alarm, when a subnormal pressure condition is produced in the sprinkler-pipes, as by the opening of a sprinkler-head or by a broken sprinkler-pipe, and to avoid sounding the alarm upon the occurrence of a sudden rise or fluctuation in the pressure, due for example to the condition known as "water-hammer", or to a subnormal pressure condition in the supply-pipe, such for instance as may be due to the opening of a hydrant, or to a break in said pipe, whereby false alarms are obviated.

The invention, broadly stated, comprehends a check-valve controlling direct communication between, what may be termed, the supply and service-pipes of the system, and a circuit-controller associated with it, which is arranged for operation by it, and a pressure-controlled element arranged in the service-pipe, and a circuit-controller associated with it and arranged for operation by it, said circuit-controllers being arranged to control a circuit in such manner that only upon operation of both circuit-controllers will an alarm be sounded.

Figure 1 represents a portion of a sprinkler-system having a check-valve with associated circuit-controller, arranged between the supply and service pipes, and having a pressure-controlled element with associated circuit-controller, arranged in the service-pipe, both circuit-controllers being arranged to control the operation of the same alarm circuit. Fig. 2 is a sectional view of the check-valve with associated circuit-controller. Fig. 3 is a sectional view of the pressure-controlled element with associated circuit-controller.

10 represents the supply-pipe and 12 the service-pipe from which branches 14 are extended bearing the sprinkler-heads, all of which parts are or may be of any usual or suitable construction, and form a part of a sprinkler-system. At the junction of the supply-pipe and service-pipe a check-valve 20 is arranged, its valve-plate 21, normally closing the opening by which direct communication is established between said pipes. Said check-valve may be of any suitable construction. As here shown, its valve-plate is arranged for engagement with a pivoted lever 23, which is arranged to control the engagement of a pair of contact-members 24, 25, which members are connected, respectively, with circuit-wires 26, 27. When the valve is in closed position the lever 23 is held with the contact-members in engagement with each other, thereby closing the circuit 26, 27, but when said valve-plate is moved away from its seat said lever 23 is moved on its pivot by the contractile spring connected with it and the contact-members are permitted to separate, thereby opening said circuit, 26, 27. This check-valve is arranged to be opened upon a reduction of the pressure in the service-pipe, due to a flow of water from the service-pipe or branches connected therewith, and operates to admit water from the supply-pipe, and upon movement of its valve-plate at such time will operate the circuit-controller 24, 25. Said check-valve remains closed when balanced by equal pressures at both sides of it and also upon a subnormal condition in the supply-pipe, due to a reduction in the pressure in said pipe. It is a fact that said valve-plate is frequently suddenly and momentarily opened by a rise in pressure in the supply-pipe due to a "water-hammer", resulting in a momentary operation of the circuit-controller, 24, 25, and the sounding of a false alarm, and it is this condition that my present invention seeks to overcome.

Herein a pressure-gage 40, is connected with the service-pipe, and said gage may be of any well-known or suitable construction, as for instance, a gage having an ordinary Bourbon spring is here shown, which spring is in open communication with the pressure; and said spring has connected with it a contact-member 42, arranged for engagement with a contact-member 43, which is insulated from the shell or case of the gage, and a circuit-wire 44 is connected with said contact-member 43, and a circuit-wire 45 is connected with the shell or case of the gage, and upon predetermined movements of said contact-member 42 by the

spring of the gage the circuit 44, 45 is opened and closed. The normal pressure contained in the service-pipe is sufficient to cause the contact-member 42 to engage the contact-member 43, so that the circuit 44, 45, is normally closed. Upon a reduction of the pressure, due to a flow of water from the service-pipe or branches connected therewith, the spring 41 is caused to move the contact-member 42 to disengage the contact-member 43, and thereby open the circuit. Upon the occurrence of a "water-hammer" and consequent sudden opening movement of the check-valve, the pressure gage will not be affected except that there may be a slight increase in pressure in the service-pipe, and such increase in pressure will act to more firmly hold the contact-member 42 in engagement with the contact-member 43. The spring of said pressure-gage, however, will not be caused to fluctuate by the "water-hammer." However, if a check-valve was not employed, then the pressure-gage would fluctuate in response to the occurrence of such a condition. By employing both a check-valve and a pressure-gage, arranged in combination and connected, respectively, with the supply-pipe and service-pipe, as herein shown and described, and arranging both circuit-controllers which are to be operated by them so as to control the sounding of the alarm only upon the operation of both said circuit-controllers, then false-alarms from this cause are obviated. As for instance, the two circuit-controllers may be arranged in parallel in a circuit, and said circuit will not be opened unless both circuit-controllers are opened; or, as is well understood, both circuit-controllers may be normally open and arranged in series and only when both are closed will the alarm circuit be closed. Said check-valve and pressure-gage, each having a circuit-controller arranged for operation by it, may have associated with them other circuit-controllers, and the circuit-controllers may be arranged to control the operation of a self-starting signal-transmitter, the starting-magnet or magnets of which are responsive only upon operation of both circuit-controllers, thereby to transmit a signal to a suitable signal-recorder as is represented in my application, No. 23,777.

The pressure-gage here shown has a dial and pointer for indicating the pressure, but, as far as my invention is concerned, this is immaterial.

I claim:

1. In an alarm-controlling means for sprinkler-systems, the combination with the supply-pipe and service-pipe of a sprinkler-system, of a check-valve arranged to open and close communication between said supply-pipe and service-pipe, and a pressure-controlled element connected with the service-pipe, circuit-controllers associated, respectively, with said check-valve and said pressure-controlled element, and a circuit in which said circuit-controllers are arranged in parallel relation, whereby the alarm-circuit will be controlled only upon operation of both circuit-controllers, substantially as described.

2. In an alarm-controlling means for sprinkler-systems, the combination with the supply-pipe and service-pipe of a sprinkler-system, of a check-valve arranged to open and close communication between the supply-pipe and service-pipe, a pressure-gage connected with the service-pipe, circuit-controllers associated, respectively, with said check-valve and pressure-gage, a circuit in which said circuit-controllers are arranged in parallel relation, whereby the circuit will be controlled only upon operation of both circuit-controllers, substantially as described.

3. In an alarm-controlling means for sprinkler-systems, the combination with the supply-pipe and service-pipe of a sprinkler-system of means controlling the flow of water from the supply-pipe to the service-pipe and a circuit-controller associated with said means and responsive to the operation thereof, a pressure-controlled element connected with the service-pipe, and responsive to variations in the pressure therein, a circuit-controller associated with said element, and a circuit arranged to be controlled by and only upon coincident operation of both said circuit-controllers, substantially as described.

4. In an alarm-controlling means for sprinkler-systems, the combination with the supply-pipe and service-pipe of a sprinkler-system, of means responsive to a reduction in the pressure in the service-pipe and also to a rise in pressure in the supply-pipe, and a circuit-controller associated with said means and responsive to the operation thereof, a pressure-controlled element connected with the service-pipe and responsive to variations in the pressure therein, and a circuit-controller associated with said element, and a circuit arranged to be controlled by and only upon coincident operation of both said circuit-controllers substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

NATHAN H. SUREN.

Witnesses:
E. P. WALDRON,
C. C. BISSETT.