J. P. CASEY.

AUTOMATIC SPRINKLER SYSTEM.

APPLICATION FILED FEB. 9, 1907.

922,456. Patented May 25, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

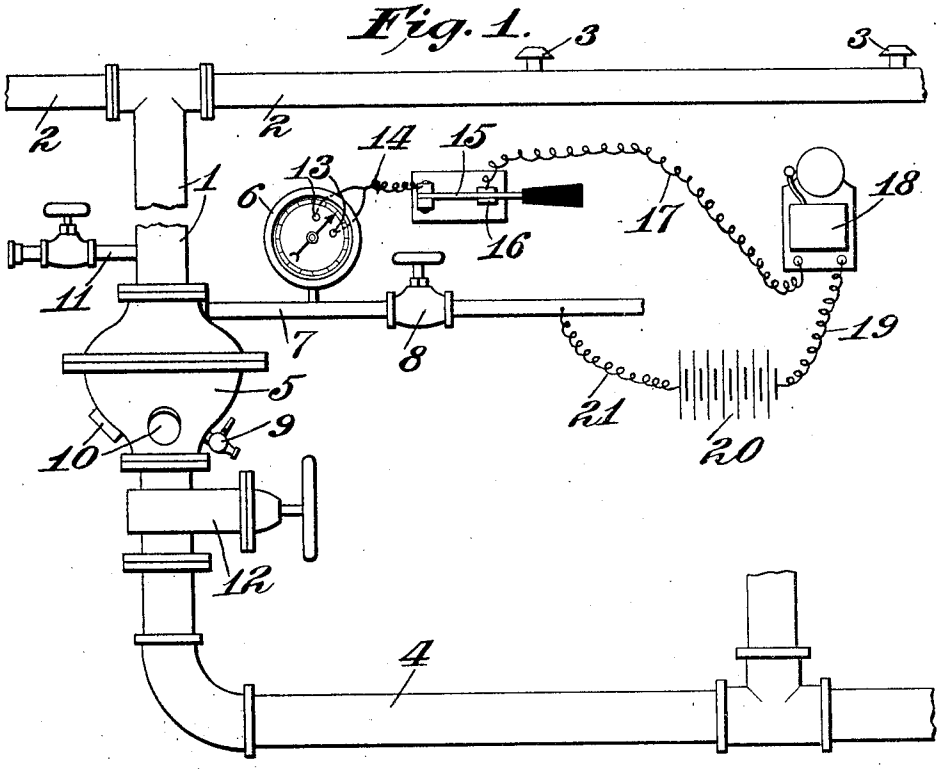
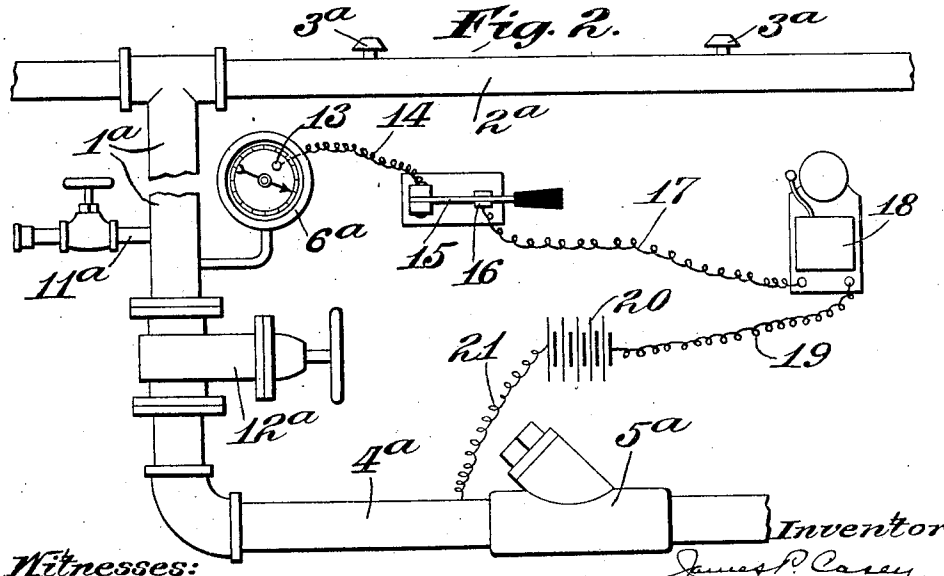


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

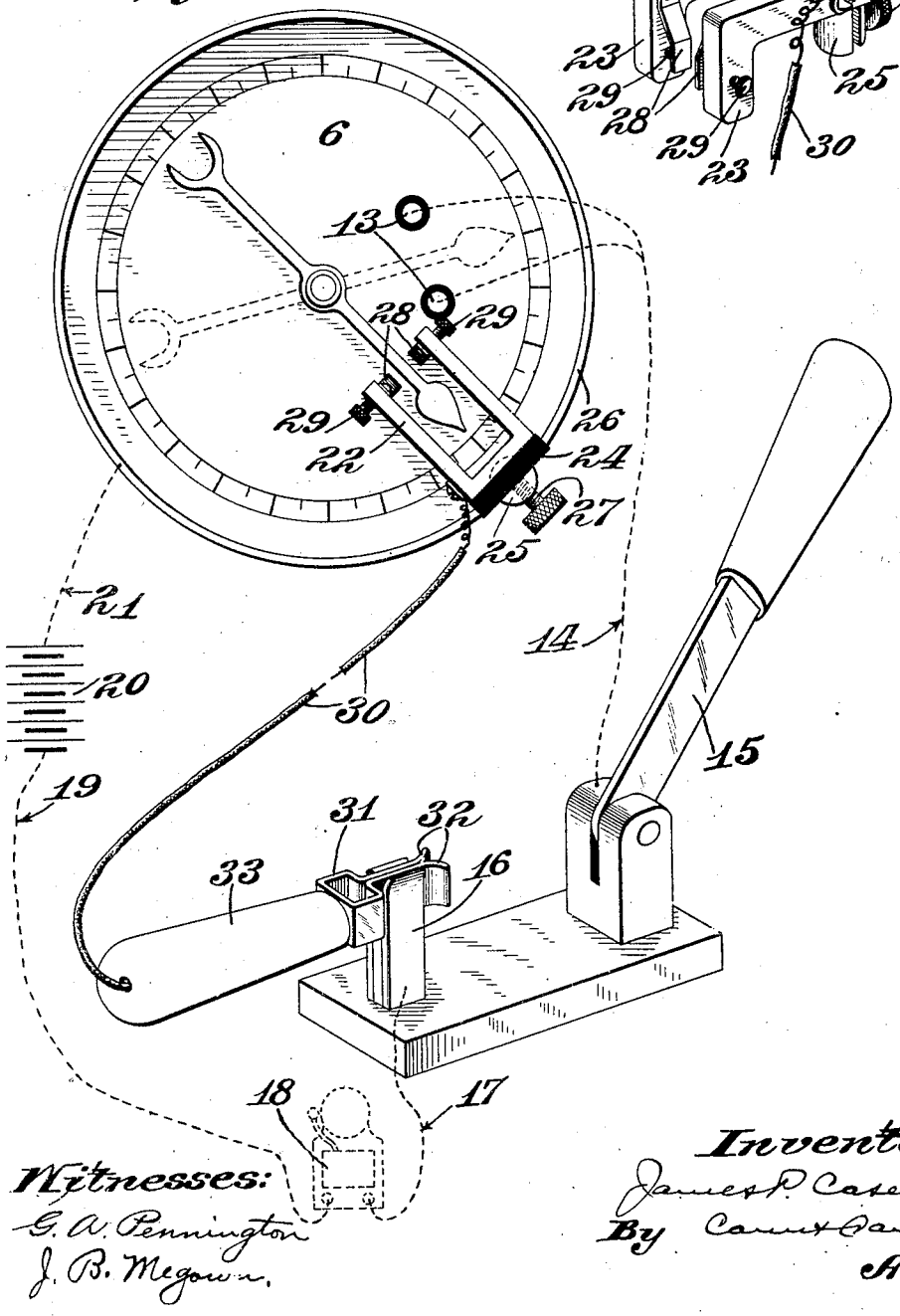


Fig. 4.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SPRINKLER SYSTEM.

No. 922,456. Specification of Letters Patent. Patented May 25, 1909.

Application filed February 9, 1907. Serial No. 356,543.

To all whom it may concern:

Be it known that I, JAMES P. CASEY, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Automatic Sprinkler Systems, of which the following is a specification.

This invention relates to automatic sprinkler systems.

In sprinkler systems now in general use, the pressure therein is kept above or below the normal pressure of the water in the service pipes connected to the city main or to a pressure tank specially provided therefor near or on the roof of the building. There are two different systems in general use, distinguished as "wet pipe" and "dry pipe" systems. In the former, the pressure in the pipes of the house system is maintained in excess of the pressure in the service pipe which communicates with the system pipes through a check-valve. In the "dry pipe" system, the air pressure therein is kept lower than the water pressure in the service pipe, which communicates with the system pipes through a pressure-regulated valve, said valve being held in check by the air pressure in the system pipes. Pressure gages are provided to indicate the pressure in the pipes of both systems, and said gages are provided with electrical contacts or stops arranged in the path of the indicator or pointer. These contacts are in a normally open electrical alarm circuit and so arranged that when the pressure in the system pipes is raised or lowered by the opening of a sprinkler head or heads, the circuit is closed and an alarm is sounded or indicated, usually at the headquarters of a salvage corps or a fire engine house. By the usual arrangement of electrical circuit, the alarm continues to sound until responded to and until a switch is opened or the circuit otherwise broken.

It often happens that it is not practicable to recharge or reset the system until after the lapse of considerable time, and it has heretofore been the practice merely to close the sprinkler heads until the system shall have been recharged. During the intervening time until the system is recharged the permanent alarm is "dead" or ineffective, and, if a sprinkler head should open during such time, no alarm would be sounded. Hence, considerable property loss would be entailed before the salvage corps would be notified.

The object of the present invention is to provide for the sounding of an alarm during the existence of conditions in the system under which the alarm has hitherto been "dead".

It consists principally in a supplemental alarm attachment hereinafter fully described.

It also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawing which forms part of this specification and wherein like symbols refer to like parts wherever they occur, Figure 1 is a diagram of an ordinary arrangement of automatic sprinkler system, commonly known as a "dry-pipe" system, and showing an ordinary electrical alarm device; Fig. 2 is a diagram of an ordinary arrangement of automatic sprinkler system, commonly known as a "wet-pipe" system, and showing an ordinary electrical alarm device; Fig. 3 is a view showing the manner in which the present supplemental alarm attachment is applied; and, Fig. 4 is a detail view of the contact member of the supplemental alarm attachment.

The "dry-pipe" system illustrated in Fig. 1 of the drawings comprises a riser-pipe 1 from which extend branch pipes 2. The branch pipes 2 usually extend throughout the building and they are provided with sprinkler heads or nozzles 3. These sprinkler heads are arranged to open at a predetermined temperature. The riser-pipe 1 is connected to a service pipe 4 by a valve casing 5. The casing 5 contains a pressure-controlled check-valve which is arranged so that when the system pipes are drained, a relatively low pressure of air in said system pipes will hold in check a greater pressure of water in the service pipe. In a "dry-pipe" system, the house pipes are charged with compressed air, usually up to 20 or 30 pounds pressure. The ordinary pressure-controlled check-valve will hold in check 75 or 80 pounds water pressure in the service pipes. A gage 6 is employed to indicate the air-pressure. This gage, as shown in the drawing, is attached to the drain pipe 7 which is provided with a valve 8. The valve 8 is kept tightly closed after the system pipes have been drained. A pet-cock 9 and removable plugs 10 are provided for openings in the valve casing 5, so that said casing may be drained, and to facilitate the adjustment of the check-valve therein. A valved pipe 11 is connected to the riser-pipe 1 for the attachment of a suitable air-pump

for increasing the air pressure in the system pipes. The service pipe 4 is provided with a gate-valve 12. This valve is kept open at all times except when it is necessary to drain the system pipes, or to cut off the flow of water through said pipes after a sprinkler head or heads shall have opened.

In a "dry-pipe" system, when a sprinkler head opens, the air pressure is released and thereupon the water pressure in the service pipe overbalances and opens the check-valve. Thereupon, the water flows into the house system pipes and out through the opened sprinkler head or heads until the gate-valve 12 is closed manually.

In the "wet-pipe" system illustrated in Fig. 2 of the drawing the service pipe 4^a is provided with a check-valve 5^a and a gate-valve 12^a. The riser-pipe 1^a is connected to the gate-valve casing, and has branch pipes 2^a extending therefrom which are provided with sprinkler heads 3^a. A pressure gage 6^a is attached to the riser-pipe 1^a and said riser-pipe also has connected thereto a valved pipe 11^a.

In a "wet-pipe" system, the pipes are kept filled with water which is maintained under pressure in excess of the pressure in the service pipe beyond the check-valve 5^a. The excess pressure is pumped into the system pipes through the pipe 11^a, and as the gate-valve is kept normally open, the same amount of excess pressure is maintained in the service pipe 4^a on the inner side of the check-valve whereby the same is held against the water pressure on the opposite side.

In a "wet pipe" system, when the sprinkler head or heads open, the excessive pressure in the house system pipes is reduced to less than the pressure of the water in the service pipe, whereupon the check valve 5^a is overbalanced and opened by the pressure of the water in the service pipe. The water from the service pipe is then free to flow through the system pipes until the gate-valve 12^a is closed manually.

In both systems, the pressure gages 6 and 6^a, respectively, are provided with electrical contacts or stops 13 which are arranged to arrest the movement of the pointer when the pressure varies beyond a certain degree. These contacts 13 are suitably insulated from the metallic portions of the gages and are connected by wires 14 to the pivot support of the pivoted switch blades 15. The switch blades are arranged to be moved into and out of engagement with the bifurcated contact members 16 which are connected by wires 17 to the magnets of electrical alarm bells 18. Wires 19 connect the bell magnets to one pole of batteries 20, while the opposite poles of the batteries are grounded on the metal water pipes through wires 21. The gage shown in the "dry-pipe" system is provided with two contacts 13. One of these contacts is arranged to arrest the pointer when the air is displaced by the water, and the pressure in the pipes is increased to that of the water when a head is opened. The other contact is arranged to arrest the pointer when the air pressure decreases, if there is a leak in the system pipes. Thus, an alarm may be given in case a sprinkler head opens, or in case the air pressure should decrease to such a degree that the water from the service pipes could overbalance the check-valve 5 and enter the system pipes. The gage shown in connection with the "wet-pipe" system is provided with a single contact, as the pressure normally maintained in such systems is in excess of the pressure in the service-pipes, and, consequently, an alarm is necessarily sounded only when said excess pressure decreases.

The foregoing explanations are made to set forth the operation of the automatic sprinkler systems now in common use, and to facilitate a better understanding of my invention.

As hereinbefore stated, the permanent alarm device is inoperative after a sprinkler head has opened and before the system pipes have been recharged to normal pressure. The present invention comprehends a supplemental alarm attachment to be temporarily substituted in place of the permanent alarm device until the same may be made effective. The supplemental attachment comprises a detachable member 22 which is forked and has angular portions 23. The member 22 is secured to an insulation block 24 which is in turn attached to a slotted post 25. The slotted post portion 25 is adapted to be fitted on the annular flanged portion 26 of the gage, and is fastened in position by a set-screw 27. On the angular portions 23 are secured resilient contact pieces 28 against which adjusting screws 29 are arranged to bear. A wire 30 is attached at one end to the member 22 and has its other end attached to a connecting piece 31. This connecting piece 31 is formed with a rectangular body portion, having resilient fingers or angular extensions 32 which can be fitted into the bifurcated contact member 16 of the switch. A suitably insulated handle 33 is provided for the connecting piece 31.

In applying the supplemental alarm attachment after a sprinkler system has been operated, it is only necessary to close the sprinkler heads which have been opened. Then, if the pressure of the water from the service pipes is not sufficient to move the gage pointer from the contact, the transparent cover is removed from the gage and the pointer may then be sprung or bent to pass clear of the contact. When the pressure has been determined, or indicated, the forked contact member 22 is attached to the flange 26 of the gage casing with its angular portions 23 straddling the pointer, but with the

contact pieces 28 spaced from said pointer. The spaces between the contact pieces 28 and the pointer may be varied by adjusting the screws 29. After the member 22 has been attached to the gage the connecting piece 31 is fitted with its finger portions 32 into the bifurcated contact member 16 of the switch, the switch blade 15 having previously been removed from engagement with said member 16 to break the circuit after the alarm had been responded to.

While the supplemental attachment has been illustrated as applied to the pressure gage of a sprinkler system, obviously, the same may be applied to the pressure gage of the water-supply tank which is usually employed in connection with the service pipe from a city water main to supply the water to sprinkler systems; and the device may be used in other connections wherein it is desired to give an alarm when a variation in pressure is indicated by a gage having a movable pointer or indicator.

Obviously, my device admits of considerable modification within the scope of my invention, and therefore I do not wish to be limited to the specific construction shown and described.

What I claim as my invention and desire to secure by Letters Patent is:

1. In an automatic sprinkler system, the combination with a gage an alarm, an alarm circuit controlled by said gage and means for disabling the said circuit of the system, of a supplemental alarm device adapted to be operatively connected to said gage while said circuit is disabled.

2. In an automatic sprinkler system, the combination with a gage, an alarm, an alarm circuit controlled by said gage and means for opening said circuit, of a supplemental alarm device constructed to be operatively connected to said gage while the original circuit of the gage is open.

3. The combination with a pressure gage having a movable indicator, contact devices limiting the movement of said indicator, and means for disabling said indicator, of a supplemental contact constructed to be operatively secured to said gage and coöperate with said indicator while the first or normal contacts are disabled.

4. In an automatic sprinkler system, the combination with the system pipes which are charged to a predetermined normal pressure, of a gage for indicating the pressure within said pipes, an electrical alarm device, an alarm attachment for said gage in circuit with said alarm device and arranged to sound said alarm when the pressure within the pipes varies beyond a certain degree, means to make said alarm attachment ineffective after said alarm has sounded until the pressure in the pipes is restored to normal and the circuit is again rendered effective, and an adjustable supplemental alarm attachment adapted to be applied to said gage to sound the alarm while the said first or normal circuit is open.

5. In an automatic sprinkler system, the combination with the system pipes which are charged to a predetermined normal pressure, of a gage for indicating the pressure within said pipes, an alarm device operatively connected to said gage, and adapted to operate when the pressure varies beyond a certain degree and is indicated by said gage, means whereby the circuit of said alarm device is disabled after sounding until the pressure in said pipes is restored to normal and the original circuit is again closed, and a supplemental alarm device constructed to be operatively connected to said gage while the first mentioned device is ineffective and its circuit open.

6. In an automatic sprinkler system, the combination with the system pipes which are charged to a predetermined normal pressure, of a gage for indicating the pressure within said pipes, a permanent electrical alarm device, an alarm attachment for said gage in circuit with said alarm device and arranged to cause said alarm device to indicate a variation from normal pressure within said pipes beyond a certain degree, a circuit breaker in said permanent alarm circuit, and a secondary alarm attachment adapted to be adjustably mounted in operative relation to said gage in its released position and to said alarm device to indicate a further variation of pressure within said pipes until the pressure is again restored to normal.

7. In an automatic sprinkler system, the combination with the system pipes which are charged to a predetermined normal pressure, of a gage having a movable indicator for indicating the pressure within said pipes, an electrical alarm device, an electrical contact member on said gage in the path of said movable indicator and in circuit with said alarm device, whereby said alarm device will sound when the pressure in said pipes varies beyond a certain degree, a normally closed circuit breaker in said alarm circuit, whereby said alarm device may be made ineffective after sounding until the pressure is restored to normal, and a supplemental electrical contact member adapted to be adjustably attached to said gage in the path of said movable indicator and to be placed in circuit with said alarm device, whereby, said alarm device will sound upon a further variation in pressure in said pipes until the pressure is restored to normal.

Signed at St. Louis, Missouri, this 6th day of Feb., 1907.

JAMES P. CASEY.

Witnesses:

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