

M. G. YOUNG.
ALARM FOR SPRINKLER SYSTEMS.
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941,053.

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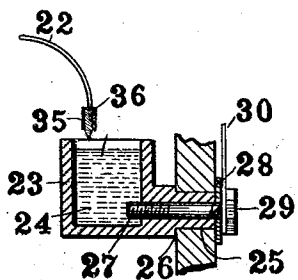
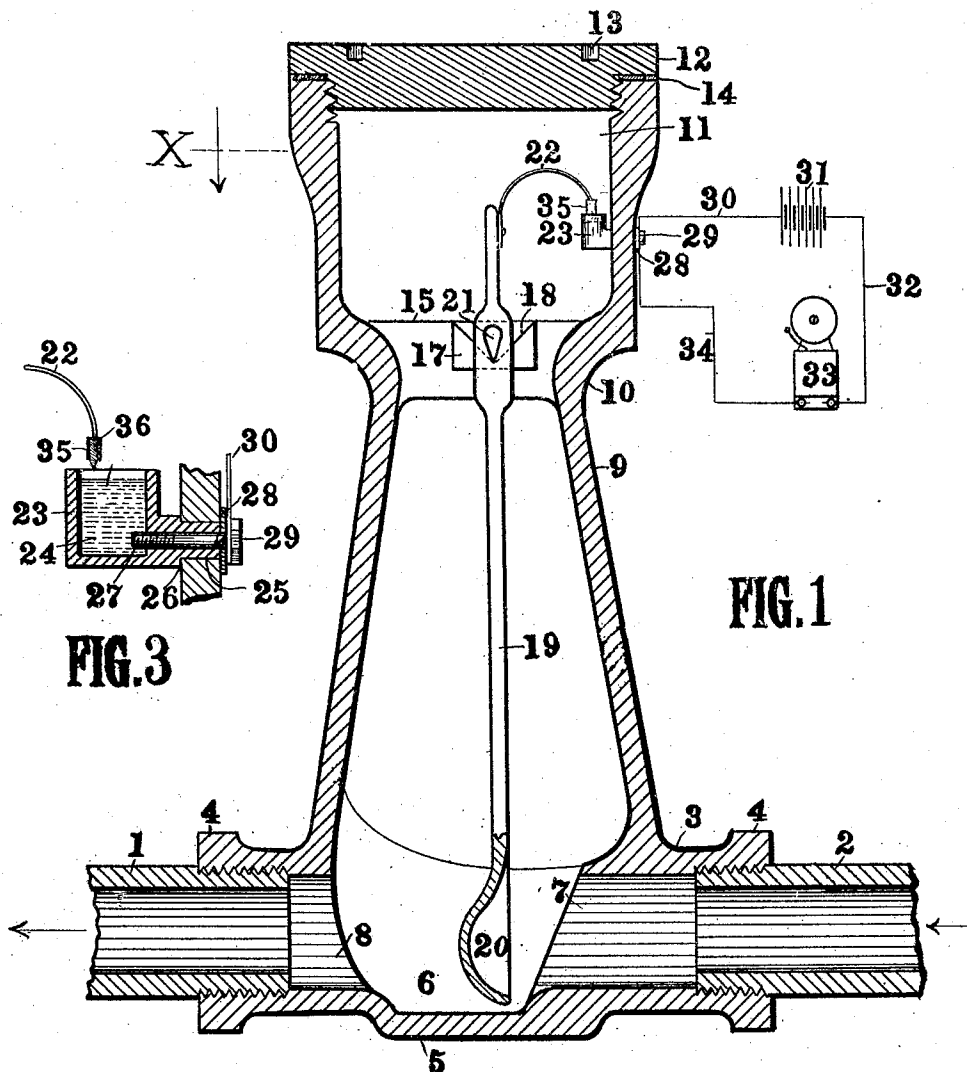


FIG. 3

FIG. 1

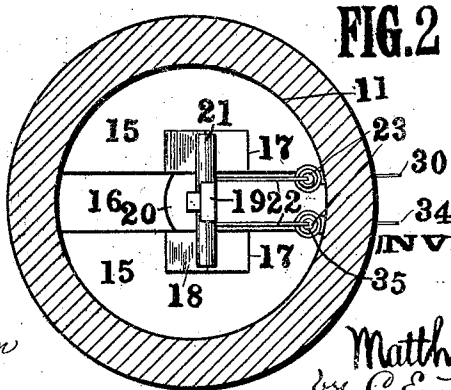


FIG. 2

WITNESSES

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ALARM FOR SPRINKLER SYSTEMS.

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To all whom it may concern:

Be it known that I, MATTHEW GILMORE YOUNG, a citizen of the United States, residing in Coventry township, in the county of Summit and State of Ohio, have invented new and useful Improvements in Alarms for Sprinkler Systems, of which the following is a specification.

This invention relates to alarm devices for automatic sprinkler systems and the object thereof is to provide a device adapted to cause an alarm upon the movement of water in the pipes of an automatic sprinkler system and is adapted to be used in connection with a dry pipe system or a system wherein the pipes are constantly filled with water.

The object of the invention, broadly speaking, contemplates interposing in the pipe line a device embodying a swinging pendulum arranged to be actuated by the movement of the current of water in the pipe and by its movement close an electric circuit in which is included a bell and a current-generating instrumentality such as a battery.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be hereinafter specifically described and illustrated in the accompanying drawings which form a part hereof wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings, in which similar reference numerals indicate like parts in the different figures: Figure 1 is a vertical, central, longitudinal, sectional view of a device embodying this invention, shown in operative relation with a pipe line of an automatic sprinkler system. Fig. 2 is a sectional view on line X of Fig. 1; and Fig. 3 is a sectional view of a mercury cup constituting one of the contact members of an electric circuit used for causing an alarm when the device is operated.

Referring to the drawings in detail, the reference numerals 1 and 2 denote the spaced ends of two pipes constituting a portion of an automatic sprinkler system. The ends of these pipes are threaded and between said ends is placed a device embodying this invention comprising a casing 3 having op-

positely-disposed interiorly-threaded sockets 4 to receive the threaded ends of the pipes 1 and 2. The main portion of this casing is enlarged at 5 to constitute a chamber 6. The portions of the casing extending inwardly from the sockets 4 of the chamber 6 are provided with passages to form an inlet duct 7 and an outlet duct 8 in open communication with the chamber 6. Extending upwardly from the enlarged portion 5 of the casing is a hollow and preferably conically-shaped portion 9 having a contracted neck portion 10 from which extends upwardly a chamber 11 the upper end of which is interiorly-threaded to receive the threads of a closure member 12 which is provided with suitable recesses 13 to receive a wrench by which the same is seated. In practice, a washer 14 is interposed between the upper face of the chamber and the closure member 12 in order to hermetically seal the joint between them. Extending across the interior of the upright portion 9 at its contracted portion 10 is an integral diaphragm 15 through which is a longitudinal slot 16 for a purpose to be stated.

Oppositely-disposed to each other and positioned in suitable recesses formed in the diaphragm 15 are a pair of friction-reducing members 17 preferably constructed of glass or other non-corrosive substance, each provided with a V-shaped notch 18, the notches being in horizontal alinement with each other. Positioned in the slot 16 is an oscillating arm 19, hereinafter called a pendulum, provided at its lower end with a spoon-shaped portion 20 oppositely-disposed to the inlet opening 7. This pendulum is provided with arms 21 extending transversely from opposite sides thereof which are preferably of the shape shown in Fig. 1 in cross section, being provided with a downwardly-extending sharpened lower edge adapted to be seated in the notches 18 of the member 17, thereby sustaining the pendulum so as to permit the free oscillation of the spoon-shaped lower end thereof with a minimum amount of friction. Secured to the upper end of the pendulum 19 are two contact fingers 22 spaced from each other and preferably arranged in parallelism with the ends thereof which are mounted on the pendulum 19 in electrical communication with each other. These fingers are preferably shaped approximately as shown in the drawings with the outer ends thereof

downwardly curved. The fingers are customarily made of some non-corrosive material and are provided on their ends with sockets 35 in which are carbon sticks 36.

5 The wall of the chamber 11 adjacent the free ends of the fingers 22 is provided with two apertures in each of which is mounted a mercury cup, shown best in Fig. 3, each consisting of a cup 23 of non-conducting material such as hard rubber in which is contained a quantity of mercury 24 and from which extends a stem 25 provided with a shoulder 26. The stem of each mercury cup 23 is inserted in one of the apertures in the wall of the chamber 11 and a threaded pin 27 is screwed through a suitable opening in the same until it projects into or comes in electrical communication with the mercury 24 in the cup. An insulating washer 28 is then placed around the pin 27 and the entire device clamped firmly against the wall of the chamber 11 by a nut 29. Before the nut 29 is screwed to place a wire 30 is wrapped about the pin and held in electrical connection therewith by said nut. The electric circuit consists of the wire 30 leading from one of the mercury cups to a battery 31 from which a wire 32 extends to a bell 33 from which a return wire 34 extends to the companion cup.

When the pendulum is in the position shown in Fig. 1 the free end of the fingers will be out of contact with the mercury by being spaced therefrom a slight distance sufficiently to prevent electrical communication between the fingers and the mercury, but if the pendulum is oscillated to the left in Fig. 1 each carbon will dip in the mercury in the respective cup provided for it and close the circuit, causing the ringing of the bell.

The operation of the device is as follows: The device is first positioned in one of the pipes constituting a portion of an automatic sprinkler system and it will be stated that it may be positioned in any branch pipe or in the main inlet to the building, in the former case causing an alarm for only that portion of the building to which the branch pipe extends, but if incorporated in the main supply pipe of the building it will cause a general alarm upon the opening of a sprinkler head at any point reached by the water flowing through the main. The device will be so positioned that the current of water will flow in the direction of the arrows from the pipe 2 through the inlet 7 and from thence through the outlet 8 and pipe 1 to the sprinkler heads. As soon as a sprinkler head is opened either by heat or a break, the water flowing through the pipe 2 and inlet opening 7 will encounter the spoon-shaped lower end of the pendulum 19 and oscillate it toward the outlet 8 causing the fingers on the upper end thereof to dip

the carbon sticks in the mercury cups, sounding an alarm.

In setting up this device, the pipes 1 and 2 are secured in the sockets 4 in the ordinary manner, the closure member 12 is removed and the pendulum inserted through the slot 16 which is wide enough to permit this if the pendulum be given a quarter turn and when lowered sufficiently give another quarter turn and the lateral arms 21 seated in the notches 18 of the member 17. The fingers are then carefully adjusted so that when the pendulum is oscillated they will dip the carbon sticks in the mercury. The cups are then substantially filled with mercury and the closure member 12 replaced.

It will be noted that as the upper end of the device is securely sealed and the air contained therein prevented from escaping it will constitute a cushion to prevent water rising high enough to interfere with the working of the device. It will be further noted that the enlarged chamber 6 is sufficiently large to permit the normal quantity of water which the pipes are adapted to carry to pass around the spoon-shaped end of the pendulum 19, thereby eliminating any danger of the interruption of the normal flow of water to the sprinkler system, but at the same time as the spoon-shaped lower end of the pendulum 19 is positioned directly in the path of the current of water it will be swung to the left sufficiently by the force of the current to close the circuit through the battery and bell to cause the ringing of the latter.

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

1. A device of the class described comprising a casing adapted to be positioned in an automatic sprinkler system so that the water flowing to the sprinkler heads will pass therethrough, a pendulum pivotally-mounted in said casing with the lower end thereof disposed in the path of the current of water passing through said casing, means carried by said casing for pivotally-supporting said pendulum and a circuit breaker carried by said pendulum adapted to close an electric alarm when said pendulum is oscillated.

2. A device of the class described comprising a casing provided with inlet and outlet openings positioned in an automatic sprinkler system so disposed that water passing to the sprinkler heads will pass through said casing, said casing provided with an upwardly-extending portion, a pendulum pivotally-mounted in said portion the lower end of which is disposed in the path of the current of water passing through said casing and a circuit breaker carried by said pendulum adapted to close an electric alarm circuit when said pendulum is oscillated by the movement of water in said pipe system.

3. A device of the class described comprising a casing provided with inlet and outlet openings adapted to receive inlet and outlet pipes respectively, said casing provided with
5 an upwardly-extending portion, a pendulum pivotally-mounted in said portion the lower end of which is adapted to be disposed in the path of the water passing through said casing and a circuit breaker carried by said
10 pendulum adapted to close an electric alarm circuit when said pendulum is oscillated by the water passing through said casing.

4. A device of the class described comprising a casing provided with inlet and outlet
15 openings adapted to receive inlet and outlet pipes respectively, said casing provided with an upwardly-extending portion, said upwardly-extending portion provided with a member for closing the upper end thereof
20 and further provided with a horizontal diaphragm having a transverse slot therein, a pair of bearings mounted in said diaphragm on opposite sides of said slot, a pendulum mounted in said slot provided with later-
25 ally-extending arms arranged to be seated in said bearings, the lower end of said pendulum disposed in the path of the water passing through said casing and a circuit breaker adapted to close an electric alarm
30 circuit when said pendulum is oscillated by the movement of water through said casing.

5. A device of the class described comprising a casing provided with inlet and outlet openings adapted to receive inlet and
35 outlet pipes, respectively, said casing provided with an upwardly-extending portion provided with a horizontally-extending diaphragm having a transversely-extending slot therein, bearings in said diaphragm, a pen-
40 dulum positioned in said slot provided with laterally-extending members mounted in said bearings, the lower end of said pendulum disposed in the path of the water passing through said casing and a circuit breaker
45 mounted on said pendulum adapted to close an electric alarm circuit when said pendulum is oscillated by the water passing through said casing.

6. A device of the class described comprising a casing provided with inlet and outlet
50 openings adapted to receive inlet and outlet pipes respectively, said casing provided with an upwardly-extending portion, said upwardly-extending portion provided with a horizontal diaphragm having a transverse
55 slot therein, a pair of bearings supported by said diaphragm on opposite sides of said slot, said bearings each provided with alined notches constituting seats, a pendulum positioned in said slot having laterally-extending
60 arms arranged to be mounted in said seats, the lower end of said pendulum disposed in the path of water passing through

said casing and a circuit breaker mounted on said pendulum adapted to close an electric alarm circuit when said pendulum is
65 oscillated.

7. A device of the class described comprising a casing provided with inlet and outlet
70 openings adapted to receive inlet and outlet pipes respectively, said casing provided with an upwardly-extending portion, said upwardly-extending portion provided with a horizontal diaphragm having a transverse slot therein, a pair of bearings supported
75 by said diaphragm on opposite sides of said slot, said bearings each provided with alined notches constituting seats, a pendulum positioned in said slot having laterally-extending arms arranged to be mounted in said
80 seats, the lower end of said pendulum provided with a spoon-shaped portion disposed in the path of water passing through said casing and a circuit breaker mounted on said pendulum adapted to close an electric alarm
85 circuit when said pendulum is oscillated.

8. A device of the class described comprising a casing adapted to be interposed in the pipe line of an automatic sprinkler system to permit water passing to the sprinkler heads
90 to pass therethrough, a pendulum pivotally-mounted in said casing with one end thereof disposed in the path of water passing through said casing to be oscillated thereby, a pair of fingers connected together
95 mounted on said pendulum, a pair of mercury cups positioned in said casing each adapted to receive one of said fingers and contact therewith when said pendulum is oscillated and an electric alarm circuit connecting
100 with said mercury cups.

9. A device of the class described comprising a casing adapted to be interposed in the pipe line of an automatic sprinkler system to permit water passing to the sprinkler
105 heads to pass therethrough, a pendulum pivotally-mounted in said casing with one end thereof disposed in the path of water passing through said casing to be oscillated thereby, a pair of cups positioned on the
110 interior of said casing, each containing a mercury, an electric alarm circuit connected with the mercury in each of said cups and a pair of contact fingers connected together and mounted on said pendulum adapted to
115 contact with said mercury and close said circuit when said pendulum is oscillated by the water passing through said casing.

In testimony whereof I have hereunto set my hand in presence of two subscribing
120 witnesses.

MATTHEW GILMORE YOUNG.

Witnesses:

GLENARA FOX,
A. E. KLING.