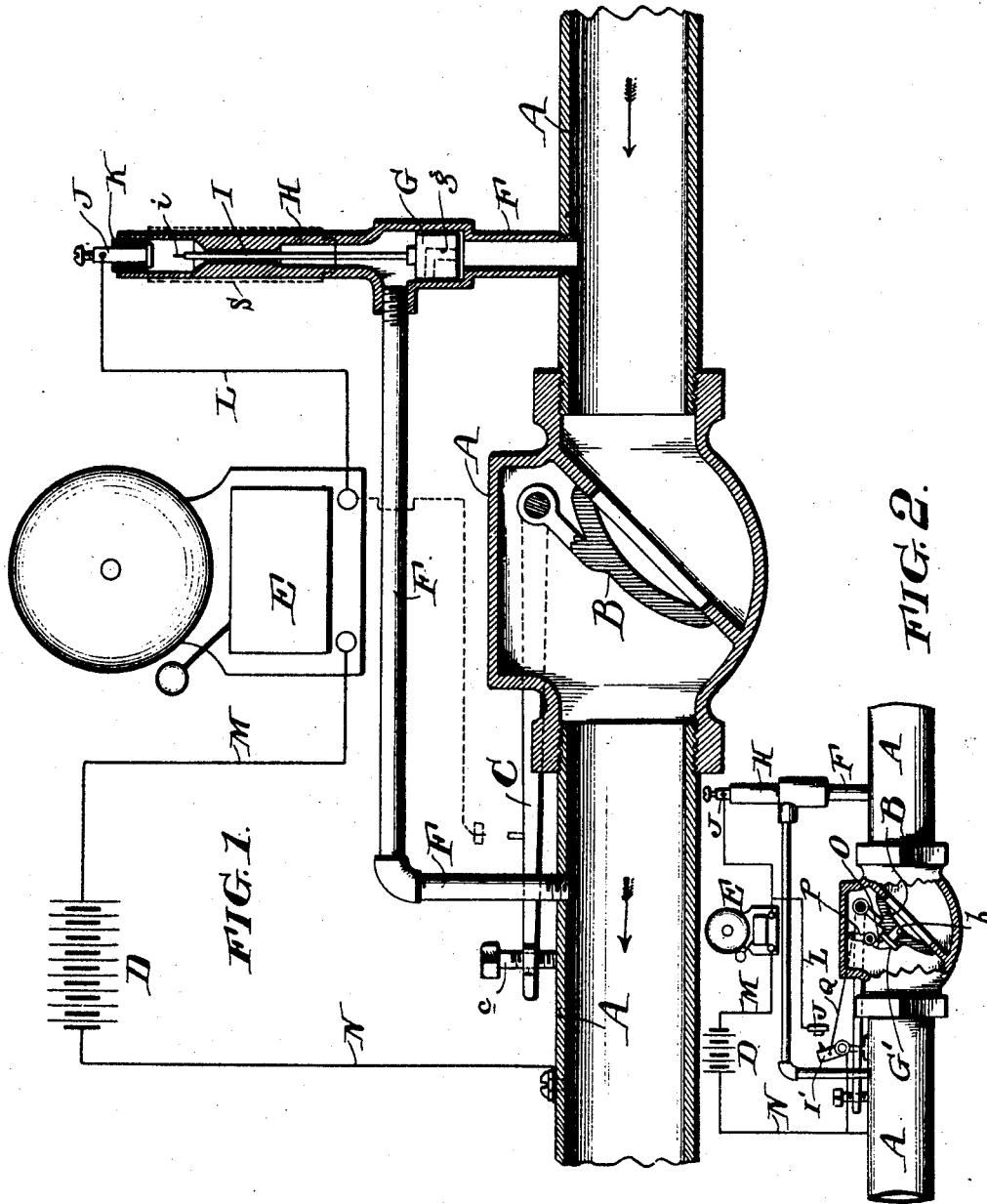


(No Model.)

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AUTOMATIC ALARM DEVICE.

No. 490,684.

Patented Jan. 31, 1893.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE W. SCHILLING AND JOHN G. HASLAM, OF PHILADELPHIA,
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AUTOMATIC ALARM DEVICE.

SPECIFICATION forming part of Letters Patent No. 490,684, dated January 31, 1893.

Application filed June 18, 1892. Serial No. 437,176. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. SCHILLING and JOHN G. HASLAM, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Automatic Alarm Devices, of which the following is a specification.

Our invention relates to automatic alarm devices for pipes, and consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings which form a part thereof.

Our invention has for its object the providing of a closed pipe with automatic alarm or indicating mechanism which shall be certain and positive in its action, and cause an operation of the alarm or indicator whenever the pipe is opened.

Our apparatus is particularly adapted for use with water pipes which supply automatic sprinklers, such as are used for fire alarms in factories and large buildings, where, upon the presence of a fire, the sprinklers are unsealed by the heat and allow the water to issue. The relief of the pressure due to this escape of the water causes a movable part in the supply pipe to open, and it has been proposed to employ devices in connection with this movable part to complete an electrical circuit through an alarm or indicator when it is opened or moved. The amount of movement, however, that is produced in the movable part by the opening of a single sprinkler or outlet is so slight, that the proper operation of the devices to complete the electrical circuit can not be relied upon, and great care and nicety are required in adjustment.

Our invention is designed to overcome these difficulties, by employing an auxiliary device that is operated independently of the main movable part for the purpose of completing the electrical circuit, so that the alarm may be operated upon the slightest variation of the pressure due to the escape of a very small amount of water, which would not ordinarily be sufficient to move the main part enough to bring the alarm devices into operation. By this means the operation of the alarm is posi-

tive and certain whether one or more of the sprinklers or outlets be opened.

In carrying out our invention we employ in connection with the water pipe and its movable part a second movable piece of less weight than the first which is operated by any change in the pressure due to the outflow of water, and an electrical alarm circuit with suitable contacts operated by the movement of the second movable piece to complete the electrical circuit and sound the alarm.

Our invention also relates to certain novel constructions and arrangements of parts which are hereinafter more fully set forth and claimed.

We shall now more particularly describe the construction of the apparatus which we employ in carrying out our invention, referring for that purpose to the drawings:

Figure 1 is a longitudinal sectional view of a closed water pipe having our improved automatic signal devices applied thereto, and Fig. 2 is a side elevation of the same with part in section showing a modified construction of the signal devices.

A is the ordinary water supply pipe leading to the sprinklers or other means of outlet.

B is the main movable part in the water pipe and may be connected with the usual lever C on the outside of the pipe. The lever C may be weighted or adjusted by the set screw c.

D is a battery.

E is an electric bell, signal or indicator.

F is a small pipe leading around the part B and making a branch communication between the two portions of the pipe A on opposite sides of the part B.

G is a movable piece located within the inlet side of the branch pipe F.

H is an extension of the inlet portion of the branch pipe F.

I is an extension of the movable piece G extending within the extension H.

J is a contact piece within the extension H beyond the part I.

K is an air tight plug of insulating material carried by the extension H and carrying the contact piece J.

L is an electrical connection between the contact piece J and the alarm, annunciator or indicator E.

M is an electrical connection between the alarm and the battery D.

N is an electrical connection between the battery D and the pipe A.

The extension I may be provided with a contact or pin or piece adapted to make contact with the contact piece J.

Normally all the sprinklers or outlets are closed and water is present throughout the pipe A. Consequently the pressure of the water is the same on each side of the part B and the valve remains closed. If at any time however any one of the sprinklers or outlets becomes opened and the water issues therefrom, the pressure upon the outlet side of the part B is relieved and there is immediately a tendency of the water to flow from the inlet side and to open the part B. As the part B is heavier than the movable piece G, the latter is moved or lifted and the extension I or contact pin thereof is brought in contact with the piece J completing the electrical circuit from the battery D through the wire N, pipes A and F, piece G, extension I, contact J, wire L, indicator E and wire N, thus instantly sounding the alarm or operating the indicator. Thus the sounding of the alarm may be made entirely independent of the operation of the part B, and since the movable piece G may be made very light in weight it will be operated upon a very slight change of the pressure of the water, which would not be sufficient to operate the part B to any appreciable extent.

As has been heretofore stated it is not practicable to satisfactorily employ an electrical connection through the lever C and rely solely upon the movement of the part B to complete the circuit there through, in consequence of the very small movement of the part B that may be produced by the opening of any outlet from the pipe A. Extreme nicety of adjustment is required, and even then the movement would not always be sufficient to insure contact being made, and the slightest wear in any of the parts might prevent the operation of the alarm.

By employing an auxiliary movable piece that may be operated upon a slight variation of the pressure the making of the electrical contact is insured. The movable piece G may be made of aluminum so as to be as light as possible. Water is in the pipe F as well as in the main pipe A, so that any relief of the pressure therein from the outward flow is immediately felt by the movable piece G. This movable piece G may be loose in the pipe F so as to move freely and also to permit the water to flow past it when it is operated. It may however be provided with a valve passageway *g*, shown in dotted lines, to open communication through the pipe F when it is operated.

The packing K of insulating material forms

an air tight plug and prevents the passage of the water through the pipe extension II.

If the outflow of the water is sufficient the part B will be opened after the alarm has been sounded through the movement of the piece G; and the water may flow through the pipe. The amount of movement of the piece G may thus be made very slight as it is not relied upon to permit the outflow of the water, that being accomplished by the part B.

The extension II, or a section, or portion thereof, may be made of glass, as indicated in dotted lines at S in Fig. 1, to permit the contacts I and J to be inspected to ascertain whether they are in proper order.

In the modified construction shown in Fig. 2 the valve B is provided with a small orifice *b* closed by a small movable valve or piece G' which is connected by an arm O through a rock shaft and stuffing box with a small lever P on the outside of the pipe.

I' is a hinged contact piece connected with the lever P by a link Q and adapted when moved to make contact with the contact piece J'. The contacts I' and J' are connected with the battery D and bell or annunciator E through the same connections L, M, M as the contact J and the pipe A in the construction previously described.

The operation of the modified apparatus is substantially the same as that of the apparatus shown in Fig. 1. Whenever the pressure on the outlet side is relieved the part G' is opened and the movement of the lever P and link Q moves the piece I' in contact with the piece J' and completes the circuit through the bell or annunciator E.

While we prefer the minor details of construction shown we do not mean to limit ourselves to them as it is apparent that they may be modified without departing from the invention.

Having now described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In an automatic alarm device for water pipes, the combination of a normally closed pipe, an automatically movable part located in said pipe and operated by the pressure of the water, a second automatically movable piece movable independently of the first and at less pressure, an electric circuit, an alarm therein, a movable contact in the circuit, a connection between the movable contact and said second movable piece, whereby the latter may be operated independently of the main movable part to move the contact and complete the electrical circuit through the alarm, a second movable contact in the circuit and connections between the second movable contact and the main movable piece.

2. In an automatic alarm device for pipes, the combination of a main pipe, a main movable part located therein and operated automatically by the pressure in the pipe, an auxiliary movable piece independent of the first and operated automatically at lower pressure

than the first, and alarm mechanism operated by said main movable piece and auxiliary movable piece respectively.

3. In an automatic alarm device for pipes, the combination of a main pipe, a main movable part located therein and operated automatically by the pressure in the pipe, a branch pipe leading around the main movable part, an auxiliary movable piece independent of the first located in the branch pipe and operated automatically at lower pressure than the first, and alarm mechanism operated by said main movable piece and auxiliary movable piece respectively.

4. In an automatic alarm device for pipes, the combination of a main pipe, a main movable part located therein and operated automatically by the pressure in the pipe, the main pipe having a communicating passageway from one side of the main movable part to the other, a second automatically movable piece closing said passageway, and operating at a lower pressure than the main movable part, an alarm, and connections respectively between said main movable piece and the second movable piece and the alarm.

5. The combination of the battery D, the alarm E electrically connected therewith, the pipe A, the main movable part B in the pipe, the branch pipe F about the part B, the movable piece G in the branch pipe F, the contact piece I carried by the piece G, the contact piece J and electrical connections between the battery D and the piece G, and the contact J and alarm E.

6. The combination of a battery, an alarm electrically connected therewith, a main pipe, a main movable part therein, a branch pipe

around the main movable part, a movable piece in the branch pipe, an extension of the branch pipe, a contact piece carried by the movable piece in the branch pipe and arranged within the extension thereof, an electrical connection between the movable piece in the branch pipe and the battery, a second contact piece carried by the extension of the branch pipe, and an electrical connection between the second contact piece and the alarm.

7. The combination of a battery, an alarm electrically connected therewith, a main pipe, a main movable part therein, a branch pipe around the main movable part, a movable piece in the branch pipe, a hollow extension of the branch pipe, a contact piece carried by the movable piece in the branch pipe and arranged within the extension thereof, an electrical connection between the movable piece in the branch pipe and the battery, a second contact piece carried by the extension of the branch pipe and insulating air tight plug in the extension of the branch pipe carrying the second contact piece, and an electrical connection between the second contact piece and the alarm.

In testimony of which invention we have hereunto set our hands.

GEORGE W. SCHILLING.

JOHN G. HASLAM.

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