C. J. JENNE.

FIRE ALARM.

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1,240,049

Patented Sept. 11, 1917.

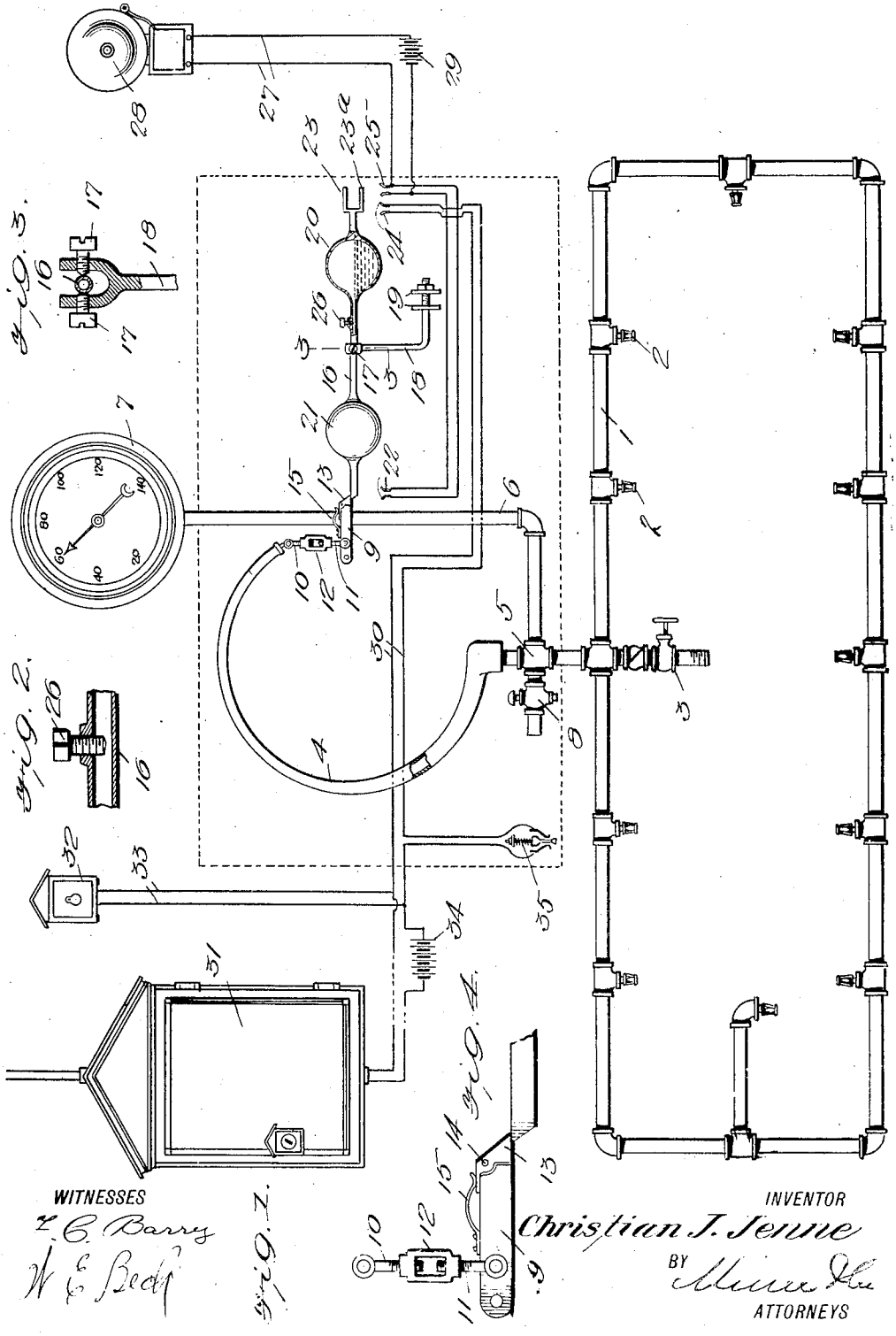


Fig. 3.

Fig. 2.

Fig. 4.

Fig. 1.

WITNESSES

E. C. Barry

W. E. Beck

INVENTOR

Christian J. Jenne

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHRISTIAN J. JENNE, OF SAN FRANCISCO, CALIFORNIA.

FIRE-ALARM.

1,240,049. Specification of Letters Patent. Patented Sept. 11, 1917.

Application filed February 9, 1917. Serial No. 147,573.

To all whom it may concern:

Be it known that I, CHRISTIAN JOHN JENNE, a citizen of the United States, and a resident of San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Fire-Alarms, of which the following is a specification.

My invention is an improvement in fire alarms, and has for its object to provide an automatic fire alarm system comprising electric and pneumatic features so combined as to enable trouble to be located without sending in an alarm that will call out the fire apparatus, and wherein means is provided whereby the subscriber's apparatus will indicate to him its condition, enabling him to either look for trouble in the apparatus or line, or to look for the fire as may be indicated by the alarm.

In the drawings:

Figure 1 is a diagrammatic view with parts in section of the improved apparatus,

Fig. 2 is an enlarged detail section of the switch arm or lever,

Fig. 3 is a section on the line 3—3 of Fig. 1, and

Fig. 4 is an enlarged detail of the trip mechanism.

The present embodiment of the invention is an improvement over my prior Patent, No. 1,168,506, granted Jan. 18, 1916, and the system comprises tubing 1 which extends through the structure to be protected, and the tubing is provided at suitable intervals with sprinkler heads 2, the said heads being adapted to open in case of fire, by fusing of a fusible plug which will permit the valve to open, and the pressure to escape from the system of tubing. The tubing is filled with air under pressure to forty or sixty pounds, and a connection 3 is provided for permitting the system to be connected with an air pump to maintain this pressure.

A Bourdon tube 4 is connected with the system by means of a cross 5, the said cross being at the large end of the Bourdon tube and connecting the same to the system. One of the lateral arms of the cross has a pipe 6 connected therewith which leads to a suitable gage 7, and a valve casing 8 is connected with the other arm.

A pawl 9 is pivoted near the small end of the tube 4, and intermediate its ends the pawl is connected to the small end of the tube by mechanism shown more particularly in Fig. 4. The said mechanism comprises rods 10 and 11 which are connected with the tube and the pawl respectively, and the said rods have their adjacent ends oppositely threaded and engaged by a double nut 12. It will be evident that by means of the nut the adjustment may be varied.

The pawl is provided with a movable section 13 at its free end, the said section being connected to the pawl by a rule joint 14, so arranged that while the section may swing downward with respect to the pawl, it cannot swing upward, and a spring 15 is provided for normally holding the parts in alinement. It will be noted that the hollow lever or switch arm 16 is pivoted intermediate its ends adjacent to the pawl by means of set screws 17 which are threaded through the arms of a fork at the upper end of one arm of an angle bracket 18, into engagement with the opposite sides of the lever. The other arm of the angle bracket is mounted in such manner that the entire bracket and the lever may be moved toward and from the pawl, the said mounting being indicated at 19.

The lever is provided near each end with a spherical enlargement 20 and 21 respectively, the enlargement 21 being adjacent to the pawl. That end of the lever adjacent to the pawl is designed to engage with a pair of spring contacts 22, while at the opposite end the lever is forked, the arms 23 and 23ª of the fork being designed to contact with spring contacts 24 and 25 respectively, under conditions to be later described. The cylindrical enlargements contain mercury, as shown, which may flow from one to the other when the lever is tilted. Means is provided for restricting the flow, the said means being in the form of a valve 26 which is threaded through the lever and by means of which the bore of the lever may be closed or partially closed when desired.

The contacts 22 and 25 are interposed in the same circuit, the said circuit consisting of lead wires 27, in which is interposed an alarm 28 and a source 29 of electrical energy. The contacts 24 are interposed in a circuit consisting of lead wires 30 which lead to the fire alarm telegraph station, indicated at 31. An auxiliary box 32 is branched onto the circuit as indicated at 33, and a battery indicated at 34, is interposed in the said

circuit. The lever, Bourdon tube and contact mechanism are arranged within a case, which is indicated in dotted lines, and an electrical cut-out indicated at 35 is provided in connection with the casing cover, so arranged that the cut-out will shunt across street fire alarm box wires when the case is open, to prevent false alarms being sent in during the testing and adjusting of the device.

In operation, should a leak occur, the decrease in pressure in the Bourdon tube will cause the same to become more curved and the pawl will be swung downwardly tipping the adjacent end of the lever downward. This movement will be slow and the mercury will have to run from the enlargement or reservoir 20 to the enlargement or reservoir 21, and will overbalance that end of the lever which is adjacent to the Bourdon tube until the lever will eventually engage the contacts 22, completing the circuit through the local alarm. The lever 16 is normally balanced to swing downward at the end remote from the Bourdon tube, and the pawl 9 holds the lever against this tendency to swing. As soon as the local circuit is closed, the alarm 28, a bell in the present instance, will be actuated, informing the subscriber that there is a leak, the alarm, however, will be local and for the subscriber only.

Should one of the sprinkler heads open in case of fire, in the same manner as the ordinary sprinkler head, the pressure in the tubing will be quickly released, and the quick contraction of the Bourdon tube will swing the adjacent end of the lever downward quickly and the pawl will pass the end of the lever, thus releasing the lever, and the heavy end of the lever will reverse this swinging movement of the lever and will cause the end adjacent to the enlargement 20 to swing downward, and the contacts 23 and 23^a will close the circuits 27 and 30 thus turning in the alarm, and in addition turning in a local alarm. The action of the Bourdon tube when there is a sudden decrease in the pressure, will be so quick and the lever will be released so quickly, that there will not be time for the mercury to run into the enlargement 21 to overbalance the normally heavy end of the tube.

The rule joint connection between the pawl and the movable section permits the lever to pass downward past the pawl, and it will be noticed that the adjacent end of the lever and the movable section of the pawl are beveled to facilitate its movement.

I claim:

1. A fire alarm system comprising a tube extending throughout the structure to be protected and having fusible plugs carried thereby, and adapted to be supplied with air above atmospheric pressure, a Bourdon tube connecting with the system, a local alarm and a central station, an electric circuit for the local alarm and an electric circuit for the central station, a hollow switch lever pivoted intermediate its ends adjacent to the blind end of the Bourdon tube, the lever being balanced to swing downwardly at the end remote from the Bourdon tube, and having at the same end a pair of contact lugs and at the other a single contact lug, each of the circuits having terminals for engagement by the pair of lugs when they swing downward to simultaneously close the said circuits, and the local circuit having terminals for engagement by the single lug when the said lever swings downward to close the local circuit, a pawl engaging above the last named end of the lever and normally holding the lever balanced, a connection between the pawl and the blind end of the Bourdon tube for moving said pawl downward to tip the lever when the pressure in the Bourdon tube is slowly lessened, and to tip and release the lever when the pressure in the tube is suddenly lessened, said lever containing a heavy fluent material adapted to run into the light end when the lever is slowly tipped to overbalance the heavy end, and means for varying the flow of the said material.

2. A fire alarm system comprising a tube extending throughout the structure to be protected and having fusible plugs carried thereby, and adapted to be supplied with air above atmospheric pressure, a Bourdon tube connecting with the system, a local alarm and a central station, an electric circuit for the local alarm and an electric circuit for the central station, a switch lever pivoted intermediate its ends adjacent to the blind end of the Bourdon tube, said lever having at each end a contact lug, said lever being balanced to swing downward at the end remote from the Bourdon tube, means controlled by the Bourdon tube for holding the lever balanced when the Bourdon tube is expanded under pressure, and for tipping the adjacent end of the lever downward when the pressure is gradually released, and for tipping and releasing the lever when the pressure is suddenly released, the local circuit having terminals for engagement by the said adjacent end of the lever for closing the same, and the central station circuit having terminals for engagement by the other lug.

CHRISTIAN J. JENNE.

Witnesses.
C. A. BOWLAND,
C. R. YEARSLEY.