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GAS DETECTOR ALARM AND VALVE ACTUATING MEANS

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FIG. 1.

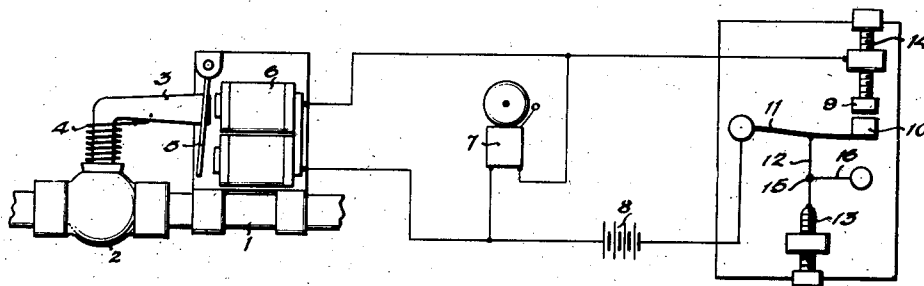
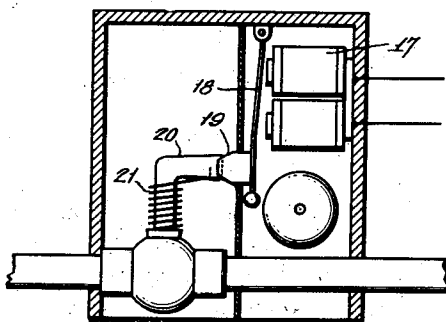


FIG. 2.



WITNESSES

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GAS-DETECTOR ALARM AND VALVE-ACTUATING MEANS.

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This invention relates to a simple and efficient apparatus whereby the escape of gas from a system will so affect the apparatus as to cause a valve controlling the supply of gas to be shut off.

Another object concerns the provision of means whereby the closing of the valve can be effected from any one of a number of points throughout the system.

A further object concerns the provision of means whereby the mere presence of gas in ever so small quantities in the vicinity of the detector will cause it to be actuated.

The invention is illustrated in the drawings, of which—

Figure 1 is a diagrammatic view of the apparatus and the circuits involved; and

Figure 2 is a modified form of part of the invention.

In view of the fact that so many accidents occur through the leakage of gas in houses and buildings, it is highly desirable to provide an apparatus which will detect the presence of unburned gas, especially illuminating gas, and instantly operate to cut off the supply. Oftentimes a circulation of air through a room will blow out a dim gas flame unknown to the persons in the house, or the gas pressure may vary sufficiently to cause the extinguishment of the flame without giving any notice of its action so that proper persons can turn off the supply. For these reasons it is very important that a detector device capable of being sensibly affected by the mere presence of unburned gas be established at one or more places throughout the system so that whenever a leak occurs in any part of the system the main supply will preferably be cut off.

To this end I have provided an electrical circuit which is normally open. The circuit is open at a switch, preferably a resilient member, which is held open by a fusible connection, the resiliency of the switch when released normally tending to move it to its closed position, immediately upon which the circuit, through an electromagnetic device and a signal such as a bell, is closed. The electromagnetic device operates an element which releases the gas valve, which is then closed by a spring action.

In order to cause the fusing of the link holding the circuit switch normally open, I have provided a substance which will become warm or sufficiently heated by the mere presence of unburned gas to heat the

fusible connection sufficiently to cause it to break. This action however takes place without the generation of sufficient heat to achieve an incandescent state. This state is not desired because the gas must not be ignited. This substance referred to is preferably platinum sponge.

In Figure 1 there is disposed a gas pipe, part of a system, in which a valve casing 2 is disposed having a valve handle 3 engaged by a spring 4 tending normally to move the valve to its closed position. This valve is preferably held in its open position by the engagement with the handle 3 of a detent bar 5. This bar acts as an armature for an electric magnet 6 and is moved to such a position when said magnet is energized as to remove it from the path of engagement with the handle 3. This electromagnet is in circuit with a bell 7, a battery 8 and switch members 9 and 10. The switch member 9 can be adjusted, and the switch member 10 is mounted preferably on a resilient arm 11 which is held in such a position by a fusible flexible link 12 as to keep the member 10 out of contact with the member 9. The other end of the fusible element 12 is engaged with an adjustable member 13 so that the degree of separation between the switch elements or members can be adjusted. Likewise the switch element 9 is mounted on an adjustable member 14. Adjacent an intermediate point of the fusible element 12 is a detector element 15 which is suitably mounted on a support 16 of any type. This detector element 15 may be directly in contact with the fusible element 12 as shown in Figure 1 or may be merely in close proximity thereto. However, the element 15 is of such material as will become heated by the mere presence of gas, and heated to such an extent that the, preferably, very fine fusible element or filament 12 will break and permit the switch element 10 to spring into contact with the switch element 9, whereby the circuit through the electromagnet 6 and the bell or signal 7 is closed, causing the actuation of both of these members. As soon as the bell is operated, a signal is given; and as soon as the electromagnet 6 is operated, the armature or detent 5 is withdrawn from engagement with the handle 3 of the valve, which is moved to its closed position immediately by the action of spring 4.

Figure 2 shows a magnet 17 in which the

bell clapper 18 is provided with a projection 19 acting as a detent in the path of the valve lever 20, and when the magnet is energized the clapper rings a bell and removes the projection 19 from the valve lever so that the spring 21 will close the valve. In this modification, therefore, the clapper performs the function of a bell ringing device and a valve releasing device at the same time.

It will be observed that this device is inexpensive, simple in its construction and operation and is capable of being actuated immediately upon the escape of sufficient gas to actuate the detector. The operation of the detector and its relation to the fusible element can be so designed that the valve will be closed almost immediately upon the escape of any gas whatsoever.

What I claim is:—

A gas detector and alarm device, which includes a gas valve, spring means engaging with a portion of said valve tending to move it to closed position, detent means normally lying in the path of a portion of said valve to hold it in an open position, an electromagnet adapted when energized to move the detent means out of the path of the operation of said valve, a circuit connected to said electromagnet, said alarm device being in said circuit, current producing means in said circuit, a switch in said circuit, a fusible member adapted to hold said switch open, said gas detector disposed in proximity to said fusible member and affected by the presence of unburned gas to generate sufficient heat to fuse said member, said switch adapted to close when released by the fusing of said member.

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