June 9, 1959 P. W. SMITH 2,889,798

FIRE DETECTION AND ALARM SYSTEMS

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Fig. 3.

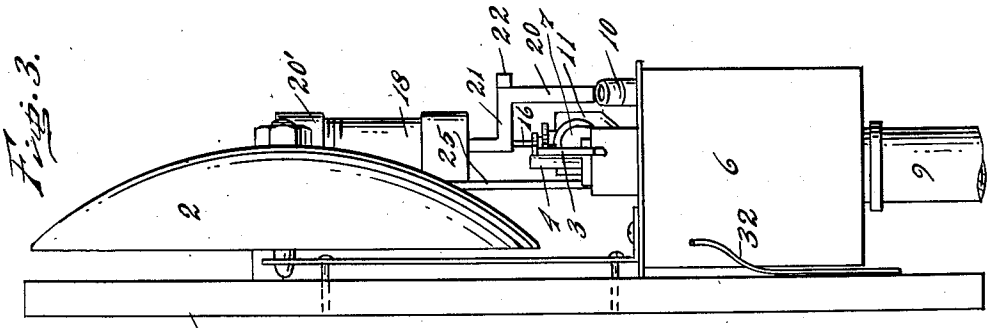


Fig. 2.

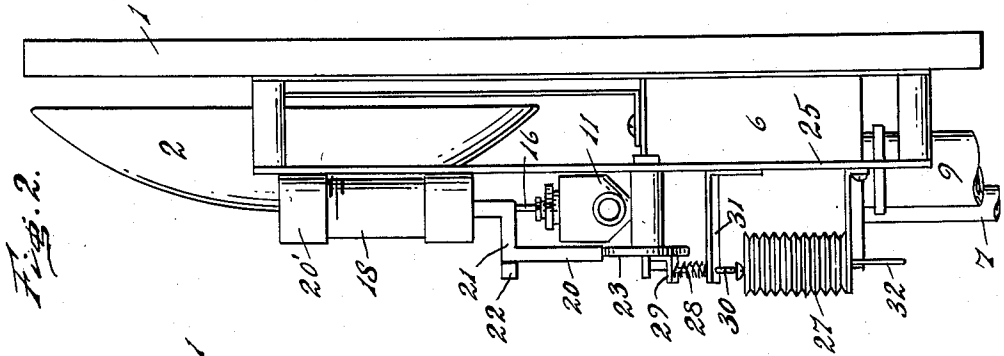
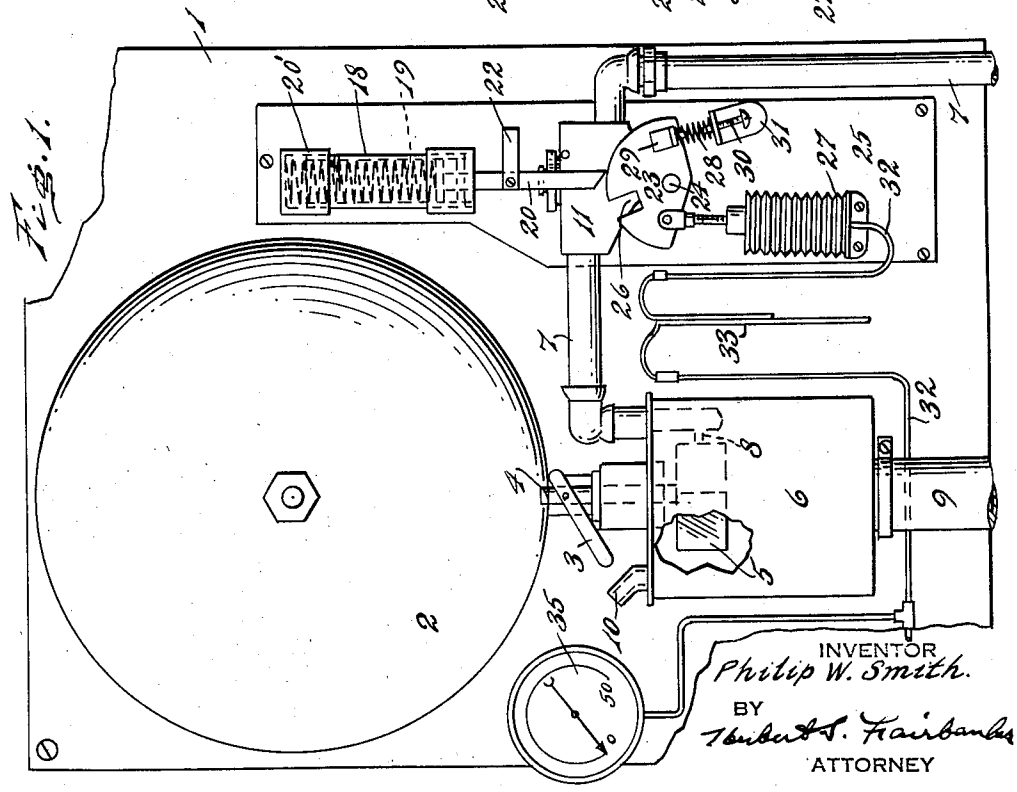


Fig. 1.



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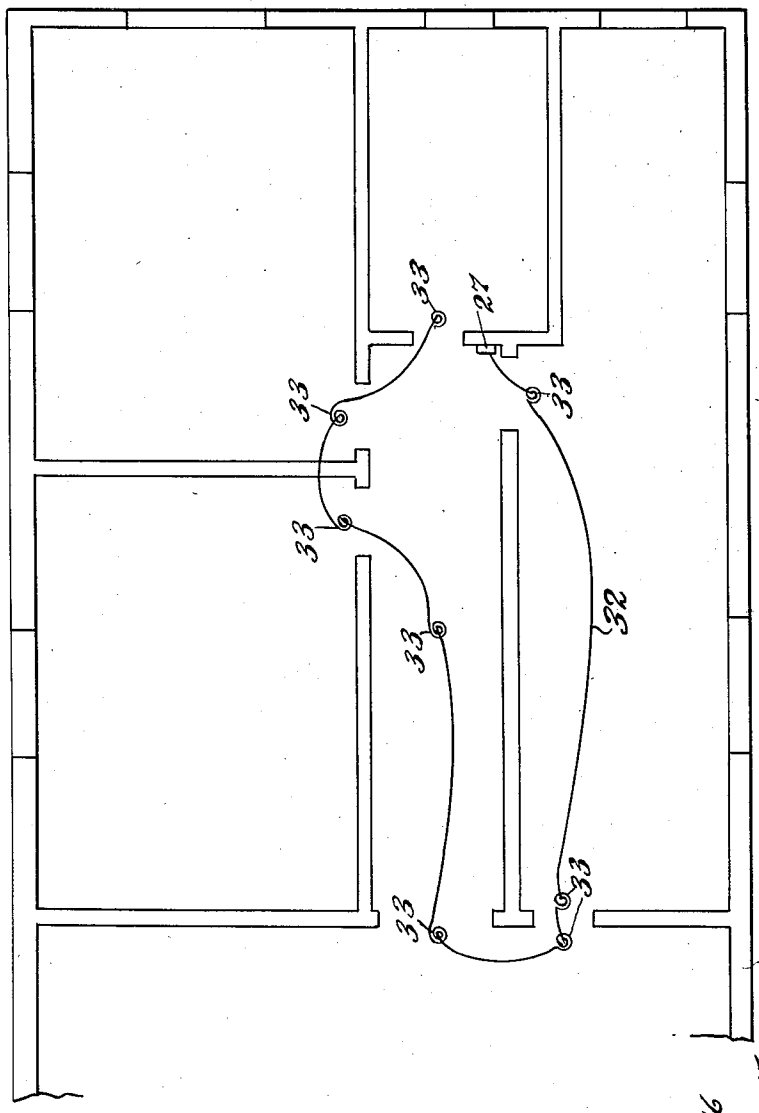


Fig. 4.

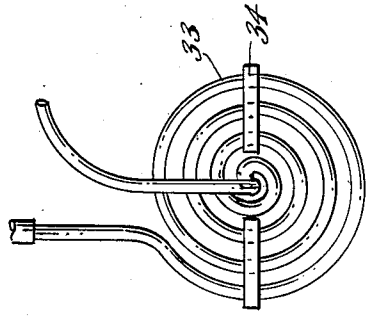


Fig. 5.

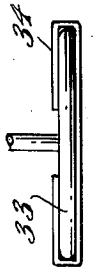


Fig. 6.

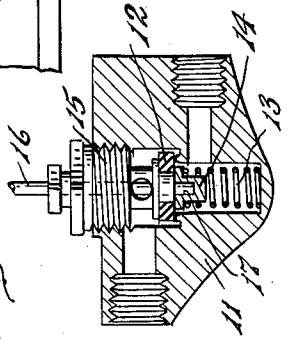


Fig. 7.

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FIRE DETECTION AND ALARM SYSTEMS

Philip W. Smith, Philadelphia, Pa.

Application March 7, 1958, Serial No. 719,962

3 Claims. (Cl. 116—103)

The object of this invention is to devise a novel fire detection and alarm system for the protection of lives and property in homes, shops and commercial establishments which will eliminate maintainance costs and which is not dependent on electrical wiring or an electrical source of power.

A further object of the invention is to devise a fire detection and alarm system which will be automatically controlled by the force against which protection is desired.

A further object of the invention is to devise a novel alarm or signal, novel water powered actuating means for said alarm or signal, novel triggering mechanism and novel heat detecting means for automatically controlling said triggering means.

With the foregoing and other objects in view as will hereinafter clearly appear, my invention comprehends novel fire detecting and alarm systems.

It further comprehends a novel fire alarm, a novel water powered motor for actuating said fire alarm, novel trigger mechanism controlling said motor, novel heat detecting means for controlling said trigger mechanism, and a novel construction and arrangement of the component parts of the system.

For the purpose of illustrating the invention, I have shown in the accompanying drawings a preferred embodiment of it which I have found, in practice, to give satisfactory and reliable results. It is, however, to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited, except by the scope of the appended claims, to the exact arrangement and organization of these instrumentalities as herein set forth.

Figure 1 is a front elevation of a fire detection and alarm system, embodying my invention.

Figure 2 is a side elevation, viewed from the right hand side of Figure 1.

Figure 3 is a side elevation, viewed from the left hand side of Figure 1.

Figure 4 is a schematic view of a building showing locations of heat detectors and tubing of the heat detecting system.

Figure 5 is a face view of one of the heat detecting units.

Figure 6 is a side elevation of Figure 5.

Figure 7 is a sectional view of a valve controlled by the trigger mechanism and controlling the motor.

Similar numerals of reference indicate corresponding parts.

Referring to the drawings.

The alarm unit

A panel **1** has a bell **2** mounted on it, and the striking power for sound is provided by a bell clapper **3** pivotally mounted near one end on a shaft **4** of a water powered motor **5**. The motor **5** is mounted in a housing **6** into which water under pressure is introduced through an inlet pipe **7** leading from a source of water supply and

having a jet **8** through which water is projected against the blades of the motor to revolve the motor. The motor housing **6** has a discharge pipe **9** and an air vent **10**.

The passage of water under pressure to the jet **8** is controlled by a valve mechanism **11** having an inlet and an outlet with a valve seat **12**. A spring **13** normally maintains a valve **14** against said seat and the seat is mounted on a threaded plug **15** secured in the body portion of the valve mechanism. The plug is apertured to communicate with the outlet of the valve mechanism. A valve plunger **16** is longitudinally movable in the plug and extends into a recess **17** in the valve **14**.

The trigger mechanism

A spring housing **18** contains a spring **19** which contacts a trigger **20** tending to move the trigger downwardly. The trigger bears against the upper end of the valve plunger **16** and is offset as at **21** and is provided with a handle **22** to provide for the manual resetting of the trigger. The tension of the spring can be adjusted by a cap **20'** threaded on the spring housing **18**. The trigger **20** rides on the periphery of a trigger control member in the form of a plate **23** pivotally mounted at its lower end as at **24** on a sub-panel **25** connected with the panel **1**. The trigger plate **23** has a slot **26** opening through its upper end and into which the trigger can extend when the slot registers with the trigger.

A bellows **27** has one end connected with the trigger plate at one side of the pivot of the plate, the bellows being mounted on the sub-panel **25**. A counter spring **28** bears at one end against a bracket **29** on the trigger plate at the opposite side of the pivotal point of the trigger plate, and at its opposite end the spring bears against an adjusting screw **30** on a bracket **31** fixed on the sub-panel **25**.

The heat detecting system

The bellows **27** forms a part of the heat detecting system and is in series with tubing **32** having heat detecting units located therein as at **33**. These heat detecting units **33** are formed of helically wound tubing having straps **34** to maintain formation. The heat detecting units are installed at ceiling heights in rooms, closets or areas to be protected and in the path of possible drafts such as over doors, stairwells etc. The system is filled with ether at 2 pounds pressure at room temperature, 70–80° F., and then hermetically sealed.

The counter pressure spring **28** and its adjusting screw allow for adjustable trip-off points of pressure from the heat detecting system. Trip-off settings may be obtained from 120° F. to 170° F., the average setting being 140° F.

The operation is as follows:

When heat is applied to any heat detecting unit or to any six lineal feet of tubing, pressure is built up within the system to cause the bellows **27** to expand and impart a clockwise movement to the trigger plate **23** until the slot **26** registers with the trigger **20** whereupon the spring **19** will move the trigger downwardly and the plunger **16** will open the valve. Water under pressure will pass to the motor **5** to revolve it. As the motor attains speed, the bell clapper **3** will swing into position to strike the bell.

The trigger is reset by moving the handle **22** upwardly.

A pressure gauge **35** connected in the tubing indicates that the hermetic seal of the heat detection system is maintained, and can also be used for testing purposes.

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

1. A fire and alarm system, comprising a heat detecting device including an enclosure containing a heat expandable gas, a trigger mechanism operatively connected to said detecting device, a fluid head conduit, a motor in

said conduit, an alarm operated by said motor and a valve in said conduit operatively associated with said trigger mechanism whereby when said trigger mechanism is actuated in response to rise in temperature of said enclosure said valve will be operated to operate said motor and control said alarm.

2. A fire and alarm system, comprising a heat detecting device including an enclosure containing a heat expandable gas, a trigger mechanism operatively connected to said detecting device and including a pivotally supported trigger plate having a slot opening through its periphery, a spring pressed trigger riding on the periphery of said trigger plate and movable into said slot when in alignment with such slot, a fluid head conduit, a motor in said conduit, an alarm actuated by said motor, and a valve in said conduit having a stem in the path of said trigger, whereby when said trigger mechanism is actuated in response to rise in temperature of said enclosure said valve will be operated to operate said motor and control said alarm.

3. A fire and alarm system, comprising a heat detecting device including an enclosure containing a heat expandable gas, a trigger mechanism operatively connected to said detecting device, a fluid head conduit, a motor in said conduit having a rotor, a rotor shaft and a bell clapper pivotally connected at one end to said shaft, an alarm having a bell in the path of said bell clapper to be actuated thereby, and a valve in said conduit operatively connected with said trigger mechanism whereby when said trigger mechanism is actuated in response to rise in temperature of said enclosure said valve will be operated to operate said motor and control said alarm.

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