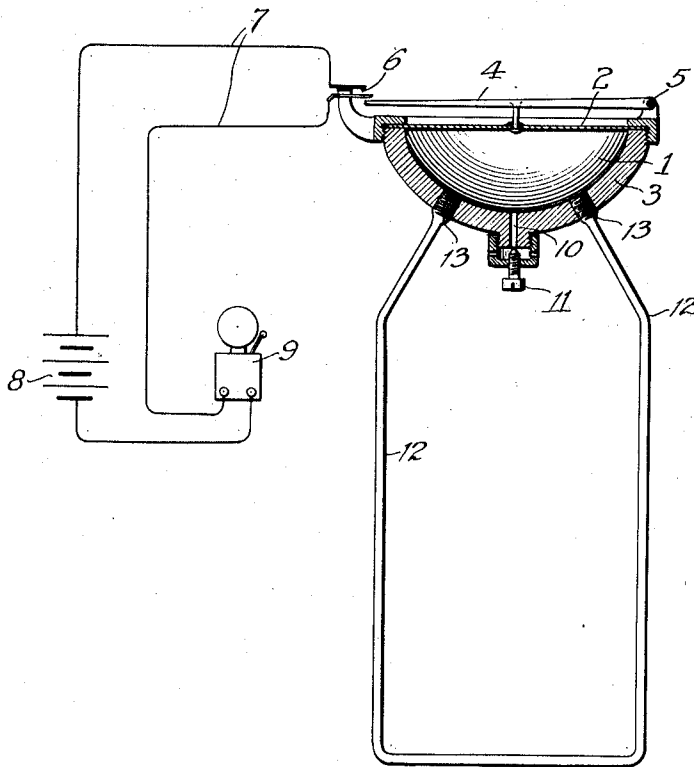


No. 884,047.

PATENTED APR. 7, 1908.

J. E. SHEPHERD.
AUTOMATIC ALARM SYSTEM.
APPLICATION FILED JAN. 13, 1908.



Witnesses
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UNITED STATES PATENT OFFICE.

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AUTOMATIC ALARM SYSTEM.

No. 884,047.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed January 13, 1908. Serial No. 410,639.

To all whom it may concern:

Be it known that I, JOHN E. SHEPHERD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Alarm Systems, of which the following is a specification.

My invention relates to improvements in automatic alarm systems and devices adapted to supervise the heat conditions in an area to be protected, and to respond by the initiation of an alarm to sudden rises in temperature.

More particularly my invention relates to protective systems of the character generally described wherein the heat responsive element is a slender pipe of metal or other highly heat-conductive material, containing air, and arranged in conjunction with a pressure indicator or responsive device, in such manner that rapid expansion of air within the piping system due to sudden heating will result in a pressure in the responsive device, which is utilized to indicate an alarm, while gradual changes of pressure do not affect the device.

The objects of my present invention are to provide a system of the character above described in which the heat responsive piping system will be safeguarded against being disabled by the collapse or closure of the pipe at any point in its length, and in which the sensitiveness of the responsive arrangement is enhanced by the provision of a double path from every point in the piping system to the responsive device.

In the embodiment of my invention shown in a single figure of the drawing; 1 indicates in general a pressure responsive device, preferably of any approved character, which is sensitive to comparatively small variations in pressure, preferably comprising a diaphragm 2 as the moving pressure responsive element, such diaphragm being conveniently arranged to close one side of a casing 3 which with the diaphragm 2 forms what I may call a pressure chamber. By such arrangement the diaphragm is adapted to bulge out if the pressure be increased in the pressure chamber and there is arranged in connection with the diaphragm a lever 4, preferably pivoted as at 5 at one side of the casing, and having its free extremity associated with means for causing or initiating an alarm, such as the electric contact spring 6

standing normally open and adapted to be closed by the lever 4 as the diaphragm bulges outward, the spring 6 being incorporated as part of an electric circuit 7, which includes the source of current supply 8 and alarm or signaling means 9, illustrated as an electric bell.

For the normal maintenance of atmospheric pressure within the pressure chamber 1 and the piping connected therewith I provide an adjustable vent, there being in the casing 3 a vent passage 10, with which is associated a regulating screw 11, so that the effective area of the vent may be diminished to any desired fineness.

Considering the device as heretofore described in a broad aspect as a pressure responsive or indicating device, an alarm device associated therewith and a regulable vent for normally maintaining atmospheric conditions within the indicator and its connections, the parts heretofore described are old, and have been shown in combination with a piping system of small diameter extending throughout an area to be protected, for the detection of sudden rises in heat in any part of the protected area. As heretofore provided, however, such piping system, essentially has been open at one end only to the pressure responsive device and closed at its other end. Such arrangement is not advantageous in various respects, as the closure or stoppage of the pipe by accident or otherwise, as by the crushing of the pipe in such manner as to close its central bore or passage, cuts off from communication with the indicating device the entire length of piping beyond the point of closure. Furthermore in such systems where pressure is to be communicated from the extreme closed end of the pipe a noticeable loss inevitably occurs due to the internal resistance of the piping system. To eliminate these disadvantages, rendering the system more sensitive and preventing disabling of the system by closure of the detector pipe at any point in its extent, I provide a detector pipe 12 arranged in loop-form, and having each end 13—13 open, and in communication with the pressure chamber 1. By this arrangement I provide two paths of pressure application from any point in the detector pipe, thus lessening the internal resistance of the pipe to a great extent, thereby rendering the system more sensitive in the matter of heat detection, and also

obviating the possibility of disabling any part of the protector by the mere closure of the pipe at any point.

5 Other and further advantages of the system as described will readily occur to those skilled in the art and need not be dwelt upon.

10 It will be apparent that in the operation of the system described slow and gradual changes in temperature result in slow exclusion or entraining of air from or into the circulation system including the detector pipe and pressure chamber, the vent, properly adjusted, permitting of suitable egress or ingress of air. If, however, a sudden rise of
15 temperature takes place within the confines of the area supervised by the detector piping 12 the application of such heat to the detector piping causes a relatively sudden increase in pressure therein which is communicated through both legs of the detector piping
20 to the pressure chamber, producing an increase in pressure in such chamber, which is greater in extent than the vent is capable

of relieving instantly so that the diaphragm 2 is caused to bulge outward, moving the lever 25 4, and closing the contact spring 6, completing the electric circuit 7 and initiating the activity of the alarm device 9.

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

In a system of the character described, a pressure responsive means, signaling means controlled by the pressure responsive means, and detector piping of relatively small diameter extending throughout the area to be
35 protected, and at both ends connected with the pressure responsive means for the purposes described.

In testimony whereof I hereunto set my hand in the presence of two witnesses. 40

JOHN E. SHEPHERD.

In the presence of—
FORÉE BAIN,
MARY F. ALLEN.