No. 672,266.

Patented Apr. 16, 1901.

F. GARDNER.

ELECTRIC FIRE ALARM SYSTEM.

(Application filed July 28, 1900.)

(No Model.)

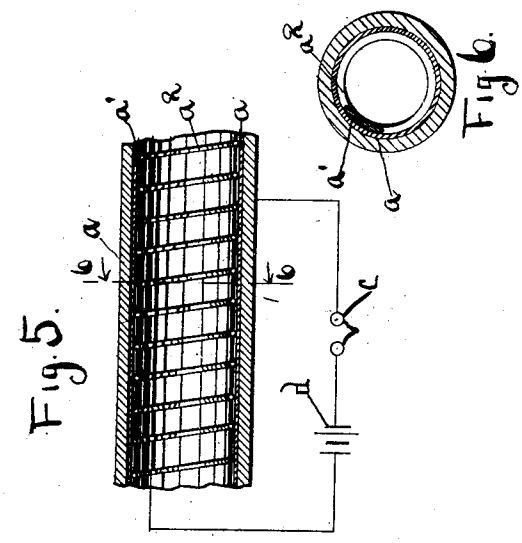


Fig. 5.

Fig. 6.

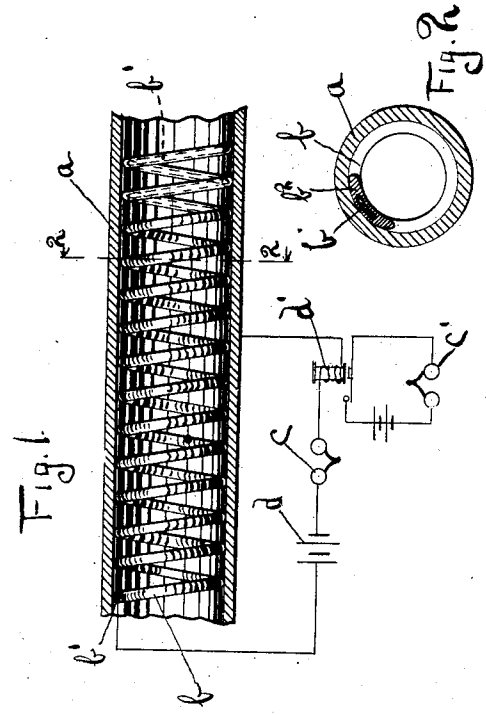


Fig. 1.

Fig. 2.

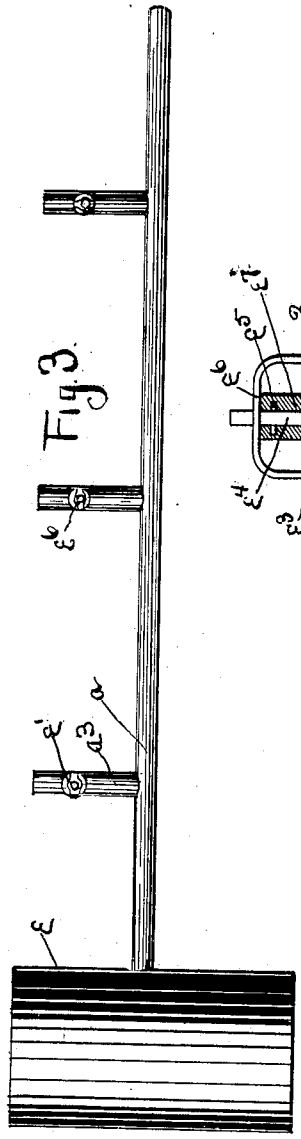


Fig. 3.

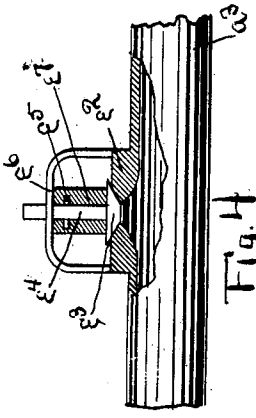


Fig. 4.

WITNESSES:

Henry W. Belfield

Will J. Bell

INVENTOR

Fulton Gardner

BY

Jones & Addington

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FULTON GARDNER, OF CHICAGO, ILLINOIS.

ELECTRIC FIRE-ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 672,266, dated April 16, 1901.

Application filed July 28, 1900. Serial No. 25,085. (No model.)

To all whom it may concern:

Be it known that I, FULTON GARDNER, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electrical Fire-Alarm Systems, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improvement in electrical fire-alarm systems, my object being to provide means for automatically sounding an alarm. Sprinkling fire-alarm systems adapted to be automatically actuated by the heat from a fire to throw a fire-extinguishing fluid, liquid or gaseous, on the flame to extinguish the same are well known in the art. In these systems a series of pipes connected with a reservoir containing the fluid are extended throughout the building to be protected, and valves are provided at intervals adapted to be opened when the temperature in the vicinity thereof rises above a prearranged amount to thereby permit the escape of the fluid to extinguish the flames. These systems, while responding to a flame in the immediate vicinity of the valve, are often slow to operate where the fire starts at some point between the location of the valves, thus permitting the fire to gain some considerable headway before the system operates.

The object of the present invention is to provide an alarm system adapted to be associated with an extinguishing system of the above-mentioned class, whereby an increase of temperature at any point along the system will serve to actuate an alarm.

In the preferred form of my invention I insert in the fluid-conducting pipes a contact device in the form of a coiled wire or spring, which is normally insulated from the metallic fluid-pipe by means of an interposed body of paraffin or other insulating material adapted to melt at a prearranged temperature. When the pipe at any point is subjected to an abnormal temperature, the interposed body of fusible material is melted, permitting the spring to make contact with the metallic pipe, and thereby close a signaling-circuit to give an alarm.

I have illustrated my invention by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section of the device of my invention. Fig. 2 is a cross-sectional view on the lines 2 2, Fig. 1. Fig. 3 is a view of a system to which my invention is adapted to be applied. Fig. 4 is a view of the valve employed. Fig. 5 is a view of a modification of my invention; and Fig. 6 is a cross-sectional view on the lines 6 6, Fig. 5.

Like letters refer to like parts in the different figures.

It has been customary in securing protection against fires in factories and other buildings to provide a system of pipes a, connected with a reservoir and filled with some fire-extinguishing fluid under pressure. The pipes a have upright extensions a^3 at intervals, each of which is provided with a valve e'. These valves e' may be of any form and are shown as consisting of a valve-seat e^2 and a stopper e^3, fitting therein. The stopper e^3 has a stem e^4, which passes through a hole in the bracket e^6 and is guided thereby. The movement of the valve-stem is further controlled by the pin e^5, which strikes against the bracket e^6 and limits the upward movement of the stem. A block of paraffin or like fusible material e^7 is fitted about the guide e^4 and under the bracket e^6 and normally holds the stopper e^3 in position. In case of a fire the flames reaching the valves e' will melt the paraffin-blocks e^7 and allow the valves to open, thus permitting the fluid in the pipes a^3 to escape and put out the fire. The result will happen, however, only in case the flames reach the valves, and in case of the fire starting at a point between two valves it might gain considerable headway before the fluid would be discharged from the valves. In order to obviate this objection, I provide means in connection with the system to give an alarm of a fire which starts at any point in the system. To accomplish this result, I provide a special coil b, which is placed on the inside of the pipes a. This coil is composed of a metallic wire b', dipped in paraffin or like material to form the coating b^2 of insulating material, and the wire is twisted before placing it in the pipe, so that the wire has a tendency to expand and come in contact with the interior of the pipe a.

The pipe a is connected with one side of the circuit which goes through the battery d and the bell or other signal c, and the wire b' is connected to the other side of this circuit. In this circuit may be introduced a relay d', so that when a current is sent through the watchman's signal c a current will also be sent through the signal c' at the fire-engine house or other station.

The operation of my invention is as follows: A fire starting in the neighborhood of the pipe a will soon cause this pipe to become heated and the paraffin surrounding the wire to melt. The wire b' will then expand and, coming in contact with the pipe a, will close the circuit through c, thus giving an alarm. I have found that a coil thus formed and coated has a creeping effect when the paraffin is melted, and the turns of the wire are thus caused to scrape along the wall of the pipe, thereby cleaning the surface to make a good electrical contact.

In Figs. 5 and 6 I have shown a modification of my invention in which the paraffin instead of surrounding the wire is formed in a thin layer a' on the inside of the pipe a and the wire a^2 is left uncovered. The melting of the thin layer of paraffin at any point permits the wire to make contact with the wall of the pipe to close the circuit.

Having described my invention, what I claim as new, and desire to have covered by Letters Patent, is—

1. The combination with the piping of a fire-extinguishing system, of a signal-circuit, a coil of wire contained in said piping and connected with one side of the signal-circuit and normally insulated from the opposite side of the circuit, and adapted when heated to close said signal-circuit, and a suitable conducting part forming said opposite side of the circuit, substantially as described.

2. The combination, with the piping of a fire-extinguishing system, of a coil of wire contained therein, a layer of paraffin or similar fusible insulating material normally insulating said wire from said pipes, and a signaling-circuit, one side of which is connected to said wire, and the other side to said piping, substantially as described.

3. The combination, with the piping of a fire-extinguishing system, of a coil of wire contained therein, and coated with paraffin, or other fusible insulating material, and a signaling-circuit connected to said piping and said coil, substantially as described.

4. In a fire-extinguishing system the combination, with a metallic pipe adapted to carry a fire-extinguishing fluid, of a coil of wire contained in said pipe, and a layer of paraffin, or other fusible material, insulating said wire from said pipe, substantially as described.

5. In a fire-extinguishing system the combination, with a metallic pipe, of a coil of wire contained therein, and coated with paraffin, or other fusible insulating material, substantially as described.

6. The combination with the piping of a fire-extinguishing system, of heat-responsive valves situated at intervals therein, an electrical signal-circuit, and means situated within said piping for closing said electrical signal-circuit when the piping is heated above a prearranged temperature, whereby the presence of a fire between the position of two adjacent valves will insure the giving of a signal, substantially as described.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

FULTON GARDNER.

Witnesses:
W. CLYDE JONES,
HENRY W. BELFELD.