July 18, 1944. A. J. GARDENHOUR 2,354,111

FIRE DETECTOR

Filed Dec. 1, 1942

Fig. 1.

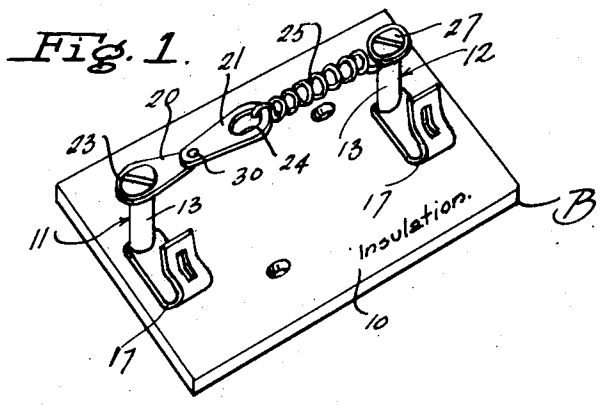


Fig. 2.

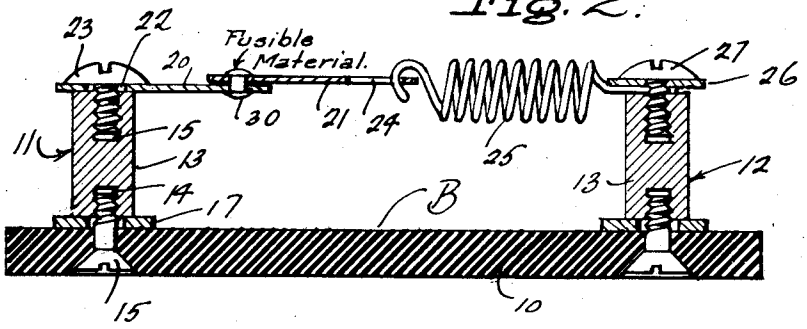
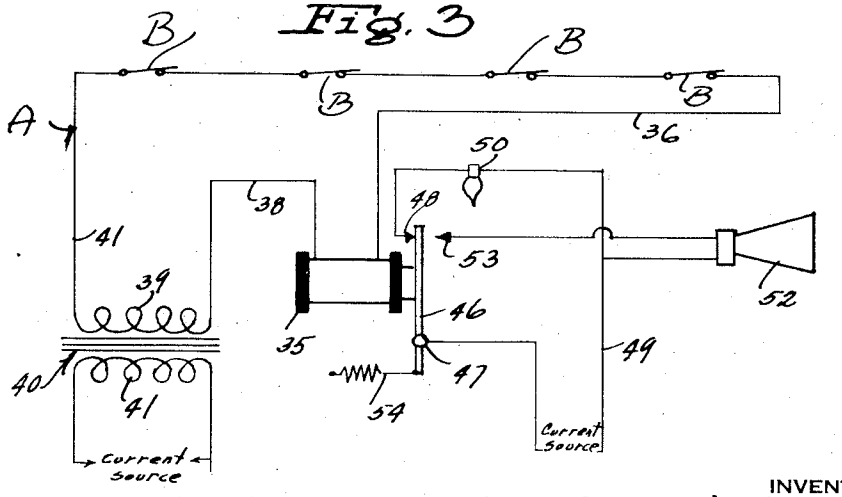


Fig. 3



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FIRE DETECTOR

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4 Claims. (Cl. 200—142)

This invention relates to improvements in fire alarm systems and apparatus.

The primary object of this invention is the provision of a relatively economically constructed fire alarm system which is foolproof and which will eliminate the necessity of providing watchmen and expensive sprinkler systems.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts thruout the several views,

Figure 1 is a perspective view of a normally closed switch unit associated as part of the fire alarm apparatus.

Figure 2 is a longitudinal cross sectional view taken thru the unit of Figure 1, and showing the details of construction thereof.

Figure 3 is a diagrammatic representation of a circuit in which the unit of Figure 1 is used.

In the drawing, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may generally designate the improved fire alarm system which may include a plurality of the units B.

The units B, which may appropriately be termed fire detectors, are adapted to be mounted upon the ceiling or walls of the building to be equipped with the fire alarm system, preferably one to eight square feet of the wall section. They are arranged in series and constitute a closed switch in a normally closed circuit to be subsequently described.

Each unit B preferably consists of a flat base 10, of some approved insulation material, preferably synthetic resin, upon which detachable binding post constructions 11 and 12 are mounted at the ends thereof. Each of these binding post constructions preferably consists of a post body 13 having lower and upper axially disposed screw threaded openings 14 and 15 therein. Each lower screw threaded opening 14 is adapted to receive the screw threaded shank of a countersunk head screw 15 by means of which the post body is positioned upon the base 10 normal to the top surface thereof. These post bodies 13 are preferably of brass or some other approved metal, and between the lower ends thereof and the insulation base 10, they detachably clamp metal terminals 17 upon the base. These terminals 17 are of the jaw type for clamping of an end of a wire therein, and of course they extend laterally of the post bodies 13, preferably in right angled relation with respect to a line drawn between the two ports 11 and 12.

Two stamped sheet metal links or members 20 and 21 are provided; the former having an opening 22 in the larger end thereof adapted to receive the shank of a cap screw 23 by means of which the link can be clamped upon the post body 13 of the binding post 11 in the manner shown in Figure 1 of the drawing. The other link 21 is provided with an opening 24 at its larger end adapted to receive one end of a coil spring 25. The other end of the coil spring 25 is adapted to be clamped upon the top of the binding post body 13 by means of a flat washer 26 and a cap screw 27. The screws 23 and 27, of course, are screw threaded axially into the binding post bodies 13.

The links 20 and 21 are flat and taper from their remote ends in reduced relation towards their proximate ends where they are apertured and adapted to receive a pin, rivet or connection 30 of fusible material, such as solder.

In the position shown in Figures 1 and 2, the coil spring 25 is under tension so that when abnormal temperatures are created in the vicinity of the fusible rivet 30, the same will melt and the spring, of course, will separate the links 20 and 21 for breaking the normally closed circuit in which the units B are placed. Of course fusible material may be placed between the proximate ends of the links 20 and 21, if so desired.

Referring to the wiring arrangement of the system A, as before mentioned, the units B are placed in series, as shown in Figure 3. A magnetic relay 35 is employed. It has a wire 36 leading off from its winding connected to one end of the series of units B; the other end of the winding being connected by wire 38 to low voltage secondary 39 of a transformer 40. The wire 41 leading from this secondary 39 is connected to the other end of the series of units B. The source of current is established on the primary winding 41 of the transformer 40, and of course the current is completed thru the secondary winding 39; the closed units B, and the relay 35. The latter is thus energized and attracts an armature 46 which is normally pivoted at 47. In this position the armature 46 engages a contact 48 of a wiring circuit 49 wherein is employed a pilot light 50. This circuit 49 of course includes the armature 46 as a part thereof and the source of current is indicated in Figure 3.

An alarm 52, which may be in the nature of a siren, has one of its contacts in the circuit 49 and its other terminal ending in a contact 53

normally spaced from the armature **46**. A spring **54** normally urges the armature **46** so that when the relay **35** is deenergized, the armature **46** will engage the contact **53** and close the circuit thru the siren or alarm **52**.

It will be apparent from the foregoing, that the low voltage power supply is constant in the secondary winding of the transformer, and the circuit thru the units B is normally closed. Upon abnormal elevation of temperatures the solder or fusible alloy of the units B will melt and break the circuit. This releases the armature and sounds the alarm.

While I have shown the fire detector system as operated from an outside source of supply, such as 110 volts A. C., it is possible to utilize an internal battery source of supply which is so arranged as to work relay an alarm either from a battery unit or direct current.

Various changes in the arrangement of the system, and in the shape, size and arrangement of parts thereof may be made to the form of invention without departing from the spirit of the same or the scope of the claims.

I claim:

1. In a fusible switch unit for fire alarm systems the combination of a flat insulation base, a pair of upstanding detachable binding posts mounted upon said base in spaced relation, terminal clips connected by said binding posts directly upon the top of said base, a pair of links, fusible material connecting proximate ends of said links, means connecting one of said links in direct contact with the upper end of one of the binding posts, and means placing said links under tension and connecting the remote end of the other link to the other binding post in non-contacting relation therewith.

2. In a normally closed fusible switch unit for fire alarm systems the combination of an insulation base having a pair of relatively spaced openings therein, a pair of binding post bodies having screw threaded openings in the lower ends thereof and screw threaded openings in the upper ends thereof, screws detachable from the bottom of said base extending thru the openings in said base and into the screw threaded openings at the lower ends of said posts for detachably connecting the said posts in right angled upstanding relation upon said base, laterally extending electric wire attaching spring terminals clamped upon the top of said base by the lower ends of said posts as an incident of attachment of the posts by said screws to said base, a pair of elongated connecting links, a fusible alloy connecting the extreme proximate ends of said links, one of said links being disposed over and in contact with one of the binding posts, a screw detachably connecting said link to the top of said binding post, a coil spring, a screw connecting one end of said coil spring upon the top of the other binding post, the opposite end of said coil spring being connected with the other link and being under tension to normally move said links apart upon melting of the fusible material connecting said links.

3. In a normally closed fusible switch unit for fire alarm systems the combination of an insulation base, a pair of binding posts mounted upon said base and extending upwardly normal thereto, a sheet metal link rigidly and detachably mounted in direct contact with one of said binding posts, a metal spring connected in electrical contact with the other binding post having a horizontally disposed coil, a sheet metal link connected with the opposite end of said spring, and fusible material connecting the proximate ends of said links so as to maintain said horizontally disposed coil spring under tension.

4. In a normally closed fusible switch unit for fire alarm systems, the combination of an insulation base, a pair of metal binding posts mounted in upstanding normal position upon the top of said base, a pair of elongated flat sheet metal links each having openings in each of the ends thereof, a screw inserted thru one end opening of one of said links and threaded in the top of one of said binding posts and clamping said link in laterally extending relation upon the said binding post parallel with the plane thereof parallel with the top surface of said base, a fusible rivet-like member in the other opening of said link and thru one of the openings of the other link for connecting said links, a horizontally positioned tensioned coil spring having one end connected to the other of said binding posts and its other end inserted in the other opening of the second mentioned link for holding said links under tension, the said mounting of the second link also positioning it with the plane thereof parallel with the top surface of said base.

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