F. HERBECK.

FIRE ALARM.

APPLICATION FILED APR. 7, 1913.

1,108,753. Patented Aug. 25, 1914.

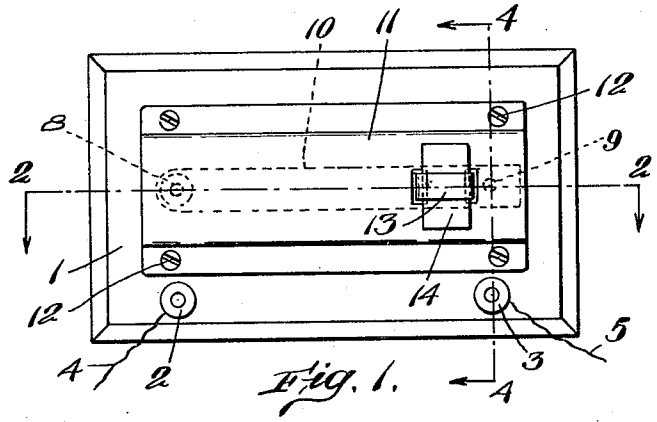


Fig. 1.

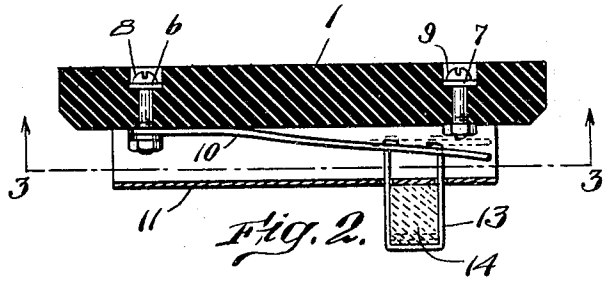


Fig. 2.

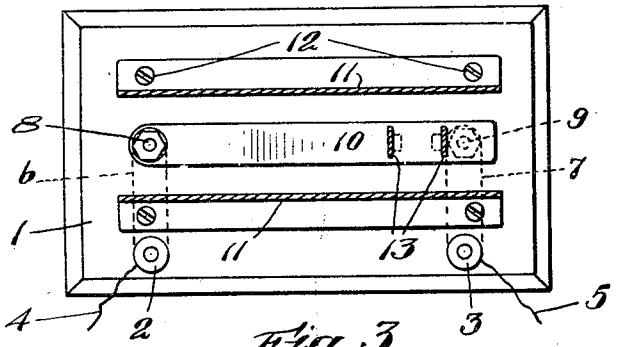


Fig. 3.

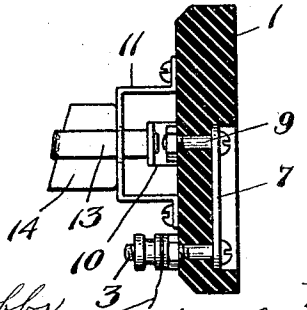


Fig. 4.

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UNITED STATES PATENT OFFICE.

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FIRE-ALARM.

1,108,753. Specification of Letters Patent. Patented Aug. 25, 1914.

Application filed April 7, 1913. Serial No. 759,320.

To all whom it may concern:

Be it known that I, FRANK HERBECK, a citizen of the United States, residing at Athol, county of Worcester, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Fire-Alarms, of which the following is a specification.

This invention relates to thermal controlling devices and particularly to a thermal circuit closer for a fire alarm. Of the several types of such devices my invention pertains to that class in which contact is usually made by the melting of some substance. This class of devices has been favored on account of its simplicity and cheapness but has been open to considerable objection on account of the time required to melt the fusible element. In my invention I have avoided this difficulty by constructing my apparatus in such a way that a complete fusing is not necessary. In fact my invention depends more upon the change of the co-efficient of friction due to the heat rather than to any more general fusing of the substance. In brief, I secure the results desired by employing a wedge shaped plug having a bearing surface which at normal temperatures offers a high co-efficient of friction, while at higher temperatures has a lower co-efficient of friction.

The construction and principle of my invention will be more fully disclosed in the specification which follows, and as illustrative of the same I have shown in the annexed drawings an embodiment which I have found well adapted for the purposes intended.

Throughout the specification and drawings like characters of reference are employed to indicate corresponding parts, and in these drawings:

Figure 1 is a plan view of an alarm device in accordance with my invention. Fig. 2 is a longitudinal, central section on the line 2—2 of Fig. 1, illustrating in dotted lines the movement of the contact finger to circuit closing position. Fig. 3 is a longitudinal section on the line 3—3 of Fig. 2, and Fig. 4 is a transverse section on the line 4—4 of Fig. 1.

The alarm device thus illustrated comprises a base 1 which is preferably a block of some non-conducting material such as hard rubber or porcelain. I have indicated at 2 and 3 binding posts mounted on said base block and connected by the lead wires 4 and 5 to an audible signal (not shown), such as an electric gong. These binding posts carry contact strips 6 and 7 fastened to the under face of said block 1 by the contact screws 8 and 9 which may be countersunk in the base 1.

Mounted on the upper face of the block 1 and held in place by the contact screw 8 is a spring contact finger 10 extending longitudinally of the block and inclosed in a housing 11 fastened to said block by the screws 12. The free end of said strip 10 is normally held above and out of contact with the screw 9 by a bail shaped metal strip 13 fastened to said contact strip 10 and projecting upwardly through the housing. This bail shaped strip is normally held in such raised position by a wedge shaped plug 14 of some fusible material resting on the top wall of the housing and forced under the bail by a relative transverse movement thereacross.

At normal temperatures the bearing surface of the plug has a relatively high co-efficient of friction. This frictional engagement reduces the liability of the plug being accidentally displaced to a minimum. But as the increasing temperature approaches the fusing point of the plug its bearing surface is gradually softened, thus reducing its co-efficient of friction. This permits the plug to be dislodged by the gradual slipping down due to its wedge shape. While the plug is slipping down, the contact finger 10 is gradually being lowered and is exerting a strong tendency to eject the plug from the retaining bail due to the spring of the metal of said contact finger. The plug will therefore be immediately ejected from the holder without the necessity of having it entirely melted. This releases said holder and permits the spring contact 10 to descend and make contact with the screw 9, thereby closing the circuit in which the annunciating devices are wired up.

I find that wax properly compounded to soften at the desired temperature makes a very satisfactory material for a plug.

In use, a house or other building to be protected is equipped with a number of these devices, each device being connected in circuit with any annunciator which will

sound an audible or display a visual signal, preferably the former, when the contact finger is released by the melting down of the fusible plug and closes the circuit. The use of the wedge shaped plug of fusible material gives to my device great promptness and certainty of action. This plug, by reason of its shape, will begin to slip as soon as it softens and will therefore be immediately ejected from the holder without necessitating its being melted entirely. This insures the announcement of the fire substantially as soon as it starts.

Various modifications in the construction and form of my device, coming within its spirit and scope may obviously be resorted to all within the limits of the appended claims.

What I, therefore, claim and desire to secure by Letters Patent is:

1. In a device of the class described a normally open annunciator circuit, a circuit closer normally disposed in non-circuit closing relation thereto, a retaining member for said circuit closer, a bearing member, a thermal control element ejectably held by said retaining member against said bearing member with a bearing which has a relatively high coefficient of friction under normal temperatures effective to hold said element against displacement and which bearing has a relatively lower coefficient of friction under abnormal rises in temperature effective to permit said element to be ejected from the retaining member and the circuit closer to move to circuit closing position and actuate the annunciator.

2. In a device of the class described, an annunciator circuit, a normally open circuit closer, a supporting member having a bearing surface, a thermal element having a bearing on the bearing surface of the support and spaced from said circuit closer by said support, a retaining member for said circuit closer ejectably holding said thermal element against said support with a bearing which has a relatively high coefficient of friction under normal temperatures and a relatively lower coefficient of friction under abnormal temperatures, said element being normally effective to maintain said circuit closer in open position while held by said retaining member and being ejected from said retaining member by the lowering of its coefficient of friction to permit the circuit closer to move to circuit closing position and actuate the annunciator.

3. A device of the class described comprising a contact normally held in open circuit with an annunciator and effective when released to close said circuit and actuate said annunciator, a holding device connected with said contact, and a fusible plug frictionally engaged with said holding device and effective to hold said contact in non-circuit closing position under normal temperatures by its frictional engagement with said holder and adapted to release said contact to permit it to close the circuit when its frictional engagement with the holder is reduced by the softening of its bearing surface under an increase in temperature.

4. A device of the class described comprising a spring contact normally held in open circuit with an annunciator and effective when released to close said circuit and to actuate the annunciator, and means normally effective to hold said contact in open circuit including a member spaced from said contact, a member connected to said contact, and a wedge shaped fusible plug normally finding bearing between said members under ordinary temperatures but displaceable by the softening of its bearing surface under an increase in temperature so as to be ejected from its engagement with said members under the spring action of the contact to permit said contact to close the circuit.

5. A device of the class described comprising an insulated base, terminals mounted thereon in electrical circuit with an annunciator, a contact operatively associated with said terminals, a housing for said contact, a bail shaped holding device fastened to said contact, and a fusible element wedged beneath said bail and normally effective to hold said contact in non-circuit closing position by its frictional engagement with the bail, and adapted to release said bail when softened under a rise in temperature to permit said contact to descend to close the circuit.

6. A device of the class described comprising an insulated base, binding posts mounted thereon, contact strips carried by said posts, contact screws fastening said strips to the base, a contact finger held by one of said screws to said base and having its free end normally held above and out of contact with the other of said screws, a bail shaped retaining member fastened to said contact near its free end, and a wedge shaped fusible plug adapted to be inserted under said retaining member and normally effective to hold said member and thus the contact finger out of circuit closing position and adapted when softened by a rise in temperature to be ejected from said retaining member and permit it and thus the contact to descend and close the circuit.

7. In a device of the class described, an annunciator circuit, a circuit closer, a thermal element having a relatively high coefficient of friction under normal temperatures and a relatively lower co-efficient of friction under abnormal temperatures and effectively disposed relative to said closer

to maintain said circuit closer in open position under normal temperatures, and a holder for said element coöperating with said circuit closer to eject said element from its effective relation with said circuit closer upon a lowering of the co-efficient of friction of said element.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK HERBECK.

Witnesses:
GEORGE F. LORD,
JOSEPH A. DUNBAR.