

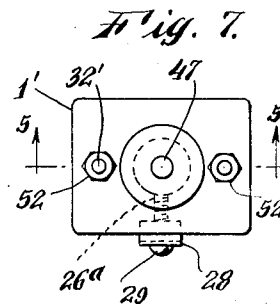
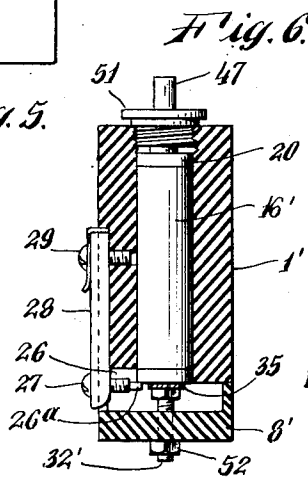
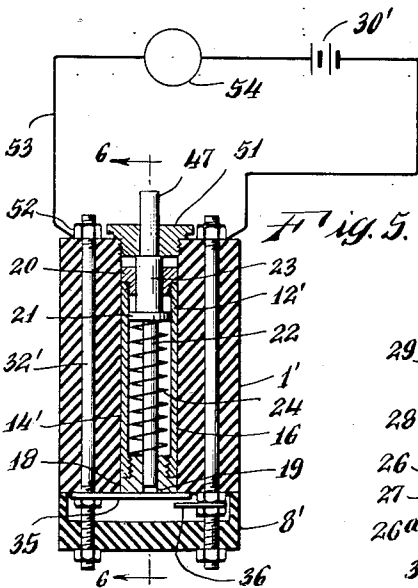
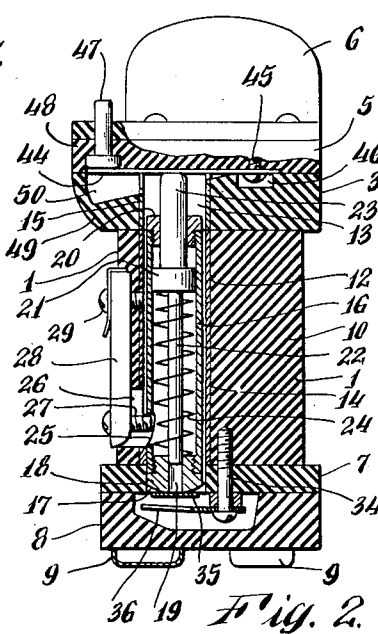
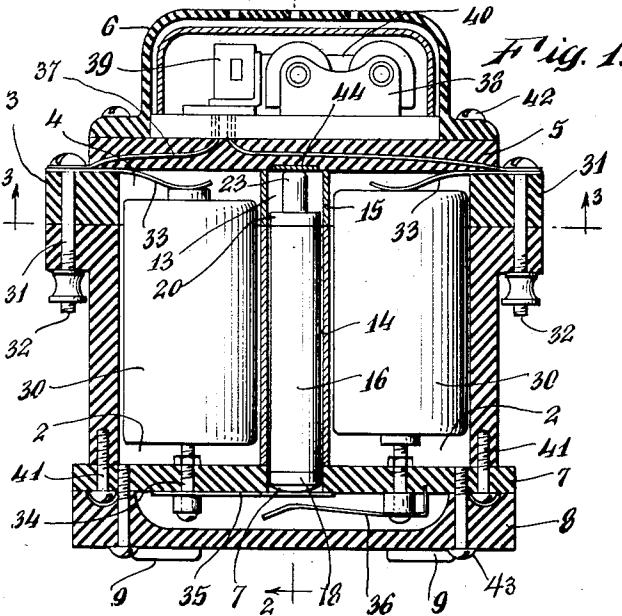
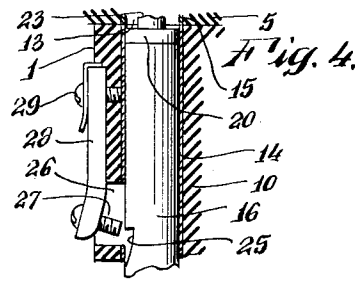
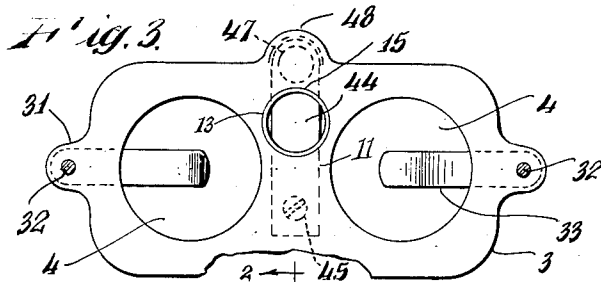
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ALARM SWITCH

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ALARM SWITCH

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4 Claims. (Cl. 200—138)

1

This invention is an improvement in alarm actuating devices, especially devices of the kind mentioned, adapted to be energized upon a rise in temperature caused by the outbreak of a fire nearby or some other cause capable of having the same effect.

An important object of the invention is to provide a compact and simple unit enclosing members for controlling the parts which emit the signal under the influence of predetermined conditions. In its practical form it embraces a casing which is designed to contain all of said members and the alarm producing parts also; or, if preferred, only the controlling members; the alarm-emitting parts being disposed at other points. Thus the unit can be set up wherever conditions requiring an alarm are likely to occur, and the parts for indicating said conditions can be located wherever it is desirable to have them.

A further object is to provide an alarm-actuating device that is of small size, can be made at low cost, and fully relied upon to emit the warning when needed.

Another object is to provide an alarm-actuating device which can be tested in all forms, independently of the controlling members which automatically respond to an emergency. Thus the operative condition of the device can be easily and frequently checked.

The nature and advantages of the invention are made clear in the following description, taken in connection with the drawings that disclose one or more forms in which the invention may be used. But this specification is explanatory only and changes may be made without departure from the general plan which distinguishes the improvement.

On the drawings,

Figure 1 is a vertical transverse sectional view of an alarm device according to this invention.

Figure 2 is a vertical section on line 2—2 of Figure 1.

Figure 3 is a plan view of the parts of the device above the line 3—3 of Figure 1, viewed from below.

Figure 4 is a view of a detail.

Figure 5 is a view similar to Figure 1 of a modification.

Figure 6 is a section on line 5—5 of Figure 5; and

Figure 7 is a top view of the device shown in Figures 5 and 6.

The working parts of the unit are enclosed in a casing having the breadth, height and thickness indicated by Figures 1 and 2, and the trans-

2

verse shape illustrated on Figure 3. The body of the casing is indicated by the numeral 1. It has a pair of chambers 2, arranged side by side and extending entirely through its length. Made fast at one end, which is at the top in practice, is a section 3, which has two openings 4, each in line and registering with one of the chambers 2. The section 3 is covered by a plate 5 which supports a cover or cap 6, that contains the alarm member, such as a bell or buzzer. The lower part of the body 1 is closed by a plate 7 covering the chambers 2; and secured to the plate 7 is a bottom cap 8. This cap has knobs or feet 9 so that the device can stand on any supporting surface.

In the body 1 between the chambers 2 is a solid part or partition 10, which, when the device is assembled, lines up with a similar part or partition 11 between the apertures 4 in the section 3. These parts 10 and 11 are hollow, containing cylindrical bores 12 and 13 respectively, in alignment with each other; and in these bores respectively are metal sleeves or linings 14 and 15. Movable mounted within the sleeves 14 and 15 is a hollow plunger 16, the lower extremity of which normally occupies an opening 17 in the plate 7. The plunger or member 16 is made up of a piece of tubing which is closed at its lower end by a screwed-in nut 18, having a central perforation 19; and at its upper end, which normally projects into the section 3, by a similar perforated nut 20. Within the tubular member 16 is a piston 21, from one end of which projects a stem 22, having its end in the perforation 19 of the nut 18; and on the other face of the piston 21 is a stud 23 that projects through the perforated nut 20 into the chamber 13 in the section 3. Between the piston 21 and the nut 18 is a spiral spring, surrounding the stem 22. Pressure on the stud 23 can force the stem 22 to project below the nut 18.

The member 16 is longer inside, between the nuts 18 and 20, than the combined lengths of the piston 21 and stem 22; and, with the stem just entering the perforation 19 in the nut 18, the piston 21 will be a short space from the nut 20, and the upper end of the stud 23 will then be adjacent the top plate 5. To retain the parts named in these relative positions, the tubular element 16 has an opening 25 just above the nut 18, and the front of the body 1 has an adjacent opening 26. Into these openings projects a screw 27, mounted on a thermally responsive element 28, affixed to the outside of the casing by a screw or other fastening means 29.

Within each chamber 2 is an electric battery

30. These batteries also extend into the apertures 4 of the section 3; and the body 1 and section 3 have matched projections 31, with registering apertures to receive bolts and fastening nuts 32 to secure the body and the section together. These bolts also secure in place under their heads on the tops of the projections 31 of the section 3 a pair of elastic contact springs 33, each of which engages a pole of one of the batteries 30. These batteries are of the usual cellular type used in flashlights, with a metallic outer casing and a bar of metal therein projecting therefrom at one end. The plate 7 carries terminal posts 34; and the batteries are so arranged that one of these posts makes contact with the shell of one battery and the other post engages the central pole of the remaining battery. On the bottom face of the plate 7, one post 34 secures a leaf spring contact 35, which extends over the aperture under the plunger 16; and the other post supports a similar contact spring 36 the end of which is beneath the aperture 17 and normally out of contact with the element 35.

At the upper end the plate 5 has conductors 37 embedded therein, with the ends exposed and projecting so that, when the conductor is in place, these ends will engage the conductor elements 33. The opposite ends of the conductors 37 project out of the upper face of the plate 5 and into the cap 6. This cap contains an electromagnet 38, a fixed terminal 39 and a vibrating armature 40. This member is of the usual construction, with the windings of the magnet, the armature and the terminal 38 in circuit with the conductors 37. The two batteries are in series and when the alarm is energized the magnet causes the armature 40 to vibrate and the buzzing sound attracts attention; or, if desired, a bell may be mounted adjacent the end of the armature 40 to ring the bell.

A rise in temperature due to a fire or some other sufficient cause will produce a bending of the element 28 as depicted in Figure 4, and then the plunger in the casing is released by the retraction of the projection 27. The spring 24 then expands from the piston 21 against the lower nut 18, forcing the plunger 16 to project from the hole 17 and depress the element 35 till it makes contact with the element 36. The circuit is now established and the bell or buzzer at once is made audible.

The body and the other parts of the casing are secured to one another by screws shown at 41, 42 and 43, in addition to the fastening means 32.

On the inner or lower face, the plate 5 bears a leaf spring 44, held in place by a screw 45 in a recess 46. The spring lies in a groove and is flush with the under face of the plate. It is centrally located with one end at the back of the plate 5, and its forward end is covered and lies in a bulging projection 48 at the front of the plate 5. Above this spring the projection contains a depressible stud or button that extends out of the top of the plate 5 and the adjacent rim of the cap 6. The section 3 has a projection 49 under the projection 48, and this projection 49 has a cavity 50 into which the end of the spring 44 can be depressed. With this construction, the device may be tested independently of the thermally actuated element 28. The stud or button element 47, if depressed by the finger, will force the stem 22 to protrude through the hole 19 in the nut 18, forcing the elements 35 and 36 to engage and complete the circuit through the buzzer or bell.

The alternative form of the invention presented in Figures 5, 6 and 7 comprises a casing having a body 1', and a central cylindrical bore 14' extending through it. The casing has a cap 8' at one end only and held on by bolts 32' extending entirely through the casing, with nuts at the ends. Made fast on the rods or bolts 32' in the cap 8' are spring terminals 35 and 36, the former extending beyond the lower end of the bore 14' and overlapping the other. Inside the bore 14' is a tubular plunger 16' of the same design as before, with a nut 18 having a perforation 19 at the bottom and a similar nut 20 in the upper end. Inside the tubular element 16 is the collar or piston 21, with a stem 22 projecting down to the perforation 19 in the lower nut 18 and a stud 23 projecting through the upper nut 20. The stud 23 is extended to form the stud 47 which projects out of the casing through a nut 51 screwed into the upper end of the bore 14'. The plunger is held inoperative by a screw 27 with a projection 26a on its inner end, normally held just under the nut 18 by the strip 28. When the strip 28 is bent upon a rise in temperature, the screw 27 is retracted as before and the spring 24 forces the plunger 16' to push down the terminal 35 into contact with the terminal 36 to close the circuit. The batteries and bell, however, are not in the casing but outside of it, at 38' and 54, as shown in Figure 5, connected by wires to the bolts 32' and terminals 35 and 36. The device can be tested as before by pressing down on the stud or button 47. This unit can be set up at any point and the bell and batteries placed anywhere else, as conditions demand.

The invention is thus found to be quite simple and inexpensive to produce, and can be relied upon to give the service desired. By testing it through pressure on the button 47, one can always check its condition.

Having described my invention, what I believe to be new is:

1. Signal apparatus comprising a casing, a movable terminal carried by said casing adjacent one end, a hollow plunger movably mounted in the casing engaging said terminal, a piston in said plunger, a stem connected to the piston and extending towards said terminal, said plunger having an opening through which the stem can be moved to engage said terminal, a stud connected to the piston and extending in the opposite direction through the adjacent end of the plunger, a cooperating terminal, a coiled spring surrounding said stem tending to force the plunger to move said plunger into circuit closing position, and a thermally responsive strip releasably engaging said plunger.

2. The signal apparatus according to claim 1 wherein said casing has a cap at one end containing said terminals and said stud projects from the opposite end of the casing.

3. Signal apparatus comprising a casing having a movable terminal adjacent one end, a cooperating terminal, a plunger in said casing, means tending to move the plunger to cause said terminals to engage each other, and a thermally responsive element on the casing restraining the plunger and operable when heated to release position, said plunger carrying an independently movable stem projecting from said casing to cause said terminals to engage each other to test said apparatus.

4. Signal apparatus comprising a casing, a movable terminal carried by said casing adjacent one

5

end, a spring pressed plunger movably mounted in the casing engaging said terminal, a cooperating terminal, a thermally responsive strip releasably engaging said plunger, a piston mounted for engagement with the first-named terminal, and means accessible from the outside of the casing for operating said piston and said movable terminal independent of the plunger.

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