

(19) AUSTRALIAN PATENT OFFICE

(54) Title
Manually Operated Hazard-warning Alarm

(51)⁶ International Patent Classification(s)
G08B 25/12 (2006.01) 20060101AFI2005100
G08B 25/12 8BMEP

(21) Application No: 2004202084 (22) Application Date: 2004 .05 .17

(30) Priority Data

(31) Number (32) Date (33) Country
03011997.8 2003 .05 .28 EP

(43) Publication Date : 2004 .12 .16
(43) Publication Journal Date : 2004 .12 .16

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(56) Related Art
DE 4406428
DE 3908885

Manually Operated Hazard-Warning Alarm

Abstract

The manually operated hazard-warning alarm has an alarm housing, a front panel (1), a breakable element and a switching insert with a limit switch (5), a switching
5 element and an alarm button (2). The switching element is formed by a switching track (6) which is connected to the alarm button (2), is provided for actuating the limit switch (5) and is guided in a guide (16) provided on the front panel (1). The switching track (6) is combined with the alarm button (2) and is designed in the form of a crosspiece and has its longitudinal edges enclosed by the rail-like guide (16). The switching track (6) has a
10 switching surface (7) which is the form of a wedge or double wedge, has its foot butting against the limit switch (5), and actuates the latter upon displacement of the switching track (6) and thus of the alarm button (2).

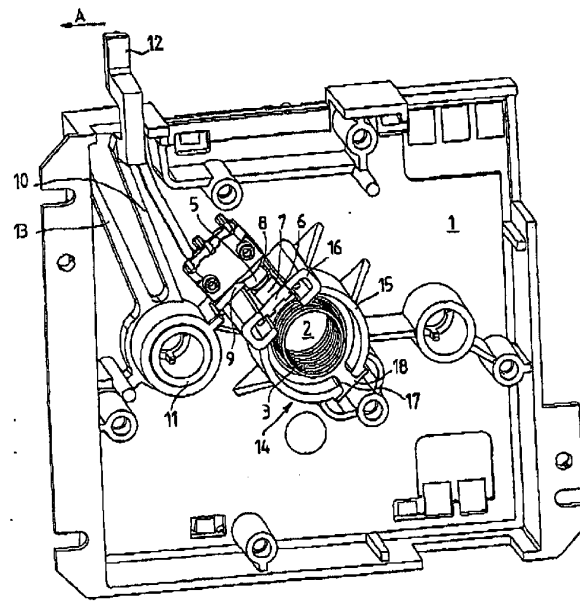


FIG. 1

Manually Operated Hazard-Warning Alarm

Field of the Invention

The present invention relates to a manually operated hazard-warning alarm having an alarm housing, a front panel, a breakable element and a switching insert, with
5 an end switch, a switching element and an alarm button.

Background of the Invention

Such manually operated hazard-warning alarms, which are used in particular in hazard-warning alarm systems for alerting the fire service or police, are usually produced in two designs, for direct and indirect actuation. The indirect-actuation type of alarm is a
10 so-called alarm-button device. In this case, it is necessary for a glass panel (the breakable element) to be broken and then for the alarm button to be pushed; the triggering element is thus the alarm button. In the case of the direct-actuation type of alarm, a so-called spring-action button design, the glass panel has to be broken, whereupon the alarm button springs out under the action of spring pressure. In this case, the triggering element is thus
15 formed by the panel and the alarm button. In both cases, the alarm-button movement actuates an electric switch, which passes the alarm message on to the alarm control center as an electrical signal. It is extremely important here for the manually operated hazard-warning alarms to function satisfactorily and to be ready at all times for reliable alarm activation.

20 EP-A-0 592 925 described a manually operated hazard-warning alarm of the type mentioned in the introduction which has a press-switch provided on a printed circuit board, it being possible for the press-switch to be actuated by an operating lever that can be adjusted by the alarm switch, and the operating lever actuating the press-switch via a leaf spring. It goes without saying that the design of the switching insert with the

operating lever and the mounting thereof, and also the leaf spring, is relatively complicated and is not optimized in respect of cost-effective production. Moreover, if unfavourable conditions combine, for example, unfavourable tolerances, the accumulation of dust, stressing of the leaf spring, this switching insert can result in difficulties in triggering the alarm.

In the case of an indirect-actuation manually operated hazard-warning alarm of the type mentioned which is sold, by the applicant of the present patent application, under the name CERBERUS DM1133 (CERBERUS – registered trademark of Siemens Building Technologies AG), the guide for the alarm button has to be of highly precise design with very narrow tolerances, in order to ensure reliable actuation of the limit switch when the alarm button is pressed. The narrow tolerances are necessary because even a small amount of tilting of the alarm button as it is actuated could result in a limit switch not being triggered. A situation where very narrow tolerances have to be maintained renders the production of the alarm button and its guide complex and increases the costs of the manually operated hazard-warning alarm.

Object of the Invention

It is an object of the present invention to overcome or ameliorate some of the disadvantages of the prior art, or at least to provide a useful alternative.

Summary of the Invention

The invention at least in a preferred embodiment provides the abovedescribed manually operated hazard-warning alarms such that, irrespective of mechanical forces and production tolerances, the switching insert ensures reliable alarm activation and can optionally be used for the two variants of alarm. The intention is also for the switching insert to be optimized in respect of cost-effective production.

The invention preferably provides that the switching element is formed by a switching track which is connected to the alarm button, is provided for actuating the limit switch and is guided in a guide provided on the front panel.

5 The guidance of the switching track means that the reliable actuation of the limit switch cannot be adversely affected any longer by tilting of the alarm button, with the result that the requirements which have to be met by the precision of the guide can be reduced to a considerable extent.

A first preferred embodiment of the manually operated hazard-warning alarm includes that the switching track is combined with the alarm button and has its
10 longitudinal edges enclosed by a rail-like guide.

A second preferred embodiment of the manually operated hazard-warning alarm includes that the switching track has a switching surface which is the form of a wedge or double wedge, has its foot butting against the limit switch, and actuates the latter upon displacement of the switching track and thus of the alarm button.

15 A third preferred embodiment of the manually operated hazard-warning alarm includes a guide crosspiece which is combined with the alarm button on the side located opposite the switching track and which is guided in a guide rail provided on the front panel.

The rail-like guide for the switching track and the guide rail for the guide
20 crosspiece preferably form a common guide part in which the part formed from the alarm button, switching track and guide crosspiece is guided such that it cannot be rotated or tilted.

A further preferred embodiment of the manually operated hazard-warning alarm in the case of which the alarm button is designed as a pushbutton, includes that the
25 switching track has an arresting protrusion aligned with the switching surface, and in that

case of which the alarm button is designed as a pushbutton, is characterized in that the switching track has an arresting protrusion aligned with the switching surface, and in that there is provided an arresting lever which butts against the switching track in the operating state of the alarm.

5 Other aspects and preferred aspects are disclosed in the specification and/or defined in the appended claims, forming a part of the description of the invention.

The invention is explained in more detail hereinbelow with reference to an exemplary embodiment and the drawings, in which:

10 Figure 1 shows, in an isometric illustration, a view of the front panel and of the switching insert of a manually operated hazard-warning alarm according to the invention as seen from the interior of the alarm; and

Figure 2 shows a view of the front panel in the direction of the arrow II from figure 1; and

15 Figure 3 shows a view of the front panel with the printed circuit board screwed on.

The basic construction of a manually operated hazard-warning alarm comprises a housing, which is covered in the forward direction by a front panel, a breakable element arranged in front of the front panel, for example a glass panel,
20 an alarm button, which is guided in the front panel, and a switching insert, which is arranged behind the front panel in the interior of the alarm. This construction is assumed as being known and will be described in any more detail here; in this context, you are referred to EP-A-0 592 925 and EP-A-1 288 881. Figures 1 and 2 merely illustrate those parts of the manually operated hazard-warning alarm
25 according to the invention, which are essential for understanding the invention, namely the front panel, which is designated 1, the alarm button, which is designated 2, and the switching insert (without the

printed circuit board). Figure 3 shows the front panel with the printed circuit board screwed on.

5 In accordance with the illustration, the front panel 1 is of box-like design and contains a central aperture for the alarm button 2, which is pushed outward by a central spring 3. That part of the front panel 1 which contains the switching insert is covered in the rearward direction by a printed circuit board 4 (figure 10 3). The printed circuit board 4 is screwed to the front panel 1 and forms a stop for the spring 3. All the parts which have current flowing through them are placed on the printed circuit board 4, this constituting a cost-saving measure. The switching 15 insert essentially contains a limit switch 5, which is arranged on the printed circuit board, and a switching track 6, which is combined with the alarm button 2. The switching track 6 is in the form of a plate which is connected to the alarm button 2 via a narrow 20 crosspiece. Arranged on the surface which is directed away from the alarm button is a switching surface 7 which slopes up in a wedge-like manner, butts against the limit switch 5 and actuates the latter when the alarm button 2 is pushed in.

25 A sawtooth-like arresting protrusion 8 is provided at a distance from the switching surface 7. In the operating state of the alarm, an arresting nose 9 of an arresting lever 10 butts against the switching track 6 in the 30 space between the switching surface 7 and the arresting protrusion 8. When the alarm button 2 is pushed in, the arresting protrusion 8 slides through beneath the arresting nose 9, as a result of which the arresting lever 10 is pivoted out a short distance and springs 35 back following the arresting protrusion 8 and thus arrests the alarm button 2 in its pushed-in, alarm position. The arresting lever 10 is of two-armed design and, in its center, is mounted on the front panel 1 such that it can be pivoted on a stationary bushing

bearing 11. The shorter arm of the arresting lever 10 bears the arresting nose 9 and the longer arm serves as an actuating arm and has its free end 12 projecting laterally out of the alarm. The actuating arm is
5 assigned an elastic component 13 such as a leaf spring, which butts against the adjacent side wall of the front panel 1 and pushes the arresting nose 9 against the switching track 6.

- 10 Provided on that side of the alarm button 2 which is located radially opposite the switching track 6 is a T-shaped guide crosspiece 18 which, together with the alarm button 2 and the switching track 6, forms a common, single-piece actuating and switching component.
15 This component is guided in a common guide part 14 arranged on the inside of the front panel 1.

The guide part 14 comprises the guide rail 16 for the switching track 6, the guide rail 17 for the guide
20 cross piece 18, and a cylindrical central part 15, which serves as a guide for the alarm button 2. The length of each of these guides is greater than the length of the part which is to be guided, and is dimensioned such that the alarm button 2, the switching
25 track 6 and the guide crosspiece 13 are guided in the respective guide over their entire length even when the alarm button 2 is pushed in. Since the switching track 6 is guided in the guide rail 16, the switching track 6 moves along a precisely defined path, with the result
30 that the limit switch 5 is actuated reliably in all circumstances. The precise movement plane of the switching track 6, moreover, makes it possible to use a limit switch 5 with a relatively large switching displacement. The guide crosspiece 18 and the guide
35 rail 17 provide an additional safeguard for precise guidance and against any tilting and/or jamming of the alarm button 2. As can be gathered from figure 3, the guide rail 16 passes through the printed circuit board.

4 at its free end and is fixed in a corresponding through-passage of the printed circuit board.

As has already been mentioned in the introduction, alarm-button and spring-action-button designs of manually operated hazard-warning alarms are known. The alarm illustrated in an alarm-button design for indirect actuation. In order to trigger an alarm, first of all it is necessary for the glass panel covering the alarm button 2 projecting out of the front panel 1 to be broken and then for the alarm button 2 to be pushed. The alarm button 2 here actuates the limit switch 5 via the switching track 6 and is fixed in this position by the arresting lever 10. In order to release the alarm button 2, the free end 12 of the arresting lever 10 has to be pivoted in the direction of the arrow A, as a result of which the arresting nose 9 releases the switching track 6 and the spring 3 switches the alarm button 2 into its operating position again.

The manually operated hazard-warning alarm illustrated can also be used, with slight modifications, as an alarm designed as a spring-action button for direct actuation. In this case, the arresting lever 10 is removed and the alarm button 2 is replaced by a button which is suitable for direct actuation and differs from the alarm button 2 for indirect actuation essentially by different shaping of the switching surface on the switching track 6, because, in this case, the limit switch is actuated when the alarm button springs out rather than when it is pushed in.

"Comprises/comprising" when used in this specification is taken to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A manually operated hazard-warning alarm having an alarm housing, a front panel, a breakable element and a switching insert with a limit switch, a
5 switching element and an alarm button, characterized in that the switching element is formed by a switching track which is connected to the alarm button, is provided for actuating the limit switch and is guided in a guide provided on the front panel.
- 10 2. The manually operated hazard-warning alarm as claimed in claim 1, characterized in that the switching track is combined with the alarm button and is designed in the form of a crosspiece and has its longitudinal edges enclosed by the rail-like guide.
- 15 3. The manually operated hazard-warning alarm as claimed in claim 2, characterized in that the switching track has a switching surface which is in the form of a wedge or double edge, has its foot butting against the limit switch, and actuates the latter upon displacement of the switching track and thus of the alarm button.
- 20 4. The manually operated hazard-warning alarm as claimed in claim 3, characterized by a guide crosspiece which is combined with the alarm button on the side located opposite the switching track and which is guided in a guide rail provided on the front panel.
- 25 5. The manually operated hazard-warning alarm as claimed in claim 4, characterized in that the rail-like guide for the switching track and the guide rail for the guide crosspiece form a common guide part in which the part formed from the alarm button, switching track and guide crosspiece is guided such that it cannot
30 be rotated or tilted.

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6. The manually operated hazard-warning alarm as claimed in any one of claims 1 to 5, characterized by a printed circuit board which is connected, preferably screwed, to the front panel, on which all the current-carrying components are fastened and which serves as a stop for a spring acting on the alarm button.
7. The manually operated hazard-warning alarm as claimed in claim 5, in the case of which the alarm button is designed as a push button, characterized in that the switching track has an arresting protrusion aligned with the switching surface, and in that there is provided an arresting lever which butts against the switching track in the operating state of the alarm.
8. The manually operated hazard-warning alarm as claimed in claim 7, characterized in that the arresting lever is designed as a two-armed pivot lever and, at the free end of one arm, which butts against the switching track, has an arresting nose which, when the alarm button is pushed in, latches in behind the arresting protrusion and arrests the alarm button in its position in which it actuates the limit switch.
9. The manually operated hazard-warning alarm as claimed in claim 8, characterized in that the other arm of the arresting lever, at its free end, projects laterally out of the housing of the alarm.
10. The manually operated hazard-warning alarm as claimed in claim 9, characterized by a resilient element which is assigned to the arresting lever and acts on the arresting lever such that the arresting nose is pushed against the switching track.
11. The alarm as claimed in claim 1, substantially as herein described with reference to the accompanying drawings.

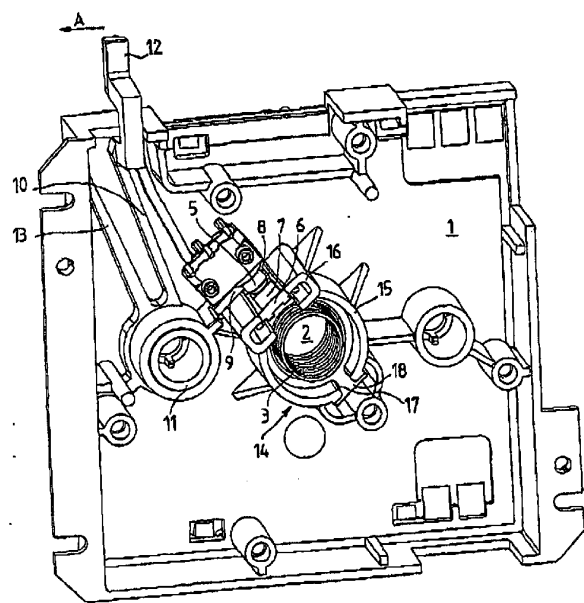


FIG. 1

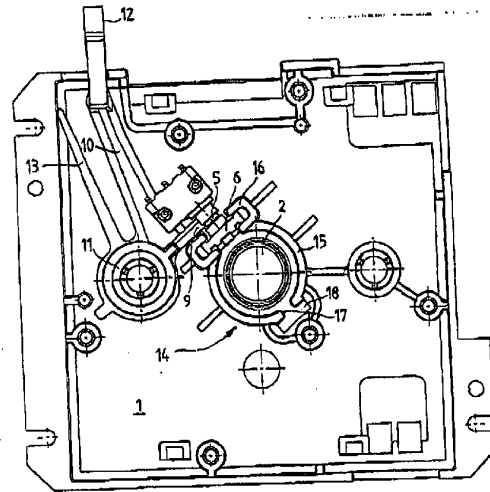


FIG. 2

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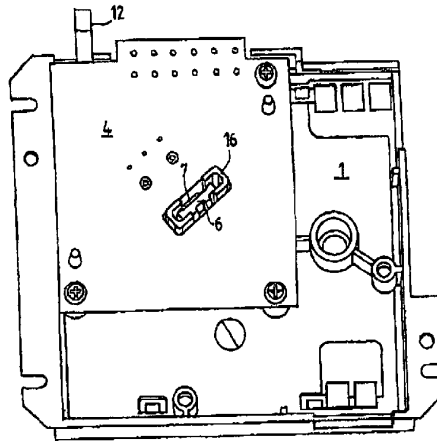


FIG. 3