

AN INDICATOR DEVICE

Field of the Invention

- 5 The present invention relates to an indicator device particularly but not exclusively for indicating an opened state of a door.

Background of the Invention

- 10 It is generally a requirement for public facilities, such as post offices and train stations, to provide utility cabinets for housing, for example, fire extinguishers and the like. Such cabinets are usually required to be non-lockable in order to allow for emergency access. However, a problem exists in so far as it is difficult to monitor whether the unlocked cabinets have been opened in non-emergency situations where the contents of the cabinet may subsequently require
- 15 maintenance after being tampered with. Unauthorised opening of the cabinet may also take place for other purposes such as, for example, placing incendiary or explosive devices within the cabinet and it is important to receive an early and unambiguous warning the cabinet has been opened in such circumstances.
- 20 A prior mechanism for identifying whether access to the cabinets has occurred involves the use of a disposable adhesive label or the like which is placed on the cabinet over an edge of a door, at a location where the label will tear upon opening the door. However, there are some instances where a tear in the label may not be readily discernible. Further, the cost of replacing the label every time the cabinet is opened may become considerable.

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Object of the Invention

It is an object of the invention to provide an indicator device which seeks to address at least one of the above problems.

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Summary of the Invention

In accordance with the invention, there is provided an indicator device including a display mechanism moveable between first and second positions, to identify a change in a monitored region, and a trigger assembly arranged to automatically actuate the display mechanism in response to the change.

Preferably, the monitored region is a cabinet and the device is used to indicate an incidence of a door of the cabinet being opened. For that purpose, the device may be provided as a unitary housing adapted to be mounted relative to the door, such that the trigger assembly interacts with the cabinet frame adjacent the door, so as to provide a visual alert whenever the door is opened.

Brief Description of the Drawings

The invention will be described, by way of non-limiting example only, with reference to the accompanying drawings in which:

Figure 1 is an exploded perspective view of an indicator device;

Figures 2a - 2d illustrate front, side, rear, and bottom views of the device of Figure 1;

Figure 3 is a front view of a rear housing of the device;

Figures 4a - 4b illustrate perspective views of a front and rear of the rear housing of the device;

Figure 5 is a perspective exploded view of the rear housing;

Figures 6a - 6c illustrate a trigger assembly of the device

Figure 7 illustrates the rear housing of the device of Figure 3 shown with an optional mounting piece;

Figures 8a - 8c illustrate diagrammatic views of the mounting piece of Figure 7;

Figure 9 illustrates views of the indicator device arranged with the mounting piece; and

Figure 10 illustrates an exploded view of the indicator device and mounting piece.

Detailed Description

Referring firstly to Figures 1, 2a -2d, the indicator device (1) includes a front and rear housing (2,3) which may be combined to form a single unitary housing (4) for mounting on a door or the

like. The front housing (2) has a circular window (5) through which can be viewed a display mechanism (6) mounted to the rear housing (3). The display mechanism (6) is formed of a cover (7) which rests on support structure (8) of a trigger assembly (9) so as to cover a display signal, or the like, when in a first position, as shown in Figure 1. The support structure (8) is arranged to be moved by the trigger assembly (9) to release the cover (7), which is then free to slide along guide rails (10), to a second position beneath the support structure (8). End stops (11) are provided on the rear housing (3) to define end of travel positions for the cover (7).

In order to reset the display mechanism (6), an elongate key (12) may be inserted through an appropriate key hole (13) in a base of the front housing (2) to engage the cover (7) and push it back up to the first position. Figure 2 shows such a key (12) fully inserted into the front housing (2). During upward movement, the cover (7) is free to pass by the support structure (8) and, provided the trigger assembly (9) is reset, the cover (7) will again be able to rest upon the support structure (8), once the key (12) has been removed.

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As may be more clearly seen from Figures 3, 4, 5, 6a - 6c, the support structure (8) is provided by way of two pivotal flaps (14,15) which are mounted on a clip (16) coupled to a lever arm (17) of the trigger assembly (9). When in the configuration shown in the present drawings, the top flap (14) falls under gravity into a horizontal orientation to provide a support for the cover (7) of the display mechanism (6). The bottom flap (15), in that arrangement, simply hangs freely beneath the lever arm (17) so as not to inhibit movement of the cover (7) along the guide rails (10).

With that arrangement, the top flap (14) is also able to pivot upwardly so as to allow the cover (7) to pass by during a reset operation and to again fall into the horizontal position to provide the support function after the cover (7) has passed. The bottom flap (15) will operate in an identical fashion to the top flap (14) in the event the device needs to be inverted for installation.

In relation to the lever arm (17) itself, a pivotal coupling (18) is provided to connect the lever arm (17) to the rear housing (3). An opposite end of the lever arm (17) is bent to form a trigger (19) which may be acted upon to cause the lever arm (17) to pivot about the pivotal coupling (18). The trigger (19) is free to pass through an aperture (20) in the rear housing (3). A torsion spring (21) is placed between the lever arm (17) and a plate (22) carrying the guide rails (10) in

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order to bias the trigger (19) into a projecting condition. As such, the biased lever arm (17), together with the trigger (19), forms part of the trigger assembly (9) which, when the trigger (19) is pressed inwardly of the rear housing (3), provides support to the cover (7), by way of the support structure (8). When the trigger (19) is allowed to project outwardly of the rear housing (3), however, the lever arm (17) is pivoted about the pivotal coupling (18) under action of the torsion spring (21), to thereby move the support structure (8) from beneath the cover (7) so as to cause the cover (7) to drop such that the display mechanism (6) moves from the first to the second position. If the trigger (19) is again pressed into the rear housing (3), the support structure (8) is returned to its initial position to allow the display mechanism (6) to be reset.

The indicator device (1) is thereby ideally suited to identify when a cabinet or the like has been accessed if arranged such that the trigger (19) is released whenever a door of the cabinet is opened.

For that particular application, the housing (4) may be secured to the cabinet door so that the trigger (19) projects through the aperture (20) formed in the rear housing (3) to engage the cabinet frame adjacent the door. When the door is in a closed condition, the trigger (19) will abut the cabinet frame and be pushed inwardly of the rear housing (3) against the bias of the torsion spring (21) to position the support structure (8) beneath the cover (7) of the display mechanism (6). As soon as the door is opened, the trigger (19) will be released and the torsion spring (21) will cause the lever arm (17) to pivot which will in turn move the support structure (8) from beneath the cover (7), to thereby allow the cover (7) to drop and expose the display sign for viewing through the opening (5) in the front housing (2). The sign, such as a display signal, is then permanently displayed through the opening (5) until an authorised person resets the display mechanism (6) using an appropriate key (12).

Accordingly, the indicator device (1) provides a robust means of clearly and unambiguously identifying when a cabinet door has been opened. The indicator device (1) may be permanently installed and is resettable to thereby avoid the unit cost increase associated with disposable indicators, as used in the prior art.

Further, it may be noted from the above that the display mechanism (6), support structure (8) and trigger assembly (9) are all adapted to operate in an inverted configuration which means the rear

housing (3) of the indicator device (1) may be readily installed in either the orientation shown or in the inverted configuration, with the front housing (2) then being fitted in place as appropriate. The indicator device (1) thereby, provides versatility in so far as the housing (4) can be mounted on either a left- or right-hinged door.

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With reference to Figures 7, 8a - 8c, 9 and 10, the indicator device (1) may be used with a mounting piece (23) to enable operation of the indicator device (1), for example in situations where there is no door frame suitable for engaging the trigger (19). The mounting piece (23) may be formed as a plate-like unit, with a fixing surface (24) suitable for fixing the mounting
10 piece (23) to a wall (27) such that it is oriented substantially perpendicular to the indicator device (1). In this way a front end surface (25) of the mounting piece (23) engages the trigger (19) to maintain the indicator device (1) in the first position while the indicator device (1) is in abutment with the mounting piece (23), and disengages from the trigger (19) when the indicator device (1) is moved from abutment with the mounting piece (23) such that the trigger (19) is released
15 causing the display sign to be exposed.

Figure 8c shows a diagrammatic sketch of an arrangement in which the indicator device (1) is fixed to a door (28) of a cabinet (29), and the mounting piece (23) is fixed to a side wall (27) of the cabinet (29).

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The mounting piece (23) may be fixed to a wall by adhesive tape (26), as depicted in Figure 10. The front profile of the mounting piece (23) may be shaped to match the profile of the indicator device (1) when the two parts are in abutment, as shown in Figure 9.

25 The invention has been described by way of example only and many modifications and variations may be possible without departing from the spirit and scope of the invention described. For example, the indicator device (1) need not be limited to use with a cabinet and may instead have application to identifying any other physical change in a monitored region that results in the trigger assembly (9) actuating the display mechanism (6).

Claims:

1. An indicator device including a display mechanism moveable between first and second positions, to identify a change in a monitored region, and a trigger assembly arranged to automatically actuate the display mechanism in response to the change.
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2. An indicator device as claimed in claim 1, wherein the display mechanism includes a display signal and a cover for selectively displaying the signal when the mechanism moves between the first and second positions.
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3. An indicator device as claimed in claim 2, including a housing with a window through which the display signal is viewable.
4. An indicator device as claimed in any one of claims 1 to 3, wherein the trigger mechanism
15 includes a lever arm with a trigger coupled to support structure, for maintaining the mechanism in the first position, arranged whereby to move the support structure upon the trigger detecting the change, in order to allow the display mechanism to move into the second position.
- 20 5. An indicator device as claimed in claim 4, wherein the device includes a housing, the lever arm being pivotally coupled to the housing and biased away from the display mechanism.
6. An indicator device as claimed in claim 5, wherein the trigger is provided at a free end of the lever arm and arranged to project through an aperture in the housing.
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7. An indicator device as claimed in claim 6, wherein the housing is adapted to be mounted relative to a cabinet door such that the trigger is pushed into the housing when the door is closed and projects from the housing when the door is opened, to thereby remove the support structure from the display mechanism, so as to cause the display mechanism to adopt the
30 second position.
8. An indicator device as claimed in claim 7, wherein the support mechanism includes a flap pivotally coupled to the lever arm.

9. An indicator device as claimed in claim 8, including a key hole in the housing for insertion of a key to return the display mechanism from the second position to the first position, in order to reset the device.

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10. An indicator device as claimed in claim 8, wherein the display mechanism includes a panel that slides along guide rails from the first position to the second position, to expose a display signal.

- 10 11. An indicator device as claimed in claim 10, wherein the flap pivots to allow passage of the panel past the support structure as the device is reset.

12. An indicator device as claimed in claim 1, wherein the display mechanism and trigger mechanism are arranged to operate in an inverted configuration.

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13. A mounting piece for use with an indicator device as claimed in any one of claims 7 to 11, wherein the mounting piece is adapted for mounting relative to the monitored region so as to cooperate with the indicator device by pushing the trigger into the housing when the cabinet door is closed and by releasing the trigger when the door is opened.

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14. A mounting piece as claimed in claim 13, wherein the piece is adapted for mounting to a surface substantially perpendicular to the door when the door is closed.