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(54) Alarm call point

(57) A re-settable alarm call point 1 has a lever 22 biased to a non-activating position by an over-centre spring 23. The lever 22 is movable against the biasing of the spring 23 towards an activating position by manual depression of a pressure plate 10 and, when the spring 23 passes through an intermediate unstable position, the lever 22 is biased to the activating position to trigger the call point. An indicator panel 15 is concealed in the non-activating position of the lever 22 and is released in response to displacement of the lever 22 to the activating position to provide a visual indication of the actuation of the call point 1. The call point 1 is manually re-set by inserting a key in the end of a cylinder 33 to return the indicator panel 15 to the concealed position and rotate the cylinder 33 to actuate a cam 38 to return the lever 22 to the non-activating position.

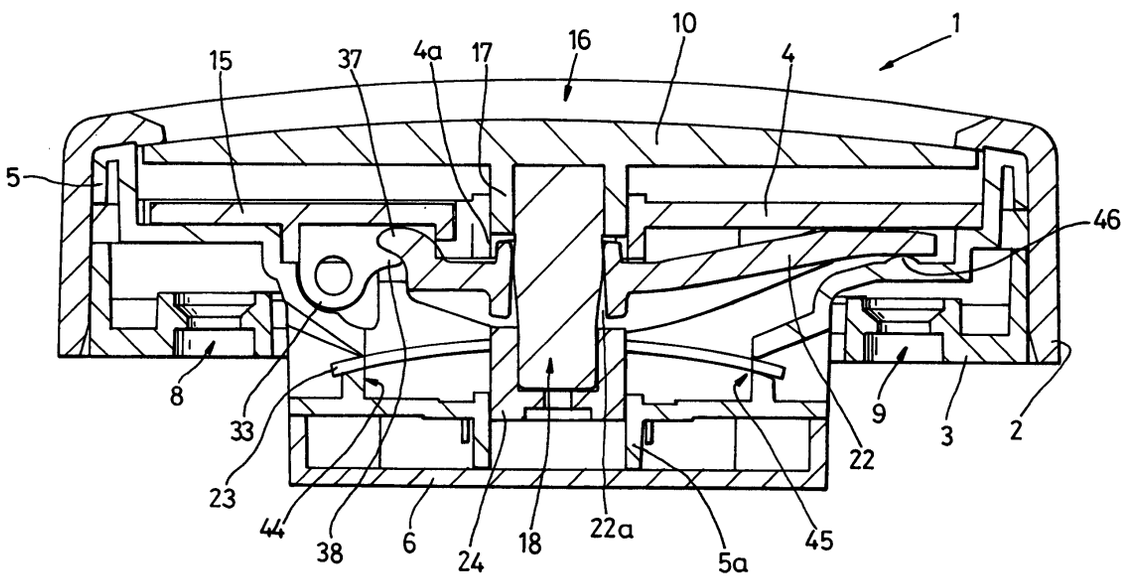

Fig. 3

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Description

[0001] The invention concerns alarm call points and in particular manually operable call points such as provided in buildings for actuation by a user to actuate an alarm system in an emergency, for example in response to a fire.

[0002] Manually operable alarm call points are known in which a switch for actuating the alarm is protected from accidental or inadvertent operation by a breakable front panel such as a glass window which is broken when actuation of the switch is required. The switch may be actuated automatically in response to breaking the front panel or the user may be required to operate the switch after breaking the front panel.

[0003] A disadvantage of this type of call point is that the front panel has to be replaced each time the call point is actuated. This normally requires a service engineer to be called out to fit the replacement front panel and reset the call point. This adds to maintenance costs, especially where false alarms are generated by malicious actuation of the call point by vandals. Moreover, a safety hazard may arise if there is a delay in repairing the call point after a false alarm. Breaking the glass may also present a safety hazard to the user and/or the presence of broken glass may interfere with operation of the call point.

[0004] Another disadvantage of this type of call point is that a separate method of actuation, usually a key, is required to carry out routine testing of the alarm system as required by regulations. Such testing does not simulate the conditions occurring in an emergency when the user is required to break the front panel to actuate the call point. Consequently, there is a risk that the call point may not operate when required. For example, an emergency situation requiring actuation of the call point may only arise many years after installation and any deterioration of the actuating mechanism over time resulting in failure of the call point when required may not be apparent from tests carried out with a key or other separate test arrangement.

[0005] Manually operable alarm call points are also known in which the breakable front panel is replaced by a non-breakable, re-settable actuator mechanism. With this type of call point testing can be carried out simulating emergency conditions and the call point re-set each time without requiring a service engineer to be called out.

[0006] A disadvantage of this type of call point is that it is more susceptible to accidental or inadvertent actuation due to the absence of a breakable front panel that acts as a deterrent against actuation under normal circumstances. In addition, the actuating mechanism is often complex which adds to cost. Also, a visual indication of actuation such as provided by the broken front panel of the other type of call point may not be apparent from inspection of the call point.

[0007] It is an object of the present invention to overcome or at least mitigate problems of the aforementioned alarm call points.

[0008] According to a first aspect of the invention there is provided an alarm call point comprising switch means and actuating means manually displaceable from a non-activating position to an activating position to activate the switch means, the displacement of the actuating means being reversible to reset the call point, the actuating means including biasing means arranged to bias the actuating means to the activating position in response to displacement of the actuating means from the non-activating position towards the activating position.

[0009] The biasing means may be arranged to bias the actuating means to the non-activating position in a stand-by condition of the call point, and reverse the biasing to bias the actuating means to the activating position in response to displacement of the actuating means from the non-activating position towards the activating position.

[0010] Preferably, the biasing means comprises an overcentre spring movable between two stable end positions through an unstable intermediate position. In this way, displacement of the overcentre spring from one stable end position is initially resisted until the spring passes through the unstable intermediate position causing the biasing to reverse and urge the spring to the other stable end position.

[0011] In this way, the actuating means is biased away from the activating position in the stand-by condition of the call point and, to trigger the call point, a person must overcome the biasing to displace the actuating means towards the activating position. This reduces the risk of accidental or inadvertent triggering of the call point. Moreover, the actuating means is retained in the activating position by the biasing means to provide a positive indication of the operation of the call point.

[0012] Preferably, the actuating means includes a manually operable pressure plate arranged such that depression of the plate by the user, for example by finger pressure, displaces the actuating means away from the non-activating position against the biasing force of the overcentre spring until the spring passes through the unstable intermediate position and automatically reverses the biasing force to urge the actuating means to the activating position.

[0013] The pressure plate may be transparent or translucent so as to simulate the appearance of a traditional breakable glass panel. For example, the pressure plate may be arranged in front of a dark, internal surface spaced from the plate in the non-activating position of the actuating means.

[0014] Preferably, the call point includes means to provide a visual indication that the call point has been actuated. The indicating means may comprise a flag that is hidden from view in the stand-by condition of the call point and is visible when the call point has been actuated. For example, the flag may be visible through the

transparent or translucent panel. In this way, it is possible to quickly identify whether or not the call point has been triggered.

[0015] In one arrangement, the flag is held in an inoperative, hidden position when the actuating means is in the non-activating position and is released to move to an operative, visible position when the actuating means is in the activating position.

[0016] The flag may comprise a coloured section of a movable panel co-operable with the actuating means so as to be held in the inoperative position by the actuating means when the actuating means is in the non-activating position and released to move to the operative position when the actuating means is in the activating position.

[0017] In this way, movement of the flag is linked to actuation of the call point to provide a visual indication when the call point is actuated. The panel may be biased towards the operative position so that the flag will move to the operative position regardless of the orientation of the call point when the panel is released for movement.

[0018] Preferably, the actuating means includes a switching element arranged for pivotal movement from the non-activating position to the activating position in response to manual depression of the pressure plate and the switch means comprises one or more switches, for example micro-switches, connectable to a circuit of an alarm system for triggering the alarm system in response to movement of the switching element to the activating position.

[0019] Advantageously, the call point is provided with means for re-setting the call point following actuation. Preferably, the re-setting means is operable to displace the actuating means from the activating position to the non-activating position. For example, the re-setting means may comprise a rotatable cam for urging the actuating means away from the activating position against the biasing of the overcentre spring until the spring passes through the unstable intermediate position and automatically returns the actuating means to the non-activating position.

[0020] The cam may be operable by a removable actuator, for example a key, and insertion of the key may also return the flag to the inoperative position. In this way, testing of the call point can be carried out that simulates actuation of the call point in an emergency thereby reducing the risk of the call point failing to actuate the alarm system when required even after being installed for several years. Also, the call point can be actuated several times and re-set after each actuation without having to replace any parts or call out a service engineer. This is of particular benefit in the event the call point is actuated accidentally or maliciously.

[0021] According to a second aspect of the invention there is provided an alarm system comprising an alarm call point according to the first aspect of the invention.

[0022] According to a third aspect of the invention there is provided an alarm call point comprising switch means, actuating means displaceable to activate the switch means, and indicator means responsive to displacement of the actuating means to provide a visual indication that the actuating means has been displaced to activate the switch means.

[0023] By linking release of the indicator means to displacement of the actuating means to the activating position, actuation of the call point and a visual indication thereof is provided substantially simultaneously so that actuation of the call point without a visual indication thereof is prevented.

[0024] According to a fourth aspect of the invention there is provided an alarm call point comprising switch means, actuating means displaceable to activate the switch means, and a manually operable pressure plate for displacing the actuating means to activate the switch means, wherein the plate remains intact during operation of the call point to allow the call point to be re-set after actuation and is transparent or translucent to simulate the appearance of a breakable plate.

[0025] By arranging the pressure plate to simulate a glass plate that has to be broken to trigger the alarm, people are deterred from setting off the alarm system unnecessarily as they believe that they would have to break the plate to trigger the call point.

[0026] According to a fifth aspect of the invention there is provided an alarm call point comprising switch means for activating an alarm system, the switch means including a switching element displaceable from a non-activating position to an activating position to activate the switch means, biasing means arranged to resist movement of the switching element away from the non-activating position, a manually operable actuator arranged to displace the switching element away from the non-activating means, biasing means arranged to resist movement of the switching element away from the activating position, and re-set means arranged to displace the switching element away from the activating position.

[0027] The switching element may be a lever arranged for pivotal movement between the non-activating and activating positions with the biasing means comprising an over-centre spring which retains the switching lever in each of the non-activating and activating means until displaced by either the pressure plate to actuate the call point or the re-set means to re-set the call point after actuation.

[0028] An embodiment of the invention will now be described, by example only, with reference to the following drawings, in which:-

Figure 1 shows an exploded view of a call point according to the invention, from above;

Figure 2 shows an exploded view of the call point, from below;

Figure 3 shows a cross-section of the call point along line B-B;

Figure 4 shows plan views of the two components of the overcentre spring shown in Figures 1 to 3;

Figure 5 shows a perspective view of the call point with the internal mechanism, excluding the flag panel, exposed;

Figure 6 shows a perspective view of the call point with the internal mechanism, including the flag panel, exposed; and

Figure 7 shows a perspective view of the connection between the flag panel and piston.

[0029] Referring first to Figures 1 to 4 of the accompanying drawings, there is shown an alarm call point 1 according to the invention. In use, the call point 1 is mounted on a wall of a building (not shown) at a convenient location for user actuation to trigger an alarm system (not shown).

[0030] The call point 1 comprises a front outer casing 2 and a back outer casing 3 made of plastics that enclose housings 4 and 5 containing the switch mechanism of the call point 1. The housings 4 and 5 are made of coloured plastics, preferably black for reasons explained later herein. An end cap 6 is also provided to cover a section 7 of the housing 5 protruding from the casing 3.

[0031] The casing 3 has holes 8 and 9 therein for receiving screws for attaching the call point 1 to a wall of a building. The casings 2, 3 and housings 4, 5 have cooperating formations (not shown) that snap-fit together for attaching the casings 2, 3 and housings 4, 5 together. In this embodiment, the casings 2, 3 and housings 4, 5 are made of plastics, however it will be understood that the casing 2,3 and housing 4,5 could be made of other suitable materials.

[0032] A manually operable actuator in the form of a transparent or translucent plastic pressure plate 10 extends across a window 16 in the front casing 2. The pressure plate 10 is located above a recessed central section 13 of the housing 4 between a pair of guides 11,12 that contact the underside of the front casing 2 either side of the window 10. The pressure plate 10 can be displaced under finger pressure towards the central section 13 for manual actuation of the call point 1 as described later herein

[0033] The switch mechanism includes micro-switches 28 and 29 provided with connections 47, 48 for connection to a circuit of an alarm system and a switching element in the form of a pivotal lever 22 for actuating the micro-switches 28 and 29 in response to displacement of the pressure plate 10 as described in more detail later herein.

[0034] The pressure plate 10 has a socket 17 on the underside received in a central hole 4a of the housing 4. One end of a button 18 is received in the socket 17. The button 18 has a portion 18a of rectangular cross-section that extends through a hole 22a in the lever 22 and through a hole 23a in an overcentre spring 23. The other end of the button 18 is secured to an end cap 24 and the button 18 connects the pressure plate 10 to the lever 22 and over-centre spring 23. The end cap 24 is slidably received in a hole 5a in the protruding section 7 of the housing 5 aligned with the hole 4a in the housing 4.

[0035] As best shown in Figure 4, the over-centre spring 23 comprises a metal spring element 30 and a washer 31. The spring element 30 consists of two arms 40, 41. The arms 40, 41 are integrally connected together at one of their ends and provided with hooks 42 and 43 at the other of their ends.

[0036] In a disassembled condition shown in Figure 4 the arms 40, 41 fork away from each other. To assemble the overcentre spring 23, the hooks 42, 43 are inserted into washer 31 so that the washer 31 holds the hooked ends of arms 40, 41 together. This causes the spring 23 to adopt a curved shape in which the arms 40, 41 deflect in a direction perpendicular to the length of the spring 23 to one of two stable positions either side of an unstable centre position. Movement of the arms 40, 41 from either stable position through the centre position causes the arms 40, 41 to deflect to the other stable position.

[0037] Each arm 40,41 has a finger 20, 21 respectively that extends towards the other arm 40,41. The fingers 20,21 are offset in the direction of the length of the spring 23 and the end cap 24 has lugs 24a received in a central region of the spring 23 between the fingers 20,21 to locate the spring 23 relative to the button 18.

[0038] The lever 22 is pivotal at one end about a ridge 46 on the housing 5 to move from a non-activating position shown in Figure 3 in which a pair of lugs 26,27 are spaced above the micro-switches 28,29 respectively to an activating position (not shown) in which the lugs 26,27 actuate the micro-switches 28,29 to trigger the alarm system in response to manual depression of the pressure plate 10.

[0039] The ends of the over-centre spring 23 are located and retained in slots 44 and 45 in the housing 5 to hold the spring 23 in place. The spring 23 biases the lever 22 to the non-activating position in a stand-by condition of the call point 1. In this position, the spring 23 is in one of its two stable end positions and resists movement of the lever 22 towards the activating position. In this way, the lever 22 is held positively in the non-activating position.

[0040] In order to actuate the call point 1, the pressure plate 10 is displaced manually by application of finger pressure to move the lever 22 towards the activating position against the biasing of the spring 23 until the spring passes through the unstable centre position whereupon the spring 23 automatically moves to the other stable end position to reverse the biasing and pull the lever 22 to the activating position in which the micro-switches 28, 29 are operated to trigger the alarm system. In this way, the lever 22 is retained in the activating position by the

biasing of the spring 23 which resists movement of the lever away from the activating position until the call point 1 is re-set as described later herein. As will be appreciated, the action of the over-centre spring 23 provides a snap action that prevents the call point 1 being actuated without the lever 22 moving to the activating position.

[0041] With reference now also to Figures 5 to 7, indicator means to provide a visual indication of actuation of the call point 1 and re-set means for re-setting the call point 1 following actuation will now be described.

[0042] The indicator means comprises a panel 15 of coloured plastics, preferably black to match the centre section 13 of the housing 4, slidably located in a cut-out section 14 of the housing 4 substantially co-planar with the centre section 13. The panel 15 is provided on the rear surface with a U-shaped projection 35 (Figure 7) that is received in an annular recess 34 in a head of a cylindrical rod 32 slidably received in a through bore of a rotatable cylinder 33 of the re-set means.

[0043] The rod 32 is axially movable between an inoperative position shown in Figure 5 in which a flag 19 on the front surface of the panel 15 is hidden from view when the lever 22 is in the non-activating position and an operative position shown in Figure 5 in which the flag 19 is visible through the plate 10 in the activating position of the lever 22 to provide a visual indication that the call point 1 has been actuated. In this embodiment, the flag 19 is provided by a section of the panel 15 of contrasting colour, for example green.

[0044] The panel 15 is also provided on the back surface with an abutment 39 that contacts lip 37 at the free end of the lever 22 to retain the panel 15 in the inoperative position when the lever 22 is in the non-activating position. The abutment 39 is released when the lever 22 pivots to the activating position allowing the panel 15 to move to the operative position under the biasing of a spring 36.

[0045] The spring 36 provides a positive actuation force to ensure the panel moves 15 to reveal the flag 19 in response to actuation of the call point 1. In some situations, however, it may be possible to dispense with the spring 36 and rely on gravity to move the panel 15 to the operative position.

[0046] The re-set means includes the cylinder 33 which is rotatable by means of a key (not shown) inserted into the end of the cylinder 33 remote from the rod 32. The key shaft has splines that engage grooves (not shown) in the cylinder 33 to transmit rotation of the key to the cylinder 33. The splines are arranged so that the key has to be fully inserted into the cylinder 33 to engage the grooves. When the key is fully inserted, the rod 32 is displaced against the biasing of spring 36 to return the panel 15 to the inoperative position.

[0047] The cylinder 33 is provided with a cam 38 intermediate the ends. The cam 38 is co-operable with the lip 37 at the free end of the lever 22 to displace the lever 22 away from the activating position against the biasing of the spring 23 when the cylinder 33 is rotated in an anticlockwise direction until the spring 23 passes through the unstable centre position whereupon the spring 23 automatically moves to the other stable end position to reverse the biasing and pull the lever 22 to the non-activating position.

[0048] The lever 22 is retained in the non-activating position by the biasing of the spring 23 and the abutment 19 on the panel 15 contacts the lip 37 on removal of the key to retain the panel 15 in the inoperative position until the call point 1 is next actuated by manually depressing the pressure plate 10 as described previously.

[0049] As will be apparent from the foregoing description, the call point 1 is actuated in response to movement of the lever 22 to simultaneously actuate the microswitches 28, 29 and release the flag 19 to provide a visual indication that positively identifies the call point 1 that has been actuated. In this way actuation of the call point 1 without releasing the flag 19 is prevented.

[0050] Furthermore, in the stand-by condition of the call point 1, the housing 4 and panel 15 provide a dark background surface visible through the pressure plate 10. In this way, the call point 1 imitates call points in which a glass plate has to be broken to operate the call point 1 that deters people from setting off the call point 1 unnecessarily as they believe that they would have to break a glass plate to trigger the alarm.

[0051] Moreover, the call point 1 can be re-set without replacing any parts and without requiring a service engineer. This reduces operating costs and increases safety by allowing the call point 1 to be tested under normal operating conditions so that any faults in the system can be readily identified during routine testing and reducing the risk of failure when the call point 1 is required to be actuated in an emergency.

[0052] It will be understood that the invention is not meant to be restricted to the above-described embodiment but includes modifications and alterations that fall within the scope of the invention as defined herein. For example, the flag could move to a different position to be visible, such as outside the casing 2,3.

Claims

1. An alarm call point comprising switch means and actuating means manually displaceable from a non-activating position to an activating position to activate the switch means, the displacement of the actuating means being reversible to reset the call point, the actuating means including biasing means arranged to bias the actuating means to the activating position in response to displacement of the actuating means from the non-activating position towards the activating position.

2. An alarm call point according to claim 1 wherein the biasing means is arranged to bias the actuating means to the non-activating position in a stand-by

condition of the call point, and reverse the biasing to bias the actuating means to the activating position in response to displacement of the actuating means from the non-activating position towards the activating position, for example the bia'sing means preferably comprises an overcentre spring movable between two stable end positions through an unstable intermediate position such that, displacement of the overcentre spring from one stable end position is initially resisted until the spring passes through the unstable intermediate position causing the biasing to reverse and urge the spring to the other stable end position.

3. An alarm call point according to claim 2 wherein, means is provided to give a visual indication when the call point has been actuated, for example a flag that is held in an inoperative, hidden position in the stand-by condition of the call point and is released to move to an operative, visible position when the call point has been actuated.

4. An alarm call point according to claim 3 wherein the flag comprises a coloured section of a movable panel co-operable with the actuating means so as to be held in the inoperative position by the actuating means when the actuating means is in the non-activating position and released to move to the operative position when the actuating means is in the activating position, and the panel is preferably biased towards the operative position so that the flag moves to the operative position regardless of the orientation of the call point when the panel is released for movement.

5. An alarm call point according to any one of claims 2 to 4 wherein means is provided for re-setting the call point following actuation, the re-setting means being operable to displace the actuating means from the activating position to the non-activating position, for example a rotatable cam for urging the actuating means away from the activating position against the biasing of the overcentre spring until the spring passes through the unstable intermediate position and automatically returns the actuating means to the non-activating position.

6. An alarm call point according to claim 5 as dependent on claim 3 or claim 4 wherein the cam is operable by a removable actuator, for example a key, and insertion of the actuator returns the flag to the inoperative position.

7. An alarm call point according to any one of the preceding claims wherein the actuating means includes a pressure plate and a switching element arranged for pivotal movement from the non-activating position to the activating position in response to manual displacement of the pressure plate, and the switch means comprises one or more switches connectable to a circuit of an alarm system for triggering the alarm system in response to movement of the switching element to the activating position.

8. An alarm call point according to claim 7 wherein the pressure plate remains intact during operation of the call point and is preferably transparent or translucent to simulate a breakable glass panel.

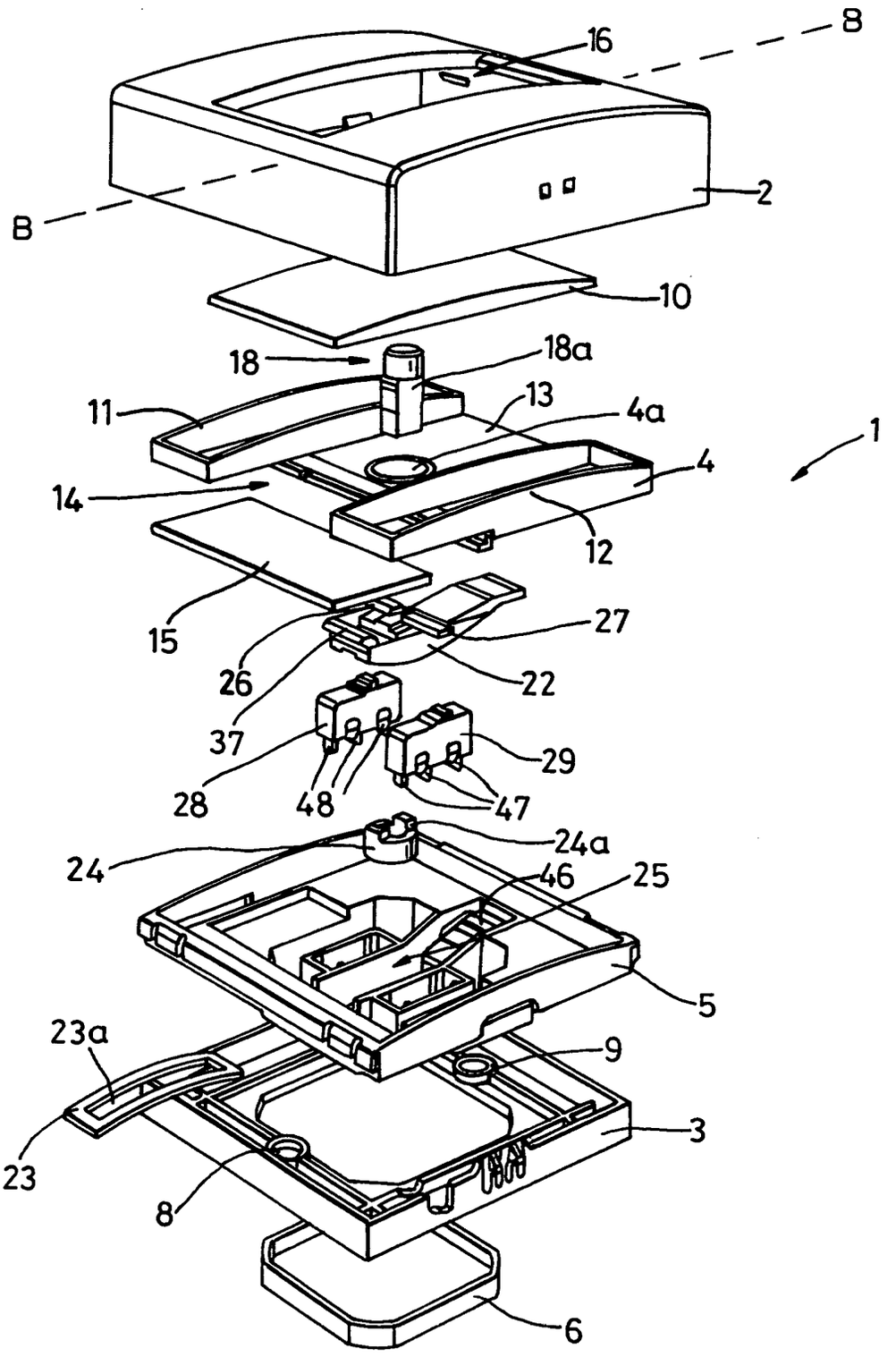
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Fig. 1

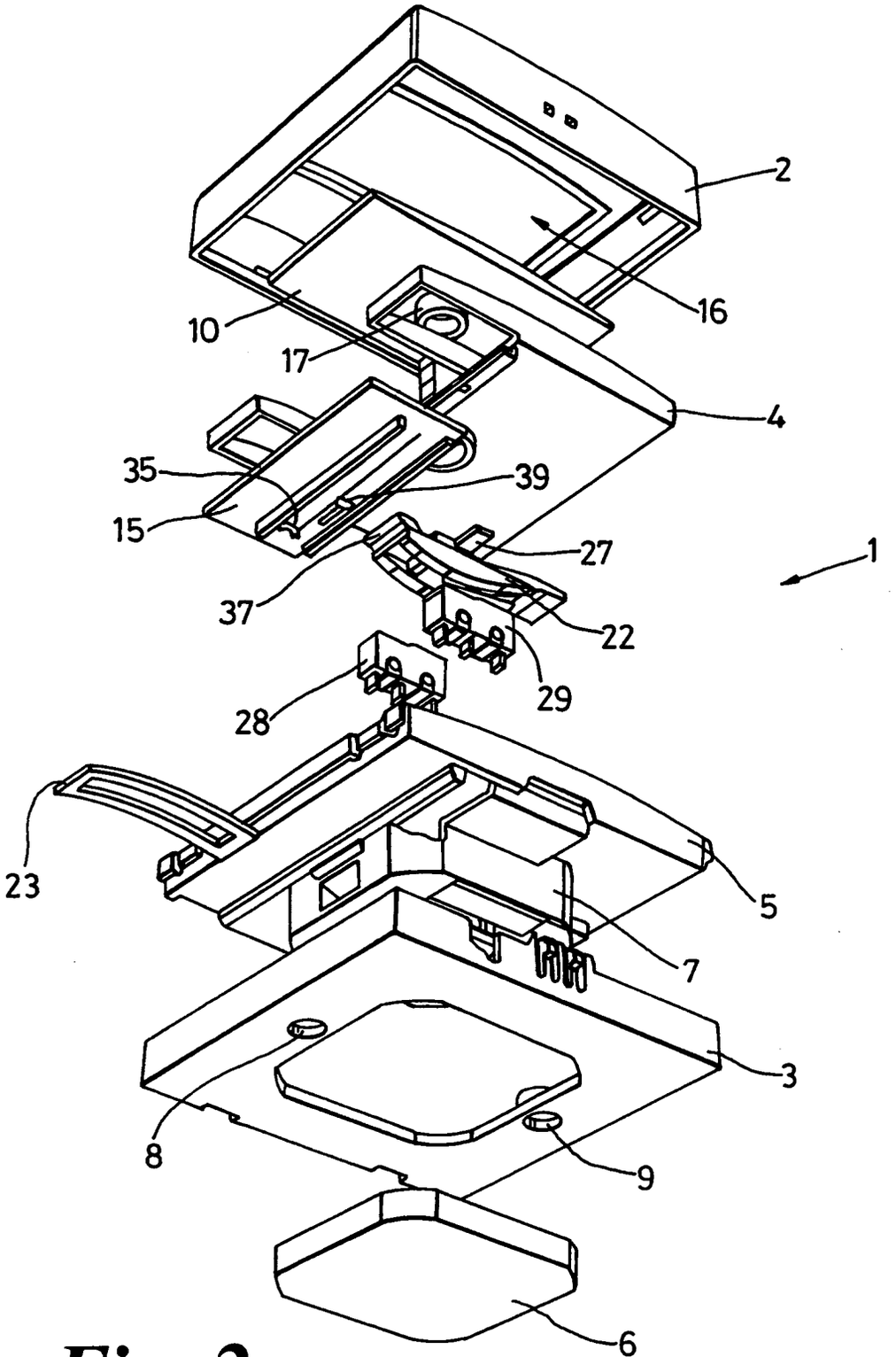

Fig. 2

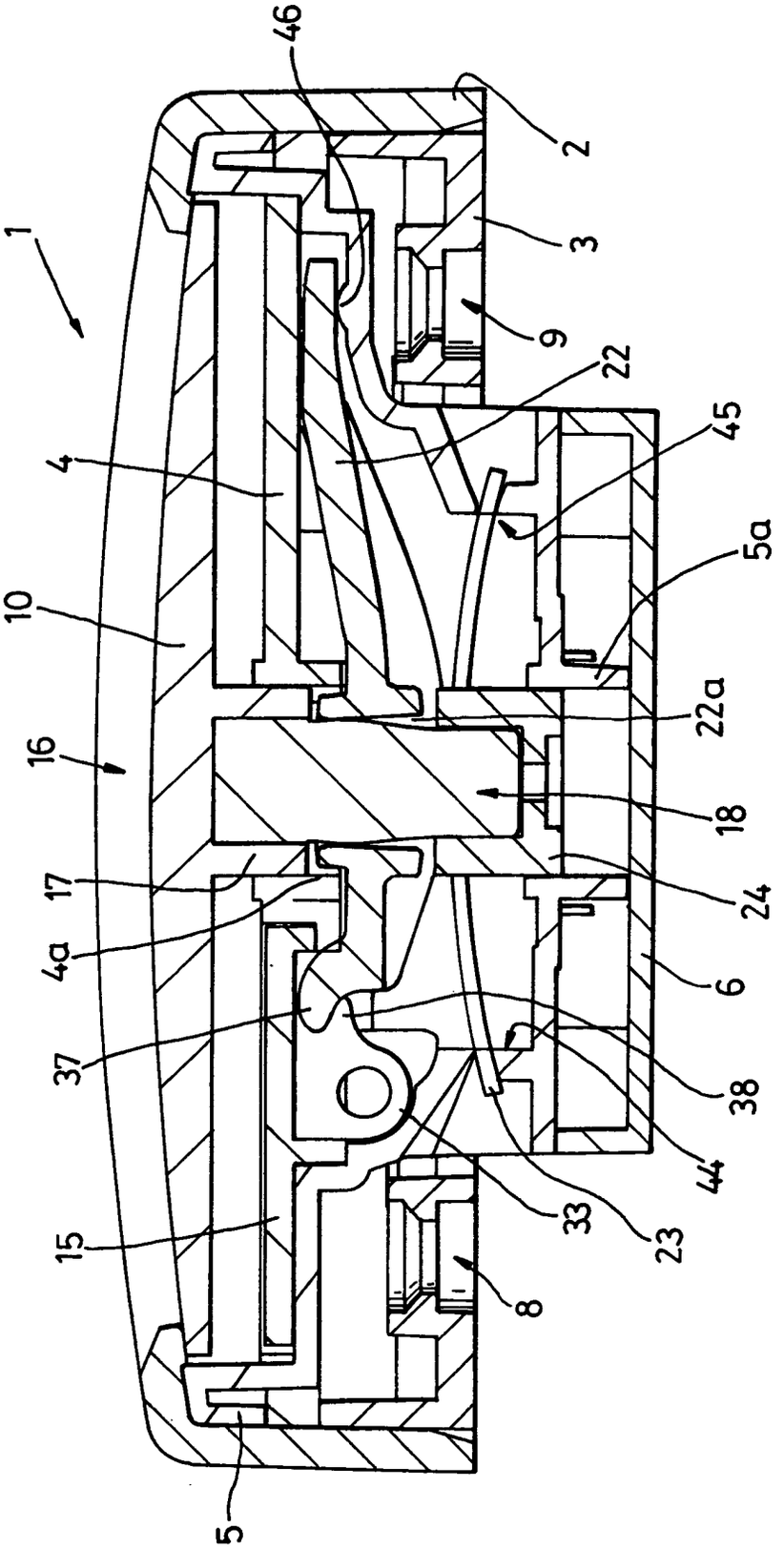

Fig. 3

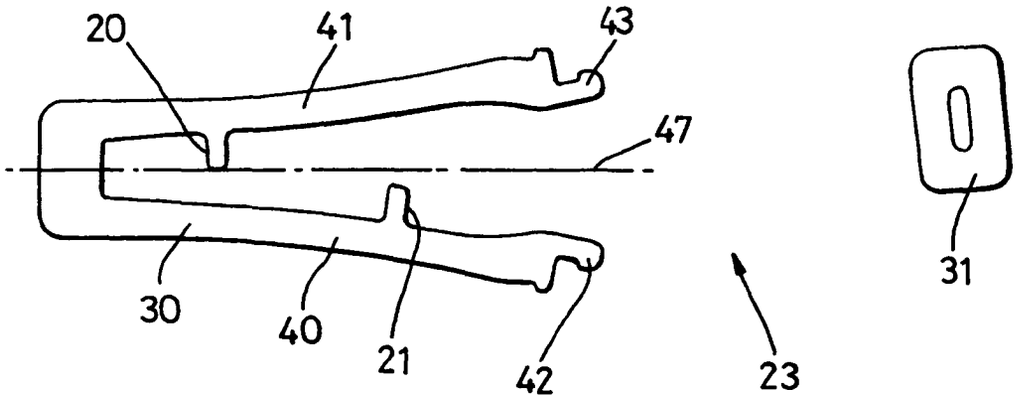

Fig. 4

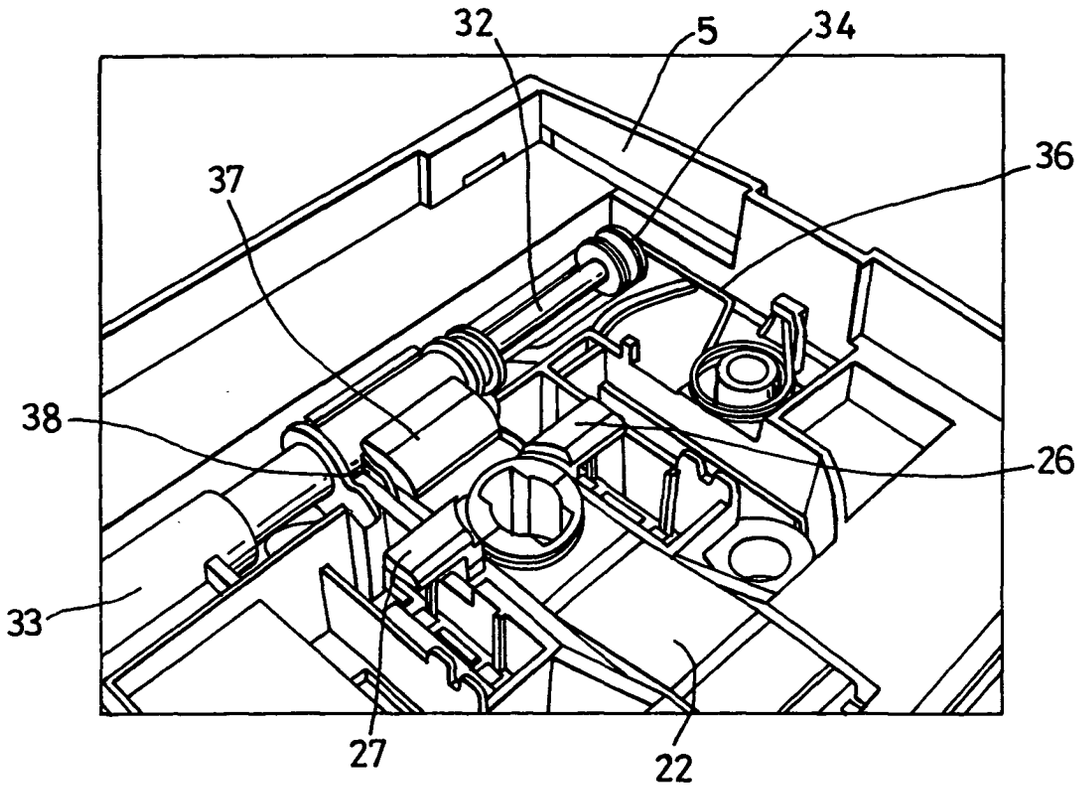

Fig. 5

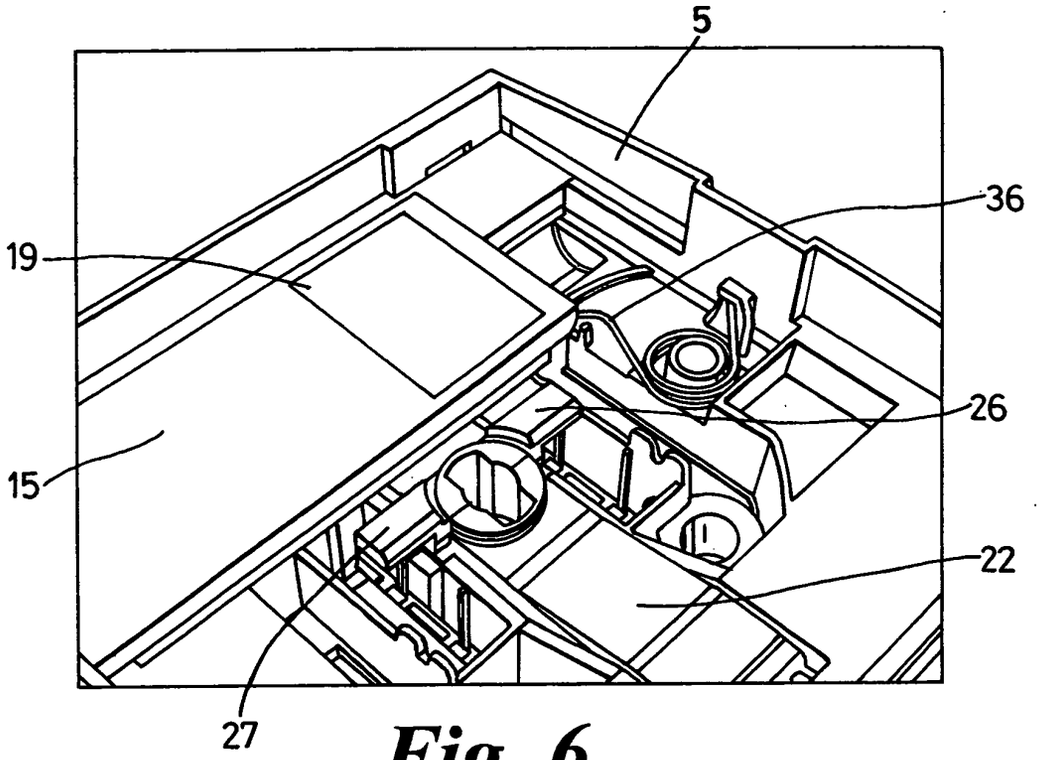

Fig. 6

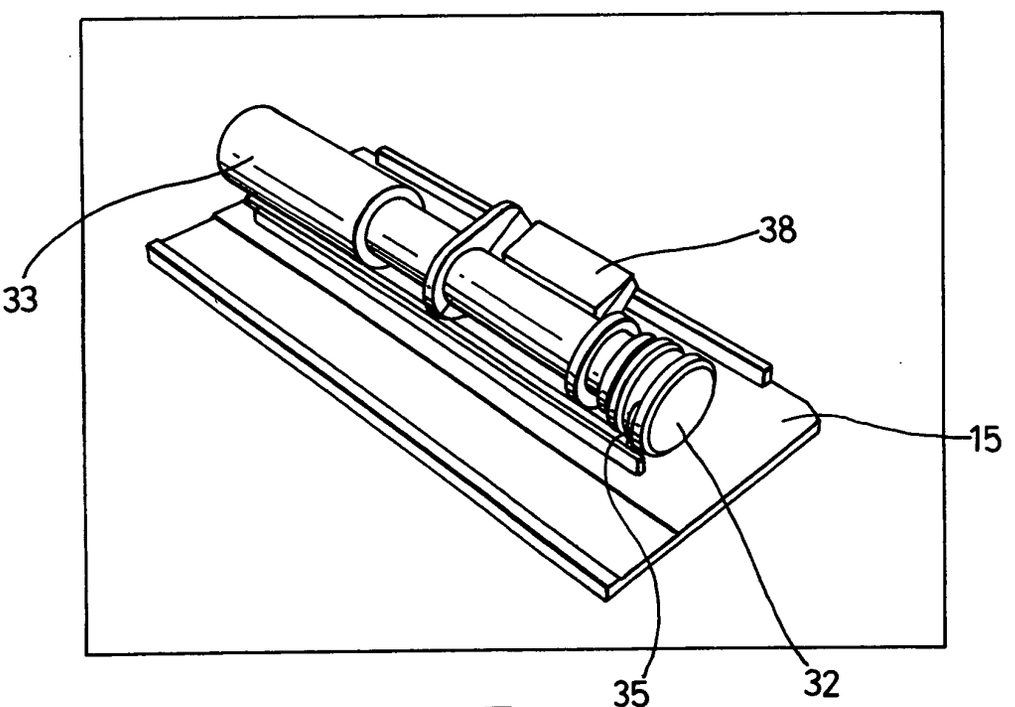

Fig. 7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 25 5903

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 February 2005	Sgura, S

CATEGORY OF CITED DOCUMENTS

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