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European Patent Office
Office européen des brevets

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Publication number:

**0 293 952
A1**

12

EUROPEAN PATENT APPLICATION

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Application number: **88200783.4**

51

Int. Cl.4: **E05B 63/00**

22

Date of filing: **22.04.88**

30

Priority: **22.04.87 NL 8700954**

43

Date of publication of application:
07.12.88 Bulletin 88/49

84

Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

71

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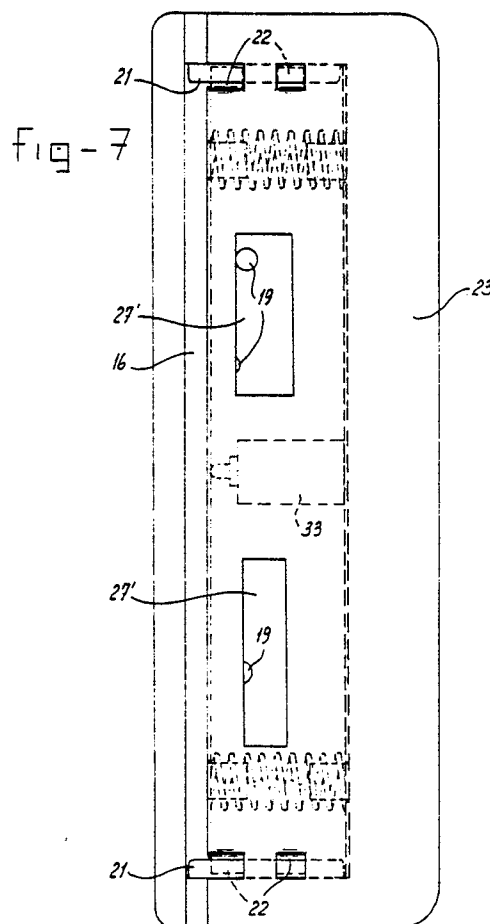
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Closing plate structure.

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The invention relates to a closing plate structure provided with a closing plate (1) which can move against pre-tensioning. The pre-tensioning is so great that in normal use the closing plate (1) is not moved, and is moved when there is an attempt to force a door locked by means of the closing plate. Through this limited movement of door and closing plate, a forcing means such as a crowbar largely loses its effectiveness. The displacement movement of the closing plate (1) can be used for setting off an alarm.



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Closing plate structure

The present invention relates to a closing plate structure which is provided with a closing plate with at least one opening for taking a bolt and which can be fitted on the frame of a panel containing the bolt.

Such a closing plate structure is used for door locks, and is generally provided with two holes. One hole here is to take the day bolt, while the other is to take the night bolt.

It has been found in practice that doors locked by means of such a closing plate structure can still be forced. If the night bolt is in its hole in the closing plate, it is slightly more difficult to force the door, but it is not impossible. For forcing a door, what is generally used is a crowbar placed with its pointed end in the gap between door and frame. The lever action of the crowbar thus introduced makes it possible for door and frame to be prized slightly apart. The distance over which this takes place is often sufficient to tip the bolt(s) out of the closing plate and to open the door.

The object of the invention is therefore to produce a closing plate structure of the type referred to in the preamble, with which it is considerably more difficult to force a locked door. This is achieved through the fact that it is provided with guide means which can be fixed to the frame and along which the closing plate can be moved to and fro in the swinging direction of the panel, and with pre-tensioning means to permit the closing plate to be pressed under pre-tensioning, against the swing-open direction of the panel, into the closing position relative to the guide means.

The pre-tensioned spring means in normal conditions hold the closing plate - and thus the door locked in the closing plate - securely fixed in the normal closed position. This means that the panel and the closing plate do not give way under the forces normally exerted on the panel, for example from leaning against the panel or from gusts of wind. However, if considerably greater forces are exerted on the panel, for example if a prizing-open moment is applied between panel and frame using a crowbar, door and closing plate can be moved against the spring pre-tensioning a little out of the frame. The consequence of this is that the long arm of the lever formed by the crowbar can be moved over such a great distance that its angular position relative to the panel, to which it originally stood approximately at right angles, changes considerably. This means first of all that it comes to rest flat against the panel or the surrounding structure, so that the moment exerted by the crowbar remains limited to the amount obtained in that position. In addition, the moment forces exerted

mutually on panel and frame change direction, so that the crowbar is less effective for tipping the bolt(s) out of the closing plate.

The closing plate structure is preferably designed in such a way that it is provided with a baseplate which can be fixed on the frame, and on which the closing plate is guided in the direction of swing of the panel, said baseplate having stop means against which the closing plate is held under pre-tensioning in the closed position, and with pre-tensioning means being provided between baseplate and closing plate. Such a closing plate structure forms a self-contained unit which can be fitted fully assembled on the frame. The structure is thicker than the known closing plate, so that the frame material has to be removed at suitable places to permit flush-mounting thereof.

According to a first embodiment, provision is made for the baseplate to be parallel to the closing plate, and opposite each hole in the closing plate to have a corresponding hole for the accommodation of a bolt, said baseplate hole(s) being of such dimensions that the bolt is movable therein in the direction of swing. At the site of the hole in the baseplate the frame material must here be removed to such an extent that the extended bolt can move over the desired distance in the direction in which the door swings out in the frame.

In connection with fitting of the spring means, provision is made for the baseplate to have a strip which runs at 90 degrees relative thereto and can be fitted against the frame rebate, the closing plate is provided with a pin which is at right angles to the strip and runs through a hole in the strip, and which can be inserted into a hole in the rebate and is provided with a stop ring at the end facing away from the closing plate, while there is a compression spring between the stop ring and the side of the strip facing it.

In order to ensure a suitable sliding guidance of the closing plate relative to the baseplate, at the edges of the bolt hole running parallel to the direction of movement of the closing plate provision is made for lips which project into the hole of the baseplate and are bent away from each other at the side thereof facing away from the closing plate. The frame material must also be removed to the desired degree at the place where these lips lie.

According to a second embodiment, the baseplate is provided on its four sides with upright edges facing the closing plate, the closing plate being slidably supported along a first pair of baseplate edges opposite each other and running in the direction of swing, the closing plate is provided with an upright edge which faces the

baseplate and which slides between the supporting baseplate edges and in the swing-open direction is on the rear side of the closing plate, while one or more compression springs are located between the side of the closing plate edge facing the closing plate and an opposite baseplate edge of the second pair of baseplate edges, in such a way that the closing plate edge is pressed under spring pre-tensioning with the side facing away from the closing plate towards the other of the second pair of baseplate edges.

The advantage of this design is that the box with four upright edges formed by the baseplate can be disposed in one recess in the frame. Besides, the bolt(s) projecting via the closing plate into this box is (are) protected from interference from the outside. With this design it is not possible to push a sharp object through the wood of the frame up to the bolts, in such a way that the latter could then be pushed in for opening the door.

The displacement of the closing plate when there is an attempted break-in can be taken further advantage of according to the invention through the fact that the closing plate is provided with means for operating an alarm when the closing plate is displaced.

The activation of an alarm when a break-in attempt is made and someone tries to force a door lock is already known per se from Dutch Patent Applications 8301465 and 8304082. The disadvantage of these known devices is, however, that there is a great chance of the lock or frame being damaged before the alarm goes off. According to the invention, break-in damage is largely avoided due to the limited giving-way of the door and the resulting limitation of the prizing-open moment which can be exerted.

In the first embodiment provision can be made in this connection for the baseplate to be provided at one end with an edge running at right angles to the baseplate and the strip, and provided with a groove which widens out in the swing-open direction, and which has sliding in it a cable with end thickened part which is at the side of the edge facing the closing plate, in such a way that when the closing plate is moved in the swing-open direction the end thickened part is slid along to the widened part of the groove, in which widened part the end thickened part can be pulled out of the groove for setting off an alarm.

In the second embodiment provision can be made between the edges on which the compression springs rest for an electrical push contact which goes into operation when said edges move towards each other.

The invention will be explained in greater detail below with reference to a number of embodiments.

Fig. 1 shows a dismantled view in perspective of a first embodiment of the closing plate structure.

Fig. 2 shows a cross section at a pin guide of the closing plate structure of Fig. 1, fitted in a frame.

Fig. 3 shows a bottom view of the closing plate structure according to Claim 2.

Fig. 4 shows the closing plate structure viewed against the swing-open direction.

Fig. 5 shows a second embodiment of the closing plate structure, partially cut away.

Fig. 6 shows cross section VI-VI of Fig. 5.

Fig. 7 shows a view corresponding to that of Fig. 5, in which the closing plate is slid in the swing-open direction.

The parts of a first embodiment of the closing plate structure shown in Fig. 1 are a closing plate 1, baseplate 2, pre-tensioning springs 3, stop rings 4, and pre-tensioning nuts 5. When these parts are assembled, the pins 6 fastened to the closing plate 1 are inserted through the holes 7 and the sleeves 8 fixed to the baseplate. The stop rings are slid round the pins 6, after which the pre-tensioning nuts 5 are tightened until the desired spring pre-tensioning is obtained.

The lips 11 which are obtained during formation of the bolt holes 9, 10 in the closing plate 1, and which can be seen best in Fig. 4, are then bent round the baseplate 2. This produces a cohesive unit, in which the lips 11 retain the closing plate 1 so that it slides on the baseplate 2. When the unit is assembled, holes 12, 13 in the baseplate are opposite the holes 9, 10 in the closing plate. As can also be seen clearly in Fig. 2, the baseplate holes 12, 13 are wider than the closing plate holes 9, 10. This makes it possible to move the closing plate 1 with lips 11 and the bolts inserted into the holes 9, 10 relative to the baseplate, against the spring tension of the springs 3. A suitable recess 15 must be provided for this in the frame 14 on which the closing plate structure is fixed, as shown in Fig. 2.

The baseplate is also provided with an edge 28, with a groove 29 which widens out in the swing-open direction. In this groove runs a cable 30 which is tightened by a spring (not shown), in such a way that the thickened part 31 at the end of the cable rests on the edge 28. The thickened part is also accommodated in a recess 32 in the closing plate 1. When the closing plate 1 is slid far enough the thickened part can be pulled through the widened part of the groove 29. This can set off an alarm unit connected to the cable.

In the second embodiment shown in Figs. 5 - 7 the closing plate structure comprises the box-shaped baseplate with bottom 16, upright edges 17 in the swing direction and upright edges 18 at right

angles thereto. This baseplate is fastened to a frame 20 by means of screws (not shown) pushed through the holes 19.

The edges 17 are provided with inward-bent guide ridges 21 mating with opposite sliding hooks 22 which are bent out of the closing plate 23. The closing plate 23 is also provided with an edge 24 projecting into the box-shaped baseplate. Pre-tensioning springs 25, held in place by lips 26 and 27 bent out of the edges 18 and 24 respectively, are disposed between said edge 24 and the front edge 18 of the baseplate in the swing-open direction of the panel.

As shown in Fig. 7, the closing plate 23 can slide against the spring force of the pre-tensioning springs 25, in the swing-open direction of a panel (not shown). The hooks 22 glide over the guide ridges 21 in the process. The force required for sliding is exerted by the panel by means of bolts (not shown) which are pushed into the bolt holes 27' of the closing plate 23.

As shown schematically in Figs. 5 and 7, provision can be made for an electrical push contact 33 which is set off during this sliding movement. An alarm unit can be set off by this push contact.

Claims

1. Closing plate structure which is provided with a closing plate with at least one opening for taking a bolt, and which can be fitted on the frame of a panel containing the bolt, **characterized in that** it is provided with guide means which can be fixed to the frame and along which the closing plate can be moved to and fro in the swinging direction of the panel, and with pre-tensioning means to permit the closing plate to be pressed under pre-tensioning, against the swing-open direction of the panel, into the closing position relative to the guide means.

2. Closing plate structure according to Claim 1, **characterized in that** it is provided with a baseplate which can be fixed on the frame, and on which the closing plate is guided in the direction of swing of the panel, said baseplate having stop means against which the closing plate is held under pre-tensioning in the closed position, and with pre-tensioning means being provided between baseplate and closing plate.

3. Closing plate structure according to Claim 2, **characterized in that** the baseplate is parallel to the closing plate, and opposite each hole in the closing plate has a corresponding hole for the accommodation of a bolt, said baseplate hole(s) being of such dimensions that the bolt is movable therein in the direction of swing.

4. Closing plate structure according to Claim 3, **characterized in that** the baseplate has a strip which runs at 90 degrees relative thereto and can be fitted against the frame rebate, the closing plate is provided with a pin which is at right angles to the strip and runs through a hole in the strip, and which can be inserted into a hole in the rebate and is provided with a stop ring at the end facing away from the closing plate, while there is a compression spring between the stop ring and the side of the strip facing it.

5. Closing plate structure according to Claim 4, **characterized in that** pin and compression spring are surrounded by a sleeve fixed to the baseplate.

6. Closing plate structure according to one of Claims 3 to 5, **characterized in that** at the edges of the bolt hole running parallel to the direction of movement of the closing plate provision is made for lips which project into the hole of the baseplate and are bent away from each other at the side thereof facing away from the closing plate.

7. Closing plate structure according to Claim 2, **characterized in that** the baseplate is provided on its four sides with upright edges facing the closing plate, the closing plate being slidably supported along a first pair of baseplate edges opposite each other and running in the direction of swing, the closing plate is provided with an upright edge which faces the baseplate and which can slide between the supporting baseplate edges and in the swing-open direction is on the rear side of the closing plate, while one or more compression springs are located between the side of the closing plate edge facing the closing plate and an opposite baseplate edge of the second pair of baseplate edges, in such a way that the closing plate edge is pressed under spring pre-tensioning with the side facing away from the closing plate towards the other of the second pair of baseplate edges.

8. Closing plate structure according to Claim 7, **characterized in that** in the swing-open direction the closing plate has on the front side a run-on face for a day bolt.

9. Closing plate structure according to one of Claims 1 to 8, **characterized in that** the closing plate is provided with means for setting off an alarm when the closing plate is moved.

10. Closing plate structure according to one of Claims 4 to 6 in conjunction with Claim 8, **characterized in that** the baseplate is provided at one end with an edge running at right angles to the baseplate and the strip, and provided with a groove which widens out in the swing-open direction, and which has sliding in it a cable with end thickened part which is at the side of the edge facing the closing plate, in such a way that when the closing plate is moved in the swing-open direction the end thickened part is slid along to the widened part of

the groove, in which widened part the end thickened part can be pulled out of the groove for setting off an alarm.

11. Closing plate structure according to Claims 7 and 8, **characterized in that** provision is made between the edges on which the compression springs rest for an electrical push contact which goes into operation when said edges move towards each other.

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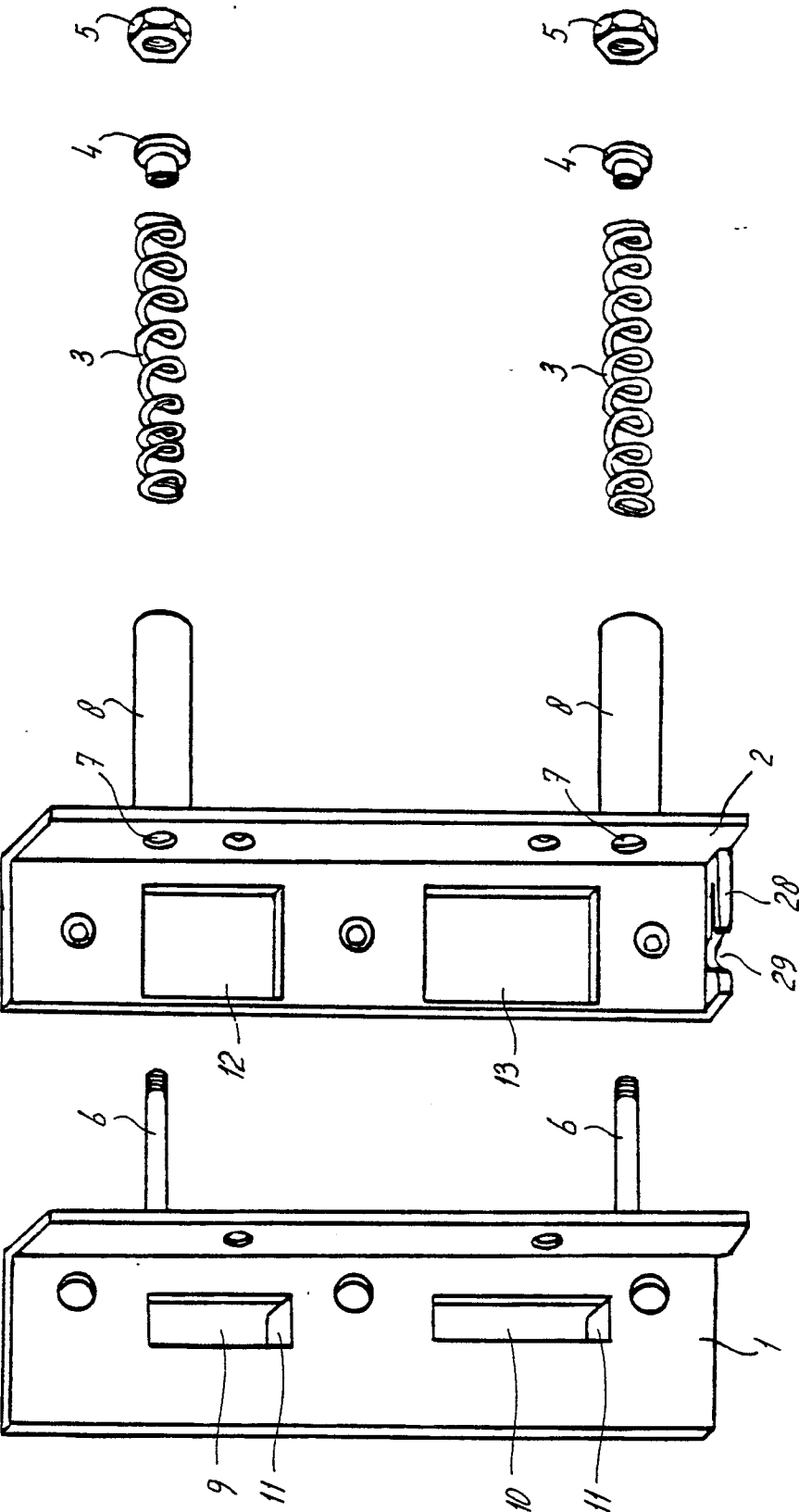
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fig-1



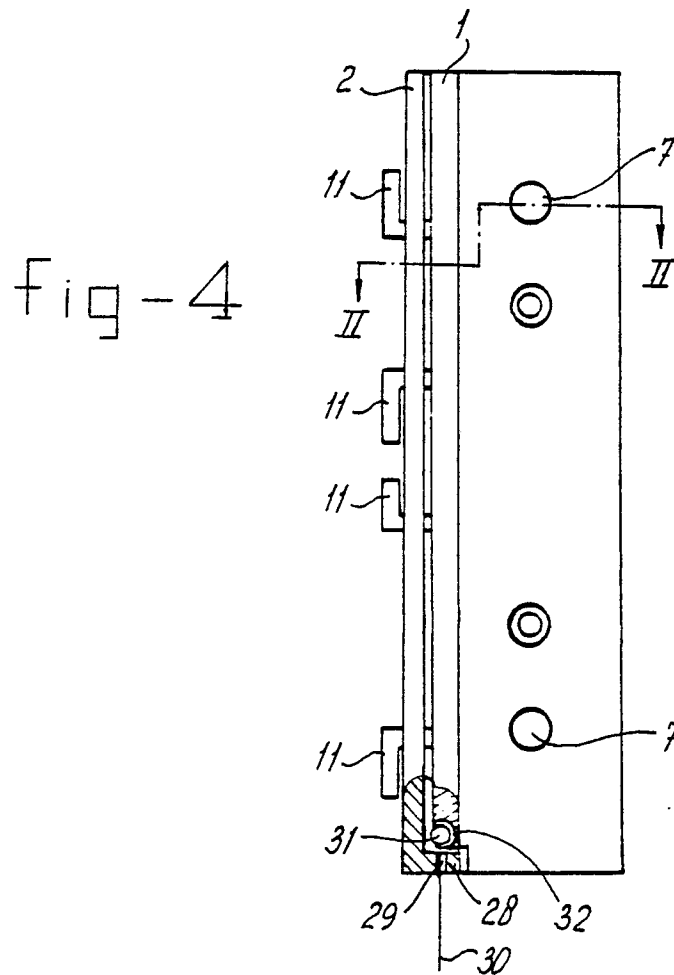
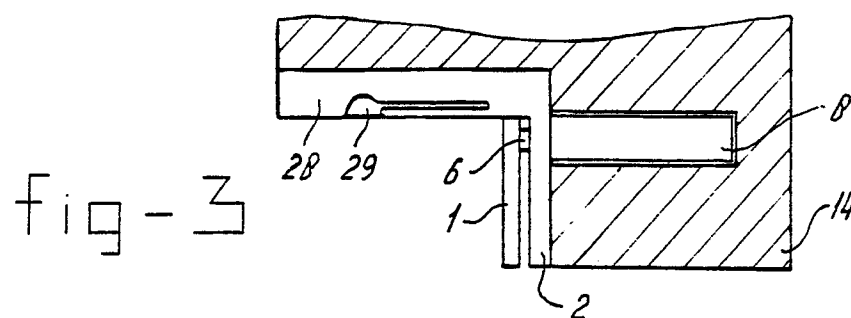
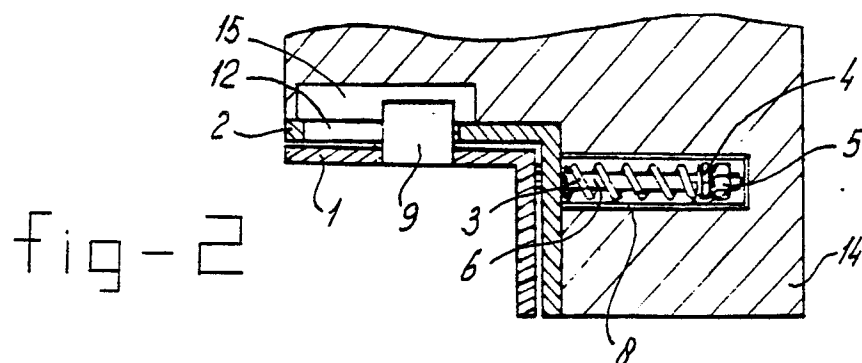


fig-5

fig-6

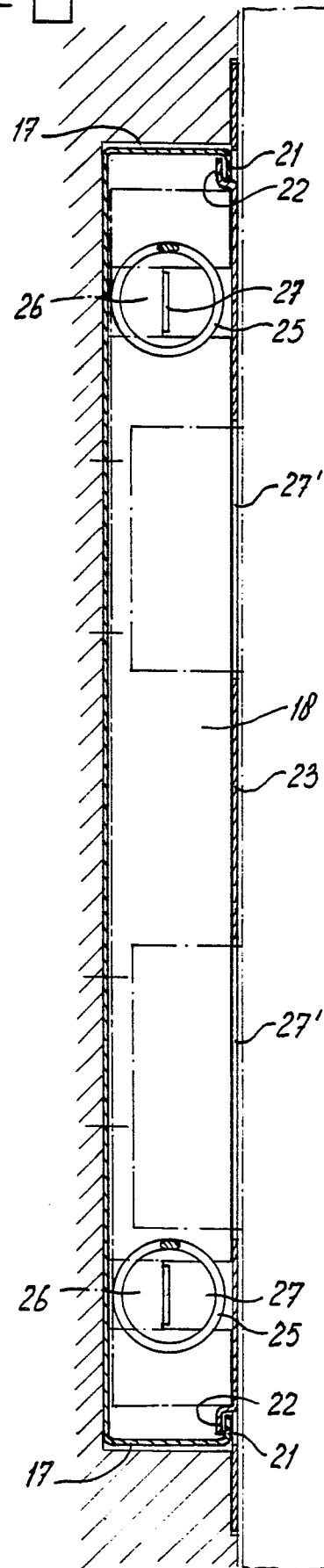
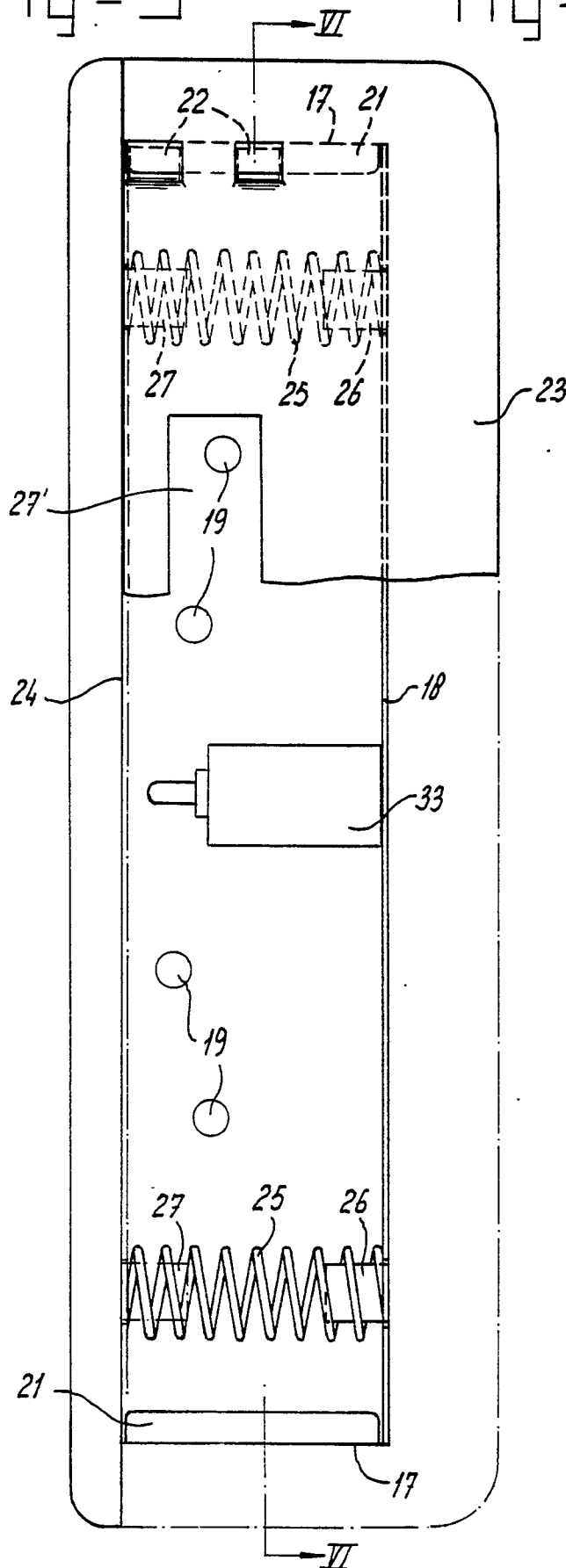
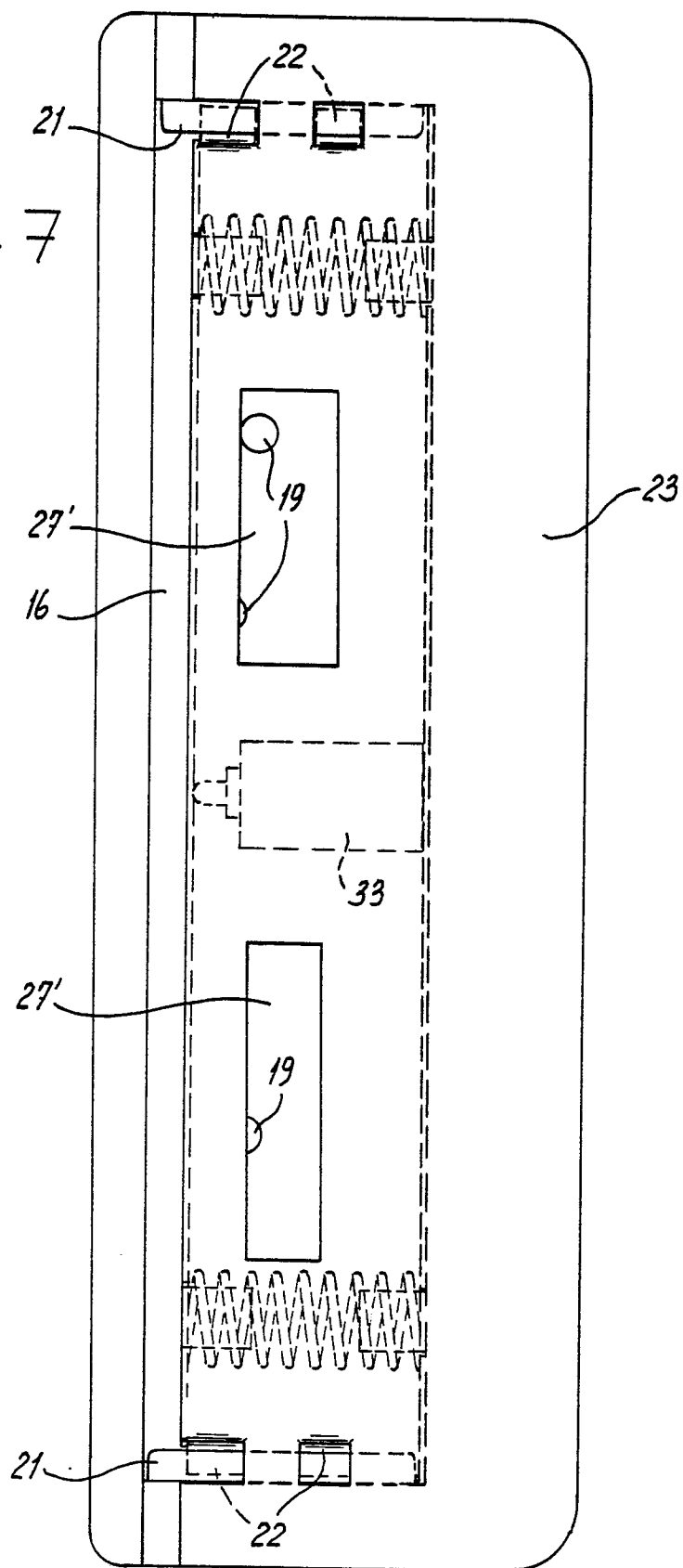


fig - 7





DOCUMENTS CONSIDERED TO BE RELEVANT			EP 88200783.4
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	DE - A1 - 2 900 632 (FA. ING. WINKHAUS) * Fig. 1-3; claims 1-12 * --	1-10	E 05 B 63/00
A	DE - A1 - 2 702 172 (CÜRTEN) * Fig. 1-3; claims 1-8 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			E 05 B
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 27-09-1988	Examiner CZASTKA
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			