

(19)



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Office européen des brevets



(11)

EP 0 635 611 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
21.01.1998 Bulletin 1998/04

(51) Int Cl.⁶: **E05B 63/20**, E05B 17/20,
E05B 65/10

(21) Application number: **94110746.8**

(22) Date of filing: **11.07.1994**

(54) **Device for locking the bolts actuated by the strike lock in a two-wing emergency door**

Zwei-flügelige Sicherheitstür mit Panikschlossgesteuerte Verriegelungsvorrichtung für Riegel

Dispositif de verrouillage pour pêne actionné par serrure anti-panique d'une porte à deux vantaux

(84) Designated Contracting States:
DE ES NL

(30) Priority: **21.07.1993 IT BO930329**

(43) Date of publication of application:
25.01.1995 Bulletin 1995/04

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**DE-C- 75 175 GB-A- 383 359
GB-A- 570 685 GB-A- 612 094
US-A- 1 629 641 US-A- 2 275 740
US-A- 2 908 523 US-A- 5 002 321**

EP 0 635 611 B1

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Description

The present invention relates to a device for locking the bolts actuated by the strike lock in a two-wing emergency door as set out in the first part of claim 1.

In emergency doors of this type, both wings open outwardly and the wing normally used to enter and exit (hereinafter termed wing A) is provided with a panic-safe lock which is designed so that the latch and the bolt can be moved simultaneously into the release position by operating the handle. The other wing (hereinafter termed wing B) acts as a rabbit for wing A and is provided with an upper and a lower bolts which are vertically slideable and connected, by means of rods, to a so-called panic-safe actuation strike lock that can be operated by means of an appropriate handle. The particularity of emergency doors of the above type is that the latch and the bolt of the lock installed on wing A engage seats of the strike lock of wing B, the mechanism whereof is preset so that if only the lock of wing A is operated, thus retracting the latch and the bolt, it is possible to open only wing A, since the strike lock keeps its bolts in locking position. In the strike lock of wing B instead there is an element which is expelled from the strike lock and acts within the mechanism of the lock of wing A, actuating the retraction of the latch and of the bolt. Therefore the actuation of the strike lock alone not only opens wing B but also opens wing A. In known emergency doors, the bolts of wing B, by means of a key-operated or lever-operated mechanism, are actuated from the closed position to the open position in contrast with return springs. When the wing is in open condition, if the thrust by means of the mechanism ceases, the springs push the bolts outwardly again. In particular, the lower bolt can descend and make contact with the floor. In order to prevent this, an appropriate device retains the rods. This device is installed at the exit point of the upper rod and is activated by the abutment of a mechanical sensor against the upper rail of the door. Devices of this type are disclosed in German patents no. 27 46 049, 29 12 881, and 35 35 344. It has been observed that these known devices are often the cause of problems due to their excessive bulk and to their troublesome installation. Another device is disclosed in European patent no. 348971. Said device has a limited bulk, but in order to retain the bolt there is an annular plate that loses its effectiveness as it wears.

GB-A-383 359 discloses a bolt locking device including a combination of elements as recited in the preamble of the appended claim 1, including in particular a pivoting catch piece arranged to engage with an abutment of a pivoting bolt head to retain the bolt head in an inward position. The catch piece is released by a spring-biased plunger projecting from the face of the door edge to engage with the door frame. The plunger is provided with an inclined slot with which engages a projection of the catch piece.

US-A-2 908 523 discloses a pivoting latch bolt dis-

posed adjacent a spring-biased slide member for retaining the latch bolt in a retracted position. The slide member includes an inclined camming face for engaging a strike of a door for sliding the slide member. The latch bolt is provided with a pin or roller which engages with a shoulder of an abutment of the slide member, when the latch bolt is in a projecting position, so as to retain the slide member in a retracted position. When the latch bolt is pivotally released into its retracted position, the slide member is released into a projecting position, and an abutment surface of the abutment of the slide member engages with the roller or pin of the latch bolt to retain the latch bolt in its retracted position, until the slide member engages the strike of the door whereupon the roller or pin is released for returning the latch bolt into its projecting position.

In both GB-A-383 359 and US-A-2 908 523, the bolts are engaged and retained in distinct singular positions assumed by the bolts.

The principal aim of the present invention is therefore to provide a device of the initially mentioned type which can obviate the shortcomings that can be noted in the known art.

The above mentioned problems are solved by the characterizing features stated in claim 1.

Further characteristics of the invention will become apparent from the dependent claims 2 to 7 and the following description of a preferred embodiment, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figures 1 and 2 are views of the device in two operating positions;

figure 3 is a partially sectional view of the device;

figure 4 is a partially sectional view of the device, taken along the plane IV-IV of figure 3;

figure 5 is a view of a different embodiment of the device.

With reference to the above figures, the device comprises a casing 1 which is composed of a substantially cylindrical cup 2 having respective plane-parallel regions 3 and 4 in opposite positions.

The cup 2 has a bottom 5 and, at the end opposite to the bottom 5, a flange 6 to which a quadrangular plate 7 is coupled.

Countersunk holes 8 for the passage of the screws by means of which the device is fixed to the wing of the door are formed at the corners of the plate 7 and of the flange 6. More specifically, the device is inserted in a cylindrical cavity 9 which is open on the upper edge 10 of the wing, so that the flat regions 3 and 4 are at right angles to the plane of said wing.

A hole 11 is formed in the bottom 5 and eccentrically with respect to the axis A of the cup; the bolt 12 is driven through said hole and engages in the lintel of the walled frame to lock the door in closed position.

The bolt 12 is constituted by a cylindrical rod which

is actuated by the strike lock in a manner that is beyond the scope of the present invention. The hole 11 through which the bolt passes is internally tangent to the cup 2, so that the bolt is in tangential contact with the inner wall of the cup along a line 13 which lies in the intermediate centerline plane P which is plane-parallel with respect to the flat regions 3 and 4.

The bolt 12 is actuated upwards by a spring, not shown, and is operatively associated with a lower bolt, also not shown, so that the actuation of the bolts occurs simultaneously.

The eccentric position of the bolt 12 allows to place a mechanical sensor 14 between said position and the wall of the cup which lies opposite to the contact point 13; said sensor 14 has the purpose of detecting the closed or open position of the door and consequently releasing or locking the bolt.

Said sensor 14 is constituted by an element having a substantially U-shaped cross-section which forms, by means of two wings 15 and 16, a semicylindrical channel 17 inside which the bolt 12 is guided.

The wings 15 and 16 are connected by a thicker portion 18 in which there is a hole 19 which lies at right angles to the axis A of the cup and is ovalized so as to intersect the channel 17.

A pin 20 is inserted in the hole 19, and its opposite ends engage in slots 21 and 22 formed in the flat regions 3 and 4 of the cup.

The slots 21 and 22 comprise a lower portion 23 which is parallel to the axis A of the cup and an upper portion 24 which is inclined so that by making the sensor 14 slide in the cup 2 the pin 20 moves transversely in the hole 19.

The end of the sensor 14 protruding from the cup 2 has a chamfer 25 which affects not only the portion 18 but also the wings 15 and 16 so as to form a sort of latch suitable to retract when the sensor strikes the lintel of the walled frame of the door.

The described device is completed by a spring 26 which acts by compression, is interposed between the bottom 5 and the sensor 14, and is partially accommodated in a recess 27 of the portion 18.

The operation of the described device will become apparent from figures 1 and 2.

Figures 2 and 3 illustrate the device in the condition in which the door is open, i.e. with the bolt 12 in retracted position. In a similar manner, the lower bolt, not shown, is in retracted position as well. Due to the action of the spring 26, the sensor 14 is pushed upwardly so that the pin 20, by following the profile of the slots 21 and 22, is moved laterally in the ovalized hole 19 and is forced against the bolt 12, which is thus locked in retracted position.

Instead, when the door is pushed into its closed position, the sensor 14, due to the abutment of the chamfer 25 against the lintel 28 of the door, is pushed so that it retracts into the cup 2, so as to space the pin 20 from the bolt 12 by means of the slots 21 and 22, thus allowing

said bolt to engage the selvage 29 of the lintel by virtue of the action of the spring which pushes it upwards. At the same time, the lower bolt also engages the selvage of the floor.

The invention perfectly achieves the intended aim.

In particular, it is noted that the device is easy to install and that by virtue of the chamfer 25 it can compensate for any differences in level between the lintel 28 and the upper edge 10 of the door wing.

According to a different embodiment of the device, shown in figure 5, a bracket 30 is rigidly coupled to the cup 2, extends downwardly, and supports a ring 31 which surrounds the bolt. A spring 33 is interposed between the ring 31 and a shoulder 32 of the bolt and expels the bolt when the sensor 14 abuts against the lintel 28.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Device for locking the bolts actuated by the strike lock in a two-wing emergency door, comprising a casing (1) adapted to be arranged in a seat (9) of the upper edge (10) of the wing on which the strike lock is applied, said casing (1) being provided with a hole (11) for the passage of the bolt (12), a sensor (14) being slideable in said casing, said sensor (14) being loaded by a spring (26), said sensor (14) comprising a pin (20) which is movable transversely to said sensor (14) in a hole (19) provided in said sensor (14) so as to lock the bolt (12) in retracted position when said sensor (14) is pushed out of said casing (1) by virtue of the action of said spring (26), the device being **characterized in that** the bolt is a sliding cylindrical rod (12) and the hole (19) in said sensor (14) extends into the path of the sliding cylindrical rod such that the pin (20) is releasably engageable with the surface of the sliding cylindrical rod, opposite ends of said pin (20) slidably engaging slots (21, 22) of said casing (1), and said slots (21, 22) being shaped for moving said pin (20) in said hole (19) of said sensor, and said sensor (14) having an end provided with a chamfer (25) for cooperating with a lintel (28) of a walled frame of the door.
2. Device according to claim 1, characterized in that said casing (1) comprises a cup (2) with a bottom (5) in which there is an eccentric hole (11) for the passage of said bolt (12) and a fixing flange (6) on the opposite side with respect to said bottom (5),

said cup (2) having two oppositely arranged flat regions (3, 4) in which said slots (21, 22) are formed.

3. Device according to claim 2, characterized in that said sensor (14) has a U-shaped cross-section with a portion which is guided between said bolt (12) and said cup (2) and with two wings (15, 16) that wrap around said bolt (12) and form a channel (17) for said bolt, said hole (19) being ovalized so as to intersect said channel (17) to act on said bolt (12) when said sensor (14) is in the position in which it is pushed out of said cup (2) by virtue of the action of said spring (26).
4. Device according to claim 3, characterized in that said slots (21, 22) which are engaged by the opposite ends of said pin (20) have a portion (23) which is parallel to the sliding direction of the sensor (14) and a portion (24) which is inclined so that during the stroke for pushing out the sensor (14) by virtue of the action of said spring (26), said pin (20) moves along said ovalized hole (19) to lock on said bolt (12).
5. Device according to any one or more of claims 2 to 4, characterized in that said passage hole (11) is arranged eccentrically in said cup (2), so that the bolt (12) is in tangential contact with the inner wall of the cup (2).
6. Device according to any one or more of claims 2 to 5, characterized in that the spring (26) which acts on said sensor (14) is partially accommodated in a recess (27) of said sensor and rests on the bottom (5) of the cup (2).
7. Device according to any one or more of claims 1 to 6, characterized in that it comprises a spring (33) which acts between a shoulder (32) of the bolt (12) and a ring (31) that surrounds said bolt and is fixed to said cup (2) by means of a bracket (30), said spring (33) being adapted to push out the bolt when said sensor (14) abuts in a door frame lintel (28).

Patentansprüche

1. Vorrichtung zum Verriegeln der durch ein Fallenschloß in einer zweiflügeligen Notausgangstür betätigten Riegel, mit einem Gehäuse (1), das in einem Sitz (9) der Oberkante (10) des das Fallenschloß tragenden Türflügels angeordnet werden kann, mit einem Loch (11) zum Durchgang des Riegels (12) versehen ist, und einen Sensor (14) verschiebbar enthält, der durch eine Feder (26) vorgespannt ist und einen quer zu dem Sensor (14) in einem Loch (19) in dem Sensor (14) bewegbaren Stift (20) zum Verriegeln des Riegels (12) in rück-

gezogener Position hat, wenn der Sensor (14) durch die Feder (26) aus dem Gehäuse (1) herausgedrückt wird, dadurch **gekennzeichnet**, daß der Riegel ein zylindrischer Schiebestab (12) ist, und daß das Loch (19) in dem Sensor (14) so am weg des zylindrischen Schiebestabes angeordnet ist, daß der Stift (20) lösbar mit der Oberfläche des zylindrischen Schiebestabes in Eingriff gebracht werden kann, wobei die beiden Enden des Stiftes (20) in Schlitzen (21, 22) des Gehäuses (1) verschiebbar geführt sind und die Schlitze (21, 22) zum Bewegen des Stiftes (20) in dem Loch (19) des Sensors geformt sind, und daß der Sensor (14) ein mit einer Schräge (25) versehenes Ende hat, das mit einem Türsturz (28) eines Türrahmens zusammenwirkt.

2. Vorrichtung nach Anspruch 1, dadurch **gekennzeichnet**, daß das Gehäuse (1) einen Becher (2) mit einem Boden (5) mit einem außermittigen Loch (11) für den Durchgang des Riegels (12) und einen Halteflansch (6) auf der dem Boden (5) gegenüberliegenden Seite hat, und daß der Becher (2) zwei einander gegenüberliegende flache Bereiche (3, 4) hat, in denen die Schlitze (21, 22) ausgebildet sind.
3. Vorrichtung nach Anspruch 2, dadurch **gekennzeichnet**, daß der Sensor (14) einen U-förmigen Querschnitt mit einem zwischen dem Riegel (12) und dem Becher (2) geführten Teil und mit zwei Flügeln (15, 16) hat, die um den Riegel (12) herumgebogen sind und einen Kanal (17) für den Riegel bilden, daß das Loch (19) oval ausgebildet ist, so daß es den Kanal (17) schneidet, um auf den Riegel (12) einzuwirken, wenn der Sensor (14) in der Position ist, in der er aus dem Becher (2) durch die Wirkung der Feder (26) herausgedrückt ist.
4. Vorrichtung nach Anspruch 3, dadurch **gekennzeichnet**, daß die Schlitze (21, 22), mit denen die beiden Enden des Stiftes (20) in Eingriff stehen, einen Teil (23) parallel zur Schieberichtung des Sensors (14) und einen geneigten Teil (24) haben, so daß während des Hubes zum Herausdrücken des Sensors (14) durch die Wirkung der Feder (26) der Stift (20) längs des ovalen Lochs (19) bewegt wird, um sich an dem Riegel (12) zu verriegeln.
5. Vorrichtung nach einem oder mehreren der Ansprüche 2 bis 4, dadurch **gekennzeichnet**, daß das Durchgangsloch (11) in dem Becher (2) außermittig angeordnet ist, so daß der Riegel (12) in tangentialer Berührung mit der Innenwand des Bechers (2) steht.
6. Vorrichtung nach einem oder mehreren der Ansprüche 2 bis 5, dadurch **gekennzeichnet**, daß die auf den Sensor (14) einwirkende Feder (26) teilweise

in einer Aussparung (27) des Sensors und auf dem Boden (5) des Bechers (2) sitzt.

7. Vorrichtung nach einem oder mehreren der Ansprüche 1 bis 6, dadurch **gekennzeichnet**, daß sie eine Feder (33) enthält, die zwischen einer Schulter (32) des Riegels (12) und einem Ring (31) wirkt, welcher den Riegel umgibt und an dem Becher (2) mit einer Halterung (30) befestigt ist, und daß die Feder (33) geeignet ist, den Riegel herauszudrücken, wenn der Sensor (14) an dem Türsturz (28) eines Türrahmens anliegt.

Revendications

1. Dispositif pour verrouiller les boulons actionnés par le verrou perceur dans une porte de secours à deux battants, comprenant un boîtier (1) adapté pour être disposé dans un siège (9) du bord supérieur (10) du battant sur lequel le verrou perceur est appliqué, ledit boîtier (1) comportant un trou (11) pour le passage du boulon (12), un palpeur (14) étant monté coulissant dans ledit boîtier, ledit palpeur (14) étant contraint par un ressort (26), ledit palpeur (14) comprenant une goupille (20) mobile transversalement par rapport audit palpeur (14) dans un trou (19) prévu dans ledit palpeur (14) de façon à verrouiller le boulon (12) en position rétractée lorsque ledit palpeur (14) est poussé hors dudit boîtier (1) sous l'action dudit ressort (26), le dispositif étant caractérisé en ce que le boulon est une tige cylindrique coulissante (12) et le trou (19) dans ledit palpeur (14) s'étend dans le trajet de la tige cylindrique coulissante de telle sorte que la goupille (20) puisse coopérer de manière libérable avec la surface de la tige cylindrique coulissante, des extrémités opposées de ladite goupille (20) venant au contact coulissant avec des fentes (21, 22) dudit boîtier (1), et lesdites fentes (21, 22) étant conformées pour déplacer ladite goupille (20) dans ledit trou (19) dudit palpeur, et ledit palpeur (14) ayant une extrémité munie d'un chanfrein (25) pour coopérer avec un linteau (28) d'un encadrement de la porte.
2. Dispositif selon la revendication 1, caractérisé en ce que ledit boîtier (1) comprend une coupelle (2) avec un fond (5) dans lequel est prévu un trou excentrique (11) pour le passage dudit boulon (12) et une bride de fixation (6) sur le côté opposé par rapport audit fond (5), ladite coupelle (2) possédant deux régions planes (3, 4) opposées dans lesquelles sont formées lesdites fentes (21, 22).
3. Dispositif selon la revendication 2, caractérisé en ce que ledit palpeur (14) possède une section transversale en forme de U avec une portion qui est guidée entre ledit boulon (12) et ladite coupelle (2) et avec deux ailes (15, 16) qui s'enroulent autour dudit boulon (12) et forment un canal (17) pour ledit boulon, ledit trou (19) étant ovalisé de manière à couper ledit canal (17) pour agir sur ledit boulon (12) lorsque ledit palpeur (14) est dans la position dans laquelle il est poussé hors de ladite coupelle (2) sous l'action dudit ressort (26).
4. Disposition selon la revendication 3, caractérisé en ce que lesdites fentes (21, 22) au contact desquelles viennent les extrémités opposées de ladite goupille (20) possèdent une portion (23) qui est parallèle à la direction de coulissement du palpeur (14) et une portion (24) qui est inclinée de telle manière que pendant la course pour pousser vers l'extérieur le palpeur (14) sous l'action dudit ressort (26), ledit boulon (20) se déplace le long dudit trou ovalisé (19) pour verrouiller ledit boulon (12).
5. Dispositif selon une ou plusieurs des revendications 2 à 4, caractérisé en ce que ledit trou de passage (11) est agencé de manière excentrique dans ladite coupelle (2) de telle sorte que le boulon (12) est en contact tangentiel avec la paroi interne de la coupelle (2).
6. Dispositif selon une ou plusieurs des revendications 2 à 5, caractérisé en ce que le ressort (26) qui agit sur ledit palpeur (14) est reçu partiellement dans un renforcement (27) dudit palpeur et s'appuie sur le fond (5) de la coupelle (2).
7. Dispositif selon un ou plusieurs des revendications 1 à 6, caractérisé en ce qu'il comprend un ressort (33) qui agit entre un épaulement (32) du boulon (12) et une bague (31) qui entoure ledit boulon et est fixée à ladite coupelle (2) au moyen d'une console (30), ledit ressort (33) étant adapté pour pousser le boulon vers l'extérieur lorsque ledit palpeur (14) vient buter contre le linteau (28) d'un encadrement de porte.

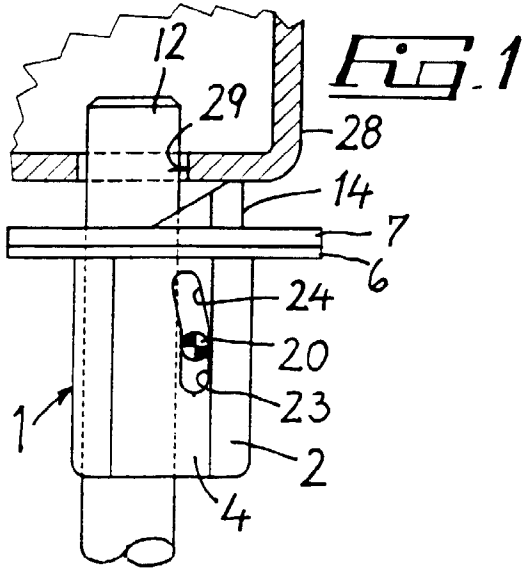


FIG. 2

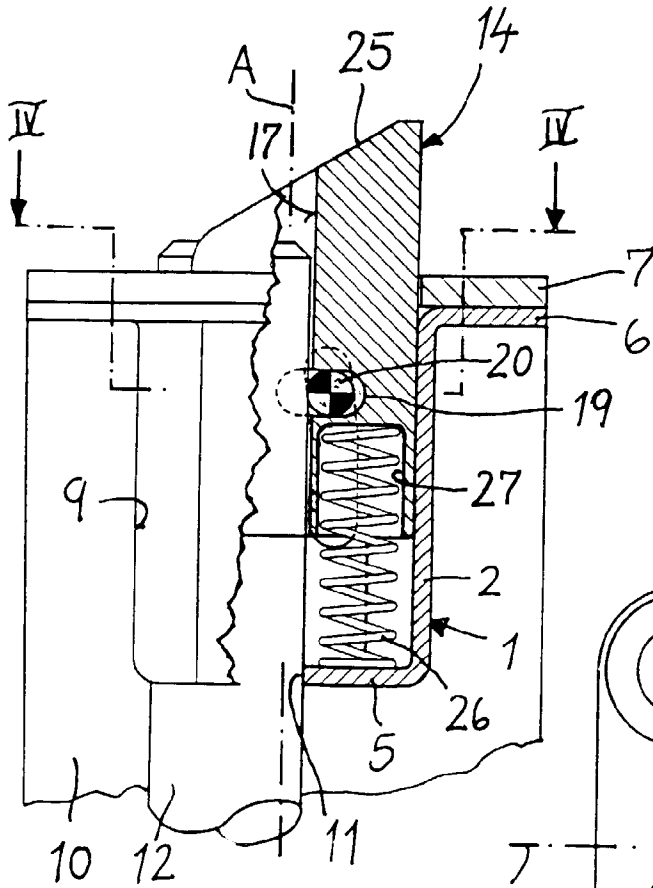
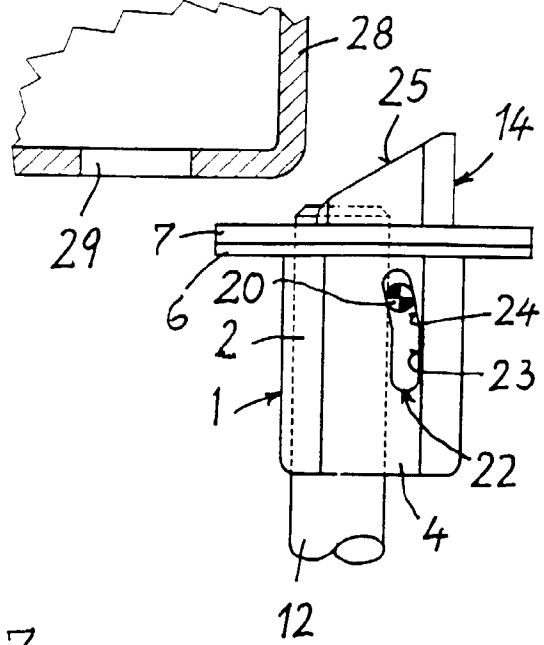
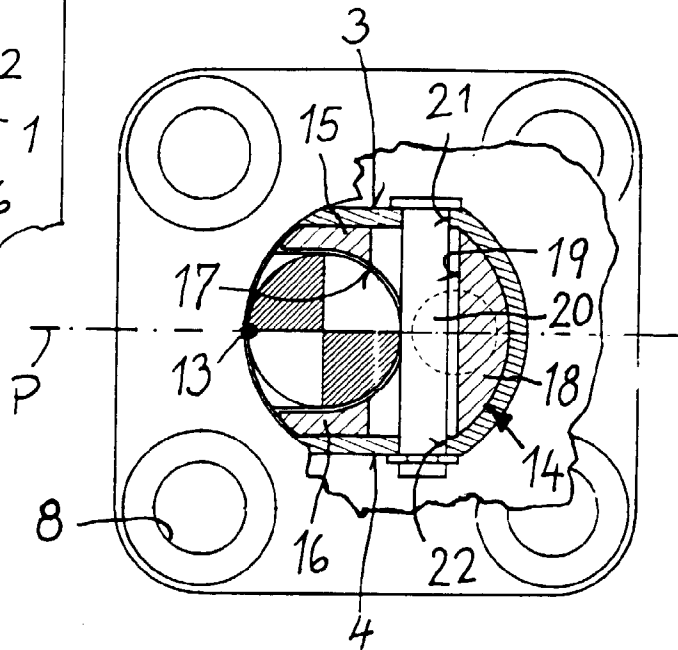


FIG. 3

FIG. 4



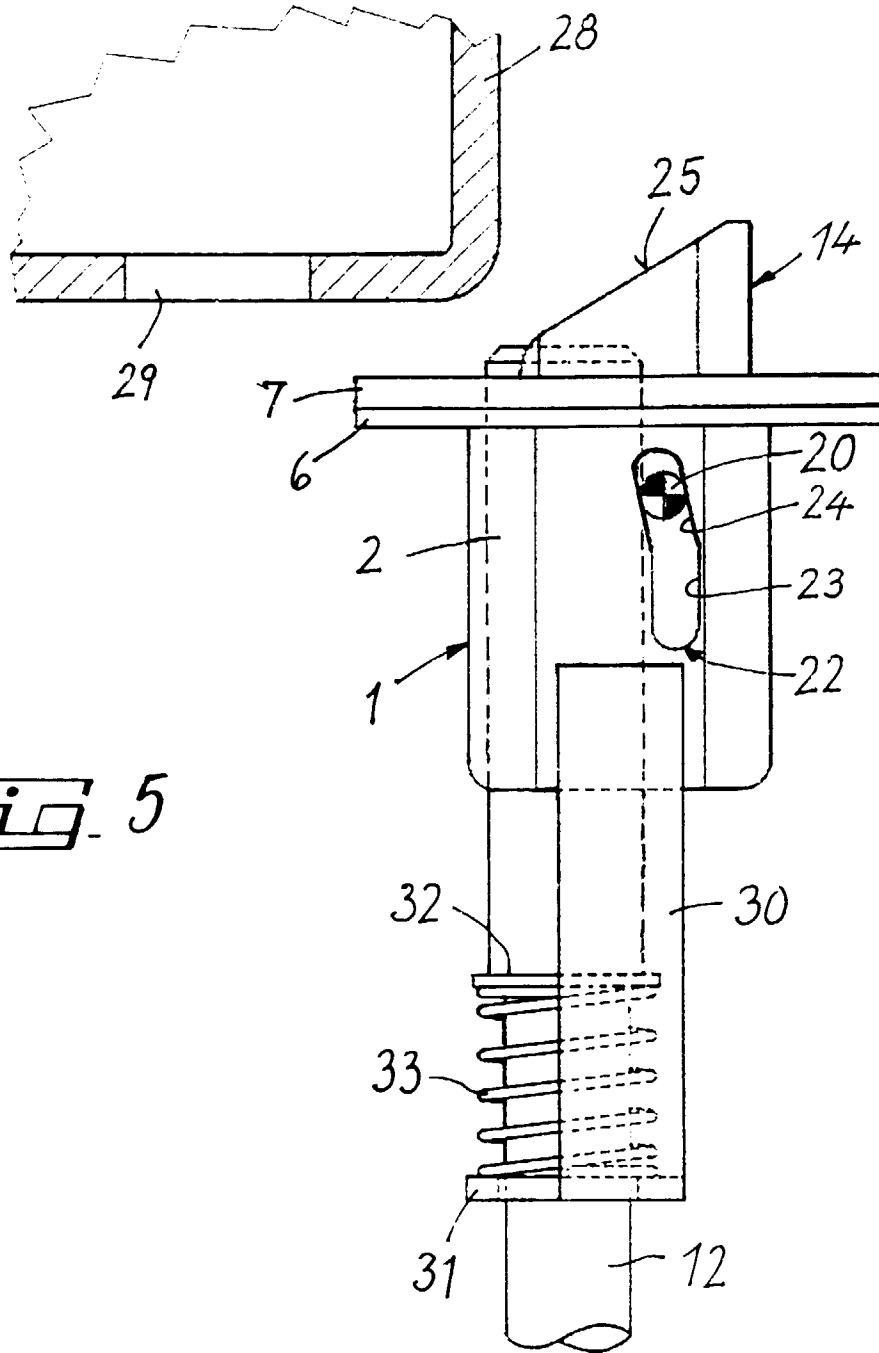


Fig. 5