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(12) # EUROPEAN PATENT SPECIFICATION

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Description

This invention relates to a combination of a device for the retention of the bolt shoot of an emergency exit door and a bolt shoot.

It is known that in many buildings, in particular those which are open to the public, the provision of special safety doors which can be opened easily from at least one side in the case of emergency, is often required. Doors of this type, which are also called "panic exits", are, for example, required for emergency exits in public buildings. Some locks used for these emergency exit doors are fitted with bolt shoots which slide vertically within the actual door; the bolt shoots, operated by special spring-loaded devices, are designed to fit into a special hole in the doorframe. The bolt shoots are moved into the lowered (open) position by means of an external mechanism (for example a panic bolt push-bar). An example of such an anti-panic system is known from WO 83/01644.

Such locks are often fitted with a retention device for holding the bolt shoot in the lowered position when the door is open. The retention device is usually moved by means of a mobile part between a withdrawn position inside the door area and an active position projecting from the door, for example adjacent to the bolt shoot.

When the door is closed, this mobile part is pushed down by coming into contact with the door head and the retention device is deactivated. When the door is opened this mobile part is sprung into the active, projecting position and retains the bolt shoot. Obviously, then the door is closed and the mobile part comes into contact with the door head, it is pushed into the lowered position again and frees the bolt shoot.

Retention devices already in use are not however without drawbacks which limit their effectiveness. In particular, some of them are of too large a size, and are not always acceptable in proportion to the dimensions of the door and its frame. Other models of retention devices require a great deal of precision during mounting to avoid preventing correct operation, which can lead to increased costs and risk of malfunction. For example, there have been complaints that the mobile part can jam in the closed position inside the bolt shoot guide, which may be manufactured with a slightly widened shape.

It is an object of the present invention to provide a retention device in which the above disadvantages are reduced or substantially obviated.

It is a further object of the invention to provide a retention device with a simple conception, sure reliable operation and versatile application.

The present invention provides a combination of a bolt shoot of an emergency exit door and a device for the retention of said bolt shoot, the device comprising a lever unit mounted for rotation about a horizontal axis between a lowered position and an active raised position, biasing means for biasing the lever unit into the active position; latch means formed on the lever unit and located in front of the bolt shoot according to the hand of the door, and adapted to project above the door when the lever unit is in the active position; characterised in that said lever unit further comprises a catch unit mounted on the lever unit which is adapted in the active position to engage a toothed section of the bolt shoot to prevent it from moving upwards.

An embodiment of a retention device according to the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a cross-section of an embodiment of the retention device, with the door in the open position, and

Figure 2 is a similar view with the door in the closed position

As is shown in these drawings, reference numeral (1) indicates the complete device for retaining the emergency exit bolt shoot (2).

The retention device (1) has a box-type housing (3), which is of an inverted U-shape, and has a hole (4) on the upper side (3a), through which the bolt shoot (2) passes freely.

This bolt shoot (2) is moved vertically in known manner by a suitable spring-loaded mechanism which is not illustrated.

Its upper end (2a) fits into a special socket (5) in the door head (6). The bolt shoot (2) is also guided by a collar (7) mounted on the outside of the housing (3).

Inside the housing (3), an oscillating lever unit (8) is mounted for rotation above a horizontal axis, by a pivot (9) which is mounted between the sides (3b) of the housing (3).

The free end of the lever unit (8) forms a latch (10) which extends upwards, in the median vertical plain of this lever (8), forming a bracket which holds the bolt shoot (2). The latch (10) is located in front of the bolt shoot (2), according to the hand of the door (indicated with an A in the illustration).

As will be further described later, in the active position, part of the end of the latch (10) protrudes from an opening (11) on the top side (3a) of the housing (3). This end section of the latch (10) forms an inclined plant (10a) which is opposite to the door hand A.

During rotation, a catch unit (13) attached to the lever unit by means of a transverse pin (12) also rotates above the pivot (9). The catch unit (13) comprises a bent U-shaped element and, in the active position, is adapted to engage a toothed section (14) of the bolt shoot (2) to prevent it from sliding upwards.

The toothing (14) on the bolt shoot (2) has a serrated profile, comprising a series of downwardly pointing conical teeth. The catch unit (13) is used to engage these teeth with the front edge of its underside (13a), which works essentially as a pawl.

The catch unit (13) and the lever (8) are moved together by a torsion spring (15) which is wound round the pivot (9) and is at one end hooked on to a bend (16) on the upper side (3a) of the housing (3). At the free end, the spring (15) acts on the rear edge of the underside (13a) of the catch unit (13), pushing the catch unit (13) into the active position.

In operation, when the door is opened by moving the bolt shoot (2) downwards, the latch (10) is no longer retained in its lowered position by the contact of its tip with the door head (6). The lever (8) can therefore rotate into the raised active position under the pressure of the spring (15). In this position, the pawl formed by the catch unit (13) engages one of the conical teeth of the serrated section (14) of the bolt shoot (2), locking the bolt shoot in the lowered position, against the force of the spring acting on the bolt shoot, as shown in Figure 1.

When the door is closed, the device moves in the opposite direction to A; the inclined plane (10a) of the latch (10) comes into contact with the edge of the door head (6) and is therefore compelled to withdraw. The lever (8) thus rotates into the lowered position, against the spring (15), freeing the bolt shoot (2) from the catch unit (13) and the bolt shoot (2) moves upwards into its slot (5) as shown in Figure 2.

In summary, this embodiment of a device according to the invention provides an excellent solution to the problem of the retention of emergency exit bolt shoots. It should be noted in particular that the location of the latch (10) in front of the bolt shoot (2) results in a reduction in overall dimensions, particularly with regard to the transverse axis, and makes easy, rapid mounting possible, since great precision is not required.

The device also has a very simple structure, which is an advantage for both effectiveness and manufacturing costs, as well as being very sturdy, so as to ensure adequate duration even when used continuously.

Claims

1. A combination of a bolt shoot (2) of an emergency exit door and a device (1) for the retention of said bolt shoot (2), the device comprising a lever unit (8) mounted for rotation about a horizontal axis between a lowered position and an active raised position, biasing means (15) for biasing the lever unit (8) into the active position; latch means (10) formed on the lever unit (8) and located in front of the bolt shoot (12) according to the hand of the door, and adapted to project above the door when the lever unit (8) is in the active position; characterised in that said lever unit further comprises a catch unit (13) mounted on the lever unit (8) which is adapted in the active position to engage a toothed section (14) of the bolt shoot (12) to prevent it from moving upwards.

2. A combination according to Claim 1 characterised in that the toothed section (14) comprises a series of downwardly pointing conical teeth for engagement with a pawl formed by the catch unit (13).

3. A combination according to Claim 1 or Claim 2 characterised in that the lever unit (8) forms a bracket which is rotated about a horizontal pivot (9) at one end and forms a latch (10) at the opposite end.

4. A combination according to any of Claims 1 to 3 characterised in that the catch unit (13) comprises a U-shaped component rotatable about the same axis as the lever unit (8) and adapted to engage the toothing (14) of the bolt shoot (2) with the front edge of its underside (13a).

5. A combination according to any of Claims 1 to 4 characterised in that the biasing means comprises a torsion spring (15) which is wound around a pivot (9) about which the lever unit (8) rotates and hooked on to the housing of the retention device at one end, the free end of the spring (15) acting upon the rear edge of the catch unit (13), so as to push the catch unit (13) into the active position.

Patentansprüche

1. Kombination eines Bolzens (bolt shoot) (2) einer Notausgangstür und einer Vorrichtung (1) für das Zurückhalten des Bolzens (2), wobei die Vorrichtung eine Hebeleinheit (8), die zwecks Rotation um eine horizontale Achse zwischen einer abgesenkten Position und einer aktiven angehobenen Position angeordnet ist, eine Vorspanneinrichtung (15) zum Vorspannen der Hebeleinheit (8) in die aktive Position, und eine Klinkeneinrichtung (10) umfaßt, welche an der Hebeleinheit (8) ausgebildet und vor dem Bolzen (2) entsprechend der Seite der Tür angeordnet ist und welche oberhalb der Tür abragen kann, wenn sich die Hebeleinheit (8) in der aktiven Position befindet,

   dadurch gekennzeichnet,

   daß die Hebeleinheit weiterhin eine Hakenein-

heit (13) umfaßt, welche an der Hebeleinheit (8) angeordnet ist und welche in der aktiven Position einen gezahnten Abschnitt (14) des Bolzens (2) ergreift, um ihn an einer Aufwärtsbewegung zu hindern.

2. Kombination nach Anspruch 1, dadurch gekennzeichnet, daß der gezahnte Abschnitt (14) eine Reihe von abwärts gerichteten konischen Zähnen zum Eingriff mit einer Klaue umfaßt, die von der Hakeneinheit (13) gebildet ist.

3. Kombination nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Hebeleinheit (8) einen Träger bildet, der an einem Ende um einen horizontalen Zapfen (9) drehbar ist und an dem entgegengesetzten Ende eine Klinke (10) bildet.

4. Kombination nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß die Hakeneinheit (13) ein U-förmiges Bauteil umfaßt, welches um die gleiche Achse wie die Hebeleinheit (8) drehbar ist und die Zahnung (14) des Bolzens (2) mit dem Vorderrand ihrer Unterseite (13a) ergreifen kann.

5. Kombination nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß die Vorspanneinrichtung eine Torsionsfeder (15) umfaßt, die um einen Zapfen (9) gewickelt ist, um welchen sich die Hebeleinheit (8) dreht und welche mit einem Ende an dem Gehäuse der Retentionsvorrichtung eingehakt ist, wobei das freie Ende der Feder (15) auf den rückwärtigen Rand der Hakeneinheit (13) wirkt, um letztere in die aktive Position zu drücken.

Revendications

1. Combinaison d'un pêne (2) d'une porte de sortie de secours et d'un dispositif (1) pour la rétention dudit pêne (2), le dispositif comprenant un ensemble à levier (8) monté pour pouvoir tourner autour d'un axe horizontal entre une position basse et une position active élevée, des moyens de sollicitation (15) pour solliciter l'ensemble à levier (8) vers sa position active; des moyens de verrouillage (10) formés sur l'ensemble à levier (8) et situés en face du pêne (12) en fonction de la poignée de la porte, et conçus pour se prolonger au-dessus de la porte lorsque l'ensemble à levier (8) se trouve en position active; caractérisée en ce que ledit ensemble à levier comprend en outre un ensemble à loquet (13) monté sur l'ensemble à levier (8) qui est conçu dans sa position active pour venir en prise avec une partie dentée (14) du pêne (12) pour éviter qu'il ne se déplace vers le haut.

2. Combinaison selon la revendication 1, caractérisée en ce que la partie dentée (14) comprend une série de dents coniques qui pointent vers le bas pour s'enclencher avec un cliquet formé par l'ensemble à loquet (13).

3. Combinaison selon la revendication 1 ou 2, caractérisée en ce que l'ensemble à levier (8) forme un bras qui est mis en rotation autour d'un axe horizontal (9) à l'une de ses extrémités et forme un verrou (10) à son extrémité opposée.

4. Combinaison selon l'une quelconque des revendications 1 à 3, caractérisée en ce que l'ensemble à loquet (13) comprend un composant en forme de U qui peut tourner autour du même axe que l'ensemble à levier (8) et qui est conçu pour s'enclencher avec les dents (14) du pêne (2), au moyen de la bordure frontale de sa partie de dessous (13a).

5. Combinaison selon l'une quelconque des revendications 1 à 4, caractérisée en ce que les moyens de sollicitation comprennent un ressort de torsion (15) qui est enroulé autour d'un axe (9) autour duquel l'ensemble à levier (8) tourne et qui est accroché au carter du dispositif de rétention à l'une de ses extrémités, l'extrémité libre du ressort (15) agissant sur la bordure arrière de l'ensemble à loquet (13), de manière à pousser l'ensemble à loquet (13) dans sa position active.

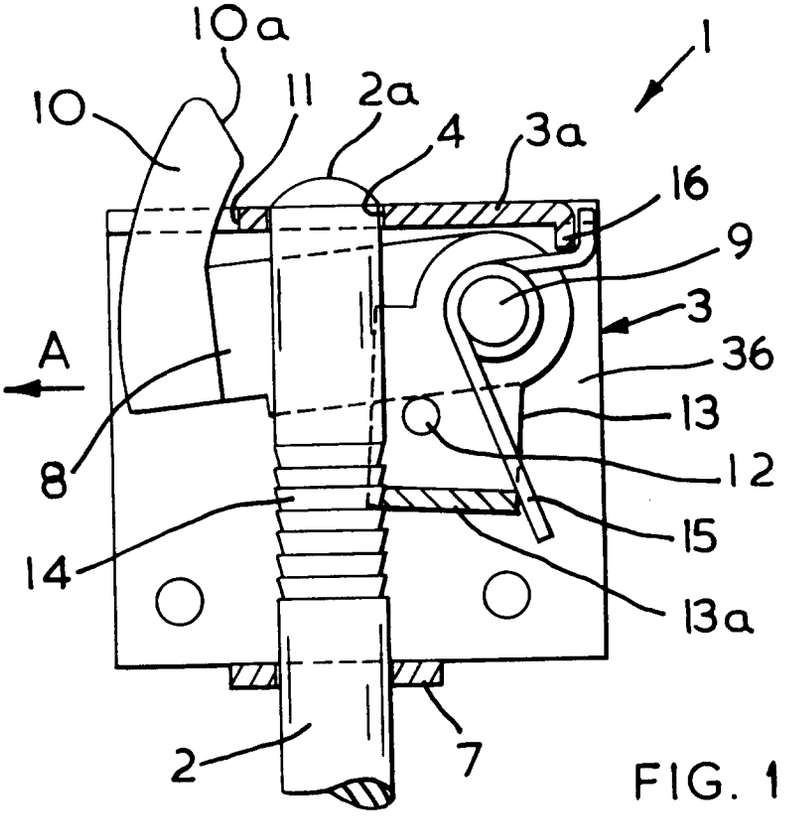


FIG. 1

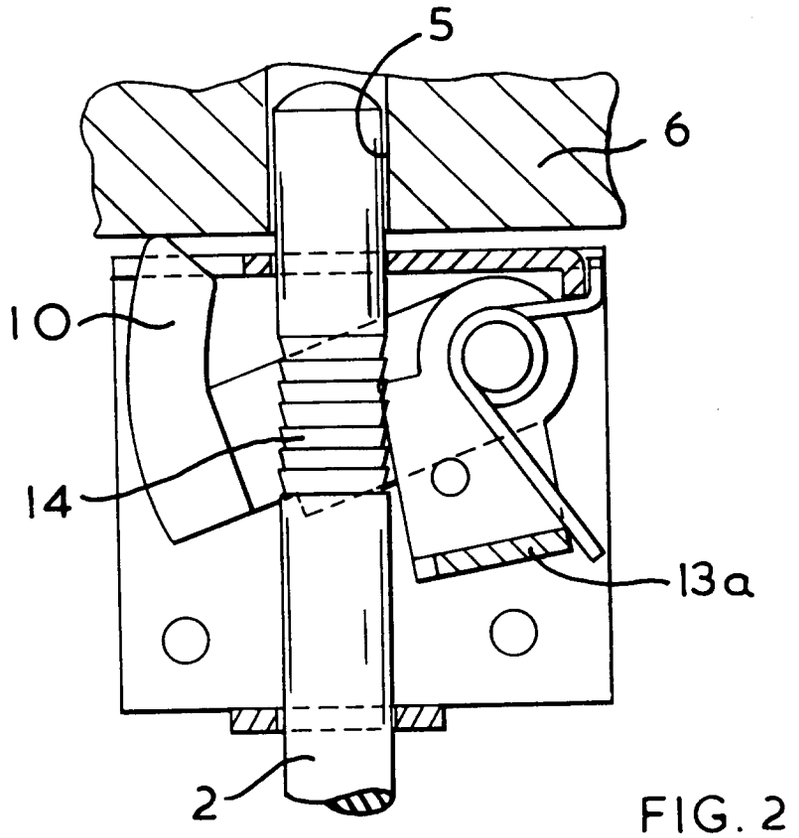


FIG. 2