Device for locking the bolts actuated by the strike lock in a two-wing emergency door.

Device for locking the bolts actuated by the strike lock in a two-wing emergency door including a casing (1) adapted to be arranged in a seat of the upper edge of the wing on which the strike lock is applied; the casing (1) is provided with a hole (11) for the passage of the bolt (12), and a sensor (14) is slideable in the casing; the sensor (14) is loaded by a spring (26) and has an end which is meant to cooperate with the lintel (28) of the walled frame of the door and has a chamfer (25); in the sensor there is a pin (20) which is movable transversely and the opposite ends whereof engage slots (21, 22) of the casing (1) which are shaped so as to lock the bolt (12) in retracted position when the sensor (14) is pushed out of the casing (1) by virtue of the action of the spring (26).
The present invention relates to a device for locking the bolts actuated by the strike lock in a two-wing emergency door.

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 rabbet 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. 2746049, 2912881, and 3535344. 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.

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.

With this aim in view, the invention provides a device the characteristics whereof are defined in the appended claims.

Further characteristics of the invention will become apparent from 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 centreline 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) and having an end provided with a chamfer (25) for cooperating with a lintel (28) of a walled frame of the door, characterized in that said sensor (14) comprises a pin (20) which is movable transversely to said sensor (14), opposite ends of said pin (20) engaging slots (21, 22) of said casing (1), and said slots (21, 22) being shaped 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).

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 pin (20) being accommodated in a hole (19) which is 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 one 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 one 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 one 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).
## DOCUMENTS CONSIDERED TO BE RELEVANT

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<tr>
<th>Category</th>
<th>Citation of document with indication, where appropriate, of relevant passages</th>
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The present search report has been drawn up for all claims

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<td>THE HAGUE</td>
<td>26 October 1994</td>
<td>Henkes, R</td>
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### CATEGORY OF CITED DOCUMENTS

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