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⑤④ **Concealed door release mechanism.**

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GB-A-2 111 113
US-A-4 181 338

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Description

Technical field

This invention relates to security devices, and more particularly to a concealed door release mechanism for doors utilizing latch bolts, of the type indicated in the first part of claim 1 (and likewise known from US—A—4 181 338).

Background art

In security devices it is desirable to automatically release locks having latch bolts or guarded latch bolts. Such bolts are carried by a door and are received in a strike which is closed by a jamb. Previously developed automatically released devices have required modification of the lip of the jamb in which the release mechanism was mounted. In addition, such prior devices were vulnerable to attack at the point where the release mechanism was exposed outside the door jamb.

The above cited US—A—4 181 338 discloses a jamb mounted strike assembly cooperative with door locks or latches having movable latch bolts. The strike assembly is for capturing and securing a door in a closed position over a related doorway and has an inbuilt capability of automatically releasing the bolt means under impact to provide emergency door opening operation.

The object of the invention is to provide a door release mechanism of the type disclosed in US—A—4 181 338, which is automatically actuated through operation of a solenoid and which is concealed within a door jamb thereby rendering the release mechanism invulnerable to attack.

In accordance with the present invention a door release mechanism for a door having a latch bolt is provided, said mechanism comprising:

a strike block adapted to receive the latch bolt and having a ramped surface over which the latch bolt travels, for urging the latch bolt into the door to thereby open the door; said ramped surface including a slotted aperture; a pivoting keeper disposed within said slotted aperture for preventing the latch bolt from travelling over said ramped surface to maintain the door in a closed position. The invention is characterized by: a dogging member pivotally attached to said keeper within the slotted aperture and adapted to engage the latch bolt; a lever member pivotally attached to said dogging member; and means attached to the strike block for actuating said lever member thereby allowing said dogging member and said keeper to pivot within the strike block and to withdraw from said aperture.

Brief description of the drawings

For a more complete understanding of the present invention and for further advantages thereof, reference is now made to the following Detailed Description taken in conjunction with the accompanying Drawings in which:

Figure 1 is a perspective view of the present door release mechanism;

Figure 2 is a side elevational view of the door

release mechanism shown in Figure 1 in the closed and locked position; and

Figure 3 is a side elevational view of the door release mechanism shown in Figure 1 in the open and unlocked position.

Detailed description

Referring simultaneously to Figures 1 and 2, the present door release mechanism is illustrated and is generally identified by the numeral 10. Door release mechanism 10 is mounted within a strike block 12 which is covered by a strike plate 14. Strike plate 14 includes apertures 16 for mounting strike plate 14 and strike block 12 to a door jamb (not shown). Strike block 12 is mounted to strike plate 14 utilizing screws 20.

Strike block 12 receives a latch bolt 22 carried by a door 24 when door 24 is in the closed position. Latch bolt 22 is retracted within door 24 as door 24 is opened. Latch bolt 22 is spring loaded and is extended into strike block 12 when door 24 is closed.

Disposed within strike block 12 is a ramped surface 26 over which latch bolt 22 travels. Also included within strike block 12 and disposed within a slot 28 within ramped surface 26 is a keeper mechanism 30. Keeper mechanism 30 is pivotable about pin 32 within strike block 12. As illustrated in Figure 2, keeper mechanism 30 is in the closed position such that latch bolt 22 is positioned below keeper mechanism 30 at the bottom end of ramped surface 26.

Interconnected to strike block 12 is a solenoid 36 which when actuated causes keeper mechanism 30 to be retracted within strike block 12 as latch bolt 22 moves across ramped surface 26 from the bottom end of ramped surface 26 to the top end thereof. Such movement thereby enables door 24 to open. In the open position of door 24, keeper mechanism 30 automatically returns to the position illustrated in Figure 2.

Referring more specifically to Figure 2, associated with pin 32 is a return spring 40 which maintains keeper mechanism 30 in the position as illustrated in Figure 2. Interconnected to keeper mechanism 30 is a channel-like dogging member 42 which is pivotally interconnected to keeper mechanism 30 via a pin 44. Also mounted on pin 44 is a roller 46. Pivotaly interconnected to dogging member 42 is a lever member 48 via a pin 50. When solenoid 36 is energized, members 42 and 48 pivot to allow keeper mechanism 30 to pivot in a clockwise direction about pin 32. As latch bolt 22 moves up ramped surface 26, it is simultaneously forced into door 24 thus releasing door 24 near the end of travel of latch bolt 22. A short continuation of ramped surface 26 is provided by a bevel 56 on the opening in strike plate 14. A slight bevel 22a may be provided on latch bolt 22 to provide a smoother operation of latch bolt 22 as it travels over ramped surface 26.

Referring simultaneously to Figures 2 and 3, Figure 2 illustrates keeper mechanism 30 in the closed position while Figure 3 illustrates keeper mechanism 30 in the open position. In the open

position of keeper mechanism 30, keeper mechanism 30 is biased to its full counter-clockwise position around pin 32 with members 42 and 48 horizontally disposed. Return spring 40 biases keeper mechanism 30 to the closed position as illustrated in Figure 2.

A bias spring 60 also extends around pin 32 and engages dogging member 42. Bias spring 60 maintains dogging member 42 in its fully counter-clockwise position about pin 44. A torsion spring 62 is mounted around pin 50 to hold lever member 48 in its fully clockwise position about pin 50. Torsion spring 62 may be held within a groove in level member 48. Springs 40, 60 and 62, bias keeper mechanism 30, dogging member 42 and lever member 48 in the position shown in Figure 2.

A push plunger 66 extends from solenoid 36 into strike block 12 when solenoid 36 is electrically energized. When solenoid 36 is energized, push plunger 66 engages pin 50 interconnecting dogging member 42 and lever member 48 to allow keeper mechanism 30 to move to a slightly less than perpendicular position within strike block 12. Latch bolt 22 is then free to move up ramped surface 26 and into a fully released condition as illustrated in Figure 3. Roller 46 mounted to pin 44 provides for a smoother operation of keeper mechanism 30 as latch bolt 22 retracts keeper mechanism 30 into strike block 12 out of the path of ramped surface 26 to allow latch bolt 22 to completely retract within door 24.

Once latch bolt 22 has cleared keeper mechanism 30, keeper mechanism 30 will automatically return to the closed and locked position due to springs 40, 60 and 62 to the position illustrated in Figure 2. When door 24 is again closed, strike plate 14 forces latch bolt 22 back into door 24. Latch bolt 22 stays within door 24 until latch bolt 22 has cleared keeper mechanism 30 at which time latch bolt 22 due to the spring loading forces on latch bolt 22 reenters strike block 12 below dogging member 42 as illustrated in Figure 2.

A fail-safe operation of the present door release mechanism 10 can be accomplished by changing the operation of solenoid 36 from a push solenoid to a spring loaded pull solenoid. In the unpowered condition, push plunger 66 is spring loaded to pin 50. When power is applied, push plunger 66 moves out of the way and dogging member 42 and lever member 48 are locked.

It therefore can be seen that the present invention provides for a door release mechanism that is substantially concealed and not visible when the door is closed. The present release mechanism is automatically actuated through operation of a solenoid thereby rendering the present release mechanism invulnerable to attack.

Whereas the present invention has been described with respect to specific embodiments thereof, it will be understood that various changes and modifications will be suggested to one skilled in the art and it is intended to encompass such changes and modifications as fall within the scope of the appended claims.

Claims

1. A door release mechanism (10) for a door (24) having a latch bolt (22), comprising:

a strike block (12) adapted to receive the latch bolt (22) and having a ramped surface (26) over which the latch bolt (22) travels, for urging the latch bolt into the door to thereby open the door; said ramped surface (26) including a slotted aperture;

a pivoting keeper (30) disposed within said slotted aperture for preventing the latch bolt (22) from travelling over said ramped surface (26) to maintain the door in a closed position;

characterized by:

—a dogging member (42) pivotally attached to said keeper within the slotted aperture and adapted to engage the latch bolt (22)

—a lever member (48) pivotally attached to said dogging member (42) and

—means (36) attached to the strike block (12) for actuating said lever member (48) thereby allowing said dogging member (42) and said keeper (30) to pivot within the strike block (12) and to withdraw from said aperture (28).

2. The door release mechanism (10) of Claim 1, further characterized by means (40, 60) for biasing said keeper (30) and said dogging member (42) within said slotted aperture (28).

3. The door release mechanism of Claim 2, further characterized by means (62) for biasing said lever member (48) in alignment with said dogging member (42).

4. The door release mechanism of Claim 1, wherein said means (36) for actuating said lever member (48) includes an electromagnetic solenoid (36).

Patentansprüche

1. Türfreigabemechanismus (10) für eine Tür (24), die eine Falle (22) aufweist, mit:

—einem Schließblock (12), der zur Aufnahme der Falle (22) gestaltet ist und eine schräge Fläche (26) besitzt, über die die Falle (22) gleitet, um diese in die Tür zu drücken und dadurch die Tür zu öffnen;

—wobei die schräge Fläche (26) eine geschlitzte Öffnung aufweist;

—einem schwenkbaren Riegel (30), der in der geschlitzten Öffnung angeordnet ist und der dazu dient, die Falle (22) am Gleiten über die schräge Fläche (26) zu hindern, damit die Tür in geschlossener Lage gehalten wird;

gekennzeichnet durch:

—ein Anschlagteil (42), das schwenkbar an den Riegel in der geschlitzten Öffnung angeordnet und so gestaltet ist, daß es die Falle (22) erfaßt,

—ein Hebelement (48), das schwenkbar an dem Anschlagteil (42) angebracht ist; und

—Mittel (36), die an dem Schließblock (12) angebracht sind, um das Hebelement (48) zu betätigen und dadurch zu gestatten, daß das Anschlagteil (42) und der Riegel (30) in dem Schließblock (12) schwenken und aus der Öffnung (28) zurück-

gezogen werden.

2. Türfreigabemechanismus (10) nach Anspruch 1, ferner gekennzeichnet durch Mittel (40, 60) zum Vorspannen des Riegels (30) und des Anschlagteils (42) in der geschlitzten Öffnung (28).

3. Türfreigabemechanismus nach Anspruch 2, ferner gekennzeichnet durch Mittel (62) zum Vorspannen des Hebelteils (48) in Ausrichtung mit dem Anschlagteil (42).

4. Türfreigabemechanismus nach Anspruch 1, wobei das Mittel (36) zum Betätigen des Hebelteils (48) einen elektrischen Hubmagneten (36) aufweist.

Revendications

1. Mécanisme de libération de porte (10) pour une porte (24) comportant un pêne demi-tour (22), comportant un pêne demi-tour, ce mécanisme comprenant, d'une part, un block de gâche (12) destiné à recevoir le pêne demi-tour (22) et présentant une surface en forme de rampe (26) sur laquelle se déplace ce pêne demi-tour (22), de façon à repousser celui-ci dans la porte afin d'ouvrir ainsi cette dernière, ladite surface en forme de rampe (26) comportant une ouverture fendue, et, d'autre part, une gâche pivotante (30)

disposée à l'intérieur de cette ouverture fendue afin d'empêcher le pêne demi-tour (22) de se déplacer sur la surface en forme de rampe (26) dans le but de maintenir la porte dans une position fermée, caractérisé par une pièce d'arrêt (42) montée pivotante sur la gâche, à l'intérieur de l'ouverture fendue, et destinée à coopérer avec le pêne demi-tour (22), une pièce formant levier (48) montée pivotante sur cette pièce d'arrêt (42) et des moyens (36) montés sur le bloc de gâche (12) en vue d'actionner cette pièce formant levier (48), en permettant ainsi à la pièce d'arrêt (42) et à la gâche (30) de pivoter à l'intérieur du block de gâche (12) et de s'effacer de ladite ouverture (28).

2. Mécanisme de libération de porte (10) de la revendication 1, caractérisé en outre par des moyens (40, 60) permettant de repousser élastiquement la gâche (30) et la pièce d'arrêt (42) à l'intérieur de l'ouverture fendue (28).

3. Mécanisme de libération de porte de la revendication 2, caractérisé en outre par des moyens (62) permettant de repousser élastiquement la pièce formant levier (48) dans l'alignement de la pièce d'arrêt (42).

4. Mécanisme de libération de porte de la revendication 1, dans lequel les moyens (36) d'actionnement de la pièce formant levier (48) sont constitués par un électro-aimant à plongeur (36).

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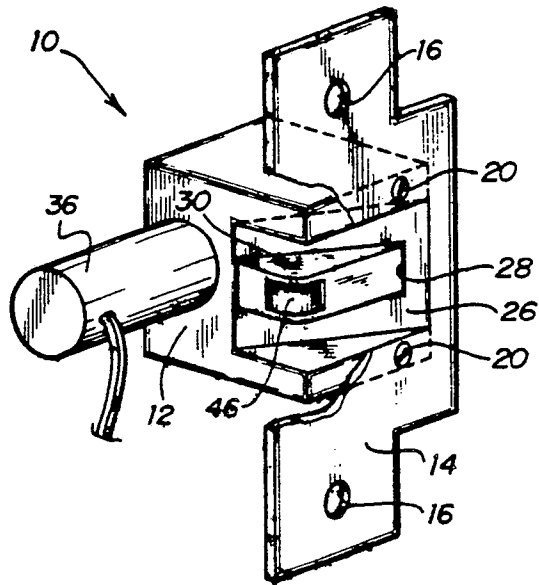


FIG. 1

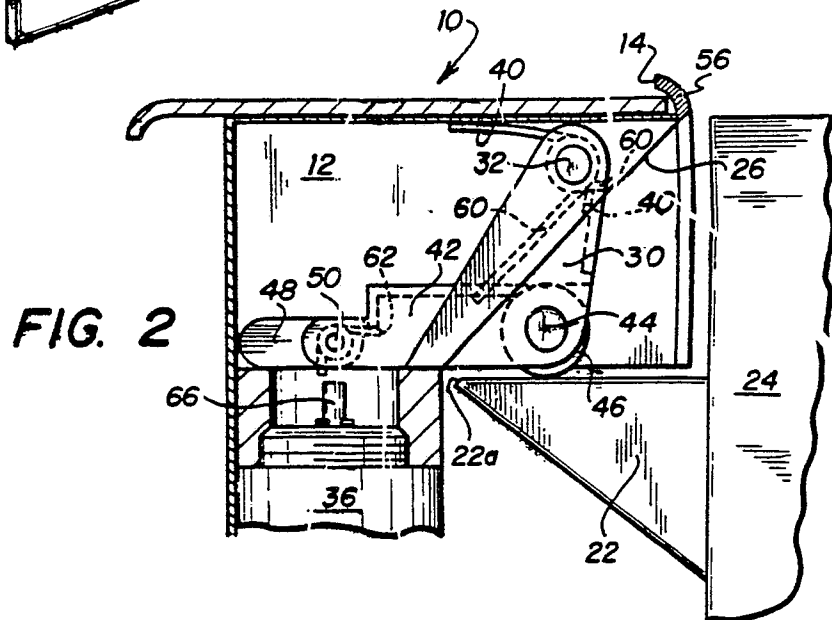


FIG. 2

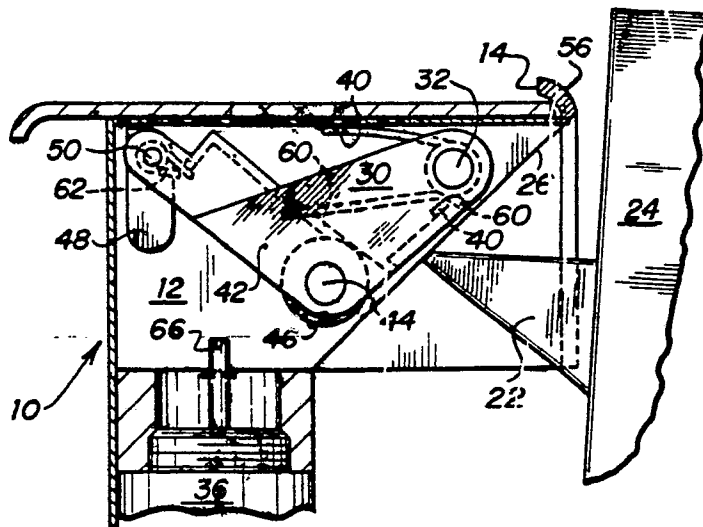


FIG. 3