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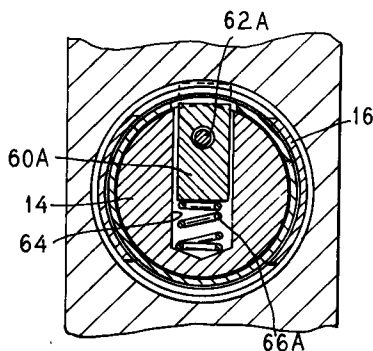
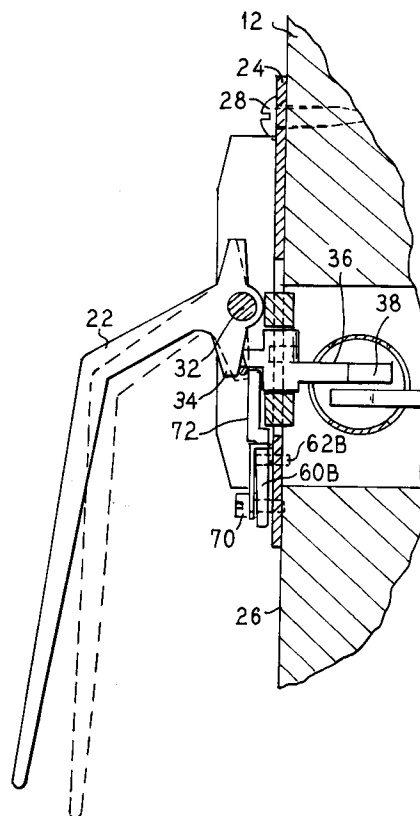
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W-8000 München 22(DE)(54) **Latch bolt assembly with fusible member.**

(57) A latch bolt assembly having a blocking member (60A,60B) which is held in a non-blocking position by a fusible element (62A,62B) and which is biased into a blocking position upon a melting of the fusible element. In one embodiment of the invention, the blocking member (60A) is pivotable into a position to engage a portion of a handle mechanism (22) of the latch bolt assembly to prevent operation of the handle. In a second embodiment of the invention, the blocking member (60A) is slidably carried in the latch bolt (14) and is slidable into a position preventing retraction of the latch bolt upon a melting of the fusible element.

FIG. 4**FIG. 5****EP 0 471 112 A1**

The present invention relates to latch bolt assemblies and more particularly to latch bolt assemblies wherein operation of the latch is prevented in a certain condition, such as during a fire, in order to prevent the spread of the fire upon the opening of a door.

Latch bolt mechanisms are well known in the art and include latch bolts that are slidably or pivotably received in a door and are actuated by a handle mechanism that is either pivotably or rotatably mounted on the door.

Latch bolt assemblies are known which include a blocking member for preventing opening of the door in the case of a fire. U.S. Patent 3,705,739 discloses a door latch mechanism in which a blocking pin is carried in the handle housing and is held in a retracted position by a fusible washer. In the event of a fire, the fusible washer will melt and the pin, which is spring loaded, will extend into the latch bolt to prevent it from retracting from the striker housing.

U.S. Patent 3,811,717 discloses a latch bolt mechanism in which the latch bolt slidably moves in the handle housing and a pivotable plate member, which is normally held in a non-blocking position by a fusible pin, is caused to move into a blocking position in engagement with the latch bolt upon a melting of the pin. An end of the blocking plate engages a head of the latch bolt.

U.S. Patent RE 30,263 discloses a catch mechanism in which a pivotable catch member carried on the door carries a spring loaded plunger which is held in a retracted position by a fusible plug. During a fire, the plug will melt and the pin will be urged into a recess in the catch mechanism casing to prevent retraction of the catch member from the casing mechanism.

U.S. Patent 4,007,954 discloses a latch bolt mechanism in which a pivotable plate member, which is normally held in a non-blocking position by a fusible pin, is caused to drop, by operation of gravity, into a position wherein an end of the plate engages an actuating lever extending between the handle and the latch bolt.

U.S. Patent 4,003,593 discloses a latch bolt mechanism in which a spring loaded pin is held in a recessed position in a housing, below the handle mechanism and, upon the melting of a retaining pin, the blocking pin will move upwardly into engagement with the handle mechanism to prevent operation of the handle.

The present invention provides a latch bolt assembly in which the latch bolt is slidable in a housing. A handle mechanism is operable to effect a sliding of the latch bolt. A blocking member is selectively moveable to a blocking position upon the melting of a fusible member which normally is engageable with a blocking member to hold the

blocking member in a non-blocking position. Biasing means are engageable with the blocking member to urge the blocking member into the blocking position upon melting of the fusible member.

In a particular embodiment of the invention, the blocking member is a pivotable member which is selectively movable to a blocking position to engage a portion of the handle. A spring is provided to bias the blocking member into the blocking position. The handle mechanism is pivotally mounted to a mounting plate and the fusible member extends between the blocking member and the mounting plate. Once the fusible member melts, the blocking member will pivot into a position to block further movement of the handle. However, the latch bolt remains free to move, even after the blocking member moves into the blocking position. Thus, a handle on the opposite side of the door could be actuated to open the door.

In a second embodiment of the invention, the blocking member is slidably carried in the latch bolt itself. The blocking member moves perpendicular to a sliding direction of the bolt once the fusible member, which may be in the form of a pin, melts. A coil spring is provided to bias the blocking member in the blocking direction. Preferably, the blocking member is carried in a plug mounted to the latch bolt and the fusible member extends between the blocking member and the plug. The housing containing the latch bolt has an opening through a side wall thereof and the blocking member, upon melting of the fusible member, moves to a position to protrude through the opening to effect the blocking of the latch bolt, that is, to prevent retraction of the latch bolt.

ON THE DRAWINGS

FIG. 1 is a perspective view of a door latch mechanism embodying the principles of the present invention.

FIG. 2 is a side elevational view of a latch bolt mounted on a door.

FIG. 3 is an enlarged side view of the latch bolt with a portion of the housing removed to expose the interior.

FIG. 4 is a sectional view of the latch bolt taken generally along the line IV-IV of FIG. 3.

FIG. 5 is a side elevational view of a handle mechanism illustrating a second embodiment of the invention.

FIG. 6 is a front elevational view, partially cut away, of the embodiment of FIG. 5.

FIG. 7 is a partial sectional view taken along line the line VII-VII of FIG. 6.

In FIG. 1 there is illustrated a latch bolt assembly generally at 10 which is mounted in a door 12. The latch bolt assembly 10 comprises a latch bolt

14 slidable in a housing 16 (FIGS. 2-4). The latch bolt housing 16 is secured in the door 12 by a plate 18 and appropriate fasteners 20 such as screws.

A handle mechanism 22 is provided to affect sliding of the latch bolt 16. A mounting plate 24 (FIGS. 5-7) is secured to a face 26 of the door 12 by appropriate fasteners 28 such as screws 28. The mounting plate 24 has a pair of upstanding walls 30 which receive a pivot pin 32 which also proceeds through the handle mechanism 22. Thus, the handle mechanism is pivotally mounted to the mounting plate 24. A cover plate 33 attached to the mounting plate 24 to enclose the operating portion of the latch bolt assembly.

The handle mechanism 22 includes a projection 34 extending from the pivot pin 32, which projection is engageable with an actuating lever 36. The actuating lever 36 is pivotally mounted in a direction perpendicular to the pivotal mounting of the handle mechanism 22. Pivoting of the handle mechanism 22 will cause a perpendicular pivoting of the actuator 36. The actuator 36 includes a projecting arm 38 which is engageable in an opening 40 in the latch bolt housing 16 such that the arm 38 will engage with a portion of the latch bolt causing the latch bolt to slide in a reciprocating manner upon operation of the handle mechanism 22.

Positioned within the latch bolt housing 16 is a biasing means 40 in the form of a coil spring which presses against a cap 42 secured to the housing 16 by appropriate means, such as a crimp connection 44. An opposite end 46 of the spring 40 presses against a plug 48 which is secured to the latch bolt 14 by appropriate fastening means such as a crimp connection 50. The spring 40 is sized so as to continuously bias the latch bolt 14 into a position protruding out of the door. In such a position the plug 48 will be exposed through the opening 40 in the housing. The arm 38 of the actuator 36 will press against a face 52 of the plug in order to overcome the bias of the spring 40 to retract the latch bolt 14 into the door.

The present invention provides a means for preventing unlatching of the latch bolt assembly under high temperature conditions, such as during a fire. In a first embodiment of the invention illustrated in FIGS. 2-4, a blocking member 60A is carried in the latch bolt 14 and is held in a non-blocking position by a fusible element 62A. In this embodiment, the blocking member 60A is a pin carried in a bore 64 in the plug 48. The pin 60A and bore 64 are arranged so that the pin 60A will move radially outwardly to project the pin 60A into the opening 40 in the housing 16 upon melting of the fusible element 62A. The fusible element 62A extends through the blocking pin 60A and is held in

the plug member 48. A biasing means 66A in the form of a coil spring is provided in the bore 64 to urge the blocking member 60A into a projecting blocking position upon melting of the fusible member 62A. When the blocking member 60A is in the protruding, blocking position, attempts to retract the latch bolt 14 into the door will be prevented since the pin 60A will engage a side wall 68 of the opening 40, thus preventing further retraction of the latch bolt 14.

A second embodiment of the invention is illustrated in FIGS. 5-7 wherein a blocking member 60B is held in a non-blocking position by a fusible member 62B. In this embodiment the blocking member 60B is a plate-like member having a pivot pin 70 extending through a face 72 thereof, the face 72 being engageable with the projection 34 of the handle mechanism 22 when the blocking member 60B is in a blocking position illustrated by dotted lines in FIGS. 5 and 6. A biasing means 66B in the form of a spring is provided to urge the blocking member 60B into the blocking position upon melting of the fusible member 62B. In this embodiment, the fusible member 62B extends between the blocking member 60B and the mounting plate 24. Since only the handle mechanism 22 is blocked by this embodiment, both the actuator lever 36 and the latch bolt 14 are free to move even when the blocking member 60B is in the blocking position. Thus, a handle mechanism on an opposite side of the door could still operate to unlatch the latch bolt mechanism if only one assembly is provided with the blocking member.

As is apparent from the foregoing specification, the invention is susceptible of being embodied with various alterations and modifications which may differ particularly from those that have been described in the preceding specification and description. It should be understood that I wish to embody within the scope of the patent warranted hereon all such modifications as reasonably and properly come within the scope of my contribution to the art.

The features disclosed in the foregoing description, in the claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

Claims

1. A latch bolt assembly comprising a latch bolt slidable in a housing; a handle mechanism operable to effect sliding of said latch bolt; a pivotable blocking member selectively movable to a blocking position to prevent movement of said handle mechanism; a fusible member engageable with said blocking member to hold said blocking member in a non-

blocking position; biasing means engageable with said blocking member to pivot said blocking member into said blocking position upon melting of said fusible member.

2. A latch bolt according to claim 1, wherein said pivotable blocking member comprises a plate-like member having a pivot pin extending through a face thereof, said face being engageable with said handle mechanism when said member is in said blocking position.

3. A latch bolt according to claim 1, wherein said biasing means comprises a spring.

4. A latch bolt according to claim 1, wherein said handle mechanism pivots to effect said sliding of said latch bolt.

5. A latch bolt according to claim 1, wherein said handle mechanism is pivotally mounted to a mounting plate and said fusible member extends between said blocking member and said mounting plate.

6. A latch bolt according to claim 1, wherein said latch bolt remains free to move after said blocking member moves into said blocking position.

7. A latch bolt assembly comprising a latch bolt slidable in a housing; a handle mechanism operable to effect sliding of said latch bolt; a blocking member carried in said latch bolt selectively movable to a blocking position to prevent movement of said latch bolt; a fusible member engageable with said blocking member to hold said blocking member in a non-blocking position; biasing means engageable with said blocking member to urge said blocking member into said blocking position upon melting of said fusible member.

8. A latch bolt according to claim 7, wherein said blocking member moves perpendicular to a sliding direction of said bolt.

9. A latch bolt according to claim 7, wherein said biasing member is a coil spring.

10. A latch bolt according to claim 7, wherein said blocking member is carried in a plug mounted to said latch bolt and said fusible member extends between said blocking member and said plug.

11. A latch bolt according to claim 7, wherein said housing has an opening through a sidewall

thereof and said blocking member moves to a position to protrude through said opening to effect said blocking.

12. A latch bolt assembly comprising a latch bolt slidable in a housing; a handle mechanism operable to effect sliding of said latch bolt; a blocking member from the group consisting of a pivotable blocking member selectively movable to a blocking position to prevent movement of said handle mechanism and a slidable blocking member carried in said latch bolt selectively movable to a blocking position to prevent movement of said latch bolt; a fusible member engageable with said blocking member to hold said blocking member in a non-blocking position; biasing means engageable with said blocking member to urge said blocking member into a blocking position upon melting of said fusible member.

13. A latch bolt according to claim 12, wherein said biasing means comprises a spring.

14. A latch bolt according to claim 12, wherein said handle mechanism pivots to effect said sliding of said latch bolt.

FIG. 4

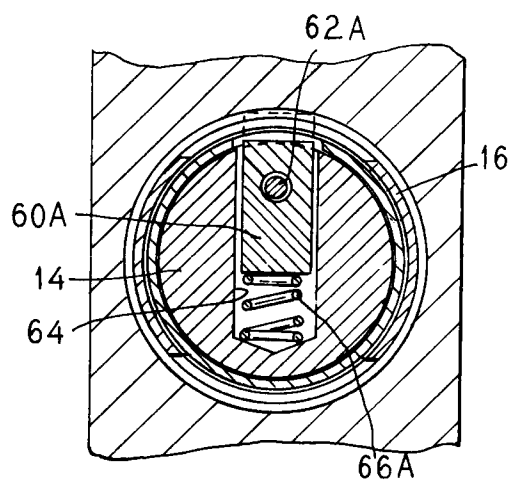


FIG. 2

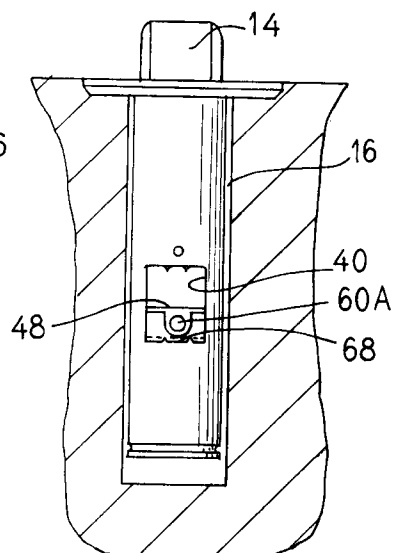


FIG. 3

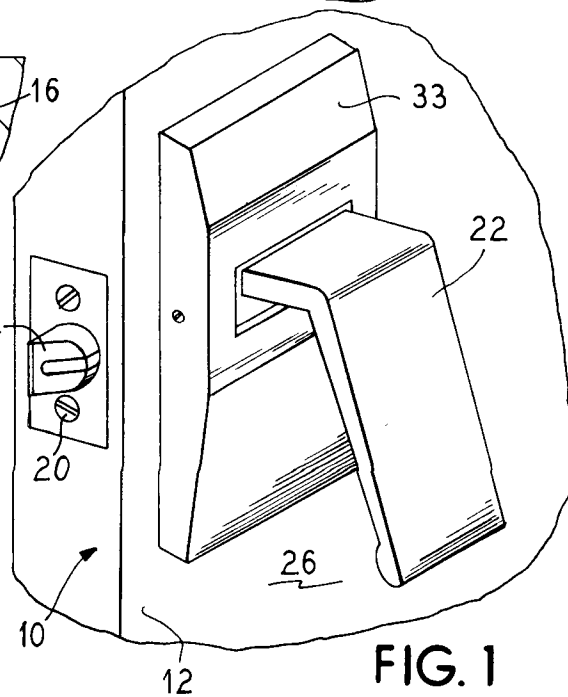
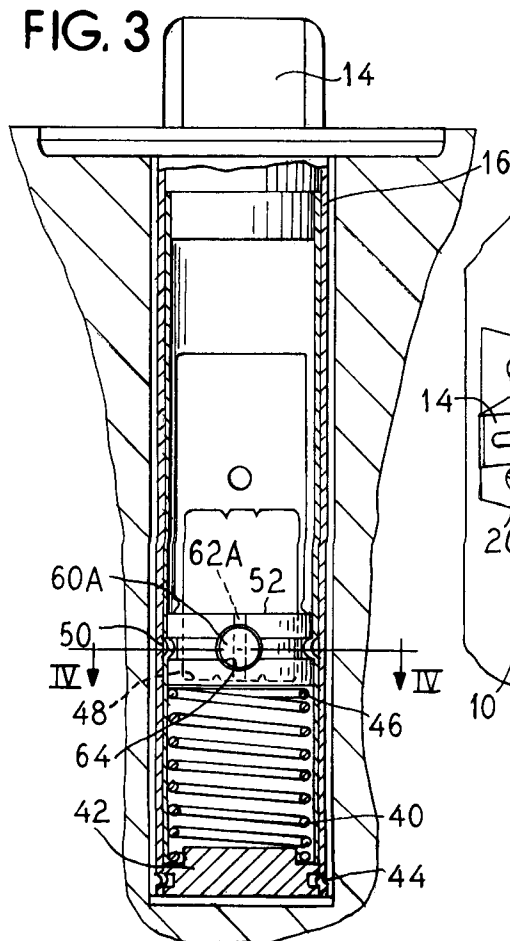
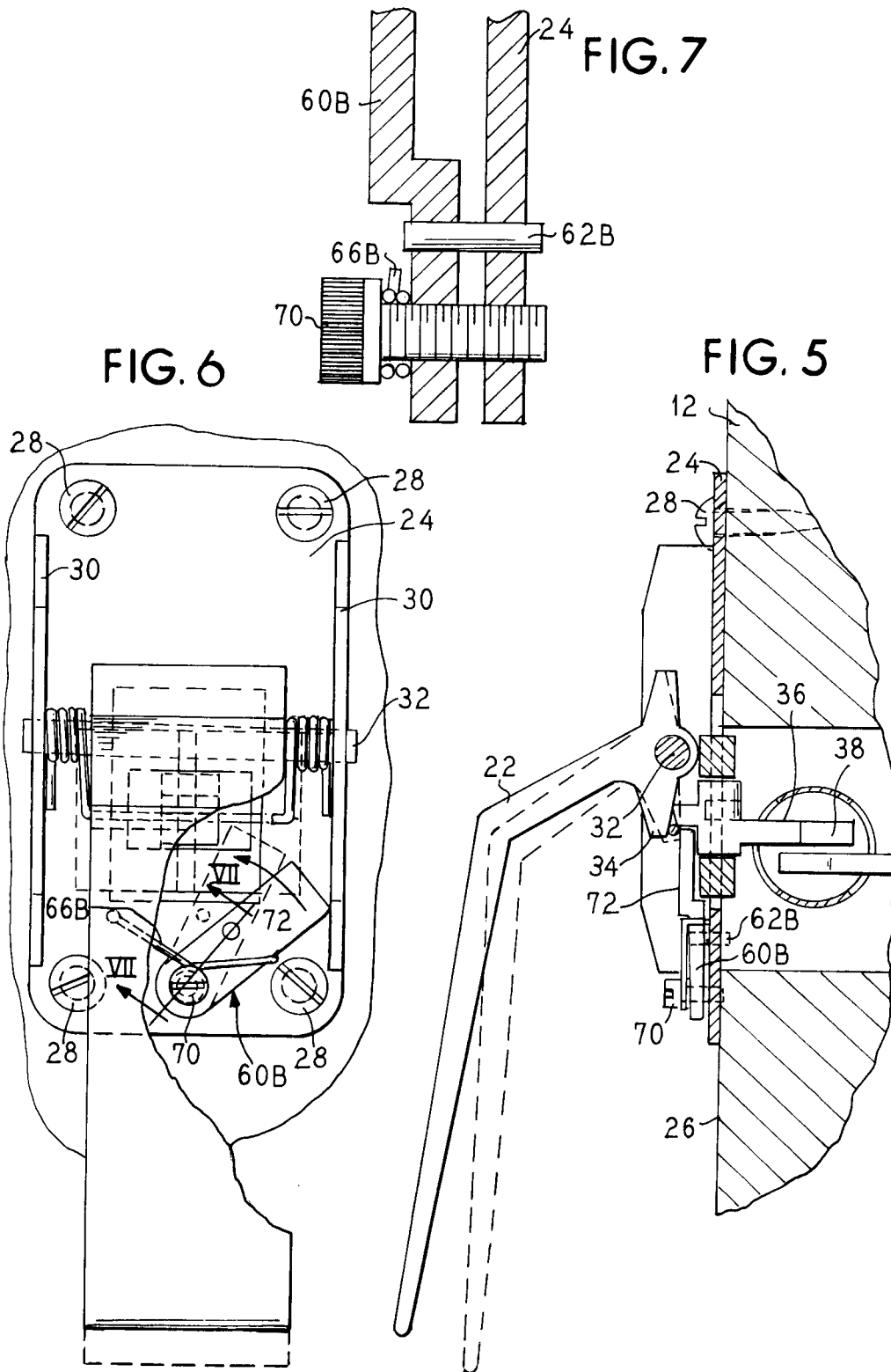


FIG. 1





Application Number

EP 90 12 2946

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X,D	US-A-4 003 593 (WILZIG) * the whole document * * - - -	1-6	E 05 B 65/10
X	US-A-4 183 565 (ALLEMANN) * the whole document * * - - - - -	7-11	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 05 B
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		13 November 91	VAN BOGAERT J.A.M.M.
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	