

1

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DOOR LATCH MECHANISM

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1 Claim. (Cl. 292—21)

The invention relates to latches of the type used on exit doors, usually referred to as panic latches, and more particularly to a "dogging-down" construction for holding such latches in an open position.

It is an object of this invention to provide a latching device including an improved construction for "dogging-down" the latch to hold it in an open or unlatched position.

Still another object of the invention is to provide a "dogging-down" mechanism for use with panic latches and the like in which the "dogging-down" mechanism is effective to hold the latch open only when the operating mechanism for the latch is moved to a predetermined position.

It is still a further object of this invention to provide a "dogging-down" mechanism for use with panic latches and the like in which the "dogging-down" mechanism is operable only at the discretion of the operator and is not automatically movable into "dogging-down" position as in the case of some mechanisms for this purpose.

It is still a further object of this invention to provide a "dogging-down" mechanism for use with panic latches and the like in which the "dogging-down" construction includes a member which is axially movable to effect a "dogging-down" operation, with the parts being so arranged that the axially movable member is limited to a certain predetermined range of movement and cannot be "backed off."

In achievement of these objectives, there is provided in accordance with an embodiment of this invention a "dogging-down" mechanism for use with panic latches and the like in which the lever member which operates the panic latch lifting rods is pivotally movable between a pair of spaced bracket arms. The pivotally movable lever member has a threaded bore in which a set screw member is movable. The bracket arm on one side of the movable lever member has a passage or bore to receive a tool which engages and turns the set screw, while the opposite bracket arm has a bore which receives an end of the set screw, to thereby hold the operating lever in a position which holds the latch members in an unlatched position. The "dogging-down" operation is performed by pivotally moving the operating lever to the position in which the latch members operated by the lever are in unlatched position. In this same position of the lever, the set screw carried by the lever is aligned with the bores of the fixed bracket members so that a tool may be inserted through the bore of one bracket member to engage and turn the set screw and so that a reduced opposite end portion of the set screw moves into the bore of the opposite bracket member. The end opening of the bore in the lever member which receives the set screw is "upset" to prevent the set screw from being backed off out of the bore in the lever. The passage in the bracket arm through which the operating tool is inserted is of smaller diameter than the bore in the lever and smaller than the diameter of the set screw to further prevent movement of the set screw out of the bore in the lever.

Further objects and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawing in which:

Fig. 1 is a view in vertical section showing details of

2

the panic door and of the panic latch mechanism embodying the invention;

Fig. 2 is an enlarged view in vertical section showing the operating lever of the panic latch mechanism; and

Fig. 3 is a view in vertical section along line 3—3 of Fig. 2 showing details of the construction of the "dogging-down" device.

Referring now to the drawing, and more particularly to Fig. 1, there is shown a door frame 10 and a threshold 12 respectively having latch-accommodating slots 14 and 16. A door generally indicated at 18 is provided at its free edge with a hollow casing 20 for receiving the latches and their actuating mechanism. At the upper end of casing 20 a latch generally indicated at 22 is pivotally supported on pin 24 and is biased by spring 26 in such manner that latch 22 normally tends to move upwardly through slot 14 to engage door frame 10 in latching relation. Latch 22 is in the shape of a bell crank and is provided with an arm 28 which extends downwardly from the pivotal axis 24 as best seen in Fig. 1. A latch 30 similar to the latch 22 just described is provided at the lower end of casing 20. The lower latch member 30 is biased by a spring 31 into latching engagement with threshold 12 through the aperture 16 of the threshold and is provided with an arm 32 which extends upwardly from the pivotal axis of latch 30.

The operating mechanism for moving the latches 22 and 30 to unlatched position includes an operating lever generally indicated at 34 which is pivotally supported by a bracket member generally indicated at 36 attached to the inner wall surface of door 18. Bracket 36 includes a pair of spaced bracket portions or arms 38 and 40 which extend on either side of lever 34 and support lever 34 for pivotal movement about an axis 42.

Operating lever 34 includes an actuating arm 44 which projects into the interior of hollow casing 20 and through an aperture 46 in a C-shaped yoke member 48 disposed on the interior of casing 20. Rod members 50 and 52 are rigidly attached to the upper and lower ends, respectively, of yoke member 48. At the upper end of rod member 50 is rigidly attached a drag angle 54 and a similar drag angle 56 is rigidly attached to the lower end of rod member 52. Rods 50 and 52 are guided for vertical movement within casing 20 by apertured bracket members 58, 60, 62 and 64 carried by casing 20. A spring 66 disposed between bracket 60 and the upper end of yoke 48, and a second spring 68 disposed between bracket 64 and the upper end of angle member 56 cooperate with the natural weight of the assembly to normally bias yoke 48 and the attached rod and angle members in a downward or latching direction.

Mounted within casing 20 below latch 22 is a bell crank lever generally indicated at 70 including an arm 72 which extends into a slot 74 of upper angle member 54. Bell crank 70 also includes an arm 76 which is movable into engagement with the downwardly extending arm 28 of latch member 22. In a similar manner, a bell crank lever generally indicated at 78 is supported at the lower end of casing 20 and includes an arm 80 which extends into a slot 82 in the lower angle member 56 and an arm 84 which is engageable with the upwardly extending leg 32 of latch member 30.

When operating handle 34 on the inside of the door is pushed downwardly about its pivotal supports, operating arm 44 which extends through slot 46 in C-shaped yoke member 48 engages the upper edge of the slot 46 and raises yoke member 48 upwardly. This causes angle member 54 at the upper end of the casing to rotate bell crank member 70 in a counterclockwise direction with respect to the view shown in Fig. 1 and causes angle member 56 at the lower end of the casing 20 to rotate

bell crank member 78 in a clockwise direction with respect to the view shown in Fig. 1. The rotation of the respective bell crank members 70 and 78 causes the respective latch members 22 and 30 to be pivotally moved in a clockwise and a counterclockwise direction, respectively, and thus to be retracted to unlatched position.

In accordance with the present invention, a "dogging-down" mechanism is provided for maintaining latch members 22 and 30 in a retracted or unlatched position when desired. For this purpose, actuating arm 44 of operating lever 34 is provided with a threaded bore 86 (see Fig. 3) which extends transversely in a horizontal direction through arm 44 in a portion of arm 44 which lies between bracket portions 38 and 40. A set screw 88 is positioned in threaded engagement with threaded bore 86. Screw 88 is provided at one of its ends with a hexagonal-shaped recess 89 which receives a suitable operating tool to permit rotation of set screw 88 within threaded bore 86. Bracket portion 40 on one side of arm 44 has a passage 90 of smaller diameter than bore 86 and set screw 88 to receive the end of the operating tool used to rotate the setscrew. Set screw 88 includes an end portion 92 of reduced diameter at its opposite end. Bracket portion 38 on the other side of actuating arm 44 has a bore which receives reduced end portion 92 of set screw 88 when the set screw is aligned with passages 90 and 94.

Under normal conditions, the weight of the C-shaped yoke member 48, of the attached rod members 50 and 52, and of angle members 54 and 56, together with the force of biasing springs 66 and 68, normally urges the entire latching assembly in a downward direction to the position shown in Fig. 1, permitting latch members 22 and 30 to be biased by their respective spring members 26, 31 into latching engagement with door frame 10 and threshold 12, respectively. In this downward position of yoke 48 and of the members attached thereto, operating lever 34 is maintained in the position shown in Fig. 1 in which threaded bore 86 in operating arm 44 together with the set screw 88, is out of alignment with passage 90 of bracket portion 40 and also out of alignment with bore or passage 94 of bracket portion 38.

When it is desired to hold latch members 22 and 30 in their unlatched position, operating lever 34 is pushed toward the surface of door 18 in a counterclockwise direction with respect to the view shown in Fig. 1 to thereby raise yoke 48 and the attached rods and angle members to move latch members 22 and 30 to unlatched position. In so doing, the threaded bore 86 and set screw 88 carried by operating arm 44 are moved into horizontal alignment with recess or bore 94 in bracket portion 38 and also into alignment with recess 90 in bracket portion 40. A suitable tool or wrench may then be inserted through passage 90 and into engagement with hexagonal socket 89. Set screw 88 may be turned to engage reduced end portion 92 of the set screw with the bore or socket 94 in bracket portion 38. The engagement of the set screw with bore or socket 94 maintains operating lever 34 and operating arm 44 in the position shown in Fig. 2 and also maintains latch members 22 and 30 in their unlatched position.

In order to prevent the set screw from "backing off," the end opening of threaded bore 86 which faces bracket portion 40 is "upset" to cause this end opening to have a slightly smaller diameter than outer diameter of set screw 88, thereby preventing a "backing off" movement of the set screw beyond the end opening of the bore 86 which faces bracket portion 40. This upsetting of the end opening of threaded bore 86 as just described in no way restricts the insertion of the operating tool into engagement with hexagonal recess 90 of the set screw since the hexagonal recess is of substantially smaller diameter than the outer diameter of the set screw. As a further means of preventing "backing off" of the set screw, bore 90 in bracket portion 40 is made of somewhat smaller

diameter than the set screw, yet of sufficient diameter to permit easy insertion of the operating tool which engages the set screw.

It can be seen from the foregoing that there is provided in accordance with this invention a "dogging-down" construction particularly useful with panic latches and the like which permits the panic latch assembly to be maintained in unlatched position. The "dogging-down" construction hereinbefore described is such as to require that the latching assembly be moved to unlatched position before the set screw member which provides the "dogging-down" action can be moved into "dogging-down" position. This prevents any possibility of "dogging-down" the latching assembly in a latched position. Furthermore, the set screw "dogging-down" construction hereinbefore described is operable to perform its "dogging-down" function only when intentionally moved into "dogging-down" position by operation of a suitable tool and does not automatically move into "dogging-down" position as in the case of some devices of this general character.

A further advantage of the construction is the fact that the set screw "dogging-down" member is securely retained in position in the operating lever member and cannot be easily removed, thereby discouraging unauthorized removal or tampering with the "dogging-down" mechanism.

While there has been shown and described a particular embodiment of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and therefore it is aimed to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

A dogging-down construction for use with a latch mounted on a panic door or the like comprising a support bracket member fixedly mounted on said door, said bracket member including a pair of transversely spaced bracket portions and a transversely extending shaft, a lever member supported on said shaft for pivotal movement between said bracket portions, means operatively connecting a portion of said lever member remote from said shaft to said latch, said lever member being movable to an actuated position to move the latch to an unlatched position, said lever member having a threaded bore, said bore being interposed between said shaft and said remote portion and said bore lying between said bracket portions at all positions of said lever member, a set screw threadedly adjustable in said bore and having a reduced end portion projecting axially thereof, one of said bracket portions having a recess of reduced diameter for receiving the reduced end portion only of said set screw, the other of said bracket portions having a passage therethru of smaller diameter than said set screw and axially aligned with said reduced recess for receiving an operating tool engageable with said set screw, said threaded bore of said lever being aligned with both said other bore and said passage to define an elongated aperture extending through said other bracket when said lever is in said actuated position and said lever and terminating interiorly of said one bracket portion when said lever is in said actuated position, said set screw being engageable by an operating tool for threaded adjustment into said recess to hold said lever in said actuated position and said set screw being entirely concealed at all times.

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