

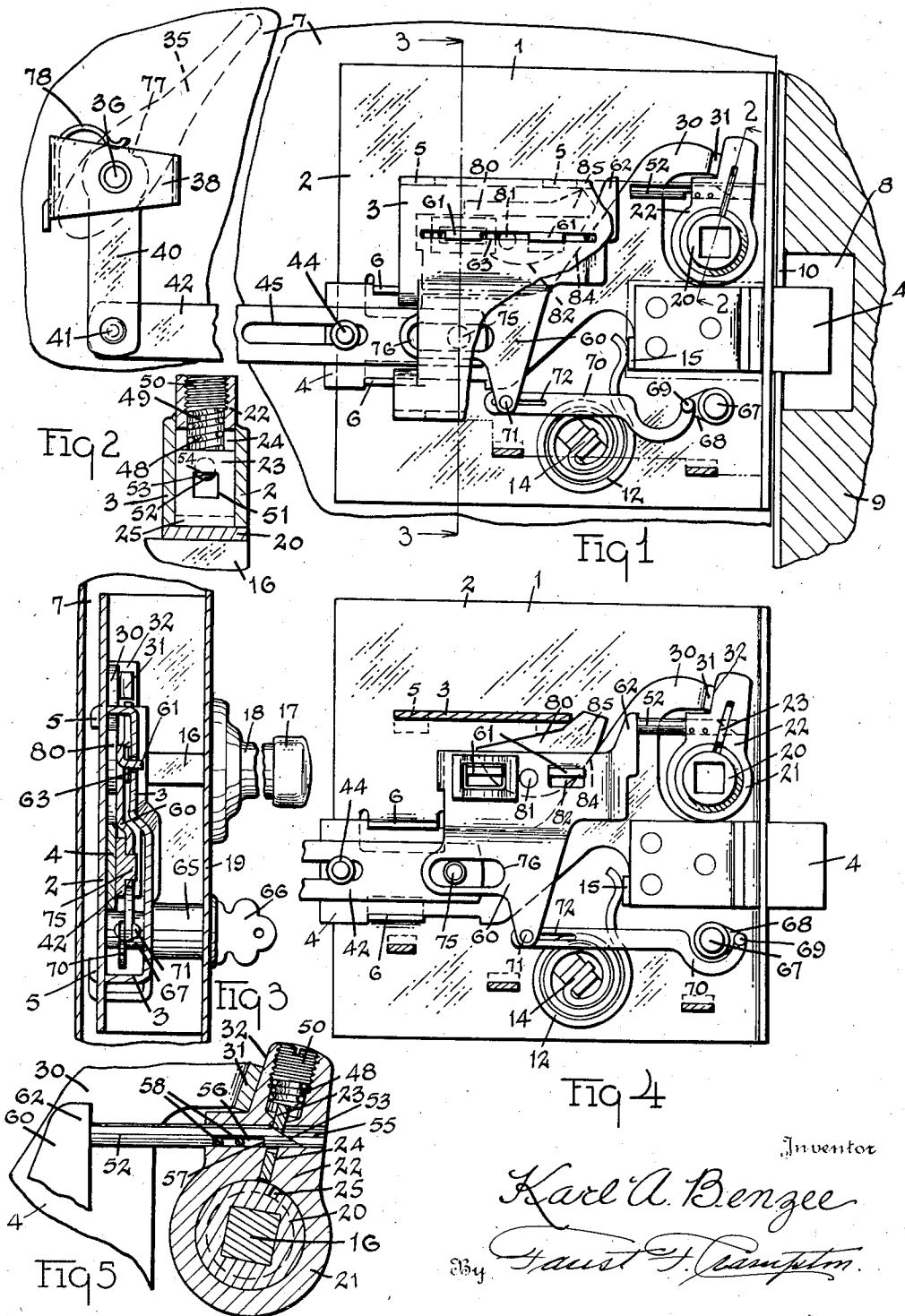
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LATCH BOLT OPERATING AND LOCKING MECHANISM

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LATCH BOLT OPERATING AND LOCKING MECHANISM

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My invention relates to a latch bolt operating and locking mechanism for a latchable closure device to enable opening of the closure device and locking of the same when closed. The invention particularly relates to a latch bolt operating and locking mechanism for a latchable closure device having a manually manipulative element for normally controlling the movements of the latch bolt and means for operatively disconnecting said element from the latch bolt to maintain a latched condition of the closure device when closed, despite manipulation of the element. The invention, therefore, readily lends itself to the provision of a latch bolt operating and locking mechanism for a door of a vehicle tonneau body and provides an efficient means for resisting entry of thieves and the like into said tonneau body.

The invention has for an object to provide a latch bolt operating and locking mechanism having a means for operatively disconnecting a latch operating element from the latch bolt whereby the latch bolt operating element may be moved without moving the latch bolt, through movements normally tending, when the element is connected, to operate the latch bolt. The invention, therefore, has for an object to provide a means for rendering a latch bolt operating element, such as a latchable door handle, freely rotatable with respect to the latch bolt, preventing movement of the latch bolt from a latched position and preventing opening of the door.

Another object of the invention is to provide a latch bolt operating and locking mechanism for a latchable closure, having means for restraining the latch bolt from movement toward an unlatched position whereby the latch bolt may not be bodily moved to unlock the closure, as distinct from moving the latch bolt operating element or handle. A further object of the invention is to provide a latch bolt operating and locking mechanism for a latchable closure, having a means for operatively disconnecting the latch bolt from a latch bolt operating element or handle and a second means for restricting the movement of the latch bolt toward an unlatched position, both of said means disposed to act coincidentally with each other and actuated by a single means whereby the latchable closure may be quickly and efficiently locked against opening or forcing.

A still further object of the invention is to provide in a latch bolt operating and locking mechanism a clutch means for operatively connecting an element for manually moving the latch to the latch bolt, said clutch means being actuated as

by a key from the outer side of the door or by a handle on the inner side or by any other well known device.

My invention has for a particular object to provide a means for supporting a latch bolt operating handle in a free and independent but operatively connectible relation to the latch bolt whereby the handle may be removed, destroyed, or moved when operatively disconnected from the latch bolt without enabling one to move the latch bolt or unlatch the door to which it is applied, and effecting thereby a locked condition of the door.

A further particular object of the invention is to provide a latch bolt operating and locking mechanism of a simple construction and of easy and inexpensive assembly adaptable for use in automobile doors.

The invention consists in other features and advantages which will appear from the following description and upon examination of the drawing. Structures containing the invention may partake of different forms and still embody the invention. To illustrate a practical application of the invention, I have selected a latch bolt operating and locking mechanism as an example of the various structures and details thereof that contain the invention and shall describe the selected latch bolt operating and locking mechanism hereinafter, it being understood that variations may be made without departing from the spirit of the invention. The particular latch bolt operating and locking mechanism selected is shown in the accompanying drawing and described hereinafter.

Fig. 1 of the drawing illustrates a view of a fragmentary section of the latch bolt operating and locking mechanism chosen for purpose of illustration. The mechanism is shown in an unlocked position. Fig. 2 illustrates a view of a section taken on the plane of the line 2-2 indicated in Fig. 1. Fig. 3 illustrates a view of a section taken on the plane of the line 3-3 indicated in Fig. 1. Fig. 4 illustrates a view of a section similar to the section shown in Fig. 1, the mechanism being shown in locked relation. Fig. 5 illustrates an enlarged view of a part of the mechanism.

My invention is particularly adapted, as has been pointed out, in one form of its embodiment, for use in connection with automobile body doors, particularly those of the type used on "closed" or tonneau bodies. Automobile body doors are commonly provided with a well known latch bolt biased by a suitable spring to engage, when the

door is in a closed position, a strike plate located in the door frame or jamb. A handle is operatively connected to the latch bolt and is adapted to be manipulated, as by rotation thereof, to move the latch bolt against the pressure of the biasing spring to an unlatched door position. My invention provides a means adapted to operatively disconnect the handle from the latch bolt and a second means operable to restrain the latch bolt against unlatching movements as distinct from the heretofore common method of locking the handle against movement to establish a locked door condition. My invention, therefore, provides a means for combatting the handle forcing methods of entry commonly employed by thieves and the like.

An embodiment of my invention comprises a handle mounted on a shaft for moving a door latch bolt to positions that may be described as "unlatched" and "latched" to effect opening of the door and to maintain the door against opening, when closed. The shaft is operatively connected to the latch bolt through a clutch means, which may be operated by an occupant from the inside or by a key from the outside, or by other equally suitable and authoritative means. An element for restraining the latch bolt against movement toward an unlatched position is operated by the means provided for operating the clutch means and coincidentally with the operation of the clutch means. Thus, not only may the door be locked with regard to unlatching movements of the handle but also against movements of the latch bolt.

In the particular construction shown in the drawing for purposes of illustration, a frame 1 is provided, comprising a base plate 2 and a housing member 3, connected to the base plate 2 by bent lugs 5. The frame 1 is adapted to be mounted in a suitable manner in a door 7. A latch bolt 4 is slidably supported by guide lugs 6 struck up from the base plate 2. The latch bolt is disposed to be reciprocally moved on the guide lugs 6 with respect to a morticed recess 8 formed in the door frame or jamb 9. The recess 8 may be provided with a suitable strike plate 10 through which the latch 4 may extend and engage to latch the door 7 against opening. The latch bolt 4 is preferably biased by a suitable spring 12 in an outwardly direction with respect to the door whereby the latch bolt 4 is normally maintained in a position for ready engagement with the strike plate 10. The spring 12 is supported on the plate 2, as shown at 14, and is adapted to yieldingly bear against a shoulder portion 15 formed on the latch bolt.

The latch bolt 4 may be withdrawn from the recess 8 and engagement with the plate 10 to unlatch the door 7 by one of several means provided. As is well known, automobile doors are commonly provided with a door unlatching handle on the outside of the body and a separate and sometimes remotely located unlatching handle on the inside. It is not my thought in describing said various unlatching mediums, to limit my invention to their inclusion. As illustrated, the latch bolt 4 may be moved to effect withdrawal of the latch bolt from the recess 8 by a handle 17 located on the outer side of the door and operating through a clutch means.

The handle 17 is mounted on a shaft 18 having a splined portion 16 which extends through the outer panel 19 of the door 7 and is keyed or fitted to a driving portion of the clutch in the form of a sleeve or bearing 20 revolvably mount-

ed in the base plate 2 and housing 3 of the frame 1, as shown in Fig. 2. The bearing 20 is disposed coaxially and preferably in close nesting relation within an annular portion 21 of a latch bolt operating cam member 22, the driven member of the clutch. The member 22 has a movable key or dog 23 movably mounted thereon, as in a slot 24 which preferably extends radially to the annular portion 21 of the member. The bearing 20 has a recess, such as the peripheral recess 25, adapted to receive one end of the dog 23 therein to thus interlock the member 22 and the bearing 20. The angular movements of the handle as imparted thereto by the operator's hand will thus be transmitted to the member 22.

The member 22 is restricted to angular movement in but one direction by the housing 3 of the frame 1. When the member 22 is moved in said direction, it slidably engages an extension 30 of the latch bolt 4. The extension 30 preferably has a flange portion 31 which is adapted to ride a cam edge surface 32 of the member 22. Thus, with angular movement of the handle 17, the member 22 is moved angularly to move, through the extension 30, the latch bolt 4 against the tension of the spring 12 and out of the recess 8 to unlatch the door 7. The door may be also unlatched from the interior thereof by a handle 35.

The handle 35 is keyed to a stub shaft 36 which may be journaled in a supporting bracket 38 connected to the door. A crank 40 is keyed at one end thereof to the shaft 36 and pivotally connected, as at 41, to a link 42. The link 42 will be reciprocated by angularly moving the handle 35. The link 42 is connected to the latch bolt 4 by a pin 44 which extends through a slot 45 formed in the link. The slot 45 is of a dimension sufficient to permit operation of the latch bolt by the handle 17 without moving the link 42 or the handle 35, in a manner well known in the art. Thus, the latch bolt 4 may be retracted from its latched position by operation of the handle 17 or by the handle 35.

In order to lock the door 7, means is provided for disengaging the bearing 20 from the member 22 and for blocking the latch bolt against retractory movements with respect to the recess 8. The movable key or dog 23 is normally biased, as by a spring 48 located in an enlarged portion 49 of the slot 24, in a direction toward a position within the recess 25. The spring 48 may be adjustably held in tension by a threaded plug 50 extending into the enlarged portion 49. The dog 23 has surfaces on which a lifting cam or means may act in a direction against the tension of the spring 48 to move the dog from engagement with the recess 25. In the form of construction shown, the dog 23 has an opening 51 through which a lifting cam, such as a plunger 52 having a cam surface 53 inclined to the axis of the plunger, is disposed to move. The surface 53 is adapted to engage an edge, such as the edge 54, of the opening 51, and, as the plunger is moved axially through the opening, the dog 23 will gradually move with reference to the recess 25. As illustrated in Fig. 5, when the plunger 52 moves toward the dog 23, the dog will be lifted out of the recess 25 and against the compression of the spring 48. When the plunger is moved in a reverse direction, the spring 48 tends to move the dog into the recess or into a position where the dog will automatically enter the recess when the slot 24 substantially registers with the recess, as when the

handle 17 has been haphazardly rotated after withdrawal of the dog from the recess.

The plunger 52 is preferably supported for axial movement in a guide conduit 55 bored in the member 22. The plunger has a cut out portion 56 forming a shoulder 57 which engages suitable limiting stop pins 58 located in the conduit 55 to thus restrict the movement of the plunger to a distance whereby the cam surface 53 thereof is maintained in constant sliding contact with the edge 54 of the opening 51, and the plunger is prevented from rotating about its axis. The plunger is caused to move with respect to the opening 51 by a control member 60.

The control member 60 is slidably supported on the frame 1, as by lugs 61 which extend through a slot 63 formed in the frame. A finger portion 62 is formed on the control member 60 and is disposed to engage the end of the plunger 52 and move the same inwardly with respect to the opening 51, when the control member is moved in a like direction. The control member 60 may be moved by suitable controlling means, such as by the operation of a barrel lock 65 or by the manipulation of the handle 35. The barrel lock 65 is of the well known construction, being supported in the door 7. The barrel lock has a key 66 and is connected to a stub shaft 67 journaled in the frame 1. The shaft 67 has a crank 68 keyed thereto. The crank 68 is pivotally connected, as at 69, to a pitman 70. The pitman 70 is connected to the control member 60 by a pin 71 which extends through a slot 72 formed in the pitman. Thus, upon rotation of the barrel lock 65 by the key 66, in a counter-clockwise direction, as shown in the drawing, the control member 60 will be moved toward the plunger 52 to move the same and unclutch the bearing 20 from the member 22 and operatively disconnect the handle 17 from the latch bolt 4. The handle 17 will remain freely rotatable with respect to the latch bolt 4 until the barrel lock is rotated in a reverse direction to move the control member 60 in a direction away from the plunger 52, permitting the spring 48, acting through the dog 23 and cam surface 53, to move the plunger outwardly and the dog 23 into engagement with the recess 25 or into a position where the dog may automatically enter the recess when the same is brought into registration with the slot 24.

The handle 35 may also be operated to actuate the control member 60. The link 42 is connected to the control member by a pin 75 which extends through a slot 76 formed in the control member 60. Upon movement of the handle 35 in a direction reverse to that in which it is moved to unlatch the door, the link 42 will be moved to move the control member 60 to operate the plunger 52 to disconnect the handle 17 from the latch bolt 4 as before. Upon movement of the handle 35 in a direction to unlatch the door, the control member will be withdrawn from the plunger and permit reengagement between the handle 17 and latch. If desired, the crank 40 may be provided with indicating notches 77 over which a bent spring 78 supported on the bracket 38 is adapted to ride to indicate to the operator of the handle 35 the positions at which the engagement or disengagement of the handle 17 is effected.

In order to hold the latch bolt 4 against movement to open the door, such as might be effected by inserting an instrument between the edge of the door 7 and its jamb 9 and bodily forcing the latch bolt against the tension of the spring 12, a

member 80 is provided and disposed, upon operation of the control member 60, to engage the latch bolt 4 and hold it against movement. The member 80 is pivotally mounted by a pin 81 on the control member 60. The member is provided with an edge cam portion 82 which is adapted to ride and frictionally engage an edge cam portion 84 formed on the extension 30 of the latch bolt 4. Thus, when the control member 60 is moved to actuate the plunger 52, the member 80 will be moved angularly about its pivotal pin 81 to swing a portion thereof, such as a shoulder portion 85, into engagement with the frame 1, such as with the lug 5 thereof, as illustrated in Fig. 4. It will be seen that the latch bolt 4 is thus restricted in its movement toward an unlatch position, the disengaging of the handle 17 and locking of the latch being effected simultaneously. When the control member 60 is moved in a reverse direction, the member 80 will be swung about its pin 81 to disengage the particular lug 5 and will permit the latch bolt 4 to be operated to open the door 7.

While in accordance with the provisions of the statutes I have illustrated and described one of the best forms of my invention now shown to me, those skilled in the art will readily understand that many changes may be made in the particular form of the construction disclosed without departing from the spirit of my invention as set forth in the appended claims, and that certain features of my invention may be used to advantage without a corresponding use of other features.

I claim:

1. A latch bolt operating and locking mechanism comprising a frame, a latch bolt movably supported on the frame, a manually operable element for moving the latch bolt, a clutch means for operatively connecting and disconnecting the manually operable element with the latch bolt, a member movably supported relative to the frame and disposed to engage the latch bolt and frame to hold the latch bolt against movement, and a controllable means for actuating the clutch means and for moving the member simultaneously with each other.

2. A latch bolt operating and locking mechanism comprising a frame, a latch bolt movably supported on the frame, a manually operable element for moving the latch bolt, a clutch means for operatively connecting and disconnecting the manually operable element with the latch bolt, a member movably supported relative to the frame and having a portion disposed to be located in wedging relation between the latch bolt and the frame to hold the latch bolt against movement, and a controllable means for actuating the clutch means to operatively disconnect said manually operable element from said latch bolt and for moving the member to said position of wedging relation coincidentally with each other.

3. A latch bolt operating and locking mechanism for a latchable closure device comprising a frame supported on the closure device, a latch bolt movably supported on the frame and biased in a direction outwardly with respect to the closure device, a handle movably supported on the frame and disposed on one side of the closure device, an annular member rotatably supported on the frame and having a portion adapted to slidably engage the latch bolt for moving the same against said bias when the annular member is rotated, a bearing member connected to the handle and disposed in coaxial nesting relation with the annular member, a dog movably

- supported on said annular member and biased in a direction toward the axis thereof, the bearing member having a recess adapted to receive an end of the dog to operatively connect said handle to said latch bolt whereby the latch bolt may be moved against its said bias, and means operative convenient to the handle for withdrawing the dog from said recess whereby the handle may be moved without moving the latch bolt.
4. A latch bolt operating and locking mechanism for a latchable closure device comprising a frame supported on the closure device, a latch bolt movably supported on the frame and biased in a direction outwardly with respect to the closure device, a handle movably supported on the frame and disposed on one side of the closure device, an annular member rotatably supported on the frame and having a portion adapted to slidably engage the latch bolt for moving the same against said bias when the annular member is rotated, a bearing member connected to the handle and disposed in coaxial nesting relation with the annular member, a dog movably supported on said annular member and biased in a direction toward the axis thereof, the bearing member having a recess adapted to receive an end of the dog to operatively connect said handle to said latch bolt whereby the latch bolt may be moved against its said bias, a latch bolt engaging member movably supported relative to the frame, and means for withdrawing the dog from said recess and moving said latch bolt engaging member into a wedging relation between the latch bolt and frame coincidentally with each other to lock the latch bolt against movement.
5. A latch bolt operating and locking mechanism comprising a frame, a latch bolt movably supported on the frame, a member movably supported on the frame and disposed to engage and move the latch bolt, a manually operable element movably supported on the frame, a clutch means for operatively connecting and disconnecting the manually operable element and the member, a second member movably supported relative to the frame and disposed to be moved into engagement with the latch bolt and the frame to hold the latch bolt against movement, and a controllable means for actuating the clutch means to operatively disconnect the manually operable element and the first named member and to move the second named member to said latch bolt holding position.
6. A latch bolt operating and locking mechanism comprising a frame, a latch bolt movably supported on the frame, a member movably supported on the frame and disposed to engage and move the latch bolt, a manually operable element movably supported on the frame, a clutch means for operatively connecting and disconnecting the manually operable element and the member, a part resistant to movement relative to the frame, a second member movably supported relative to the frame and disposed to be moved into engagement with the latch bolt and the part to hold the latch bolt against movement, and a controllable means for actuating the clutch means to operatively disconnect the manually operable element and the first named member and for moving the second named member to said latch bolt holding position.

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