United States Patent [19]

Zawadzki

[11] **3,767,238**

[45] **Oct. 23, 1973**

[54] **PUSH PLATE PANIC EXIT DEVICE**

[75] Inventor: **George Z. Zawadzki,** Indianapolis, Ind.

[73] Assignee: **Von Duperin, Inc.,** Indianapolis, Ind.

[22] Filed: **May 4, 1972**

[21] Appl. No.: **250,185**

[52] **U.S. Cl.** **292/21,** 70/279, 70/464, 292/92, 292/168, 292/201, 292/223

[51] **Int. Cl.** **E05b 65/10**

[58] **Field of Search** ..... 70/92, 279, 464; 292/21, 33, 41, 53, 92, 166, 168, 170, 221, 227, 237, DIG. 37

[56] **References Cited**

UNITED STATES PATENTS

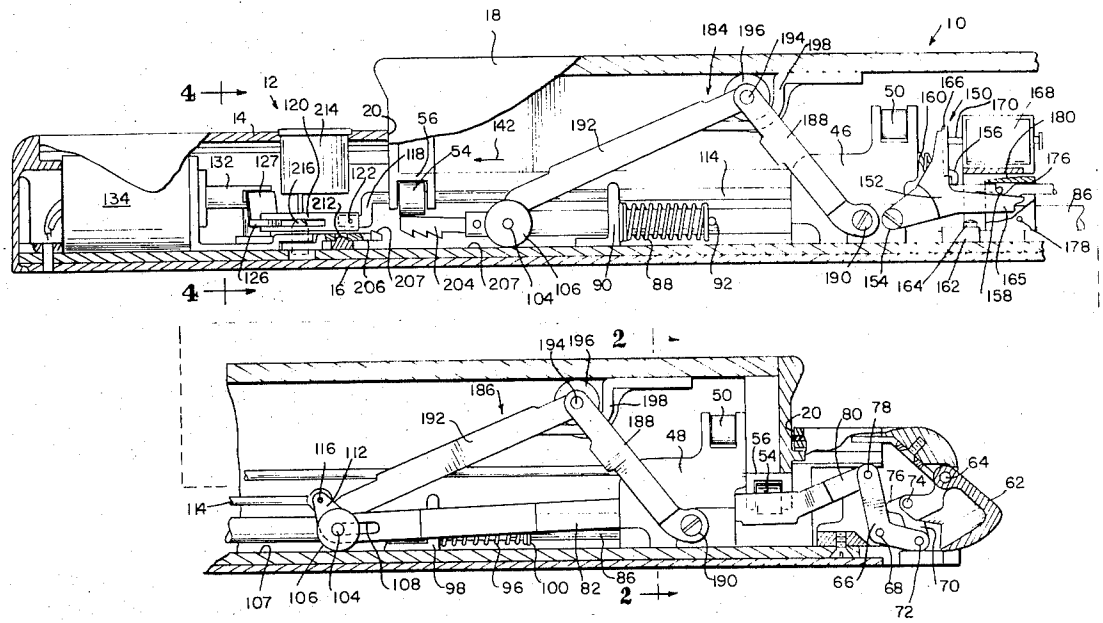
2,316,199	4/1943	Vetter	70/264
3,024,053	3/1962	Cox et al.	292/21
3,614,145	10/1971	Zawadzki	292/92
3,663,047	5/1972	Zawadzki	292/92

Primary Examiner—Albert G. Craig, Jr.
Attorney—William R. Coffey

[57] **ABSTRACT**

A panic exit latch and actuator assembly comprising an elongated, rod-like latch bolt actuator element rectilinearly movable along its axis and disposed in an elongated, horizontally extending housing traversing a door, a panic plate supported for movement outwardly and inwardly relative to the housing, and toggle mechanisms providing an operative connection between the panic plate and the actuator element to move the actuator element from its latch-projected position to its latch-retracted position in response to movement of the panic plate inwardly. A dogging system including a control member extending alongside the actuator element is provided, and connection mechanism is provided for connecting the latch bolt to the actuator element as well as to the control member, this mechanism permitting movement of the latch bolt inwardly without movement of the actuator element. A solenoid is provided for moving the control member to dog the latch bolt and a solenoid-operated lock is provided for locking the control member in its position effective to dog the latch bolt. The push plate is supported for rectilinear movement outwardly and inwardly by rollers journal mounted on the housing to roll on the push plate and rollers journal mounted on the push plate to roll on the housing.

35 Claims, 9 Drawing Figures



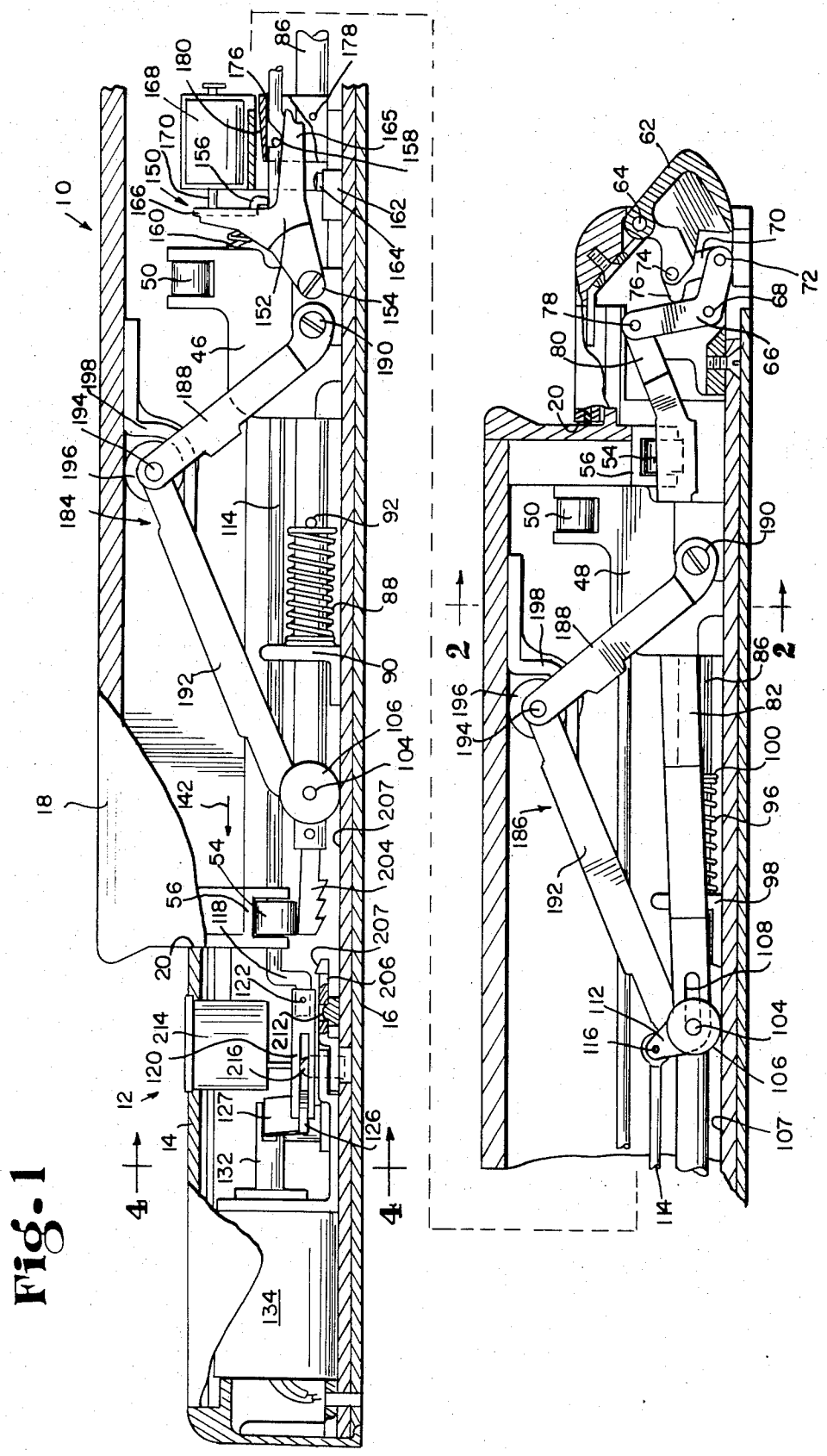


Fig. 1

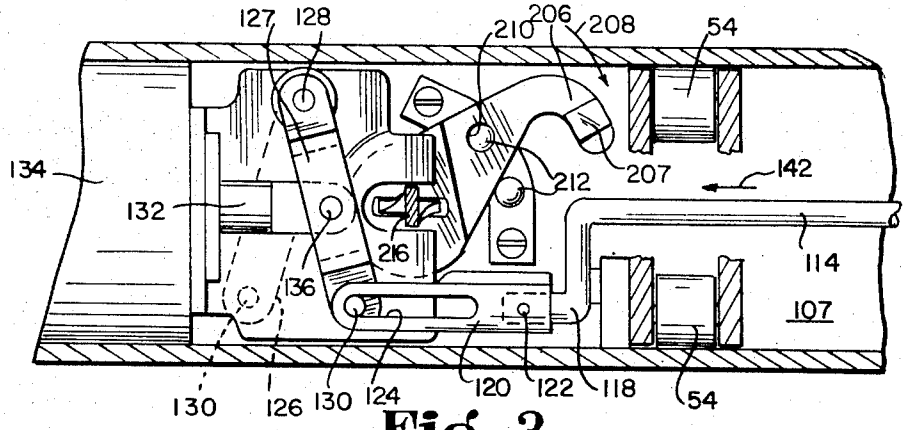


Fig.3

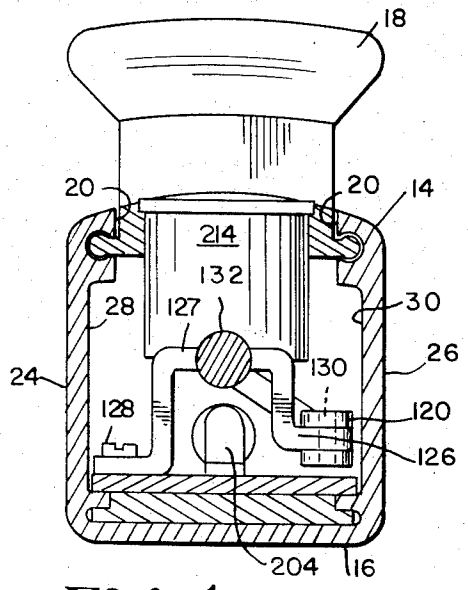


Fig.4

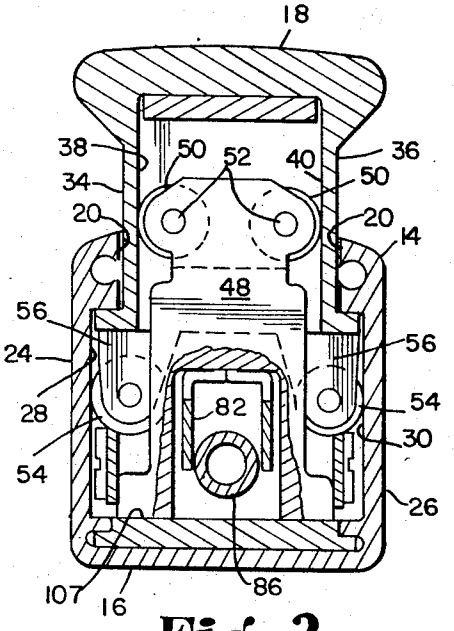


Fig.2

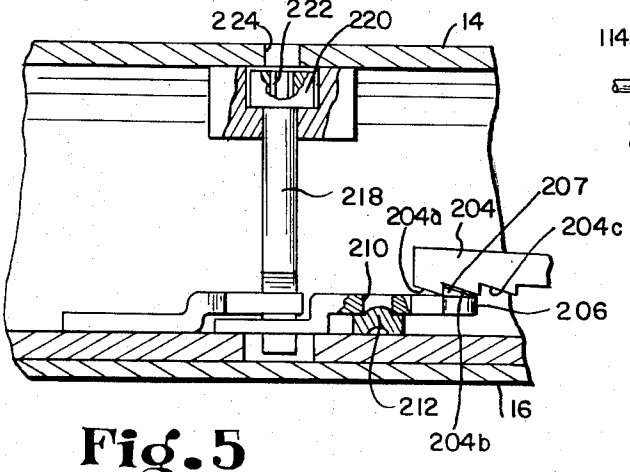


Fig.5

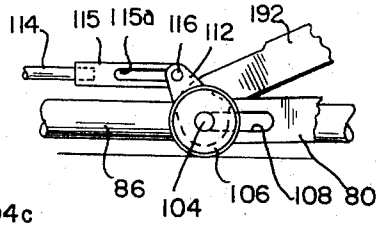


Fig.1a

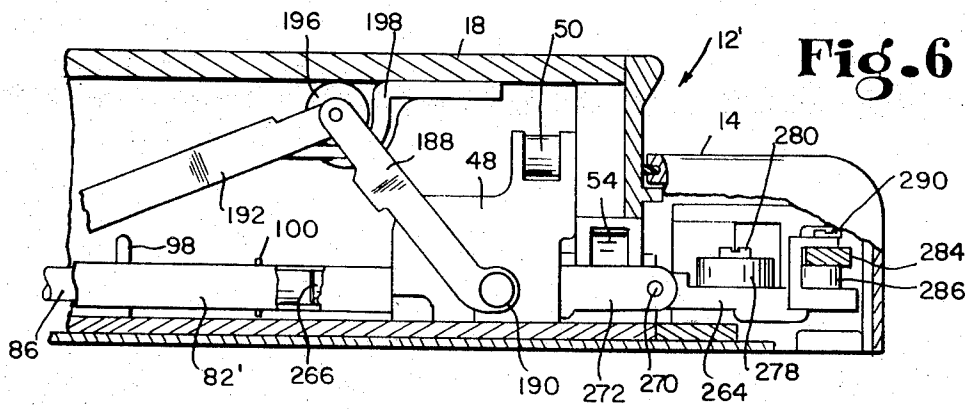


Fig.6

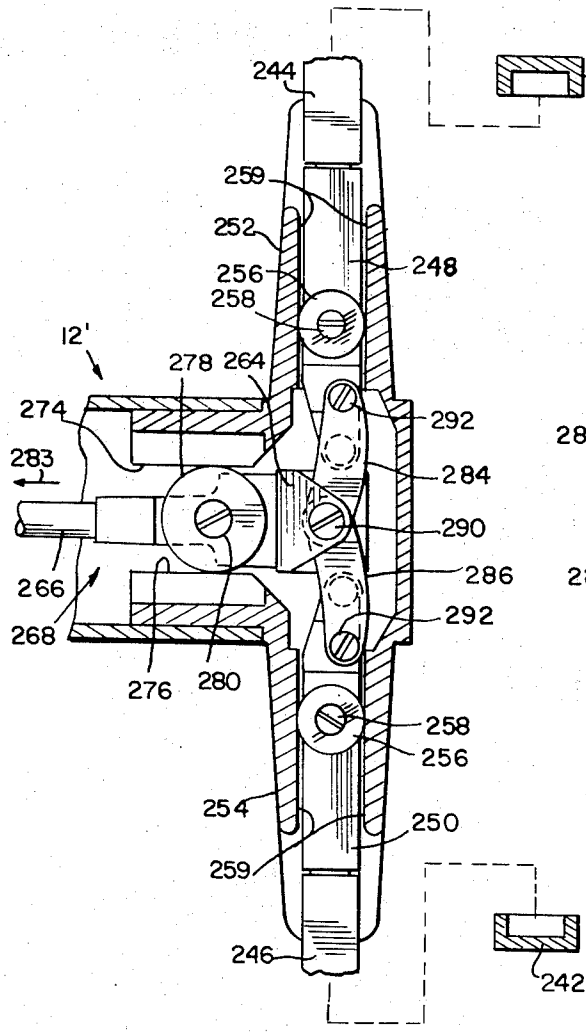


Fig.7

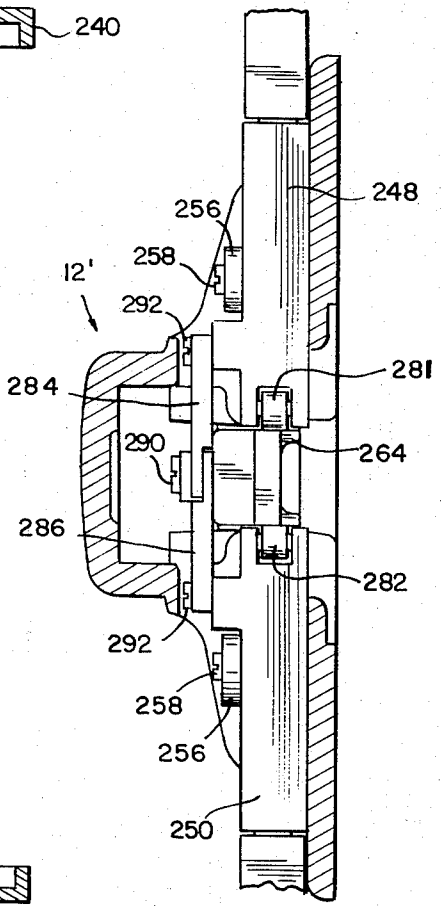


Fig.8

PUSH PLATE PANIC EXIT DEVICE

A primary object of the present invention is to provide a panic exit latch and actuator assembly of the type including a push plate as a panic bar supported for rectilinear movement outwardly and inwardly relative to the housing of the assembly. Such panic exit latch and actuator assemblies are disclosed in prior patent applications Ser. No. 61,110 filed Aug. 5, 1970, now U.S. Pat. No. 3,663,047; Ser. No. 65,201 filed Aug. 19, 1970, now U.S. Pat. No. 3,614,145; and Ser. No. 135,028 filed Apr. 19, 1971, now U.S. Pat. No. 3,730,574. Reference is made to these prior patent applications and patents and the references cited therein.

In such assemblies, the actuator element is connected to the latch bolt by a lost-motion connection permitting movement of the latch bolt to its retracted position without movement of the actuator element. In the assembly of the present invention, control means is provided for dogging the latch bolt in its retracted position, the control means including a control member connected to the latch bolt, electrically operated means for moving the control member from its latch-projected position to its latch-retracted position, and means for locking the control member in its latch-retracted position. The locking means includes a locking member for engaging and holding the control member in its latch-retracted position, yieldable means for urging the locking member into engagement with the control member, and second electrically operated means effective, when operated, to disengage the locking member. In the illustrative embodiment, the control member is formed with a locking portion engaged by the locking member, and the said actuator element carries a cover for the locking portion effective to block the locking member when the control member moves with the actuator element. As will be seen, this is required because in the illustrative and preferred embodiment, the actuator element and control member are connected to the latch bolt by the same lost-motion connection means such that the control member moves with the actuator element upon inward movement of the panic bar.

An important advantage of the dogging system of the present invention, i.e., the said control means including the control member, is that a heftier solenoid can be used to move the control member to its dogging position to retract the latch bolt, and a mechanical locking means can hold the control member in its retracting position. Then, when desired, a smaller solenoid is used to trip the locking means to release the control member.

In the illustrative and preferred embodiemnt, the housing means for the assembly is generally horizontally extending and provides upper and lower wall sections extending generally horizontally outwardly and parallel to the push plate or push bar. The push bar is disposed between the said upper and lower wall sections, and the push bar provides upper and lower walls extending generally horizontally inwardly and parallel to the wall sections. The push bar is supported and guided for rectilinear movement outwardly and inwardly by a plurality of rollers including first rollers journalled on the push bar for rotation about horizontal axes parallel to the push bar rollably to engage the upper and lower wall sections and second rollers journalled on the housing means for rotation about horizontal axes parallel to the push bar rollably to engage the upper and lower walls of the push bar. It has been found that this roller method of supporting and guiding the push bar is extremely durable and effective. It will be appreciated that such push bars are subjected to extremely rough use, particularly by school children in schools. The roller system of the present invention has been found to resist such use.

The assembly of the present invention is ideally suited for use in retracting latch bolts disposed at the upper and lower edges, respectively, of a door and connected to the actuator element by vertically extending rods. The said rods are substantially coaxially vertically arranged with their remote ends operatively connected to the latch bolts respectively and their adjacent ends in confronting relation to each other. The rods are reciprocable toward each other to retract their respective latch bolts and away from each other projection of their respective bolts. In the illustrative and preferred embodiment, a connector block, supported for reciprocation with the actuator element by roller means, is disposed in the housing means adjacent the said adjacent ends of the rods. Rigid links are provided for connecting the adjacent ends of the rods respectively to the connector block so that the rods will move vertically when the block moves horizontally.

Another object of the present invention is to provide such an assembly including rollers for supporting and guiding the movable elements relative to the housing means, the said rollers being positioned and proportioned and designed to provide the maximum durability of operation and freedom of movement of the elements.

Other objects and features of the present invention will become apparent as this description progresses.

To the accomplishment of the above and related objects, this invention may be embodied in the forms illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific constructions illustrated and described, so long as the scope of the appended claims is not violated.

In the drawings:

FIG. 1 is a full length elevational view, sectioned and cut away to show the elements of the assembly of the present invention;

FIG. 1*a* is a fragmentary view showing an alternative lost-motion connection between the dogging control member and the latch bolt;

FIG. 2 is a sectional view taken along the line 2—2 in FIG. 1;

FIG. 3 is a view of the dogging mechanism of the present invention showing the electrical means for dogging the latch bolt as well as the mechanical means for dogging the latch bolt;

FIG. 4 is a sectional view taken along the line 4—4 in FIG. 1;

FIG. 5 is a fragmentary sectional view showing a manual dogging device operated by a wrench;

FIG. 6 is a fragmentary sectional view showing the assembly of the present invention adapted for use in retracting latch bolts at the upper and lower edges, respectively, of a door;

FIG. 7 is a fragmentary and sectional plan view of the structure shown in FIG. 6 showing how the latch bolt rods are connected to the actuator element; and

FIG. 8 is a view taken from the right-hand side of FIG. 7 with the housing broken away to show the con-

nection of the latch bolt rods to the connector block which is connected to the actuator element.

Referring now to the drawings, it will be seen that there is illustrated an assembly 10 including a housing means 12 providing a front surface 14 and a rear surface 16 which is attached to the door. A push plate or push bar 18 extends through an opening bounded by the edges 20 in the front surface 14, the push bar being mounted for rectilinear bodily movement toward and away from the rear surface 16 as described in the said prior applications Ser. Nos. 61,110; 65,201; and 135,028. These prior applications disclose the toggle mechanism structure of the assembly of the present invention and particularly the manner in which the push bar 18 is movable outwardly and inwardly to move an actuator element or a retractor element to retract the latch bolt.

When the assembly 10 is mounted on a door to extend generally horizontally thereacross with the rear surface 16 against the surface of the door, the housing means 12 provides an upper wall section 24 and a lower wall section 26 which extend horizontally outwardly (upwardly in FIGS. 2 and 4) from the door to provide a downwardly facing surface 28 and an upwardly facing surface 30. As best seen in FIGS. 2 and 4, the push bar 18 is formed to provide an upper wall 34 and a lower wall 36 which extend horizontally inwardly and parallel to the wall sections 24, 26 to provide a downwardly facing surface 38 and an upwardly facing surface 40. As best seen in FIG. 2, the walls 34, 36 are disposed between the wall sections 24, 26.

Inside the housing means 12, a pair of longitudinally spaced apart support and guide units 46, 48 is provided. As will be discussed hereinafter, these units 46, 48 serve various functions, one of which is to journal mount rollers which rollably engage the surfaces 38, 40. Particularly, a pair of rollers 50, is journal mounted by pins 52 on each unit 46, 48 for rotation about horizontally extending axes parallel to the push bar 18 rollably to engage, respectively, the surfaces 38, 40. In this specification, and in the claims appended hereto, the terms "rolling on" and "rollably engaging" are considered to be synonymous. As viewed in FIG. 2, the upper roller 50 rolls under and against the downwardly facing surface 38 while the lower roller 50 rolls on and against the upwardly facing surface 40. However, the assembly may be inverted on a door such that the surfaces 38, 40 are reversed.

Adjacent each end of the push bar 18, a pair of rollers 54 are journal mounted on the push bar by brackets 56 for rotation about horizontally extending axes parallel to the push bar. As best seen in FIG. 2, these rollers 54 rollably engage, respectively, the downwardly and upwardly facing surfaces 28, 30. The longitudinal spacing between the rollers 50, 54, the vertical spacing between the rollers, and the horizontal spacing between the rollers in the direction of movement of the push bar 18 all contribute to the stability of the assembly and its durability.

In the drawings, the latch bolt is indicated by the reference numeral 62. The latch bolt is conventionally mounted for pivotal movement about a pivot pin 64 as best seen in FIG. 1. A lever crank 66 is mounted for pivotal movement about the axis of the pin 68 disposed inwardly from the pivot pin 64. The latch bolt 62 is drivingly connected to the crank 66 by a short rigid link 70 by pivot pins indicated at 72, 74. The rigid link 70 includes a protruding portion 76 which abuts against the upwardly extending arm of the crank 66. This latch bolt linkage mechanism, and its advantages, are described in the said prior application Ser. No. 135,028 filed Apr. 19, 1971.

The distal end of the upwardly extending arm of crank 66 is pivotally connected as indicated at 78 to the righthand end 80 of a rigid link 82 which is also described in said prior application. The link 82 is a major component of the first means for connecting the actuator element 86 to the latch bolt 62. The actuator element 86 has a first position corresponding to the latch-projected position of the bolt 62 and a second position corresponding to the latch-retracted position of the bolt 62. The actuator element 86 is rectilinearly movable in the direction of its axis between its first and second position. A spring 88 (FIG. 1) is coiled about the actuator element 86 and disposed between a bracket 90 in the housing and a pin 92 on the element 86 yieldably to urge the element to its latch-projected position. Another such coiled spring 96 is disposed between a bracket 98 in the housing and a flange 100 on the link 82 yieldably to urge the link 82 to the right (FIG. 1) to its latch-projected position. A pair of journal pins 104 extend upwardly and downwardly from the actuator element 86, and a pair of rollers 106 is journal mounted on each of these pins 104 to roll on the floor 107 of the housing, one roller 106 on each side of the actuator element. As best seen in FIG. 2, the rigid link 82 is formed with an inverted U-shaped section such that it provides a depending flange on each side of the actuator element 86. These flanges are provided with elongated slots 108 through which the axially outer ends of the pins 104 at the right-hand end of the actuator element extend. It is the length of these slots 108 (only one of which is shown) which provides the lost-motion connection between the bolt 62 and the actuator element. That is, the bolt 62 can move inwardly to move the rigid link 82 to the left as viewed in FIG. 1 without moving the actuator element 86 away from its first position corresponding to its latch-projected position. Since the pin 104 is normally against the left-hand end of the slots 108, any movement of the actuator element 86 to the left toward its second position will start to move the bolt 62 inwardly.

At its left-hand end, the link 82 is provided with an upwardly extending flange portion 112 to which a control member 114 is connected as indicated at 116. The control member 114 extends alongside the actuator element 86 from the connection 116 to a point to the left of the left-hand end of the push bar 18 as viewed in FIG. 1. The left-hand end of the control member 114 is formed as indicated at 118 (FIGS. 1 and 3), and a connector member 120 is connected to the control member as indicated at 122. As best seen in FIG. 3, this connector member 120 is provided with a slot 124 elongated in the direction of length of the actuator element 86 and control member 114. A lever member 126 is mounted for pivotal movement about a pin 128 extending perpendicularly from the floor 107 of the housing, the distal end of this member 126 carrying a pin 130 which extends into the slot 124. Normally, this pin 130 is at the left-hand end of the slot 124 so that the control member 114 can move to the left without movement of the member 126.

The armature 132 of a solenoid 134 is pivotally connected to the intermediate, raised portion 127 of the

member 126 by a pivot pin 136. Thus, when the solenoid 134 is energized to retract its armature 132, the member 126 is pivoted clockwise about the axis of the pin 128 (FIG. 3) to move the control member 114 in the direction of the arrow 142 to move the link 82 in the same direction to retract the latch bolt 62. Such a movement by the solenoid 134 does not change the position of the actuator element 86. The purpose of the solenoid 134 is to permit a security official at a remote control center to dog the latch bolt 62 in its retracted position.

The present invention includes electrically operated lock means 150 for holding the control member 114 in its latch-retracted position so that the solenoid 134 can be deenergized as soon as it has moved the control member to that position. The locking means 150 includes a locking member 152 mounted for pivotal movement about the axis of a fastening element 154 at the base of the unit 46, this member 152 including a hook portion 156 as illustrated. The control member 114 is formed with a locking portion or detent 158 which is engaged by the hook portion 156. A spring 160 acting between the unit 46 and the member 152 to urge the member clockwise about the axis of the element 154 is provided. When the control member moves to the left to its latch-retracted position, the spring 160 urges the hook portion 156 into engagement with the detent 158 to hold the control member. A switch 162 having a plunger 164 operated by an arm 165 of the member 152 is used to indicate, to the control panel, when the control member is locked in its latch-retracted position. The locking member 152 is provided with another arm portion 166 which cooperates with a solenoid 168 mounted in the housing so that its armature 170 pushes against the arm. When the solenoid 168 is energized, its armature 170 pushes the locking member 152 against the urging of the spring 160 to release the hook portion 156 from the detent 158 to permit the control member 114 to move to its latch-projected position.

In some cases, it may be desirable to have the hook portion 156 frictionally engage the control member 114 with sufficient force to provide a desired degree of frictional drag resisting movement of the member.

It will be appreciated that neither solenoid 134 nor solenoid 168 must be energized during the entire period that the latch bolt 62 is dogged in its retracted position. The solenoid 134 is energized only during the instant when the control member 114 is being moved in the direction of the arrow 142 and the solenoid 168 is energized only during the instant when the locking means is being released. The security personnel at the control center can detect when the bolt 62 is dogged by watching signal means dominated by the switch 162.

In one illustrative embodiment of FIG. 1, the control member 114 is connected to the latch bolt 62 by the same connection means (including link 82) which connects the actuator element 86 to the latch bolt such that the movement of the actuator element from its latch-projected position to its latch-retracted position also moves the control member 114. When the control member is moved thus by the actuator element 86, it is desired to prevent locking by the lock means 150. This is accomplished by providing a cover 176 for the locking portion (detent 158) of the control member 114, the cover being fastened to the actuator element 86 for movement therewith by means such as the illustrated pin 178. The cover 176 may be provided with an inclined surface as indicated at 180 which moves under the hook portion 156. Thus, when the control member 114 moves by itself to its latch-retracted position, the detent 158 is exposed for engagement by the hook portion 156. When the control member 114 and actuator element 86 move together to their left (FIG. 1), the cover 176 carried by the actuator element prevents functioning of the locking means 150.

In another illustrative embodiment of FIG. 1*a*, the portion 112 of the member 80 is connected to the control member 114 by means of a lost-motion connector member 115 having an elongated slot 115*a* receiving the pin 116. In this embodiment, the control member 114 is not moved by the actuator element 86 to the left (arrow 142) nor by the member 80 as it is moved to the left by the latch bolt 62. In this embodiment, the elongated slot 124 which permits movement of the member 114 to the left without movement of the armature 132 may be eliminated and the distal end of the lever 126 may be merely pivotally connected to the connector member 120. Further, in this embodiment, the cover 176 may be eliminated if desired.

In accordance with the present invention, first means provides an operative connection between the actuator element 86 and the latch bolt 62 as discussed above while second means provides an operative connection between the push bar 18 and the actuator element to move the actuator element from its said first position to its said second position in response to movement of the push bar inwardly. In the illustrative and preferred embodiment, the said second means includes the toggle mechanisms 184, 186 which function as fully described in the said prior patent applications. Particularly, each toggle mechanism 184, 186 includes a rigid link 188 pivoted at one end to its associated support and guide unit 46, 48 as indicated at 190. Another link 192 is pivotally connected by a pin 194 to the distal end of its associated link 188. A roller 196 is journalled on each pin 194 to roll in a support bracket 198 attached to the push bar as illustrated. The opposite end of each link 192 is pivotally connected to the actuator element 86 by the adjacent pin 104. Thus, as described in the said prior applications, movement of the push bar 18 inwardly moves the actuator element in the direction of the arrow 142 (FIG. 1) in opposition to the spring 88.

As shown best in FIGS. 1 and 2, the actuator element 86 extends through openings formed in the bases of the guide and support units 46, 48. Similarly, the rigid link 82 extends through such an opening in the unit 48.

The left-hand end of the actuator element 86 is provided with a hook portion 204 formed with a series of hooks 204*a*, 204*b* and 204*c*, best seen in FIGS. 1, 4 and 5. This hook portion 204 is used manually to dog the latch bolt 62 in its retracted position by dogging the actuator element 86 in its latch-retracted position.

The hook portion 204 is engaged and held in its selected latch-retracted position by a member 206 which is mounted on the floor 107 to be pivotally movable as indicated by the arrow 208 (FIG. 3). The member 206, which has a hook portion 207 engageable with each of the hooks 204*a*, 204*b*, 204*c*, has two positions determined by its detent opening 210 (FIG. 3) engaging two peripherally spaced apart protrusions 212. In the illustrative embodiment of FIGS. 1 and 3, a cylinder lock 214 is mounted in the housing to provide a tang 216 which moves the member 206 between its two posi-

tions. A security official having a key for the lock 214 may manually dog and release the latch bolt 62.

In the embodiment of FIG. 5, the member 206 is moved between its two positions by a bolt 218 having a head 220 providing a socket 222. A person having the proper socket wrench may gain access through the opening 224 in the front surface to turn the bolt to move the member 206.

Turning now to FIGS. 6, 7 and 8, it will be seen that the assembly is applicable to a vertical system, i.e., a system including latch bolts 240, 242 respectively at the upper and lower edges of the door with vertically extending rods 244, 246 connected respectively to the latch bolts. Conventionally, the rods 244, 246 are substantially coaxially vertically arranged with their remote ends operatively connected to the latch bolts 240, 242, respectively, and their adjacent ends in confronting relation to each other adjacent the right-hand end of the housing means 12'. The rods 244, 246 are shown connected, at their adjacent ends, to blocks 248, 250 which are reciprocably disposed in vertically extending portions 252, 254 of the housing means 12'. Each block 248, 250 is movably supported and guided by a roller 256 journal mounted by means of a fastening element 258 for rotation against opposing vertically extending track surfaces 259 of the housing portions 252, 254 as illustrated. The purpose of these rollers 256 is to assure free vertical movement of the blocks 248, 250 even though non-vertical forces are applied to the blocks.

The rigid link 82' is connected at its right-hand end to a connector block 264 supported and guided for horizontal movement in the housing means 12'. As viewed in FIG. 7, a horizontally extending straight rod 266 is rigidly connected to the block 264 as indicated at 268 to extend to the left to be snugly disposed within the inverted U-shaped cross section of the link 82'. The purpose of the rod 266 is to keep the connector block 264 perfectly aligned with the rigid link 82'.

The right-hand end 272 of the rigid link 82' is connected to the connector block 264 by the pin indicated at 270 so that the connector block moves with the rigid link. In order to assure free movement of the connector block 264 in spite of the different components of force applied to it, the housing means 12' is formed to provide downwardly and upwardly facing track surfaces 274, 276 extending horizontally in the direction of movement of the connector block 264. Then, a roller 278 is journal mounted on the block 264 by means of a fastening element 280 and arranged rollably to engage the track surfaces 274, 276.

The inner end of each block 248, 250 carries a journal mounted roller 281, 282 which rollably engages the adjacent surface of the connector block 264 when the block is in its latch-projected position. These rollers 281, 282 are journal mounted for rotation about axes parallel to the journal axis for the roller 278. When the block 264 moves to the left in the direction of the arrow 283 in FIG. 7 from its latch-projected position, the adjacent ends of the blocks 248, 250, and the rollers 281, 282, move into the position occupied by the right-hand end of the connector block 264. The blocks 248, 250 are moved, respectively, downwardly and upwardly by rigid links 284, 286 providing a connection between the block 264 and the blocks 248, 250. The rigid links 284, 286 are pivotally connected, at their ends, by fastening elements 290, 292 as illustrated. The axes of these elements 290, 292 are parallel to the above-described axes of the rollers 256, 278. When the connector block 264 moves to the right, the rigid links 284, 286 move the blocks 248, 250, respectively, upwardly and downwardly. This movement is facilitated by the rollers 281, 282 engaging and rolling on the upper and lower surfaces of the connector block 264 and by the rollers 256 rolling on the surfaces 259.

What is claimed is:

1. A panic exit latch and actuator assembly comprising a housing means, a latch bolt movable between a projected position and a retracted position, an actuator element, means supporting said actuator element for movement between a first position and a second position, first means providing an operative connection between said actuator element and said latch bolt to move said latch bolt toward its retracted position in response to movement of said actuator element from its first position to its second position, a push plate supported for movement outwardly and inwardly relative to said housing means, second means providing an operative connection between said push plate and said actuator element to move said actuator element from its first position to its second position in response to movement of said push plate inwardly, control means including a control member movable between a first position and a second position, said first means providing an operative connection between said control member and said latch bolt to move said latch bolt to its retracted position when said control member is moved from its first position to its second position, said first connection means including a lost-motion connection permitting movement of said latch bolt to its retracted position by said control member without moving said actuator element from its first position to its second position, electrically operated means for moving said control member from its first position to its second position, and means for locking said control member in its second position.

2. The assembly of claim 1 in which said control member is operatively connected by said first means to said actuator element to move therewith when said element moves from its first position to its second position, said locking means including a locking member for engaging and holding said control member in its second position, yieldable means for urging said locking member into engagement with said control member, and second electrically operated means effective, when operated, to disengage said locking member.

3. The assembly of claim 2 in which said control member is formed with a locking portion engaged by said locking member, said actuator element carrying a cover for said locking portion effective to block said locking member when said control member moves with said actuator element.

4. The assembly of claim 1 in which said control member is operatively connected by said first means to said actuator element to move therewith when said element moves from its first position to its second position, said locking means including electrically operated means for engaging and holding said control member.

5. The assembly of claim 4 in which said electrically operated means for engaging and holding includes a locking member movable into holding engagement with said control member, spring means for yieldably urging said locking member into engagement with said control member, and solenoid means effective, when

operated, to disengage said locking member from said control member.

6. The assembly of claim 5 in which said control member is provided with a locking portion engaged by said locking member, said element carrying a cover for said locking portion effective to block said locking member when said control member moves with said element.

7. A panic exit latch and actuator mechanism comprising a retractor element rectilinearly movable between a latch-projected position and a latch-retracted position, means yieldably biasing said element normally toward its latch-projected position, a push plate elongated in the direction of movement of said element, means guiding said push plate for rectilinear bodily movement outwardly and inwardly in a direction perpendicular to the line of movement of said element, toggle means providing an operative connection between said push plate and said element to move said element in opposition to said biasing means away from its said latch-projected position when said push plate is moved inwardly toward said element, a latch bolt movable between a projected position and a retracted position, means providing an operative connection between said latch bolt and said element to move said latch bolt toward its retracted position when said element is moved away from its said latch-projected position, said connection means including a lost-motion connection permitting movement of said latch bolt toward its retracted position without moving said element in opposition to said biasing means from its latch-projected position, and control means for dogging said latch bolt in its said retracted position, said control means including a control member operatively connected to said latch bolt and movable between a latch-projected position and a latch-retracted position, said control member being independently movable relative to said element, electrically operated means for moving said control member to its latch-retracted position, and means for locking said control member in its latch-retracted position.

8. The mechanism of claim 7 in which said control member is operatively connected by said connection means to said retractor element for movement therewith when said element moves from its latch-projected position to its latch-retracted position, said locking means including electrically operated means for engaging and holding said control member in its latch-retracted position.

9. The mechanism of claim 8 in which said electrically operated means for engaging and holding includes a locking member movable into holding engagement with said control member, spring means for yieldably urging said locking member into engagement with said control member, and solenoid means effective, when operated, to disengage said locking member from said control member.

10. The mechanism of claim 9 in which said control member is provided with a locking portion engaged by said locking member, said element carrying a cover for said locking portion effective to block said locking member when said control member moves with said element.

11. The assembly of claim 2 in which said control member is formed with a notch into which said locking member extends to lock said control member, a cover for said notch effective to block said locking member, said cover being attached to said actuator element to move therewith to keep said notch covered when said control member is moved by said element.

12. The mechanism of claim 7 in which said locking means includes electrically operated means for engaging and holding said control member in its latch-retracted position.

13. The mechanism of claim 12 in which said electrically operated means for engaging and holding includes a locking member movable into holding engagement with said control member, spring means for yieldably urging said locking member into engagement with said control member, and solenoid means effective, when operated, to disengage said locking member from said control member.

14. The mechanism of claim 13 in which said control member is connected by said connection means to said element for movement therewith from its latch-projected position to its latch-retracted position, and in which said control member is provided with a locking portion engaged by said locking member, said element carrying a cover for said locking portion effective to block said locking member when said control member moves with said element.

15. A panic exit latch and actuator assembly comprising an elongated housing means, a latch bolt disposed at one end of said housing means and movable between a projected position and a retracted position, an elongated actuator element disposed within and generally parallel to said housing means, means supporting said actuator element for rectilinear movement in the direction of its length, an elongated push bar generally parallel to said housing means and having a portion disposed outside said housing means, means within said housing means for supporting and guiding said push bar for rectilinear movement toward and away from said actuator element, means providing an operative connection between said actuator element and said latch bolt to move said latch bolt toward its retracted position in response to movement of said actuator element in one direction, and means providing an operative connection between said push bar and said actuator element to move said actuator element in said one direction in response to movement of said push bar toward said actuator element, said supporting and guiding means including a plurality of rollers supporting said push bar for movement relative to said housing means.

16. The assembly of claim 15 in which said housing means is generally horizontal and provides upper and lower wall sections extending generally horizontally outwardly and parallel to said push bar, said push bar being disposed between said upper and lower wall sections, said push bar providing upper and lower walls extending generally horizontally inwardly and parallel to said wall sections, said plurality of rollers including first rollers journalled on said push bar for rotation about horizontal axes parallel to said push bar and rollably engaging said upper and lower wall sections and second rollers journalled on said housing means for rotation about horizontal axes parallel to said push bar and rollably engaging said upper and lower walls of said push bar.

17. The assembly of claim 16 in which said first rollers include a pair of rollers at each end of said push bar, one of said rollers of each pair rolling on the underneath side of said upper wall section and the other of

said rollers of said pair rolling on the upper side of said lower wall section.

18. The assembly of claim 16 in which said second rollers include at least two pairs of rollers spaced apart in said housing means to support opposite ends of said push bar, one of said rollers of said pair rolling on the underneath side of said upper wall of said push bar and the other of said rollers of said pair rolling on the upper side of said lower wall of said push bar.

19. The assembly of claim 17 in which said second rollers include at least two pairs of rollers spaced apart in said housing means to support opposite ends of said push bar, one of said rollers of said pair rolling on the underneath side of said upper wall of said push bar and the other of said rollers of said pair rolling on the upper side of said lower wall of said push bar.

20. A panic exit latch and actuator assembly comprising an elongated housing means having a rear surface adapted to be secured in transverse relation to the inner surface of a hinged closure and having an opposite front surface, a latch bolt movable between a projected position and a retracted position, an actuator element, means supporting said actuator element for movement, two support and guide units disposed within said housing means at longitudinally spaced apart points, an elongated push bar generally parallel to said housing means and penetrating the front surface of said housing means, rollers journal mounted on said support and guide units and arranged rollably to engage and support said push bar for rectilinear reciprocation toward and away from said rear surface of said housing means, means providing an operative connection between said actuator element and said latch bolt to move said latch bolt toward its retracted position in response to movement of said actuator element in one direction, spring means biasing said actuator element in the opposite direction, and means providing an operative connection between said push bar and said actuator element to move said element in said one direction in response to movement of said push bar toward said rear surface of said housing means.

21. The assembly of claim 20 in which said housing means provides upper and lower wall sections extending generally horizontally outwardly and parallel to said push bar, said push bar being disposed between said upper and lower wall sections, said push bar providing upper and lower walls extending generally horizontally inwardly and parallel to said wall sections, and said rollers including a pair of rollers journalled on each said support and guide unit and arranged to roll on, respectively, said upper and lower walls of said push bar.

22. The assembly of claim 21 in which the rollers of each pair are mounted such that one roller rolls on the underneath side of said upper wall and the other roller rolls on the upper side of said lower wall.

23. The assembly of claim 21 including additional rollers journal mounted on said push bar for rotation and positioned to roll on said upper and lower wall sections.

24. The assembly of claim 22 including additional rollers journal mounted on said push bar for rotation and positioned to roll on said upper and lower wall sections.

25. The assembly of claim 22 including additional rollers journal mounted on said push bar rollably to engage said wall sections.

26. The assembly of claim 25 in which said additional rollers include rollers rolling on the underneath side of said upper wall section and rollers rolling on the upper side of said lower wall section.

27. A panic exit latch and actuator assembly comprising an elongated housing means having a rear surface adapted to be secured in transverse relation to the inner surface of a closure hinged about a vertical axis and having an opposite front surface, latch bolts disposed respectively at the upper and lower portions of such a closure for movement between projected positions and retracted positions, an elongated actuator element disposed in said housing means parallel to said rear surface, means supporting said actuator element for rectilinear reciprocation in the direction of its length, an elongated push bar generally parallel to said housing means and having a portion disposed outside said front surface of said housing means, means supporting said push bar for rectilinear movement toward and away from said rear surface and perpendicular thereto, means providing an operative connection between said actuator element and said latch bolts to move said latch bolts to their retracted positions in response to movement of said actuator element in one direction, and means providing an operative connection between said push bar and said actuator element to move said actuator element in said one direction in response to movement of said push bar toward said rear surface, said means providing an operative connection between said actuator element and said latch bolts including a rod for each latch bolt, said rods being substantially coaxially vertically arranged with their remote ends operatively connected to said latch bolts respectively and their adjacent ends in confronting relation to each other, said rods being reciprocable toward each other to retract their respective latch bolts and away from each other upon projection of their respective bolts, a connector block disposed in said housing means adjacent said adjacent ends of said rods, means supporting said block for rectilinear reciprocation in the direction of movement of said actuator element, means for connecting said block to said actuator element for movement therewith in said one direction, rigid links for connecting the adjacent ends of said rods respectively to said block, each said link having one of its ends connected to said block for pivotal movement relative thereto about a first axis perpendicular to the direction of movement of said actuator element and parallel to the direction of movement of said push bar and the other of its ends connected to the adjacent end of its associated rod for pivotal movement about a second axis parallel to said first axis.

28. The assembly of claim 27 in which said means supporting said block for rectilinear reciprocation includes roller means journalled on said block and rollably engaging said housing means.

29. The assembly of claim 27 in which said housing means is generally horizontally extending and formed to provide, above and below said connector block, downwardly and upwardly facing track surfaces extending horizontally in the direction of movement of said block, said means supporting said block for rectilinear reciprocation including roller means journalled on said block and rollably engaging said track surfaces.

30. The assembly of claim 29 in which said roller means includes a single roller journalled on said block

rollably to engage said downwardly and upwardly facing track surfaces.

31. The assembly of claim **30** in which said first pivotal axes for said links coincide, said single roller being journal mounted on said block for rotation about an axis parallel to said coinciding first axes and lying in the same general horizontal plane as the axis for said actuator element.

32. The assembly of claim **31** including a roller journal mounted on each said adjacent end of said rods for rotation about an axis parallel to said coinciding axes and the axis for said single roller, said connector block being provided with upper and lower surfaces rollably engaged by the last said rollers.

33. The assembly of claim **1** in which said first connection means includes a second lost-motion connection permitting movement of said latch bolt to its retracted position by said actuator element without moving said control member from its first position to its second position, said locking means including a locking member for engaging and holding said control member in its second position, yieldable means for urging said locking member into engagement with said control member, and second electrically operated means effective, when operated, to disengage said locking member.

34. The mechanism of claim **7** including second lost-motion connection between said control member and said latch bolt permitting movement of said latch bolt toward its retracted position without movement of said control member from its latch-projected position to its latch-retracted position, said locking means including electrically operated means for engaging and holding said control member in its latch-retracted position.

35. The mechanism of claim **34** in which said electrically operated means includes a locking member for engaging and holding said control member in its latch-retracted position, yieldable means for urging said locking means into engagement with said control member, and solenoid means effective, when operated, to disengage said locking member.

* * * * *

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,767,238 Dated October 23, 1973

Inventor(s) George Z. Zawadzki

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the title page, the name of the Assignee should be -- Von Duprin, Inc. --.
Column 2, line 16, after "other" insert -- upon --.
Column 4, line 30, after "U-shaped" insert -- cross --.

Signed and sealed this 4th day of June 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents