United States Patent [19]

Williams

[11] **3,877,262**

[45] **Apr. 15, 1975**

[54] **EMERGENCY EXIT LATCH AND ACTUATOR ASSEMBLY**

[75] Inventor: **Merton S. Williams,** Terryville, Conn.

[73] Assignee: **Emhart Corporation,** Bloomfield, Conn.

[22] Filed: **Sept. 20, 1973**

[21] Appl. No.: **399,277**

[52] **U.S. Cl.** **70/92;** 292/92

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

[58] **Field of Search** 70/92; 292/21, 92

[56] **References Cited**

UNITED STATES PATENTS

1,539,350	5/1925	Clark	292/92
2,320,298	5/1943	Phillips	292/92
3,432,631	3/1969	Deutscher et al.	200/61.67

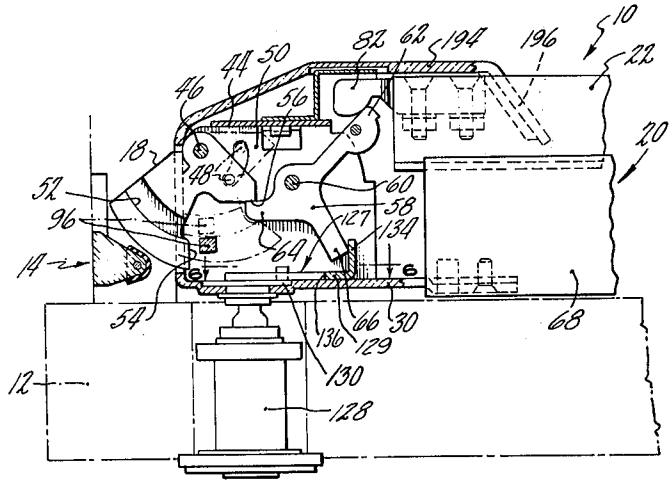
Primary Examiner—Albert G. Craig, Jr.

Attorney, Agent, or Firm—McCormick, Paulding & Huber

[57] **ABSTRACT**

An elongated emergency exit bolt and actuator assembly for mounting on the inner face of an outwardly opening door to extend transversely thereacross includes a crossbar supported by parallel links to move in a horizontal plane generally toward and away from the door and to instantly release the door upon movement in the direction of egress. The crossbar has an operating finger secured to one end thereof for engaging an associated part of a pivoted retractor lever engageable with the latch bolt to pivot it to retracted position. The unit includes a latch bolt deadlocking mechanism, and a dogging mechanism for releasably retaining the crossbar in a depressed position corresponding to a retracted position of the latch bolt. Additional latch bolt actuating mechanism may be provided for retracting the latch bolt from the outer side of the door independently of the crossbar. The unit may further include locking mechanism for releasably retaining the latch bolt in a retracted position, or for disabling or locking the additional latch bolt actuating mechanism.

30 Claims, 14 Drawing Figures



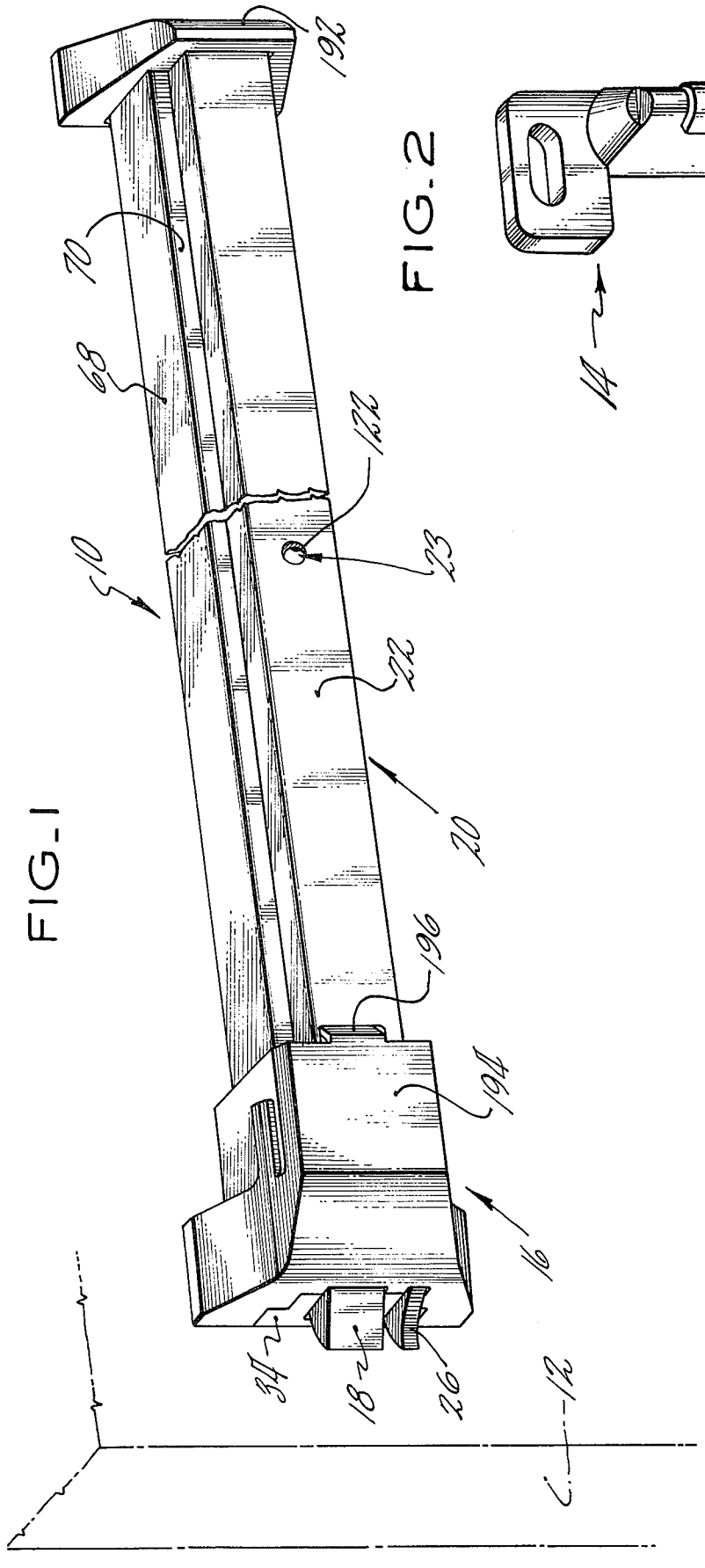


FIG. 1

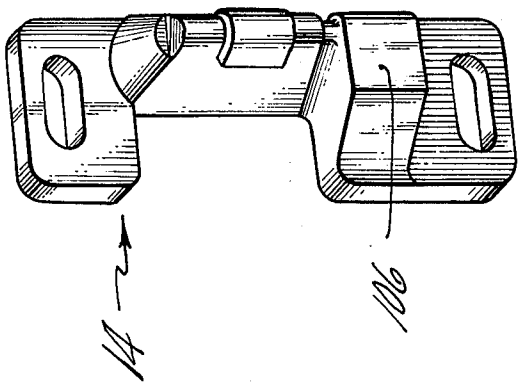


FIG. 2

FIG. 3

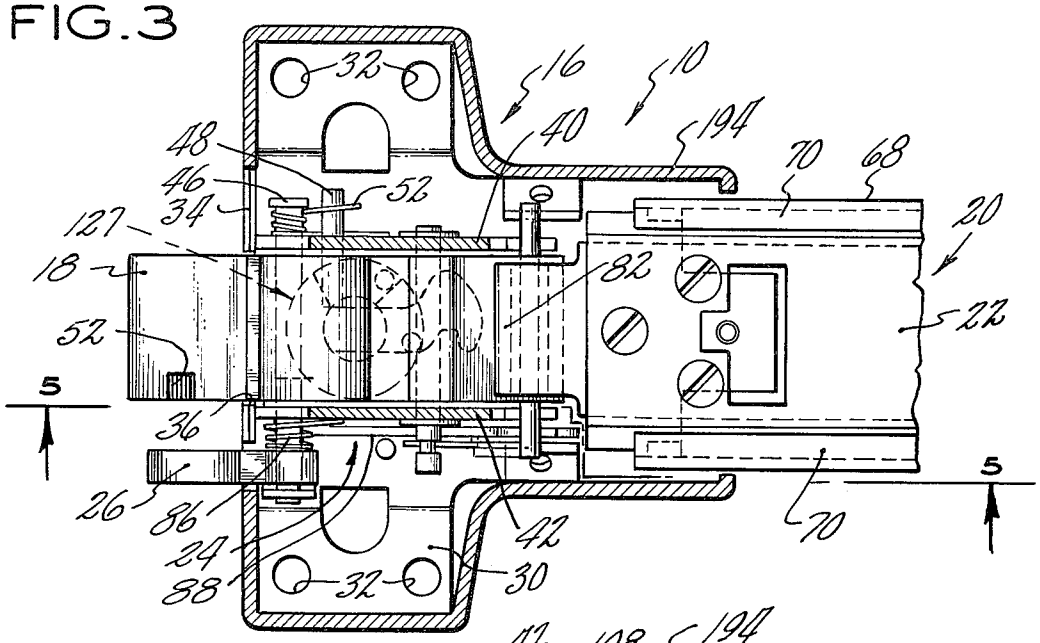


FIG. 4

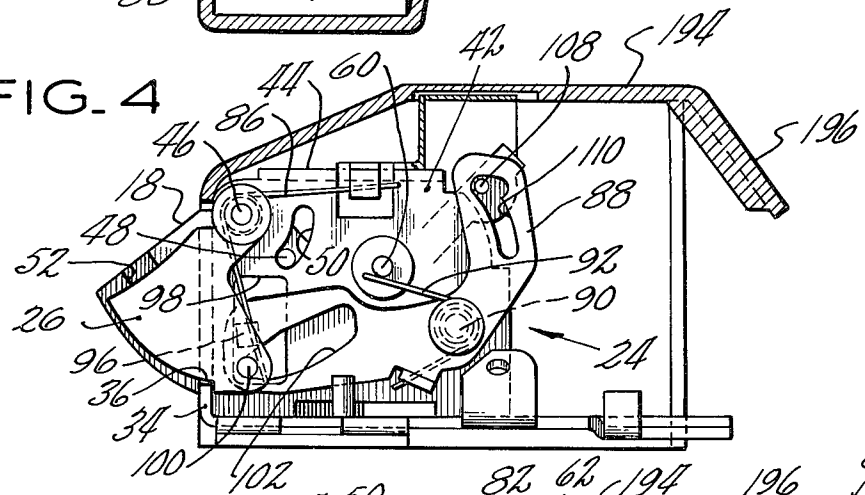
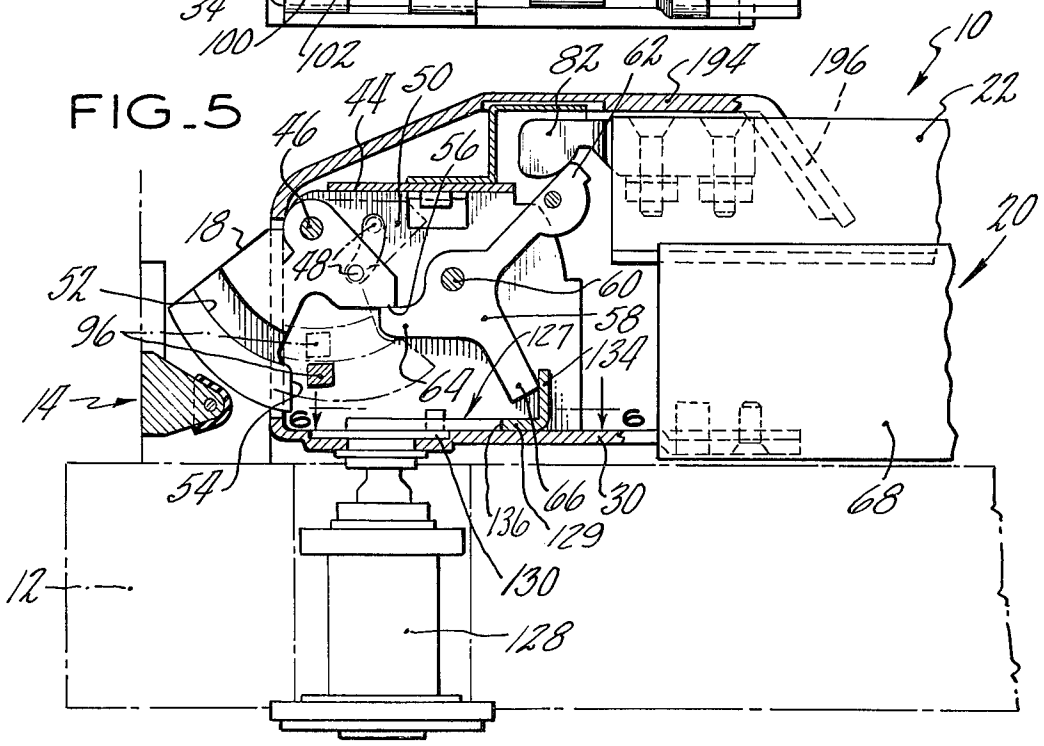
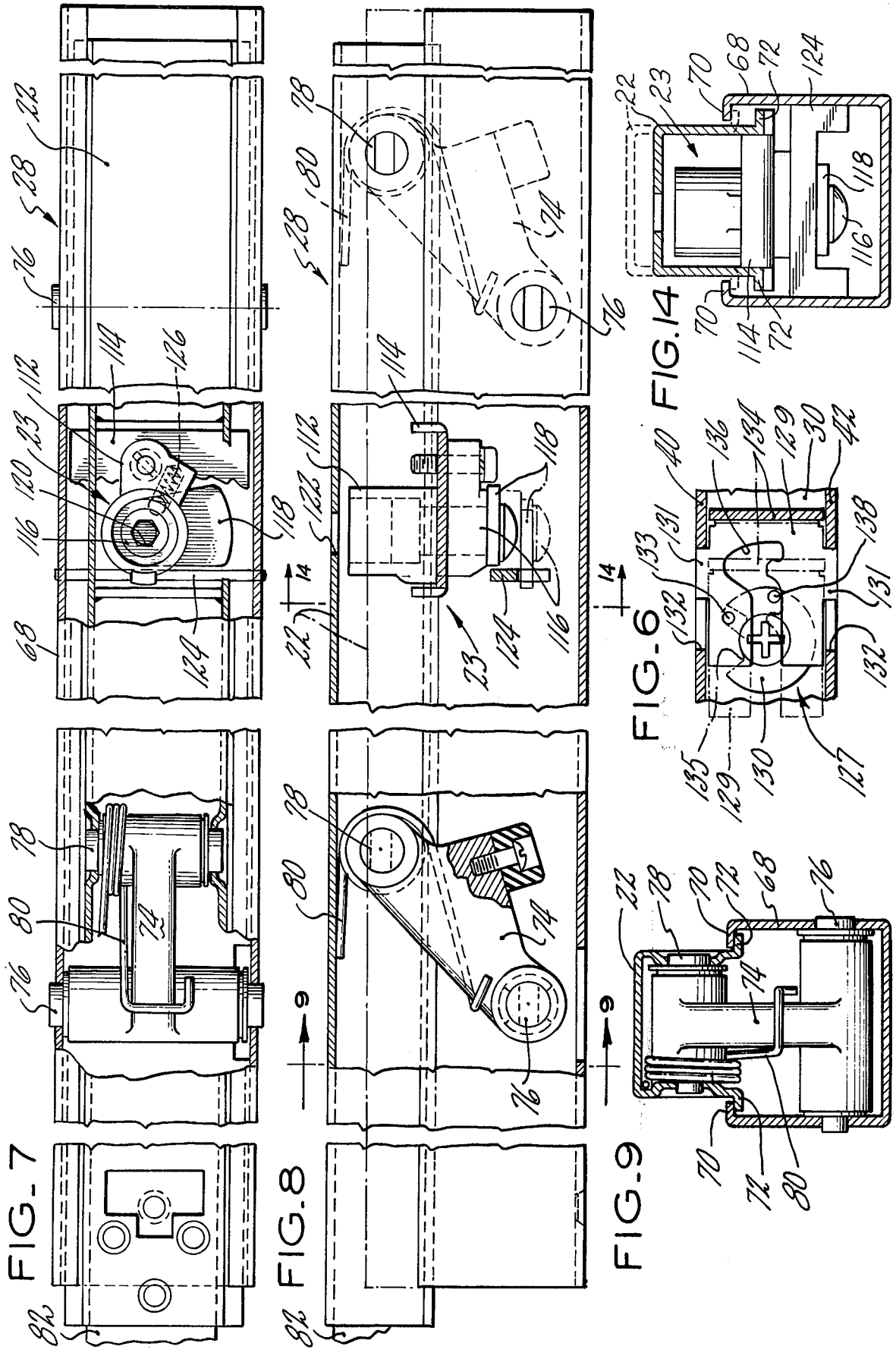


FIG. 5




FIG. 7
FIG. 8
FIG. 9
FIG. 14
FIG. 6

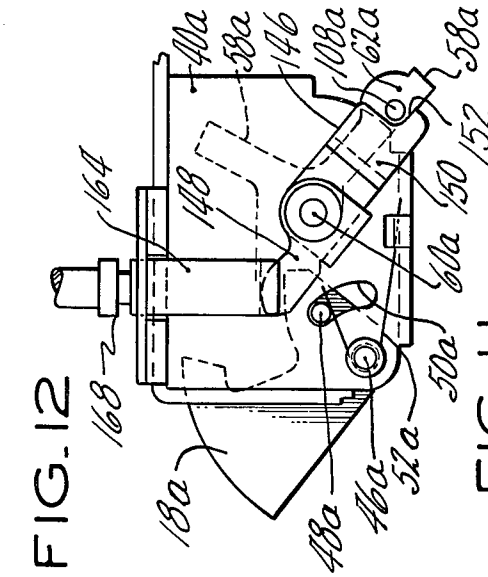


FIG. 12

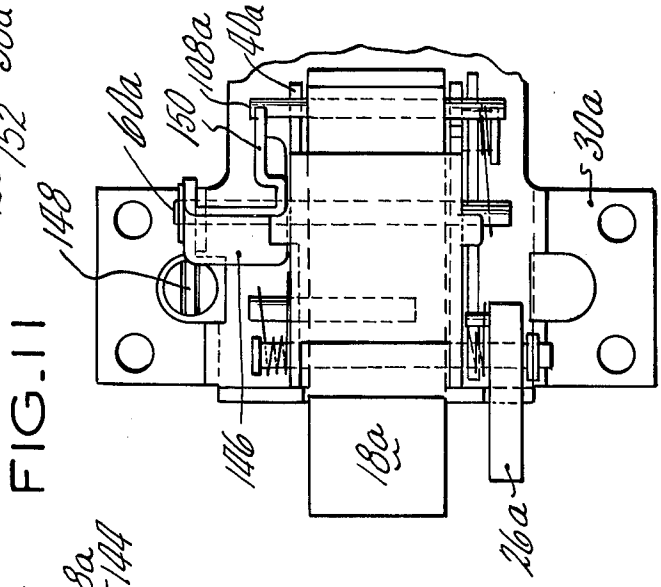


FIG. 11

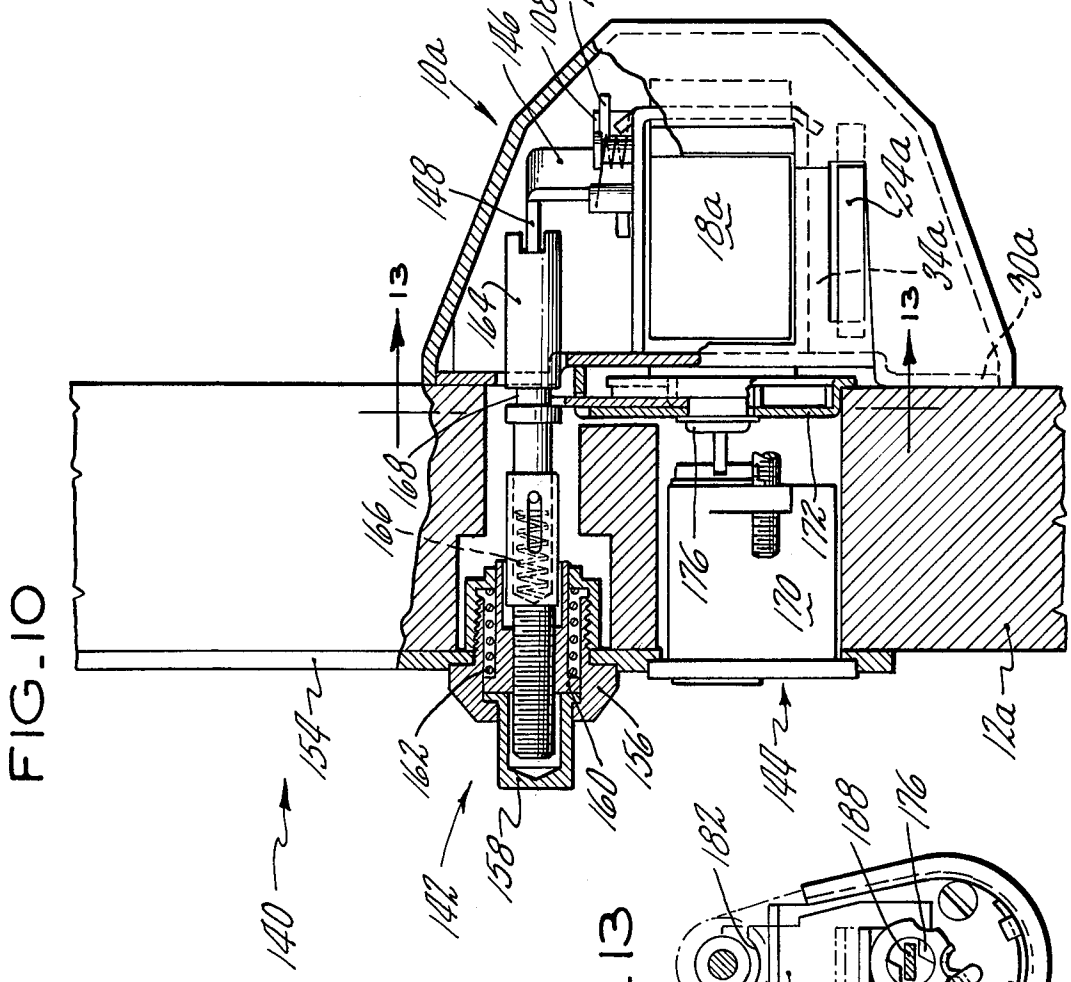


FIG. 10

FIG. 13

EMERGENCY EXIT LATCH AND ACTUATOR ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates in general to emergency exit bolts and the like and deals more particularly with an improved emergency exit bolt and actuator assembly of rim or surface mounted type. Emergency exit or panic bolts of the aforedescribed general type are well-known in the art, however, such bolts are usually costly to manufacture and relatively difficult to install. The general aim of the present invention is to provide an improved emergency exit bolt and actuator unit of the aforedescribed general type for low cost manufacture and simplified installation which may be provided in a wide variety of functions to meet all normal exit requirements.

SUMMARY OF THE INVENTION

In accordance with the present invention, an improved emergency exit bolt and actuator assembly is provided which includes an elongated frame supporting a pivoted latch bolt and an elongated actuating member adapted to extend transversely of the inner surface of an outwardly opening door. The actuating member is supported by links for simulataneous arcuate movement and longitudinal translation relative to the frame in a generally horizontal plane and toward and away from the door between an active and inactive position. A retractor finger carried by the actuating member is engageable with an associated part of a retractor element pivotally supported on an axis parallel to the latch bolt axis to pivot the retractor element from a first position to a second position in response to movement of the actuating member to its active position. Another part of the retractor element is engageable with an associated part of the latch bolt to move the latch bolt from a projected to retracted position in response to pivotal movement of the retractor from its first to its second position. However, the latch bolt is freely movable from its projected to its retracted position out of engagement with the retractor element. The unit may include additional actuating mechanism for operating the retractor element independently of the aforementioned actuating member. The unit is constructed and arranged so that its length may be readily altered by one having ordinary skill to adapt it to the width of a door on which it is to be installed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view and shows an emergency exit bolt and actuator assembly embodying the present invention mounted in operative position on the inner face of an outwardly opening door.

FIG. **2** is a somewhat enlarged perspective view of a strike assembly for use with the emergency exit latch unit of FIG. **1.**

FIG. **3** is a somewhat enlarged fragmentary elevational view of the assembly of FIG. **1,** with the cover broken away to reveal structure therebehind.

FIG. **4** is a fragmentary bottom view of the assembly of FIG. **1,** the cover being shown in longitudinal section.

FIG. **5** is a fragmentary sectional view taken generally along the line **5—5** of FIG. **3,** but shows the assembly mounted in an operative position on the inner face of a door, the strike assembly of FIG. **2** being shown mounted on the door frame.

FIG. **6** is a fragmentary sectional view taken generally along the line **6—6** of FIG. **5.**

FIG. **7** is a fragmentary elevational view of the assembly of FIG. **1** and shows the panic or crossbar assembly.

FIG. **8** is a fragmentary bottom view of the crossbar assembly of FIG. **7.**

FIG. **9** is a sectional view taken generally along the line **9—9** of FIG. **8.**

FIG. **10** is a somewhat enlarged fragmentary elevational view of an emergency exit bolt and actuator assembly embodying the invention shown mounted in an operative position on a door as viewed looking toward the edge of the door, portions of the door and unit housing shown broken away.

FIG. **11** is a fragmentary elevational view of the latch bolt assembly of FIG. **10** shown with the cover removed therefrom.

FIG. **12** is a fragmentary plan view of the latch bolt assembly of FIG. **11.**

FIG. **13** is a fragmentary sectional view taken generally along the line **13—13** of FIG. **10.**

FIG. **14** is a sectional view taken along the line **14—14** of FIG. **8.**

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to the drawings, an emergency exit bolt and actuator assembly embodying the present invention is indicated generally by the reference numeral **10.** The assembly **10** is of a rim or surface mounted type, and in FIGS. **1** and **5** is shown mounted on the inner surface of an outwardly opening door **12** for engagement with a strike assembly indicated generally at **14** and mounted in an operative position on a frame of the door **12,** as shown in FIG. **5.** The assembly **10** comprises a latch bolt mechanism designated generally by the numeral **16** which includes a latch bolt **18** and an actuating mechanism indicated generally at **20** which includes an elongated actuating member or crossbar **22.** The crossbar **22** is mounted in a horizontal position on the door to span a substantial portion of the door width and is operable at all times. A slight pressure on the panic bar or crossbar **22** will instantly retract the latch bolt to release it from engagement with the strike assembly **14** to release the door **12** and allow immediate egress. A novel dogging device associated with the crossbar **22,** indicated generally at **23,** and best shown in FIGS. **7** and **8,** may be employed to lock the crossbar **22** in a depressed position whereby to maintain the latch bolt **18** in a retracted position to permit the door **12** to be freely opened by either a push or a pull.

The assembly **10** further includes a deadlocking mechanism indicated generally at **24** and best shown in FIG. **4** for deadlocking the latch bolt when the door is closed and the latch bolt **18** is projected. The latter mechanism includes an auxiliary bolt **26** which cooperates with the strike assembly **14** in a manner well known in the art. One or more optional actuating mechanisms may be provided to operate the latch bolt from the outer side of the door independently of the crossbar **22** or to lock the latch bolt in its retracted position independently of the dogging device **23.** When the assembly **10** is provided with an additional bolt actuating mechanism operable from the outer side of the

door, a locking mechanism may also be included to disable the latter actuating mechanism.

Considering now the latch bolt mechanism in further detail, and referring particularly to FIGS. 3–5, the mechanism 16 comprises a frame, which is preferably formed from sheet metal and includes a mounting plate 30 which has apertures 32, 32 in its upper and lower ends, as best shown in FIG. 3 to receive fasteners which secure the assembly 10 to the surface of a door. At its forward end, the plate 30 has an inwardly bent portion 34 which forms a face plate for the bolt mechanism and has an aperture 36 to receive the latch bolt 18 therethrough. The frame further includes a generally U-shaped support bracket which is mounted on the plate 30 adjacent the portion 34, and includes top and bottom walls respectively indicated at 40 and 42 staked or otherwise suitably secured to the plate 30 and integrally connected at their inner ends by the inner end wall 44. Thus, the mounting plate 30 and the U-shaped support bracket cooperate to form a box-like structure which opens rearwardly or toward the crossbar 22. The latch bolt 18 is pivotally supported within the box-like frame by a vertically disposed pivot pin 46 which extends through the latch bolt and through and beyond the top and bottom walls 40 and 42. A pin 48 mounted on the latch bolt 18 extends upwardly therefrom and through an arcuate slot 50 formed in the top wall 40. A torsion spring 52 mounted on the pivot pin 46 above the top wall 40 acts between the pin 48 and the frame to bias the latch bolt 18 in a clockwise direction toward its projected position, as viewed from below in FIGS. 4 and 5. The slot 50 cooperates with the pin 48 to limit angular movement of the latch bolt 18 between its projected or full line position and its retracted or broken line position of FIG. 5. An arcuate groove 52 opens through the bottom surface of the latch bolt and has its center of curvature at the center of the pivot pin 46. The latch bolt further includes a generally vertically disposed abutment surface 54 which faces rearwardly and a generally vertically disposed bearing surface 56 which faces outwardly or toward the door 12 when the latch bolt is in its projected position, as best shown in FIG. 5.

Operative connection between the latch bolt 18 and the crossbar 22 is provided by a retractor element or lever 58 supported within the frame by a pivot pin 60 which extends through the retractor lever 58 in parallel alignment with the pivot pin 46 and has its upper and lower ends respectively supported in the upper and lower walls 40 and 42. The retractor lever 58 includes three angularly spaced parts or legs designated 62, 64 and 66 which extend outwardly in generally radial directions from the pin 60. It should be noted that the leg 64 is engageable with the bearing surface 56 on the latch bolt when the latch bolt is in its projected position, as best shown in FIG. 5. However, the latch bolt is free to pivot in a counterclockwise direction to its retracted or broken line position of FIG. 5 out of engagement with the retractor lever 58.

Considering now the actuating mechanism or crossbar assembly 20 in further detail and further referring to FIGS. 7–9, the assembly 20 includes a horizontally elongated channel member 68 secured to the mounting plate 30 to form a rearward extension of the latch bolt mechanism frame. The length of the channel member 68 may vary in accordance with the width of the door on which the assembly 10 is to be mounted. The channel member 68 opens inwardly and has longitudinally extending lips 70, 70 at its inner end which define the channel opening. The crossbar 22 comprises another channel member equal in length to the length of the channel member 68 but of somewhat smaller cross-sectional dimension. The crossbar 22 is telescopically received within the opening in the channel member 68 and has longitudinally extending flanges 72, 72 at its outer end for respectively engaging the lips 70, 70 as best shown in FIG. 9. The crossbar 22 is supported in the channel member 68 by a pair of parallel links 74, 74 which are supported by pivot pins 76, 76 to pivot about axes parallel to the axis of the latch bolt 18 and as best shown in FIG. 8. Each link 74 is further connected to the crossbar 22 by another vertically disposed pivot pin 78 which extends through the inner end of the link and is mounted on the upper and lower walls of the crossbar 22. Each link 74 has a torsion spring 80 associated therewith which acts between the link and the crossbar 22 to bias the crossbar to its extended position or full line position of FIGS. 7 and 8. At its forward end, the crossbar 22 carries an actuator element or retractor finger 82 which is secured thereto by suitable fasteners. The retractor finger 82 is adapted for engagement with the retractor leg 62 as best shown in FIG. 5.

The structure hereinbefore described which includes the latch bolt 18, the retractor lever 58, the crossbar 22 and support structure comprises a complete operating unit and a structure embodying the aforesaid elements may be provided to perform a basic emergency exit latch function.

When the crossbar 22 is biased to its extending position, the flanges 72, 72 respectively engage the lips 70, 70. A slight pressure exerted upon the crossbar in an outward direction or toward the door 12 causes the crossbar to pivot or move in an arcuate path and simultaneously translate in a rearward direction toward its depressed or broken line position of FIG. 8. The retractor finger 82 which engages the retractor lever leg 62 causes the retractor lever 58 to pivot in a clockwise direction, as it appears in FIG. 5. The latter clockwise movement of the retractor lever 58 causes a generally corresponding counterclockwise movement of the latch bolt 18 due to coengagement of the leg 64 and the bearing surface 56 to pivot the latch bolt 18 toward its retracted or released position relative to the strike assembly 14 and to release the door and allow it to move to its open position. As the door closes the inclined surface on the face of the latch bolt 18 engages the strike assembly 14 to pivot the latch bolt toward its retracted position. When the latch bolt 18 clears the strike assembly 14, and the door 12 has attained its fully closed position, the latch bolt is again biased to its projected position by the torsion spring 52.

DEADLOCKING MECHANISM

The deadlocking mechanism 24 will now be more fully considered with particular reference to FIGS. 3 and 4. As previously noted, the deadlocking mechanism includes an auxiliary latch bolt 26, the latter bolt being mounted on the lower end of the pivot pin 46 and below the bottom wall 42. A torsion spring 86 encircles the pin 46 between the auxiliary bolt 26 and the bottom wall 42 and acts between a tab formed on the bottom wall and the auxiliary bolt to bias the latter bolt to a projected position. The auxiliary bolt 26 is pivotally

movable between projected and retracted positions and cooperates with the strike assembly **14** to control movement of a generally L-shaped deadlocking plate or lever **88** mounted on a stud **90** supported on the bottom wall **42.** The deadlocking lever **88** pivots on the stud **90** and about an axis generally parallel to the axis of the latch bolt **18** and auxiliary bolt **26.**

A torsion spring **92** mounted on the stud **90** acts between a tab on the lever **88** and the lower end of the pivot pin **60** to bias the deadlocking lever **88** in a counterclockwise direction and toward a deadlocking position, as viewed from below in FIG. **4.** The deadlocking lever carries a blocker or post **96** at its forward end which projects upward through an aperture **98** in the bottom wall **42.** The auxiliary bolt **26** carries a control pin **100** received in a cam slot **102** in the deadlocking lever **88.** The control pin **100** cooperates with a cam surface defined by the slot **102** to move the spring biased deadlocking lever **88** to an inactive or unlocked position when the door is opened and the auxiliary bolt **26** moves to its projected position and to hold the deadlocking lever **88** in its unlocked position while the door remains in an open position. The post **96** is aligned with the arcuate groove **52** in the latch bolt **18** when the deadlocking lever **88** is in its unlocked position to permit free pivotal movement of the latch bolt, as shown in broken lines in FIG. **5.** However, the blocker **96** is out of alignment with the groove **52** in a blocking position shown in full lines in FIG. **5,** when the deadlocking lever **88** is in its locking position. In the latter position, the post **96** is disposed rearwardly of the abutment surface **54** to prevent pivotal movement of the latch bolt **18** toward its retracted position.

As the door **12** is moved toward a closed position, both the latch bolt **18** and the auxiliary bolt **26** move to retracted positions upon engagement with the strike assembly **14.** The latch bolt leads the auxiliary bolt slightly and engages the strike assembly **14** before the auxiliary bolt engages it. Accordingly, the post **96** which is held in its inactive position by the projected auxiliary bolt **26** enters the slot **52** before the auxiliary bolt engages the strike assembly **14** to release the deadlocking lever **88** from its unlocked position. Thus, the latch bolt **18** is free to pivot to its fully retracted position in engagement with the strike assembly **14** as the door closes. When the door attains its fully closed position and the latch bolt **18** clears the strike assembly **14,** the torsion spring **52** biases the latch bolt to its projected position. However, the auxiliary bolt **26** is retained in its retracted position by engagement with an abutment surface **106** on the strike assembly, the latter abutment surface being best shown in FIG. **2.** When the auxiliary bolt **26** is retracted, the control pin **100** is disposed in the rear portion of the cam slot **102** and allows the deadlocking lever **88** to pivot or rock slightly in a counterclockwise direction under the biasing force of the spring **92,** as it appears in FIG. **4,** to move the post **96** to its blocking or full line position shown in FIG. **5.** In the latter position, the post **96** is disposed rearwardly of the abutment surface **54** to prevent movement of the latch bolt **18** to its retracted position.

Movement of the deadlocking lever **88** is further controlled by a drive pin **108** which comprises a part of the retractor leg **62** and extends into and through another cam or control slot **110** in the inner end of the retractor lever **88.** Initial pivotal movement of the retractor lever **58,** as in response to depression of the crossbar **22,** causes the pin **108** to cooperate with a cam surface defined by the inner end portion of the control slot **110** whereby to pivot the deadlocking lever **88** in a clockwise direction and toward its release or unlocked position, as viewed in FIG. **4.** The pin **108** then enters the main arcuate portion of the slot **110** wherein it is free to travel as the retractor lever **58** moves to its second position. The latter pivotal movement of the retractor lever **58** causes retraction of the latch bolt with the blocker **96** disposed within the arcuate groove **52.**

DOGGING MECHANISM

Under some circumstances, it may be desirable to provide the emergency exit bolt assembly of the present invention with a dogging device for moving the crossbar **22** to and retaining it in a depressed position corresponding to a retracted position of the latch bolt **18** whereupon the door is released and is at all times free to be pulled or pushed to open position.

The dogging device **23** best shown in FIGS. **7** and **8** includes a housing **112** mounted in fixed position on and fastened to a bracket **114** welded or otherwise suitably secured to the crossbar **22.** The housing **112** provides a journal for a rotary part **116** disposed with its axis normal to the longitudinal axis of the crossbar. At its inner end, the rotary part **116** has an eccentric cam **118** fixed thereto for angular movement therewith. A hexagonal slot **120** formed in the inner end of the rotary part **116** and accessible through an aperture **122** in the bar **22** is adapted to receive a hexagonal key (not shown) used to turn the rotary part. Rotation of the rotary part **116** in a clockwise direction from its undogged position, as viewed in FIG. **7** brings the cam **118** into engagement with an abutment surface provided by a vertically disposed cross member **124** mounted in fixed position on and extending across the channel **68.** Coengagement with the side of crossbar **124** and the edge of cam **118** causes simultaneous arcuate and translational movement, about pivots **76, 76** and **78, 78,** of the crossbar **22** in a rearward direction and toward its depressed position. When the crossbar **22** attains its fully depressed or dogged position, the cam **118** enters a slot in the cross member **124,** as best shown in FIG. **8,** to positively retain the crossbar **22** in its dogged or depressed position. A spring-ball detent mechanism indicated at **126,** FIG. **7,** mounted in the housing **112** cooperates with the rotary part **116** to releasably retain it in either its dogged or undogged position and to prevent it from being dislodged therefrom by normal vibration or shock encountered in opening and closing the door **12.**

BOLT RELEASE AND HOLDBACK MECHANISM

If desired, the basic emergency exit bolt assembly **10** may also be provided with a latch bolt release and holdback mechanism for operation from the outer side of the door **12** such as indicated generally at **127** and best shown in FIGS. **3, 5** and **6.** The latter mechanism includes a conventional key operated lock cylinder **128** mounted in the door **12,** as shown in FIG. **5,** a key slide **129,** and a rotary plug **130.** The slide **129** is supported within the box-like frame structure which houses the latch bolt mechanism **16** and is disposed generally adjacent the mounting plate **30** by ears **131, 131** respectively received in slots **132, 132** in the top and bottom walls **40** and **42,** as best shown in FIG. **6,** for limited sliding movement forwardly and rearwardly of the

frame. The slide **129** has a drive pin which pin **133** is received in a radially outwardly opening notch **135** in the plug **130.** At its rear end, the slide **129** has an inwardly turned end portion **134** for engaging the retractor leg **66.** The slide **129** also has a generally hook-shaped cam slot **136** formed therein, as best shown in FIG. **6.** The plug **130** is supported for rotation in the mounting plate **30** about an axis generally normal thereto and carries an eccentric pin **138** which is disposed within the cam slot **136.** Rotation of the plug **130** in a counterclockwise direction as viewed in FIGS. **3** and **6** causes the pin **133** to cooperate with the notch **135** to cam the slide **129** in a forward direction or toward the latch bolt **18.** This slide movement causes the end portion **134** to engage the retractor leg **66** and pivot the retractor lever **58** in a clockwise direction, from its position in FIG. **5** to move the latch bolt **18** to its retracted position. In the illustrated case, the plug **130** is driven by a connecting bar, FIG. **5,** associated with the lock cylinder **128.**

The latch bolt may be retracted by rotating a key (not shown) associated with the lock cylinder **128** in a clockwise direction. When the key is released, the spring **52** which biases the latch bolt toward its projected position also acts through the latch bolt and the retractor lever **58** to bias the slide **129** toward its rear position. However, if it is desired to lock the latch bolt **18** in its retracted position, the key is first rotated in a clockwise direction to retract the latch bolt which is then manually held in its retracted position, to overcome the biasing force of the spring **52,** while the key is rotated in a counterclockwise direction to its limit to position the eccentric pin **138** in the lower rear portion of the hook shaped slot **136,** as it appears in broken lines in FIG. **6.** The pin **138** cooperates with the slot **136** to releasably retain the slide **129** in its forward position and thereby retain the retractor lever **58** in its second or bolt retracting position.

PUSH BUTTON ACTUATING MECHANISM

As previously noted, the emergency exit bolt and actuator assembly of the present invention may also be provided with further actuating mechanism for operating the latch bolt from the outer side of a door. Referring now particularly to FIGS. **10–13,** an assembly embodying the present invention and indicated generally at **10***a* includes a push button actuating mechanism indicated generally at **140** which includes a push button assembly designated generally by the numeral **142** and the associated locking mechanism **144** for locking or disabling the push button assembly. The assembly **10***a* is similar in most respects to the assembly **10** previously described and parts similar to parts previously described bear the same reference numeral and will not be hereinafter further discussed.

The assembly **10***a* differs from the previously described unit in that the pivot pin **60***a* extends for some distance above the frame top wall **40***a* to provide pivotal support for a vertically off-set lever **146** which has upper and lower end portions respectively designated at **148** and **150** extending in generally opposite directions from the pin **60***a*. The lower portion **150** has an abutment **152** thereon for engaging the pin **108***a* mounted in the outer end of the retractor lever leg **62***a*. At this point, it should be noted that pivotal movement of the lever **146** in a counterclockwise direction from its position in FIG. **12** causes corresponding counterclockwise rotation of the retractor lever **58***a* and resulting retraction of the latch bolt **18***a*. However, it should be further noted that the retractor lever **58***a* is free to rotate in a counterclockwise direction out of engagement with the lever **146.**

The push button assembly **142** is mounted on an escutcheon plate **154** secured to the outer face of the door **12***a* and is retained in assembly therewith by a two-part housing **156.** The assembly **142** further includes a push button **158** and a plunger **160** slidably received in the housing **156** and biased toward a projected position by a compression spring **162** substantially as shown in FIG. **10.** The assembly **142** also includes an elongated two-part plunger shank **164** threaded into the plunger **160** and axially adjustable to accommodate the push button assembly **142** to doors of differing thickness. The rear part of the plunger shank **164** is received in a bore in the forward part thereof and retained therein by a pin which extends transversely through the rear part and through axially extending slots in the forward part. A compression spring **166** acts between the forward and rear shank parts to provide lost motion connection therebetween. The shank **164** has an annular locking recess **168** formed in its rear part intermediate the lost motion connection and its inner end. A notch in the inner end of the shank **164** receives the outer end of the lever portion **148.** The locking mechanism **144** includes a lock cylinder **170** disposed in an opening in the outer face of the door **12***a* and a lock unit **172,** best shown in FIG. **13.** The lock unit **172** is received in an opening in the inner face of the door **12***a* and has a housing **174** which supports a rotary plug **176** which carries a cam **178.** A locking plate **180** slidably supported in the housing **174** between the inner wall thereof and the cam **178** has a locking portion **182** at its upper end generally aligned with the locking recess **168** when the push button assembly **142** is in its projected position. The locking plate further includes inwardly projecting tabs **184** and **186** which provide cam surfaces for coengagement with the rotary cam **178.** Rotation of the cam **178** is controlled by the lock cylinder **170** which has a connecting bar **188** received within the plug **176.** A detent spring **190** disposed within the housing cooperates with notches in the cam **178** to releasably retain it in either its locked or released position.

Considering now the operation of the assembly **10***a*, when the push button **158** is depressed, the lever **146** rotates in a counterclockwise position as viewed above in FIG. **12** to cause corresponding counterclockwise movement of the retractor lever **58***a* and retraction of the latch bolt **18***a* independently of the crossbar actuating mechanism as previously described. The push button mechanism is locked by rotating a key in the lock cylinder approximately 90° in a counterclockwise direction to rotate the cam **178** and to move the locking plate **180** to its locking position. Thereafter, the key may be rotated 90° in a counterclockwise direction to its shed position so that the push button mechanism **142** is disabled or locked. The reverse procedure is employed to unlock the push button mechanism. The lost motion connection associated with the plunger shank **164** prevents retraction of the bolt as by pounding on the push button when it is in its locked position. The arrangement of the lost motion connection is such that the push button **158** may be depressed to a position wherein the outer end of the button is at least flush with

the outer end of the push button housing **156** before the motion is transmitted through the push button shank to the lever **146.**

An emergency exit bolt and actuator assembly of the present invention may be readily installed on a door by one having ordinary skill in the art. Referring to FIG. **1,** the assembly is first adapted to the width of the door by dogging or otherwise securing the crossbar **22** in its depressed position after which the crossbar **22** and its supporting frame member **68** may be cut to required length with a hacksaw or the like. The rear link **74** is spaced a sufficient distance from the rear end of the crossbar to permit severance of a substantial portion thereof without impairing the function of the assembly **10.** Thus, a single assembly **10** may be provided for use on doors in a wide range of sizes. The rear end portion of the channel **68** is secured to the inner face of a door by clamp plate (not shown) concealed by a cover **192,** FIG. **1,** which cooperates in holding engagement with the channel **68.** The latch bolt end of the assembly is secured to the door by fasteners received in the apertures **32, 32.** A cover **194** secured to the plate **30** by threaded fasteners, (not shown) completes the assembly. An inclined tab **196** at the rear of the cover **194** extends through an aperture in the crossbar **22** to discourage unauthorized tampering with the bolt assembly or insertion of a wedge or the like between the cover and crossbar to retain the crossbar in a depressed position.

I claim:

1. An emergency exit latch and actuator assembly comprising an elongated frame adapted to be secured to the inner face of an outwardly opening door to extend transversely thereof, a latch bolt supported on said frame for pivotal movement between projected and retracted positions, a retractor element supported on said frame for pivotal movement about an axis parallel to the axis of said latch bolt between first and second positions and including first and second parts, said first part being engageable with an associated part of said latch bolt to move said latch bolt from its projected to its retracted position in response to movement of said retractor element from its first position to its second position, said latch bolt being movable from its projected to its retracted position independently of said retractor element and with said associated part out of engagement with said first part, an elongated first actuating member having an actuator part engageable with said second part, links supporting said first actuating member for simultaneous arcuate movement toward and away from the door and translation in a generally longitudinal direction relative to said frame between an inactive and active position, said actuator part being engageable with said second part when said retractor element is in its first position to pivot said retractor element from its first to its second position in response to the movement of said first actuating member from its inactive to its active position.

2. An emergency exit latch and actuator assembly as set forth in claim **1** wherein said actuator part comprises a retractor finger projecting from one end of said first actuating member.

3. An emergency exit latch and actuator assembly as set forth in claim **1** wherein said assembly includes a second actuating member supported on said frame for movement relative thereto between first and second positions and engageable with a part of said retractor element when said retractor element is in its first position to pivot it to its second position in response to movement of said second actuating member from its first to its second position, said retractor element being pivotally movable from its first to its second position out of engagement with and independently of said second actuating member, and means for moving said second actuating member from its first to its second position.

4. An emergency exit latch and actuator assembly as set forth in claim **3** wherein said retractor element includes a third part and said second actuating member is engageable with said third part.

5. An emergency exit latch and actuator assembly as set forth in claim **4** wherein said retractor element comprises a lever and said first, second and third parts comprise angularly spaced and generally radially outwardly extending portions of said lever.

6. An emergency exit latch and actuator assembly as set forth in claim **3** wherein said second actuating member comprises a slide supported for sliding movement between its first and second positions and said means for moving said second operating member comprises a rotary plug journalled on said frame and engageable with a part of said slide member.

7. An emergency exit latch and actuator assembly as set forth in claim **6** wherein said part of said slide member comprises a pin projecting from said slide member and received in a notch in said rotary plug.

8. An emergency exit latch and actuator assembly as set forth in claim **6** including means for releasably retaining said second actuating member in its second position.

9. An emergency exit latch as set forth in claim **8** wherein said means for releasably retaining said second actuating member comprises an eccentric pin carried by said plug and a generally hook shaped slot formed in said slide receiving said eccentric pin therein.

10. An emergency exit latch and actuator assembly as set forth in claim **3** including means for biasing said second actuating member to its first position when said latch bolt is in its projected position.

11. An emergency exit latch and actuator assembly as set forth in claim **10** including means for biasing said latch bolt toward its projected position, said means for biasing said latch bolt comprising said means for biasing said second actuating member.

12. An emergency exit latch and actuator assembly as set forth in claim **3** wherein said second actuating member comprises a lever supported for pivotal movement about an axis parallel to the axis of said latch bolt between first and second positions corresponding to said first and second positions of said retractor element.

13. An emergency exit latch and actuator assembly as set forth in claim **12** wherein said lever is supported for coaxial pivotal movement relative to said retractor element.

14. An emergency exit latch and actuator assembly as set forth in claim **12** wherein one end of said lever is engageable with said second part of said retractor element.

15. An emergency exit latch and actuator assembly as set forth in claim **14** wherein said means for moving said second actuating member comprises a push button assembly adapted to be mounted on the outer face of the door and having a shank for extending inwardly through said door to engage the other end of said lever

and a push button associated with the outer end of said shank.

16. An emergency exit latch and actuator assembly as set forth in claim 15 including means for disabling said push button assembly.

17. An emergency exit latch and actuator assembly as set forth in claim 16 wherein said means for disabling said push button assembly comprises a locking mechanism engageable with an associated portion of said shank for releasably retaining said shank in fixed position relative to said frame.

18. An emergency exit latch as set forth in claim 17 wherein said push button assembly includes a lost motion connection between said push button and said associated portion of said shank.

19. An emergency exit latch and actuator assembly as set forth in claim 1 wherein said frame includes an elongated inwardly opening channel member and said first actuating member comprises an elongated outwardly opening channel member substantially equal in length to said inwardly opening channel member extending longitudinally of said inwardly opening channel member in telescopic relation thereto.

20. An emergency exit latch and actuator assembly as set forth in claim 19 wherein said links comprise a pair of parallel links connecting said channel members, said links having axes generally parallel to the axis of said latch bolt.

21. An emergency exit latch and actuator mechanism as set forth in claim 1 including a dogging mechanism for moving said first actuating member to and releasably retaining said first actuating member in said active position.

22. An emergency exit latch and actuator assembly as set forth in claim 21 wherein said dogging mechanism includes a rotary part supported for angular movement relative to said first actuating member and having an eccentric cam thereon for engaging an abutment on said frame to move said first actuating member to its active position in response to angular movement of said rotary part.

23. An emergency exit latch and actuator assembly as set forth in claim 1 includingg a deadlocking mechanism comprising a deadlocking lever supported for pivotal movement about an axis generally parallel to the axis of said latch bolt between a locking position and a non-locking position and having a first cam surface thereon, said deadlocking lever having a blocker engageable with an associated portion of said latch bolt when said latch bolt is in its projected position and said deadlocking lever is in its locking position for deadlocking said latch bolt in its projected position, an auxiliary bolt supported for pivotal movement between projected and retracted positions and having a first cam for engaging said first cam surface to move said deadlocking lever to its non-locking position as said auxiliary bolt moves toward its projected position, said auxiliary bolt in its projected position maintaining said deadlocking lever in its non-locking position.

24. An emergency exit latch and actuator assembly as set forth in claim 23 including means for biasing said deadlocking lever toward its locking position.

25. An emergency exit latch and actuator assembly as set forth in claim 23 wherein said deadlocking lever has a cam slot therein defining said first cam surface and said first cam comprises a pin carried by said auxiliary bolt and extending into said cam slot.

26. An emergency exit bolt as set forth in claim 23 wherein said latch bolt has an arcuate groove therein having a center of curvature on the axis thereof and said blocker is aligned with said groove when said deadlocking lever is in its non-locking position to permit movement of said latch bolt between its projected and retracted positions with said blocker disposed in said groove.

27. An emergency exit latch and actuator assembly as set forth in claim 23 wherein said deadlocking lever has a second cam surface thereon and said retractor element has a second cam thereon engageable with said second cam surface when said deadlocking lever is in its locking position and said retractor element is in its first position to move said deadlocking lever to its non-locking position in response to initial movement of said retractor element from its first toward its second position.

28. An emergency exit latch and actuator assembly as set forth in claim 27 wherein said deadlocking lever has a control slot therein defining said second cam surface and said second cam comprises a pin carried by said retractor element and extending into said control slot.

29. An emergency exit latch and actuator assembly as set forth in claim 27 wherein said deadlocking lever is pivotally supported intermediate its ends, said first cam surface is associated with one end portion of said deadlocking lever, and said second cam surface is associated with the other end portion of said deadlocking lever.

30. An emergency exit latch and actuator assembly as set forth in claim 1 wherein said latch bolt has an arcuate groove therein having its center of curvature on the axis thereof and said assembly includes a deadlocking mechanism comprising a deadlocking lever supported intermediate its ends for pivotal movement about an axis generally parallel to said latch bolt axis between a locking position and a non-locking position and having a cam slot in one end portion thereof defining a first cam surface and a control slot in the other end portion thereof defining a second cam surface, said deadlocking lever having a blocker thereon engageable with an associated portion of said latch bolt when said latch bolt is in its projected position and said deadlocking lever is in its deadlocking position to deadlock said latch bolt in its projected position, said deadlocking lever in its non-locking position maintaining said blocker in general alignment with said groove, means for biasing said deadlocking lever toward its locking position, an auxiliary bolt supported for coaxial pivotal movement relative to said latch bolt between projected and retracted positions and having a first cam extending into said cam slot for engaging said first cam surface to move said deadlocking lever to its non-deadlocking position in response to movement of said auxiliary bolt toward its projected position, said auxiliary bolt in its projected position maintaining said deadlocking lever in its non-locking position, and a second cam associated with said retractor element and extending into said control slot for engaging said second cam surface when said deadlocking lever is in its locking position and said retractor element is in its first position to move said deadlocking lever to its non-locking position in response to initial movement of said retractor element toward its second position.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,877,262 Dated April 15, 1975

Inventor(s) Merton S. Williams

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

Col. 11, line 43, "includingg" should read --including--
Col. 2, line 26, "Fig. 8" should read --Fig. 7--
Col. 6, line 37, "crossbar" should read --cross member--

Signed and Sealed this

fourteenth Day of October 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks