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3,045,464

SWING DOOR LATCH-LOCK MECHANISM

Filed Nov. 2, 1959

3 Sheets-Sheet 1

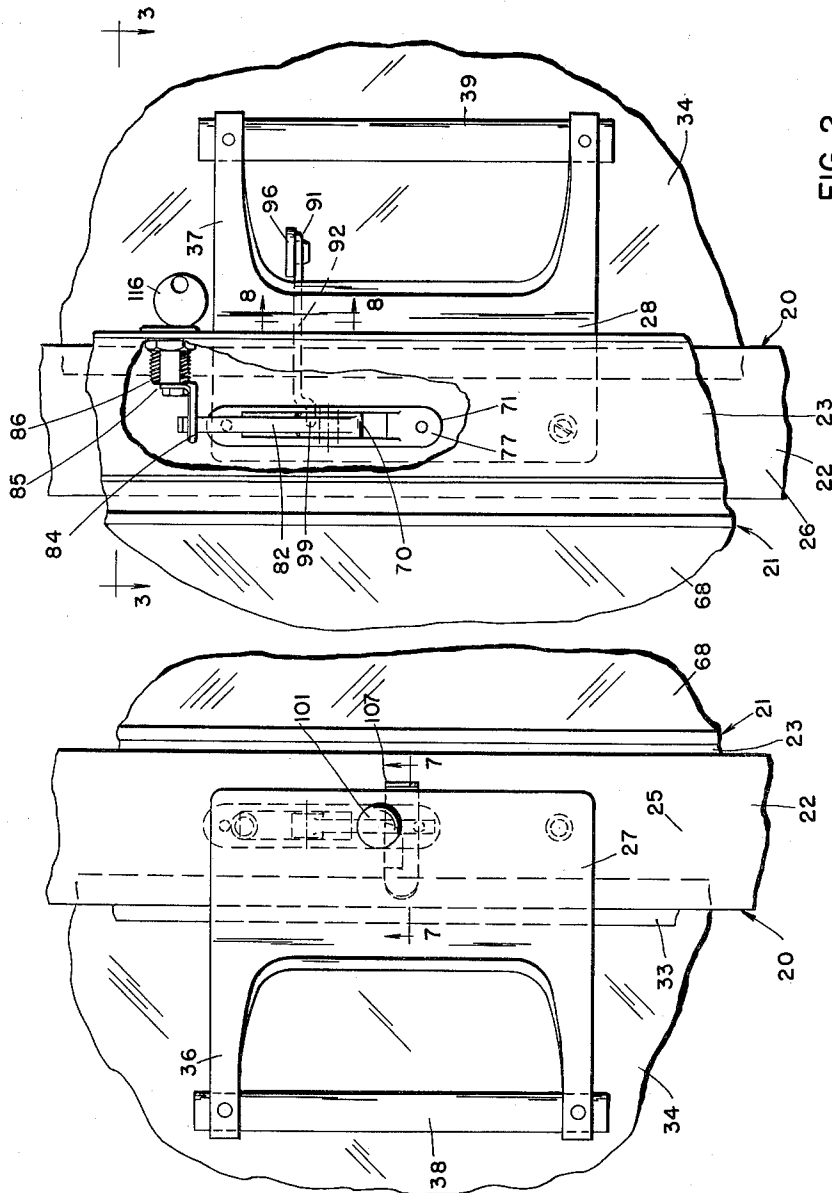


FIG. 1

FIG. 2

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FIG. 3

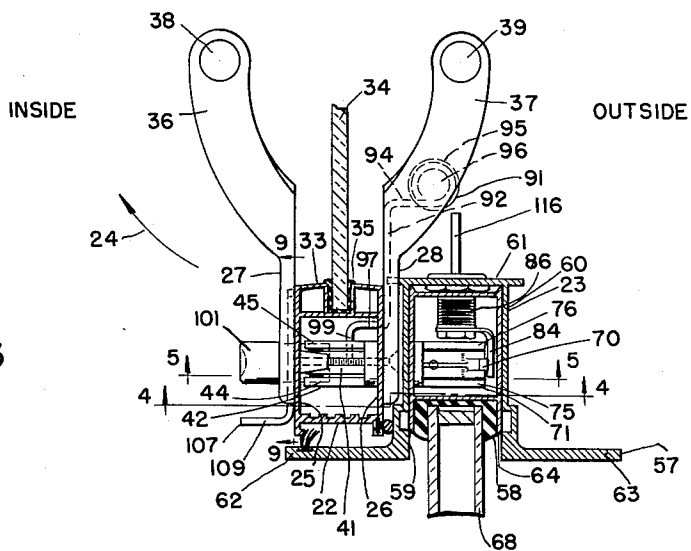
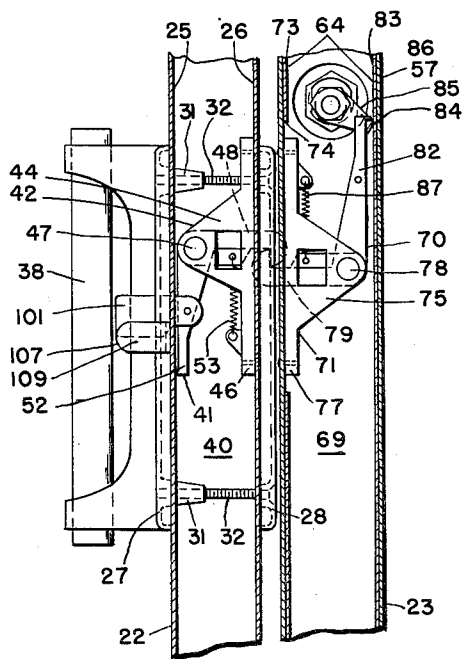


FIG. 4



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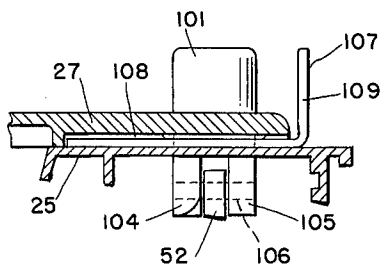


FIG. 7

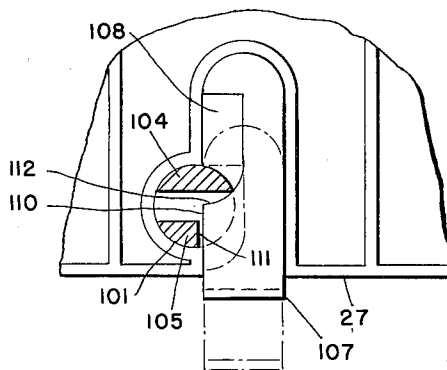


FIG. 9

FIG. 5

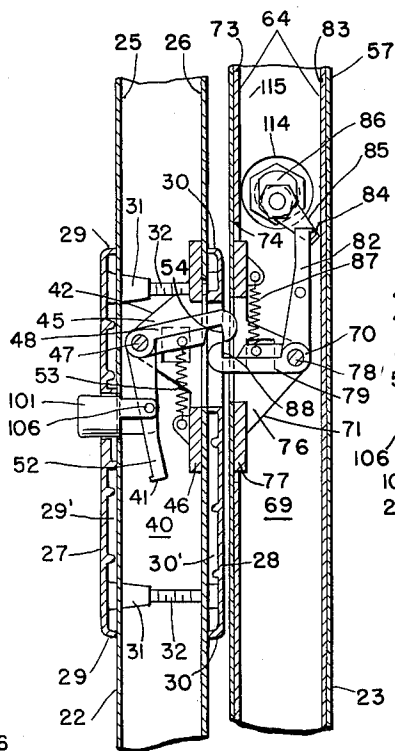


FIG. 6

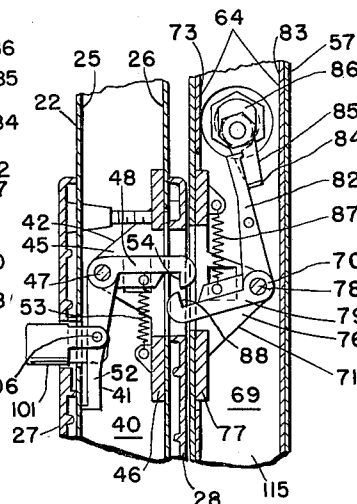
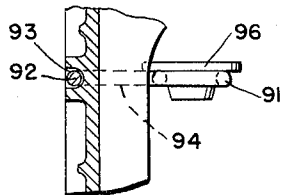


FIG. 8

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SWING DOOR LATCH-LOCK MECHANISM

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4 Claims. (Cl. 70-144)

This invention relates to latch mechanisms and more particularly and specifically to latch mechanisms for use with a swing door or panel wherein the stile of the swing panel overlaps the stile of a fixed panel of a multi-panel partition which may, for example, include a sliding or rolling panel, a swing panel and a fixed panel, or wherein the stile of the swing panel overlaps the stile of a door frame.

An object of the invention is to provide a simple and unique latch arrangement associated with the overlapping stiles of a swing panel member and a fixed member including inside and outside hand manipulated latch releasing means to permit opening of the swing panel from the inside or the outside, hand manipulated latch locking means accessible from the inside only to prevent opening of the swing panel from the outside by manipulation of said outside latch releasing means, and key operated means associated with the latch arrangement for unlocking the swing panel.

More specifically, it is an object of the invention to provide a latch-lock arrangement for the overlapping stiles of a swing panel member and a fixed member including, a latch member disposed within the stile of the swing panel member and a cooperating keeper member disposed within the stile of the fixed member, hand manipulated latch releasing means carried by the inside and outside of the stile of the swing panel to permit opening of the swing panel from inside and outside, a latch locking member carried by the stile of the swing panel member accessible from the inside only rendering the outside latch releasing means ineffective to release the latch and normally preventing opening of the swing panel member from outside, and a key operated means carried by the stile of the fixed member operatively connected with the keeper member for releasing it from engagement with the latch member to permit opening of the swing panel from outside.

Another object resides in the provision of latch releasing means associated with the inside of the swing panel member and latch releasing means associated with the outside of the swing panel member, disposed relative to the inside and outside swing panel handles, so that the inside latch releasing means and the inside swing panel handle are adapted to be simultaneously manipulated with one hand for opening the swing panel from inside, and so that the outside latch releasing means and the outside swing panel handle are adapted to be simultaneously manipulated with one hand for opening the swing panel from outside.

Another object resides in the provision of simple means, specifically a hand manipulated slide member, that is accessible from the inside only for selectively rendering the inside and outside latch releasing means effective or ineffective to release the latch.

A still further object resides in the provision of a unique latch mechanism associated with the overlapping stiles of a swing panel member and a fixed member wherein the cooperative components of the mechanism are of simple and inexpensive construction, and wherein the latch member and keeper member are identical in construction, as also are the brackets for the latch and keeper members as well as other parts, thereby reducing manufacturing costs.

Still further objects and advantages of the invention will

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become more readily apparent to those skilled in the art when the following description is read in the light of the accompanying drawings.

Referring now to the accompanying drawings in which like numerals designate similar parts throughout the several views:

FIGURE 1 is a fragmentary front-inside elevation of the overlapping stiles of a swing panel and a fixed panel with the hidden latch components of the swing panel stile shown in dotted lines;

FIGURE 2 is a rear outside elevation like FIGURE 1 with portions of the fixed panel stile broken away to show the latch components therein;

FIGURE 3 is a sectional view taken on line 3-3 of FIGURE 2;

FIGURE 4 is a sectional view taken on line 4-4 of FIGURE 3;

FIGURE 5 is a sectional view taken on line 5-5 of FIGURE 3 with the latch components in the swing panel stile shown in unlatched position;

FIGURE 6 is a sectional view similar to FIGURE 5 with the latch components in the fixed panel stile shown in unlatched position;

FIGURE 7 is an enlarged sectional view taken on line 7-7 of FIGURE 1;

FIGURE 8 is an enlarged sectional view taken on line 8-8 of FIGURE 2; and

FIGURE 9 is an enlarged sectional view taken on the line 9-9 of FIGURE 3.

The latch-lock mechanism of the present invention is of a type adapted for cooperative utility between a stile of a swing door and a door frame jamb, or between a stile of a swing door panel and the stile of a fixed door or panel. For purpose of illustration the latch-lock mechanism is disclosed in the drawings and will be hereinafter described as applied to the adjacent stiles of a swing door or panel and a fixed door panel.

With the swing panel 20 in closed position, the fixed panel 21 and the swing panel 20 are disposed in offset parallel vertical planes, with the vertical stile 22 of the swing panel and the vertical stile 23 of the fixed panel in adjacent overlapping relation. The swing panel 20 is arranged to swing in the direction of arrow 24, FIGURE 3, about its end opposite the stile 22, suitable means, not shown, being provided for pivotally mounting the said opposite end of the panel 20.

The stile 22 is of generally hollow rectangular shape in transverse cross section, preferably formed as an extrusion of a light metal such as aluminum. Secured to the inside and outside walls 25 and 26, respectively, of the stile 22, and at a suitable height for closing and opening the swing panel 20, are the respective inside and outside handle plates 27 and 28. The plates 27 and 28 are provided, respectively, with respective shallow in-turned peripheral portions 29 and 30, forming between plate 27 and stile wall 25, a shallow chamber 29', and between plate 28 and stile wall 26, a similar shallow chamber 30', as best shown in FIGURE 5.

In a preferred arrangement for securing the handle plates 27 and 28 on the stile 22, the inner face of the inside handle plate is provided with a pair of vertically spaced tapered bosses 31 extending through suitable openings in the inside wall 25 of the stile 22. The bosses 31 are internally threaded from their free ends to receive retaining screws 32 which extend through the outside handle plate 28 and the outside wall 26 of the stile 22. Thus by threading the screws 32 into or out of the bosses 31, the handle plates 27 and 28 can be rigidly secured to or removed from the stile 22. The handle plates 27 and 28 project inwardly beyond the inner end wall 33 of the stile 22 in the direction of the hinged end of the swing panel 20 on either side of and spaced from the

glass pane 34 which is received in a glazing channel 35 in the inner end wall 33, as best shown in FIGURE 3. The inwardly projecting ends of the handle plates 27 and 28 terminate in bifurcated end portions 36 and 37 which diverge with respect to each other and at their free ends carry the vertical grasping rods 38 and 39.

A latch mechanism, generally indicated at 40, is mounted within the stile 22 of the swing panel 20 and includes an L-shaped latch member 41 pivotally mounted on a bracket 42 which is secured in any suitable manner to the internal face of the outside wall 26 of the stile 22 opposite the handle plate 28. The bracket 42 includes a pair of laterally spaced ears 44 and 45 which extend from the bracket base 46 toward the inside wall 25 of the stile 22, and the L-shaped latch member 41 is pivotally mounted at its vertex on a horizontal pin 47 extending between and carried by the spaced ears 44 and 45. The latch member 41 referring to FIGURES 4 and 6 is positioned so that its latch arm 48 extends horizontally outward through openings in the bracket base 46, the outside stile wall 26 and the outside handle plate 28, respectively, and its lever arm 52 extends downwardly along the inside wall 25 of stile 22, with its lower end engaging the wall 25 to horizontally position the latch arm 48. A vertically mounted spring 53, attached at its upper end to the latch arm 48 and at its lower end to the bracket 42 biases the latch member 41 in the aforesaid position, as best shown in FIGURES 4 and 6.

The free end of the latch arm 48 is formed with a depending latching detent 54 having an outer recurvate surface and an inner vertical keeper engaging surface adapted to engage behind a detent of a keeper member carried by the fixed panel stile 23 as hereinafter described, for normally retaining the swing panel 20 in closed or latched position.

The fixed panel stile 23, which, as previously explained, is in overlapping or juxtaposed relation with respect to the swing panel stile 22, includes a stile element 57, preferably formed as an extrusion of a light metal such as aluminum. The stile element 57 is generally U-shaped in transverse cross section providing a channel 58 defined by an inside wall 59 in juxtaposition with respect to the outside wall 26 of the swing panel stile 22 when the swing panel 20 is in closed position, an outside wall 60, and an outer end wall 61. Flanges 62 and 63 project laterally in opposite directions from the inner edges of the walls 59 and 60, whereby the flange 62 and inside wall 59 provide an L-shaped recess for receiving the swing panel stile 22.

Disposed within the channel 58 of the stile element 57 is an extruded hollow stile element 64 of generally rectangular cross section, provided with inwardly projecting flanges to define a U-shaped glazing channel for receiving the glass panes 68 of the fixed panel 21.

A keeper mechanism, generally indicated at 69, is mounted within stile element 64 of the fixed panel 21 and includes an L-shaped keeper member 70, which can conveniently be identical in construction with the latch member 41. The keeper member 70 is pivotally mounted on a bracket 71 which is secured, in suitable manner, to the internal face of the inside wall 59 of the stile element 57, the juxtaposed wall 73 of the stile element 64 being provided with an opening 74 to accommodate the bracket 71. The bracket 71 is conveniently made identical in construction with the latch supporting bracket 42, and includes a pair of laterally spaced ears 75 and 76 which extend from the bracket base 77 toward outside wall 60 of the stile element 57. The L-shaped keeper member 70 is pivotally mounted at its vertex on a horizontal pin 78 extending between and carried by the spaced ears 75 and 76, and is normally biased into a position such that its keeper arm 79 extends horizontally inward toward the latch arm 48 through openings in the bracket base 77, the wall 73 of stile element 64 and the wall 59 of stile element 57, respectively, and its lever arm 82 extends

upwardly adjacent the interior face of the outside wall 83 of stile element 64. The upper free end of the lever arm 82 is arranged to engage the arm 84 of a crank 85 operatively associated with a key actuated tumbler 86. A vertically mounted spring 87, attached at its upper end to the bracket 71 and at its lower end to the keeper arm 79 biases the upper free end of the lever arm 82 against the crank arm 84 which in turn is biased into engagement with the wall 83 of stile element 64, whereby the keeper member 70 is normally retained in the position shown in FIGURES 4 and 5.

The free end of the keeper arm 79 is formed with an upstanding latching detent 88 having an outer recurvate surface and an inner vertical surface adapted to engage behind the latch arm detent 54, whereby the swing panel 20 is normally retained in latched position.

In order to open the swing panel 20 from the outside, there is provided a latch release lever 91 which, as hereinafter described, functions to pivotally move the latch 40 from its latched position, wherein the latch arm detent 54 engages behind the keeper arm detent 88, to a position wherein the detent 54 is raised free of engagement with detent 88.

The latch release lever 91 includes a horizontally extending rod 92 which is rotatably supported in the shallow outside handle plate chamber 30', in a channel 93 formed with the interior surface of the outside handle plate 28 as shown in FIGURE 8. The rod 92 is rotatably retained in the channel 93 by the outside wall 26 of the stile 22 which engages the free edges of the channel defining walls. One end of the rod 92 projects from the chamber 30' into the bifurcated end portion 37 of the handle plate 28, and at that end is formed with a horizontally disposed projection 94 extending outwardly at right angles with respect to the axis of rod 92 and at its free end being formed with a return bend 95 arranged to support a rod actuating disc 96. At its opposite end the rod 92 is formed with a horizontally disposed projection 97 extending inwardly at right angles with respect to the axis of rod 92 through a slot in the wall 26 into the interior of the stile 22. At its inner end, the projection 97 is formed with a horizontally disposed right angled extension that projects through an opening in the bracket ear 45 and engages the under side of the latch arm 48 of the latch member 41.

Thus, upon depressing the disc 96 and thereby rotating the rod 92, the extension 99 swings upwardly to pivotally raise the latch arm 48 against the tension of the spring 53 and effects disengagement of the latch arm detent 54 from the keeper arm detent 88, as shown in FIGURE 5, whereupon the swing panel 20 may be swung open. It will be noted that the disc 96 is so disposed relative to the grasping rod 39, so that when the fingers of the right hand are curled around the rod 39, the thumb is in position to depress the disc 96, so that the panel 20 can be unlatched and swung inwardly with one hand and in practically one motion.

In order to open the swing panel 20 from the inside, there is provided a latch release button 101 which, as hereinafter described, also functions to pivotally move the latch 40 from its latched position, wherein the latch arm detent 54 engages behind the keeper arm detent 88, as shown in FIGURE 4, to a position wherein the detent 54 is raised free of engagement with detent 88 as shown in FIGURE 5.

The latch release button 101 is generally cylindrical in form and projects axially through registering openings in the inside handle plate 27 and inside wall 25 of swing panel stile 22. The end of the button 101 projecting into the stile 22 is bifurcated presenting spaced projections 104 and 105 which straddle and are pivotally attached to the latch lever arm 52 as by pin 106.

Referring particularly to FIGURE 4, it will be seen that by pressing on the end of the latch release button 101 projecting from the handle plate 27, the latch lever arm 52 pivots in a counter-clockwise direction to pivotally

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raise the latch arm 48 against the tension of the spring 53 and effect disengagement of the latch arm detent 54 from the keeper arm detent 88, as shown in FIGURE 5, whereupon the swing panel 20 may be swung open.

Means is provided for selectively restraining the latch 40 against pivotal movement from the position shown in FIGURE 4, whereby to render both the latch release lever 91 and the latch release button 101 ineffectual to move the latch arm 48 to a position to disengage the latch arm detent 54 from the keeper arm detent 88.

This means includes a locking slide plate 107 arranged for horizontal sliding movement in the inside handle plate chamber 29' in a plane parallel with the plane of the stile wall 22. The locking slide plate 107 is slidably supported in a channel 108 formed with the interior surface of the handle plate 27 and is retained therein by the stile wall 25 which engages the free edges of the channel defining ribs. One end of the slide plate 107 projects from the chamber 29 and carries a tab 109 extending at right angles with respect to the plane of the slide plate 107. By grasping the tab 109 with the fingers, the slide plate 107 can be moved inwardly to the position shown in FIGURES 7 and 9 to lock the latch release button 101. In the locking position of the slide plate 107, its upper edge portion 110 is arranged to engage behind a shoulder 111 formed by recessing the lower portion of the projection 105 of the bifurcated end of the button 101. The locking slide plate 107 is provided with a recess 112 which is arranged to register with the button 101 when the slide plate 107 is moved outwardly to the position shown in phantom in FIGURE 9, in which position the button 101 is free to move in or out.

It will be noted that the locking slide plate 107 is accessible from the inside for movement to its latch locking or latch releasing position. However, it is not accessible from the outside, so that when the slide plate 107 is in its latch locking position, the swing panel 20 cannot be opened from outside, except by means of the key actuated tumbler 86, previously referred to, which controls movement of the keeper member 70, and hence the movement of the keeper arm 79, as hereinafter described.

The key actuated tumbler 86 is secured to the outer end wall 61 of the fixed panel stile 23 at a level slightly above the level of the upper end of the keeper lever 82, and extends into the stile through an aperture 114 in the juxtaposed end wall 115 of the inside stile element 64. The inner end of the tumbler barrel mounts the crank 85 which is locked on the barrel to position the crank arm 84 of the crank 85 in engagement with and between the wall 83 of the stile element 57 and the upper end of keeper latch lever 82.

Upon turning the key 116 in one direction, the crank arm 84 of the crank 85 moves in a clockwise direction from its normal position, as shown in FIGURES 4 and 5, thereby pivotally rotating the keeper lever 82 and keeper latch arm 79 of the keeper member 70 in a counterclockwise direction against the tension of spring 87. Such pivotal rotation of the latch arm 79 effects disengagement of the keeper arm detent 88 from the latch arm detent 54, as shown in FIGURE 6, and permits swinging of the swing panel 20 to its open position. Upon releasing the key 116, the keeper member 70 is returned to the normal position shown in FIGURES 4 and 5, by the spring 87.

Still assuming that the latch 40 is retained in the position shown in FIGURE 4, by the latch locking slide plate 107, the swing panel 20 can be returned to latched closed position, for, as the swing panel 20 approaches its closed position, the rounded strike surface of the latch arm detent 54 engages the rounded strike surface of the keeper arm detent 88, thereby forcing the keeper arm 79 to swing downwardly against the tension of spring 87, and permitting the latch arm detent 54 to engage behind the keeper arm detent 88.

From the foregoing description it is seen that an apparatus is provided which furnishes a latch means for the

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overlapping stiles of a swing panel and a fixed panel which acts automatically to latch the swing panel or door upon closing it against a fixed panel or door which is releasable from inside by a simple latching button and from outside by a simple latch operating lever. It is further seen that the latch may be set from inside by a simple latch locking slide to retain the swing panel in closed latched-locked position, the swing panel being releasable from locked position from outside by means of a key operating tumbler which operates the keeper to disengage it from locked position with the latch.

In the foregoing description certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art since such words are used for illustrative and descriptive purposes and are intended to be broadly construed within the limitations of the prior art.

I claim:

1. A latch mechanism for overlapping stiles of a swing panel member and a fixed member comprising, a latch member pivotally mounted in said swing member stile and projecting therefrom to said fixed member stile, a keeper member pivotally mounted in said fixed member stile and projecting therefrom to said swing member stile, each said latch and keeper members being pivotally movable into and out of latched position one with respect to the other, biasing means associated with said latch member and biasing means associated with said keeper member, each biasing means normally biasing its associated member in latched position, finger pressure responsive means on the inside and on the outside of said swing panel member, each operatively connected with said latch member for pivotally moving the same to unlatched position against the tension of said latch biasing means, means accessible only from the inside of said swing panel member operatively associated with said latch member for rendering said outside finger pressure responsive means ineffective to move said latch member to unlatched position, and a key operated means carried by said fixed member stile operatively connected with said keeper member for pivotally moving the same to unlatched position against the tension of said keeper biasing means.

2. A latch mechanism for overlapping stiles of a swing panel member and a fixed member comprising, a latch member pivotally mounted in said swing member stile and a keeper member pivotally mounted in said fixed member stile, said latch member and said keeper member projecting through apertures in the adjacent walls of said swing member stile and said fixed member stile for engagement in latched position, biasing means associated with said latch member and said keeper member for normally retaining them in latched position, an elongated latch operating button projecting through the inside wall of said swing panel stile mounted for axial movement normal to the plane of said inside stile wall, the inner projecting end of said button having a pivotal connection with said latch member for pivotally moving the latter to unlatched position upon inward movement of said latch operating button, a latch operating rod mounted for rotation contiguous to the outside wall of said swing panel stile, one end of said latch operating rod extending into said swing panel stile for engagement with said latch member for pivotally moving the latter to unlatched position upon rotation of said rod, the other end of said rod projecting from between the adjacent walls of said swing member stile and said fixed member stile and carrying finger operated means for rotating said rod, means contiguous to the inside wall of said swing member stile operative to prevent inward movement of said latch operating button to render said latch operating rod ineffective for moving said latch member to unlatched position, and a key operated means carried by said fixed member stile operatively connected with said keeper member for pivotally moving the same to

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unlatched position against the tension of said keeper biasing means.

3. A latch mechanism for overlapping hollow stiles of a swing panel member and a fixed member comprising, openings in the confronting side walls of said overlapping stiles, a latch member in each of said stiles mounted for pivotal movement about horizontal axes disposed in parallelism with the plane of said confronting side walls, said latch members projecting transversely from their pivotally mounted ends through said openings in latching engagement, biasing means associated with each of said latch members for normally retaining them in latched position, finger pressure responsive means extending through the remote side wall of said swing member stile operatively connected with the latch member in said swing member stile for pivotally moving the same to unlatched position, against the tension of said latch biasing means, finger pressure responsive means extending through the said confronting side wall of said swing member stile operatively engaging the latch member in said swing member stile for pivotally moving the same to unlatched position, finger pressure responsive means carried by said remote side wall of said swing member stile selectively movable to position to render the latch member in said swing member stile incapable of movement to unlatched position by said first and second named finger pressure responsive means, and a key operated means carried by said fixed member stile operatively connected with the latch member mounted in said fixed member stile for pivotally moving the same to unlatched position against the tension of said latch biasing means.

4. In a latch mechanism for overlapping hollow stiles of a swing panel member and a fixed member, the confronting side walls of said overlapping stiles being provided with registering openings, a latch member pivotally mounted in said swing member stile, a keeper member

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pivotally mounted in said fixed member stile, said latch and keeper members extending from their pivotally mounted ends through said openings for latching engagement in the closed position of said swing member, biasing means associated with said latch member and biasing means associated with said keeper member for normally retaining them in latched position, finger pressure responsive means on the inner and on the outer side of said swing panel member, each operatively connected with said latch member for pivotally moving the same to unlatched position against the tension of said latch biasing means to permit opening of said swing member from inside and outside, finger pressure responsive means disposed on the inner side of said swing member stile selectively movable to position to immobilize said latch member against movement to unlatched position by the finger pressure responsive means on the outer side of said swing panel member, and a key operated means carried by said fixed member stile operatively connected with said keeper member for pivotally moving the same to unlatched position against the tension of said keeper biasing means whereby said swing panel member is movable to open position from outside irrespective of the position of said latch immobilizing finger pressure responsive means.

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