United States Patent [19]

Imer

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[54] **SLIDING DOOR LOCK**

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[52] **U.S. Cl.** **70/100,** 70/95, 292/181

[51] **Int. Cl.** **E05b 65/08**

[58] **Field of Search** ..... 49/449; 70/90, 95, 100, 70/141; 292/162, 181, DIG. 46, DIG. 47

[56] **References Cited**

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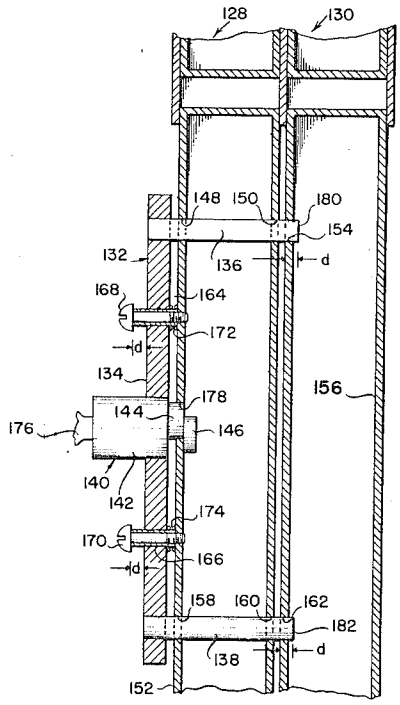
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Primary Examiner—Albert G. Craig, Jr.
Attorney, Agent, or Firm—Shlesinger, Arkwright, Garvey & Dinsmore

[57] **ABSTRACT**

The invention relates to a lock for use with a pair of overlapping doors or windows which are slidably mounted in a pair of adjacent upper tracks, wherein one of the tracks includes a vertical side rail. The lock includes a faceplate and at least one bolt member secured to the faceplate and adapted to slidably pass through the frame of one of the closure members into engagement with the frame of the other. An eccentric-type lock device mounted on the faceplate is adapted to engage one of the closure members for the purpose of securing the faceplate thereto. The upper edge of the faceplate is adapted to abut the side rail of the upper track when it is locked to the inside closure member and thereby limit the vertical movement of the two closures in the upper tracks and/or secure the two doors rigidly together to prevent lateral shifting relative to each other.

3 Claims, 7 Drawing Figures



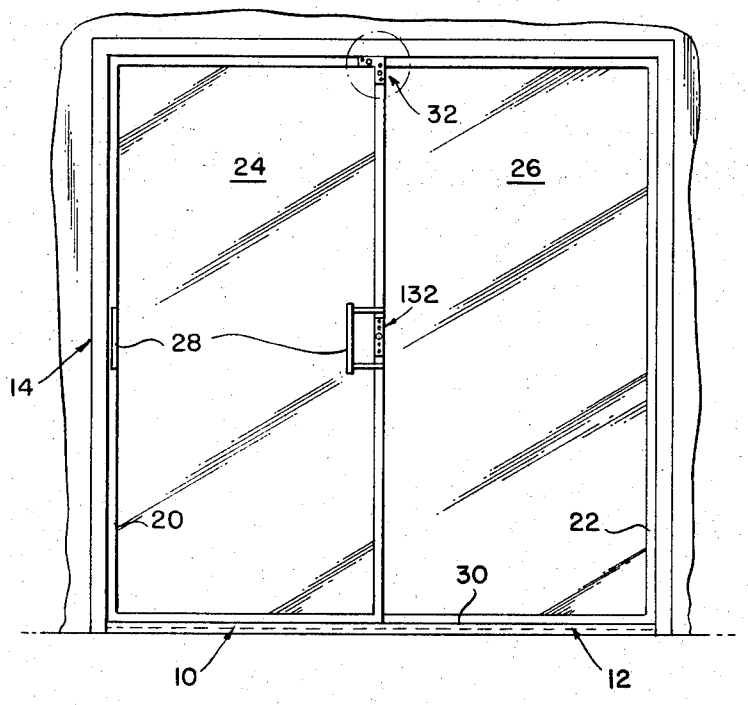


Fig. 1

Fig. 2

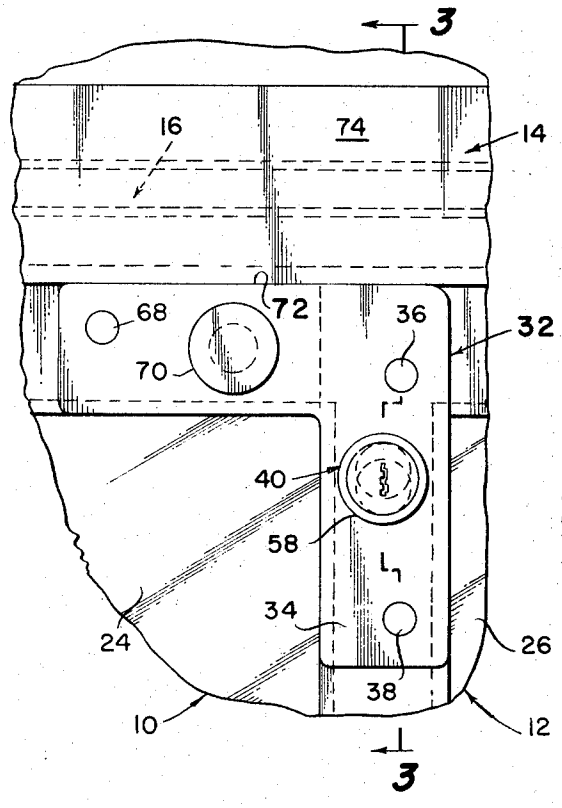


Fig. 3

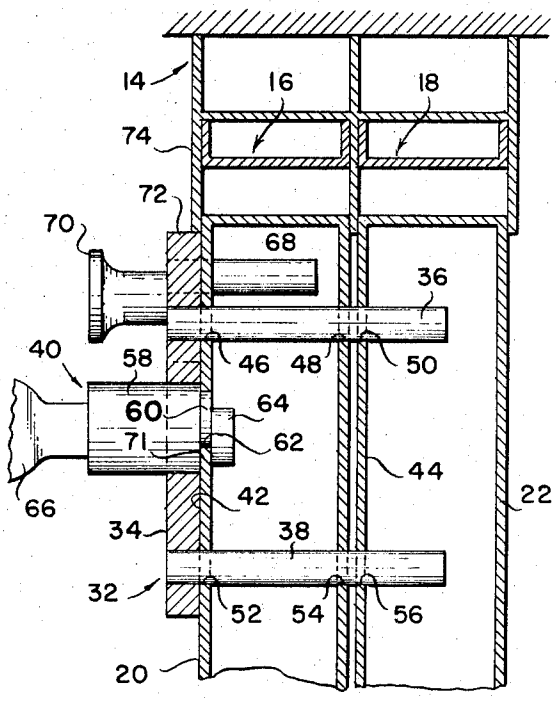


Fig. 4

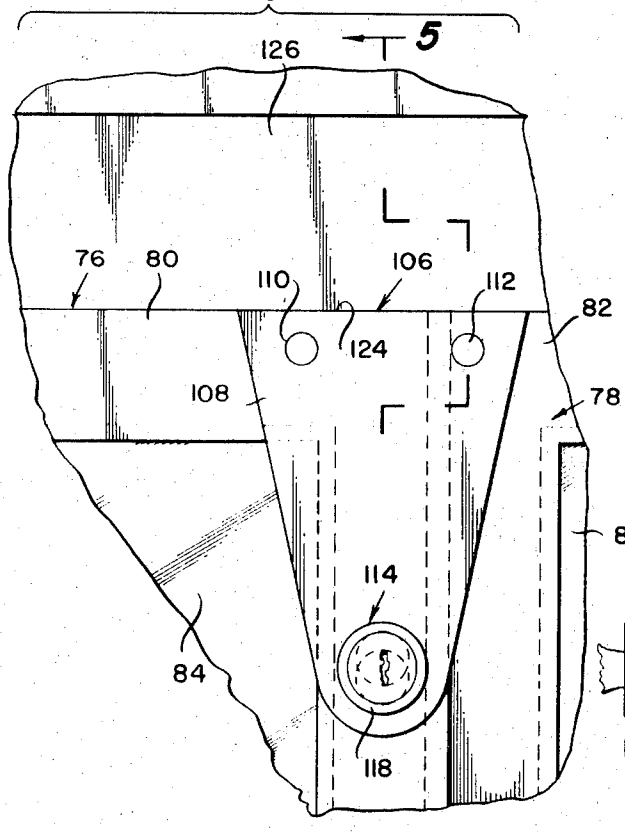
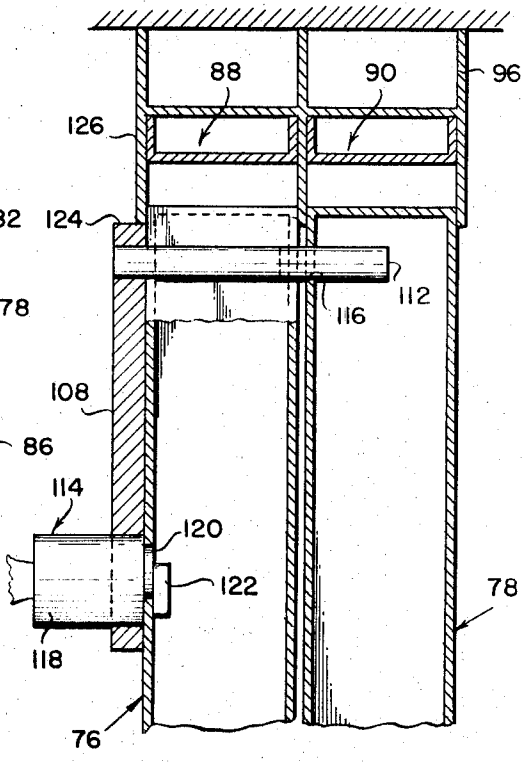
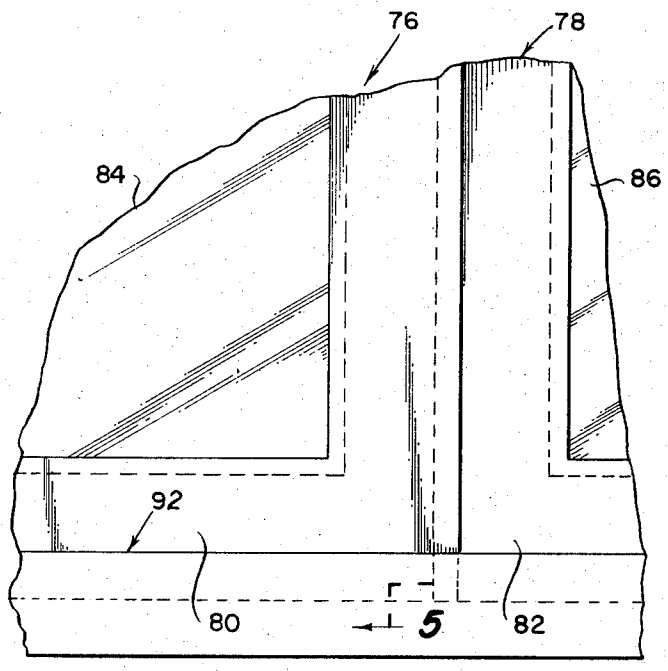
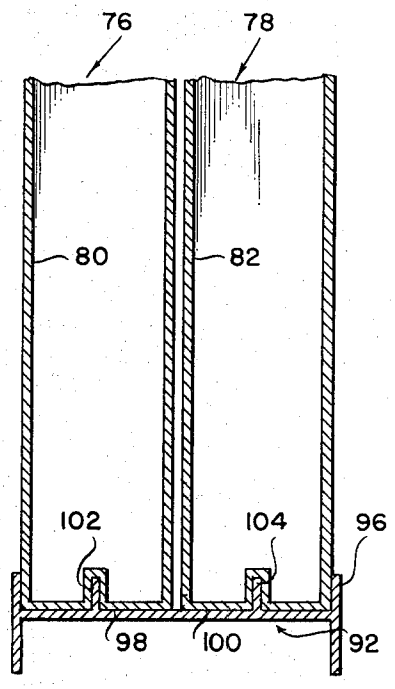

126
5
76
80
110
106
112
82
124
108
78
86
114
84
118

Fig. 5


88
90
96
126
124
112
116
108
114
120
122
78
118
76


76
78
84
86
92
80
5
82


76
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96
98
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92

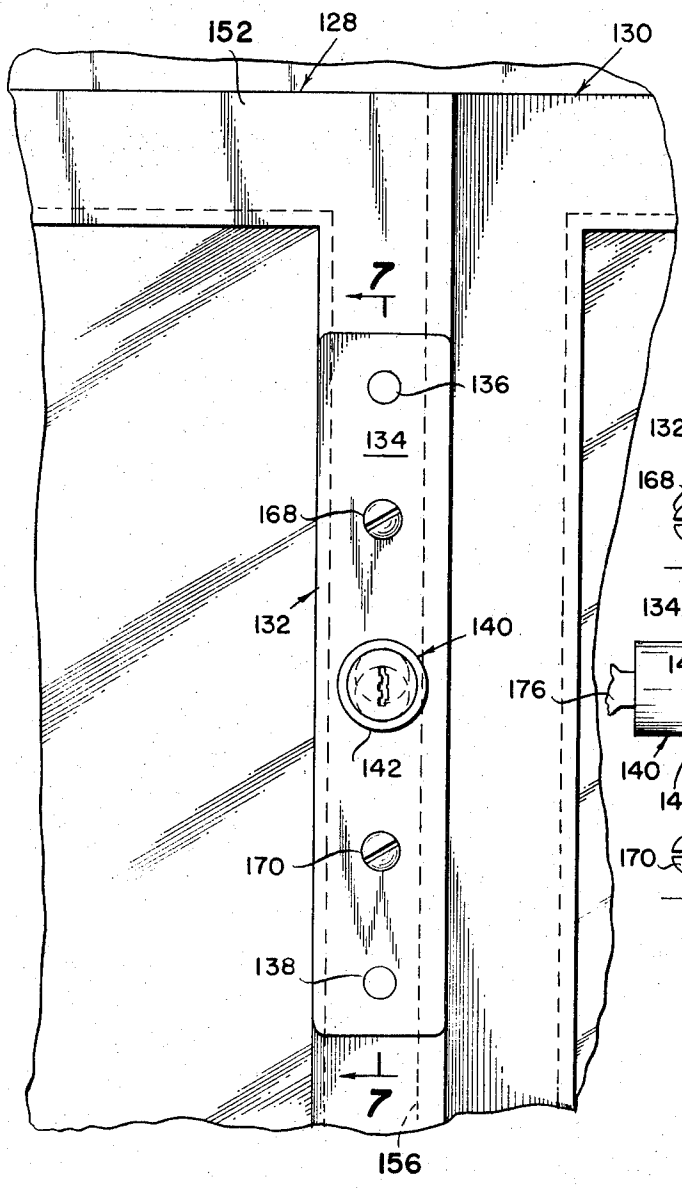

152
128
130
7
136
134
168
132
140
142
170
138
7
156

Fig. 6

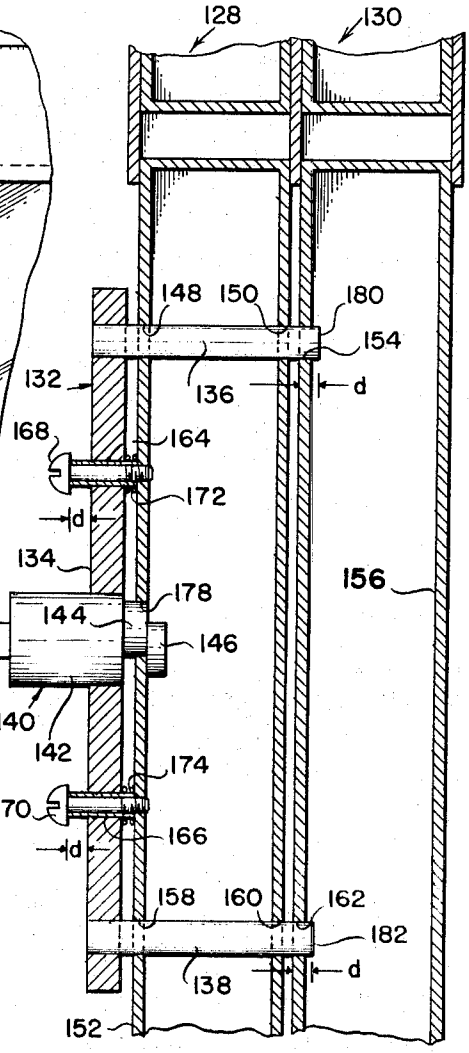

128
130
148
150
180
154
132
136
d
168
164
172
d
134
156
178
144
146
176
140
142
174
170
166
d
158
160
162
182
138
d
152

Fig. 7

SLIDING DOOR LOCK

BACKGROUND OF THE INVENTION

A class of doors frequently employed in both residential and commercial buildings are those known as sliding doors, or patio doors. Normally they are located on the ground level and for this reason are often the point of entry for a burglar or someone attempting to gain unauthorized access to the interior of the building. While various locking devices have been designed for use with sliding doors, they are often difficult and expensive to install as well as easy to render inoperative should the glass panel be broken or cut.

Since the doors are conventionally mounted in upper and lower tracks and supported on their lower edge, there must be sufficient clearance between the upper edge of the panel and the roof of the upper track to permit the door to be lifted upwardly into the upper track and then dropped into the lower. Because of this clearance in the upper track, however, it is fairly easy to lift and remove the door from the outside and thereby gain entry even though the doors may be locked against horizontal sliding.

OBJECTS OF THE INVENTION

It is therefore, an object of this invention to provide a sliding door lock which prevents the panels from sliding horizontally relative to each other in their respective tracks.

Another object of this invention is to provide a sliding door lock which limits the vertical movement of the panels in the upper tracks thereby preventing their being lifted from the lower tracks and removed.

A further object of this invention is to provide a sliding door lock which may be easily installed without the necessity for extensive modification of the existing doors.

Yet another object of this invention is to provide a sliding door lock which is unobtrusive when mounted on the doors.

A still further object of this invention is to provide a sliding door lock which may be rapidly locked and unlocked.

Another object of this invention is to provide a sliding door lock which may be permanently mounted on the doors.

Yet another object of this invention is to provide a sliding door lock which cannot be rendered inoperable even in the event an intruder breaks or cuts the glass panel and is able to reach inside.

A still further object of this invention is to provide a lock which has applicability for locking a wide variety of closures such as sliding windows, display case doors, etc.

These and other objects of the invention will be apparent from a reading of the following specification and reference to the appropriate drawings.

SUMMARY OF THE INVENTION

The invention relates to a lock for use with a pair of overlapping closure members which are slidably mounted in a pair of adjacent upper tracks, one of the tracks including a side rail. The lock comprises a faceplate, first bolt means secured to the plate and adapted to pass through one of the closure members and at least partially through the other of the closure members, lock means associated with the plate for securing the plate to one of the closure members and retaining the bolt means within the closure members, and means on the faceplate for abutting the upper track side rail when the plate is locked to one of the closure members to thereby limit vertical movement of the closure members in the upper tracks.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view of the present invention mounted on a pair of sliding doors;

FIG. 2 is an enlarged elevational view of the present invention mounted on a pair of sliding doors;

FIG. 3 is a sectional view of FIG. 2 taken along line 3—3 and viewed in the direction of the arrows;

FIG. 4 is an elevational view of a second embodiment of the present invention mounted on a pair of sliding doors;

FIG. 5 is a sectional view of FIG. 4 taken along line 5—5 and viewed in the direction of the arrows;

FIG. 6 is an elevational view of a third embodiment of the present invention mounted on a pair of sliding doors; and

FIG. 7 is a sectional view of FIG. 6 taken along line 7—7 and viewed in the direction of the arrows.

FIGS. 1, 2 AND 3

A conventional sliding glass door arrangement comprises generally a pair of door panels **10** and **12** mounted in a rectangular frame **14**, the latter including a pair of adjacent parallel upper tracks **16** and **18** as well as a pair of lower tracks (not shown) in which the panels **10** and **12** are slidably mounted. The panels **10** and **12** themselves comprise rigid frames **20** and **22** normally made of metal, panes of glass **24** and **26** mounted therein and a handle or latch mechanism **28** for opening or closing one of the panels.

The panels **10** and **12** are mounted in frame **20** by first lifting them within upper tracks **16** and **18**, a sufficient distance to permit the lower edge of the door frames **20** and **22** to clear the lower side rails **30** of frame **14**. The panels **10** and **12** are then dropped within the lower tracks and supported therein on their lower edges. It is standard practice to permanently lock one of the panels **10** or **12** from sliding while permitting the other to be opened or closed by sliding it in its upper and lower tracks in overlapping relation to that panel which is immobile. A more detailed illustration of the manner in which the doors are mounted may be had by reference to FIG. **5**.

The lock device **32** comprises generally a faceplate **34**, a pair of locking bolts **36** and **38** and a keylock **40**. The faceplate **34** may be any shape but in a preferred embodiment it is L-shaped and of a width conforming to the width of the frames **20** and **22** thereby rendering it fairly unobtrusive when mounted on the door. The locking bolts **36** and **38** are preferably rigidly secured to faceplate **34** by welding, threading or the like and extend therefrom a distance at least as great as the distance between the outer surface **42** of frame **20** and the inner surface **44** of frame **22**. Bolt **36** passes through aligned apertures **46**, **48** and **50** while bolt **38** passes through aligned apertures **52**, **54** and **56** in the overlapping portions of frames **20** and **22**. The apertures **46** through **56** should be large enough to permit the bolts **36** and **38** to pass through them easily yet sufficiently small to preclude "play" between panels **10** and **12**.

The keylock 40 is preferably of the type normally used to lock the dials of telephones and includes a cylinder 58 housing a set of tumblers (not shown), a stationary disc 60 which slidably fits within an aperture 60 in frame 20 and a rotatable disc 64 eccentrically mounted relative to stationary disc 60. By turning key 66, disc 64 is rotated eccentrically about disc 60.

Stud 68 is rigidly secured into faceplate 34 and passes through an aperture in frame 20 to further stabilize the lock 32 when it is mounted on door panels 10 and 12. Knob 70 assists in mounting and demounting the lock 32. It should be noted that bolts 36 and 38 do not pass completely through frame 22 nor does stud 68 pass through frame 20 thereby preventing their being forced inwardly from outside.

The lock operates in the following manner.

To lock the door panels 10 and 12, they are slid to their closed positions adjacent the right and left sides of frame 14. The eccentric disc 64 is first rotated to a position where it and disc 60 will pass through aperture 62 and then bolts 36 and 38 are guided through aligned apertures 46, 48, 50 and 52, 54, 56, respectively, in the overlapping portions of frames 20 and 22. When face plate 34 is flush with the outer surface 42 of frame 20, key 66 is turned thereby rotating eccentric 64 until a portion 71 of frame 20 is sandwiched between cylinder 58 and eccentric 64. At this time, the door panels 10 and 12 are prevented by bolts 36 and 38 from sliding in their respective tracks relative to each other.

If the lock device 32 is mounted on frame 20 so that the upper edge 72 of faceplate 34 abuts the upper track siderail 74, neither of door panels 10 nor 12 may be lifted out of their respective lower tracks and removed.

Through the combination of the bolts 36 and 38 passing through frames 20 and 22 thereby preventing horizontal movement of the door panels 10 and 12 and the abutment of side rail 74 by faceplate 34, the side panels 10 and 12 are maintained as a single unit locked against any appreciable movement within frame 14 to thereby preclude their being removed or opened by a would-be burglar.

The door panels 10 and 12 are unlocked by rotating eccentric 64 until it is aligned with aperture 62 and then withdrawing bolts 36 and 38 from their respective apertures 46–56 by demounting the lock device 32 from door panel 10.

The lock may be installed on virtually any sliding door combination by merely drilling two holes through frame 20 into frame 22 and a single hole into frame 20. By locating the device adjacent the upper track 16, the upper edge 72 of faceplate 34 will limit the movement of frame 20 within upper track 16, and, consequently, the movement of frame 22 within upper track 18.

FIGS. 4 and 5

The embodiment of the invention illustrated in FIGS. 4 and 5 may be employed where the door panels 76 and 78 do not overlap sufficiently to permit each of the bolts to pass through both of them.

The doors 76 and 78 include rectangular frames 80 and 82 within which panes of glass 84 and 86 are mounted. The panels 76 and 78 themselves are slidably mounted in upper tracks 88 and 90 and lower track 92 in door frame 96. As was the case with the panels in FIG. 1, panels 78 and 76 are supported on their lower edges 98 and 100 by lower track 90 and are guided by means of rails 102 and 104.

The lock device 106 comprises a faceplate 108, a pair of bolts 110 and 112 secured to faceplate 108 and extending therefrom and a keylock 114. While keylock 114 may be separable from faceplate 108, it is preferable that it be rigidly secured thereto. Instead of each of bolts 110 and 112 passing through both panel 76 and panel 78 as was the case with the embodiment illustrated in FIGS. 1 through 3, bolt 110 passes through a single aperture (not shown) in frame 80 and bolt 112 passes through a single aperture 116 in frame 82. Since both of the bolts 110 and 112 are secured to a rigid faceplate 108, the door panels 76 and 78 are precluded from horizontal sliding within their respective tracks.

Keylock 114, which is of the same type described in conjunction with FIGS. 1 through 3, includes a cylinder 118, a stationary disc 120 and an eccentrically mounted rotatable disc 122.

If the device 106 is again mounted with its upper edge 124 in abutment with the side rail 126 of upper track 88, the movement of panels 76 and 78 within upper tracks 88 and 90 will be limited thereby preventing their being lifted out of lower track 90.

FIGS. 6 AND 7

The embodiment of the invention illustrated in FIGS. 6 and 7 is adapted to be permanently mounted on the inside door panel 128 rather than removed each time the doors are unlocked. The door panels 128 and 130 are mounted in a manner identical to those described in conjunction with FIGS. 1 through 5.

The lock device 132 comprises a faceplate 134, a pair of bolts 136 and 138 and a keylock 140, the latter including a cylinder 142, a stationary disc 144 and a rotatable eccentrically mounted disc 146. Bolt 136 slidably passes through apertures 148 and 150 in frame 152 and aperture 154 in frame 156 while bolt 138 slidably passes through apertures 158 and 160 in frame 152 and aperture 162 in frame 156.

Faceplate 134 is slidably mounted on a pair of ferrules 164 and 166 which in turn are secured to frame 152 by means of bolts 168 and 170. Compression springs 172 and 174, which are positioned around ferrules 164 and 166 urge faceplate 134 away from frame 152. It should be noted that bolts 136 and 138 extend into frame 156 a distance "*d*" equal to the distance *d* between the heads of bolts 168 and 170 and faceplate 134.

The device operates in the following manner. To lock the panels 128 and 130 from sliding relative to each other, eccentric 146 is rotated by key 176 to a position where it will pass through aperture 178. Faceplate 134 is then depressed against springs 172 and 174 until eccentric 146 can be rotated within panel 152. In this position (see FIG. 7), the ends 180 and 182 of bolts 136 and 138 will pass through apertures 154 and 162 into the interior of frame 156 thereby locking the panels 128 and 130 against relative sliding motion.

To unlock the doors, key 176 is turned until eccentric 146 is permitted to pass through aperture 178. At this time, the pressure of springs 172 and 174 will urge faceplate 134 to slide on ferrules 164 and 166 a distance *d* until the head of bolts 168 and 170 are contacted. Since bolts 136 and 138 are rigidly secured to faceplate 134, their ends 180 and 182 will be retracted a distance equal to distance *d* from within frame 156 thereby allowing the panels 128 and 130 to slide relative to each other.

It should be noted that the spring release mechanism described in conjunction with FIGS. 6 and 7 could be employed with the embodiment of FIGS. 4 and 5 by shortening bolts 110 and 112 and recessing the springs in faceplate 168 to permit its lying flush on frame 80.

While this invention has been described as having a preferred design, it will be understood that it is capable of further modification. This application is, therefore, intended to cover any variations, uses or adaptations of this invention following the general principles thereof and including such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains, and as may be applied to the essential features hereinbefore set forth and fall within the scope of this invention or the limits of the appended claims.

What I claim is;

1. A lock for use with a pair of overlapping closure members at least one of which is slidably mounted in an upper track including a side rail, said lock comprising:

a. faceplate means,

b. first bolt means secured to said faceplate means for passing through one of the closure members and at least partially through the other closure members to thereby prevent the closure members from sliding relative to each other,

c. lock means associated with said faceplace means for securing said faceplate means to one of the closure members and retaining said bolt means within the closure members, and

d. release means associated with said faceplate means for urging said faceplate means away from the closure to which it is adapted to be locked and said bolt means out of engagement with one of the closure members to thereby permit the closure members to slide relative to each other,

e. said release means including pin means slideably passing through said faceplate means and being adapted to be secured to the closure member to which said faceplate means is adapted to be locked,

f. said release means further including spring means positioned around said pin means.

2. In combination with a pair of relatively sliding overlapping closure members mounted in upper and lower tracks, a lock comprising:

a. faceplate means,

b. first bolt means being secured to said faceplate means and slidably passing through one of said closure members into an overlapping portion of the other of said closure members,

c. lock means for releaseably securing said faceplate means to one of said closure members, and

d. second bolt means secured to said faceplate means and passing through one of said closure members into an overlapping portion of the other of said closure members,

e. one of said upper tracks including a side rail,

f. a portion of said faceplate means abutting said side rail to thereby limit the vertical movement of said closure members in said upper tracks.

3. In combination with a pair of relatively sliding overlapping closure members mounted in upper and lower tracks, a lock comprising:

a. faceplate means,

b. first bolt means being secured to said faceplate means and slideably passing through one of said closure members into an overlapping portion of the other of said closure members,

c. lock means for releaseably securing said faceplate means to one of said closure members, and

d. release means for resiliently urging said faceplate means away from said closure members a distance sufficient to withdraw said bolt means from said the other of said closure members,

e. said release means including pin means slideably passing through the aperture in said faceplate means and secured to one of said closure members,

f. said release means further including spring means positioned between said faceplate means and said one of said closure members.

* * * * *