Feb. 4, 1936. H. G. VOIGHT 2,029,901

EXIT DOORLOCK

Filed Dec. 12, 1934 3 Sheets-Sheet 1

Fig. 1.

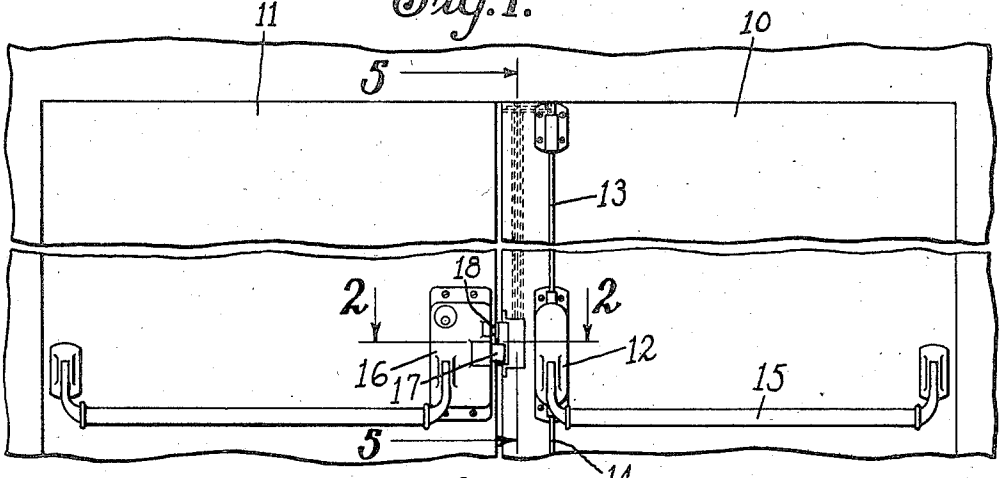


Fig. 2.

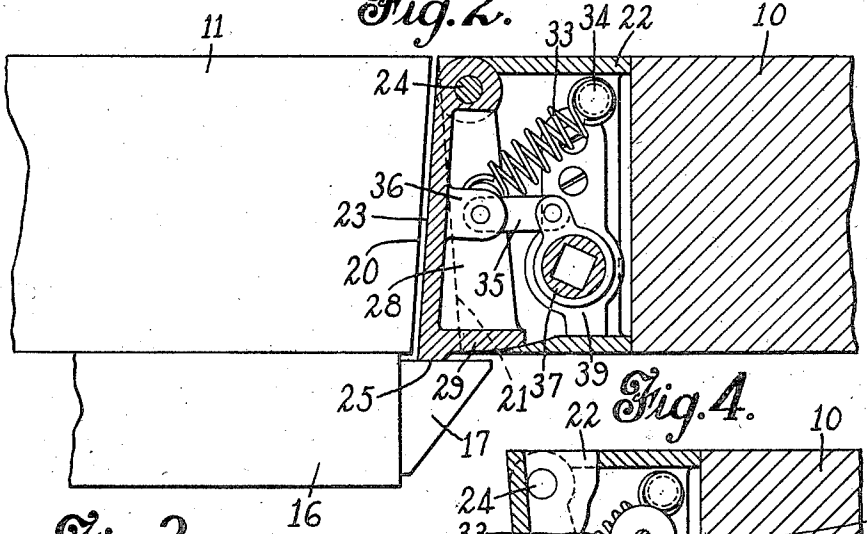


Fig. 3.

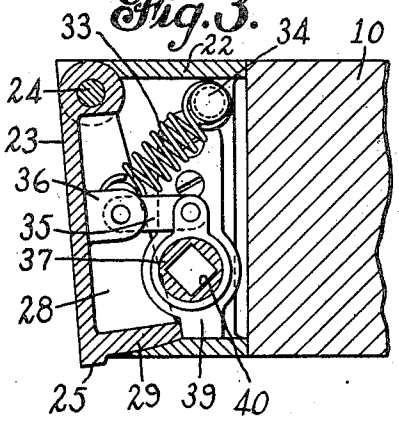
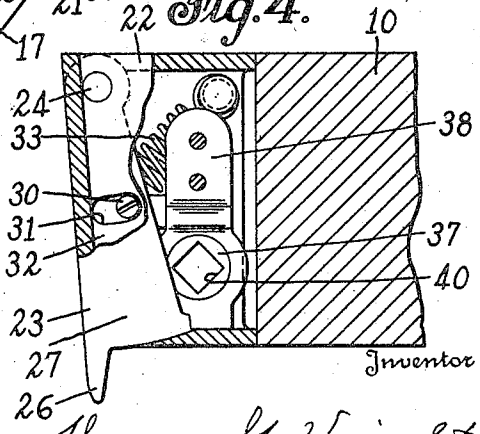


Fig. 4.



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Feb. 4, 1936. H. G. VOIGHT 2,029,901

EXIT DOORLOCK

Filed Dec. 12, 1934 3 Sheets-Sheet 2

Fig. 5.

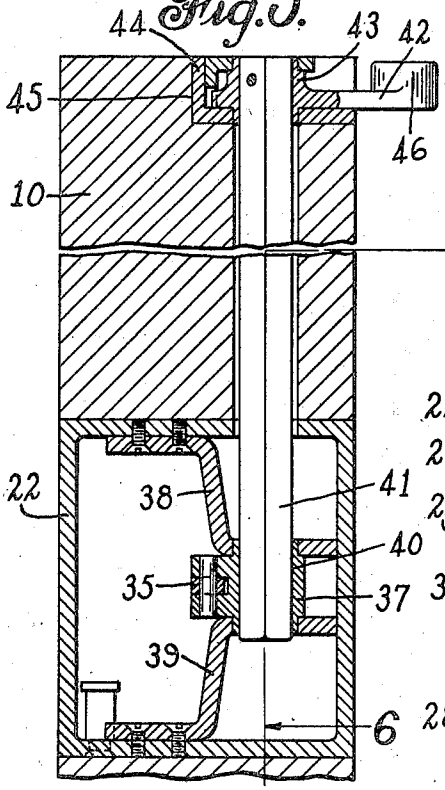


Fig. 6.

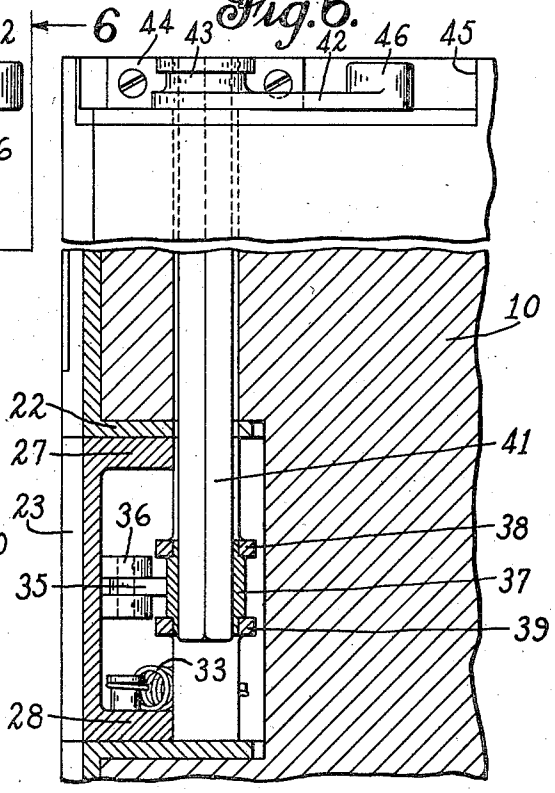


Fig. 7.

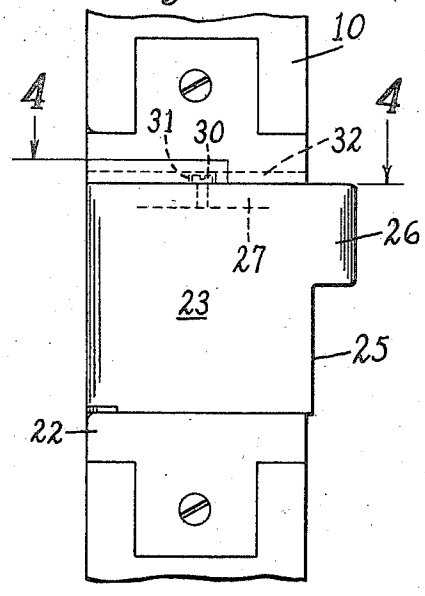
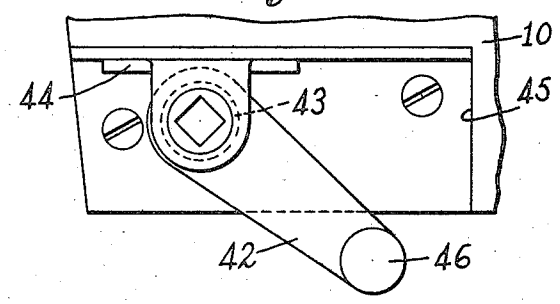


Fig. 8.



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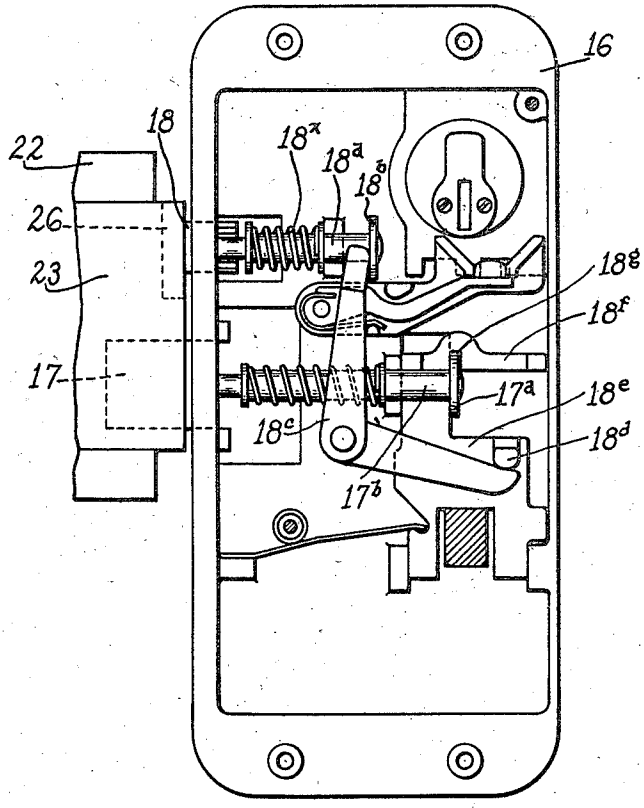
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Feb. 4, 1936. H. G. VOIGHT 2,029,901

EXIT DOORLOCK

Filed Dec. 12, 1934 3 Sheets-Sheet 3

Fig. 9.



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UNITED STATES PATENT OFFICE

2,029,901

EXIT DOORLOCK

Henry G. Voight, New Haven, Conn., assignor to Sargent & Company, New Haven, Conn., a corporation of Connecticut

Application December 12, 1934, Serial No. 757,103

10 Claims. (Cl. 292—92)

This invention relates to locks and more particularly to a lock adapted to be applied to double doors, such as the exit doors of a public building. The lock is adapted to be used in connection with so-called panic bars which lie across the face of the door and are operable to retract the latch and permit the door to open.

In the case of doors of this type, one of the doors is usually normally closed and secured at the top and bottom, while the other door is provided with a lock or latching mechanism which cooperates with a strike or strike plate upon the first or normally closed door. It is desirable, however, to have the doors arranged so that in an emergency, or when desired, either of the doors may open or both may open simultaneously. In order that this may be done, it is necessary to cut back or bevel the facing edges of the two doors so that neither will bind against the other when opened alone or when opened simultaneously. When the facing edges of the doors are cut back or beveled in this manner, there is a space left between them, which is undesirable for several reasons, one being that it will permit the insertion of a tool to force back the bolt and permit the door to be opened by an unauthorized person.

Another disadvantage of such a lock is that the latch bolt does not overlap the strike sufficiently to engage it in a secure manner.

One object of the present invention is to provide a lock or latching structure for a door of this character which will obviate the disadvantages above referred to.

Another object of the invention is the provision of a lock mechanism for double swinging doors which will provide a movable strike or latch-engaging member upon one of the doors to engage the latch upon the other door.

A still further object of the invention is the provision of a lock structure having a movable strike plate which will project beyond the edge of the door to engage the latch bolt and thus provide for a greater area of engagement between the bolt and strike than if the strike were flush with the edge of the door and casing.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the drawings:

Fig. 1 is a front elevational view of a pair of double swinging doors having applied thereto a lock embodying my invention;

Fig. 2 is a sectional view of the lock structure on line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 2 showing the parts of the strike mechanism in another position;

Fig. 4 is a sectional view through the strike mechanism on line 4—4 of Fig. 7;

Fig. 5 is a vertical sectional view on line 5—5 of Fig. 1;

Fig. 6 is a partial sectional view on line 6—6 of Fig. 5;

Fig. 7 is a view of the edge face of the door carrying the strike mechanism;

Fig. 8 is a detail view showing the tripping lever at the top of the door; and

Fig. 9 is an elevational view of the latch bolt mechanism within the casing.

To illustrate a preferred embodiment of my invention, I have shown in Fig. 1 of the drawings a pair of swinging doors 10 and 11. The door represented by the numeral 10 is the one which will be normally closed and is provided with a bolt casing 12 having the bolts 13 and 14 projecting upwardly and downwardly therefrom to engage the door casing at the top and bottom to hold the door in closed position. These bolts will, as is usual, be operated by the panic bar 15.

While I have shown my lock structure as being applied to double swinging doors, it will be understood that it may, if desired, be employed with a single swinging door. In such case, the strike mechanism applied to the door 10, as will be hereinafter described, will usually be applied to the door casing of a single door.

Upon the inside of the door 11 is mounted the lock casing 16 having a latch bolt 17 and a dogging plunger 18 which projects from the front edge of the lock casing and engages the strike when the door is closed, to be retracted into the lock casing and dog the latch bolt against retraction by an instrument inserted between the edges of the doors. Such a plunger is commonly used with doors of this type, and may, as shown in Fig. 9, be like that shown in the Carroll Patent No. 1,555,829. As illustrated, the dogging plunger 18 may be provided with a stem 18^a slidably mounted within the lock case and having at its rear end a flange 18^b engaged with one end of a bell crank lever 18^c, the other end of which engages a lug 18^d on a dogging slide 18^e provided with a part 18^f having a slot 18^g to embrace the flange 17^a on the stem 17^b of the latch bolt 17. The latch bolt 17 is thus held against retraction when the dogging plunger is in retracted position, as shown in Fig. 9. When the door is opened the dogging plunger is protracted by its spring 18^x, and the lower end of the bell crank lever 18^c

is raised, thus freeing the flange 17a from the slot 18g to permit retraction of the latch bolt.

In this instance, the lock case 16 is applied to the face of the door so that the latch bolt 17 engages the face of the cooperating door or a strike plate mounted upon the face of this door. It will be noted that the facing edges of the doors are cut back or beveled to some extent, as shown by the full line 20 in connection with the door 11 and by the dotted line 21 in Fig. 2 which represents the edge face of the door 10. It will be apparent that this provides against any binding action if either of the doors is opened before the other or if both are opened simultaneously.

It will be apparent that only a small portion of the latch bolt 17 engages the edge of the door 10 and that there would normally be a considerable space between the doors which might permit the insertion of an instrument therebetween to force the latch bolt to a disengaging position.

In order to provide a better engagement between the bolt and strike and also to obviate the other disadvantages referred to, I have provided a strike plate which is movable to a projected position beyond the face of the door 10. For this purpose, a casing 22 is provided adjacent the edge of the door 10 and a strike plate 23 is pivoted at one edge, as shown at 24, to this casing. This strike plate is shown in face view in Fig. 7 and is provided with an engaging face or edge 25 behind which the latch bolt engages, as shown in Fig. 2, and above this edge is provided with a projection 26 designed to engage the face of the dogging plunger 18 to cause it to be retracted into the lock case 16 and dog the latch bolt against retraction. As shown in Fig. 2, the edge 25 may, if desired, extend forwardly slightly beyond the edge face of the door so as to snugly engage the back of the latch bolt 17.

The strike plate 23 is provided with upper and lower flanges 27 and 28 and a face flange 29, which face flange is designed to swing rearwardly into the casing 22 when the door is opened, and the strike plate is moved to a retracted position. A pin or screw 30 is secured to, and extends upwardly from, the flange 27 and operates in a slot 31 in the top wall 32 of the casing 22 so that the swinging movement of the strike 23 is limited by the length of this slot. A spring 33 is secured to the lower flange 28 of the strike plate and to a pin 34 secured to the casing to normally hold the strike plate in retracted position.

In order that the strike plate 23 may be moved to protracted position when the door is closed, a link 35 is pivoted at one end to a pair of ears 36 secured at the rear face of the strike plate and pivotally connected at its other end to a rollback 37 rotatably mounted between arms 38 and 39 secured to the casing 22, as shown more especially in Fig. 5.

The rollback is provided with a non-circular opening 40 through which is inserted the end of a rod 41, this rod extending to the top of the door, as shown in Figs. 5 and 6.

A lever arm 42 is provided with a hub member 43 secured to the upper end of the rod 41 and journaled for oscillatory movement in a bracket 44 secured in a rabbet 45 at the upper edge of the door. The free end of the arm 42 is provided with a boss 46 adapted to engage the lintel or upper portion of the door casing so that this lever will be moved to a position within the rabbet 45 when the door 10 is closed. It will be understood that when the door is open, the lever normally stands in an outwardly projecting position, as shown in Fig. 8, due to the action of the spring 33 and connection with the rod 41. That is, the position of the lever 42 shown in Fig. 8 corresponds with the retracted position of the strike 23 shown in Figs. 3 and 4, which positions also correspond to the open position of the door.

A brief description of the operation of the lock mechanism may now be helpful. As has already been stated, when the door 10 is open, the lever stands in the position shown in Fig. 8, and the strike 23 is retracted by the spring 33 to the position shown in Fig. 4. This door will normally be closed first, although this is not essential as the mechanism will operate equally well regardless of which door may be first closed. When the door 10 is closed, the boss 46 on the lever 42 is engaged by the lintel or door casing at the top of the door and is cammed inwardly, thus rotating the rod 41 and rollback 37, which causes the strike plate 23 to be thrown outwardly by the link 35 against the action of the spring 33 to the position shown in Fig. 2, where it projects beyond the edge of the door 10 and, as shown in Fig. 2, lies substantially parallel with the edge 20 of the door 11.

If the door 11 is now closed, the latch bolt 17 engages the strike plate 23 and will be cammed rearwardly into the casing until it passes the edge 25 of the strike plate, where it will be projected in the usual manner to engage behind this edge of the plate. In the meantime, the dogging plunger 18 has engaged the face of the strike plate and has been cammed rearwardly into the casing. After the latch bolt passes the edge 25 of the strike plate, the plunger will still be engaged by the extended projection 26 shown in Fig. 7, so that it will at all times be held in protracted position when the door is closed.

If it is desired to open the door 11, the latch bolt 17 will be retracted and the door may be opened in the usual manner, as the edge 20 will clear the face of the strike plate 23. If the door 10 is opened, or if both doors are opened together, the boss 46 of the lever 42 will at the beginning of the opening operation tend to move away from the door casing. This will permit the spring 33 to act upon the strike plate 23 to urge this plate to a retracted position. Even if the spring were not present, this retracting movement would be caused by engagement of the strike plate with the face 20 of the door 11. The spring, however, will hold the strike plate in retracted position when the door 10 is fully opened.

It will be apparent that when the door 10 is fully opened, the strike plate will no longer project beyond the edge 21 of this door but will be in substantially flush position with the edge 21, as shown in Figs. 3 and 4, and that when the doors are closed, this pivoted member substantially closes the space therebetween adjacent the latch bolt so as to prevent unauthorized tampering therewith, and in addition to provide for a secure engagement between said latch bolt 17 and the strike plate.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the appended claims.

What I claim is:

1. In a latching mechanism for double doors, a casing mounted upon one of said doors adjacent the edge thereof and having a latch bolt adapted to project therefrom, a latch bolt engaging mem-

ber pivotally mounted adjacent the edge of the other of said doors and adapted to project into the space between the doors to engage the latch bolt, and said member being movable toward non-projecting position by engagement with the edge of said first door when said second door is opened.

2. In a latching mechanism for double doors, a casing applied to one of said doors adjacent the edge thereof and having a latch bolt adapted to project therefrom, a bolt-engaging member movably mounted adjacent the edge of the other door, said member being adapted to move from a position flush with the edge of said second door to a position projecting from said edge into the space between the doors to engage said latch bolt, and said member being movable toward non-projecting position by contact with said first door when said second door is opened.

3. In a latching mechanism for double doors, a casing applied to one of said doors adjacent the edge thereof and having a latch bolt adapted to project therefrom, a fitting applied to the second door adjacent the opposing edge thereof, a strike plate pivoted to said fitting and adapted to lie substantially flush with the edge of said door or to be moved to a projecting position into the space between said doors to there engage the latch bolt, and means actuated by the closing of the door upon which it is mounted to move said strike plate to projecting position.

4. In a latching mechanism for double doors, a casing applied to one of said doors adjacent the edge thereof and having a latch bolt adapted to project therefrom, a fitting applied to the second door adjacent the opposing edge thereof, a strike plate pivoted to said fitting and adapted to lie substantially flush with the edge of said door or to be moved to a projecting position into the space between said doors, and means to move said strike plate to the position substantially flush with the edge of the door when the door is opened.

5. In a latching mechanism for double doors, a casing applied to one of said doors adjacent the edge thereof and having a latch bolt adapted to project therefrom, a fitting applied to the second door adjacent the opposing edge thereof, a strike plate pivoted to said fitting and adapted to lie substantially flush with the edge of said door or to be moved to a projecting position into the space between said doors, and means actuated by contact with the door frame when the door is closed to move said strike plate to projecting position.

6. In a latching mechanism for double doors, a casing applied to one of said doors adjacent the edge thereof and having a latch bolt adapted to project therefrom, a fitting applied to the second door adjacent the opposing edge thereof, a strike plate pivoted to said fitting and adapted to lie substantially flush with the edge of said door or to be moved to a projecting positon into the space between said doors, means actuated by contact with the door frame when the door is closed to move said strike plate to projecting position, and a spring to return said strike plate to a flush position when the door is opened.

7. In a latching mechanism for double doors, a casing applied to one of said doors adjacent the edge thereof and having a latch bolt adapted to project therefrom, a fitting applied to the second door adjacent the opposing edge thereof, a strike plate pivoted to said fitting and adapted to lie substantially flush with the edge of said door or to be moved to a projecting position into the space space between said doors, a rollback in said fitting and connected to said strike plate, an arm pivotally mounted at the top of the door adapted to engage the door frame and be actuated thereby when the door is closed, and means connecting said arm to said rollback to move the latter in a direction to project the strike plate.

8. In a latching mechanism for double doors, a casing applied to one of said doors adjacent the edge thereof and having a latch bolt adapted to project therefrom, a fitting applied to the second door adjacent the opposing edge thereof, a strike plate pivoted to said fitting and adapted to lie substantially flush with the edge of said door or to be moved to a projecting position into the space between said doors, a rollback in said fitting and connected to said strike plate, an arm pivotally mounted at the top of the door adapted to engage the door frame and be actuated thereby when the door is closed, means connecting said arm to said rollback to move the latter in a direction to project the strike plate, and a spring to return said strike plate to flush position when said arm is moved away from said frame.

9. In a latching mechanism for double doors, a casing applied to the edge of one door and having a latch bolt projecting therefrom, a latch bolt engaging member movably mounted adjacent the edge of the second door and adapted to project into the space between the doors into engagement with said latch bolt, and said latch bolt engaging member being movable toward non-projecting position by contact with the first door when said doors are opened simultaneously or when said second door is opened before said first door.

10. In a latching mechanism for double doors, a casing applied to the edge of one door and having a latch bolt projecting therefrom, a latch bolt engaging member movably mounted adjacent the edge of the second door and adapted to project into the space between the doors into engagement with said latch bolt, said latch bolt being moved to non-projecting position when said first door is closed after said second door, and said member being moved to non-projecting position when said second door is opened before said first door.

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