June 14, 1955 B. A. QUINN 2,710,535

PUSH-PULL DOOR LATCH WITH LOCK

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Fig. 1

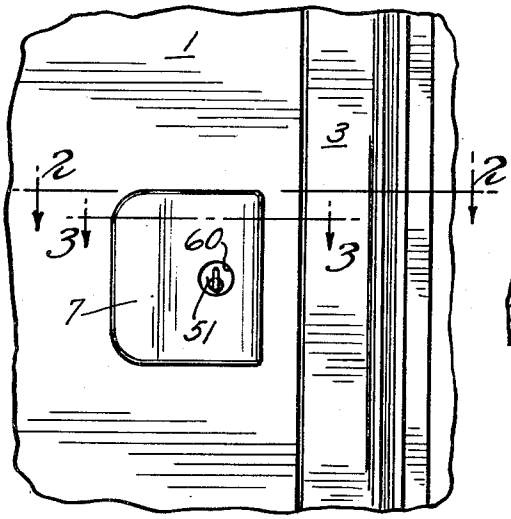


Fig. 2

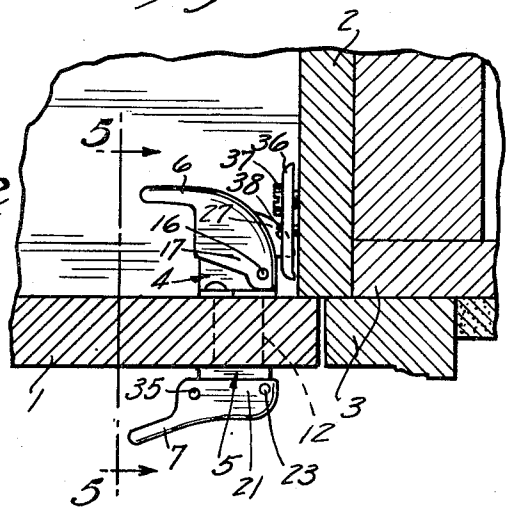


Fig. 3

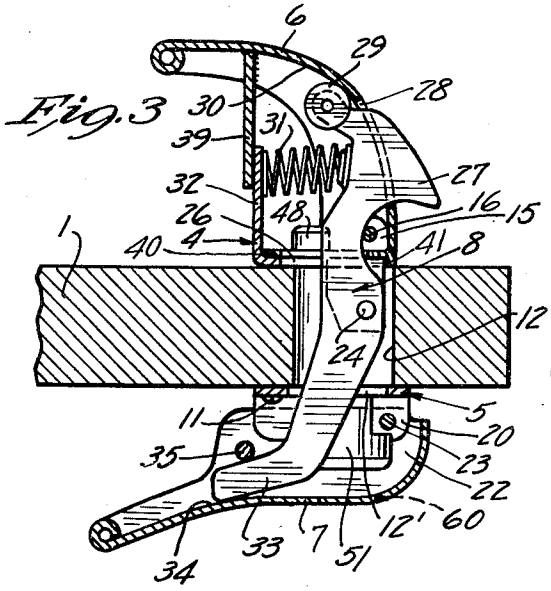
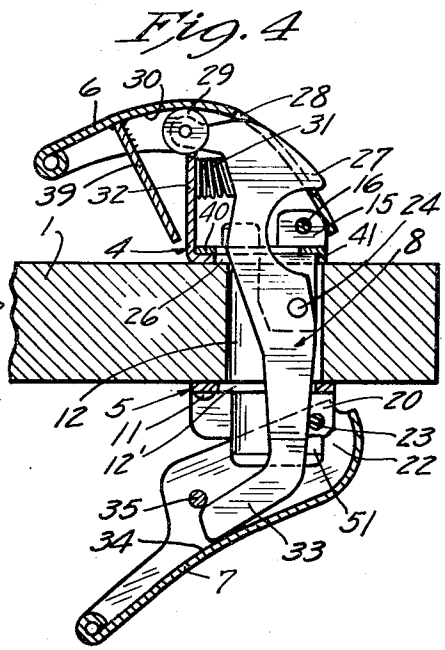


Fig. 4



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Fig. 5

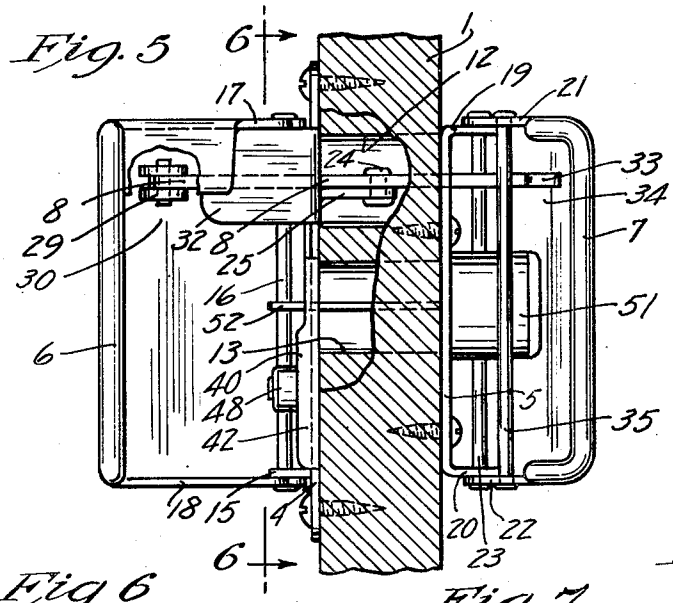


Fig. 6

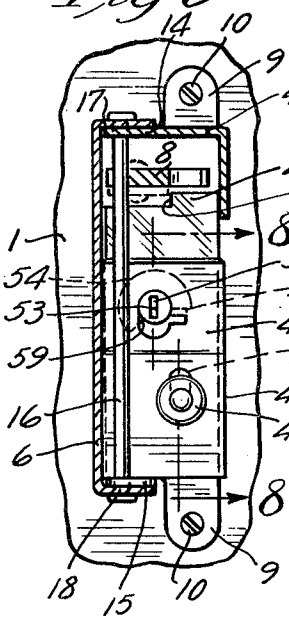


Fig. 7

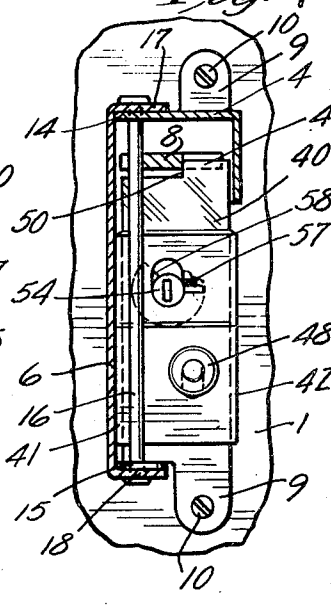
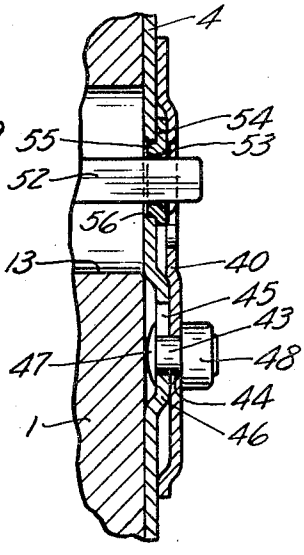


Fig. 8



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PUSH-PULL DOOR LATCH WITH LOCK

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Application January 2, 1953, Serial No. 329,235

10 Claims. (Cl. 70—150)

My invention relates generally to door latches, and more specifically to improvements in door latches of the "push-pull" variety exemplified in my prior United States Letters Patent 2,317,300, issued April 20, 1943.

Formerly several types of push-pull latches have been produced, the most common of these being the "notched-in" type and the "bored-in" type. In both of the above mentioned types, a single generally U-shaped handle or a two-piece joined handle of substantially the same shape has been utilized, one end thereof being located adjacent the inner side of the door and the other end thereof being located adjacent the outer side of the door. This arrangement necessitates either a relatively large notch in the edge of the door, in the case of the notch-in type, a relatively large hole bored through the door in the case of the bored-in type, or handles of relatively small cross section. In the event that a large notch or hole is cut in the door, the door itself is substantially weakened. This is particularly true in the case of metal storm or screen doors which are often of very light weight and which utilize a minimum quantity of material. On the other hand, if the latch receiving notch or bored hole in the door is relatively small, latch handles of sufficiently small size to be contained therein, unless expensively made are relatively weak and easily bent out of shape. Moreover, the above construction permits of but a limited variation in ornamental design of the handles and a relatively flimsy appearing handle results.

An important object of my invention is the provision of a push-pull latch which can be readily applied with a minimum of material removed from the door to a door or similar closure.

Another object of my invention is the provision of a door latch as set forth, the handles of which may be made in a wide variety of shapes and sizes and which will not easily become bent or damaged after prolonged use.

A still further object of my invention is the provision of a latch of the above type which may be readily applied to wood or metal doors.

Still another object of my invention is the provision of novel locking mechanism for the latch mechanism of my improved latch.

Another object of my invention is the provision of a door latch which is relatively simple and inexpensive to manufacture and install, which is efficient in operation, and which is rugged in construction and durable in use.

Generally stated, my invention comprises inner and outer mounting brackets adapted to be rigidly secured to the inner and outer sides of a door respectively, a pair of handle members one each independently pivotally mounted to one of said mounting brackets and a latch bar mounted on one of said mounting brackets and adapted to project through a relatively small aperture in the door and having its opposite ends in operative engagement with said handles.

The above and still further highly important objects and advantages of my invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings, which illustrate the invention, and in which like characters indicate like parts throughout the several views:

Fig. 1 is a fragmentary view in elevation of a door and door frame showing one of the latch handle members of my invention applied to the door;

Fig. 2 is a view partly in plan and partly in horizontal section taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged horizontal section taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a view corresponding to Fig. 3 but showing a different position of some of the parts;

Fig. 5 is an enlarged vertical sectional taken substantially on the line 5—5 of Fig. 2, some parts being broken away;

Fig. 6 is a view partly in elevation and partly in section taken substantially on the line 6—6 of Fig. 5;

Fig. 7 is a view corresponding to Fig. 6 but showing a different position of some of the parts; and

Fig. 8 is an enlarged fragmentary section taken on the line 8—8 of Fig. 6.

In the preferred embodiment of the invention illustrated, a door 1 is hingedly mounted for opening and closing swinging movements with respect to a door frame 2 that forms a portion of a door casing 3. The door 1 is hinged to the door casing in the conventional manner by means of hinges, not shown. Preferably the door 1 is of the screen or storm variety, and as shown swings to a closed position against one edge portion of the frame 2 which provides a stop therefor.

My improved door latch comprises inner and outer mounting brackets 4 and 5 respectively, inner and outer door handles 6 and 7 respectively pivotally connected to their respective mounting brackets 4 and 5, and a latch bar 8. The inner mounting bracket 4 is provided at its upper and lower ends with a pair of lugs or ears 9 through which extend mounting screws 10 that are screw threaded into the door 1. The outer mounting bracket 5 is secured to the outer surface of the door 1 by mounting screws or the like 11. The mounting brackets 4 and 5 overlie opposite ends of a pair of vertically spaced parallel apertures, the upper of which is indicated at 12 and the lower one of which is indicated at 13, see particularly Fig. 5. The inner mounting bracket 4 is provided adjacent its upper and lower ends with outwardly projecting flanges or lugs 14 and 15 respectively through which extends a vertically extended hinge pintle 16. The inner handle 6 is formed to provide upper and lower inturned flanges 17 and 18 respectively, the former of which overlies the flange 14 and the latter of which underlies the flange 15. The hinge pintle 16 extends through suitable aperture in the inturned flanges 17 and 18 whereby to provide the above-mentioned pivotal connection between the handle 6 and its cooperating inner mounting bracket 4. The outer mounting bracket 5 at its upper and lower ends is provided with outturned and lower lugs 19 and 20 respectively that are engaged by respective cooperating inturned flanges 21 and 22 formed integrally with the outer handle 7. The lugs 19 and 20 and their cooperating flanges 21 and 22 are provided with aligned apertures through which extends a pintle pin or the like 23 to provide the pivotal connection between the outer handle 7 and its cooperating mounting bracket 5. The mounting brackets 4 and 5 are preferably made from relatively heavy sheet metal, and the inner and outer handles are also preferably metallic being formed from sheet or cast metal. With reference to Figs. 3 to 5 inclusive, it will be seen that the pintles 16 and 23 are disposed in parallel relationship at opposite sides of the door 1.

The latch bar 8 extends longitudinally through the upper aperture 12 and is pivotally secured intermediate its ends, as indicated at 24 to an inturned lug 25 integrally formed with the inner mounting bracket 4 and projecting axially into the aperture 12. The latch bar 8 extends inwardly of the door through a slot or opening 26 in the inner mounting bracket 4, and is provided adjacent its inner end with a latch lug 27 that projects

laterally outwardly through an opening 28 in the inner handle member 6. At its inner end, the latch bar 8 is provided with a head in the nature of a pair of spaced rollers 29 that engage an inner surface portion 30 of the handle 6 for a purpose which will hereinafter become apparent. The latch bar 8 is yieldingly biased in a latch lug extended direction through the opening 28 by a coil compression spring 31 interposed between the latch bar 8 adjacent its lug 27 and an inturned anchoring lip 32 integrally formed with the mounting bracket 4, see Figs. 3 and 4. As shown, the latch bar 8 extends outwardly through the aperture 12 in the door 1 and a slot or opening 12' in the outer mounting bracket 5, and terminates in a tail portion 33 outwardly of the pintle pin 23, said tail portion 33 being disposed between an inner surface portion 34 of the handle member 7 and a tail portion engaging element in the nature of a pin 35 anchored at its opposite ends to the upper and lower flanges 21 and 22 respectively of the outer handle member 7.

The latch lug 27 is adapted to be moved into and out of operative engagement with a striker plate 36 mounted on the door frame 2 by means of a mounting screw 37 and rigidly locked in place by a locking screw 38, see Fig. 2. The striker plate 36 may be of any suitable type commonly used for this purpose. Inasmuch as the striker plate 36 in itself forms no part of the instant invention, further detailed showing and description thereof is deemed unnecessary. As above indicated, the latch lug is yieldingly biased toward operative engagement with the striker plate by the spring 31. The latch bar 8 may be pivotally moved about its pivot mounting 24 toward a latch lug retracted position as indicated in Fig. 4 by swinging the outer handle 7 in a direction away from the door about the axis of its pintle 23, or by pushing the free end of the handle 6 toward the door in a direction about the pivotal axis of its pintle pin 16. As shown, each of these movements is in a door opening direction. When the free end portion of the outer handle 7 is pulled, the pin 35 engages the adjacent side of the tail portion 33 to swing the latch bar 8 in a lug retracting direction, whereas when the inner handle 6 is swung toward the door 1, the inner surface 30 of the handle 6 exerts a camming action upon the rollers 29 to move the latch bar 8 in a latch lug retracting direction as indicated in Fig. 4. With reference to Figs. 3 to 5 inclusive, it will be seen that the inner handle 6 is provided with a stop flange 39 which engages the anchoring lip 32 to limit swinging movement of the inner handle 6 in a direction of its free end away from the door 1 thereby limiting latch lug extending swinging movement of the latch bar 8 due to the engagement of the head forming rollers 29 with the inner surface 30 of the handle 6. It should further be noted that the spring 31, working against the latch bar 8 maintains the outer handle 7 in its normal position of Fig. 3 by engagement of the pin 35 with the adjacent edge of the tail portion 33.

Means for locking the latch bar 8 in its latch lug extended strike plate engaging position of Figs. 2 and 3 comprises a locking member in the nature of a slide plate 40 which overlies the inner mounting bracket 4 and which is provided with inturned flanges 41 and 42 which engage opposite side edges of the mounting bracket 4. The slide 40 has mounted thereon a retainer pin 43 which extends through an opening 44 in the slide plate and through an overlying slot 45 elongated in a direction longitudinally of the mounting bracket and disposed in a raised portion 46 thereof. The retainer pin 43 is provided at one end with a head 47 that is disposed between the raised portion 46 of the mounting bracket 4 and the adjacent surface of the door 1. At its opposite end, the retainer pin 43 is provided with an enlarged knob or head 48 by means of which the slide 40 may be raised or lowered. The slide 40 is formed at its upper end to provide an upwardly extending finger 49 which under sliding movements of the slide 40 in a vertical direction is movable into and out of the path of travel of the latch bar 8, see Figs. 6 and 7. The finger 49 defines a stop shoulder 50 which, when the slide is raised, is engageable with the adjacent edge portion of the latch bar 8 and which provides a positive stop against movement of the latch bar 8 in a direction to disengage the latch lug 27 from the striker plate 36.

From the above it will be seen that the locking member 40 is associated with the inner mounting bracket 4 adjacent the inner side of the door. I further provide means for utilizing the slide 40 when it is desired to lock the door from the outside against intrusion. A conventional cylinder lock 51 is rigidly mounted on the outer mounting bracket 5 in overlying relationship to the lower transverse aperture 13 to the door 1. The lock 51 is preferably of the type commonly opened with a key and is provided with a rigid rotary cross sectionally rectangular link 52 that extends axially through the aperture 13 in the door and through a cross sectionally rectangular central opening 53 in a segmental rotary member 54. The rotary member 54 is formed to provide a central boss 55 which seats in a circular opening 56 in the mounting bracket 4 and which mounts the rotary member 54 for rotation with respect to the mounting bracket 4. The rotary member 54 is held against axial movement by engagement of its outer surface with the under surface of the overlying slide 40, see particularly Fig. 8. The slide 40 is formed to provide an inturned lug 57 that is engageable alternately by the circumferentially spaced ends 58 and 59 of the segmental rotary member 54 to raise or lower the slide 40 upon rotation of the link 52 such rotation being effected by manipulation of a key, not shown but insertable into the lock 51 through an opening 60 in the outer handle member 7.

The above arrangement permits the apertures 12 and 13 in the door 1 to be of relatively small diameter and permits the handle members 6 and 7 to be made in a wide variety of designs and shapes. The relatively small diameter holes do not materially affect the strength of the door and handles may be made at a reasonable cost while retaining sufficient strength to insure relatively long life in spite of hard usage.

My novel lock has been thoroughly tested and found to be completely satisfactory for the accomplishment of the objectives set forth; and while I have shown a commercial embodiment of my latch, it will be understood that the same is capable of modification as to structure and arrangement of parts within the spirit and scope of the invention as defined in the claims.

What I claim is:

1. In a push-pull door latch; inner and outer mounting brackets adapted to be secured to opposite sides of a door and over the opposite ends of an aperture extending through said door adjacent one edge thereof; inner and outer handle members respectively pivotally secured to said inner and outer mounting brackets; a latch bar pivotally mounted intermediate its ends to one of said brackets; said latch bar having a head at one end engageable with one of said handle members and a latch lug laterally extendable and retractable through an opening in said one of the handle members, said latch bar being adapted to extend through said aperture in the door and having a tail portion engageable with the other of said handle members in spaced relation to the pivotal mounting of said other handle member; means yieldingly biasing said latch bar in a latch lug extending direction; and a tail portion engaging element on said other handle member operative responsive to swinging movement of said other handle member in one direction to move said latch bar in a latch lug retracting direction against the yielding bias of said means.

2. In a push-pull door latch; inner and outer mounting brackets adapted to be secured to opposite sides of a door and over the opposite ends of an aperture extending through said door adjacent one edge thereof; inner and

outer handle members respectively pivotally secured to said inner and outer mounting brackets; a latch bar pivotally mounted intermediate its ends to said inner bracket; said latch bar having a head at one end engageable with said inner handle member and a latch lug laterally extendable and retractable through an opening in said inner handle member, said latch bar being adapted to extend through said aperture in the door and having a tail portion engageable with said outer handle member in spaced relation to the pivotal mounting of said outer handle member; yielding means biasing said latch bar in a latch lug extending direction; and a tail portion engaging element on said outer handle member operative responsive to swinging movement of said outer handle member in one direction to move said latch bar in a latch lug retracting direction against the bias of said yielding means.

3. The structure defined in claim 1 in further connection with stop means positively limiting pivotal movements of said inner handle member in one direction.

4. The structure defined in claim 2 in which the head on said latch bar comprises a roller journalled on the inner end of said latch bar and in further combination with a cam-acting surface portion on said inner handle in camming engagement with said roller whereby to cause latch lug retracting movements to be imparted to said latch bar upon swinging movements of said inner handle member in one direction.

5. In a push-pull door latch; inner and outer mounting brackets adapted to be secured to opposite sides of a door and over the opposite ends of an aperture extending through said door in spaced relation to one edge thereof; inner and outer handle members respectively pivotally secured to said inner and outer mounting brackets for swinging movements about spaced parallel axes; a latch bar pivotally mounted intermediate its ends to said inner bracket within the aperture in said door for swinging movements about an axis parallel to the pivot axes of said handle members; said latch bar having a head at one end engageable with said inner handle member and a latch lug laterally extendable and retractable through an opening in said inner handle member, said latch bar being adapted to extend through said aperture in the door and having a tail portion engageable with said outer handle member in outwardly spaced relation to the pivotal mounting of said outer handle member; yielding means biasing said latch bar in a latch lug extending direction; and a tail portion engaging element on said outer handle member operative responsive to swinging movement of said outer handle member in one direction to move said latch bar in a latch lug retracting direction against the bias of said yielding means.

6. The structure defined in claim 2 in further combination with means for positively locking said latch bar in a latch lug extended position, said means comprising a locking plate mounted for sliding movements on said inner bracket into and out of the path of travel of said latch bar.

7. In a push-pull door latch, inner and outer mounting brackets adapted to be secured to opposite sides of a door and over the opposite ends of a pair of spaced apertures extending through said door in spaced relation to one edge thereof, inner and outer handle members respectively pivotally secured to said inner and outer mounting brackets, a latch bar pivotally mounted intermediate its ends to one of said brackets, said latch bar being adapted to extend through one of the apertures in the door and engageable at its opposite ends with said handle members to be moved thereby, a latch lug on said latch bar laterally extendable and retractable through an opening in one of said handle members upon pivotal movements of said handle members, means yieldingly biasing said latch bar in a lug extending direction, a locking member mounted for sliding movements on one of said brackets in and out of the path of travel of said latch bar, a cylinder lock carried by the other of said brackets, and connections between said cylinder lock and said locking member including a link adapted to extend through the other of said apertures in the door, whereby to move said locking member into and out of the path of travel of said latch bar.

8. In a push-pull door latch; inner and outer mounting brackets adapted to be secured to opposite sides of a door and over the opposite ends of a pair of spaced apertures extending through said door in spaced relation to one edge thereof, inner and outer handle members respectively pivotally secured to said inner and outer mounting brackets; a latch bar pivotally mounted intermediate its ends to one of said brackets; said latch bar having a head at one end engageable with one of said handle members and a latch lug laterally extendable and retractable through an opening in said one of the handle members, said latch bar being adapted to extend through one of said apertures in the door and having a tail portion engageable with the other of said handle members in spaced relation to the pivotal mounting of said other handle member; means yieldingly biasing said latch bar in a latch lug extending direction; means on said other handle member operative responsive to swinging movement of said other handle member in one direction to move said latch bar in a latch lug retracting direction against the yielding bias of said first mentioned means; a locking member mounted for sliding movements on one of said brackets into and out of the path of travel of said latch bar; a cylinder lock carried by the other of said brackets; and connections between said cylinder lock and said locking member including a link adapted to extend through the other of said apertures in the door, whereby to move said locking member into and out of the path of travel of said latch bar.

9. In a push-pull door latch, inner and outer mounting brackets adapted to be secured to opposite sides of a door and over the opposite ends of a pair of spaced apertures extending through said door in spaced relation to one edge thereof, relatively wide plate-like inner and outer handle members respectively pivotally secured to said inner and outer mounting brackets, a latch bar pivotally mounted intermediate its ends to said inner bracket, said latch bar being adapted to extend through one of the apertures in the door and engageable at its opposite ends with said handle members to be moved thereby, a latch lug on said latch bar laterally extendable and retractable through an opening in said inner handle member upon pivotal movements of either thereof, spring means biasing said latch bar in a lug extending direction, a locking member mounted for sliding movements on said inner bracket into and out of the path of travel of said latch bar, a cylinder lock carried by said outer bracket and extending toward said outer handle; and connections between said cylinder lock and said locking member including a link adapted to extend through the other of said apertures in the door, whereby to move said locking member into and out of the path of travel of said latch bar, said outer handle member having an aperture substantially in axial alignment with said cylinder lock to permit insertion of a key into said lock.

10. The structure defined in claim 9 in which said connections between the cylinder lock and the locking member include a rotary member carried by said inner bracket and engaged by said link, and a cooperating lug on said locking member, opposite sides of said lug being engaged by said rotary member upon rotation of said rotary member in opposite directions.

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