W. B. SMITH.

SLIDING DOOR LOCK.

APPLICATION FILED FEB. 5, 1914.

1,143,653.

Patented June 22, 1915.

2 SHEETS—SHEET 1.

Fig. 1

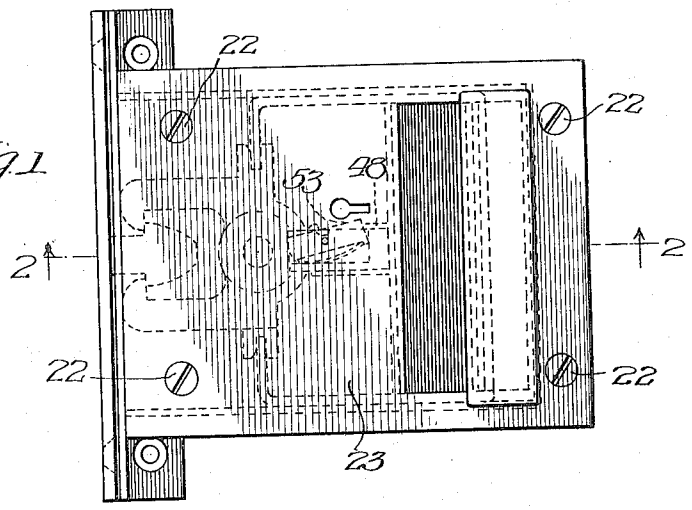


Fig. 2

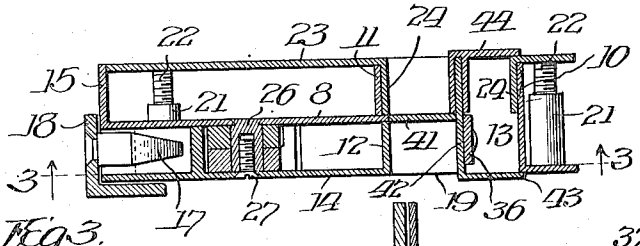


Fig. 3.

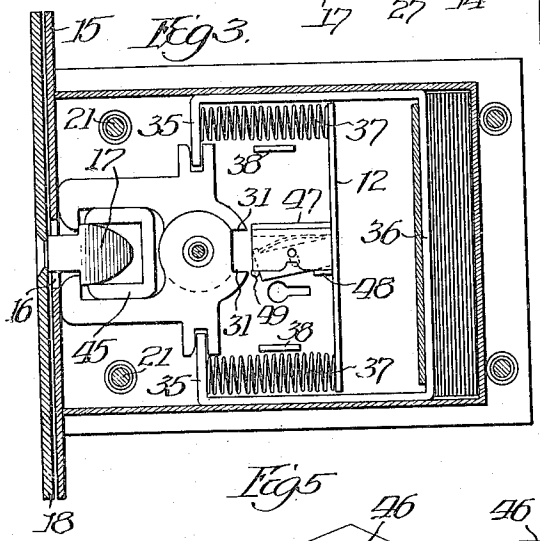


Fig. 4

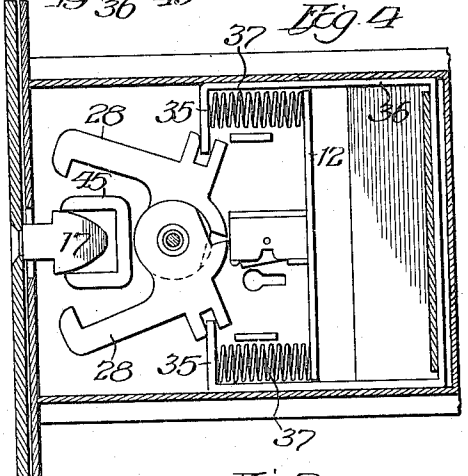


Fig. 5

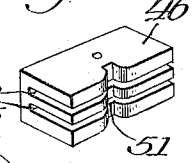


Fig. 6

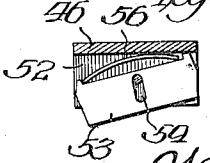
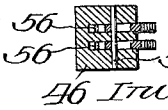


Fig. 7



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2 SHEETS—SHEET 2.

Fig. 8.

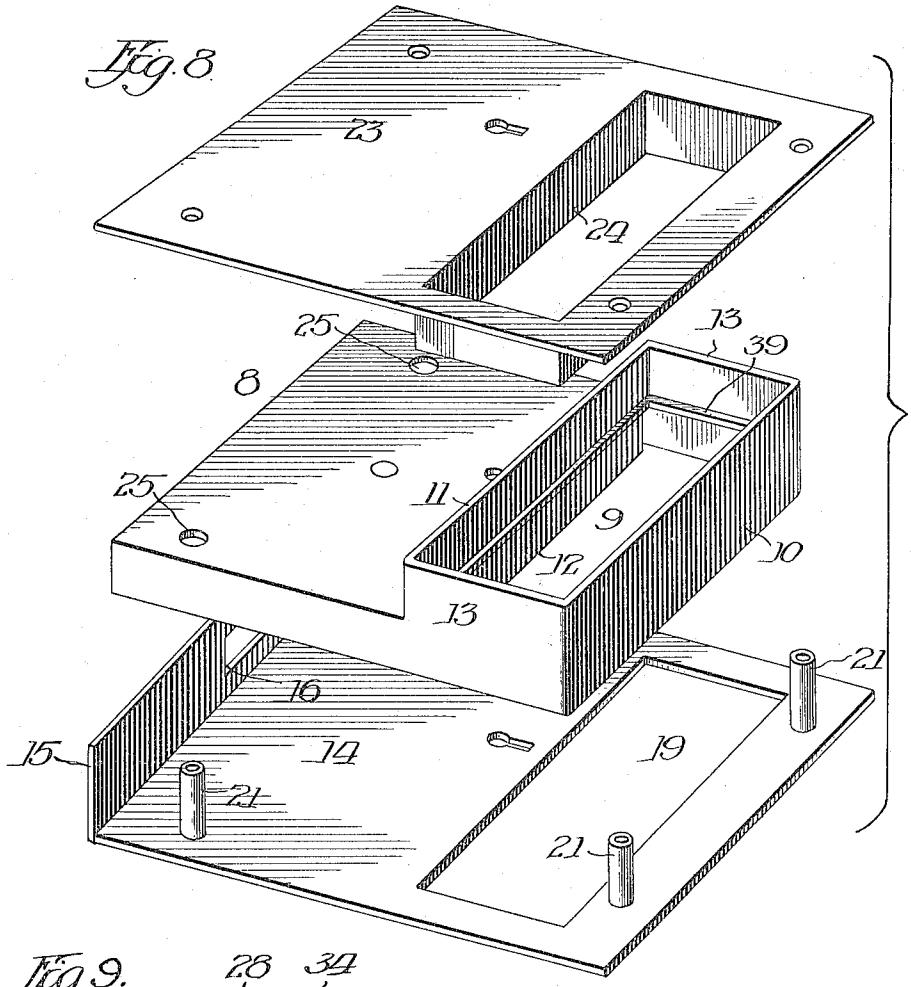


Fig. 9.

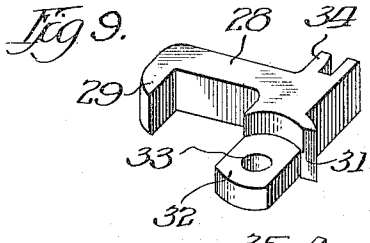
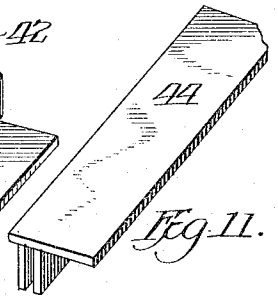


Fig. 10.

Fig. 11.



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WILLIAM B. SMITH, OF DANVILLE, ILLINOIS.

SLIDING-DOOR LOCK.

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Application filed February 5, 1914. Serial No. 816,663.

To all whom it may concern:

Be it known that I, WILLIAM B. SMITH, a citizen of the United States, residing at Danville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Sliding-Door Locks, of which the following is a specification.

This invention relates in general to locks and has more particular reference to locks adapted to be used on sliding doors, such as barn doors, garage doors and the like, for holding such doors in closed position.

One of the objects of the invention is the provision of a lock of this general character which will be simple in construction, cheap to manufacture and easy to manipulate and which will automatically latch the door in closed position but will present means at both sides of the door adapted to be grasped by the hand and moved to release the latch in the act of opening the door.

Another object is the provision of novel locking mechanism by means of which the latches can be positively locked and unlocked through the instrumentality of a key, the locking mechanism being constructed so that accidental locking or unlocking is precluded.

Other objects and many of the attendant advantages of this invention will be readily apparent as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawings.

Referring to the drawings Figure 1 is a side elevation of a lock embodying my invention; Fig. 2 is a longitudinal sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2, showing the latches in closed but unlocked position; Fig. 4 is a similar view showing the latches in open position; Fig. 5 is a detailed perspective view of the locking bolt; Fig. 6 is a longitudinal sectional view of the locking bolt; Fig. 7 is a transverse sectional view of the locking bolt; Fig. 8 is a combined perspective view of the face plates and central member of the casing in a separated position; Fig. 9 is a perspective view of one of the latches; Fig. 10 is a perspective view of the operating yoke, and Fig. 11 is a perspective view of one of the handles.

On the drawings reference character 8 designates the central portion of the casing provided at its rear end with an opening or pocket 9 extending therethrough to receive the manually controlled mechanism for operating the latches which will be later described, this opening being bounded at the rear by the wall 10 and at the front by the walls 11 and 12 and at the sides by walls 13, the walls 10, 11, 12 and 13 together forming a pocket of considerable depth rigidly secured to the member 8. The locking mechanism is disposed between the central plate 8 of the casing and one of the face plates 14, which is equipped with an end plate 15 provided with an aperture 16 to receive the keeper 17 carried by plate 18 which in practice is fastened to the door jamb, or, if twin doors are employed, is fastened to the inner edge of one of said doors. The plate 14 is provided with an aperture 19 alining with the previously mentioned opening or pocket 9. A plurality of studs 21 carried by the plate 14 are internally threaded to receive the screws 22 which are employed to secure the other face plate 23 to the plate 14 thereby forming the complete lock casing. The screws 22 are quite long so that the distance between the face plates 14 and 23 may vary to accommodate the lock to doors of different thicknesses, it being manifest that the door will be mortised to receive the lock which will be set in the mortise with the face plate 14 flush with one face of the door, and the plate 23 will thereafter be applied to the other face of the door and secured in position by the screws 22. The plate 23 is provided with inwardly extending flanges 24 which project into the opening or pocket 9, and if the plate 23 should be spaced farther from the plate 8 than is shown in Fig. 2 the flanges 24 will form the walls of the opening beyond the edges of the walls 10, 11 and 13. It will be manifest from Fig. 8 that one pair of studs 21 on plate 14 project through corresponding openings 25 in the member 8 so that said member is securely locked in position between the face plates.

A boss or pivot stud 26 is secured to the central member 8 in any preferred manner and in the present instance this stud is tapped to receive a screw 27 which also serves to clamp the face plate 14 to the central member. Upon the stud 26 is pivotally mounted a pair of latches 28. Each of the latches, as best shown in Fig. 9, comprise a main body portion equipped at its outer end

with a hook or shoulder 29 adapted to engage with the keeper 17 and at the rear of the pivot each latch is provided with a shoulder 31, the full thickness of the latch so constructed that when the latches are assembled on the pivot stud these shoulders are opposed to each other, as shown in Fig. 3. The bases 32 of the latches are shaped to overlap each other and are provided with bearing openings 33 which fit over the stud 26. Each latch is also equipped on its outer side opposite the base 32 with a grooved shoulder 34, each adapted to receive an inturned end 35 of the operating yoke 36. The ends of the wall 12 are spaced from the side walls of the central member as shown in Figs. 3 and 4 to accommodate the sides of the yoke. The latches are normally urged into the closed position shown in Fig. 3 by means of a pair of expansion springs 37 disposed between the ends 35 of the yoke and the wall 12, suitable lugs 38 secured to the member 8 being provided to prevent displacement of these springs.

The crown of the yoke is disposed within the pocket 9 and the end walls 13 of the pocket are provided with guiding ribs 39 (Fig. 8) to assist in guiding the yoke in its reciprocatory movements. A plate 41 secured to the yoke closes the opening through the pocket in front of the crown of the yoke and a plate 42 secured to the crown of the yoke extends transversely of the pocket in position to be engaged by the fingers of a person opening the door from either side of the lock. The plate 42 is extended rearwardly as indicated at 43 at one side of the lock to close the opening at the rear of the yoke and another plate 44 which is secured to the opposite edge of plate 42 after the face plate 23 has been secured in position, is adapted to close the opening at the opposite side of the lock. It will thus be manifest that the opening through the lock is completely closed except when the yoke is drawn rearwardly against the force of springs 37 to release the latches and cold air, rain, snow, etc., are thereby prevented from entering the building through the pocket 9. The member 44 may be bolted, screwed or otherwise fastened to the plate 42 when the lock is mounted in the door.

For the purpose of centering the lock with respect to the keeper 17 I have provided a U-shaped member 45 positioned in alinement with the opening 16 in the end of the lock casing so that when the tapered keeper 17 enters the opening it will engage with the centering member and lift the door or lower it, as necessity may require, to properly center the keeper with respect to the lock thereby insuring that both of the latches will engage with the keeper shoulders.

In order that the latches may be locked in operative position so that they cannot be released through the instrumentality of the yoke in the usual way I have provided locking mechanism which will now be described. At the rear of the pivot stud 26 and in alinement with the notch or groove formed between the opposed shoulders 31 of the latches I have mounted a locking bolt 46 which is adapted to move longitudinally into position between said shoulders and backwardly away from the shoulders when required, said bolt being guided in its movements by guide plate 47, a stud 48 and a pin 49. The bolt is provided on one side with a transversely extending groove 51 and is also provided with a plurality of longitudinally extending grooves 52. Tumblers 53, adapted to loosely fit in the grooves 52, are equipped with centrally disposed transversely extending slots 54 through which a pin 55 passes to secure the members to the bolt. A leaf spring 56, positioned at the rear of each of the tumblers 53, tends to force the tumblers outwardly with respect to the slots 52, their outward movement being limited by the pin 55 which also serves as a pivot about which the tumblers may rock. When the bolt is in unlocked position, as shown in Figs. 3 and 4, the stud 48 holds the rear end of the tumblers 53 inwardly and the front ends are urged outwardly by the springs 56 so that the tumblers rock about the pin 55 into the position shown in Figs. 3 and 4 with their forward ends disposed behind the pin 49. The locking bolt is therefore held against accidental movement into locking position. When a key of the proper shape is inserted into the lock in a key-hole which is disposed adjacent to the locking bolt turning movement of the key in a counter-clockwise direction, viewing Figs. 3 and 4, will press the tumblers 53 inwardly to release them from the pin 49 and the end of the key will engage in the groove 51 of the bolt to slide the bolt forwardly into locked position between the shoulders 31. When the bolt is moved to this position the rear ends of the tumblers will move outwardly and be positioned in front of the stud 48, as shown in Fig. 1, thereby locking the bolt in locked position so that it can only be released by the key which is then turned in the opposite direction to release the tumblers and withdraw the bolt.

It will thus be manifest that the bolt is automatically locked in both operative and inoperative positions with the result that accidental movement of the bolt is prevented and manipulation of the lock can only be effected by a properly shaped key. When the locking bolt is released the latches are yieldingly held in operative position by the springs 37 and when the door is closed these latches will automatically engage with the keeper 17. Opening movement of the door can then be effected by grasping the plate 42

carried by the yoke from either side of the yoke and pulling backwardly thereon. The rearward movement of the yoke will release the latch and further pulling action will open the door. As soon as the yoke is released the springs 37 will close the latches and also return the plate 41 to its forward position to close the opening through the pocket.

It is believed that my invention and its mode of operation will be fully understood from the foregoing and it will be obvious that various changes in the structural details disclosed may be made within the scope of the invention as set forth in the following claims.

I claim:

1. In a door lock, the combination of a casing, a pair of latches concentrically pivoted in said casing, each latch being provided with a shoulder opposed to a similar shoulder on the other latch, a manually operable sliding yoke connected with said latches, a locking bolt adapted to be positioned between said opposed shoulders of the latches to lock the latches in locked position, and means for holding said locking bolt in locked and in unlocked positions.

2. In a door lock, the combination of a casing, a pair of latches concentrically pivoted in said casing and provided with rearwardly extending oppositely disposed shoulders, a locking bolt longitudinally slidable in said casing adapted to be interposed between said shoulders to hold the latches in locked position, and a spring-pressed means carried by said bolt adapted to automatically engage with a projection fixed on said casing to hold said bolt in locked and in unlocked positions.

3. In a door lock, the combination of a casing, a pair of pivoted latches provided with rearwardly extending opposed shoulders, a locking bolt slidable into position between said shoulders, and a tumbler pivotally carried by said bolt in position to automatically engage with a fixed projection on said casing when said bolt is moved to extreme position in either direction whereby said bolt is positively held against movement.

4. In a door lock, the combination of a casing, a pair of latches mounted therein and provided with oppositely disposed shoulders, a locking bolt slidable into position between said shoulders to hold the latches against opening movement, a tumbler provided with a centrally disposed transverse slot, a pin extending through said slot whereby said tumbler is secured to the bolt, a spring urging said tumbler outwardly with respect to the bolt, and a pair of stops fixed on the casing in position to cooperate with said tumbler to hold the bolt in locked and in unlocked positions.

5. In a door lock, the combination of a casing, a latch pivotally mounted therein and provided with a rearwardly extending shoulder, a longitudinally slidable locking bolt provided with a longitudinal groove, a tumbler disposed in said groove and having a slot and pin connection with said bolt, a spring normally urging said tumbler outwardly in said groove, and stops mounted on said casing adjacent said bolt in position to be engaged by the ends of said tumbler whereby the bolt is held in locked and in unlocked positions.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."