June 21, 1960 J. S. GROSSMAN 2,941,832

SLIDING DOOR LOCK

Filed April 15, 1957

FIG. 1.

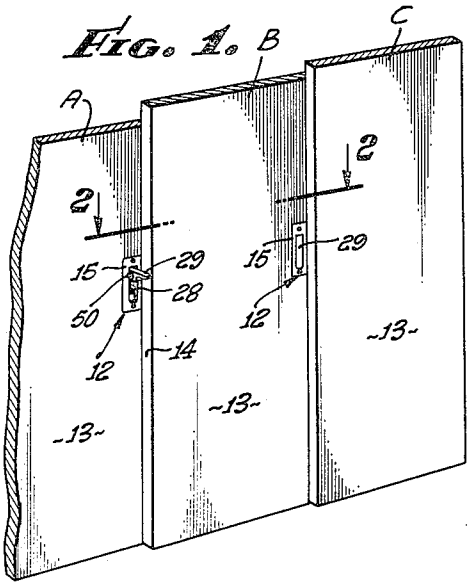


FIG. 2.

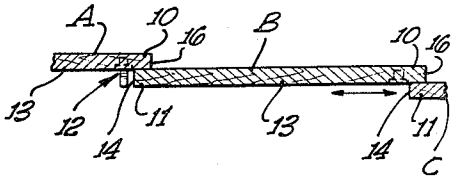


FIG. 3.

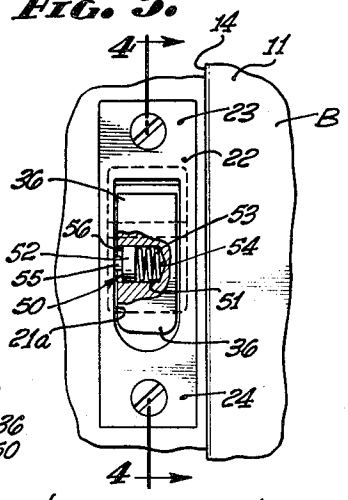


FIG. 4.

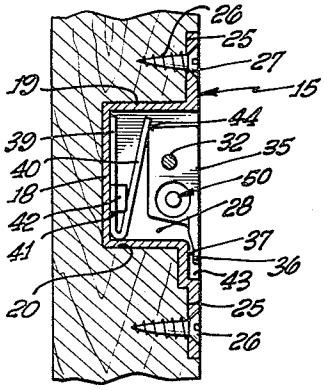


FIG. 5.

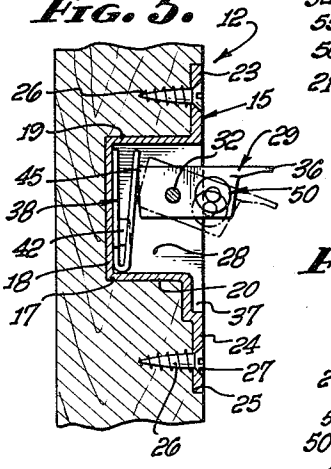


FIG. 7.

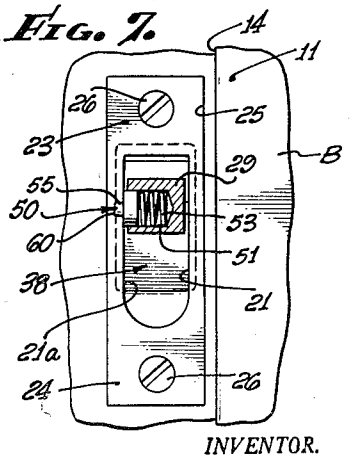
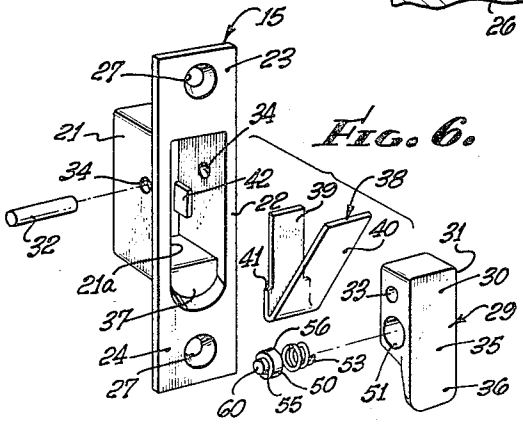


FIG. 6.



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2,941,832

SLIDING DOOR LOCK

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10 Claims. (Cl. 292—207)

The present invention relates to locks, and more specifically to locks for releasably securing doors and other closure devices in particular positions.

Some types of sliding doors are secured in a closed condition by lock devices, which are readily releasable from the inside of the closed space or room when the door is to be opened. Unfortunately, such lock devices can also be released from the outside of the enclosed space by use of relatively simple tools, and they cannot, therefore, offer the desired protection against intruders.

Accordingly, it is an object of the present invention to provide a releasable lock that cannot be shifted to an open condition from the outside of a room or other enclosed space.

Another object of the invention is to provide a releasable lock which is positively held in its locking condition by a detent device which can be released only from the inside of a room or corresponding area.

A further object of the invention is to provide a releasable lock device which is positively held in its locking condition by a detent device, the releasable lock and detent device being of strong and sturdy construction and capable of production at a relatively low cost.

This invention possesses many other advantages, and has other objects which may be made more clearly apparent from a consideration of a form in which it may be embodied. This form is shown in the drawings accompanying and forming part of the present specification. It will now be described in detail, for the purpose of illustrating the general principles of the invention; but it is to be understood that such detailed description is not to be taken in a limiting sense, since the scope of the invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is an isometric view of a plurality of sliding doors to which the lock device exemplifying the present invention has been secured;

Fig. 2 is an enlarged cross-section taken along the line 2—2 on Fig. 1;

Fig. 3 is a front elevation, with parts being broken away, of one of the lock devices, shown in combination with a sliding door arrangement, with the lock device in condition to permit opening of a door;

Fig. 4 is a longitudinal section taken along the line 4—4 on Fig. 3;

Fig. 5 is a view similar to Fig. 4, illustrating the lock device in its door closing condition;

Fig. 6 is an isometric exploded view of the lock device;

Fig. 7 is a view similar to Fig. 3 illustrating the lock device secured in its door locking condition.

The embodiment of the invention is disclosed in the drawings as being used in conjunction with one or a plurality of sliding doors A, B, C adapted to be moved across a wide space (not shown), such as a door opening, to close the same. As shown in Figs. 1 and 2, the plurality of sliding doors A, B, C can be shifted to an

open position by being pushed to the left. Conversely, the doors are moved to a closed position by being shifted to the right, the forward portions 10 of the doors overlapping the rear portions 11 of adjacent door or closure sections. When in such overlapping positions, it may be desired to prevent the doors from sliding to an open position. To accomplish this purpose, a door lock 12 is mounted in the front face 13 of a door at its forward portion 10, and is adapted to extend across the rear side edge 14 of an adjacent door to prevent the latter from being shifted to an open position, such as to the left, as disclosed in Figs. 1 and 2. Assuming that the several door or closure locks 12 disclosed in the drawings are in their locked position, the lock 12 in the door or closure section A will prevent shifting of the adjacent door section B to the left, whereas the lock 12 in the door or closure section B will engage the rear vertical edge 14 of the section C and prevent its being shifted to the left, or to an open position.

Each door lock 12 includes a case or housing 15 adapted to be mounted within the front portion 13 of a door adjacent its leading vertical edge 16. A suitable socket 17 is formed in the door to receive the case or housing 15, the latter including a back wall 18, top 19, bottom 20 and side walls 21 extending forwardly thereof, and merging into a front wall or face plate 22 that has upper and lower end portions 23, 24 disposed within recesses 25 formed in the door face 13, so that the face plate 22 lies flush with the front surface 13 of the door. The case 15 is attached to the door by screws 26 passing through countersunk holes 27 in the end portions 23, 24 of the face plate.

The top, bottom, side and back walls 19, 20, 21, 18 define a chamber 28 in which the stop 29 of the door lock is received. This stop has a body portion 30 provided with sides 31 adjacent the sides 21 of the case, the body portion being pivotally mounted on a hinge or pivot pin 32 passing through a transverse hole 33 in the body and also disposed in aligned holes 34 in the side walls 21 of the case. The stop 29 is adapted to occupy a vertical position, such as disclosed in Figs. 3 and 4, in which its outer face 35 is disposed substantially completely within the case 15 and flush with the outer surface of the face plate 22. When in this position, the lock 12 is ineffective in preventing sliding of an adjacent door to an open condition. The stop 29 is adapted to be swung about its hinge axis to a position outwardly of the case 15 by grasping a depending tongue 36, which is adapted to be located in a notch or recess 37 in the face plate 22, and swinging the stop upwardly to the position illustrated in Fig. 4, at which the stop 29 and its tongue 36 will extend across the rear side edge 14 of an adjacent door or closure member, and thereby preclude its being shifted to a rear or open position.

The stop 29 is normally retained in its ineffective position, with its outer face 35 flush with the face plate 22 by a leaf spring 38 of generally U or V shape. This spring is mounted within the case 15 behind the stop 29, with its rear arm 39 adapted to bear against the back wall 18 of the case or housing. This rear arm merges at its lower portion into a front arm 40 that engages the body 30 of the lock or stop 29. The spring is held in appropriate assembled position within the case by having transverse shoulders 41 on the rear arm engage the lower end of companion lugs 42 projecting inwardly from the side walls 21 of the case.

When the stop 29 is in the position illustrated in Figs. 3 and 4, the upper portion of the front arm 40 of the spring engages the body 30 of the stop above its hinge pin 32, and tends to retain the stop in its ineffective position. Upon insertion of the finger or fingernail in the

space 43 existing between the tongue 36 and the lower end portion 24 of the face plate, the stop 29 can be swung in an upward direction on its hinge pin 32, the upper rear edge 44 of the body pressing the front spring arm 40 rearwardly of the case until the stop is in its outwardly extending position (Fig. 5). The spring arm 40 will engage the rear end surface 45 of the stop and tend to releasably hold it in such position, in which it will be disposed across the rear vertical edge 14 of an adjacent door section.

The sliding doors A, B, C are shifted to the position disclosed in Figs. 1 and 2, and each stop 29 can be swung outwardly to lie immediately behind the rear vertical edge 14 of an adjacent door to prevent the sliding of any door section to an open position. However, the insertion of a suitable tool or piece of metal (not shown) from the outside of the door through the space existing between adjacent sections will enable an intruder to force the stop 29 in a downward position against the action of the leaf spring 38, which will then enable the door to be shifted to the left, as shown in Figs. 1 and 2, or to the open position. By virtue of the present invention, such action is prevented.

To accomplish the purpose just referred to, a detent 50 is provided in the stop. As specifically disclosed, this detent is slidable in a transverse socket 51 in the stop 29, the detent assuming any desired shape. As an example, the inner portion 52 of the detent may be cylindrical and slide within a companion cylindrical transverse socket 51. The detent is urged in an outward direction by a helical spring 53 mounted in the socket 51 and bearing against the base 54 of the latter and against the detent 50, to force it outwardly of the side 31 of the stop. The outer portion 55 of the detent is reduced in diameter with respect to the inner portion 52, to form a shoulder 56 engageable with a side wall 21*a* of the face plate 22 and limit the extent of outward movement of the detent 50 with respect to the socket 51.

When the stop 29 is to be disposed in its released condition, with its outer face 35 flush with the face plate 22, the detent 50 is pressed inwardly against the action of spring 53 until the end 60 of its outer portion 55 will clear the adjacent front face of the face plate, whereupon the stop 29 can be swung inwardly completely within the case 15, the outer end 60 of the detent merely sliding along the inner surface of a side wall 21. When the stop 29 is to be placed in its door locking position, it is swung outwardly, and when placed in its door locking position, the spring 53 will force the detent 50 partially out of its socket 51 to the extent limited by engagement of the shoulder 56 with the adjacent side wall 21, 21*a* of the case 15. The detent 50 and socket 51 are so located in the stop 29 that the shoulder 56 will be in position to engage the side wall 21, 21*a* of the case at the forward or front portion of the latter, such as disclosed in Fig. 5. When the shoulder 56 so engages the side wall of the case, the outer portion 55 of the detent overlies the adjacent front face of the face plate 22. If an attempt is now made to swing the stop 29 about its hinge pin back into the case, or to the position illustrated in Fig. 4, the outer portion 55 of the detent will preclude such action by engaging the front of the face plate. Accordingly, any attempt by an intruder to swing the stop 29 downwardly to a position unlocking a door is prevented.

The detent 50 is held in its appropriate assembled location within the transverse socket 51 of the stop 29 by engagement of the side wall 21, 21*a* of the case with the end 60 of the detent, when the lock 29 is disposed fully within the chamber 28. It is prevented from being removed from the socket 51 when the stop 29 is in its outward or door locking position by engagement of the shoulder 56 with the forward portion 21*a* of the side wall 21. Thus, regardless of the position of the stop 29 with respect to the case, the detent 50 cannot be removed from the socket 51.

In assembling the lock device, the spring 38 is mounted in the case 15 with its rear arm 39 adjacent the back wall 18, the spring 53 and detent 50 are then placed in the stop socket 51 and the detent pressed inwardly. The stop 29 is then inserted in the case and pressed against the forward arm 40 of the spring 38 until the case and stop holes 34, 33 are aligned. When this occurs, the pressure on the detent 50 can be released and it will be confined in the socket 51 by the side wall 21 of the case. The hinge pin 32 can then be inserted through the holes 34, 33 to complete the assembly. When the case 15 is mounted in the door socket 17, the side walls 21 of the socket will prevent inadvertent removal of the hinge pin 32 from the holes 34, 33.

The inventor claims:

1. In a lock: a housing; a stop member mounted in said housing for movement between a retracted position within said housing and a position in which said member extends from said housing; detent means mounted on said stop member and engageable with said housing, when said stop member extends from said housing, to prevent shifting of said stop member to said retracted position, said detent means having a portion engageable with said housing, when said stop member extends from said housing, to retain said detent means on said stop member; and a generally U-shaped spring in said housing having rear and front arms, said rear arm engaging said housing, said front arm engaging said stop member to yieldably hold said stop member in its retracted and extended positions.

2. In a lock: a housing; a stop member pivotally mounted in said housing for swinging movement between a retracted position within said housing and a position in which said member extends from said housing; and detent means mounted on said stop member and engageable with said housing, when said stop member extends from said housing, to prevent shifting of said stop member to said retracted position, said detent means having a portion engageable with said housing, when said stop member extends from said housing, to retain said detent means on said stop member; and a generally U-shaped spring in said housing having rear and front arms, said rear arm engaging said housing, said front arm engaging said stop member to yieldably hold said stop member in its retracted and extended positions.

3. In a lock: a housing having a side wall and a face plate portion; a stop member mounted in said housing for movement between a retracted position within said housing and a position in which said member extends from said housing; and detent means movably mounted on said stop member and adapted to project therefrom; said detent means overlying and being engageable with said face plate portion, when said stop member extends from said housing, to prevent shifting of said stop member ot said retracted position; said detent means having a portion engageable with said side wall, while said detent means overlies said face plate portion, to retain said detent means on said member.

4. In a lock: a housing having a side wall and a face plate portion; a stop member pivotally mounted in said housing for swinging movement between a retracted position within said housing and a position in which said member extends from said housing; and detent means movably mounted on said stop member and adapted to project therefrom; said detent means overlying and being engageable with said face plate portion, when said stop member extends from said housing, to prevent shifting of said stop member to said retracted position; said detent means having a portion engageable with said side wall, while said detent means overlie said face plate portion to retain said detent means on said member.

5. In a lock: a housing; a stop member mounted in said housing for movement between a retracted position within said housing and a position in which said member extends from said housing; said stop member having a

bore therein; a detent movably mounted in said bore; spring means in said bore urging said detent outwardly to a position engageable with said housing, when said stop member extends from said housing, to prevent shifting of said stop member to said retracted position, said detent having a portion engageable with said housing, when said stop member extends from said housing, to retain said detent on said stop member; and a generally U-shaped spring in said housing having rear and front arms, said rear arm engaging said housing, said front arm engaging said stop member to yieldably hold said stop member in its retracted and extended positions.

6. In a lock: a housing having a side wall and a face plate portion; a stop member mounted in said housing for movement between a retracted position within said housing and a position in which said member extends from said housing; said stop member having a bore therein; a detent member movably mounted in said bore; and spring means in said bore urging said detent outwardly to a position overlying and engageable with said face plate portion, when said stop member extends from said housing, to prevent shifting of said stop member to said retracted position; said detent portion having a shoulder engageable with said side wall, while said detent overlies said face plate portion, to retain said detent member in said bore.

7. In a lock: a housing having a side wall and a face plate portion; a stop member pivotally mounted in said housing for swinging movement between a retracted position within said housing and a position in which said member extends from said housing; said stop member having a bore therein; a detent member movably mounted in said bore; and spring means in said bore urging said detent outwardly to a position overlying and engageable with said face plate portion, when said stop member extends from said housing, to prevent shifting of said stop member to said retracted position; said detent portion having a shoulder engageable with said side wall, while said detent overlies said face plate portion, to retain said detent member in said bore.

8. In a lock: a housing having a side wall and a face plate portion; a stop member pivotally mounted in said housing for movement between a retracted position within said housing substantially flush with said face plate and a position in which said member projects from said housing; said stop member having a generally cylindrical bore therein; a generally cylindrical detent slidably mounted in said bore; said detent having a shoulder and a terminal portion extending from said shoulder; and spring means in said bore urging said detent outwardly to a position, when said stop member extends from said housing, in which said terminal portion overlies and is engageable with said face plate portion and said shoulder engages said side wall to retain said detent in said bore.

9. In a lock: a housing; a stop member pivotally mounted in said housing for swinging movements between a retracted position within said housing and a position in which said member extends from said housing; detent means mounted on said stop member and engageable with said housing, when said stop member extends from said housing, to prevent shifting of said stop member from said retracted position, said detent means having a portion engageable with said housing, when said stop member extends from said housing, to retain said detent means on said stop member; and a generally U-shaped spring in said housing having rear and front arms, said front arm engaging said stop member above its pivot axis when said stop member is in retracted position to yieldably retain said stop member in said retracted position, said front arm engaging the rear end of said stop member when said stop member is in its extended position to yieldably retain said stop member in said extended position.

10. In a lock: a housing having a side wall and a face plate portion; a stop member pivotally mounted in said housing for movement between a retracted position within said housing substantially flush with said face plate and a position in which said member projects from said housing; said stop member having a generally cylindrical bore therein; a generally cylindrical detent slidably mounted in said bore; said detent having a shoulder and a terminal portion extending from said shoulder; spring means in said bore urging said detent outwardly to a position, when said stop member extends from said housing, in which said terminal portion overlies and is engageable with said face plate portion and said shoulder engages said side wall to retain said detent in said bore; and a generally U-shaped spring in said housing having rear and front arms, said front arm engaging said stop member above its pivot axis when said stop member is in retracted position to yieldably retain said stop member in said retracted position, said front arm engaging the rear end of said stop member when said stop member is in its extended position to yieldably retain said stop member in said extended position.

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