March 10, 1970 R. L. ISENBERG 3,499,675

SLIDING DOOR LOCK

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Fig. 1.

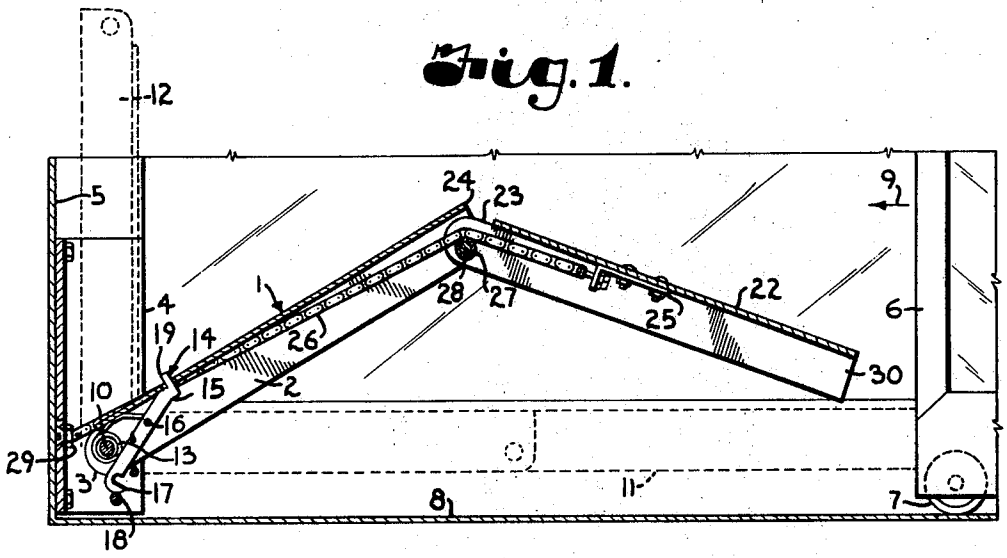


Fig. 2.

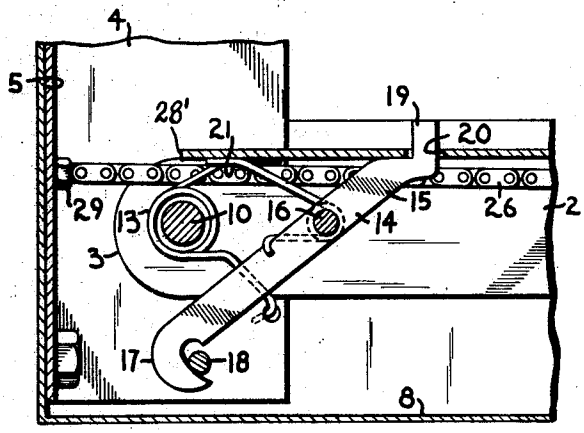
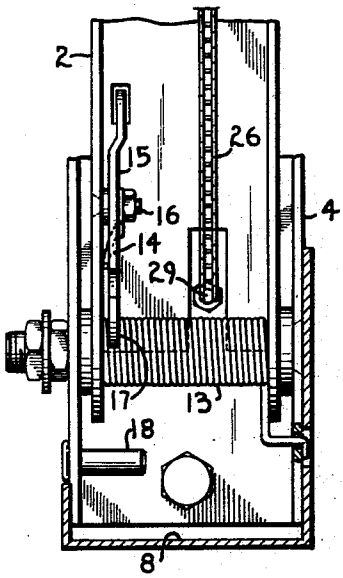


Fig. 3.



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SLIDING DOOR LOCK

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ABSTRACT OF THE DISCLOSURE

A first arm is pivotally mounted adjacent the well of a sliding door near the jamb for pivoting from a vertical position to a horizontal position directed toward the sliding door. A second arm is pivotally connected to the free end of the first arm and when both arms are extended toward the sliding door, the door is blocked against movement toward the jamb. A tensile member is anchored at one end thereof on the second arm and directed over a pivot pin between the first and second arm and anchored at the other end thereof adjacent the jamb in a position whereby the pivoting of the first arm automatically produces corresponding pivoting of the second arm between a folded position against the first arm, when the first arm is vertical, to a fully extended position away from the first arm when the first arm is horizontal. Suitable locking structure is provided for maintaining the arms in extended position in opposition to resilient means urging withdrawal of the arms into vertical folded position.

This invention relates to door detents and more particularly to lock structures for sliding doors.

There is a demand for lock structures in addition to the usual latch locks normally used to secure sliding doors.

This invention contemplates a sliding door lock structure which uses a pair of pivotally connected arms one of which is pivotally connected adjacent the door jamb, the arms being cooperatively arranged to retain the door in closed position when extended but adapted to easily fold out of the way to permit the door to be opened.

The principal objects of the present invention are: to provide a sliding door locking structure of the compressive brace type which is simple in construction, easily installed and operated, takes little space in both locked and unlocked condition, and well suited for its intended purpose.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and examples certain embodiments of this invention.

FIG. 1 is a cross-sectional side elevation showing lock structure embodying this invention in an intermediate position between locked and unlocked condition.

FIG. 2 is a fragmentary cross-sectional side elevation of the structure on a larger scale showing details of a latch arm and associated members in horizontal, locked condition.

FIG. 3 is a cross-sectional end elevation of the structure showing the latch arm and associated members in vertical, unlocked condition.

Referring to the drawings in more detail:

The reference numeral **1** generally indicates a sliding door lock structure embodying this invention. The lock structure **1** includes a first or base arm **2** in the form of a channel connected at one end **3** thereof to a bracket **4** which is suitably mounted against the jamb **5** of a sliding door assembly. The sliding door assembly includes a sliding door **6** mounted on suitable rollers **7** which

operate in a well **8** when the door is opened in the direction indicated by the arrow **9**.

The base arm **2** is connected to the bracket **4** by a suitable pivot pin **10** for pivoting from a horizontal position directed toward the door **6**, indicated by the broken lines **11**, to a vertical position indicated by the broken lines **12**. A suitable resilient member, in this case a helical spring **13** surrounding the pivot pin **10**, bears simultaneously against the base arm **2** and the bracket **4** for continuously urging the base arm **2** upwardly toward the vertical position indicated at **12**.

A latch assembly **14** includes a latch arm **15** pivotally mounted intermediate the ends thereof at **16** to the base arm **2**. The latch arm **15** has a hook structure **17** at one end thereof adapted to engage a pin **18** rigidly secured to the bracket **4**, the other end **19** of the latch arm **15** projecting upwardly through an opening **20** in the web of the base arm **2** forming a push button release for selectively pivoting the latch arm **15** about the pivot at **16**. A suitable latch spring **21** urges the latch arm **15** counterclockwise as viewed in FIG. 2 so as to maintain engagement between the hook structure **17** and the pin **18**. The base arm **2** is thereby maintained in a horizontal position, as indicated by the broken lines **11**. When, however, the latch arm end **19** is depressed, the hook structure **17** is disengaged from the pin **18** permitting the helical spring **13** to lift the base arm **2** vertically. Upon returning the base arm **2** to the horizontal, the hook structure **17** rides over the pin **18** and engages same to retain the arm again in the position at **11**.

A secondary arm **22** is also in the form of a channel and is preferably of generally the same length as the base arm **2**. The arm **22** has one end of **23** thereof pivotally connected to the free end **24** of the base arm **2** for pivoting thereabout in a vertical plane. The total length of the arms **2** and **22** together in a linearally extended condition project substantially the entire length of the well **8**, thus blocking movement of the sliding door **6**. The arms **2** and **22** are suitably constructed so that pivoting of the arm **2** about the arm **22** cannot proceed counterclockwise, as viewed in FIG. 1, beyond a linearally extended position.

An anchor bracket **25** is secured to the under side and within the arm **22** and anchors thereon one end of a tensile member, in this example a chain **26**. The chain **26** is threaded over a sleeve **27** surrounding the pivot pin **28** joining the arms **2** and **22** and extends rearwardly within and along the arm **2** toward the jamb **5**. The chain **26** projects through an opening **28'** near the end **3** of the arm and terminates in engagement with an anchor **29** fixed to the bracket **4** rearwardly of the pivot pin **10**. The relative positions of the anchor **29** and pivot pin **10** are such that the chain **26** moves rearwardly within and with respect to the arm **2** when the latter is pivoted downwardly from the position **12** to the position **11**.

The chain **26** is maintained in a taunt condition between the anchor bracket **25** and the anchor **29** when the base arm **2** is moved downwardly out of the vertical position **12**. The rearward movement of the chain **26** as the arm **2** is pivoted downwardly causes the arm **22** to pivot in a counterclockwise direction about the pivot pin **28** to the extent that the free or outer end **30** of the secondary arm **22** is always maintained generally at the same elevation as the pivot pin **10**, resulting in the arms **2** and **22** finally together assuming an aligned columnar position blocking the sliding door **6** when the arm **2** reaches the horizontal. The arms are then maintained in this position through the above described engagement between the hook structure **17** and the pin **18** providing an effective lock against opening the door **6**.

When it is decided to unlock the door, the latch arm end **19** is depressed, as by pressing with a foot, thus

permitting the spring 13 to lift the arm 2. This results in also lifting the end 23 of the arm 22 while permitting same to pivot about the pin 28 toward the arm 2 due to slackening of the chain 26.

The arms 2 and 22 are of a configuration to nest within each other at the vertical position so that a minimum of space is occupied when the arms are unlocked.

It is to be understood that, while one form of this invention has been illustrated and described, it is not to be limited thereto.

What is claimed and desired to secure by Letters Patent is:

1. Locking structure for selectively retaining a sliding door in a closed position comprising:
(a) bracket means adapted for mounting at the end of the path taken by said door when moving toward an open position,
(b) a first arm having one end thereof pivotally mounted on said bracket for movement in a vertical plane between a vertical position and a horizontal position projecting from said bracket toward said door in closed position,
(c) a second arm having one end thereof pivotally connected to the other end of said first arm for movement in a vertical plane between a vertical position folded against said first arm in said vertical position and a horizontal position projecting from said first arm in said horizontal position toward said door in closed position,
(d) said first and second arms in said horizontal positions having a total length substantially equal to the length of the path taken by said door when moved from an open to a closed position, and
(e) means for selectively maintaining said arms in said horizontal positions for blocking the opening of said door.

2. The structure as set forth in claim 1 wherein:
(a) resilient means is provided in said structure for urging said first arm toward said vertical position, and
(b) said means for selectively maintaining said arms in said horizontal positions includes a latching device.

3. The structure as set forth in claim 2 wherein:

(a) said resilient means is a helical spring having ends bearing respectively against said first arm and said bracket means.

4. The structure as set forth in claim 2 wherein:
(a) said latching device includes a latch arm pivotally connected to said first arm and having a hook portion at one end thereof, and
(b) a pin fixed to said bracket and adapted for engagement with said hook portion when said first arm is in said horizontal position.

5. The structure as set forth in claim 4 wherein:
(a) said latch arm has another end projecting upwardly through said first arm for pivotal actuation of said latch arm to release said hook portion from said pin.

6. The structure as set forth in claim 1 wherein:
(a) said means for selectively maintaining said first and second arms in said horizontal positions includes a tensile member anchored at one end thereof to said second arm and at the other end thereof at a location spaced rearwardly of the pivotal connection between said bracket and first arm,
(b) said tensile member being threaded over the pivotal connection between said first and second arms.

7. The structure as set forth in claim 6 wherein:
(a) said first arm is hollow, and
(b) said tensile member extends longitudinally within said first arm.

8. The structure as set forth in claim 1 wherein:
(a) said first and second arms are configured to nest within one another in said folded condition.

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