United States Patent [19]

Mieras

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[54] **FLIP DOWN DOOR LOCK**

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[52] **U.S. Cl.** **292/262;** 292/DIG. 46

[51] **Int. Cl.²** **E05C 17/04**

[58] **Field of Search.** 292/DIG. 46, DIG. 9, DIG. 49, 292/262, 304, 305; 49/449

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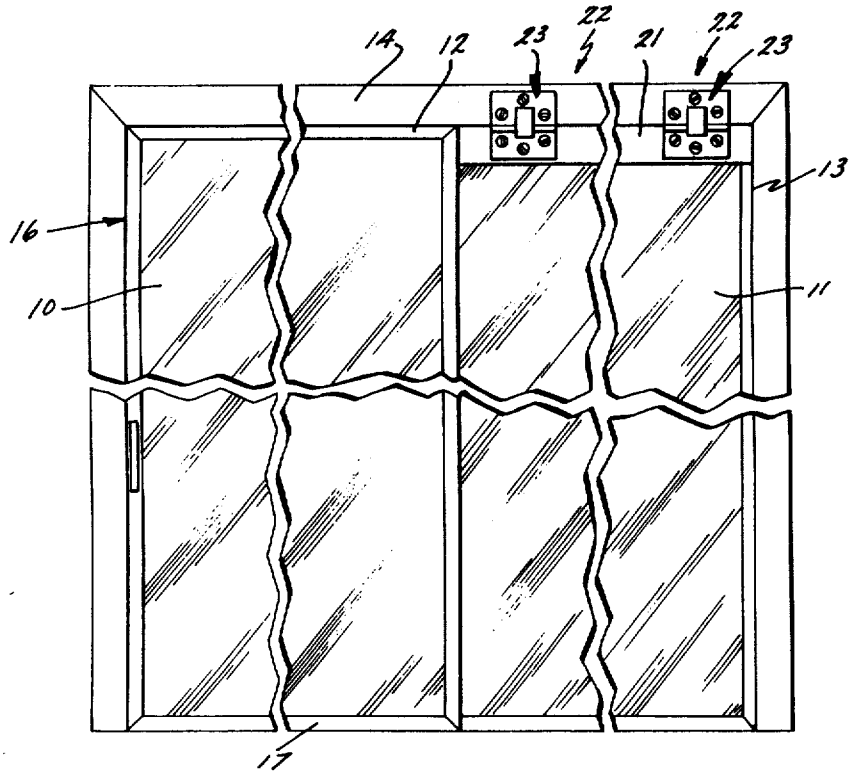
Primary Examiner—Richard E. Moore

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[57] **ABSTRACT**

A lock for sliding doors utilizes an elongated locking bar and means for mounting the bar in a first closed position wherein the bar acts to lock the closure by preventing sliding thereof, and in a second open position wherein the bar member allows sliding of the door. Preferably, the mounting means includes a spring-lock hinge assembly, which acts to bias the bar in its first closed position, and supports it in its second open position without additional support means.

4 Claims, 7 Drawing Figures



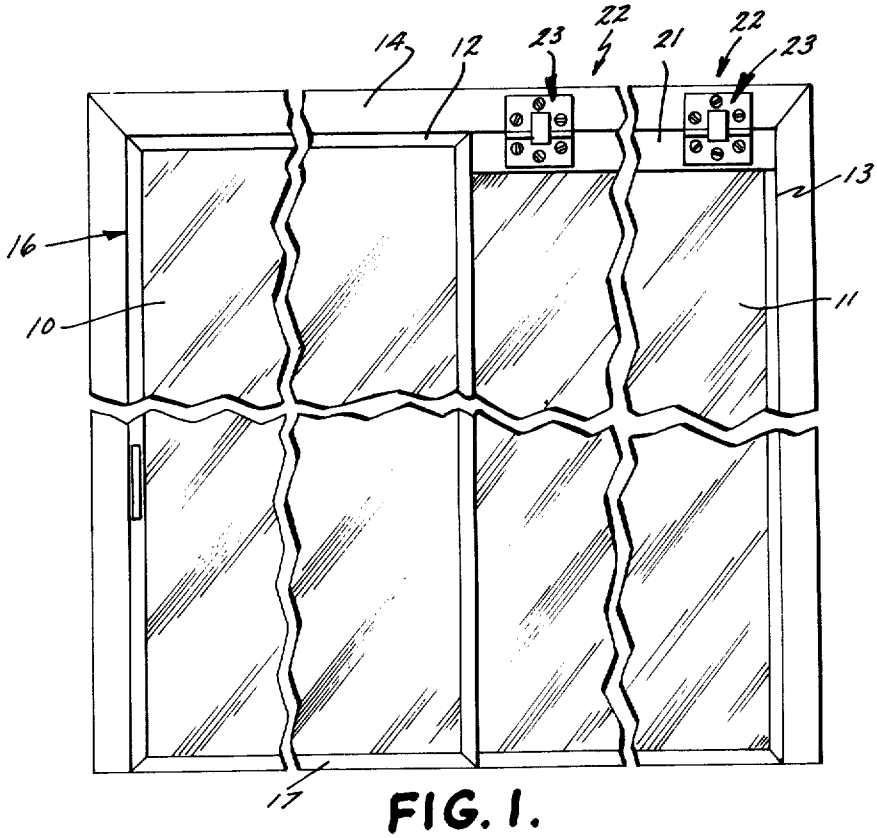


FIG. 1.

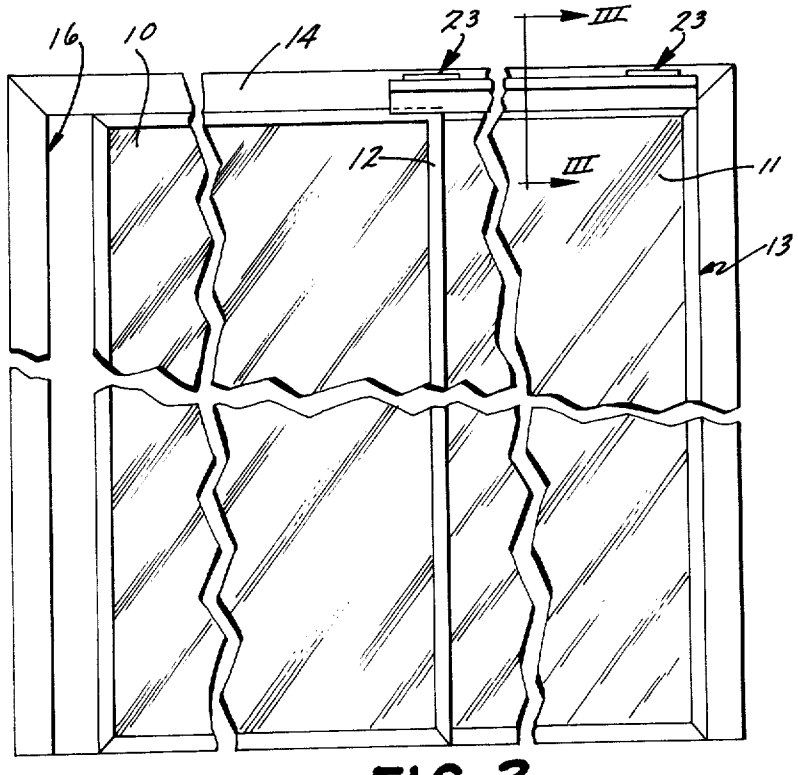


FIG. 2.

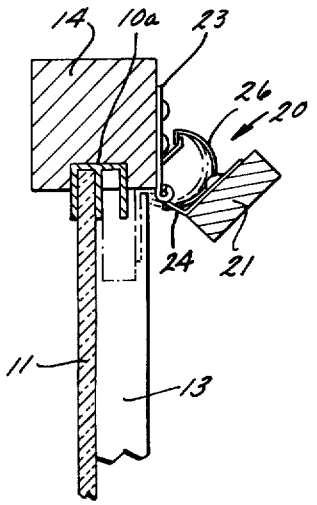


FIG. 3.

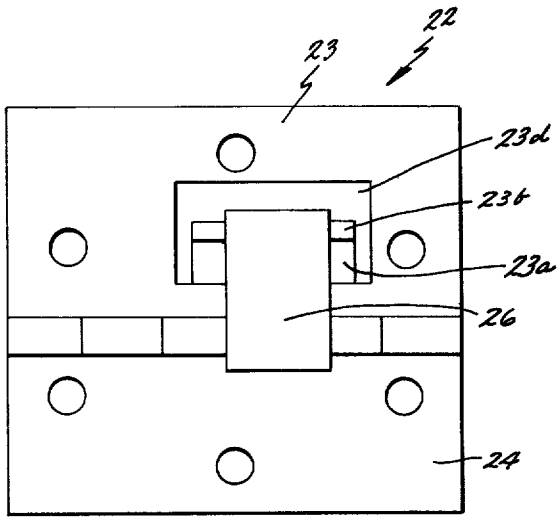


FIG. 4.

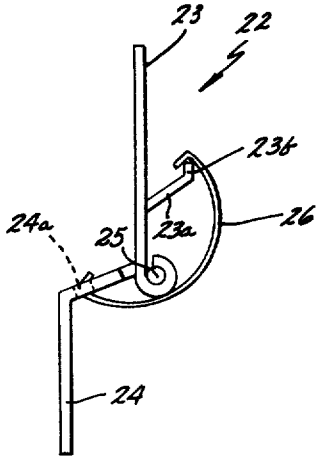


FIG. 5.

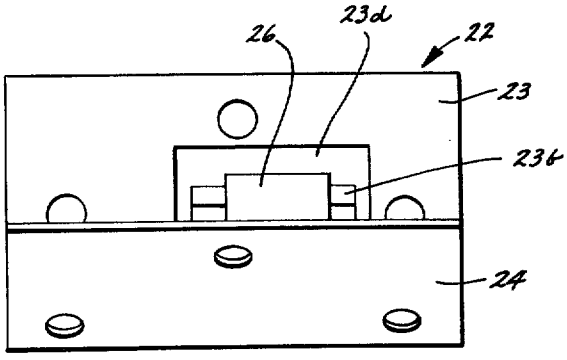


FIG. 6.

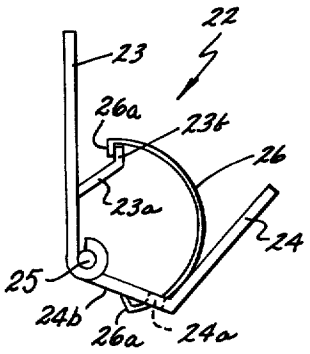


FIG. 7.

FLIP DOWN DOOR LOCK

BACKGROUND OF THE INVENTION

The locking device of this invention relates to locks for sliding closures and particularly to locks for sliding doors.

Numerous simple devices have been utilized for locking sliding doors. The most common such device consists of an elongated bar which is manually placed in the bottom track of the sliding door between the door jamb and the abutting door housing frame.

Because of the inconvenience of having to manually place the bar in such a position and then manually removing and storing the bar when not in use, devices were developed which are hingedly mounted below the sliding door housing so as to store the bar in spaced relationship generally parallel to the bottom track of the housing. Such devices are usually engaged by pivoting the stop bar with one's foot into the door securing position between the door jamb and housing frame. Gravity acts to hold the bar in this position until it is desired to open the sliding door and then the bar is manually pivoted from the locking position into a storage position along the bottom of the door where gravity similarly acts to hold the bar.

The disadvantage of such door stopping devices is that the bar when not securing the sliding door generally interferes with use of floor space adjacent the sliding door. Also, an actual safety hazard may develop because of the danger of tripping or falling over the bar and mounting. Further, in some instances, the bar may be actually disengaged by vibrating the door and/or the door frame by one who is external to the door.

OBJECTS AND SUMMARY OF THE INVENTION

Accordingly, it is an object of this invention to provide a locking device which will securely lock a sliding glass door or other sliding closure when in a closed position and which may be disengaged only by one positioned inside the area being secured by the door or closure and not by one standing on the outside tampering with the door frame.

It is another object of the present invention to provide a locking device that is urged into abutting relationship with respect to the door but which may be manually released and which is retractable to permit opening of the door in a direction opposite to which it was closed.

It is a still further object of this invention to provide a locking device which does not interfere with the use of floor space adjacent to the sliding closure.

And, it is still an even further object of this invention to provide a locking device for sliding closures which resists disengagement by vibration of the closure and/or the frame housing the closure.

These and other objects and advantages of the present invention are accomplished by utilizing a locking means for a sliding closure wherein the sliding closure is slidably mounted in a frame having a header and two jambs. The locking means comprises an elongated bar member and mounting means for suspending the bar member from the header in a first closed position in abutting engagement between the edge of the closure and its adjacent jamb. The mounting means further includes, means for permitting swinging movement of the bar member from the closed position to a second open position in disengagement from between the edge

of the closure and the jamb to allow sliding of the closure in the frame.

Preferably, the mounting means for the elongated bar member includes a spring-lock type hinge assembly which resists disengagement when the locking member is in a closed position and which acts to secure the locking member over the closure when the locking member is in the open position without additional support means.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a partial elevational front view of a sliding assembly with a locking device engaged in the door securing or closed position;

FIG. 2 shows a partial elevational front view of the sliding door of FIG. 1 with the locking device in the non-door securing or open position;

FIG. 3 is an enlarged partial vertical cross-sectional side view of the locking device taken along plane III—III of FIG. 2;

FIG. 4 is an enlarged plan view of the spring-lock hinge assembly of the locking device in FIG. 1 when the locking device is in its closed position;

FIG. 5 is a side view of the spring-lock hinge assembly taken along plane V—V of FIG. 4;

FIG. 6 is an enlarged plan view of the spring-lock hinge assembly of the locking device in FIG. 2 when the locking device is in its open position; and

FIG. 7 is a side view of the spring-lock hinge taken along plane VII—VII of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, sliding closure locking device **20** comprises an elongated locking member or bar **21** with hinge assemblies **22** (FIG. 1–3) attached thereto. The device **20** is suspended above the sliding door or closure **10** by attachment of hinge assemblies **22** on the sliding door upper or header **14** and shown in FIGS. 1 and 2. As is apparent from the Figures, bar **21** is generally parallel to header **14** and is supported by assemblies **22** at all times in spaced relation therefrom.

The sliding door frame comprises an upper frame or header **14**, two side walls on jambs **13** and **16** and a sill along its bottom portion. It further includes a channel **10a** in the header **14** along which door **10** may be slid.

Locking member or bar **21**, as shown in FIGS. 1–3, is elongated and generally rectangular in shape. In the embodiment shown therein, it is rigid and comprised of a relatively strong material, e.g., metal or wood. If desired, bar **21** may include at both ends thereof stopping surfaces, such as rubber-gripping boots or the like.

Referring to FIGS. 4–7, it can be seen that each spring-lock hinge assembly **22** comprises a flat rectangular planar upper anchoring surface **23** and a similar lower anchoring surface **24** both joined by a hinge portion **25** therebetween and a C-shaped clip **26**.

The upper anchoring surface **23** includes along a rectangular slot **23***d* therein and a flange **23***a* which protrudes outwardly from the upper anchoring surface **23** and comprises an upwardly directed lip **23***b* thereon. Lower anchoring surface **24** includes a slot **24***a* in the nonseating portion **24***b* of the inverted L-shaped lower anchoring surface **24**.

C-shaped clip **26**, connecting anchoring surfaces **23** and **24**, is made of a shape-remembering material such as spring steel comprises lips **26***a* along both ends thereof. The lips **26***a* are inwardly directed from the

C-shaped clip **26**. Clip **26** is positioned between upper anchoring surface **23** and lower anchoring surface **24** by engagement of one of its lips **26***a* over the lip **23***b* of flange **23***a* and by extending through slot **24***a* and engagement of the other of its lips **26***a* with the portion of the nonseating wall **24***b* forming slot **24***a* in lower anchoring surface **24**.

As seen in FIGS. **4** and **5**, when hinge assembly **22** is in a closed position, clip **26** is distended over hinged portion **25** of hinge **22**. Because of the distension, clip **26** acts to resist upward rotation of lower anchoring surface **24**.

In the relaxed or open position shown in FIGS. **6** and **7**, clip **26** acts to suspend surface **24** in the position shown. As is apparent from all these figures, lips **26a** in the both open and closed positions are secured over lips **23***b* of flange **23***a* and over the portion of wall **24***b* forming slot **24***a* in lower anchoring surface **24**.

Assembly **22** is attached to header **14** and bar **21** by screws driven through holes **27** in anchoring surfaces **24** and **25**. As seen in the preferred embodiment, two assemblies **22** are used but as is apparent, one or several assemblies can be used and placed in whatever position is convenient.

As seen in FIG. **1**, locking device **20** prevents opening of movable door **10** along its door channel or track **10***a* (FIG. **3**) by engagement of bar **21** at one end with the door edge **12** of door **14** and at its other end with frame side or jamb **13**. Locking device **20** in its disengaged position, shown in FIG. **2**, allows free movement of the sliding door **10** along track **10***a*. Further, in its disengaged or open position, bar **21** is held in spaced relationship above track **10***a* by the spring-lock hinge assemblies **22** without any support in addition to the hinges.

As can be seen particularly in FIG. **3**, when device **20** is in the open position, any desired spaced relation between track **10***a* and bar **21** may be utilized as long as bar **21** is in contact with edge **12**. Further, as seen in FIG. **3**, bar **21** is secured in its engaged or closed position by not only gravity but also by spring-lock hinge assemblies **22** which, because of distortion of clip **26**, act to push bar **21** into static door **11**. Because hinge assemblies **22** force bar **21** into static door **11**, vibration of sliding door **10**, door track **10a** or other adjacent wall sections will not disengage the closure device.

OPERATION

When locking device **20** is in the disengaged or open position, locking bar **21** is secured out of the plane formed by door edge **12** and jamb **13** by lock hinge assemblies **22**. Specifically, in each assembly **22**, clip **26** attached to upper anchoring surface **23** along flange **23***a* and to lower anchoring surface **24** in slot **24***a* secures locking bar **21** in the open position by suspending lower anchoring surface **24** attached thereto from upper anchor surface **23** (FIGS. **2–3**) above jamb **12**.

When it is desired to secure or lock the movable door **10**, door **10** is moved into a closed position against frame side or jamb **16** (FIG. **1**) and bar **21** attached to spring-lock hinge assemblies **22**, is moved downward into the plane formed by jamb **12** housing wall **13** (FIGS. **6–7**). As bar **21** is moved downwardly, clip **26** which is secured between upper wall **11** and bar **21** on the anchoring surfaces as described above is distended or distorted over hinge portion **25** and biases bar **21** inward against static door **15** securing movable door **10**. When it is desired to move door **10**, bar **21** is subsequently upwardly rotated out of the plane formed by jamb **13** and closure edge **12**.

To readily adapt the locking bar **21** to closures of different sizes, bar **21** may comprise any one of a number of suitable adjustment means, e.g., telescoping elements, etc..

It will be understood that various changes in the details, materials, steps, and arrangements of parts which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and the scope of the invention as expressed in the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A locking means for preventing opening of a sliding closure wherein the sliding closure is slidably mounted in a frame having a header above the sliding closure and two jambs, said header having at least one sliding channel on the header along which the closure slides, said locking means comprising: an elongated rigid bar member; and mounting means for suspending said bar member from said header in a first closed position in abutting engagement between the edge of said closure and an adjacent jamb, said mounting means including a spring lock-hinge assembly for permitting swinging movement of said bar member from said first closed position to a second open position in disengagement from between the edge of said closure and said adjacent jamb to allow sliding of said closure in said frame and biasing said locking bar into said first closed position when therein and supporting said bar member over the closure when in said second position without additional support.

2. In combination with a sliding closure with a frame having jambs at both sides thereof, a header above the sliding closure and at least one sliding channel on the header along which the closure slides, said closure being capable of sliding along said channel until one of its edges engages an adjacent jamb, a locking means for said closure comprising:

an elongated rigid bar means; and

mounting means for suspending said bar member from said header in a first closed position in abutting engagement between one edge of said closure and an adjacent jamb, said mounting means including a spring-lock assembly for permitting swinging movement of said bar member from said first closed position to a second open position in disengagement from between said one edge of said closure and said adjacent jamb to allow sliding of said closure in said channel, said assembly biasing said locking bar into said first closed position when therein and supporting said bar member over the closure when in said second open position without additional support.

3. A locking means as recited in claim **1** wherein said spring-lock assembly comprises:

an upper anchoring surface rigidly attached to said header and having a flange,

a lower anchoring surface rigidly attached to said elongated rigid bar member, hingedly attached to said upper anchoring surface, and having a slotted opening, and

a C-shaped resilient clip having a flange at each end, one flange cooperating with the flange of the upper anchoring surface and the other flange cooperating

with the slotted opening of the lower anchoring surface.

4. A locking means as recited in claim 2 wherein said spring-lock assembly comprises:

an upper anchoring surface rigidly attached to said header and having a flange,

a lower anchoring surface rigidly attached to said elongated rigid bar member, hingedly attached to said upper anchoring surface, and having a slotted opening, and

a C-shaped resilient clip having a flange at each end, one flange cooperating with the flange of the upper anchoring surface and the other flange cooperating with the slotted opening of the lower anchoring surface.

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