ABSTRACT

Apparatus for locking sliding doors including an alarm which will indicate the presence of an unauthorized person when the sliding door is being forced. The apparatus includes a telescoping bar which can be pivotally attached at one end to a sliding door with the remote end of the bar engaging a fixed structure. The remote end of the bar includes a trigger electrically connected to an alarm which is energized when the door is forced open a slight amount.

4 Claims, 9 Drawing Figures
BAR LOCK FOR SLIDING DOORS

BACKGROUND OF THE INVENTION

1. Field of the Invention
This invention relates generally to building structures of various kinds including windows and doors, and relates particularly to doors which are moved laterally as differentiated from doors which swing upon a fixed pivot.

2. Description of the Prior Art
Heretofore sliding doors normally have been provided with a lock having a latch bar in the shape of a hook receivable within an opening or keeper carried by the door frame and having means, such as a cam or the like, for retaining the latch bar within the keeper. This type of lock has not been satisfactory since it is easily opened by unauthorized persons and therefore home owners and building proprietors have obtained a bar of wood, metal, plastic or other material and placed the same between the sliding door and the fixed structure of the building to prevent the door from being opened even if the lock were disengaged. This has not been satisfactory since no convenient place has been provided for storing the bar when not in use, and even when in use an alarm normally has not been provided which would warn the home owner or building proprietor that someone was trying to force entry into the building. If an unauthorized person found that he could not successfully open the sliding door, he would merely look for another entry into the building if an alarm was not sounded.

SUMMARY OF THE INVENTION
The present invention is a bar lock for sliding doors which can be mounted on either the sliding door or the fixed door frame so that it will be in a substantially vertical position when not in use but can be pivoted to a generally horizontal position when in use. The bar includes an alarm so that slight lateral movement of the sliding door will energize a signal and simultaneously will prevent further lateral movement. The bar preferably is arranged of telescopic parts which can be locked together at a desired length. It is an object of the invention to provide a bar lock for a sliding door which can be easily and quickly applied, which will substantially prevent sliding movement of the door, and which will energize a signal to indicate that some one is trying to force entry through the door.

BRIEF DESCRIPTION OF THE DRAWINGS
FIG. 1 is a perspective illustrating one application of the invention.
FIG. 2 is a front elevation thereof.
FIG. 3 is a section on the line 3—3 of FIG. 1.
FIG. 4 is an enlarged section on the line 4—4 of FIG. 2.
FIG. 5 is a fragmentary enlarged section on the line 5—5 of FIG. 4.
FIG. 6 is a section similar to FIG. 4 of a modified form of the invention.
FIG. 7 is an enlarged section on the line 7—7 of FIG. 6.
FIG. 8 is a side elevation of a further modified form of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS
With continued reference to the drawings, the wall 10 of a building is provided with a relatively large opening 11 for the reception of a sliding door assembly 12. Such assembly includes a fixed panel 13 having a relatively large pane of glass 14 mounted in a rubber gasket 15 carried by a frame 16. The frame 16 normally is located in fixed position within the opening 11. Adjacent to and slightly overlapping the fixed panel 13 is a movable panel or sliding door 17 including a relatively large pane of glass 18 mounted in a rubber gasket 19 carried by a frame 20. The sliding door 17 normally is suspended from an overhead track (not shown) by means of rollers or slides to permit relatively free lateral movement of the sliding door.

In order to limit sideways swinging of the door 17, the lower portion of the frame 20 normally is provided with a groove which slidably receives a tongue mounted on the floor. Along one side of the door 17 an operating handle 21 is provided on both the interior and the exterior of the door so that the door can be opened from either side. Also, a latch bar type of lock usually is provided adjacent to the handle for locking the door in closed position. The structure thus far described is conventional and forms no part of the present invention.

With reference to FIGS. 1–5, the sliding door 17 is located interiorly of the fixed panel 13 and therefor is known as an inside slider. In this modification a bracket 25 is connected to the rear of the frame 20 in any desired manner, as by self-tapping screws 26 or the like substantially midway of the height of the door. The bracket 25 is generally U-shaped in cross section and includes spaced generally parallel side walls 27 to which one end of a bar lock 28 is pivotally attached by a pin 29.

The bar lock includes a tubular member 30 and a telescopic member 31 slidably received within the tubular member 30. One end of the tubular member 30 is pivotally connected to the pin 29 while the opposite end is provided with opposed openings 32 in which a pin or elongated member 33 is removably received. The inner end of the telescopic member 31 is provided with a plurality of opposed openings 34 which can be brought into registration with the openings 32 so that the pin 33 will extend through the aligned openings and lock the members 30 and 31 in adjusted position. The remote or outer free end of the telescopic member 31 normally is received within a bracket 35 when used with an inside slider type sliding door. The bracket 35 includes generally parallel side walls 36 connected by a bottom wall 37 and a rear wall 38. The rear wall is mounted on a fixed structure such as the wall 10 in any desired manner, as by screws 39.

With particular reference to FIG. 5, the outer free end of the telescopic member 31 is provided with a tubular insert 40 having a plate 41 welded or otherwise attached to one end and such plate extends outwardly beyond the insert 40 in a position to abut the end of the telescopic member 31 to positioning the insert. Within the insert 40 an alarm or signal 42 is electrically connected to batteries 43 and to a trigger or switch plunger 44. The trigger extends outwardly through an opening 45 in the plate 41 and is separated from the batteries
by a spring or other resilient member 46. If desired the telescopic member 31 may be provided with a plurality of slots 47 to permit sound waves from the alarm 42 to pass into the atmosphere exteriorly of the telescopic member. Also, if desired a magnet 48 (FIG. 2) may be provided for holding the bar lock 28 against the door frame 20 when not in use.

In the operation of this modification, the bracket 25 is mounted on either the frame 20 or the wall 10 so that the bar lock 28 will remain suspended in a substantially vertical position when not in use. When the lock is to be applied, the bar lock 28 is pivoted upwardly to a generally horizontal position after which the pin 33 is removed and the telescopic member 31 is extended from the tubular member 30 until the outer end is resting on the bottom wall 37 of the bracket 35. In this position openings 32 and 34 are moved into alignment with each other and the pin 33 is reapplied through the aligned openings to lock the telescopic member 31 and the tubular member 30 in adjusted position. If an intruder or unauthorized person forces the latch bar of the conventional door lock and moves the sliding door 17 laterally, such door movement will move the bar lock 28. After a slight lateral movement, the trigger 44 will engage the rear wall 38 of the bracket 35 and make contact with the batteries 43 to complete a circuit to the alarm 42 and energize the alarm. Simultaneously the plate 41 at the outer end of the telescopic member 31 will engage the rear wall 38 of the bracket 35 and prevent additional lateral movement of the sliding door. The alarm can be of the type that will operate only as long as the trigger 44 is in engagement with the batteries 43, or it may be of the type that, once it is energized, will continue to operate until reset. In this case, it may be convenient to mount a reset button on the exterior of the telescopic member 31.

With reference to FIGS. 6 and 7, in some instances the sliding door 17 is mounted on the exterior of the fixed panel 13 and is known as an outside slider. In order to accommodate the bar lock 28, the bracket 25 is mounted on the frame 16 of the fixed panel 13 and a mounting bracket 52 is fixed to the trigger 44. In order to do this, the bracket 52 includes a generally U-shaped portion 52 with one of the legs having an outwardly extending flange 54 with an opening 55 therein. A screw 56 extends through the opening 55 into the end of the trigger 44 to attach the bracket to the trigger. The other leg of the U-shaped portion is adapted to be received between the glass 18 and the gasket 19 of the sliding door to anchor the end of the telescopic member 31. Preferably the bracket 52 is placed just above the handle 21 so that the handle will stop any tendency of the bar lock to move downwardly when the bracket is applied.

In the operation of this modification, the bar lock 28 normally is disposed in a generally vertical position with the telescopic member 21 retracted within the tubular member 30 when not in use. When it is desired to lock the door 17, the bar lock 28 is moved to a substantially horizontal position after which the pin 33 is removed and the telescopic member 31 is extended. During outward movement of the telescopic member, the bracket 52 is located immediately above the handle 21 and one leg of the U-shaped portion is inserted between the gasket 19 and the glass 18. After the leg of the bracket 52 is inserted between the gasket and the glass, the openings 32 of the tubular member 30 are aligned with the openings 34 of the telescopic member 31 and the pin 33 is reapplied through the aligned openings to lock the members in adjusted position. Any slight lateral movement of the sliding door 17 will cause the trigger 44 to engage the batteries 43 and sound the alarm 42 and simultaneously prevent any additional lateral movement of the sliding door.

With reference to FIGS. 8 and 9, a further modified form of the invention is disclosed in which the tubular member 30 and the telescopic member 31 are somewhat longer and the outer free end of the telescopic member is received within a bracket 57 mounted on the wall 10 in such a position that the bar lock is disposed at an upwardly extending angle of approximately 45°. It has been found that the sliding door 17 could be moved upwardly to remove the groove at the bottom of the door from the tongue of the track, after which the door could be swung inwardly to permit ingress without actual sliding movement of the door 17. In order to prevent this, the bracket 57 includes side walls 58, an inclined bottom wall 59, and a rear wall 60 with the rear wall having an enlargement or projection 61 with a face 62 disposed generally normal to the bar lock 28. The bracket 57 preferably is mounted in a position such that the openings 32 and 34 of the tubular member 30 and telescopic member 31 are in registration when the trigger 44 is slightly depressed by the face 62 of the enlargement. When the bar lock is applied as previously described in the other modifications, any slight lateral or upward movement of the door 17 will complete the closing of the trigger to energize the alarm and simultaneously will cause the end of the telescopic member to engage the base 62 and prevent any additional movement in either direction.

1. Apparatus for locking a sliding structure relative to a fixed structure comprising a first hollow elongated member, a second elongated member telescopically received within said first member, means for connecting said first and said second members together in adjusted position, means for swingably mounting one end of one of said members on one of the sliding or fixed structures, said member means mounted on the other of the sliding or fixed structures for supporting the free end of the other of said members, the free end of said other member being in axial spaced relationship to a portion of said bracket means to permit slight lateral movement of the sliding structure in one direction, an alarm carried by one of said member, trigger means connecting said alarm to a source of electrical energy, and said trigger means extending outwardly from one of said members, whereby slight lateral movement of the sliding structure causes the trigger to energize said alarm and further lateral movement of the sliding structure is prevented by said first and second members.

2. The structure of claim 1 in which said first and second members are disposed in a generally horizontal plane in locking position and disposed in a generally vertical plane in unlocked position.

3. The structure of claim 1 in which said first and second members are disposed at an angle to a horizontal plane in locking position to permit limited lateral and vertical movement of the sliding structure.

4. A bar lock for a sliding door comprising a first elongated member having opposite openings adjacent one end, a second elongated member telescopically received within said first member, said second member
having a plurality of openings alignable with the opposed openings of said first member, pin means receivable within aligned openings of said first and second members, signal means carried by said second member, switch means extending from said second member and selectively electrically connecting said signal means to a source of electrical energy, means for swingably mounting one end of said first member on said sliding door or a fixed structure adjacent thereto, bracket means mountable on the other of said sliding door or said fixed structure in a position to support the free end of the other member and providing stop means engageable by said switch means, said free end normally being axially spaced from said stop means to permit slight lateral movement of said movable structure, whereby slight lateral movement of the sliding door causes said switch means to engage the stop means and close an electrical circuit to energize the signal, and said first and second members provide a positive stop to prevent further movement of said sliding door.

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