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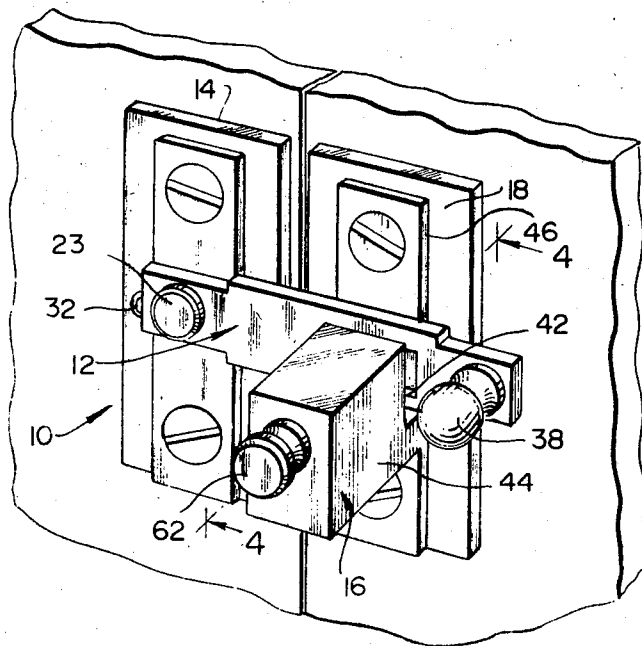
[54] **SAFETY DOOR LOCK**
 2 Claims, 6 Drawing Figs.

[52] U.S. Cl..... **292/207,**
 292/341.15
 [51] Int. Cl..... **E05c 3/04**
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 341.15; 49/354, 356

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ABSTRACT: A tamperproof safety lock for securing a doorway is provided. The latch is pivotally mounted at one end to a plate which is secured to the inside surface of the door adjacent to the edge. A second plate is mounted on the door molding in alignment with the first plate. The distance between the two plates when the door is closed is such that the latch may pivot to bridge the gap between the two plates. The second plate includes a grooved latch stop. The groove within the latch stop is of a thickness greater than the thickness of the latch and receives the latch when it is pivoted to the locked position. The latch includes an opening adjacent the free end thereof in alignment with the latch stop. A portion of the latch stop is bored and receives a spring biased locking bolt which may be manually operated to extend into the groove and through the opening in the latch. The bolt thus prevents the latch from being rotated to the "open" position.



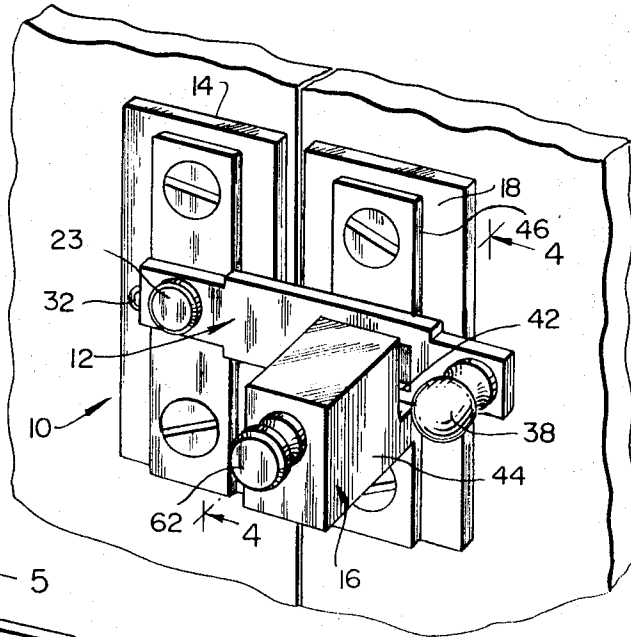


FIG. 1

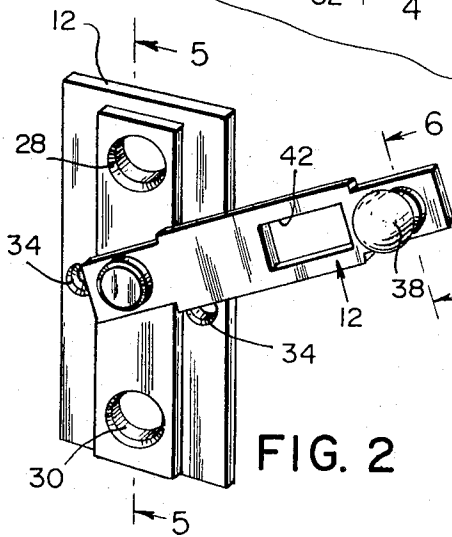


FIG. 2

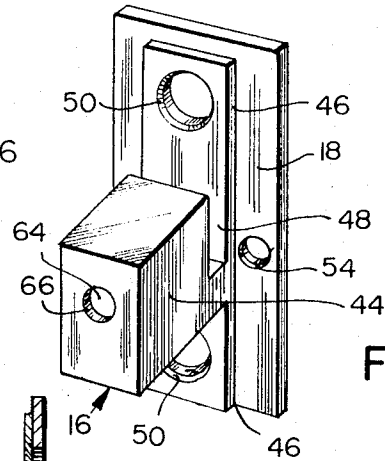


FIG. 3

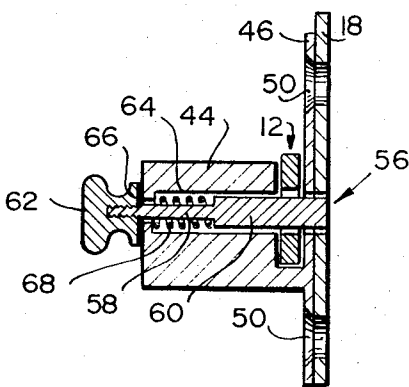


FIG. 4

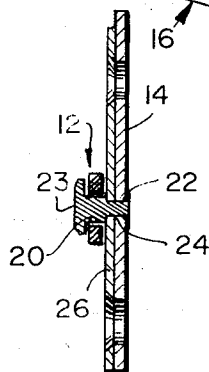


FIG. 5

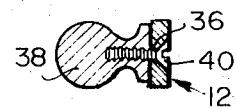


FIG. 6

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SAFETY DOOR LOCK

BACKGROUND OF THE INVENTION

1. Field of the Invention

Door lock mechanisms having a pivotal latch which engages a locking bolt.

2. Description of the Prior Art

It is a common practice for intruders to gain entry through locked doors by wedging a thin strip of material against the bolt of the common self-closing type door locks. This practice is even possible with the employment of commonly used night latches which are rim locks wherein the bolt is mounted on the interior side of the door. In the past, only with the use of the more expensive dead bolt type locks can this practice of gaining access by wedging the bolt to the open position be curtailed.

Attempts have been made to utilize a secondary lock in addition to the self-closing sloped bolt lock. Among those attempts are the hook and eyelet arrangement wherein a pivoted hook would be affixed to either the door or the molding adjacent to the door and an eye would be affixed to the opposite surface, i.e. door surface of molding surface.

Unfortunately, the use of the hook and eyelet did not deter intruders as the hook was itself susceptible to being disengaged from the eyelet by means of the same thin strip of material manipulated through the space between the door and its molding from the outside.

Additionally, the use of a slide bolt mounted on the inside surface of the door and adapted to be slid into a female receptacle of the molding, i.e. a bracket or a bored hole, has been employed. The disadvantage encountered with the use of these sliding bolts was the fact that not only did the bolts prevent the door from being open from the outside, but that it was so easy to manipulate, often young children would lock themselves in. Furthermore, there was no positive lock arrangement separate and apart from the bolt, which would secure the bolt in its closed position.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a safety lock of the foregoing general character which is so constructed that it is not subject to any of the foregoing drawbacks.

More specifically, it is an object of the invention to provide a safety lock of the character described which is simple and rugged in construction, easy to use, yet can be fabricated by mass production methods at an appreciably lower cost than prior devices designed to serve the same function.

A further object of the invention is to provide a safety lock of the character described which precludes the possibility of intruders gaining admittance therethrough by manipulating the latch from the outside with any commonly used burglary device.

It is another object of the present invention to provide a safety lock of the character described wherein a pivoted latch may be manipulated to a closed position locking a door with a bolt subsequently actuated to engage the latch thus preventing the latch from being moved to the open position.

Still another object of the present invention is to provide a safety lock of the character described wherein a pivoted latch is engaged by a spring-biased bolt which prevents the latch from being manipulated open by intruders.

Still another object of the present invention is to provide keyless safety lock of the character described which is so designed that it may not be accidentally engaged by a child while playing.

Other objects of the invention in part will be obvious and in part will be pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts hereinafter described and of which the scope of application will be indicated in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings in which is shown one possible embodiment of the invention:

5 FIG. 1 is a perspective view illustrating a safety lock constructed in accordance with and embodying the present invention, the lock being in a closed position and securing a door;

FIGS. 2 and 3 are perspective views of the pivoted latch and the latch stop, respectively, both in partially disassembled form;

10 FIG. 4 is a cross-sectional view taken substantially along the line 4-4 of FIG. 1;

FIG. 5 is a cross-sectional view taken substantially along the line 5-5 of FIG. 2 and showing the pivot which secures the latch to its plate and about which the latch rotates; and

15 FIG. 6 is a cross-sectional view taken substantially along the line 6-6 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

20 The safety lock of the present invention provides a simple and secure means whereby unauthorized entrance through a doorway may be prevented. The mechanism includes a latch which is pivotally mounted to a latch plate. The plate is in turn affixed to the interior surface of a door which may be either inwardly or outwardly opening. The latch plate is mounted to the door adjacent the forward edge of the door and, mounted to the molding in cooperating alignment with the latch plate is a latch stop. The latch stop includes a notch which receives the latch and prevents the opening of the door.

30 The latch stop additionally includes a hollowed out portion within which a spring-biased locking bolt is housed. The bolt is movable from its normal position wherein it extends across the notched surface of the latch stop to a second position wherein the notched surface is clear.

35 The pivoted latch includes a rectangular opening adjacent the unpivoted end which is engaged by the locking bolt when the latch is seated within the notch of the latch stop. With the spring-biased locking bolt engaging the rectangular opening of the latch stop, the pivoted latch may not be disengaged from the latch stop. Thus, it is impossible for the pivoted latch to be manipulated to an open position from the outside of the doorway.

45 In order to disengage the latch from the notch of the latch stop, it is necessary to pull the locking bolt, retracting it from the rectangular opening of the latch. Thereafter, the latch may be rotated and disengaged from the latch stop so that the door may be opened.

Referring now in detail to the drawings, the reference numeral 10 denotes a safety door lock constructed in accordance with and embodying the invention. Said lock is formed of two interengageable sections, one of which includes a pivoted latch 12 mounted to a supporting latch plate 14 which is to be affixed to the interior surface of a door adjacent an edge thereof.

55 The second section includes a latch stop 16 which is secured to a supporting plate 18. The latch stop supporting plate 18 is mounted to the door molding in alignment with the latch plate 14 of the pivoted latch 12. The distance between the mounted supporting plates, when the door is closed, is such that the pivoted latch 12 may bridge therebetween. The pivoted latch 12 is constructed, preferably of metal bar stock, and is of a generally rectangular shape. There may be included, along the upper and lower edges, various shoulders or indentations for design purposes. Adjacent the end from which the latch 12 is pivotally mounted, is a circular opening 20. Through this opening 20 a rivet 22 having an enlarged head 23 is inserted, said rivet 22 serving to secure the latch 12 to the latch plate 14. The rivet 22 also passes through an opening 24 in the latch plate 14. The opening 24 is at or slightly above the approximate center of the latch plate 14. Between the latch plate 14 and the latch 12 is a spacing panel 26. The panel 26 also has an opening through which the rivet 22 passes and the end of the rivet 22 is peened to form a conventional retaining head at the rear surface of the latch plate 14.

The latch plate 14 includes suitable mounting holes 28 and 30 through which mounting screws are inserted which screws engage the door. Two of the mounting holes 28 and 30 are positioned adjacent the upper and lower ends of the latch plate 14 and are aligned with matching holes in the spacing panel 26 so that the spacing panel 26 is secured to the latch plate 14 not only by the rivet 22, but by the mounting screws 28 and 30 which pass through the holes. Additional mounting holes are provided adjacent the side edges of the latch plate 14 at the approximate midheight thereof. Auxiliary mounting screws may be inserted through these holes into the door and thus the latch 12 will be securely mounted to the door, making it extremely difficult for the door to be forced open.

Adjacent the opposite end of the latch 12, a second circular opening 36 is formed. This opening 36 serves to facilitate the mounting of a latch knob 38 which is used to manipulate the latch. The latch knob 38 has a female threaded bore which is engaged by a threaded bolt 40 passing from the opposite side of the opening 36.

A rectangular opening 42 is adjacent the free end of the latch 12 and hence adjacent the latch knob 38. The rectangular opening serves to lock the latch 12 in its closed position in a manner to be subsequently described.

Mounted on the molding in alignment with the latch plate 14 is the latch stop 16. The latch stop 16 is formed in the general shape of a horizontally oriented squat "T" having a thickened trunk portion 44, the "T" lying on its side with its head 46 perpendicular to a horizontal axis. Formed at the juncture of the upper portion of the trunk 44 and the weblike head 46, is a vertical groove or slot 48. The slot 48 extends downwardly and in line with the head 46, a distance approximately three-quarters the vertical thickness of the trunk. The depth of the slot 48 is greater than the width of the latch 12 and the thickness of the slot is slightly greater than the thickness of the latch 12 so that the latch may be received within the slot. The remaining portion of the trunk 44 beneath the slot 48 serves as a stop to limit the pivotal movement of the latch.

The latch stop 16 is secured to the stop supporting plate 18 by mounting screws which additionally secure the supporting plate 18 to the door molding. The mounting screws pass through aligned mounting holes 50 in the head 46 of the latch stop 16 and through the supporting plate 18 respectively. The supporting plate 18 may be additionally secured to the molding by auxiliary mounting screws passing through additional mounting holes 54 at the approximate midheight of the supporting plate 18 adjacent the side edges.

With the latch plate 14 and the latch stop 16 mounted in their respective positions on the door and door molding, the latch 12 may be swung to a position wherein it is resting within the slot 48. If the door is inwardly opening, and unauthorized entry is attempted, such forced opening of the door will be prevented as the latch 12 will abut the wall of the slot 48, distant from the head 46.

Conversely, if the door is an outwardly opening door, and unauthorized entry is attempted with the latch 12 seated in the slot 48, the forced opening of the door will be prevented as the latch 12 will abut the surface of the slot 48 distant from the trunk 44.

To further enhance the utility of the present invention, a spring-biased locking bolt 56 is furnished within the trunk 44 of the latch stop 16. The locking bolt 56 engages the rectangular opening 42 of the latch 12 to prevent the pivoting of said latch out of the slot 48.

The locking bolt 56 is shaped as an elongated cylindrical shaft which is stepped at its approximate midlength so that the bolt 56 includes a first cylindrical section 58 and a second cylindrical section 60. The first section is of smaller diameter than second section 60. The end of the first section 58 is threaded to engage a matingly threaded knob 62.

The bolt 56 is slidably housed within a bored opening 64 of the trunk. To facilitate assembly of the locking bolt 56, a second opening in line with and of the same diameter as the

opening 64 passes through the supporting plate 18. At the interior end of the bored opening 64, a restricted through hole is provided. The through hole passes to the front end of the trunk 44 and is of a diameter slightly larger than the first section 58 of the bolt and smaller than the diameter of the bored opening 64.

To assemble the latch stop 16, the bolt 56 is inserted through the bored opening 64, threaded end first, and with a vertical coil spring 68 positioned over the first section 58.

The internal vertical coil diameter of the spring 68 is smaller than the diameter of the second section 60 so that an end of the spring 68 will abut the shoulder formed at the step between the two sections of the bolt. The opposite end of the spring 68 will abut the interior end of the bored opening 64 and will not extend into the through hole 66.

The bolt is positioned within the bored opening 64 with its threaded end extending from the through hole 66 and then the bolt knob 62 is turned, engaging the threaded end of the bolt 56.

The bolt 56 is now spring biased to a normal position wherein the second section 60 extends across the slot 48 of the latch stop 16. This normal position is fixed either by abutment of the end of the second section 60 with the door molding or by engagement of the knob 62 with the front end of the trunk 44. With the latch in an open position, and the bolt 56 in its normal position, the latch 12 will not completely seat itself within the slot 48. To fully seat the latch 12 within slot 48, the bolt 56 must be withdrawn into the bored opening 64 of the trunk 44 by pulling the knob 62.

With the bolt in its retracted position, the latch 12 may pivot into the slot 48. To secure the latch 12 in the slot 48, the knob 62 is released and the spring 68 forces the bolt 56 across the slot 48. The two plates, 14 and 18, are so positioned that when the latch 12 is seated within the latch stop 16, the bolt 56 passes through the rectangular opening 42 and thus the bolt 56 will prevent rotation of the latch 12 to the open position. To open the lock, it is necessary to pull the knob 62 outwardly, thus withdrawing the latch bolt 56 from the rectangular opening 42.

With this structure, it is seen that in order to lock the door by seating the latch 12 within the latch stop 16, it is necessary to pull the latch bolt knob 62. This operation requires considerable dexterity and therefore it would be difficult for a young child to lock himself inside a room, e.g. a bathroom.

Furthermore, once the latch 12 is in its locked position, resting within the slot 48 of the latch stop 16, and with the latch bolt 56 passing through the rectangular opening 42, it is impossible to pivot the latch 12 to open position without first releasing the latch bolt 56 by pulling the bolt knob 62.

An intruder will not be able to gain access by merely attempting to force the latch 12 the open position from the outside as it is necessary to pull the bolt knob 62 before the latch 12 can be rotated.

The safety lock of this invention is not only useful to secure doors but may easily be mounted to secure windows. Where it is desired to secure a casement window, the mounting arrangement will be the same as that used for doors. If an ordinary double-hung window is to be secured, the latch 12 or latch stop 16 may be horizontally mounted, i.e. the latch will swing in a horizontal plane, to the upper edge of the lower window frame with the mating latch or stop secured to the upper window frame surface in alignment therewith when the window is closed.

It will be understood that the latch plate 14 and spacing panel 26 previously described could be formed of one piece molded or stamped construction and similarly the latch stop 16 could be formed in one-piece construction with the stop-supporting plate 18. Such modification would permit easy assembly and reduce production costs. The one-piece construction would result in a savings of material and in the reduction in the total weight of the safety door lock because portions of the supporting plates which face and are mounted on the door and moulding respectively, may be hollowed out.

Thus, it will be seen that there is provided a safety lock which achieves the several objects of the invention and which is well adapted to meet the conditions of practical use.

As various other possible embodiments might be made of the above invention and as various changes might be made in the embodiment set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A keyless tamperproof safety lock for securing a portal and serving to prevent unauthorized entrance through the portal, said lock comprising a latch pivotably mounted on a first surface, said first surface being mounted on a latch plate, a latch stop mounted on a second surface, said second surface being mounted on a supporting plate, said latch stop and second surface being of unitary construction and forming a generally T-shaped structure lying on its side, said latch stop and second surface remaining stationary relative to said first surface when said portal is opened, said latch being engageable in a slot formed at the junction of said latch stop and said second surface, the width of said slot being greater than the thickness of said latch, a portion of said latch being received

within said slot when the latch is rotated to the locked position, the latch stop having a spring-actuated bolt moveable in a direction substantially perpendicular to the plane of said second surface, a bore in said second surface and said supporting plate in alignment with said movable bolt, means forming an opening in said latch, the bolt being engageable with the latch through said opening when the latch is in its locked position and said bolt engaging said bore through said second surface and said supporting plate thereby preventing the rotation of the latch to disengage the slot without the disengagement of the bolt through the opening.

2. A keyless tamperproof safety lock constructed in accordance with claim 1 wherein the bolt is substantially cylindrical and is formed of two cylindrical sections, one of said sections being of a larger diameter than the other, a shoulder formed at the juncture between the sections, the spring is a helical coil spring, the spring being positioned over the cylindrical section having the smaller diameter, one end of the spring abutting the shoulder, the other end of the spring abutting an end of the bore to urge the portion of the bolt into the slot.

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