

March 16, 1971

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3,570,285

AUXILIARY DOOR LOCK

Filed Feb. 20, 1969

2 Sheets-Sheet 1

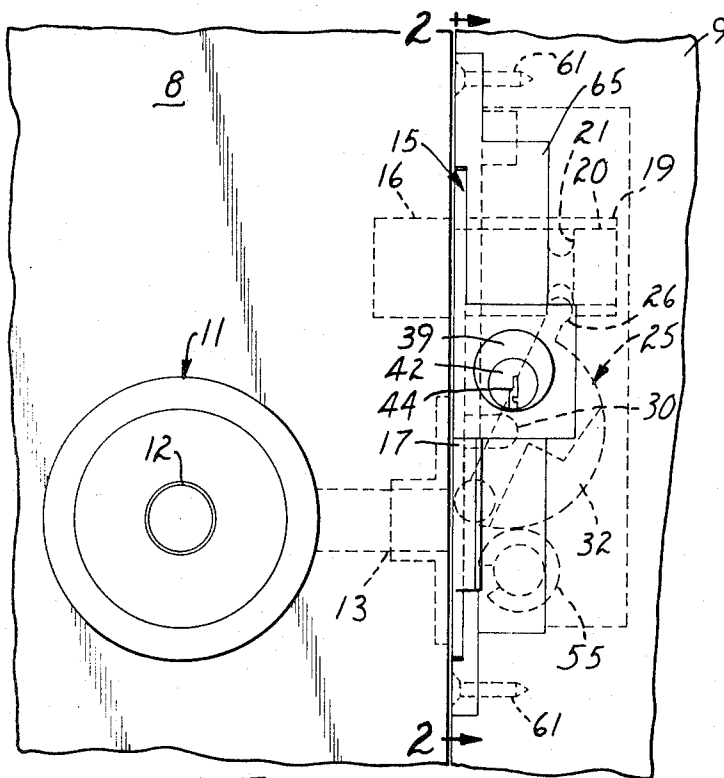


FIG. 1

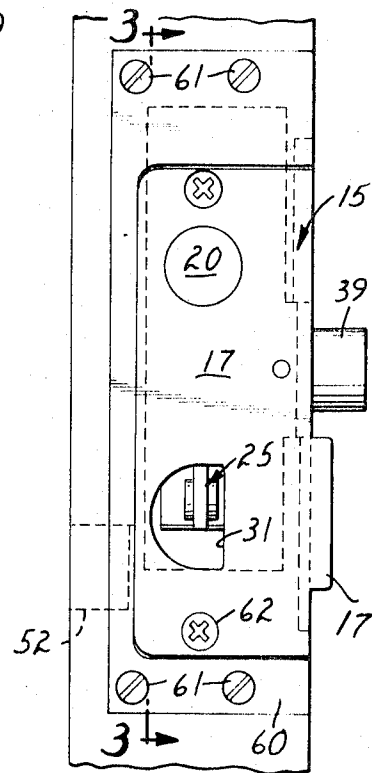


FIG. 2

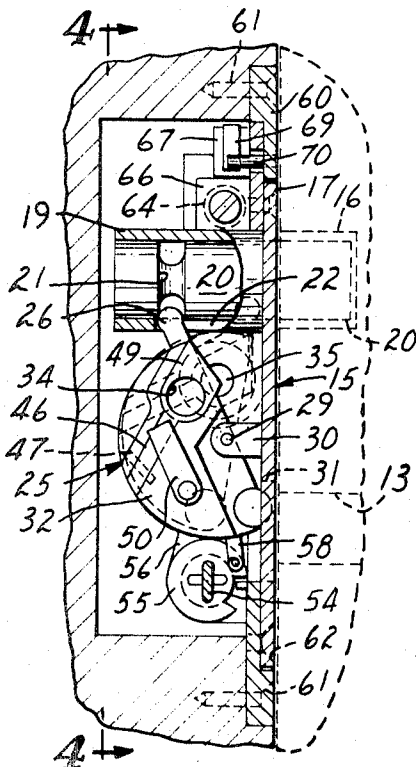


FIG. 3

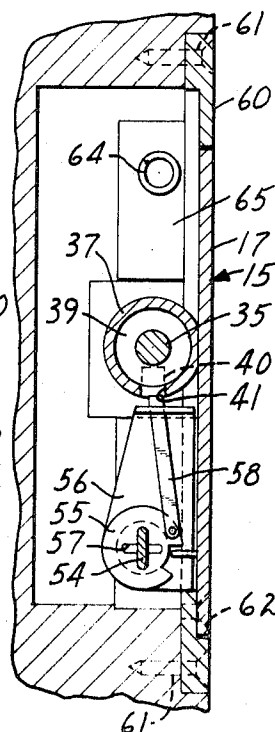


FIG. 5

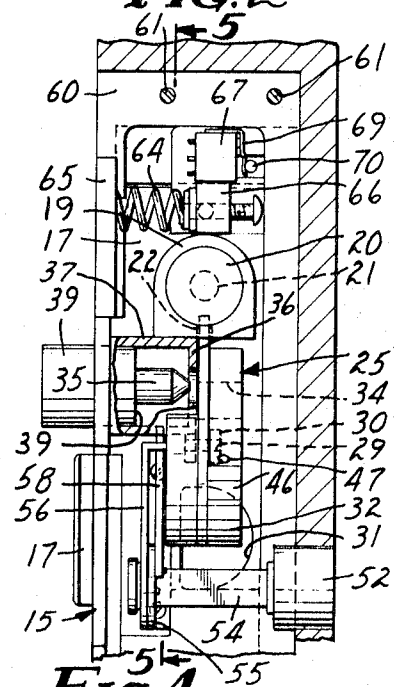


FIG. 4

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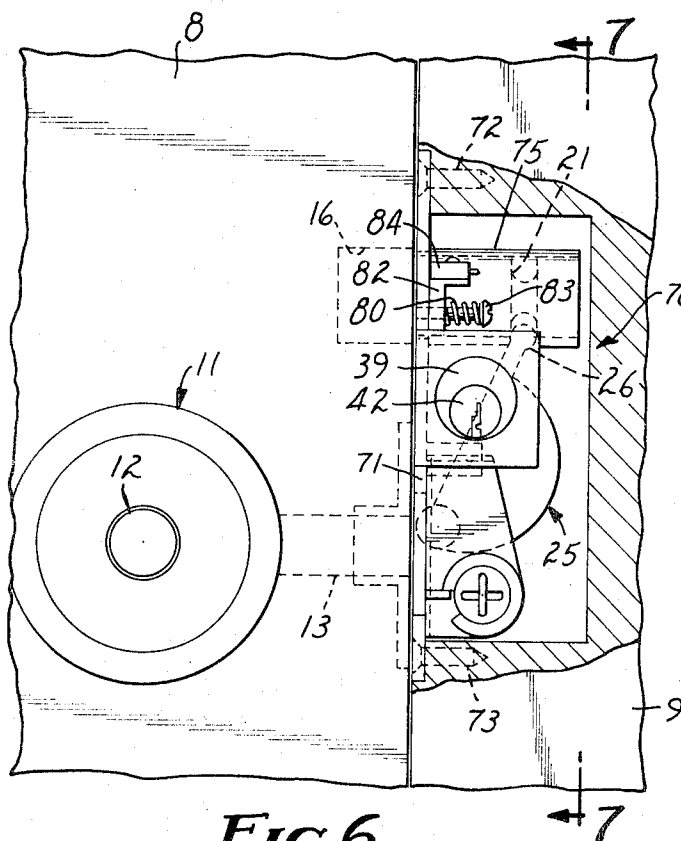
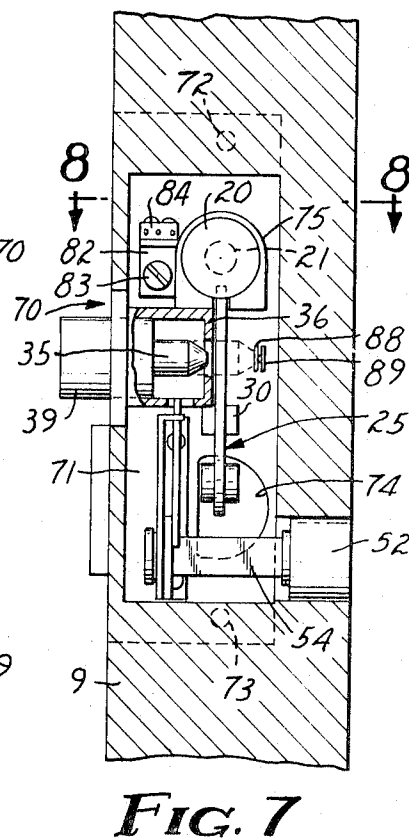
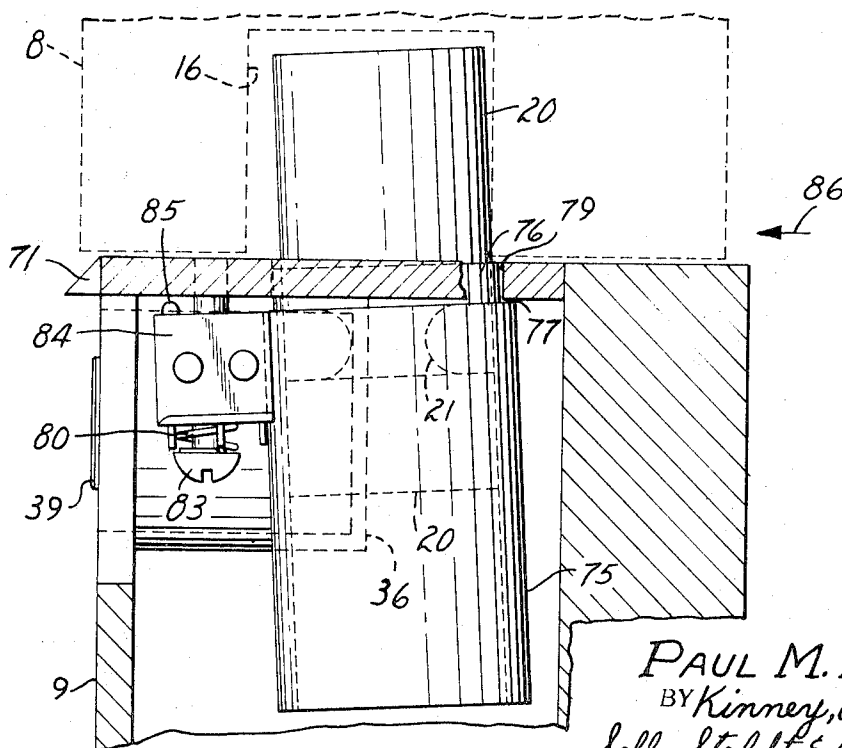
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AUXILIARY DOOR LOCK

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Continuation-in-part of application Ser. No. 771,089, Oct. 28, 1968. This application Feb. 20, 1969, Ser. No. 801,120

Int. Cl. E05b 59/04; G08b 13/08

U.S. Cl. 70—107

12 Claims

ABSTRACT OF THE DISCLOSURE

An auxiliary lock for two relatively movable building members comprising a slidable bolt movable into locking position upon closure of the members and operation of an existing lock of a conventional type. The auxiliary lock of the present invention also has a key-operated locking device to maintain the bolt of the auxiliary lock in closed position even upon subsequent disabling of the conventional lock. The lock of the present invention is also provided with signaling means actuatable in the event one attempts to separate the closure members by exerting force upon one or the other of the members with the lock in secured position.

This application is a continuation-in-part application of copending application Ser. No. 771,089, filed Oct. 28, 1968, now abandoned.

This invention relates to a security device and in one aspect it concerns a lock for a closure member of a building or the like operating in conjunction with a conventional lock to add increased security for the closure such as a door.

Locks of numerous types are available for securing the doors of buildings. It is only a few of these systems however which will actually provide protection against unauthorized intrusion. Very few of the common conventional closure locks will provide much of any resistance to one wishing to gain entrance and who is not deterred by the fact that a lock must be picked, a window must be broken to operate the lock from the inside or that a bar must be used to force the door or the lock. It is possible to gain admittance through a majority of the locks on doors of residences by merely breaking a window and reaching therethrough to operate the door handle from the inside. It is however expensive normally to replace this lock and install a lock having not only the spring biased latching bolt which normally retains the door in the closed position but also a dead bolt which may cross the parting line between the two relatively movable building members providing increased nighttime protection against the aforementioned methods of unauthorized entry.

It is therefore the purpose of the present invention to add another lock to this already replete selection but one which will stand out as being complementary to the existing conventional tumbler or bored locks on doors and yet one which will increase the protection offered by the existing lock. This lock will effectively upgrade the existing locks to offer protection provided presently only by substantially more elaborate hardware.

Another aspect of the lock of the present invention is that it is easily installed on existing buildings.

The lock of the present invention has no degrading appearance characteristics.

Another aspect of this present invention is that the lock will afford protection for doors having windows therein which are easily broken permitting access to the door lock from the inside.

Another aspect of the present invention is that the use of a predetermined force against the door when closed with the lock in operating or projected position will trigger a switch either to cause a light to come on at the location or actuate a signal setting off an on-site or a remote alarm.

The lock of the present invention also is constructed to accommodate a member to lock and maintain the same in secured position through a remote operator.

The auxiliary lock of the present invention comprises a slidable bolt mounted on a frame, a pivotally mounted lever connected to the bolt to slide the same upon being pivoted by a force applied against said lever, and a slidable key operated cylinder lock having a bolt engageable with said lever to maintain the slidable bolt in locked position upon movement of the lock plug to a locking position. The frame mounting the bolt may be pivotally mounted on one of two relatively movable building members such that a force against the bolt will pivot the frame energizing through suitable switch contacts an electric circuit. Alternatively, the frame mounting the bolt may be rigid with a plate supporting the lever, and the plate may be pivoted.

The various aspects of the present invention described above will be more fully understood after reading the following description which refers to the accompanying drawings wherein:

FIG. 1 is a fragmentary elevational view of two building members and one embodiment of the lock member of the present invention;

FIG. 2 is an end view taken along line 2—2 of FIG. 1 showing one of the building members and the lock member;

FIG. 3 is a vertical sectional view of the lock member of FIG. 2 taken along line 3—3;

FIG. 4 is a cross-sectional view taken along line 4—4 of FIG. 3;

FIG. 5 is a cross-sectional view taken along line 5—5 of FIG. 4;

FIG. 6 is a fragmentary elevational view of two building members and a second embodiment of the lock member constructed in accordance with the present invention;

FIG. 7 is a vertical sectional view of the lock of FIG. 6 taken along line 7—7 of FIG. 6 showing the alternate position of the parts in broken lines; and

FIG. 8 is a transverse sectional view of the lock taken along line 8—8 of FIG. 7 with parts in the locked position.

The lock of the present invention is adapted for use in conjunction with relatively movable building members such as a door member 8 and the door frame or jamb 9 which mate along a parting line therebetween. The door 8 as illustrated, is provided with the conventional tumbler or bored door lock having a bolt operating handle or door knob 11 on either side with the inside knob 11 constructed with a locking button or turn member 12 in the center thereof to lock the outside knob against rotation. The outside knob conventionally has a keyway to unlock the knob and permit the opening of the door. The conventional bored door lock structure has a spring biased bolt or latch member 13 movable into and out of the door, which latch 13 is engageable with a latch receiving opening on the door jamb to hold the door in place relative to the jamb. The latch 13 is retractable upon turning the knobs and is cammed to a retracted position when the door is swung to the closed position. This permits one to lock the door on the inside and then exit through the door. As the door swings closed the latch 13 engages the striker plate on the door jamb and is retracted until the door is closed and the latch is aligned with the latch receiving opening on the jamb 9.

In FIG. 1 of the drawing, the latch 13 is shown in its retracted position in the door 8 and a first embodiment of the auxiliary lock, generally designated 15, constructed in accordance with the present invention, has its bolt in the retracted or non-locking position also. As the latch 13 would be driven from the door it would enter a latch receiving opening applying a force to act against a lever to move a bolt across the parting line from the door jamb into the door.

The lock 15 of the present invention is adapted to be substituted for the striker plate which is normally attached to the door jamb and formed with a latch receiving opening to be aligned with the bolt 13 to receive the same.

The lock 15 of the present invention would require some alteration of an existing door jamb and an additional hole 16 or bored in the door 8 to receive a bolt of the auxiliary lock.

The lock 15 of the present invention comprises a first frame member or strike plate 17 affixed to the door jamb 9. The plate 17 has an outer face substantially flush with the parting face of the door jamb and supports on its rear face a hollow tubular support frame or cylinder 19 in which is a slidably and rotatably mounted cylindrical bolt 20. The bolt 20 is formed at one end with a circumferential groove 21. The cylinder 19 is formed with a slot 22 along its lower side through which is fitted one end of the pivoted first class lever 25 having at said one end a projection 26 which extends through the slot 22 and into the circumferential groove of the bolt 20. The lever 25 is pivoted about a pin 29 extending through the lever and bridging the space between two ears 30 projecting from the rear face of the strike plate 17.

The opposite end of the lever 25 is disposed below the ear 30 and is generally aligned with a latch receiving opening 31 formed in the plate, which latch receiving opening 31 would be disposed in aligned position on the jamb with the bolt 13 of the tumbler lock on the door. Thus in operation when the bolt 13 is projected from the door into the latch receiving opening 31, it would strike the lower free end of the lever causing it to pivot about the pin 29 and drive the bolt 20 out from the cylinder 19 and through an aligned opening in the plate 17 into the hole 16 bored in aligned position in the door 8.

Thus, in its simplest form, the lock of the present invention provides an auxiliary bolt which is moved across the parting line between the relatively movable door members upon pivotal movement of the lever 25 when acted upon by the conventional spring biased bolt of the door lock structure.

The lever 25 has an enlarged offset surface upon which is mounted a mass 32 of sufficient weight to bias the bolt 20 to the retracted position as indicated in FIGS. 1 and 3. The mass 32 is positioned to the side and below the pivot pin such that upon retraction of the bolt 13 from the keeper opening removing the force thereof from the lower face end of the lever, the bolt 20 will be withdrawn from the door back into the cylindrical support frame.

The auxiliary lock structure of the present invention is also illustrated as having a locking member which upon actuation will maintain the bolt 20 in its extended locking position upon retraction of bolt 13. This independent locking means is accomplished by holding the lever 25 in the bolt actuated position and against retraction or pivotal movement upon withdrawal of the bolt 13. As illustrated, the lever 25 is formed with an aperture 34 in the body thereof between the pin 29 and the projection 26 which, when the lever 25 is pivoted to the operative position, is aligned with the axis of a bolt element 35 which moves axially to enter the aperture 34 and lock the lever 25 against further pivotal movement until it is retracted. The bolt element 35 projects through a rear

end wall 36 of a hollow sleeve 37 and is fixed to the end of a cylinder lock 39. The bolt element 35 has a tapered end to readily engage the opening 34 in the lever 25 will serve to move the lever and bolt to the fully locked position if not accomplished by bolt 13.

The cylinder lock 39 is retained within the sleeve 37 by a set screw projecting from the cylinder lock 39 and riding in a groove in the housing which set screw is inserted through an opening formed therein in the usual manner and thus not shown. The cylinder lock is retained in locked position by a retractable spring biased projection 40 entering a recess 41 (as seen in the bottom of the housing in FIGS. 4 and 5) when the bolt element 35 projects from the sleeve wall 36 to retain the bolt 20 in place. Operation of the plug 42 of the cylinder lock 39 by a key inserted in the keyway 44, retracts the projection 40 from the recess allowing retraction of the bolt element 35 and the cylinder lock 39, releasing the lever 25. A pair of compression springs (not shown) supported by short pins in the cylinder lock 39 apply a force against the cylinder lock 39 driving it out of the sleeve away from the rear wall 36 upon release of the projection 40. The bolt 20 is illustrated in locked position in dotted lines in FIG. 3 where the aperture 34 would be aligned with bolt 35.

To preset the auxiliary lock such that the lock is set to secure the door after the door is closed, the lever 25 is formed with a pivotally mounted bolt-element receiving member 46 (FIG. 3), having a head portion 49, which member 46 is pivotally connected to the mass 32 of lever 25 by the pin 47. The lever 25 has a cut-out portion in the mass 32 and in the body of the lever to receive the head 49 of the member 46, which head is formed with the aperture 34. As shown in FIG. 3 the member 46 is flush with the mass on the near side and the head 49 has an offset portion on the opposed side. With the door open and the bolt 20 retracted, the lock cylinder 39 may be pushed into the sleeve 37 and the bolt element 35 will engage the head 49 of the pivoted member 46 causing it to pivot on pin 47 away from the lever 25 against the bias of a leaf spring 50. Upon subsequent closure of the door, the bolt 13 will engage the lever 25 causing the same to pivot on pin 29 and drive the bolt 20 across the parting line into the door 8. When this occurs, the bolt element receiving aperture 34 in the member 46 becomes aligned with the bolt element 35 and thus slides down the bolt element under the bias of the spring 50 to a position securing the lever 25 against rotation even though the bolt 13 is subsequently retracted from the end of the lever.

The auxiliary lock 15 of the present invention may also be unlocked from the outside surface of the door jamb. To accomplish this, the outside of the door jamb is formed with a lock cylinder 52 having the normal key-operated tumblers permitting a plug to turn about its axis in the cylinder causing rotation of a follower 54. The follower 54 is projected through the jamb to engage a rotatable driver 55 supported on a bracket 56 from the plate 17. As indicated in FIGS. 4 and 5, rotation of the follower 54 which is disposed in the cruciform aperture 57 of the rotatable member 55 causes rotation of the member 55 about its axis serving to move the driver element 58 which projects through the bracket 56 into the recess 41 and into engagement with the projection 40 therein. This driver element 58 thus forces the projection 40 back into the cylinder lock 39, releasing the same so that it may be biased outwardly retracting the bolt element 35 from the aperture 34 in the lever 25 permitting the door to be opened as usual.

The lock 15 as illustrated in FIGS. 1 through 5 may also serve as a detection device in the event an attempted entry is made through the door 8 without the use of the proper keys for both the door bored lock and the auxiliary lock. This detection is provided for the embodiment in FIGS. 1 through 5 by pivotally supporting the plate

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17 on a second frame or support frame 60 which is fixedly secured by screws 61 into the door jamb 9. The first frame or plate 17 is mounted on the frame 60 by a screw 62 forming the pivot axis. With this type of mounting, a force placed against the bolt 20 when extending across the parting line between the jamb and door would cause the strike plate 17 to pivot about the pin 62. This pivotal movement acts against the force of a compression spring 64, positioned between flange 65 on the second frame 60 and a stop 66, with an adjustment means, on the pivotal strike plate 17. A switch 67 is mounted on the plate 17 which has a switch arm 69 positioned in abutting relation to a pin 70 on the fixed frame 60 causing actuation of the switch 67 upon relative movement of the plate 17 and pin 70. This structure is most clearly illustrated in FIGS. 3 and 4 and the plate 17 is notched to receive the pin 70 near the switch arm 69 and permit relative movement.

The embodiment of the auxiliary lock, generally designated 70, formed in accordance with the present invention and illustrated in FIGS. 6, 7, and 8, shows an alternative form of providing detection of an attempted entry. In these figures, similar parts to those in FIGS. 1 through 5 have similar reference numerals.

In this embodiment when sufficient force is applied against the door, when locked, in a direction to open the door the bolt 20 is pivoted relative to a jamb mounting frame or strike plate 71 having a latch receiving opening 74. The plate 71 is fixed rigidly to the jamb 9 by two screws 72 and 73. The slidable cylindrical bolt 20 is mounted in a tubular generally cylindrical frame or cylinder 75 having a slot therein to receive the projected end 26 of the lever 25 in the circumferential groove 21. The frame 75 has an end portion 76 of reduced outer diameter forming a shouldered edge 77 which abuts the rear face of the plate 71. The reduced end 76 is loosely received in an opening 79 in the plate 71 permitting pivotal movement of the frame 75 and bolt 20 about the edge 77. The frame is normally held in a set position with the edge 77 flush with the plate 71 by a spring 80 bearing against a bracket 82 which bracket is secured to the frame 75 adjacent the end portion 76. The spring 80 is supported by a bolt 83 extending through the spring 80 and the bracket 82 and threadably received in the plate 71.

A switch 84 is secured to the top of the bracket 82 and in the normal position of the frame 75 the switch plunger 85 is depressed by engagement with the rear face of the plate 71. When a force is applied against the door 8, as indicated by the arrow 86 in FIG. 8, the bolt 20 is engaged by the edge of the opening 16 and causes the bolt 20 to pivot the frame 75 about the edge 77 at a location opposite the bracket 82 against the bias of compression spring 80. Compression of the spring 80 under the force 86, which is necessarily more than normally exerted against a door to open the same, causes the switch to move away from the plate 71 and to close a circuit to produce a signal or generate an alarm. The spring 80 can vary in strength, the same as spring 64, but they should not be too easily compressed causing false alarms.

FIG. 7 also shows a pair of contacts 88 and 89, which are normally open, and which are closed by engagement with the bolt element 35. These contacts provide a sensing or indicating method for determining when the cylinder locks 39 are closed. Thus the doors of a plant could be wired together and to a panel so that one could easily check whether all the locks were secured.

The locks constructed in accordance with the present invention add to the effectiveness of the retractable bolt 13 and provide protection to the door 8 having a conventional bored lock in the event an unauthorized person breaks the glass in the door and attempts entry by reaching in to operate the inside knob of the door which normally will release the bolt 13 without any resistance. The cylinder lock 39 requires the use of a key from the inside and/or the outside to release the cylinder lock 39 of the auxiliary lock of this invention once the cylinder lock 39 is forced

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into the lock position restricting retractable pivotal movement of the lever 25.

As an added feature, the connection of the end projection 36 of the lever 25 to the bolt member 20 in the groove 21 permits free rotation of the bolt member in the sleeve 19 as well as sliding movement, thus making it very difficult for one to try to saw through the bolt 20 and gain entrance.

It is also possible to provide other means for driving the bolt element 35 into the aperture 34 than the manually movable cylinder lock 39. Such other drive means may include a solenoid as a substitute for the cylinder lock, which solenoid can be controlled by a remote switch to drive a bolt element like element 35 into the lever. Alternatively, the pin or bolt element 20 may be normally biased to a securing position and released by a solenoid. Further, the pin or bolt element 35 used to secure the lever may be an armature moved by a winding as in a solenoid and operated by a remote switch. This remote operation would be useful to secure all doors in a plant or shop, for example.

Having thus described the present invention what is claimed is:

1. An auxiliary door lock supported on one of two relatively movable building members and operable upon movement of a first locking member to hold said two members in fixed position, said auxiliary lock comprising

a frame including a strike plate mountable on one of said building members, said strike plate having a latch receiving opening for receiving a said first locking member movably mounted on the other building member,

a slidable bolt movable relative to said frame from a retracted unlocked position in said frame into inserted locking position projecting from said strike plate and into the other of said building members for bridging the parting line therebetween,

lever means pivoted on said frame and having one end engaging said bolt and being positioned near said latch receiving opening for moving said bolt into locking position upon force being applied to the lever means by a said first locking member, and

lock means engageable with said lever means for retaining said bolt in locking position.

2. An auxiliary lock according to claim 1 wherein said lock means engageable with said lever comprises a movable key-operated cylinder lock mounted on said frame and having means engageable with said lever means to prevent pivotal movement thereof when said lever means is in said locking position.

3. An auxiliary lock according to claim 1 wherein said bolt is freely rotatable.

4. The auxiliary lock of claim 1 wherein said lever means includes means, resiliently mounted thereon for engagement with said lock means, permitting said lock means to be actuated prior to movement of said lever means to said actuated position and cooperable automatically with said lock means upon movement of said lever to said actuated position to hold said lever in said actuated position.

5. An auxiliary lock according to claim 1 wherein means are provided for normally urging said lever means to an inoperative position moving said bolt to a retracted position when said building members are separated.

6. An auxiliary lock according to claim 5 wherein said means for normally urging said lever means to an inoperative position comprises a counterbalance weight on said lever means for pivoting said lever means about its pivot on said frame.

7. An auxiliary lock according to claim 1 wherein said lock means comprises a key-operated cylinder lock mounted in a retaining sleeve for sliding movement in a direction transverse to the axis of said bolt and having a bolt element on the inner end thereof for engagement with an aperture in said lever means, and means defining an aperture in said lever means.

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8. An auxiliary lock according to claim 1 wherein said bolt is slidably mounted in a tubular support and said lever means engaging said bolt is provided with an end portion cooperating with a groove in said bolt for moving said bolt axially and permitting relative rotary movement between said bolt and said end portion of said lever means.

9. An auxiliary lock according to claim 8 wherein said tubular support is mounted for movement on said frame against the bias of a spring, and switch means operable to produce a signal upon the movement of said tubular support on said frame.

10. An auxiliary lock according to claim 1 wherein said bolt is slidably mounted in a tubular support frame, said tubular support frame being mounted for movement relative to said strike plate on said frame on the side of said strike plate opposite the other of said two members, spring means normally maintaining said tubular support frame fixed relative to said strike plate and yieldable in response to pressure against said bolt, and switch means for operating an alarm upon movement of said tubular support frame against the bias of said spring means.

11. An auxiliary lock according to claim 1, wherein said strike plate is mounted on a support frame for limited movement thereto,

an electrical switch supported on one of said strike plate and support frame,

means for actuating said switch mounted on the other of said strike plate and support frame, and

means for resiliently resisting relative movement between said strike plate and said support frame and for operating said switch.

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12. An auxiliary lock according to claim 1 wherein said lock means includes a bolt element engageable with said lever means, releasable means for retaining said bolt element in locking position relative to said lever means, and key-operated cylinder locks adapted for mounting on either side of a said building member having means for releasing said releasable means, and for disengaging said bolt element from said lever means.

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U.S. Cl. X.R.

70—262, 441; 200—61.64; 340—274