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INT CL⁴ E05B, E05C

(54) Security device

(57) A security device, suitable for affording additional security to a door or window which is already secured with a latch or lock, comprises a bolt, adapted for mounting within the thickness of a door or window for linear movement between a retracted position within the door or window and an extended position in which it engages a socket in a surrounding doorframe or windowframe, and a generally flat bolt plate, adapted for mounting for linear movement between a retracted position and a locking position in which said bolt plate operates to prevent said linear movement of said bolt. In certain illustrated embodiments eg Fig. 2, the bolt plate is adapted to engage a socket in the bolt. In other illustrated embodiments eg Fig. 6, the bolt plate is adapted to engage a spindle to prevent the spindle rotating to retract the bolt.

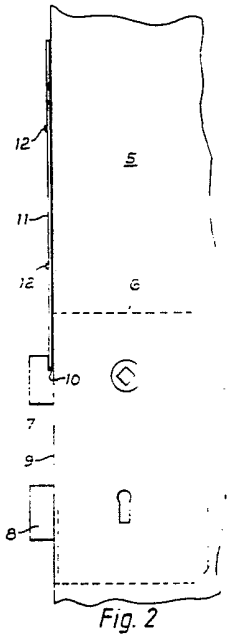

Fig. 2

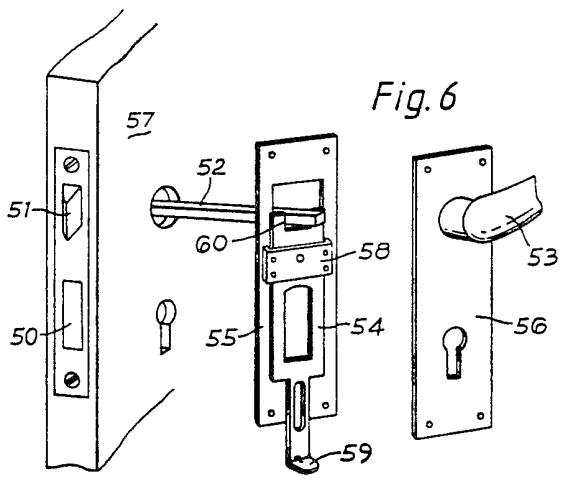

Fig. 6

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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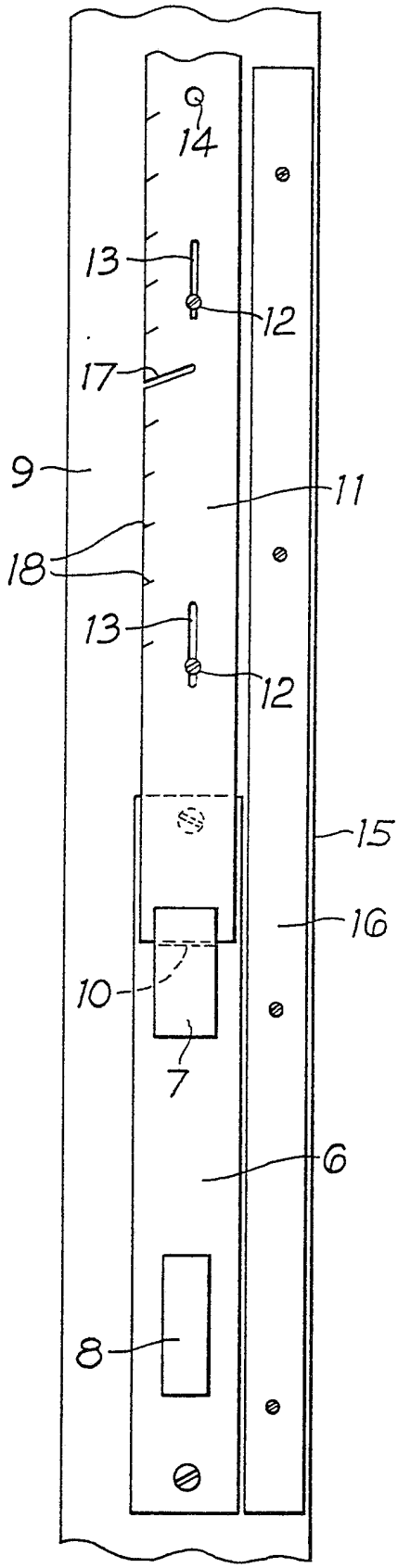

Fig. 1

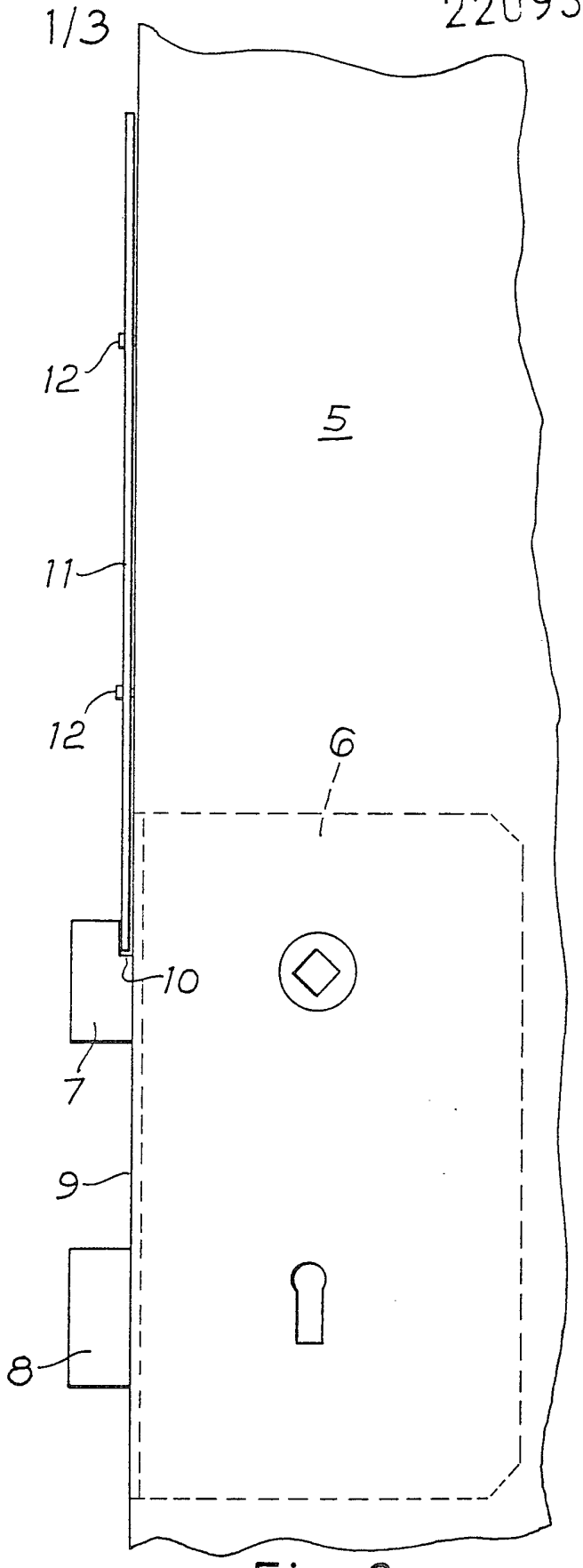

Fig. 2

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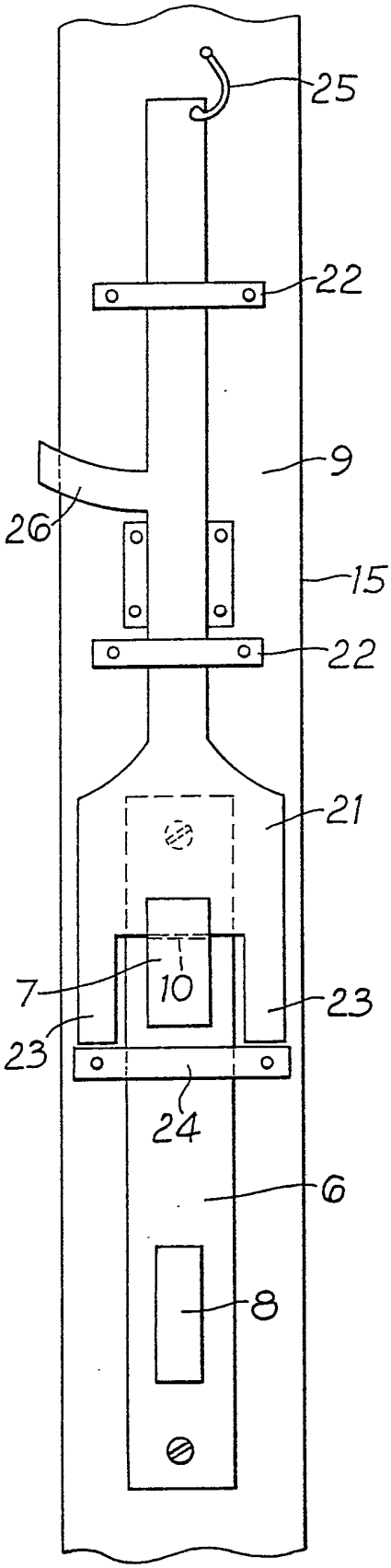

Fig. 3

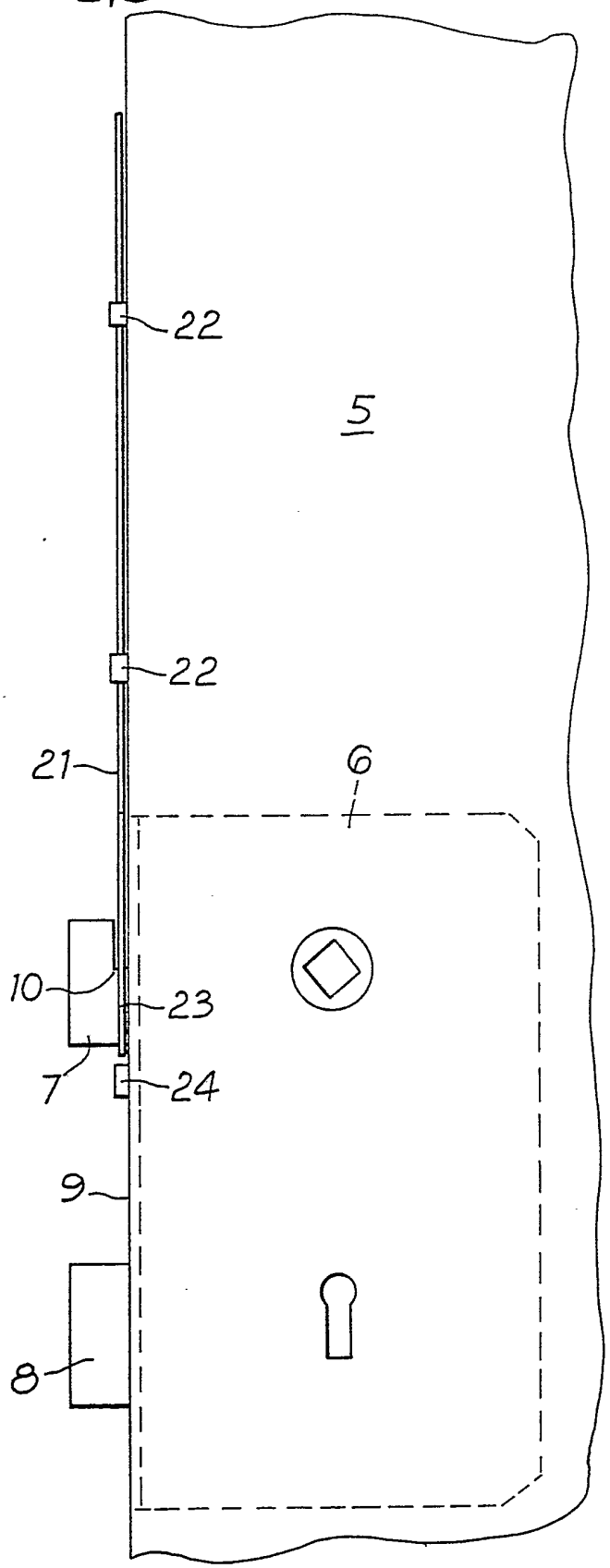

Fig. 4

Fig. 5

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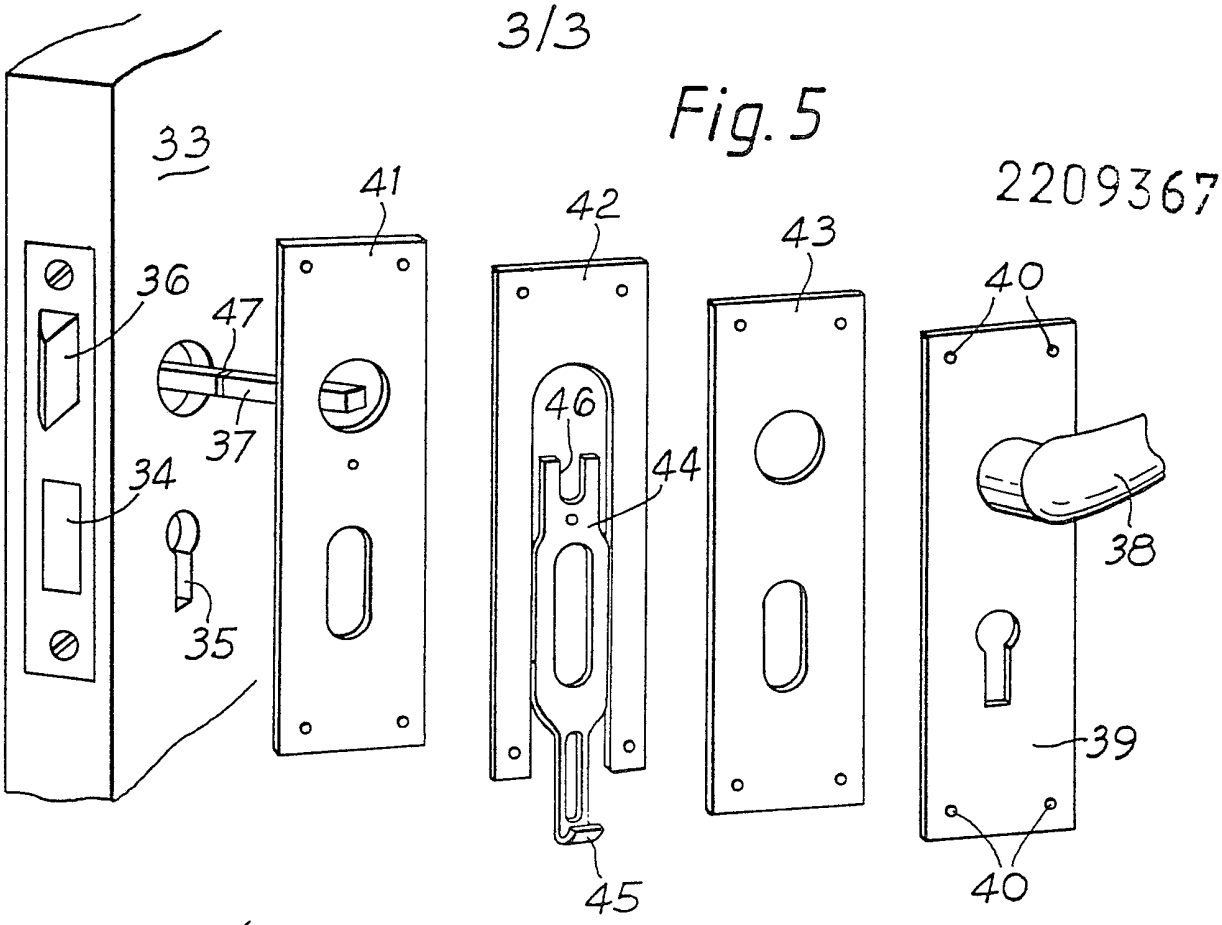
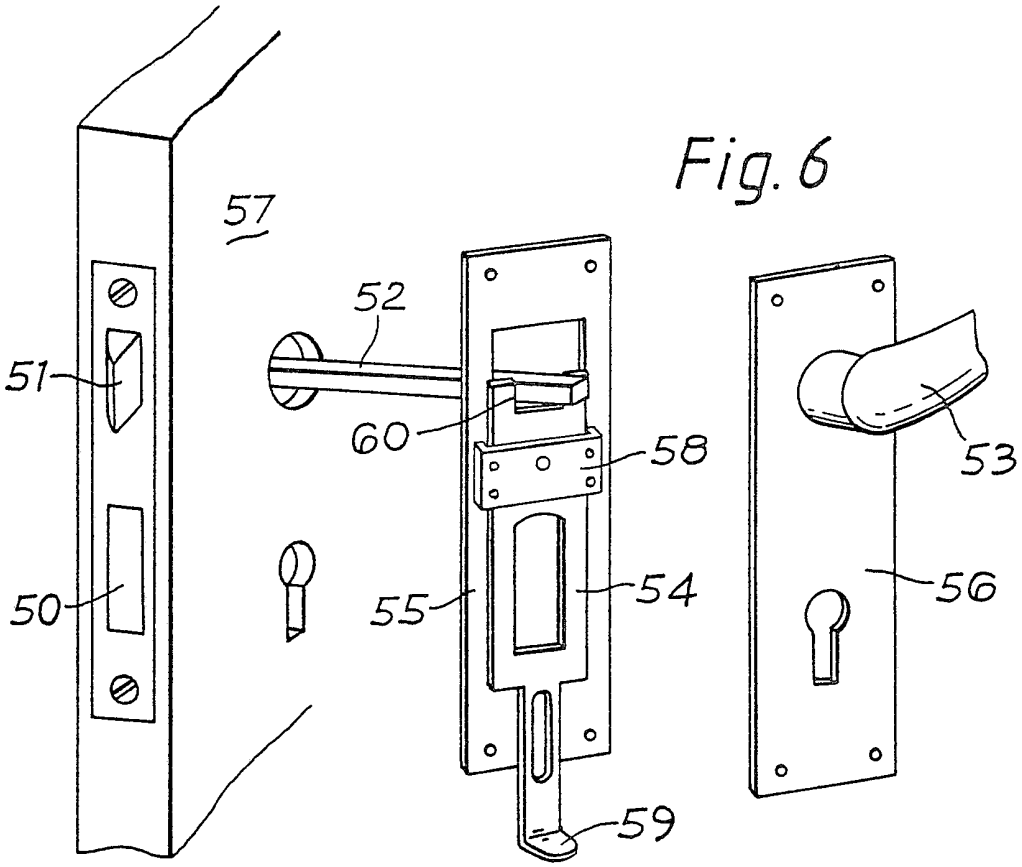


Fig. 6



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Security Device

The present invention is a security device, suitable for affording additional security to doors and windows which are already secured with a latch or lock.

The need to secure domestic and other property against intruders has become progressively more important in recent years and conventional bolts and locks are often insufficient for this purpose. Burglars have become more skilled and more determined and casual burglars have increased in number. However the purchase and fitting of additional security devices may prove too expensive for the average householder. Often the persons at risk, for example elderly persons living alone, are those least able to afford, or least able to fit, the security devices available.

Having gained entry to premises, often the burglar's first concern is to establish a route of quick escape. In other situations, a burglar may introduce a young person through, say, a small window and then that person's first task it to open a door from the inside, in order to admit the burglar and again provide an escape route. Thus in both such circumstances, a burglar is impeded, and burglary may even be prevented, if the door is not readily openable from the inside. In these circumstances a simple sliding bolt or a door chain may prove to be inadequate additional security.

The security device of the present invention has been devised with the object of making available a simple device, which may be produced relatively cheaply and fitted relatively easily and which overcomes or reduces some or all of the disadvantages of such prior additional security devices.

With this object in mind, the security device according to the present invention comprises a bolt, adapted for mounting within the thickness of a door or window for linear movement between a retracted position within the door or window and an extended position in which it engages a socket in a surrounding doorframe or windowframe, and a generally flat bolt plate, adapted for mounting for linear movement between a retracted position and a locking position in which said bolt plate operates to prevent said linear movement of said bolt.

As indicated, the security device may be applied to the securing of either a door or a window. However, to avoid undue repetition, the description hereinafter will be related to the securing of doors. Wherever reference is made to the use of a device in connection with a door, it should be understood that the reference, modified if appropriate, is intended equally to relate to windows.

The device may be applied to external doors but is equally applicable to internal doors. Thus a person in a bedroom or other room may wish to gain additional security by locking not only the outside doors but also the door of the room which he is currently occupying. Moreover the locking of internal doors may be a

useful additional inconvenience to a burglar wishing to move around within the building or to establish a route of quick escape.

The security device according to the present invention may be embodied in various forms. Thus in one form, the bolt plate may be adapted for mounting upon one of the mutually engaging surfaces of the door and doorframe or of the window and windowframe such that, in its locking position, the bolt plate engages a socket in the bolt. Thus the bolt plate penetrates the bolt from the side and prevents the bolt being retracted from its socket in the frame. In this form of the device, the bolt may be a conventional bolt of a doorlock or latch, for example the bolt of a lever lock or other form of tumbler lock or the spring-loaded bolt of a door latch. Where a door latch and a door lock are combined in a single unit, as is the case with many outside doors, the invention may be applied to the bolt of either the latch or the lock. In one alternative form of the security device,the bolt plate is mounted to engage a transverse spindle which extends through the door or window to operate the latch bolt, such that when the bolt plate engages the spindle the latter cannot turn to withdraw the latch bolt. To achieve this end, the bolt plate may be mounted on the inside or outside face of the door or window, rather than on the outer edge thereof.

When the device is of the type wherein the bolt plate directly engages the bolt itself, preferably the bolt plate is mounted on the outer edge surface of the door itself but it may alternatively be mounted on the corresponding surface of the door

frame. Thus, in its linear movement into engagement with the bolt when the door is closed, the bolt plate slides within the narrow space which separates the door and its frame. The bolt plate may be actually let into the door surface but wholly satisfactory results are obtainable when the bolt plate is on the surface; thus the additional work involved in setting the bolt plate within the door surface is unnecessary.

Because, in this form of the invention, the bolt plate is enclosed within a very narrow gap in use, means are preferably provided to simplify the task of moving it between its locking and retracted positions. When the purpose of the device is solely to prevent inward access and the door is such (for example, without windows) that access to the inner side of the device cannot be gained through the fabric of the door itself, then a simple laterally-projecting handle may be provided for moving the bolt plate. Such a handle may be made in a single piece with the bolt plate or may be formed separately and then riveted, bolted or otherwise attached to the bolt plate. When the device is to be fitted in a situation where ready access to the inside of the door can be gained, including by breaking a window pane or thin door panel, the means for moving the bolt plate is preferably disposed wholly within the space between the door and its frame. For example, one or more slots may be cut into an edge of the bolt plate, into which either a narrow screwdriver blade or similar tool or a tool made specifically for the purpose may be fitted to effect movement of the bolt plate. To further mislead or delay a burglar, several dummy notches may

be provided, which may appear in the available restricted view to be similar to the aforesaid slot or slots but which are too shallow, or wrongly directed, to allow the necessary engagement of the relevant tool.

When the bolt plate is designed to engage a socket in the bolt, because the bolt plate is necessarily generally flat, the socket may be a simple narrow slot, cut into the side of the bolt in a direction transverse to the line of action of the bolt. Such a cut may easily be made by a householder with the narrow blade of a hacksaw.

In this bolt-engaging form of the invention, a fixed plate, of similar thickness to the bolt plate or slightly thicker than it, may be mounted on the door or doorframe adjacent to the bolt plate so as to prevent unauthorised access to the end of the bolt plate with a tool, whereby the plate might otherwise be disengaged from the bolt without the use of the legitimate handle or tool.

The form of the invention in which the bolt plate engages a socket in the bolt has proved to be very effective but installation of the device entails either mounting it upon one of the mutually abutting surfaces of the door and doorframe or of the window and windowframe or, if there is insufficient space between those surfaces, actually cutting into the surface in order to fit the bolt plate flush with the surface. The form of the invention wherein the bolt plate engages a bolt-operating spindle has the advantage that it is not necessary to cut into the edge of the door to instal the device. This latter form of the invention is a preferred form.

Thus this preferred form of the invention comprises a bolt, adapted for mounting within the thickness of a door or window for linear movement between a retracted position within the door or window and an extended position in which it engages a socket in a surrounding doorframe or windowframe, a spindle, extending transverse to the line of action of said bolt and adapted by rotation upon its axis to withdraw said bolt into the retracted position of the bolt, and a generally flat bolt plate mounted for linear movement in a direction transverse to the length of said spindle between a retracted position and a locking position in which said bolt plate engages the spindle and restricts or prevents rotation of said spindle.

In this preferred form of the invention, the bolt may be the conventional bolt of a door latch, for example a bolt which is urged into its closed or locking position by a suitable spring. However the bolt may take any other form which is operated by rotation of a spindle extending transverse to the bolt action. Typically, the bolt may be the latch bolt of a unit in which a door latch and a door lock are combined but the invention has the particular advantage that, by application to a simple latch which is normally not lockable, that latch may be converted into a lock.

The bolt, in this preferred form of the invention, is operated by rotation of a transverse spindle, as is the bolt of many door latches. The spindle may be a spindle of the type conventionally used for such latches, which typically is a short length of steel of rectangular, especially square, cross-section, or may be formed with a different cross-section or modified as described hereinafter.

For example, the spindle may be of square cross-section where it engages the bolt mechanism but of modified cross-section in the region of its ends, for example where it engages the door handles.

The generally flat bolt plate is mounted for linear movement transverse to the length of the spindle. To that end, it may be mounted upon the inside or outside face of the door for movement towards and away from the spindle. It is particularly preferred that the plate be mounted upon or within a door handle fitting by means of which a handle for rotating the spindle is mounted upon the door. For example, the handle may be mounted upon the door by means of a flat mounting plate and the bolt plate may be retained between the mounting plate and the door surface, or preferably between guide plates which are themselves retained between the handle mounting plate and the door surface.

The bolt plate engages the spindle from the side of the latter and thus restricts or prevents rotation of the spindle. To achieve this, the bolt plate may be provided with a cut-away slot in one end thereof or a tapered or otherwise suitably shaped aperture, the slot or aperture being of such dimensions as to at least partially surround the spindle and prevent its rotation. The spindle may be of modified cross-section in the area wherein it is engaged by the bolt plate, for example to improve the fit of the bolt plate upon the spindle or to prevent axial movement of the spindle once it is engaged. Thus the spindle may have one or more slots cut into it across its length, so that an intending intruder is prevented from dismantling the device by removing the spindle axially.

It may be that an intending intruder will attempt to force this device by applying very heavy rotational pressure on the handle with the object of rotating the spindle by distorting the bolt plate. While such distortion may be very difficult to achieve, it may nonetheless be desired to provide one or more points of relative weakness in the spindle such that such heavy pressure has the preferential effect of distorting or breaking the spindle, rather than distorting the bolt plate. In one preferred form of the invention, the spindle is of flat rectangular cross-section, either throughout its length or, if desired, in only a part of its length. One or more holes may then be provided, passing through the flat cross-section, to form such a point of relative weakness as aforesaid.

Conveniently a fixed or detachable operating handle is provided, for example in the form of an extension to the bolt plate, to enable the bolt plate to be slid into and out of engagement with the spindle.

In the security device according to the invention, the bolt plate may be made of metal (for example of aluminium or steel), a plastics material or other suitable material or combinations of two or more of these. When the bolt plate is intended to engage the latch spindle, it may be generally rectangular or oval in plan, depending in particular on the shape of the door handle mounting.

When a security device according to the present invention has been fitted to a door, it may be desired to display a warning sticker or sign, advising potential intruders that the property concerned has extra security protection beyond the visible locks and the like.

The invention will now be further described with reference to the accompanying drawings, wherein:-

Fig. 1 is a front elevation of a first embodiment of the security device according to the present invention;

Fig. 2 is a side elevation of the device of Fig. 1;

Fig. 3 is a front elevation of a second embodiment of the security device according to the present invention;

Fig. 4 is a side elevation of the device of Fig. 3;

Fig. 5 is an exploded perspective view of a third embodiment of the security device according to the present invention; and

Fig. 6 is a similar view of a fourth embodiment of the security device according to the invention.

Referring firstly to Figs. 1 and 2, a door 5 is fitted with a combined lock and latch unit 6, which is located in the conventional way within the thickness of the door with a spring-loaded latch bolt 7 and key-operated lock bolt 8 extendable from the edge face 9 of the door into corresponding sockets in the door frame (not shown). The latch bolt 7 has a narrow slot 10 cut vertically into its upper edge.

Mounted on the face 9 of the door 5 is a flat bolt plate 11 of the order of 1 to 2mm thickness. The bolt plate 11 is able to

slide linearly up and down over the door face 9 upon pins 12 which engage elongated slots 13 in the bolt plate. The bolt plate 11 may be held in an upper, retracted position by a peg (not shown) inserted through an aperture 14 in its upper end into a hole in the door face 9. When the bolt plate 11 is moved, or allowed to move under gravity when the peg is removed, into its lower position it enters the slot 10 in the latch bolt 7 and prevents that bolt being withdrawn. Thus even if a potential intruder succeeds in picking the lock and withdrawing the lock bolt 8, the door remains securely locked by means of the latch bolt 7. Any attempt to displace the plate 11 upwardly from the outside 15 of the door is thwarted by a protector plate 16 (omitted from Fig. 2), which is secured to the door surface 9 alongside the bolt plate 11. On the other hand, legitimate lifting of the plate 11 may be achieved by inserting a narrow screwdriver or flat-edged tool into a slot 17 in the edge of the plate 11. A number of dummy slots in the form of notches 18 are also provided in the edge of the plate 11, to mis-lead or confuse an intruder searching for the slot 17.

Referring now to Figs. 3 and 4, in which parts identical to those of Figs. 1 and 2 are identified by the same reference numerals, an alternative form of bolt plate 21 is shown. The plate 21 is retained on the edge face 9 of the door 5 by brackets 22, which allow sufficient linear movement for the plate to slide into and out of engagement with the slot 10 in the bolt 7. The bolt plate 21 is yoke-shaped at its lower end, with arms 23 extending on opposite sides of the bolt 7. Illicit

manipulation of the bolt plate from the outside 15 of the door is prevented by an obstruction bar 24, upon which the arms 23 rest when the bolt plate engages the bolt 7.

In Fig. 3 an alternative means for retaining the bolt plate 21 in its withdrawn position is shown, in the form of a retaining hook 25. This figure also shows an alternative lifting means for the bolt plate, namely a handle 26 integral with the plate 21. This form of lifting means is best used only when access from the outside only of the door needs to be prevented.

The third embodiment of the invention, as illustrated in Fig. 5, is shown as applied to a combined lock and latch unit, set in the thickness of a door 33 in the usual manner. The lock bolt 34 is operated by a key inserted via a keyhole 35 and the spring latch 36 is retractable by rotation of a square-cross-sectioned spindle 37 operated by a handle 38. The door handle 38 is pivotally mounted on a support plate 39, secured to the door by screws inserted via mounting holes 40.

Sandwiched between the face of the door 33 and the support plate 39 are three spacer plates 41, 42 and 43. A bolt plate 44 is slidable between the plates 42 and 43 towards and away from the spindle 37 by operation of a handle 45. In the end of the bolt plate 44 remote from the handle 45 is a square-cut slot 46. The width of the slot 46 may match closely the outer dimension of the spindle 37 such that, when the bolt plate 44 is moved to its uppermost position, the spindle 37 is held against rotation. Alternatively, the width of the slot 46 may be slightly less than that of the spindle 37 and the spindle may be cut to a

shallow depth as shown at 47 to allow the bolt plate 44 to enter the cut and hold the spindle against withdrawal in an axial direction.

The device of Fig. 6 is also shown as applied to a combined lock and latch unit, which includes a lock bolt 50 operated by a key and a sprung latch 51 retractable by rotation of a spindle 52 by a handle 53. In this embodiment, a bolt plate 54, mounted on or in a guide plate 55, is sandwiched between the door handle support plate 56 and the surface of the door 57. The bolt plate 54 is retained on the guide plate 55 by a cross-piece 58 and can be moved linearly by means of a handle 59 between a lower, retracted position and an upper position, as shown, in which a square-cut slot 60 engages the spindle 52 and prevents it rotating. As in the device of Fig. 5, the spindle 52 may be provided with one or two shallow cuts (not shown) to permit the bolt plate to retain the spindle against axial withdrawal.

The operation of the two embodiments of the security device according to the invention illustrated in Figs. 5 and 6 will be readily understood. In each case, when the bolt plate is retracted to its lower limiting position, the lock bolt and latch function normally. However, when the bolt plate (44 or 54) is moved to engage the respective spindle (37 or 52), the spindle cannot rotate and the latch (36 or 51) cannot be withdrawn. In this way the latch has, in effect, become a second lock bolt.

It will be seen that the security device according to the present invention may be manufactured cheaply and installed easily

and may either add security to an existing lock or may be used to convert a latch into a lock. By its use whole buildings or single rooms may be secured. Indeed it could be used to modify the security of a building in such a way that each room is isolated from its neighbours and illicit entry thereby confined to a single room at a time. While in all of the illustrated embodiments the device is in the form of a combined lock and latch, the invention is readily applied with equal simplicity and success to a latch unit which does not include a lock bolt.

CLAIMS

1. A security device which comprises a bolt, adapted for mounting within the thickness of a door or window for linear movement between a retracted position within the door or window and an extended position in which it engages a socket in a surrounding doorframe or windowframe, and a generally flat bolt plate, adapted for mounting for linear movement between a retracted position and a locking position in which said bolt plate operates to prevent said linear movement of said bolt.

2. A security device as claimed in claim 1, wherein the bolt plate is adapted for mounting upon one of the mutually engaging surfaces of the door and doorframe or of the window and windowframe such that, in its said locking position, the bolt plate engages a socket in the bolt.

3. A security device as claimed in claim 2, having one or more slots in an edge of the bolt plate, whereby movement of the bolt plate may be effected.

4. A security device as claimed in claim 2, wherein a handle projects laterally from the bolt plate.

5. A security device as claimed in any of claims 2 to 4, wherein said socket is a narrow slot in the side of the bolt.

6. A security device as claimed in any of claims 2 to 5, wherein a fixed plate is mounted adjacent to the bolt plate to prevent unauthorised access to the latter.

7. A security device as claimed in claim 1, having a spindle, extending transverse to the line of action of the bolt and adapted by rotation upon its axis to withdraw said bolt into the retracted position of the bolt, wherein the bolt plate is mounted for said linear movement in a direction transverse to the length of the spindle and wherein said bolt plate in its locking position engages the spindle and restricts or prevents rotation of the spindle.

8. A security device as claimed in claim 7, wherein the spindle is of modified cross-section in the area wherein it is engaged by the bolt plate.

9. A security device as claimed in claim 8, wherein one or more slots are provided in the spindle in said area.

10. A security device as claimed in any of claims 7 to 9, wherein said spindle is provided with one or more points of relative weakness.

11. A security device as claimed in any of claims 7 to 10, wherein the bolt plate is mounted upon or within a handle fitting by means of which a handle for rotating the spindle may be mounted upon a door or window.

12. A security device as claimed in any of claims 7 to 11, wherein the bolt plate has a slot in one end thereof or a shaped aperture therein, said slot or aperture being of such dimensions as to at least partially surround the spindle and prevent its rotation.

13. A security device as claimed in any of the preceding claims, wherein said bolt plate is made of metal or a plastics material.

14. A security device substantially as hereinbefore described with reference to, and as illustrated in, Figs. 1 and 2 or Figs. 3 and 4 of the accompanying drawings.

15. A security device substantially as hereinbefore described with reference to, and as illustrated in, Fig. 5 or Fig. 6 of the accompanying drawings.

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