

Improved Security Arrangements

The present invention concerns improved security arrangements and is particularly concerned with security arrangements for hinged doors and similar arrangements, for example, hinged windows and gates. In this specification the term door is intended to cover windows, gates and other similar structures.

There have been many proposals to provide security arrangements for doors which offer greater security than existing arrangements, for example mortise locks, bolts and security chains. One such arrangement includes a bar which is mounted in the door frame or the door cill and is movable from a retracted position in which the door can swing open to an extended position in which it extends over an edge region of the door. The bar can extend along substantially the entire length or width of the door, depending on whether it is frame or cill mounted.

Modern building and door construction techniques call for standardisation, that is, doors are of standard dimensions, openings built into walls for doors are of standard dimensions. Consequently door frames occupying the space between the door and the door opening are of standard dimensions.

The mechanisms required to operate security arrangements including elongate bars of the types described above are bulky and cannot be fitted to a door frame without modifying also the building structure surrounding the door frame. As a result they are sometimes mounted in a non-standard door space. Additionally there is an obvious requirement of reliability from these mechanisms as a failure could cause an inability to secure the door or, perhaps worse still, an inability to open the door. It has been partially due to the search for reliability that operating mechanisms have been bulky.

It has also been recognised that users of door security systems are reluctant to use the systems consistently if the operating mechanism is

inconvenient. They tend to leave doors unsecured in such circumstances.

According to the present invention there is provided a door security arrangement comprising a frame member adapted for mounting alongside an edge of a hinged door which, in use, is not hinged and has an abutment face lying in a plane parallel to the hinge axis, an elongate member slidably mounted in the frame member and having a length which is generally equal to the length of the edge of the door against which it is mounted, the elongate member being movable from a retracted position in which it permits the door to swing past it to an extended position in which it locks the door and lies alongside the abutment face of the door, operating means being provided within the frame member to move the elongate member between said extended and retracted positions and hold it in said positions, said means comprising an operating bar slidably mounted to the frame member alongside the elongate member and substantially parallel to it, the operating bar including first means cooperable with corresponding means on the elongate member and moving means for reciprocating the operating bar in a direction substantially transverse to the movement of the elongate member.

Preferably said first means comprises at least one guide channel and said corresponding means includes a pin for each guide channel extending from the elongate member in the guide channel.

Preferably the elongate member is moveable from said extended position to first and second retracted positions.

A door security arrangement comprising a frame member adapted for mounting alongside one edge of a hinged door which, in use, is not hinged, an elongate member slidably mounted in the frame member and moveable from a retracted position to an extended position in which it locks the door and a recess in the said edge of the door for accommodating the elongate member, the elongate member being moveable from its extended position in which it occupies said rebate to lock the door and first and second retracted positions,

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said edge of the door having a protrusion extending in the direction away from the door hinge on one side of the rebate, the elongate member engaging the protrusion when it occupies said first retracted position to allow the door to open in one direction and lying clear of the protrusion when it occupies said second retracted position to allow the door to open in both directions.

Preferably the elongate member is supported in the frame member by a rail and roller assembly.

Preferably the means for reciprocating the operating bar includes a motor having an output crank to which is pivotally connected by one of its ends a connecting rod, the other end of which is connected to the operating bar.

Preferably the connection of the other end of the connecting rod to the operating bar includes a bracket assembly fixable to the operating bar and through which the connecting rod is slidably mounted, a coil spring fixed at its end remote from the bracket assembly to the connecting rod, arranged on the side of the bracket assembly adjacent the crank and an end stop on the connecting member.

Preferably the motor is an electric motor. It may be a pneumatic, hydraulic or clockwork motor.

Preferably motor control means are provided and include an actuating assembly, means for constraining the motor such that in an operating cycle it rotates the output crank through half of a revolution and limit switches cooperable with the operating bar to detect the end of its movement in each direction.

Preferably the actuating assembly incorporates a timer and a reed or similar switch, the reed switch being cooperable with a magnet mountable on the door such that when the door is closed, after a predetermined time delay controlled by the timer, the actuating means actuates the motor.



Preferably each guide channel includes a section which is inclined relative to the longitudinal axis of the operating bar, movement of a guide pin from one end of the inclined section to the other causing movement of the elongate member between the extended and retracted positions.

Alternatively each guide channel has two transversely spaced inclined sections.

Preferably the guide channels comprise first and second longitudinally extending sections which are spaced from each other relative to the transverse and longitudinal axes of the bar, said inclined section joining said spaced sections.

Preferably said second inclined section extends from the upper end of the upper longitudinally extending section.

Preferably a release and reconnection mechanism is provided to disconnect and reconnect the operating bar from and to the motor and includes a bracket assembly slidable over the operating bar and to which the other end of the connecting member is attached, the bracket including a pin, movable into an aligned hole in the operating bar such that the bracket moves with the bar and out of the aligned hole such that the bar can move through the bracket.

Preferably the pin is movable by a bell crank pivotally mounted on the bracket assembly and acting at one end on the pin and fixed at the other end to an operating cable.

Preferably the operating cable is actuable by a handle mounted to the exterior of the door frame on the side thereof remote from the elongate member.

Preferably an additional hole is provided in the operating bar aligned

with the pin when the bar has moved to a position where each guide pin has travelled to the end of the additional section of the guide channel.

Preferably the additional hole has an inclined face leading therefrom to enable the pin to move out of the hole against the action of its biasing spring on movement of the bracket assembly in one direction and to move the bar with the bracket assembly on movement of the bracket assembly in the other direction.

Preferably a ratchet and pawl assembly is provided to hold the operating bar against movement when the pawl engages the ratchet. The release means for the pawl is connected to the operating cable.

Preferably an additional bell crank and cable assembly is provided and is actuable by an electro-magnet which may be actuated by a remote device.

Preferably a battery for operating the motor is incorporated in the door frame.

Preferably means are provided in or on or adjacent the door frame for charging the battery, the means comprising solar panels and/or a trickle charger connected to a mains electric supply.

Preferably the actuating means includes a mechanical or electronic key, or a swipe card or radio control arrangement or any other suitable signalling device.

Preferably the frame is fabricated from sheet steel formed into a channel section and a cover plate.

An embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

Fig. 1 is an elevation of part of a door and its frame at the unhinged edge of the door.

Fig. 2 is a sectional elevation taken on the line II.II of Fig. 1.

Fig. 3 is a detailed view of part of Fig. 2 showing a driving motor;

Fig. 4 is an elevation of an operating bar;

Fig. 5 is an elevation of an elongate member;

Figs. 6 and 7 are detailed elevations to an enlarged scale of the operating bar and elongate member in two different operating conditions;

Fig. 8 is a further detailed view from Fig. 2 of a release mechanism to an enlarged scale; and

Fig. 9 is a cross-section taken on the line IX.IX of Fig. 8.

Figs. 10, 11 and 12 are diagrammatic plans of a door frame and the edge of a door opposite from the hinged edge with a locking arrangement in, respectively, extended first retracted and second retracted positions.

Figs. 13, 14 and 15 are views corresponding to Figs. 6 and 7 of a modified arrangement providing and corresponding to the position shown in Figs. 10 to 12.

Fig. 16 shows a detailed view of a modified release mechanism; and

Fig. 17 shows a side elevation of the details shown in Fig. 16.

A door frame 10 is fabricated from sheet steel and comprise a first channel shaped member 12 and a second cover member 14, the cover member

defining in that section 20 of the door frame adjacent the edge 16 of the door which is not hinged, a slot (not shown) in which is mounted a rectangular cross-section elongate member 22 which can be moved from an extended or locking position, shown in the chain line 24 in Fig. 1 to a retracted position in which the outer edge 26 of the elongate member 22 lies alongside the frame cover member 14 or below it thereby allowing the door to swing past the frame and elongate member. The door is prevented from hinging beyond its closed position by the normal clapping strip of the frame (not shown). When locked by the security arrangement it is prevented from opening by the elongate member which overlies the inner, abutment face 18 of the door.

The elongate member 22 is provided with two or more roller bearings 28 near its upper end 30, the bearings being spaced apart in the direction of the longitudinal axis of the elongate member by a distance which is substantially equal to the thickness of a horizontally extending mounting plate 32 fixed to the frame member 10 adjacent its upper end.

At spaced locations along the length of the elongate member 22 there are provided operating pins 34 each of which carries a roller bearing 36.

The door frame 10 is provided also with mounting members 38 in which an elongate operating bar 40 is slidably mounted for movement between a first upper extreme position (Fig. 6) to a second lower extreme position (Fig. 7). A spring 41 downwardly biases the bar 40. The operating bar 40 is provided with a guide slot or channel 42 for each pin of the elongate member 22. Each guide channel 42 comprises a first section 44 extending in the longitudinal direction of the operating bar and a second section 46 which is transversely and longitudinally spaced from the first section 44 and is joined to the first section by an inclined mid-section 48. The bearings and pins 34, 36 of the elongate member 22 are mounted in the guide channels 42. It will be realised that with the pins and bearings of the elongate member occupying the upper ends of the guide channels (Fig. 7) movement of the operating bar 40 in an upwards direction (bearing in mind the elongate member is constrained to move only in

a transverse direction by the roller and rail assembly 28,32) causes transverse movement of the elongate member 22 when the pins travel across the inclined sections 48. Thus vertical movement of the operating bar moves the elongate member between its extended and retracted positions (Figs. 6 and 7 respectively). It will also be realised that when the pins occupy the section 44, 146 which are at 90° to the elongate member it effectively locks in there positions.

Movement of the operating bar is caused by an electric motor 50 mounted within the frame 10 and driving an output crank 52 which has a connecting member 54 pivotally mounted thereto. The connecting member 54 is slidably mounted in a bracket assembly 76 mounted on the operating bar 40 and is surrounded, on the side of the bracket adjacent to the motor by a coil spring 60, the outer end of which engages an abutment 61 on the connecting member. The connecting member 54 has an adjustable end stop 57 at its outer end which abuts the bracket assembly 76. It will be realised that a half rotation of the crank 52 will result in movement of the operating bar 40 along its longitudinal axis and that movement of the crank through the other half rotation will result in a reverse movement of the operating bar 40.

An electric supply is provided for the electric motor and conveniently comprises a battery 62 mounted within the frame member 10 and charging means (not shown) for the battery. The charging means may be solar powered or may comprise a trickle charger connected to a mains supply. Electronic control means 64 are provided for the motor 50. These include a pair or limit switches 66 cooperable with limit switch actuating members 68 on the operating bar 40, the limit switches 66 being located such that they sense the full extent of movement of the operating bar to cause the motor to stop. The actuating means comprise also a movement initiator (not shown) which may comprise a switch or a push button or a key or a magnetic swipe card or key and reader assembly or a hand-held radio transmitter and receiver assembly. Actuation of these means initiates a first half revolution of the motor 50.

The actuation means include also a reed or proximity switch 68 which senses a magnet 70 mounted in the edge of the door 18 such that when the door is closed the reed switch is actuated to cause movement of the motor which ultimately causes extension of the elongate member into its locking position. Conveniently a variable delay timer 72 is incorporated in the control means between the reed switch 68 and the motor 50 such that the locking of the door is delayed for a predetermined but adjustable time after the door has been closed. A time delay can be incorporated in an opening cycle.

An additional manually operated release mechanism shown diagrammatically in Figs. 2 to 4 by the reference 80 is illustrated in detail in Figs. 8 and 9 connects the connecting rod 54 to the operating bar 40. It comprises a bracket assembly 76 to which the other end of the connecting member 54 is attached and which is slidably mounted to the operating bar. The bracket assembly 76 slidably mounts a locking pin 74 which is movable from an extended position in which it penetrates an aligned hole 82 in the operating bar 40 and a retracted position in which it is free from the hole, thereby enabling relative movement between the operating bar and the bracket and consequently the connecting member 54. Two cable operated release mechanisms are provided for the pin 74 which is spring urged to its locking position by a coil spring 78 which is compressed between the bracket 76 and a plate 84 fixed to the pin. Each cable release mechanism includes a bell crank 86 pivotally mounted to the bracket assembly 76 with one end of the crank abutting the plate 84 and the other end being attached to an operating cable 88. The operating cables 88 are the inner cables of Bowden cable assemblies 90, the covers of which are fixed to the bracket assembly 76. One of the cables 88 has an operating handle fixed to its outer end, the operating handle being mounted on the door frame on that side of the door remote from the elongate member. Thus, in an emergency, the handle can be pulled causing disengagement of the operating bar 40 under the influence of gravity and spring 41 and retraction of the elongate member 22. The other cable is connected to an electro-magnet which is actuated remotely by any suitable device so that, if required, the normal actuating mechanism for the elongate member can be disengaged, for

example in an emergency.

The coil spring 60 surrounding the other end of the operating member 54 has a length which is equal to the length of the stroke of the operating member and is of a value which is just under the output torque of the motor. This means that if any part of the security arrangement jams during a locking operation the motor will continue to rotate and will overcome the spring force thereby imparting no movement to the bracket assembly 76 and the operating bar 40. After the first half cycle of motor rotation is completed it will move into the second half cycle thereby returning the arrangement to the position where the elongate member is retracted. This preserves the motor and enables the cause of the jam to be released without the door being locked in the closed position.

The modification of the invention illustrated in Figs. 10 to 17 is intended to for use with a hinged door which, in certain circumstances, can open in both directions. This application is particularly useful for a prison cell door which normally opens inwards into the cell. It is, however, convenient that on occasions, for example, if a prisoner barricades the door, that it can open outwardly. The door frame and hinges require modification to allow inward and outward opening and the security arrangement described above with reference to Figs. 1 to 9 is modified in a manner to be described below.

One modification is that the elongate member 22 which, as illustrated in Fig. 1 in its extended position lay alongside an outer face of the door, in the modification in its extended position, occupies a longitudinally extending rectangular rebate 110 which extends along the edge 16 of the door opposite to the hinged edge and defines the abutment face 18 for locking the door. A protrusion 112 is formed from the door edge 16 and extends in the direction away from the hinged edge to provide a door stop normally preventing outward opening of the door, that is movement in an anti-clockwise direction as shown in Figs. 10 to 12. Fig. 10 shows the door secured in a closed position by the extended elongate member 22. Fig. 11 shows the elongate member in a first

retracted position in which the door can open inwards, that is clockwise in the drawings and Fig. 12 shows the elongate member in a second, fully retracted position in which it is clear of the protrusion 112 and allows the door to swing open in both the inwards and outwards directions.

Conveniently, the edge 16 of the door is reinforced by a profiled steel or plastic reinforcing member 114.

Movement of the elongate member 22 between the extended position shown in Fig. 10 and the partially retracted position shown in Fig. 11 is achieved by the apparatus and in the manner described above and illustrated with reference to Figs. 1 to 9.

It is intended that the additional movement of the elongate member 22 to the second retracted position and its return to the extended door locking position illustrated in Fig. 10 can be achieved by the motor 50 without modification thereto.

Figs. 13, 14 and 15 illustrate a modified operating bar 140 and an elongate member 22 in the three positions corresponding to Figs. 10, 11 and 12 respectively, that is extended, and retracted to the first and second retracted

positions. It will be evident from Figs. 13 to 15 that the modified operating bar 140 has modified guide channels 142, the modification comprising an incline extension 144 leading from the upper end of the first section 44.

The operation of the security arrangement between the positions illustrated in Figs. 10 and 13 and 11 and 14 is as described above with reference to Figs. 1 to 9 but in an emergency situation when retraction of the elongate member to the second fully retracted position is called for to allow the door to hinge outwardly and inwardly, the extension 144 at the top of the guide 142, when the modified operated bar 140 is moved downwardly (to be described below) from the position shown in Fig. 14 to the position shown in Fig. 15

allows the operating pin 34 to move to the upper end of the guide channel 142 thus moving the locking bar to the second fully retracted position shown in Figs. 12 and 15.

The downward movement of the operating bar 140 to its lowermost position is activated by operation of the release cable 88 which is mounted in a modified manner to the bracket assembly 76 as illustrated in Figs. 16 and 17. In this modification, the operating bar 140 rather than being the single member illustrated in Figs. 1 to 9 is a member fabricated from plate sections 150 in which the guide channels 142 are cut and smaller dimensioned interconnecting sections 152 to which the plate sections 150 are fixed.

On actuation of the cable 88 by a remote release handle or other device, the bell crank 86 is pivoted to retract the pin 74 from the hole 82 and, under the influence of gravity and spring 41, the operating bar 140 is allowed to move to its lowest position, as illustrated in Fig. 15. The door can then be swung in either direction and when it is returned to its normal closed position, it is required that actuation of the motor 50 returns the elongate member 22 initially to its first retracted position, permitting one way door opening as shown in Fig. 11 and thereafter to its fully extended locking position as shown in Fig. 10.

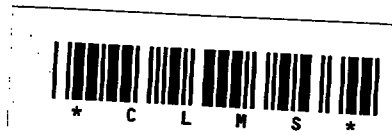
It will be realised that one rotation of the motor 50 cannot result in sufficient vertical movement of the operating bar 140 to move it from its lowermost position as illustrated in Fig. 15 to its uppermost position as illustrated in Fig. 13. In fact, two rotations are required.

As illustrated in Fig. 16 an auxiliary hole 182 is formed in the operating bar. The hole is formed by punching out three sides of a rectangle to form a tongue 184 attached by its lower end to the operating bar and deforming the tongue outwardly to form an incline surface 186 and a downwardly facing surface 190 against which the pin 74 may abut.

When the operating bar 140 is in its lowermost position (Fig. 15), the locking pin 74 under the action of its spring 78 moves into the auxiliary hole 182 so that the operating bar 140 is connected to the bracket assembly 76 as it is moved in the upward direction by the connecting member 54. Half a rotation of the crank moves the operating bar 140 to the position shown in Fig. 14 at which stage a pawl 120 of pawl assembly engages a ratchet 122 mounted to a fixed member 124 of the door frame 10. This engagement prevents the downward movement of the operating bar 140 as the crank 52 further rotates, this rotation causing movement of the bracket assembly 76 over the operating bar 140 in a relatively downwards direction, this movement being possible due to the inclined surface 186 which does not impede relative movement between the operating bar 140 and the bracket assembly 76 but merely retraction of the pin 74 until it becomes aligned with the hole 82 at which point it engages the hole 82 under the influence of its spring 78 as shown in Fig. 16. Thereafter further rotation of the motor 50 and crank 52 results in the return of the operating bar 140 to its uppermost position as illustrated in Fig. 13, this second phase of movement being exactly similar to that described with reference to Figs. 1 to 9. During this movement the end of cable 88 is free to slid through the arm 86.

It will be observed from Fig. 17 that the pawl 120 is mounted on a auxiliary bracket 176 fixed to the operating bar 140 above the slidable bracket assembly 76. The auxiliary bracket carries a pivot bar 128, on which the pawl 120 is mounted and a mounting arm 126 through the outer end of which passes the inner cable 88 of the release cable assembly, the outer member 90 of the cable being fixed to the bracket 176. A coil spring 130 surrounding the inner cable 88 is interposed between the bracket assembly 176 and the end of the arm 126 to bias the pawl to the ratchet engaging position. A stop 132 is fitted to the inner cable 88 and when the cable is moved to retract the pin 74 from the hole 82 during the initial release of the door the stop abuts the arm 126 to disengage the pawl 120 from the ratchet 122 against the action of spring 130 which normally holds the pawl in the engaged position.

Various other modifications can be made without departing from the scope of the invention, for example the electric motor can be replaced by hydraulic, pneumatic, clockwork or hand operated arrangements providing rotation of the crank shaft. The crank shaft and connecting rod assembly can be replaced by a rack and pinion or other suitable mechanical assembly. The guide channels can take different shapes. The elongate member can be arranged alongside the top or bottom of the door as an alternative to or in addition to side mounting. In a further modification the elongate member can be mounted mid-way across the frame in a one way opening door such that in its extended position it occupies a longitudinally extending slot formed in the edge of the door. In a still further modification the security arrangement can include two elongate members each with its associated moving mechanism and control so that the door can be locked on both sides or either side at the operator's option.

CLAIMS

1. A door security arrangement comprising a frame member adapted for mounting alongside an edge of a hinged door which, in use, is not hinged and has an abutment face lying in a plane parallel to the hinge axis, an elongate member slidably mounted in the frame member and having a length which is generally equal to the length of the edge of the door against which it is mounted, the elongate member being movable from a retracted position in which it permits the door to swing past it to an extended position in which it locks the door and lies alongside the abutment face of the door, operating means being provided within the frame member to move the elongate member between said extended and retracted positions and hold it in said positions, characterised in that said means comprises an operating bar (40, 140) slidably mounted to the frame member (10) alongside the elongate member (22) and substantially parallel to it, the operating bar (40,140) including first means (42,142) cooperable with corresponding means (34) on the elongate member (22) and moving means (50,52,54) for reciprocating the operating bar (40,140) in a direction substantially transverse to the movement of the elongate member (22).
2. A door security arrangement as claimed in claim 1, characterised in that said first means comprises at least one guide channel (42, 142) and said corresponding means includes a pin (34) for each guide channel extending from the elongate member (22) into the guide channel.
3. A door security arrangement as claimed in claim 1 or claim 2, characterised in that the elongate member (22) is moveable from said extended position to first and second retracted positions.
4. A door security arrangement comprising a frame member adapted for mounting alongside an edge of a hinged door which, in use, is not hinged, an elongate member slidably mounted in the frame member and moveable from a retracted position to an extended position in which it locks the door and a

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recess in the said edge of the door for accommodating the elongate member characterised in that the elongate member (22) is moveable from its extended position in which it occupies said rebate (110) to lock the door and first and second retracted positions, said edge of the door (18) having a protrusion (112) extending in the direction away from the door hinge on one side of the rebate (11), the elongate member (22) engaging the protrusion (112) when it occupies said first retracted position to allow the door to open in one direction and lying clear of the protrusion when it occupies said second retracted position to allow the door to open in both directions.

5. A door security arrangement as claimed in claim 4, characterised in that operating means are provided in the frame member to move the elongate member (22) between said extended and retracted positions and hold it in said positions, said means comprising an operating bar (40, 140) including guide channels (42, 142) co-operable with pins (134) extending from the elongate member (42) and means (50, 52, 54) for reciprocating the operating bar (40, 140) in a direction substantially transverse to the movement of the elongate member.

6. A door security arrangement as claimed in any preceding claim, characterised in that the elongate member (22) is supported in the frame member (10) by a rail and roller assembly (32,28).

7. A door security arrangement as claimed in any of the preceding claims characterised in that the means for reciprocating the operating bar includes a motor (50) having an output crank (52) to which is pivotally connected by one of its ends a connecting rod (54), the other end of which is connected to the operating bar (40,140).

8. A door security arrangement as claimed in claim 7, characterised in that the connection of the other end of the connecting rod (54) to the operating bar (40,140) includes a bracket assembly (76) fixable to the operating bar (40,140) and through which the connecting rod (54) is slidably mounted, a coil spring





(60) fixed at its end remote from the bracket assembly (76) to the connecting rod (54), arranged on the side of the bracket assembly adjacent the crank (52) and an end stop (57) on the connecting member.

9. A door security arrangement as claimed in claim 7 or claim 8, characterised in that motor control means are provided and include an actuating assembly (68,70,72) means for constraining the motor such that in an operating cycle it rotates the output crank through half of a revolution and limits switches (66) cooperable with the operating bar (40,140) to detect the end of its movement in each direction.

10. A door security arrangement as claimed in claim 9, characterised in that the actuating assembly incorporates a timer (72) and a reed or similar switch (68), the reed switch (68) being cooperable with a magnet (70) mountable on the door such that when the door is closed, after a predetermined time delay controlled by the timer, the actuating means actuates the motor.

11. A door security arrangement as claimed in any of claims 7 to 10, characterises in that each guide channel (42,142) includes a section (48) which is inclined relative to the longitudinal axis of the operating bar (40,140), movement of a guide pin (34) from one end of the inclined section (48) to the other causing movement of the elongate member (22) between the extended and retracted positions.

12. A door security arrangement as claimed in claim 11, characterised in that each guide channel has two transversely spaced inclined sections (48,144).

13. A door security arrangement as claimed in claim 11 or claim 12, characterised in that the guide channels (42,142) comprise first and second longitudinally extending sections (44,46) which are spaced from each other relative to the transverse and longitudinal axes of the bar, said inclined section (48) joining said spaced sections.

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14. A door security arrangement as claimed in claim 12 or claim 13, characterised in that said second inclined section (144) extends from the upper end of the upper longitudinally extending section (44).
15. A door security arrangement as claimed in any of claims 7 to 14, characterised in that a release and reconnection mechanism is provided to disconnect and reconnect the operating bar (40,140) from and to the motor (50) and includes a bracket assembly (76) slidable over the operating bar and to which the other end of the connecting member (54) is attached, the bracket (76) including a pin (74), movable into an aligned hole (82) in the operating bar such that the bracket moves with the bar and out of the aligned hole such that the bar can move through the bracket.
16. A door security arrangement as claimed in claim 15, characterised in that the pin (74) is moveable by a bell crank (86) pivotally mounted on the bracket assembly (76) and acting at one end on the pin and fixed at the other end to an operating cable (88,90).
17. A door security arrangement as claimed in claim 16, characterised in that the operating cable (88,90) is actuable by a handle mounted to the exterior of the door frame (10) on the side thereof remote from the elongate member (22).
18. A door security arrangement as claimed in any of claims 15 to 17, characterised in that an additional hole (182) is provided in the operating bar (140) aligned with the pin (74) when the bar has moved to a position where each guide pin has travelled to the end of the additional section (144) of the guide channel (42).
19. A door security arrangement as claimed in claim 18, characterised in that the additional hole (182) has an inclined face (186) leading therefrom to enable the pin (74) to move out of the hole (182) against the action of its biasing spring (74) on movement of the bracket assembly (76) in one direction and to move the bar (140) with the bracket assembly (76) on movement of the





bracket assembly in the other direction.

20. A door security arrangement as claimed in claim 19, characterised in that a ratchet and pawl assembly is provided to hold the operating bar against movement when the pawl (120) engages the ratchet (122).

21. A door security arrangement as claimed in claim 20, characterised in that the release means (126,128) for the pawl (120) is connected to the operating cable (88,90).

22. A door security arrangement as claimed in any of claims 16 to 21, characterised in that an additional bell crank (86) and cable assembly (88,90) is provided and is actuable by an electro-magnet which may be actuated by a remote device.

23. A door security arrangement as claimed in any of claims 7 to 22, characterised in that a battery (62) for operating the motor (50) is incorporated in the door frame (10).

24. A door security arrangement comprising an operating means having an operating bar moveable in first and second substantially opposite directions, an elongate member constrained to move in third and fourth substantially opposite directions, which are substantially perpendicular to the movements of the operating bar and guide formations connecting said operating bar and elongate member, whereby movement of the operating bar in said first or second opposite directions is translated by the guide formations to respective movement of the elongate member in said third and fourth directions.

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