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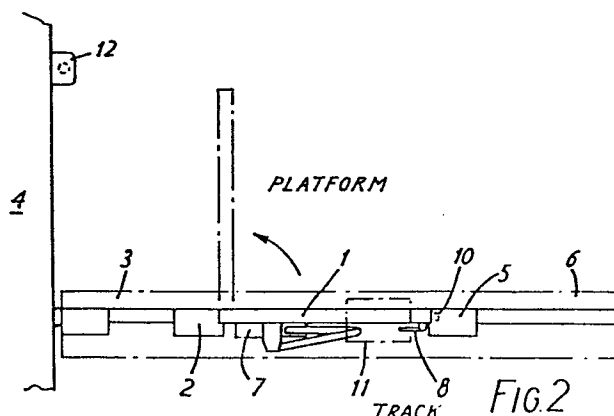
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(54) **Electric door lock mechanism, particularly for use in emergency exits.**

(57) A lock mechanism particularly suitable for an emergency door in a railway platform edge screen. The door is normally locked shut but on the side facing the track has a panic handle for emergency use. On the platform side a "secret" means is provided for unlocking the door which releases a movable latch keeper which normally locks the door by positively engaging a latch bolt. The keeper is prevented from moving by a locking means held in position by the armature of an energised solenoid. The "secret" unlocking means temporarily de-energises the solenoid which withdraws the locking means permitting movement of the keeper if the door is opened. After a predetermined delay period the solenoid is re-energised and the door is automatically re-locked.



Electric door lock

5 The invention relates to an electric door lock mechanism, particularly for use with emergency access doors especially of the type which are required to provide emergency access in one direction only but also to permit occasional use of the door in the opposite direction.

10 Doors of the type referred to are normally locked in the closed position and have on one side a so-called "panic handle" with which the door lock mechanism may be operated to unlock the door, thus, permitting it to be opened. On the opposite side of the door there may be no immediately apparent means for unlocking the
15 door, although, some concealed or secure means is usually provided in order that the locked mechanism may be freed.

20 According to the present invention there is provided a door lock mechanism comprising for the door a latch mechanism, and for an adjacent door jamb a co-operating movable latch keeper which, in use, is arranged to positively engage with the latch mechanism to secure the door in a closed position, first
25 unlocking means accessible on one side of the door for manually withdrawing the latch mechanism to permit the door to be opened from that side, and second unlocking means located remotely from the door and arranged to free the movable latch keeper thereby permitting the
30 door to be opened from the other side.

35 Preferably the second unlocking means is provided with a delay timer arranged such that at the end of a predetermined period following actuation the movable latch striker is re-locked so that the door is again secured in a closed position.

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The invention and how it may be carried into practice will now be described, by way of example only, with reference to the accompanying drawings in which:

5 Fig. 1 is a detail of a side elevation of a railway platform screen emergency access door,

 Fig. 2 is a plan view of that part of the screen of Fig. 1 and showing both sides of the door.

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 Fig. 3 illustrates the major components of the latch mechanism, and

 Fig. 4 shows a circuit diagram of an electrical
15 control of the latch arrangement of Fig. 3.

 The emergency access door of the drawings is part of a railway platform edge screen, the emergency door being located at the end of the platform adjacent an
20 end wall. It is intended to permit emergency access from the trackside only onto the platform. Such a platform screen in some countries, is required at underground railway stations. The emergency access door is located, then, at a platform end facing a
25 tunnel and is intended for emergency access from the tunnel onto the safety of the platform.

 In normal circumstances an access door of this type must be locked against persons attempting to gain entry
30 to the railway tunnel from the platform. However, it is preferably still available to be used by authorised personnel wishing to gain access to the railway tunnel for example for maintenance purposes. For this reason the platform side of the door is provided with a
35 concealed release mechanism which, in the example being described, is energised by a remotely mounted controller.

Referring to the drawings, the emergency door is viewed from the track side in Fig. 1. The door is indicated at 1 and is hinged on its left side, in the drawing, to a vertical post 2 in an end section 3 of the platform screen lying between the door 1 and a wall 4 (see Fig. 2). The door 1 closes against a vertical jamb 5 forming part of the main platform screen 6.

At the head of the door there is mounted a door close mechanism 7, e.g. a spring assisted pneumatic closer, which automatically returns the door to the closed position. At normal door handle height there is provided a panic handle 8 mounted on the track side of the door 1 connected with a latch mechanism generally indicated at 9 including a latch bar which engages with a striker mechanism mounted in the door jamb 5. The latch mechanism 9 comprises a conventional horizontally moving latch bar and withdrawal mechanism operable by rotation of a horizontal rotary member, connected to be rotated by the handle 8 which is pivoted about a vertical axis through one edge.

A strike mechanism 10 mounted in the door jamb 5 to engage the latch bar or bolt of the door is shown in Fig. 3. This mechanism comprises a pivoted striker or keeper 20 pivotally mounted on a vertical axis pin 21 and biased by a keeper spring 22 towards the engaged position. In Fig. 3 looking downwards in the drawing the spring 22 biases the keeper 20 in a clockwise direction. The keeper 20 is prevented moving in an anti-clockwise direction by a locking pin 23 abutting its flat rear face 24. It is also prevented from turning in the opposite direction by its hidden vertical face abutting a fixed part of the door jamb, shown shaded in the drawing.

The locking pin 23, actually a pivoted roller in

the embodiment, is carried horizontally by a yoke 25 comprised basically of two parallel arms 25a, 25b pivotally mounted on a horizontal axis 26 mounted in the door jamb 5. Movement of the yoke 25 is controlled
5 by a solenoid 27.

The solenoid 27 is mounted with the axis of its central movable armature 28 extending in a vertical direction. The upper end of the armature 28 carries a
10 cross-wise mounted pin 29 the ends of which are engaged with the distal ends of the yoke arms 25a and 25b. The manner of engagement of the pin 29 with the arms 25a and 25b permits some sliding movement in a direction along a radius from axis 26, necessary since the point
15 of engagement of the pin with the arms is not at a constant distance from the axis 20 as the armature moves along its vertical path.

The armature 28 is shown in an extended position
20 which locks the latch keeper 20 in position. The solenoid includes an armature bias spring (not shown) which is arranged to retract the armature 28 when the solenoid coil is de-energised, the spring acts in the same direction as gravitational force on the armature.
25 The keeper is only locked in position, therefore, when the solenoid coil is energised.

The electric lock door control 11 is operated, to withdraw the striker locking pin, by a key-operated
30 switch 12, in Fig. 2, which is mounted remotely from the door on the platform side and preferably in a concealed position in the embodiment being described.

The control circuit of the electric door lock is
35 shown in Fig. 4. The coil of the solenoid 27 is shown at 30, it is connected to an electrical supply of 110 volts A.C. through the contacts of a switch T_1 ,

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indicated at 31. The switch 31 is operated by a variable timer arrangement generally indicated at 32 which is triggered to operate by a key-operated cut-out switch 12. The timer 32 is preferably a pneumatic timer which when operated hold the contacts of switch 31 open while the pneumatic mechanism returns to its initial position. The rate of return is variable by adjustable of a throttled orifice in the pneumatic circuit.

The cut-out switch 12 is preferably key-operated, that is, a key must be inserted and turned to close a set of switch contacts which energise a coil to set a plunger in the pneumatic timer. The rate at which this plunger returns to its initial position is the operating period of the pneumatic timer.

In alternative forms of pneumatic timer the plunger may be set by a manual depression or by push-button closure of the contacts of cut-out switch 12. However, the key-operated method is preferred because of the additional security this provides.

In normal circumstances the striker locking pin is engaged with the striker to lock it in a fixed position in which it is engaged with the latch bar of the door carried latch mechanism 9. Thus, the door 1 is locked in the closed position. A person wishing to gain access to the platform through the emergency door 1 from the track side only has to push the panic handle 8 to operate the latch mechanism 9 to withdraw the latch bar permitting the door to be pushed inwardly towards the platform, subsequently the door close mechanism 7 returns the door to the closed locked position.

A person approaching the door 1 from the platform side is not immediately able to open the door because

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he cannot operate the latch mechanism 9 to withdraw the latch bar. However, the door 1 may be opened by using the key-operated switch 12 to operate the electric control lock 11 which, in turn, energises the electric lock in the striker mechanism 10 to withdraw the
5 striker locking pin. The door 1 may then be opened by pulling on a recessed grip 13 provided in the platform side of the door. As the door 1 moves away from the closed position the latch bar bears against one side of
10 the striker which, now being free, rotates to disengage the latch bar and allows the door to be opened.

Preferably there is a time delay period associated with the electric lock control which, at the end of the
15 delay period, re-energises the striker pin withdrawal means re-locking the striker mechanism. This time delay period is provided by the pneumatic timer described above.

20 The effect of this is that the door may only be opened from the platform side during the delay period, which may be set at any predetermined interval, for example five seconds, but this may be longer if desired. If the door is not opened within that period
25 it is automatically re-locked. The latch bar is preferable resiliently mounted in the latch mechanism 9 and has a chamfered end facing the striker mechanism 10 so that the latch will engage the striker mechanism and re-lock the door automatically upon closing, whether or
30 not the striker mechanism has itself been re-locked.

CLAIMS

1. A door lock mechanism comprising in the door a latch bolt mechanism, and in the door jamb a co-operating movable latch keeper which, in use, is
5 arranged to positively engage with the latch bolt to secure the door in the closed position, first unlocking means accessible on one side of the door for manual withdrawal of the latch bolt and second unlocking means accessible on the opposite side of the door to free the
10 movable latch keeper thereby permitting the door to be opened from said other side.
2. A door lock mechanism as claimed in claim 1 including locking means engagable with the latch keeper
15 to lock the keeper in engagement with the latch bolt and the second unlocking means is arranged to withdraw said locking means whereby to free the latch keeper.
3. A door lock mechanism as claimed in claim 1 or
20 claim 2 wherein the second unlocking means is arranged to be operated by means positioned remotely from the door.
4. A door lock mechanism as claimed in any one of
25 claims 1 to 3 wherein the second unlocking means is coupled to manually actuatable means for operation to free the latch keeper.
5. A door lock mechanism as claimed in claim 4 wherein
30 the manually actuatable means comprises means operable by a key.
6. A door lock mechanism as claimed in any preceding claim wherein the second unlocking means is arranged to
35 temporarily withdraw the locking means for a predetermined limited period only.

7. A door lock mechanism as claimed in claim 6 wherein the second unlocking means includes a pneumatic timer.

5 8. A door lock mechanism according to any preceding claim wherein the second unlocking means comprises an electrically operated solenoid having a movable armature coupled with the locking means such that when the solenoid is energised the latch keeper is locked in position and when the solenoid is de-energised the
10 latch keeper is freed.

9. A door lock mechanism substantially as hereinbefore described with reference to the accompanying drawings.

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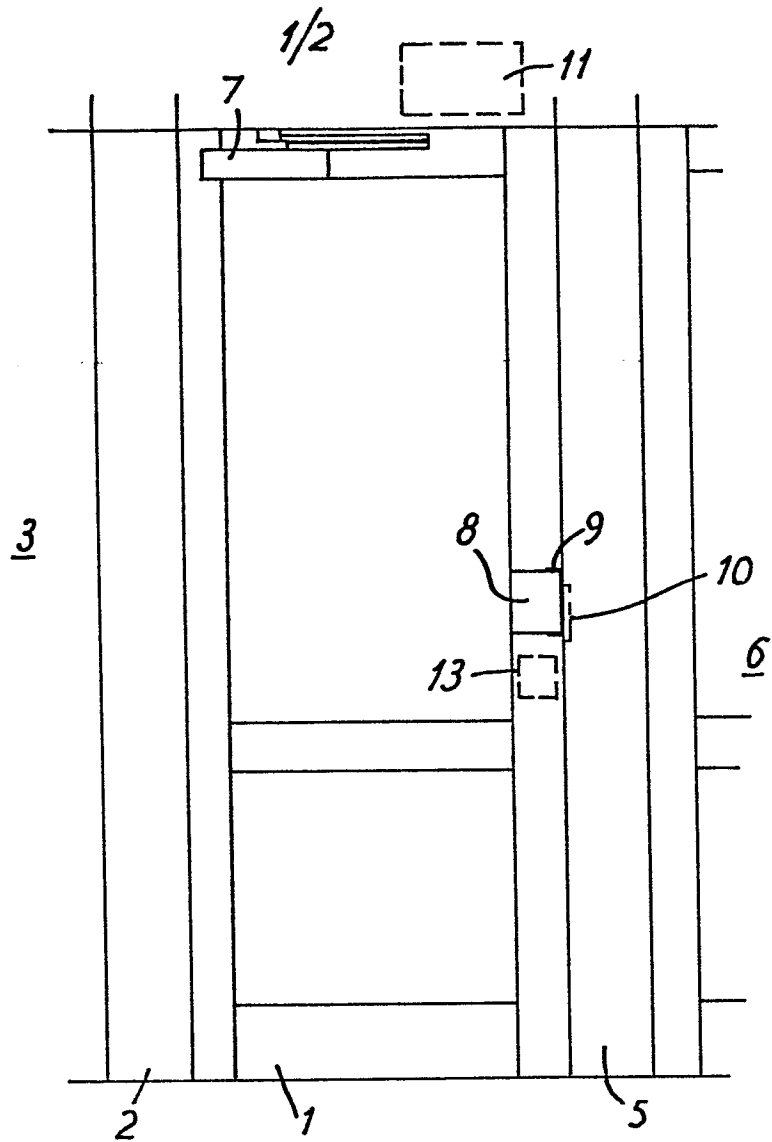


FIG. 1

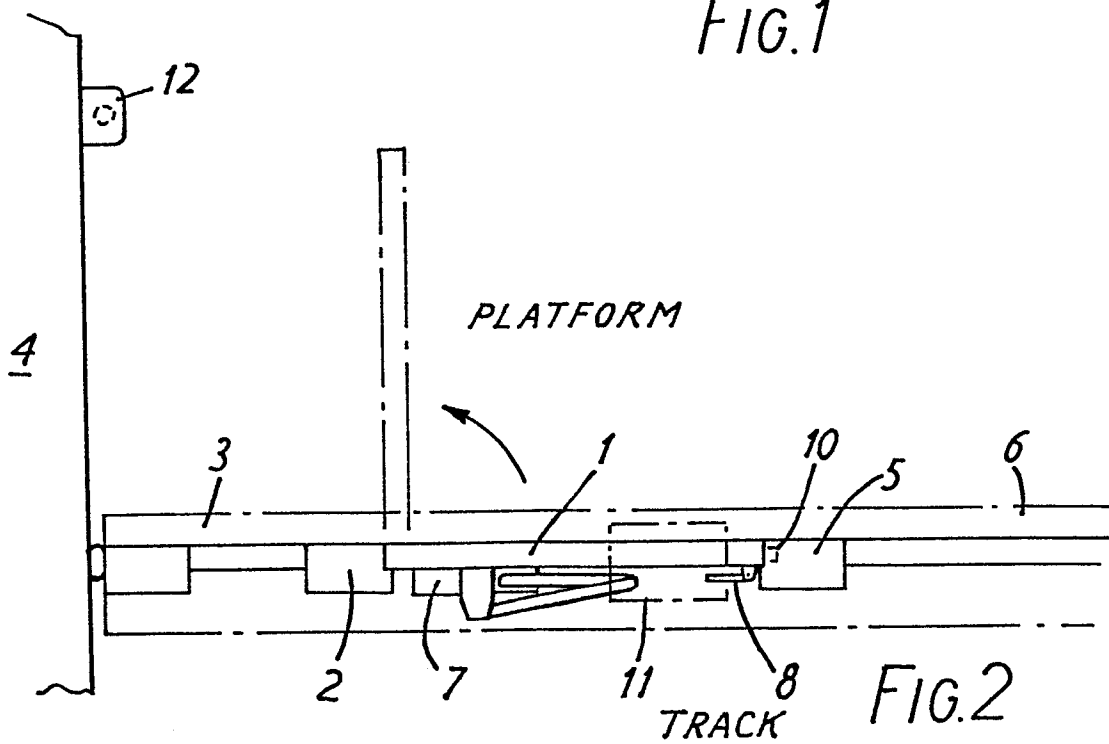
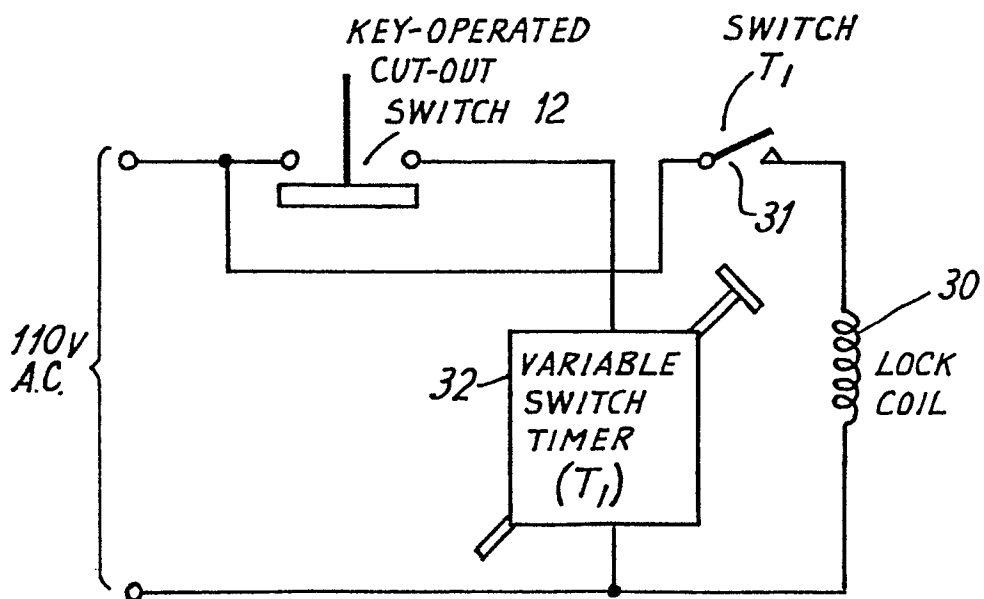
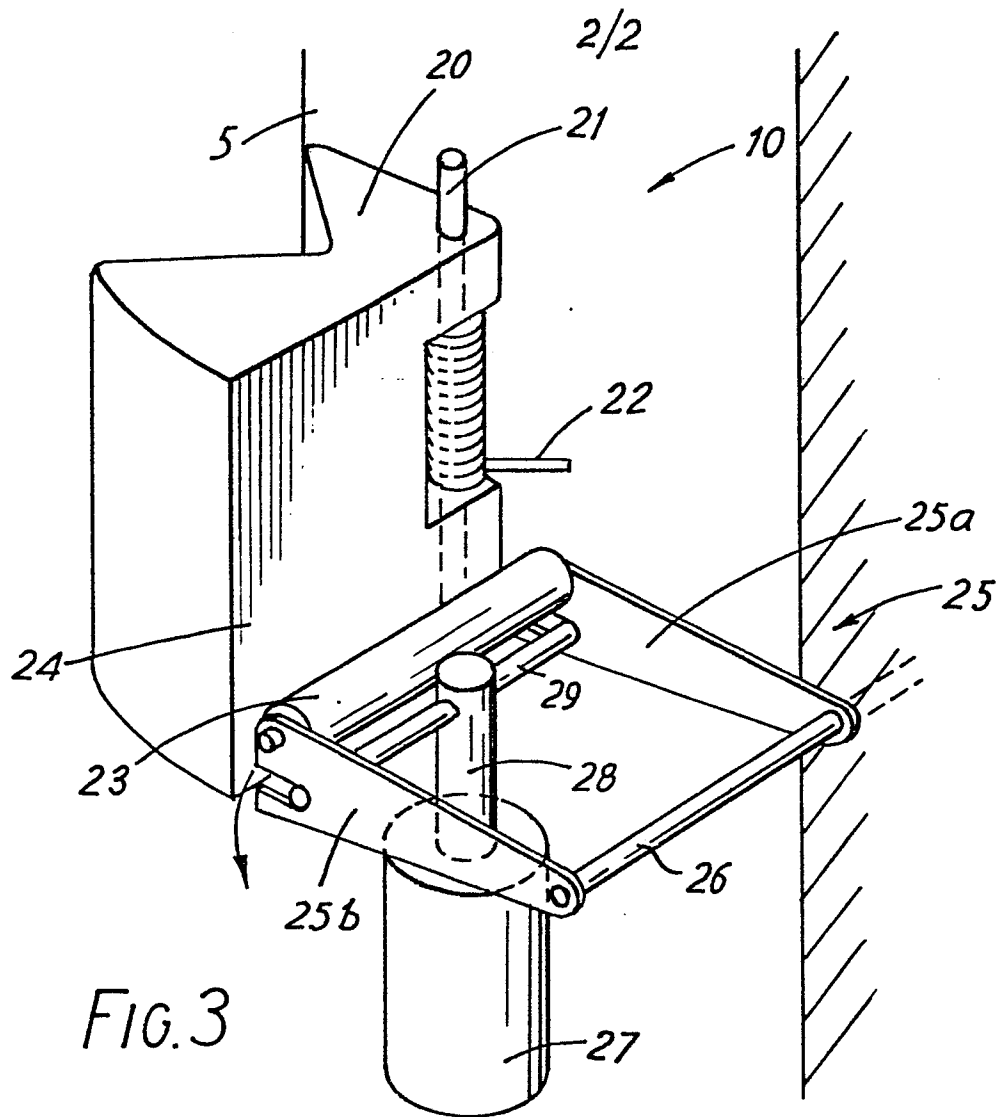


FIG. 2





DOCUMENTS CONSIDERED TO BE RELEVANT			EP 85306230.5
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
A	DE - A1 - 3 032 086 (SCOVILL SICHERHEITSEINRICHTUNGEN GMBH) * Fig. 1-11 * --	1,2,3, 4,6,8, 9	E 05 B 65/10
A	DE - A1 - 2 555 592 (BRÄNDSTRÖM, PAUL HERBERT) * Fig. 1-2 * ----	1,2,3, 4,5,9	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			E 05 B
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 16-10-1985	Examiner CZASTKA
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	