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(54) **A locking device for a closure panel.**

(57) A security lock for a window has a locking bar (2) which, in the locked position, projects to engage a window frame. The window is unlocked by withdrawing the locking bar (2). An elongate plunger (14) carrying a knob (16) at one end extends within a housing (6) and carries a projection (18) which, in the locked position, extends within a hole (20) provided in the locking bar (2). A compression spring (22) acts to maintain the projection (18) in the hole (20) so that withdrawal of the locking bar (2) to its unlocked position is prevented. To withdraw the locking bar (2) it is necessary to lift the plunger (14) and hold the projection (18) out of the hole (20) against the action of the spring (22) whilst the locking bar (2) is moved. Although operation of the security lock is relatively simple it will generally require the use of the two hands, one to lift and hold the plunger (14) whilst the other moves the locking bar (2). This means that whilst the security lock is operated easily from inside the window, a potential thief reaching through the window when broken will find it much more difficult to perform the required two-handed manipulation. Furthermore, to enhance security, the plunger (14) may be provided with a pin (24) which needs to be aligned with a groove (26) to enable the plunger to be lifted. Markings (28) visible from the inside of the window only facilitate the required alignment.

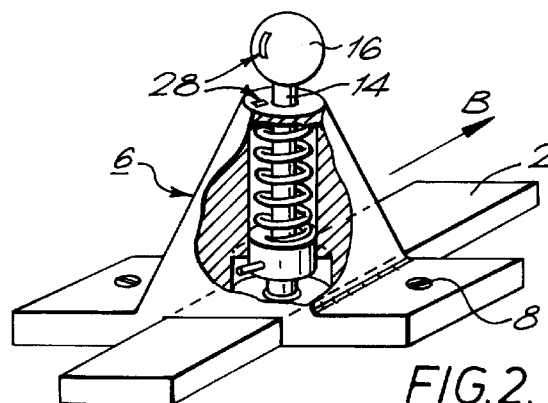


FIG. 2.

The present invention relates to a locking device for a closure panel for an opening, for example, such as a door or a window.

Increasingly, windows as well as doors are fitted with security locks. However, if such locks do not require a key, or only require a standard and readily available key, it is relatively simple for a thief to break the glass of the window near to the lock and reach through the window to operate the lock.

It is an object of the present invention to provide a locking device for a closure panel, such as a door or window, which is simple and easy for an occupier to operate, but which is also difficult for a thief to operate.

According to a first aspect of the present invention there is provided a locking device for a closure panel for an opening, said locking device comprising at least first and second cooperating parts moveable relative to one another to define a locking position and an unlocked position, wherein said cooperating parts are arranged such that it is necessary to place said first and second parts in a predetermined relative configuration in order to move said cooperating parts to said unlocked position.

A locking device in accordance with an embodiment of the invention requires two individual, cooperating parts to be placed simultaneously into said predetermined configuration. Whilst this is not a problem for a person with easy access to the locking device, for example the house occupier, it can cause extreme difficulties for a person approaching the locking device from an unconventional angle and/or in restricted circumstances. Thus, it is difficult for a potential thief, for example, gaining access to the lock from outside by breaking part of the window or other closure panel to arrange the two cooperating parts in the unlocked position.

In one embodiment, the cooperating parts are arranged such that simultaneous movement of both of them is necessary to move the cooperating parts to the unlocked position, and/or the first part has to be held in an unlocked position to enable movement of the second part to said unlocked position.

With such an arrangement, where movement of both of the cooperating parts is required, or one part has to be held to enable movement of the other, a person would generally operate the locking device using two hands. This makes it very difficult for a potential thief to operate the locking device by breaking a window and reaching into the locking device with one arm, and it is also difficult in these circumstances for the thief to reach in with both arms.

Additionally and/or alternatively, the cooperating parts are arranged such that it is necessary to place said first and second parts in a predetermined alignment in order to move said cooperating parts to the unlocked position.

The predetermined alignment is preferably indi-

cated by visual markings on one side only of the first and second cooperating parts. Such markings make it simple when facing the one side of the locking device to place the first and second cooperating parts in the alignment required. Of course, if a thief, for example does not have access to said one side of the locking device, the visual markings will not be visible, and hence will find it difficult to make the necessary alignment.

In a preferred embodiment of a locking device as defined above, said first and second cooperating parts comprise locking means moveable between a locked and an unlocked position, and retention means biased towards a position in which the retention means prevents movement of said locking means to its unlocked position.

In a preferred embodiment said locking means comprises a reciprocal locking bar, and said retention means is arranged to engage said locking bar to prevent its movement.

For example, in an embodiment, said retention means carries a projection arranged in the locked position to engage in an appropriate recess in said locking bar. It is necessary to withdraw the projection from said recess to enable movement of the locking bar to its unlocked position. Preferably, the projection is biased by resilient means into engagement with the recess such that withdrawal of the projection is against the action of said biasing means.

In a preferred embodiment, withdrawal of said projection is only enabled when said retention means is in one particular position relative to said locking bar. Confirmation that said retention means is appropriately located for withdrawal may be provided by visual markings.

In a preferred embodiment, the projection is provided on a plunger mounted within a housing which provides a guide channel for the locking bar. The plunger is rotatable and carries a second projection extending at an angle to said first projection. The housing has a bore receiving the plunger and a recess for receiving said second projection. The arrangement is preferably such that withdrawal of said plunger along said bore is possible only when said second projection is aligned with the recess therefor.

The present invention also extends to a locking device specifically designed such that it is easier to open from one side thereof than a further side opposed to said one side.

Embodiments of the present invention will hereinafter be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a vertical section through a locking device of the present invention,

Figure 1a shows a view taken on the line A-A of the locking device of Figure 1, and

Figure 2 shows a perspective view of the locking device of Figures 1 and 1a.

The locking device shown in the drawings may be used on any closure panel for an opening. However, it will be described hereinbelow specifically as a security lock for a window. As will be seen, the locking device does not require a key, and yet is secure. It is generally very simple to operate but it does require visual inspection to ensure that cooperating parts are appropriately aligned, and it also generally requires the use of two hands to manipulate it. The locking device is specifically designed to be simple to operate for someone with good access to the lock, for example the occupier of a house, but much more difficult to operate for someone to the rear or at the side of the lock. Thus, if a thief were to break the window and reach through, to gain access to the locking device, he would generally find it difficult, if not impossible, to operate the locking device.

The locking device is, in known manner, mounted on a closure panel to be secured, and includes a locking bar 2 for engagement with a second closure panel or with a surround. In the locked position, the locking bar 2 is arranged to protrude in one, locking, direction, for example as indicated by the arrow B in Figure 2, and the locking device is unlocked by withdrawal of the locking bar from the protruding position.

As can be seen in Figure 1, the locking bar 2 is arranged to slide in a longitudinally extending guide channel 4 provided in a housing 6. This housing 6 is secured, for example by screws 8, to the closure panel (not shown). The housing 6 also has a substantially vertically extending bore 10, which extends substantially at right angles to the longitudinal extent of the channel 4. The bore 10 communicates with the channel 4 by way of an increased diameter portion which thereby defines an annular shoulder 12.

An elongate plunger 14 carrying a knob 16 at one end thereof extends through the bore 10 within the housing 6. At its end remote from the knob 16, the plunger 14 carries a projection 18 which, in the locked position illustrated, extends within a hole 20 provided in the locking bar 2. A compression spring 22 is housed within the bore 10 and acts to maintain the projection 18 in the hole 20 whereby withdrawal of the locking bar 2 to its unlocked position is prevented. It will be appreciated that in order to withdraw the locking bar 2, it is necessary to withdraw the projection 18 from the hole 20 by lifting the plunger 14. Because of the presence of the spring 22, biasing the plunger towards the locking bar 2, it is necessary to hold the plunger 14 in the withdrawn position against the action of the spring 22 whilst the locking bar 2 is moved. Of course, once the locking bar 2 has been withdrawn out of its locked position, the solid upper surface thereof will keep the plunger 14 in its withdrawn position.

It will be appreciated that although operation of the locking device is relatively simple it will generally require the use of the two hands, one to lift and hold

the plunger 14 in the withdrawn position whilst the other hand moves the locking bar 2. In this respect a projection (not shown) will generally be provided on the locking bar 2 at a suitable position to facilitate its movement.

In the embodiment of the locking device illustrated, withdrawal of the plunger 14 is only possible if the plunger 14 is correctly aligned within the housing 6 and hence relative to the locking bar 2. In this respect, and as can be seen, the plunger 14 carries a second projection or pin 24 which extends generally radially, substantially at right angles to the extent of the projection 18. In the locked position, this pin 24 is accommodated within the increased diameter section of the bore 10. However, it will be appreciated that abutment of the projection 24 with the annular shoulder 12 will prevent withdrawal of the plunger 14. To enable withdrawal to take place, the housing 6 is provided with a recess or groove 26 which communicates with the bore 10 and with its increased diameter section. It will be appreciated that if the projection 24 is aligned circumferentially with the groove 26, withdrawal of the plunger 14 will be possible, as the pin 24 will enter the groove 26. However, the plunger 14 is rotatable about its longitudinal axis, and the groove 26 for receiving the pin 24 is relatively small compared to the circumferential extent of the bore 10. Therefore, precise circumferential alignment of the pin 24 with the groove 26 is necessary to enable lifting of the plunger 14. To facilitate this, appropriate markings 28 are provided on the housing 6 and on the knob 16. It is therefore relatively simple to rotate the plunger to align the markings 28 whereby withdrawal of the plunger 14 is enabled. However, if the markings 28 are positioned on the locking device to face into a room, they will not be visible from outside the windows, and alignment cannot be achieved by use of the markings 28.

It is not, of course, impossible to correctly align the pin 24 and the groove 26 by trial and error, but it would take time and patience, and a thief may well not wish to delay. Furthermore, the annular shoulder 12 may be provided with a number of shallow grooves 30 to frustrate attempts to find the correct alignment by "feel". Thus, by rotating the plunger 14 carefully with the pin 24 in contact with the annular shoulder 12 the entry of the pin 24 into a groove 26 or 30 might be sensed or felt. However, as the shallow grooves 30 do not enable withdrawal of the plunger such attempts would be frustrating.

In a modification of the invention, not illustrated, the top surface of the housing 6 is shaped to define a recess in which the knob 16 is received in the locked position of the plunger 14. The recess is large enough to enable access to the knob, but the recessed position thereof compounds the problems facing a thief attempting to operate the locking device from outside.

The invention has been described above with reference to one particular embodiment of a locking de-

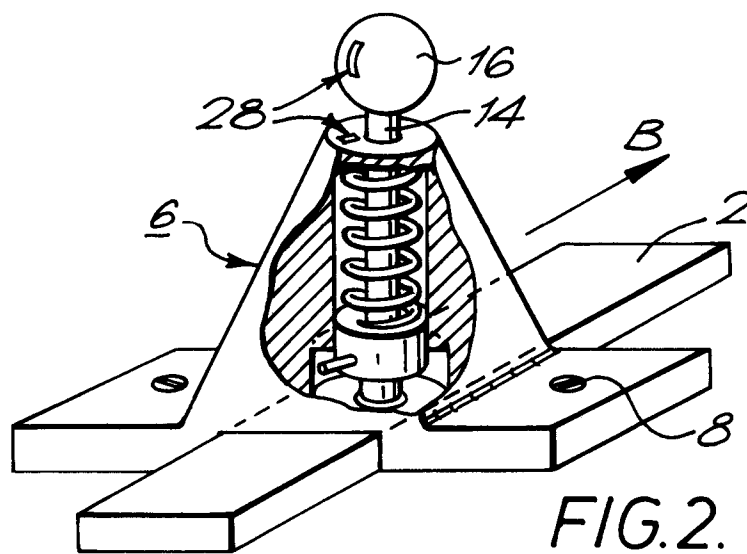
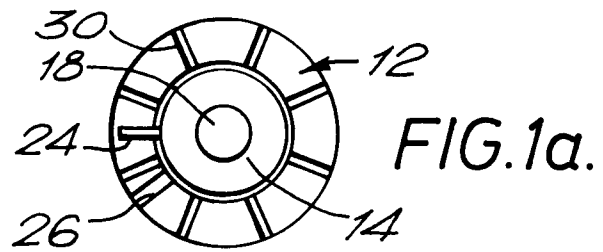
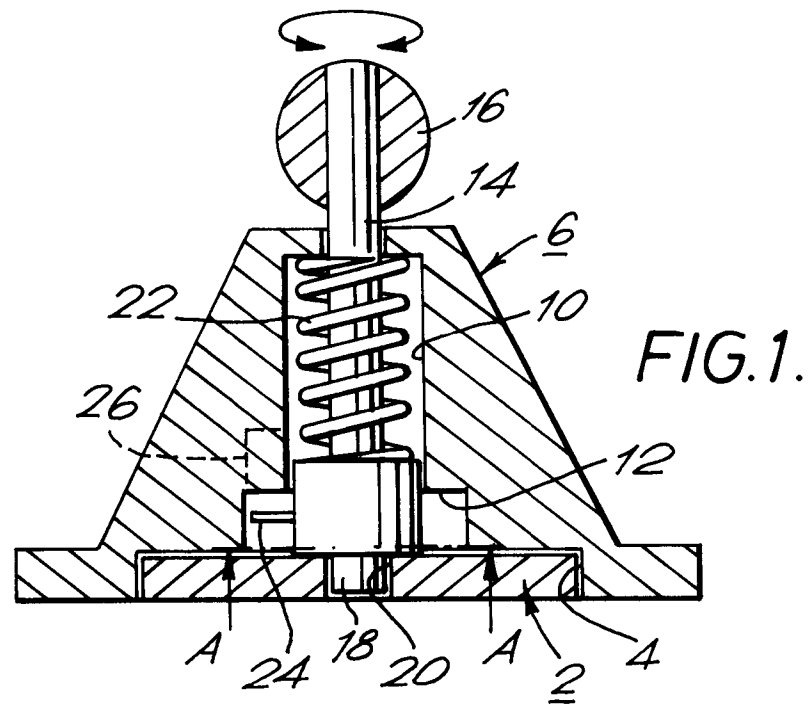
vice. Of course, it will be appreciated that other modifications in and variations to the construction may be made within the scope of this application.

Claims

1. A locking device for a closure panel for an opening, said locking device comprising at least first and second cooperating parts (2, 14) moveable relative to one another to define a locking position and an unlocked position, wherein said cooperating parts (2, 14) are arranged such that it is necessary to place said first and second parts in a predetermined relative configuration in order to move said cooperating parts to said unlocked position.
2. A locking device as claimed in Claim 1, wherein said cooperating parts (2, 14) are arranged such that simultaneous movement of both of them is necessary to move the cooperating parts to the unlocked position.
3. A locking device as claimed in Claim 1 or 2, wherein said first cooperating part (14) has to be held in an unlocked position to enable movement of said second cooperating part (2) to said unlocked position.
4. A locking device as claimed in any preceding claim, wherein said cooperating parts (2, 14) are arranged such that it is necessary to place said first and second parts in a predetermined alignment in order to move said cooperating parts to the unlocked position, and wherein said predetermined alignment is preferably indicated by visual markings (28) on one side only of the first and second cooperating parts.
5. A locking device as claimed in any preceding claim, said first and second cooperating parts comprise locking means (2) moveable between a locked and an unlocked position, and retention means (14) biased towards a position in which the retention means prevents movement of said locking means to its unlocked position, and wherein said locking means comprises a reciprocal locking bar (2), and said retention means (14) is arranged to engage said locking bar to prevent its movement.
6. A locking device as claimed in Claim 5, wherein said retention means (14) carries a projection (18) arranged in the locked position to engage in an appropriate recess (20) in said locking bar (2), withdrawal of the projection (18) from said recess (20) enabling movement of the locking bar to its

unlocked position.

7. A locking device as claimed in Claim 6, wherein said projection (18) is biased by resilient means (22) into engagement with the recess (20) such that withdrawal of the projection is against the action of said resilient means.
8. A locking device as claimed in Claim 6 or Claim 7, wherein said withdrawal of said projection (18) is only enabled when said retention means (14) is in one particular position relative to said locking bar.
9. A locking device as claimed in Claim 8, wherein visual markings (28) are provided and are arranged to confirm when said retention means is appropriately located for withdrawal.
10. A locking device as claimed in any of Claims 6 to 9, wherein said projection (18) is provided on a plunger (14) mounted within a housing (6) which provides a guide channel (4) for the locking bar (2), said plunger (14) is rotatable and carries a second projection (24) extending at an angle to said first projection (18), wherein said housing (6) has a bore (10) receiving the plunger and a recess (26) for receiving said second projection, and wherein withdrawal of said plunger along said bore is possible only when said second projection is aligned with the recess therefor.





European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 92309989.9

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 92309989.9
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	FR - A - 2 271 373 (LA CUIVRERIE CENTRALE) * Fig. 1-3; claims 1-8 *	1-10	E 05 B 1/00
A	DE - B - 2 644 570 (FRIEDR. FINGSCHIEDT) * Fig. 1-2; claims 1-3 *	1-10	
A	GB - A - 1 383 648 (SYDNEY STANLEY SWAYNE) * Fig. 1-3; claims 1-23 *	1-10	
A	GB - A - 1 110 454 (INTERLOCK INDUSTRIES LTD.) * Fig. 1-6; claims 1-12 *	1-10	
A	GB - A - 623 135 (ATLAS BRASS FOUNDRY) * Fig. 1-2; claims 1-4 *	1, 2, 4, 5, 6, 7-10	
A	GB - A - 2 098 268 (MALLINSON-DENNY LTD.) * Fig. 1-4; claims 1-8 *	1-10	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	GB - A - 2 221 491 (PAUL WALMSLEY) * Fig. 1-4; claims 1-3 *	1-9	E 05 B E 05 C
A	US - A - 1 393 032 (D.L.McFEGGANS) * Fig. 1-6; claims 1-2 *	1-8	
A	CH - A - 574 036 (ERNST KÜNZLER AG) * Fig. 1-6; claim *	1-5, 6-10	
A	DE - A - 3 002 224 (SCHMID, R.) * Fig. 1-3; claims 1-8 *	1-7	
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 04-03-1993	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	

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