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WO-A-02/084043
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DE-C1- 10 005 193
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DESCRIPTION

Background of the invention

[0001] The invention relates to a roof skylight window comprising:

- a window casement frame which, in use, demarcates a window casement opening;
- a tiltable window frame

whereby the tiltable skylight window is incorporated in the window casement frame, tiltable around a pivot center-line between a closed position, wherein the window casement opening is closed, and an open position, wherein the window casement opening is at least partially open; whereby the tiltable skylight window frame comprises a rectangular window frame composed of four

frame members with a glass pane incorporated therein;

whereby the tiltable skylight window further comprises:

- a ventilation passage provided in one of the frame members;
- a cover plate which is moveable between a closed position closing the ventilation passage and an open position releasing the ventilation passage;
- a first locking member moveable between a locking position and a disengaging position, whereby the first locking member in the locking position of the tiltable window frame engages the window casement frame in order to lock the tiltable window frame in relation to the window casement frame, and whereby the first locking member permits the tilting of the tiltable skylight window frame around the pivot center-line in the disengaging position;
- an operating member having a longitudinal axis, which operating member is operationally connected to both the cover plate and the first locking member so that, in operation, the first locking member and the cover plate can be moved between a first operating position in which the cover plate and the first locking member are respectively in the closed and locking position, and a second operating position in which the cover plate and the first locking member are respectively in the open or disengaging position.

A window lock for a slideable and tiltable window sash is known, for example, in US6135510, in which a sliding bolt is shown for blocking a tiltable window sash.

[0002] A tiltable skylight window by the name of Velux is also known, for example, in DE 100 05 193 C1, in which an additional security device in the form of a bracket is available. A disadvantage in the current art is that the tiltable skylight windows are insufficiently secure with regard to opening from the exterior by undesired intruders.

Summary of the invention

[0003] The object of the invention is to provide an improved roof skylight window and, in particular, a roof skylight window with an improved burglar security having a compact construction. The invention provides therefore a roof skylight window, whereby said roof skylight window is further provided with a second locking member having a longitudinal axis, which second locking member is moveable along its longitudinal axis between a locked position and a disengaged position, and whereby, on the one hand, the second locking member engages the operating member in the locked position and the window casement frame or the rectangular window frame on the other hand for locking the operating member in the first operating position, and whereby the second locking member in the disengaged position releases the operating member for operation, and wherein the longitudinal axis of the second locking member and the longitudinal axis of the operating member are substantially parallel for extensive integration of the second locking member and the operating member, and wherein the second locking member is slideably connected with the operating member. By locking the operating member in an operating position an additional security is achieved against unlocking the roof skylight window. This additional security is particularly significant when the operating member is in the vicinity of a ventilation passage which renders the operating member relatively easy to operate from the exterior.

[0004] In one embodiment of the roof skylight window the second locking member engages in the locked position on the one hand with the operating member and to the tiltable skylight window frame on the other hand for locking the operating member in the first operating position.

[0005] Because the second locking member engages the tiltable skylight window frame, the second locking member can generally be constructed shorter, which therefore benefits overall rigidity.

[0006] In one preferred embodiment of the roof skylight window, the second locking member is accommodated in the rectangular window frame (frame) in the locking position.

[0007] In one preferred embodiment the second locking member is in the locked position accommodated in the window casement frame.

[0008] Because the second locking member engages the window casement frame, the second locking member will also contribute to the locking of the tiltable skylight window in a closed position and thus further improve burglar security.

[0009] In one preferred embodiment the roof skylight window is further provided with a securing member and the second locking member is in the locked position incorporated in the securing member.

[0010] By using a securing member, the invention can be easily adapted to existing roof skylight windows simply by mounting the securing member. Additional modifications to the

window casement frame or tiltable skylight window are not necessary.

[0011] In one embodiment of the roof skylight window, not forming part of the invention, the cover plate is connected with the frame and made to hinge on a hinge axis along the length of the ventilation passage, the second locking member is slideably connected with the cover plate along the longitudinal axis of the second locking member and whereby the longitudinal axis is substantially perpendicular to the hinge axis and a securing member is provided on a horizontal side of the cover plate opposite the hinge axis.

[0012] A sturdy accommodation of the operating member is achieved by placing the second locking member square to the hinge of the cover plate. In this embodiment not forming part of the invention, tolerances in the fit of the second locking member in the securing member have the least influence and permit only the slightest possible tilting movement of the operating member.

[0013] In one embodiment of the roof skylight window, the operating member comprises a hand grip which is operationally connected with the second locking member in order for this to be moved between the locked position and the disengaged position.

[0014] This embodiment provides for an improved operation of the skylight window since it is possible, when operating the skylight window, to be automatically forced to slide the second locking member into, for example, the locked position so that the roof skylight window can be opened.

[0015] In one preferred embodiment of the skylight window, the hand grip and the second locking member are operationally connected by means of a gripping force exercised substantially perpendicular to the longitudinal axis of the hand grip.

[0016] The use of the gripping force makes operation of the second locking member very easy and, of course, when the disengagement of the skylight window is desired, the operating member is automatically caused to unlock and disengage in order to make the locking of the skylight window operable. This coupling between the second locking member and the hand grip enables the operator to combine actions and the disengagement of the operating member and the unlocking of the skylight window are made operable by means of a single action. According to the invention, the second locking member is slideably connected with the operating member.

[0017] In one preferred embodiment of the roof skylight window, the second locking member is accommodated in an accommodation space within the hand grip. This integration of the second locking member and the hand grip provides a compact construction and a good and robust guidance of the second locking member.

[0018] In one preferred embodiment of the roof skylight window, the second locking member is pretensioned in the direction of the locked position.

[0019] The pre-tensioning causes the second locking member to automatically return to its locked position when the roof skylight window is locked, thereby automatically locking the operating member. This reduces the effect of errors being made by the operator, for example, if the operator simply forgets to lock the operating member.

[0020] In one preferred embodiment of the roof skylight window said roof skylight window comprises an electrodrive, driveably connected with the second locking member in order to drive that part.

[0021] This enables an operator to remotely operate the second locking member.

Brief description of the figures

[0022] The accompanying figures show various embodiments of a roof skylight window according to the present invention, in which:

Fig. 1 is a roof skylight window in perspective view;

Fig. 2 is a detail in perspective view of a first embodiment of a roof skylight window according to the invention;

Fig. 3 is a detail in perspective view of a second embodiment of a roof skylight window not forming part of the invention;

Fig. 4 is a detail in perspective view of a third embodiment of a roof skylight window according to the invention;

Fig. 5 is a detail in perspective view of a fourth embodiment of a roof skylight window according to the invention;

Fig. 6 is a cross-section of a hand grip of an embodiment of a roof skylight window according to the invention;

Fig. 7 is a cross-section of a detail of a known tiltable roof skylight window with a locking mechanism.

Description of the embodiments

[0023] Fig. 1 shows a roof skylight window in perspective view. The window casement frame 5 is mounted to the roof and a tiltable skylight window (wing) 2 is mounted tiltable in the window casement frame 5. The tiltable roof skylight window 2 comprises a frame (window frame) 3 in

which a glass window pane 4 is mounted. The frame 3 is provided with an operating member 6 with which the lock (not shown) is made operable. Here, the operating member 6 is connected on its lowermost side with the frame 3, thus enabling the tilting action of the operating member 6 in relation to the frame 3 to operate the locking of the skylight window 1. Here, the operating member 6 is provided with a hand grip 10 and a cover plate 11 which covers a ventilation opening in the illustrated position.

[0024] Fig. 2 shows a detail in perspective view of a first embodiment of a roof skylight window according to the invention. The operating member 6 comprises a locking member 7 that is slideably connected with a locking housing 25, which is mounted by screws 26 to the hand grip 10. Here, the frame 3 is provided with a securing member 9 permanently connected with the frame 3. One such securing member 9 is possibly also connected with window casement frame 5. Locking member 7 can be moved to a locking position 8 in which locking member 7 is at least partially accommodated into securing member 9, whereby operating member 6 is permanently connected with frame 3 and the locking of the skylight window 1 is no longer operable, thus improving burglar security. The longitudinal axis of the locking member 7 and the longitudinal axis of the operating member 6 are substantially parallel, thereby producing a firm basis for the further extensive integration of the locking member 7 and the operating member 6. Another embodiment is also conceivable, whereby the locking member 7 is at least partially accommodated in its locked position into the frame 3 itself, possibly by means of a recess made in the frame 3.

[0025] Fig. 3 shows a detail in perspective view of a second embodiment of a roof skylight window not forming part of the invention. In this embodiment the longitudinal axis of the locking member 7 is substantially perpendicular to the longitudinal axis of the operating member 6. The securing member 9 is provided on that side of the operating member 6, opposite the side that is tiltable connected with the frame 3 around the hinge 24. This results in a strong locking action of the operating member 6. Here, hand grip 10 is placed at a distance from the cover plate 11 by means of spacing sleeves 12. Locking member 7 is provided with a locking bolt 13 which can slide into a locking position 8 in order to cause locking member 7 to slide into its locked position.

[0026] Fig. 4 shows a detail in perspective view of a third embodiment of a roof skylight window according to the invention. Here, locking member 7 extends substantially into the hand grip 10, thus producing an integrated and compact solution. Here, hand grip 10 is a hollow tube provided with a recess 14 enabling the operation of locking member 7 by means of a locking bolt 13. Spring 15 tensions locking member 7 in the direction of the locking position 8 so as to ensure that the operating member is locked. Locking member 7 is at the end directed towards the securing member provided with a bevel 16 so that locking member 7 is automatically guided into securing member 9 in conjunction with the pre-tensioning when the tiltable skylight window 2 is closed. Securing member 9 is mounted to frame 3 in order to make operating member 6 fixedly connectable to frame 3. It is conceivable that window casement frame 5 is also provided with a second securing member whereby locking member 7 extends in its locked position up to the second securing member.

[0027] Fig. 5 shows an embodiment whereby the locking member 7 is partially accommodated in window casement frame 5 in order to lock operating member 6. To this end, window casement frame 5 is provided with a securing member 9 or recess 9. Furthermore, here locking member 7 is operationally connected with an electrical drive 17. Various known drives are conceivable, such as, for example, an electromagnetic drive with a solenoid which is possibly battery-fed. Operation is preferably by remote control, for example, by means of an infrared connection.

[0028] Fig. 6 shows a cross-section of a hand grip 10. By means of a coupling piece 20, operating knob 18 drives a movement converter 19, which is rotatably connected with the hand grip 10 around cam 22. Locking member 7 is also connected to a movement converter 19 by means of a coupler 20 and driven by the converter. As the operator grips the hand grip 10 to open the roof skylight window 1, operating knob 18 is, at the same time, forced downwards and locking member 7 is disengaged from the locked position so that the locked position of the roof skylight window is released and the tiltable skylight window can be opened.

[0029] Fig. 7. shows a known tiltable roof skylight window with a locking mechanism 23 that is operated by an operating member 6 to lock and unlock the roof skylight window. It may be clear that the foregoing description is incorporated herein in order to illustrate the operation of the various embodiments of the invention and not to limit the scope of the invention. Based upon the previous descriptions, those skilled in the art will recognize that many variations that fall within the spirit and scope of the present invention as defined by the appended claims are possible.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- [US6135510A \[0001\]](#)
- [DE10005193C1 \[0002\]](#)

Patentkrav

1. Tagovenlysvindue (1), omfattende:

- 5 - en vindueskarmramme (5), som under brug afgrænser en vindueskarmåbning;
- en vipbar vinduesramme (2);
- 10 hvor den vipbare vinduesramme (2) er indbygget i vindueskarmrammen (5), der kan vippes omkring en drejemidterlinje mellem en lukket position, hvor vindueskarmåbningen er lukket, og en åben position, hvor vindueskarmåbningen er mindst delvis åben;
- hvor den vipbare tagvinduesramme (2) omfatter en rektangulær vinduesramme (3), som består af fire rammeelementer med en glasrude (4) indbygget deri; hvor det vipbare tagvindue (2) yderligere omfatter:
- 15 - en ventilationspassage, som er tilvejebragt i et af rammeelementerne;
- en dækplade (11), som kan bevæges mellem en lukket position, der lukker ventilationspassagen, og en åben position, som frigør ventilationspassagen;
- et første låseelement, der kan bevæges mellem en låst position og en frigjort position, hvor det første låseelement i den låste position af den vipbare vinduesramme (2) går i indgreb med vindueskarmrammen (5) for at fastlåse
- 20 den vipbare vinduesramme (2) i forhold til vindueskarmrammen (5), og hvor det første låseelement gør det muligt at vippe den vipbare vinduesramme (2) omkring drejemidterlinjen i den frigjorte position;
- et betjeningselement (6) med en langsgående akse, hvor betjeningselementet (6) er funktionsmæssigt forbundet med både dækpladen (11) og det
- 25 første låseelement, således at under drift kan det første låseelement og dækpladen (11) bevæges mellem en første driftsstilling, i hvilken dækpladen (11) og det første låseelement er i henholdsvis den lukkede og den låste position, og en anden driftsstilling, i hvilken dækpladen (11) og det første låseelement er i henholdsvis den åbne og frigjorte position; hvor tagovenlysvin-
- 30 duet (1) yderligere er forsynet med et andet låseelement (7) med en langsgående aksel, hvor det andet låseelement (7) kan bevæges langs sin langsgående aksel mellem en låst position (8) og en frigjort position;

5 hvor det andet låseelement (7) på den ene side går i indgreb med betje-
ningselementet (6) i den låste position (8) og vindueskarmrammen (5) eller
på den anden side den rektangulære vinduesramme (3) for at låse betje-
ningselementet (6) i den første driftsstilling, og hvor det andet låseelement
10 (7) i den frigjorte position frigør betjeningselement (6) til betjening, og hvor
den langsgående akse af det andet låseelement (7) og den langsgående ak-
se af betjeningselementet (6) i det væsentlige er parallelle for at sikre omfat-
tende integrering af det andet låseelement (7) og betjeningselementet (6), og
15 hvor det andet låseelement (7) er forskydeligt forbundet med betjeningsele-
mentet (6).

2. Tagovenlysvindue ifølge et hvilket som helst af de foregående krav, hvor
det andet låseelement (7) i den låste position (8) er anbragt i den rektangu-
lære vinduesramme (3).

15 3. Tagovenlysvindue ifølge et hvilket som helst af de foregående krav, hvor
det andet låseelement (7) i den låste position (8) er anbragt i vindueskarm-
rammen (5).

20 4. Tagovenlysvindue ifølge et hvilket som helst af de foregående krav, hvor
tagovenlysvinduet (1) yderligere er forsynet med et sikringselement (9), og
det andet låseelement (7) i den låste position (8) er anbragt i sikringselemen-
tet (9).

25 5. Tagovenlysvindue ifølge et hvilket som helst af de foregående krav, hvor
betjeningselementet (6) omfatter et håndtag (10), som er funktionsmæssigt
forbundet med det andet låseelement (7) for at bevæge dette mellem den
låste position (8) og den frigjorte position, og hvor især håndtaget (10) og det
30 andet låseelement (7) er funktionsmæssigt forbundet ved hjælp af en gribe-
kraft i det væsentlige vinkelret på den langsgående aksel af håndtaget (10).

6. Tagovenlysvindue ifølge et hvilket som helst af de foregående krav, hvor det andet låseelement (7) er indbygget i et integreringsrum indvendigt i håndtaget (10).
- 5 7. Tagovenlysvindue ifølge et hvilket som helst af de foregående krav, hvor det andet låseelement (7) er forspændt i retningen af den låste position (8).
8. Tagovenlysvindue ifølge et hvilket som helst af de foregående krav, hvor tagovenlysvinduet (1) omfatter en elektrodrivindretning (17), der er funktionsmæssigt forbundet med det andet låseelement (7) for at drive denne del.
- 10

DRAWINGS

Fig 1

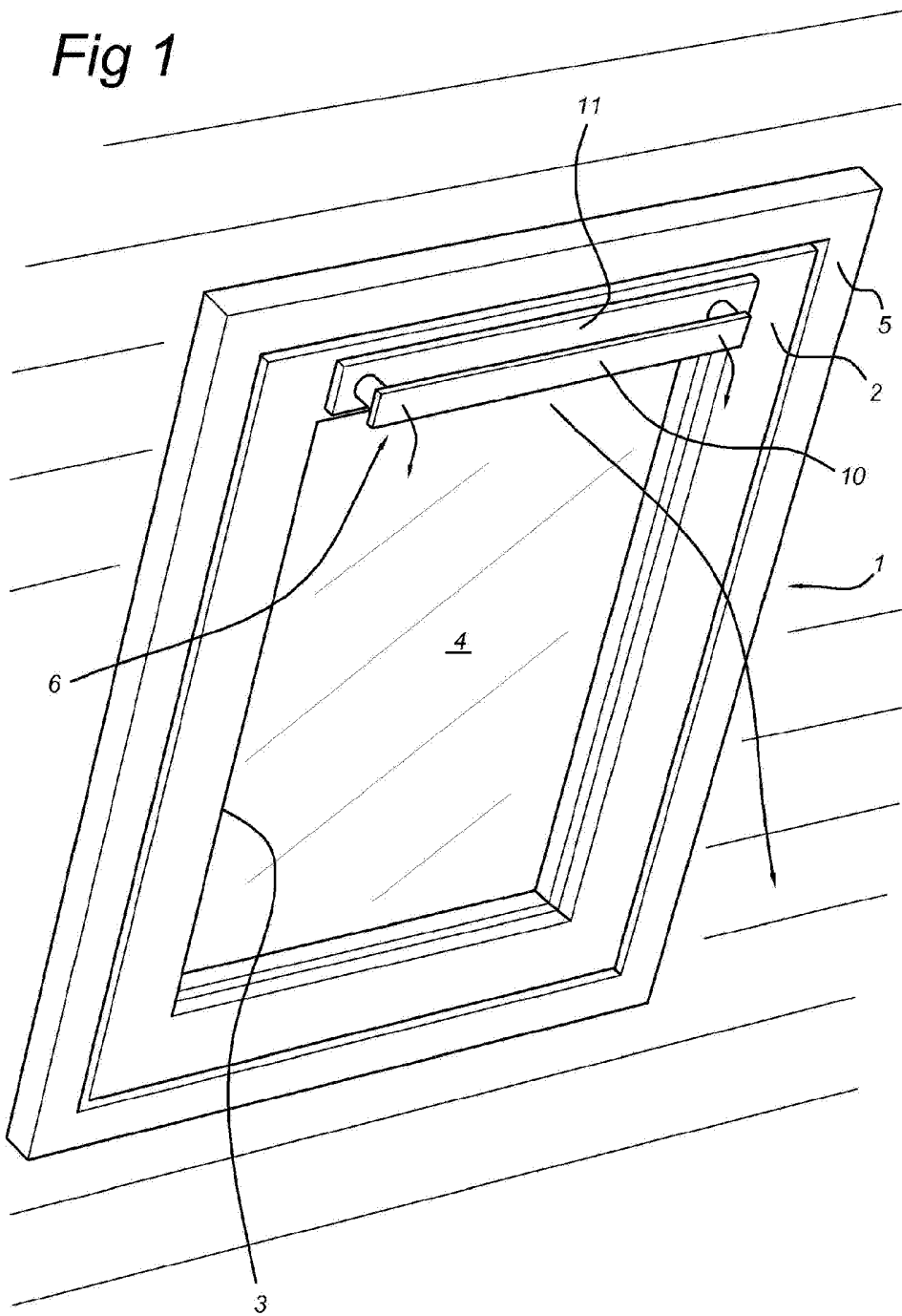


Fig 2

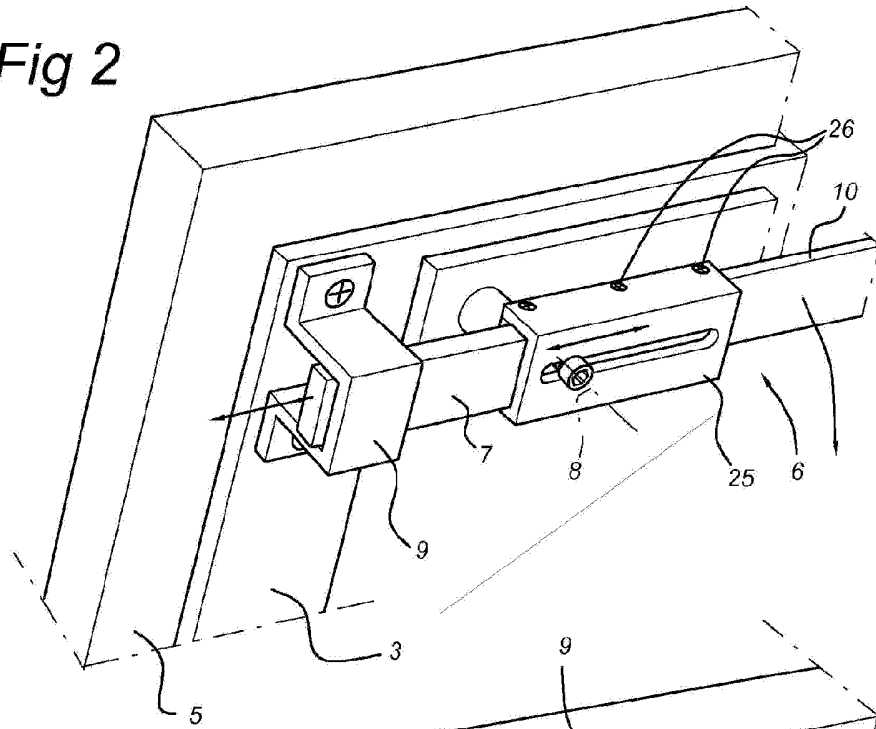


Fig 3

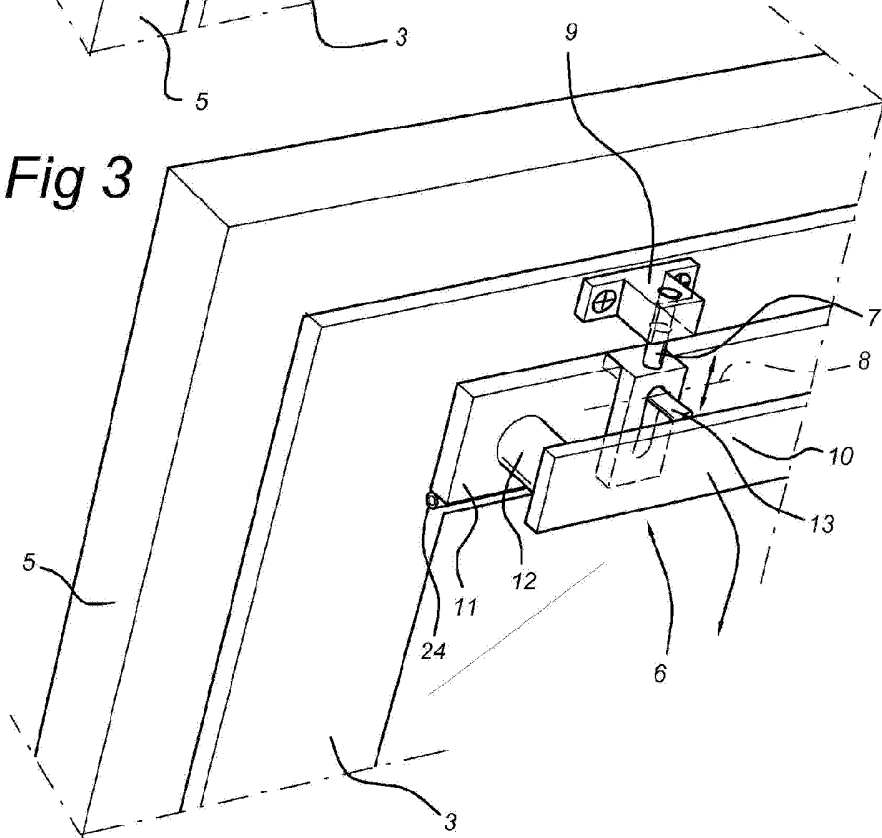


Fig 4

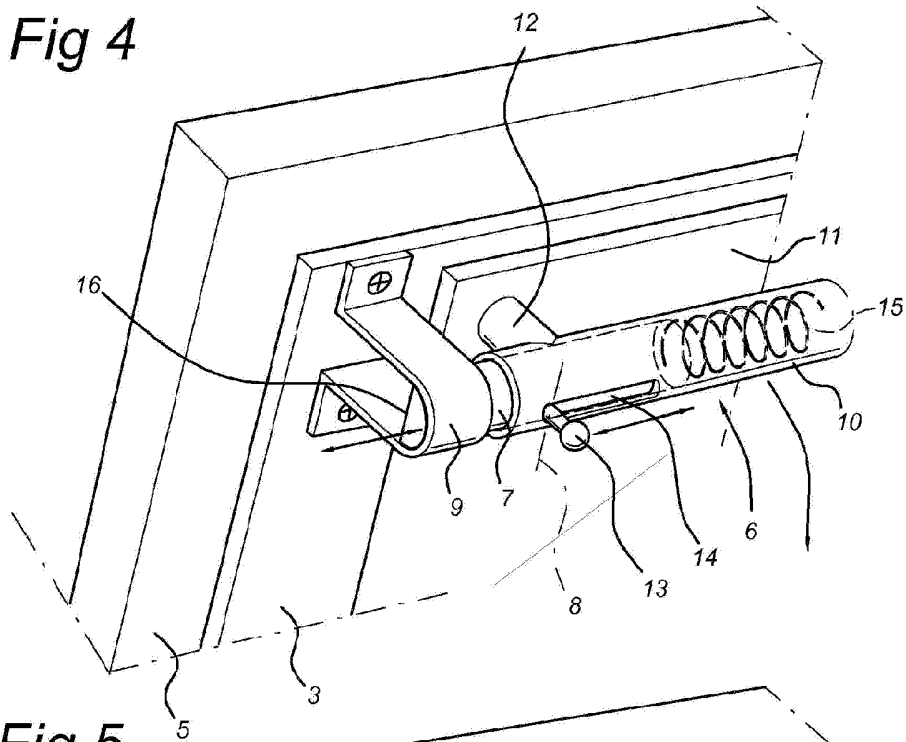


Fig 5

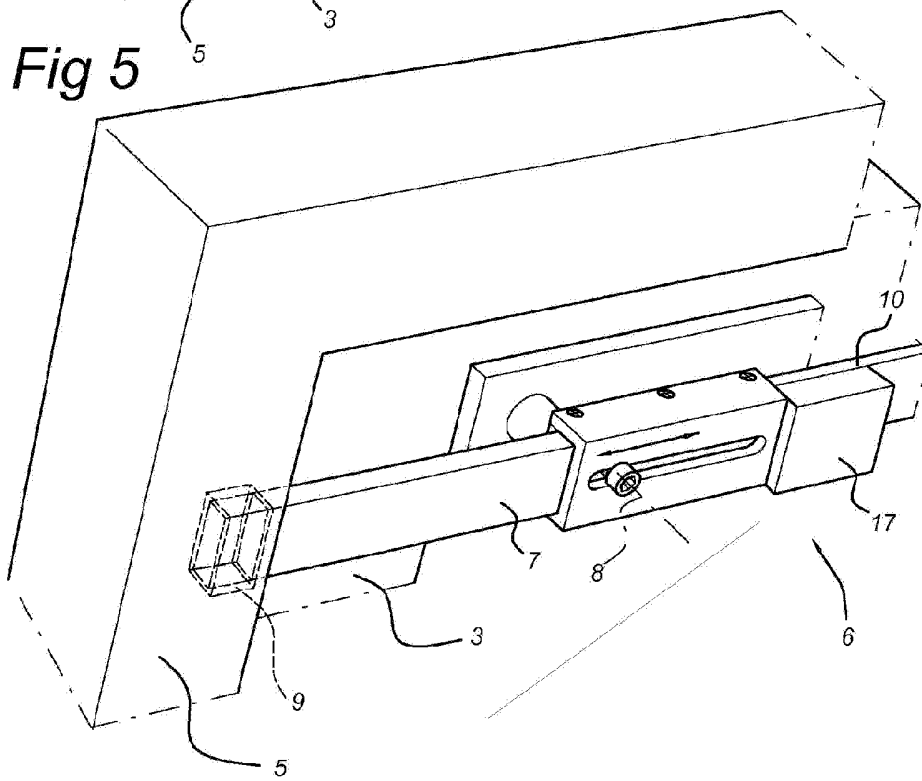


Fig 6

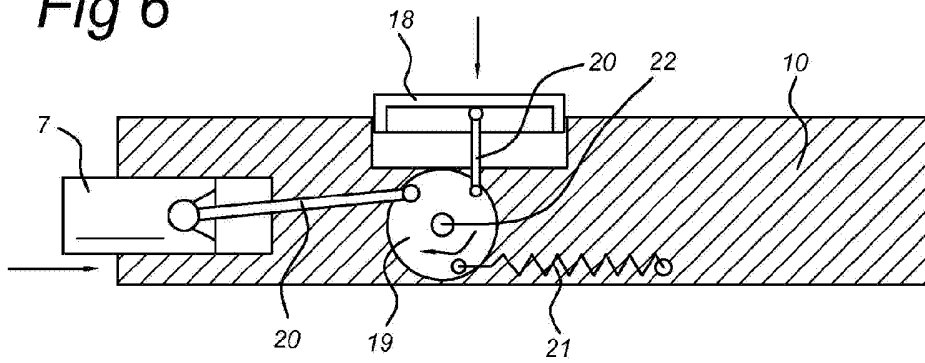


Fig 7

