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(72) Inventors:
• **Robinson, David**
Brighthouse HD6 2RW (GB)
• **Collins, Paul**
Brighthouse HD6 2RW (GB)

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(74) Representative: **Orr, William McLean**
Urquhart-Dykes & Lord,
Tower House,
Merrion Way
Leeds LS2 8PA (GB)

(71) Applicant: **Avocet Hardware PLC**
Brighthouse HD6 2RW (GB)

(54) A device for fastening an openable window or door member to a frame

(57) An espagnolette type fastening device 1 for mounting on an openable door or window frame member and which co-operates with a one piece keeper plate 14 mounted on a fixed frame, in which the fastening device 1 is provided with locking cams 10 and a hook 4 which cooperate with respective keeper elements of the keeper plate;

in which the fastening device 1 has an alignment

mark 13 which acts as a reference mark, to assist in the installation of the keeper plate 14, in that the position of the reference mark 14 is marked with respect to the fixed frame when the fastening device 1 is moved to a closed position, and a reference mark 22 on the keeper plate 14 is then aligned with the reference mark made on the fixed frame so that it can then be in clear alignment with the fastening device when the installation is completed.

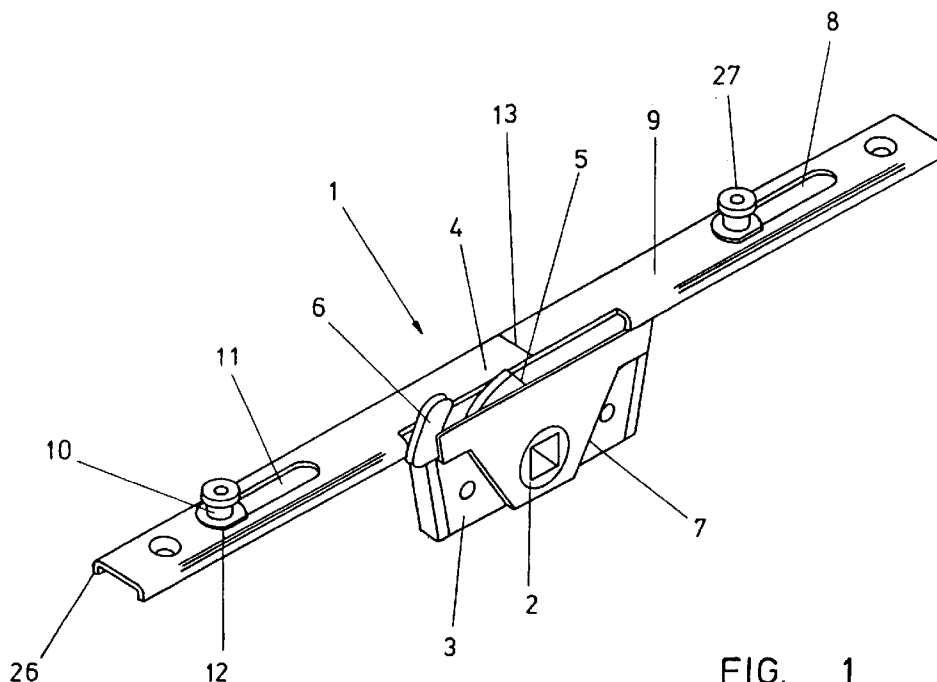


FIG. 1

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Description

[0001] This invention relates to a device for fastening an openable window or door member to a frame. It also relates to a keeper plate for attachment to a door or window frame for interengagement with the fastener of an openable door or window member.

[0002] A common method of unauthorised entry into a building is to prise a window from its frame. This is typically done by inserting a crowbar or similar tool into the gap between the window and the frame adjacent to the window fastening and then prising the two apart.

[0003] It is well known in the art of security fastenings that fastenings having a number of locking members for locking interengagement with a frame at several remotely spaced points are to be preferred. Such fastenings significantly increase the difficulty associated with prising apart the window and the frame. This is because a plurality of locking members can evenly distribute the force applied by the crowbar around the frame preventing it from breaking. A fastening having only one locking member will concentrate the force applied by the crowbar at a single point on the frame increasing the ease with which it can be broken.

[0004] However, in order to install such a fastening it is necessary to make several precisely shaped and aligned holes in the frame for interengagement with the locking members of the fastening. This is both difficult and time consuming, making such fastenings relatively unpopular.

[0005] The present invention provides a device comprising a fastening having a plurality of locking members and a keeper plate for interengagement with the locking members when the two are aligned.

[0006] Accordingly, in one aspect, the invention provides a device for fastening an openable door or window member to a frame, comprising:

a fastening for attachment to said openable member and having a plurality of locking members, each locking member being adjustable between open and locking positions; and

a keeper plate for attachment to said frame; said fastening and said keeper plate each having a reference mark for alignment of said fastening and said keeper plate;

the keeper plate and the plurality of locking members being for interengagement when the fastening and keeper plate are aligned and when the locking members are in the locking position.

[0007] The device of the invention greatly simplifies installation of such a multi-locking member fastening. Only one point on the fastening and one point on the keeper plate need to be aligned for all the locking members to be correctly aligned for interengagement with the keeper plate.

[0008] At least one of the locking members of the de-

vice may comprise:

a pinion housing;

a pinion rotatably mounted in the housing and adapted to be rotated by a spindle of an actuating handle between said opening and locking positions; a hook attached to said pinion and rotatable by the spindle of the actuating handle between opening and locking positions.

[0009] The keeper plate may comprise a bar about which said hook engages when said keeper plate and said fastening are aligned and when said hook is in said locking position.

[0010] At least one of the locking members may comprise an elongate member slidable longitudinally between said open position and said locking position;

said keeper plate may be suitable for interengagement with said elongate member when said elongate member and said keeper plate are aligned and said elongate member is in said locking position.

[0011] The device may further comprise a mechanism arranged within said housing interconnecting said pinion and said elongate member such that rotation of said hook between said open and locking positions slidably moves the elongate member between said open and locking positions.

[0012] Preferably, the keeper plate may comprise a guide means for maintaining said openable door or window member and said frame in constant relative spacial alignment when fastened.

[0013] Preferably the keeper plate comprises a raised portion spaced apart from said frame when said keeper plate and said frame are attached;

said raised portion comprising a channel open at one end.

[0014] The elongate member may have a cam protruding from said member.

[0015] Said channel and said cam may be arranged such that on alignment of said fastening and said keeper plate said cam slidably engages said channel on adjustment of said elongate member between the opening and locking positions.

[0016] The cam may be shaped to prevent the separation of said cam and said channel in a direction perpendicular to the plane of said channel.

[0017] Such a device has the advantage that as the portion of the keeper plate which engages the locking member is raised from the frame it is only necessary to attach the keeper plate to the frame. It is not necessary to make any holes in the frame for engagement with the cams, simplifying installation further.

[0018] In a further aspect of the invention there is provided a keeper plate for attachment to a door or window

frame and for interengagement with the fastening of an openable door or window member,

the fastening comprising:
 an elongate member longitudinally slidable along its length between open and locking positions;
 there being a cam protruding from said elongate member.

[0019] The keeper plate may comprise

a planar raised portion arranged such that on attachment of said keeper plate to said frame said raised portion is spaced from and substantially parallel to said frame;
 the raised portion having a cam engagement aperture having a first cam extending generally perpendicular to the long axis of the keeper plate and a second arm extending generally parallel to the long axis of the keeper plate arranged such that on closing the openable member with the elongate member in the open position the cam enters the first arm of said aperture via said opening and then on sliding the elongate member to the locking position the cam interengages with the second arm of the aperture, locking the openable member in place.

[0020] Preferably the keeper plate will comprise a plurality of spaced raised portions.

[0021] The elongate member bar have a plurality of cams for interengagement with said raised portions.

[0022] The keeper plate may further comprise a central planar portion having an opening and a bar extending across said opening, said bar being for hooking engagement with a hook of said fastening.

[0023] The present invention will now be described by way of example only with reference to the accompanying drawings in which:

Figure 1 is a perspective view of the fastening of the device according to the present invention in the open position;

Figure 2 is a perspective view of the keeper plate of the device according to the invention;

Figure 3 is an exploded view of the fastening device and the keeper plate showing how they interengage; and

Figures 4, 5 and 6 show the fastening device and the keeper plate mounted on an openable door or window frame member and a fixed frame respectively.

[0024] Referring to Figure 1, the fastening 1 is adapted to fasten an openable window or door to a fixed frame and comprises a pinion 2 rotatably mounted within a pin-

ion housing 3. The pinion 2 is adapted to be rotated by a spindle of an actuating handle (not shown).

[0025] Attached to the pinion 2 is a hook 4 comprising a main body 5 and a claw 6 extending from the main body 5 at an end remote from the pinion 2. Rotation of the pinion 2 results in the rotation of the hook 4 about the pinion axis.

[0026] The hook 4 is shown in the open position, substantially contained within the pinion housing 3. The hook 4 may be rotated into a locking position in which the main body 5 abuts against the side wall 7 of the pinion housing 3. In this position the claw protrudes from the pinion housing 3 for engagement with the bar of a keeper plate.

[0027] The pinion 2 has peripheral teeth (not shown) for meshing with a rack mounted on an elongate member 8. The elongate member is an espagnolette bar. Rotation of the pinion 2 causes longitudinal sliding of the espagnolette bar 8 along its length between open and locking positions with respect to a guide plate 9 which extends from the pinion housing 3. The guide plate 9 is arranged such that on insertion of the pinion housing 3 into a recess in the openable door or window, said guide plate 9 lies along the edge of said openable door or window. Other types of mechanism for converting the rotational motion of the pinion 2 into the linear motion of the espagnolette bar are possible.

[0028] The espagnolette bar 8 has a number of mushroom cams 10 extending from the bar 8 through apertures 11 in the guide plate 9. The apertures limit the motion of the espagnolette bar 8 to be between the open and locking positions. Cam plates 12 extending from the base of the mushroom cams 10 maintain the guide plate 9 and espagnolette bar 8 member in close alignment.

[0029] There is an alignment mark 13 on the cam plate 12 side of the guide plate 9. The alignment mark 13 extends substantially parallel to the axis of rotation of the pinion 2 and perpendicular to the longitudinal axis of the guide plate 9.

[0030] Referring to Figure 2, the keeper plate 14 is adapted for attachment to frame for a window or door and for interengagement with the fastening of the window or door. The keeper plate 14 comprises a substantially planar central portion 15 and a plurality of raised portions 16 connected to the central portion 15 by bridging portions 17. The raised portions 16 lie in the same plane whilst the central portion 15 lies in a plane parallel to the plane of the raised portions 16.

[0031] The keeper plate 14 is generally U-shaped, the base 18 of the U being formed by the raised 16 and central 15 portions and having relatively short side walls 19 extending from these portions. The side walls 19 are used to correctly align the keeper plate 14 with respect to the frame to which it will be attached.

[0032] The central portion 15 includes a plurality of central apertures 19, 20 extending substantially parallel to the long axis of the keeper plate 14. A bar 21 for engagement with the hook of a door or window fastening

extends across each of the apertures 19, 20. An alignment mark 22 for aligning the keeper plate 14 with a fastening is displayed on the central portion 15. The alignment mark 22 extends generally perpendicular to the long axis of the keeper plate 14.

[0033] Each raised portion 16 has a mushroom cam engagement aperture 23 having a first arm 24 extending generally perpendicular to the long axis of the keeper plate and a second arm extending generally parallel to the long axis 14 of the keeper plate. The first arm of the cam engagement aperture 23 is open at one end for allowing the cam to enter.

[0034] In order to install the device the fastening 1 is attached to a door (or window). The pinion housing 3 is engaged in a recess in the door and the guide plate 9 is attached to the edge of the door. It is usually screwed in place. The guide plate 9 has small side walls 26 which ensure that it is slightly raised from the door edge when attached allowing the espagnolette bar 8 to slide in the gap between the two.

[0035] Once the fastening 1 is in place the door is closed and the position of the fastening alignment mark 13 is noted on the surrounding window frame. The door is then opened.

[0036] The keeper plate 14 is aligned on the frame with its alignment mark 22 adjacent to the position of the alignment mark 13 of the fastening. The position of the central apertures 20 of the central portion 15 are noted on the frame.

[0037] The keeper plate 14 is then removed and a recess is formed in the frame at the marked positions of the central apertures 20. The keeper plate 14 is then realigned and fastened in position, usually by screws.

[0038] In order to close the door the pinion 2 is rotated until the hook 4 and mushroom cams 10 are in the open position. As the door is closed the mushroom cams 10 enter into the first arm 24 of the cam engagement apertures 23. The enlarged mushroom heads 27 of the cams are located between the frame and the raised portion 16.

[0039] The head of the mushroom cam 27 is wider than the second arm 25 of the cam engagement aperture 23. Therefore, the mushroom cam 27, along with the hook 4, prevent the separation of door and frame.

[0040] The fastening can engage with either of the central apertures 19, 20. When engaged with the first aperture 19 the window or door is spaced slightly from the frame for ventilation. When the fastening is engaged with the second central aperture the door or window abuts tightly against the frame preventing ventilation.

[0041] One of the side walls of the second central aperture 20 is slightly non parallel with the long axis of the keeper plate 14. When the door is in the closed position and the hook rotated from the open to locking positions the hook wall abut against this side wall. As rotation is continued the hook will slide along this side wall pulling the door towards the frame, tightening the seal between the two. When the door abuts against the guide means 20 the pinion 2 is rotated. The hook 4 rotates to the lock-

ing position engaging the bar 21 extending across the central aperture 20. Simultaneously, the espagnolette bar 21 slides along its length and the mushroom cams 10 slide into the second arm 25 of the cam aperture 23.

[0042] During the installation of the device only one reference point is to be noted. (The position of the alignment mark of the fastening 1 on the surrounding frame). However, when the door is closed and the pinion 2 rotated to the locked position the door and frame are interengaged at a number of points.

[0043] Similarly, the only recess formed in the frame is one for the hook. As the raised portions 16 are raised from the frame the mushroom cams 10 can interengage with the cam engagement aperture 23 without the need to form recesses in the frame.

[0044] Figure 3 is an exploded view of the fastening device 1 and the keeper plate 14, showing how they interengage. Figures 4 and 5 show the fastening device 1 and the keeper plate 14 mounted on an openable door or window frame member and a fixed frame respectively. Figure 6 shows how the hook of the fastening device engages with a keeper slot of the keeper plate.

[0045] The illustrated embodiment of the invention also incorporates anti-crash features (see reference 26 in the Figures) as disclosed in more detail in publication number GB 2304784, to which attention is drawn. The disclosure in GB 2304784 is incorporated herein by reference.

Claims

1. A device for fastening an openable door or window member to a frame, comprising:

a fastening for attachment to said openable member and having a plurality of locking members, each locking member being adjustable between open and locking positions; and
a keeper plate for attachment to said frame; said fastening and said keeper plate each having a reference mark for alignment of said fastening and said keeper plate;
the keeper plate and the plurality of locking members being for interengagement when the fastening and keeper plate are when aligned and when the locking members are in the locking position.

2. A device as claimed in claim 1 wherein at least one of said locking members comprises:

a pinion housing;
a pinion rotatably mounted in the housing and adapted to be rotated by a spindle of an actuating handle between said opening and locking positions;
a hook attached to said pinion and rotatable by

the spindle of the actuating handle between opening and locking positions.

the keeper plate comprising a bar about which said hook engages when said keeper plate and said fastening are aligned and when said hook is in said locking position.

3. A device as claimed in claim wherein said locking member comprises:

an elongate member slidable longitudinally between said open position and said locking position;

said keeper plate being suitable for interengagement with said elongate member once the elongate member and said keeper plate are aligned and said elongate member is in said locking position.

4. A device as claimed in claim 2 further comprising an elongate member slidable longitudinally between said opening position and said locking position with respect to said keeper plate and:

a mechanism arranged within said housing interconnecting said pinion as an elongate member such that rotation of said hood between said open and locking positions slidably moves the elongate member which when said opening and locking positions.

5. A device as claimed in claim 1 further comprising a guide means for maintaining said openable door or window member and said frame in constant relative spacial alignment and fastened.

6. A device as claimed in claim 3,

said keeper plate further comprising a raised portion spaced apart from said frame when said keeper plate and said frame are attached;

said raised portion comprising a channel open at one end;

the elongate member having a cam protruding from said member;

said channel and said cam being arranged such as an alignment of said fastening and said keeper plate, said cam slidably engages the channel on adjustment of said elongate member between the opening and locking positions; the cam being shaped to prevent the separation of said cam and said channel in a direction perpendicular to the plane of said channel.

7. A keeper plate for attachment to a door or window frame and for interengagement with the fastening of an openable door or window member;

the fastening comprising

an elongate member longitudinally slidable along its length between open and locking positions;

there being a cam protruding from said elongate member;

said keeper plate comprising

a planar raised portion raised such that an attachment of said keeper plate to said frame said raised portion is spaced from the substantially parallel to said frame

the raised portion having a cam engagement aperture having a first cam extending generally perpendicular to the long axis of the keeper plate and a second arm withstanding generally parallel to the long axis of the keeper plate arranged such that on closing the openable member of the elongate member in the opening position the cam enters the first arm of said aperture via said opening and then on sliding the elongate member to the locking position the cam interengages with the second arm of the aperture locking the openable member in place.

8. The keeper plate as claimed in claim 7 further comprising a plurality of spaced raised portions

said elongate member having a plurality of cams for interengagement with said raised portions.

9. The keeper plate as claimed in claim 7 further comprising a central planar portion an opening and a bar extending across said opening

said bar being for hooking engagement with a hook of said fastening.

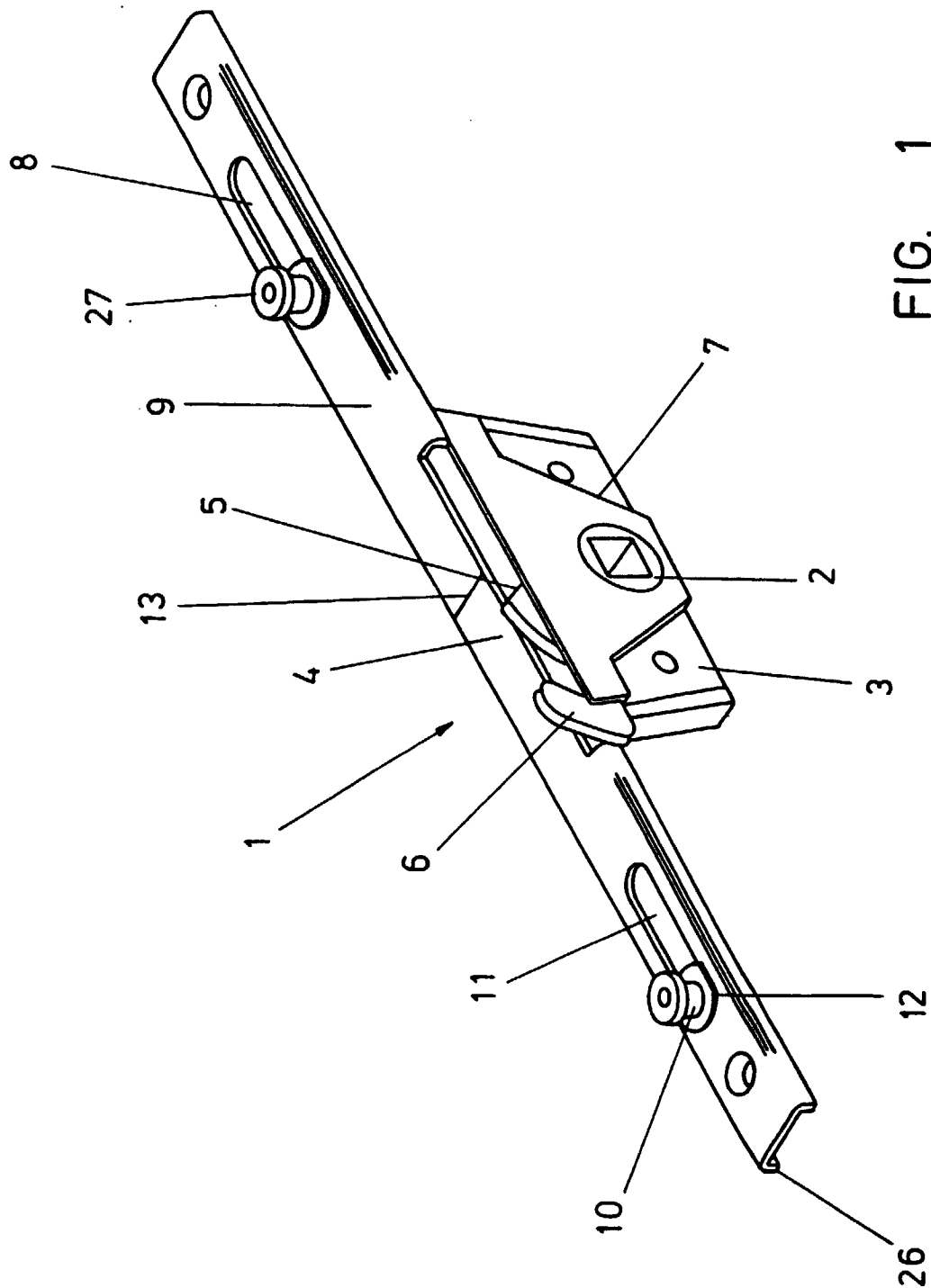


FIG. 1

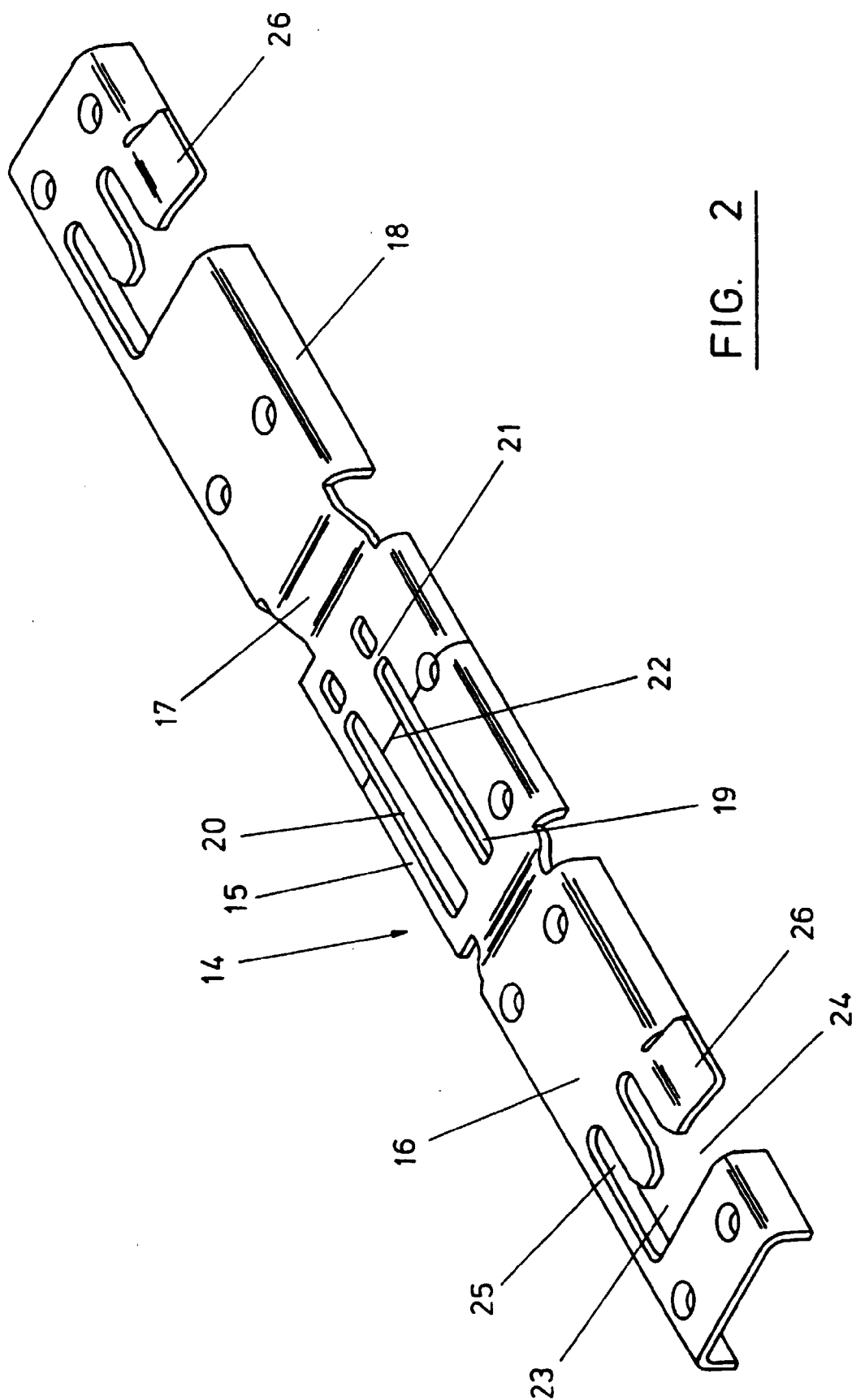


FIG. 2

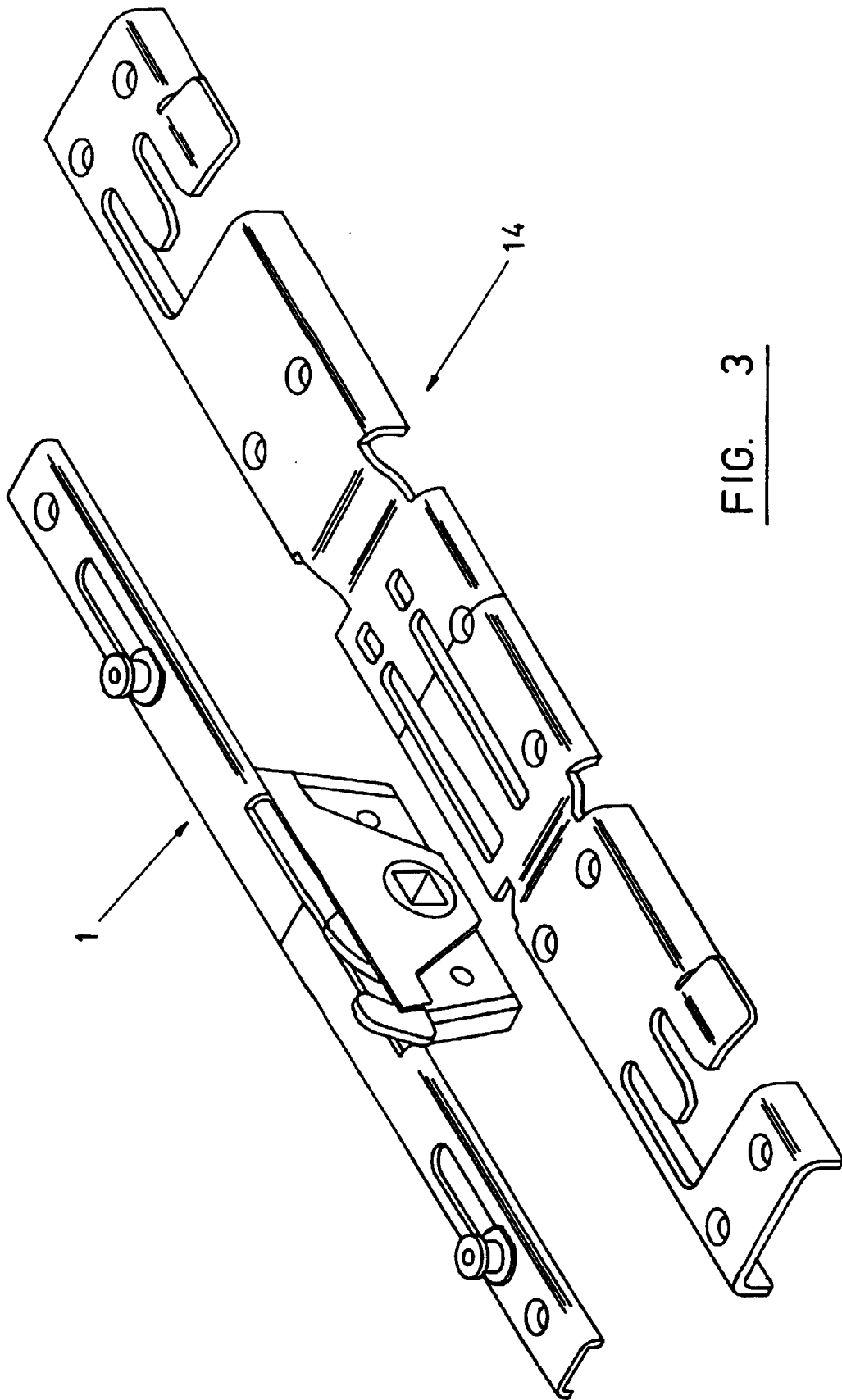


FIG. 3

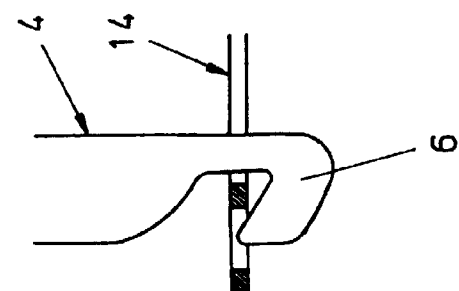


FIG. 6

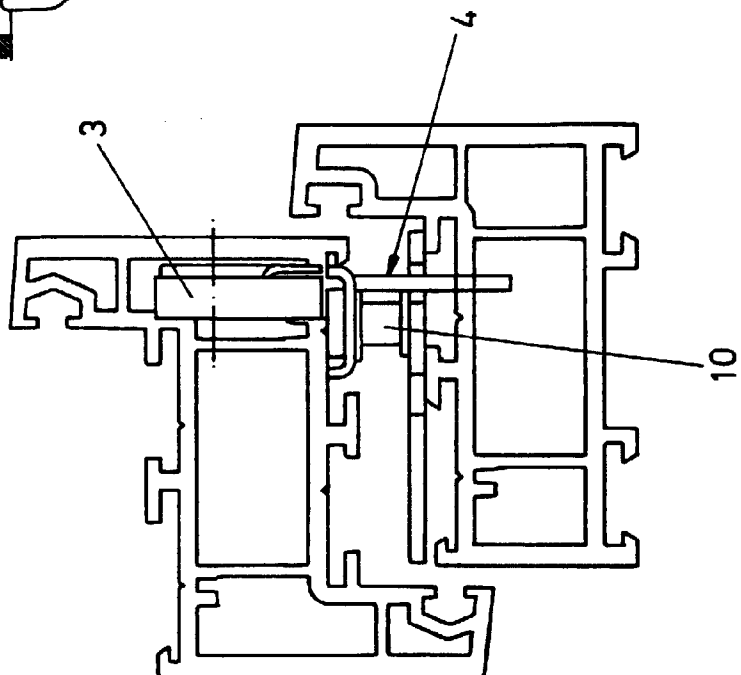


FIG. 5

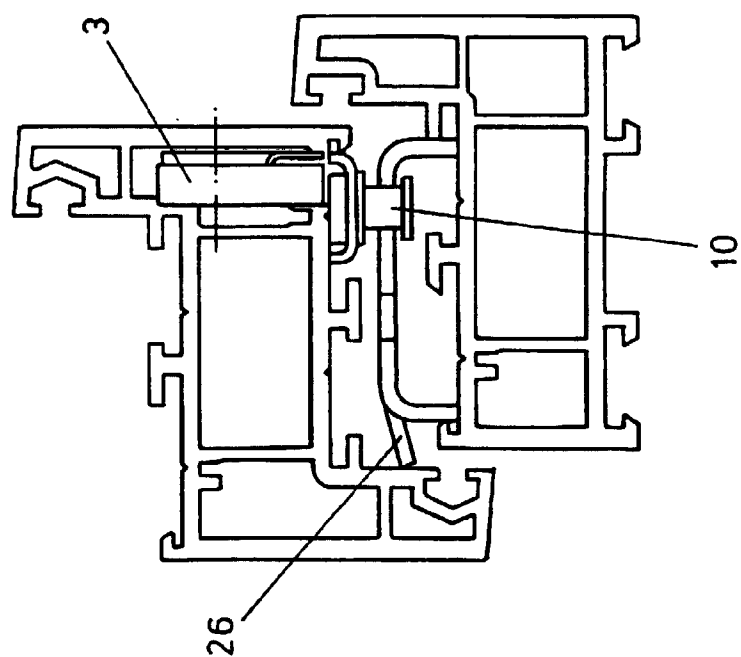


FIG. 4