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(56) Documents Cited:
GB 2399859 A **GB 2398104 A**
GB 2363160 A **GB 2330173 A**
GB 2273526 A **GB 2262308 A**
EP 1362973 A2

(58) Field of Search:
UK CL (Edition X) **E2F**
INT CL⁷ **E05C, E05D**
Other: **ONLINE: EPODOC, WPI**

(54) Abstract Title: **Stay with releasable sliding supports**

(57) A stay including an arm 12 for supporting a load, a track 11 and a linkage 18, 15 for hingingly connecting the arm 12 to the track 11. The stay also comprises first and second supports 13, 14 located in the track in fixed positions by a releasable mechanism and a releasable connection respectively; when these are both engaged, the arm can be moved from a "closed" position overlying the track to a restrained open position. When the releasable mechanism is engaged and the releasable connection is released, the arm 12 can move to an egress position. When the releasable mechanism is released, the arm 12 can move to a "clean" position. The releasable connection may comprise two inter-engaging portions, such as an enlarged head 22, which may be arrow-shaped, and mouth, deflectable hook or catch. These portions may be resettably separated when the stay experiences an opening force along the track above a predetermined level. A member 34 for releasing the releasable mechanism may be slidably located in the track.

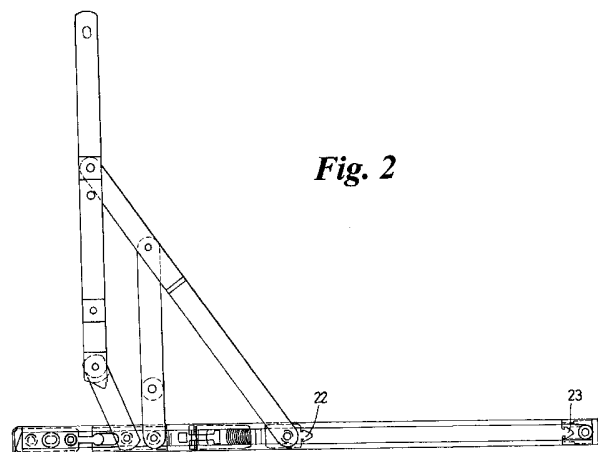


Fig. 2

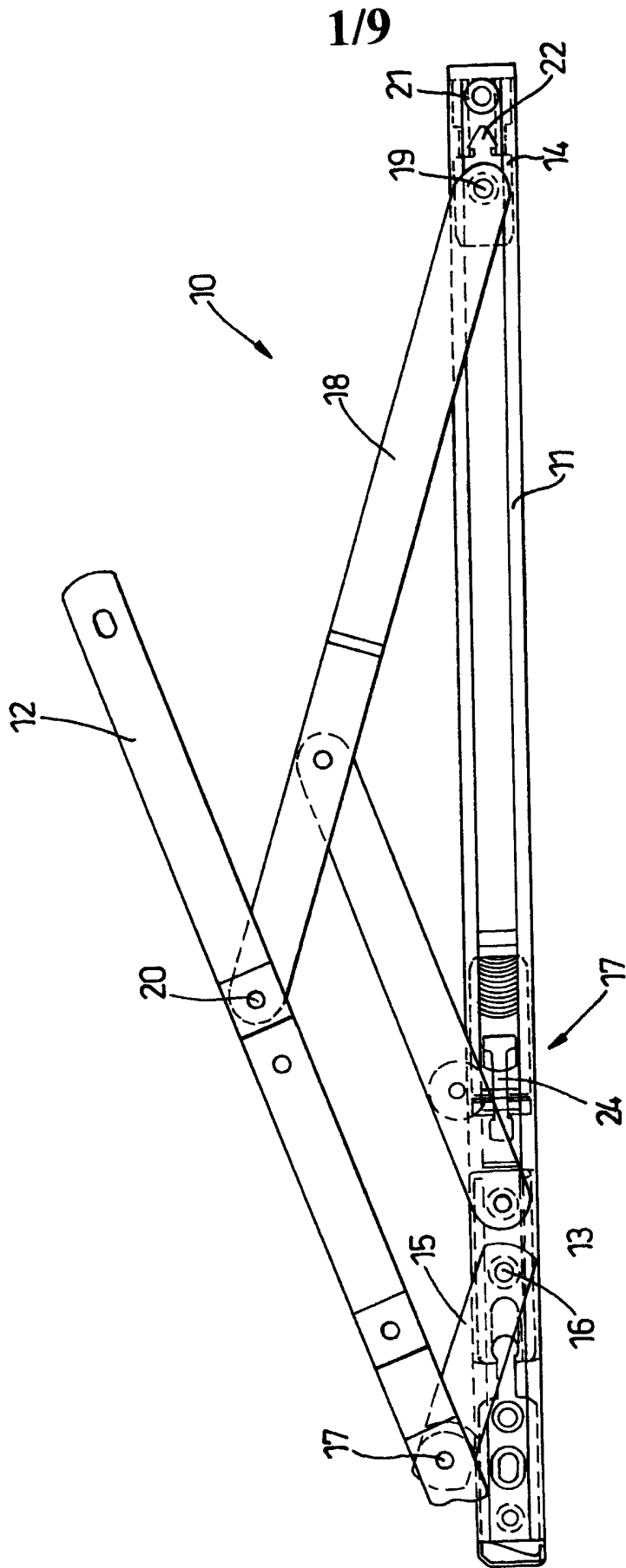
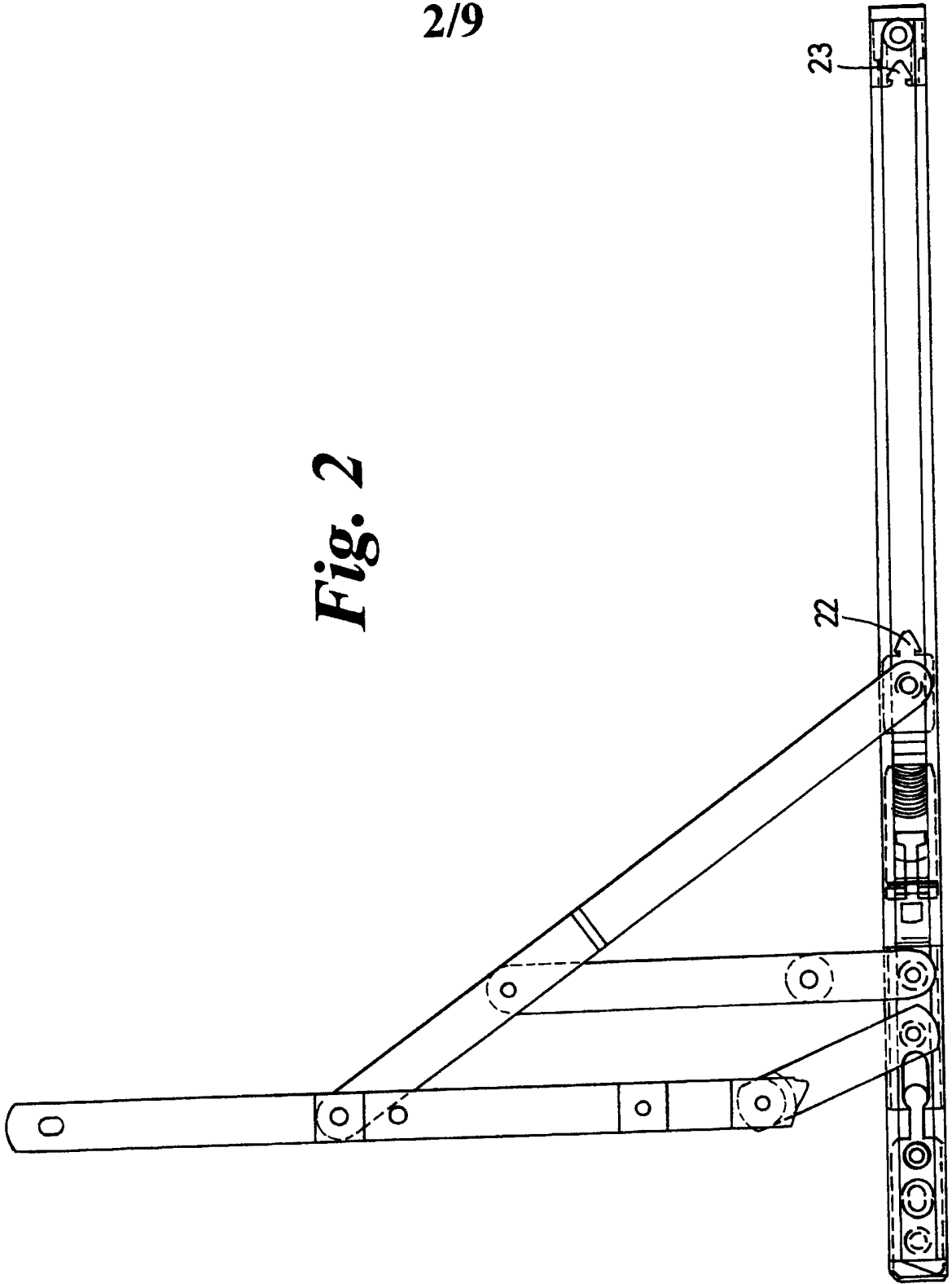


Fig. 1

Fig. 2



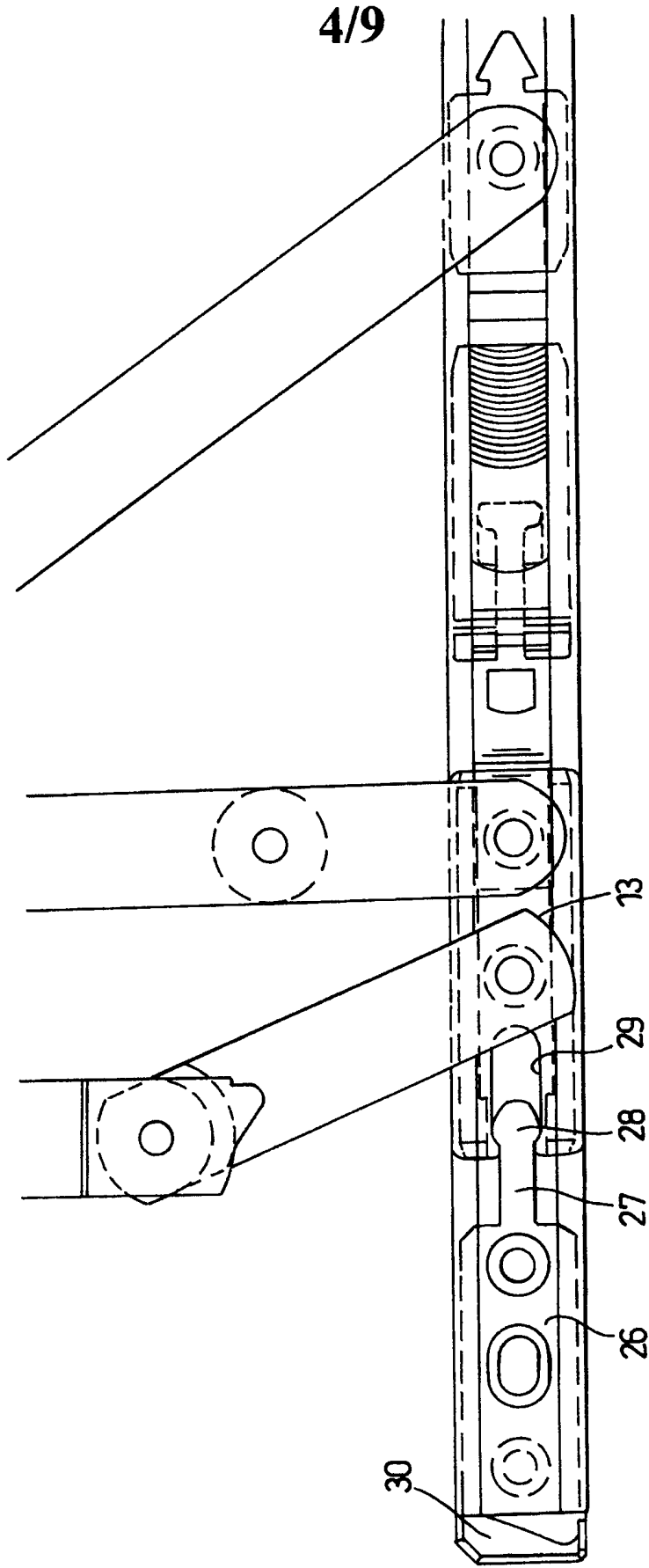


Fig. 4

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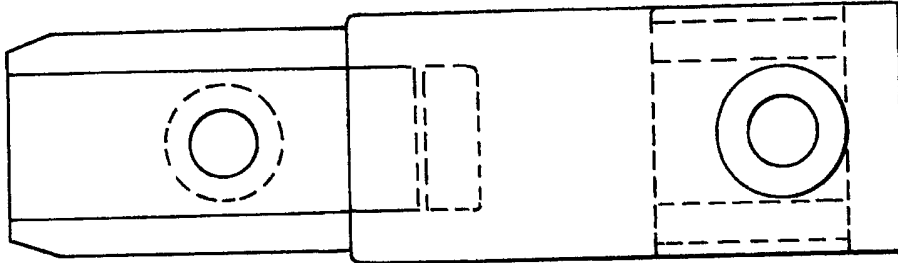


Fig. 5(a)

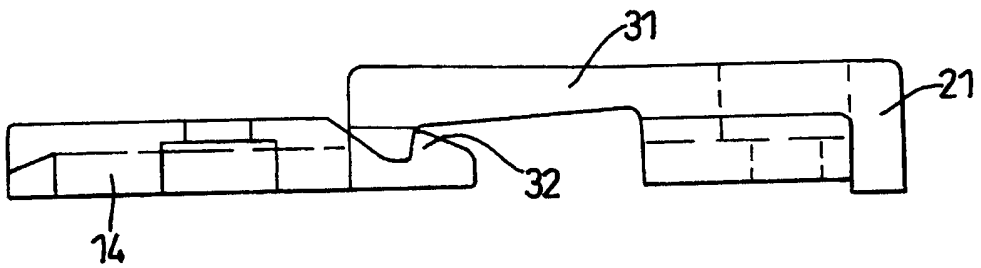


Fig. 5(b)

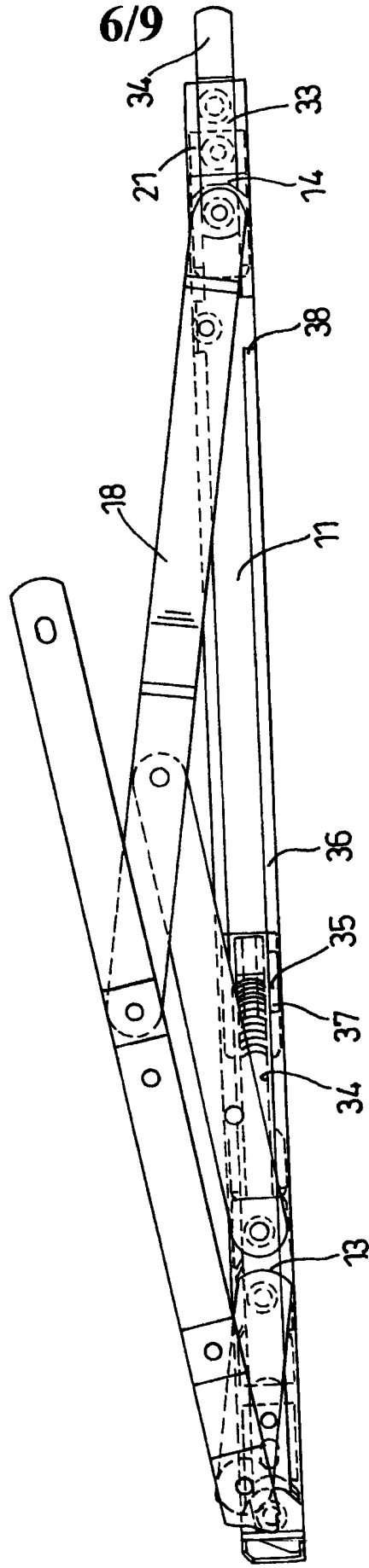
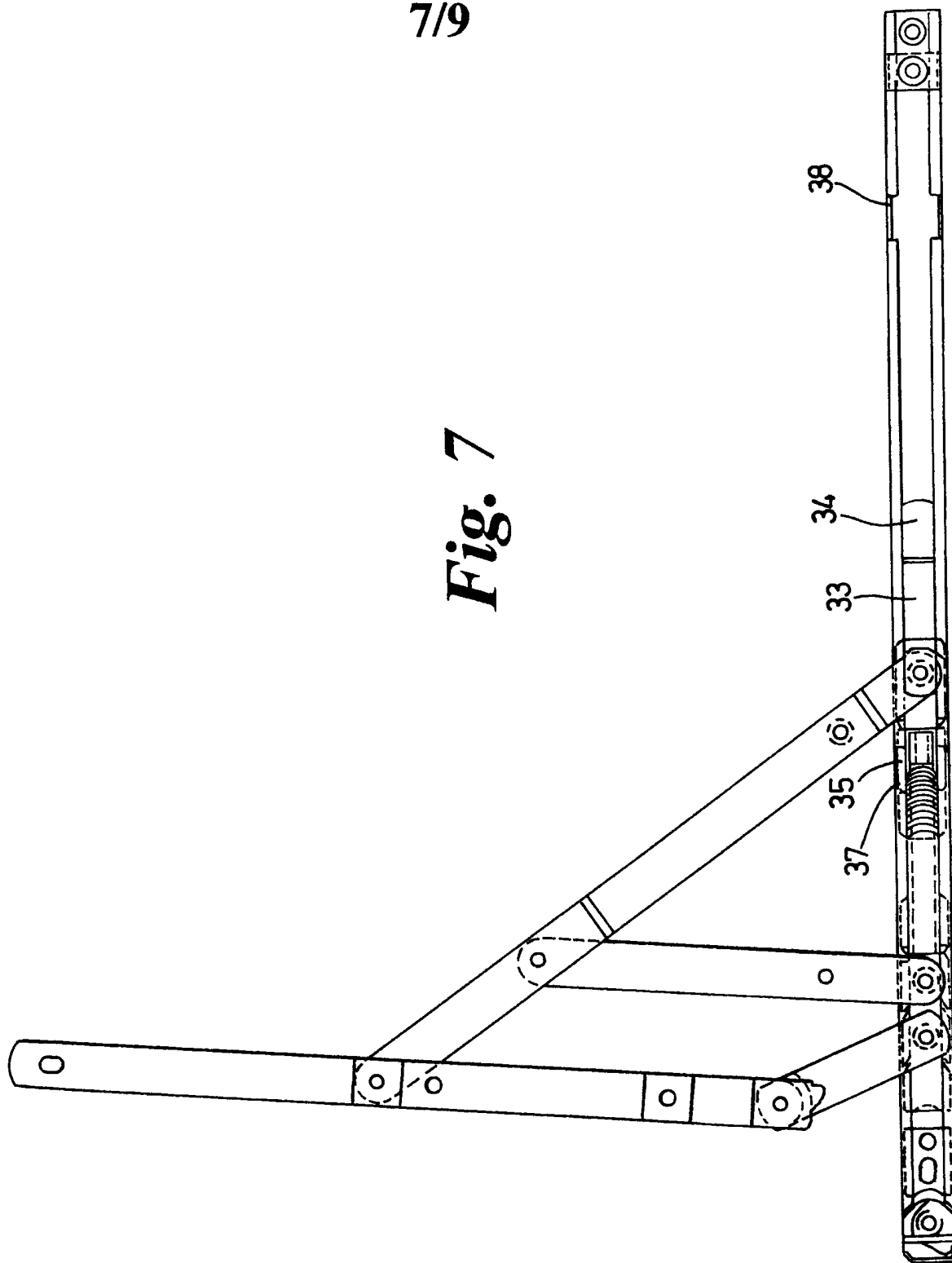


Fig. 6

Fig. 7



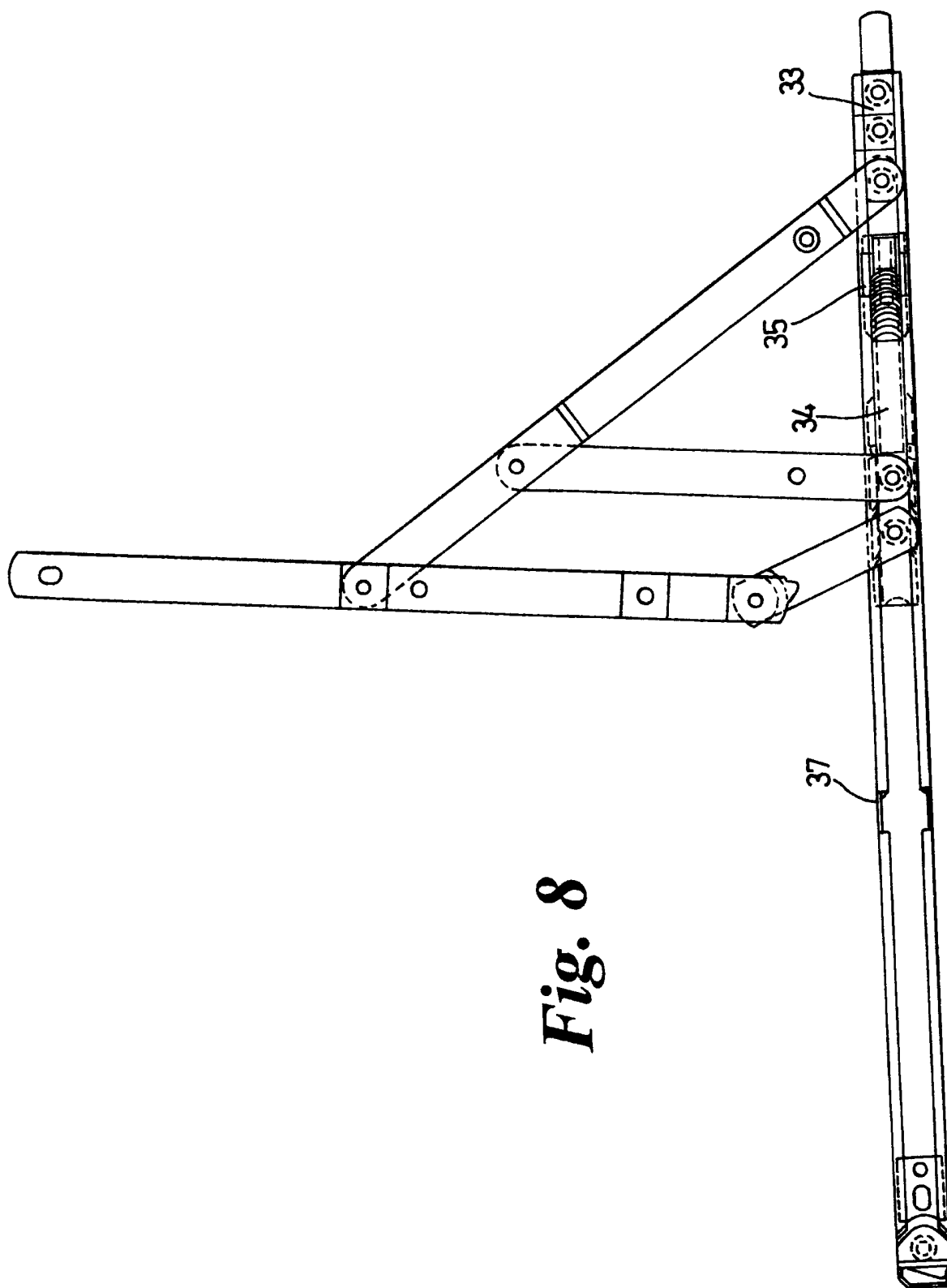
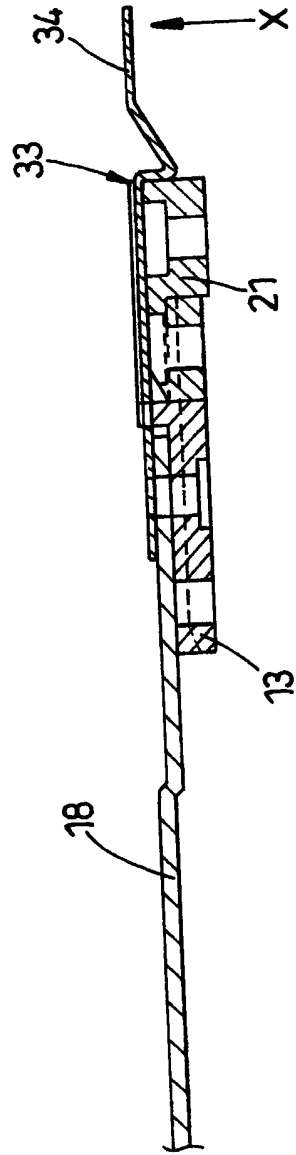
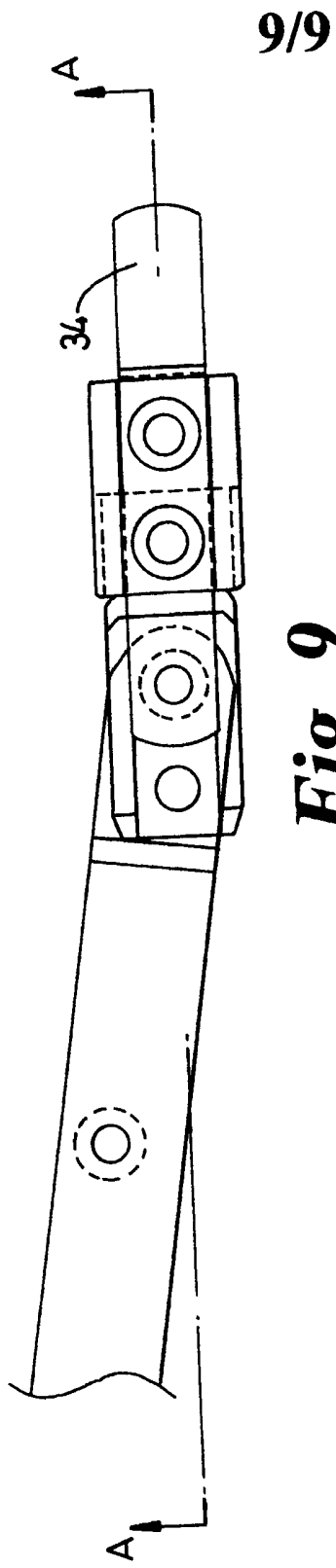


Fig. 8



Stay

This invention relates to stays such as window stays.

Stays, which are in the basic form of a four-bar mechanism, in which an arm can be hinged relative to a track, that is fixed on the frame, are well known.

5 In most such stays the pivots connected to one end of the arm stay fixed and the pivot connected to the other end of the arm moves or vice versa, but in some stays there are two pivot carrying sliders. Depending on the construction, different stays provide different functions. For example there are a group of stays which are known as restrictor stays, which can have their opening
10 restricted to prevent children falling out, but in general this restriction can be released to allow the stay to open more fully to enable easy clean or full egress. As a restrictor stay is intended to resist significant force, the release mechanisms tend to be complicated or at least extremely positive and they can cause difficulties in emergencies.

15 A second approach is to have a stay which restrains the opening, but which will allow full egress opening when a significant force is applied to the window.

In order to provide good egress, the fully open normal position of a released restrictor or restrained window has a window carrying arm extending at
20 about 90 degrees to the track that is mounted on the window frame from a point adjacent one end of the track. This means that the side of the window that is on the outside, when the window is closed, is not accessible for cleaning purposes. This has led to the development of stays, typically to slider stays, in which the arms can be slid from the egress position along the track, whilst maintaining its

essentially 90 degree orientation. When it extends from a position intermediate the length of the track, both sides of the window are accessible for cleaning purposes, but of course egress is prevented. Initial designs required the arms to be slid back into the egress position, before the window could be closed and this could be rather cumbersome. At least some versions of the two-slider stay have enabled the window to be closed from any position, including its cleaning position. However, none of these stays achieve the combination of restraint, egress and cleaning.

From one aspect the invention consists in a stay for windows or the like including an arm for supporting a load, a track, the first support located in the track in a fixed position by a releasable mechanism whereby when released the first support can move along the track, the second support located in the track in a further spaced fixed position by releasable connection whereby when released the second support can move along the track and a linkage for hingingly connecting arm to the track and including at least one link member connected to the first support and another link member connected to the second support whereby:

- (a) with the releasable mechanism and the releasable connection engaged, the arm can be moved from a "closed" position overlying the track to a restrained open position;
- (b) with the releasable mechanism engaged and the releasable connection released, the arm can be moved to an egress position in which it is located adjacent one end of the track and at about 90 degrees thereto; and

- (c) With the releasable mechanism released, the arm can be moved to a "clean" position in which it is located intermediate the ends of the track and at about 90 degrees thereto.

In a preferred embodiment the stay further includes means for preventing movement of the first support, when the stay is in the egress position. This is particularly desirable, because should the releasable mechanism become released, or not be properly re-engaged for any reason, it prevents the window wandering into a "clean" position and preventing suitable egress.

Additionally, with the current arrangements, the user has to lean across a fully opened window to release the restraining mechanisms in the opposed pairs of stays that support the window. In that case the movement prevention means may include a frictional engagement between an extension of the support and detent member fixed with respect to the track or vice versa.

The releasable connection may be constituted by two inter-engaging portions that can resetably separated when the stay experiences an opening force in a longitudinal direction along the track above a predetermined level.

One portion may have a projection having an enlarged head and the other portion may have an open-mouthed opening, the mouth being deflectable to allow passage of the head there through when the stay experiences the opening force. The projection may be in the form of an arrow head or a jigsaw puzzle piece limb. Alternatively one of the inter-engaging portions may be in the form of a deflectable hook.

The releasable mechanism may include a catch on the first support for engaging the track and the releasable member may be coupled to the support

for movement therewith and for relative movement thereto, the releasable member being arranged to release the catch on movement towards the support and when the releasable member is slidably located within the track.

Although the invention has been defined above it is to be understood it includes any inventive combination of the features set out above or in the following description.

The invention may be performed in various ways and specific embodiments will now be described, by way of example, with reference to the accompanying drawings in which:

10 Figure 1 is a view from above of a stay in a restraint position;

Figure 2 is a similar view with a stay in the full egress position;

Figure 3 is a similar view with a stay in its easy clean position;

Figure 4 is an enlarged view of one end of the track with a stay in the full egress position;

15 Figures 5a and b are a view from above and a side view respectively of an alternative form of the releasable connection;

Figure 6 is a view from above of an alternative embodiment in a restraint position;

20 Figure 7 is a similar view with the stay of Figure 6 in the full egress position;

Figure 8 is a similar view in its easy clean position; and

Figures 9 and 10 are a view from of above and side respectively of the release connection of the alternative embodiment.

As can be seen in Figure 1 a stay, generally indicated at 10, essentially

comprises a track 11, for mounting on the frame, a window carrying arm 12, a first support 13, a second support 14, a link 15 extending between a pivot 16 on the support 13 and a pivot 17 at one end of the arm 12, a further link 18, extending between a pivot 19 on the support 14 and an intermediate pivot 20 on the arm 12 and a brace pivotally connected between the link 18 and the support 13. The support 14 is held, as will be described in more detail below, fixed to an anchor portion 21 located in the track. If the support 14 and the anchor 21 are viewed as a single member, the configuration is well known in the art and its operation is well understood. In this configuration the arm 12 can be moved into the restraint position illustrated in Figure 1.

Looking now at the combination of the support 14 and the anchor 21 in more detail, it will be noted that the support 14 has an arrow head projection 22, which engages in a correspondingly shaped open mouthed opening 23 (this is best seen in Figure 2) in the anchor 21.

Under normal forces applied to a window mounted on the arm 12, the engagement between the support 14 and anchor 21 will not be broken, but when the longitudinal force, along the track, on the support 14 exceeds a predetermined level, then the head 22 will break out of the mouth 23 by deflecting the lips thereof. The predetermined level of force is the equivalent of a reasonable push being applied to the window by an adult.

When such a push is applied, then the stay 10 can move into the full egress position as indicated in Figure 2. On closing of the window from that full egress position, the head 22 will re-engage in the mouth 23 and so the next normal opening of the window will be into the restraint position.

The support 13 is held in a locked position by a releasable catch mechanism generally indicated at 17. The operation and construction of a suitable catch mechanism is described in our co-pending patent application 0403344.5 and the disclosure of that application is hereby incorporated by reference. For the purposes of the current specification it is sufficient to understand that operation of the release mechanism 17 disengages a catch 24 from the track 11 which would normally allow the support 13 to move along the track 11. Indeed if the release mechanism 17 is so operated, when the stay 12 is in its release position, then the support 13 can slide along the track 11 towards the support 14 to allow the stay to move into its easy clean position as illustrated in Figure 3. Thus advantageously, and in contrast to many previous designs, the easy clean position can be achieved without first passing through the egress position.

However, as can best be seen in Figure 4, movement prevention means, generally indicated at 25, are provided to prevent the support 13 moving towards the easy clean position from the egress position. As has been mentioned above, this is particularly advantageous, because it prevents the window being accidentally moved towards the easy clean position, partially closing the egress gap, when the window is intended to provide egress and also prevents dangerous attempts at operating the release mechanisms with an open window.

In detail the movement prevention means 25 comprises a second anchor 26 having a projection 27 with an enlarged head 28, which engages in an open-mouthed opening 29 in the support 13. By a proper design of the head 28 and mouth 29, it is possible to have an engagement between the head 28 and mouth

29 that can readily be broken, when the support 13 is released in the restraint position, but which cannot readily be broken, when the stay is in the egress position. This is because of the different geometries that exist in those two positions. The exact design of the head and mouth will be dependant on the dimensions of the arm, the links and the window, but suitable variations can readily be determined by one skilled in the art.

It will be appreciated that the projection 27 could be carried on the support 13 and the mouth 29 provided in the anchor 26. Conveniently the anchor 26 may be moulded integrally with the end cap 30 of the stay 10.

Although the arrow head arrangement for providing the releasable connection between the support 14 and anchor 21, is particularly convenient, a jigsaw style connection can also be used as can the arrangement illustrated in Figures 5a and b, wherein the anchor 21 is provided with a projecting hook portion 31 that engages in a cooperating formation 32 on the support 14. When the longitudinal opening force is sufficient the hook 31 will be deflected upwardly to ride over the formation 32 and it will be understood that on the return of the support 14 similar movement can allow re-engagement.

The Applicants' window is therefore very versatile, particularly as each function (easy clean, restraint and egress) is achieved by normal operation of the window and does not require awkward translation of the window along the track.

Turning to Figures 6 to 10 an alternative embodiment is illustrated which includes a further alternative releasable connection between the support 14 and anchor 21 and an alternative movement prevention means 25.

If the first the support 14 carries a longitudinal spring catch 33 which engages over the outer end of the anchor 21 and which can be disengaged by lifting its tab 34 in the direction of the arrow X. In emergency the catch 33 will simply cover over the anchor 21 in response to a large opening force applied to the window. Re-engagement occurs by reversed covering.

A body 34 which is slidably mounted in the track 11 and is interposed between the supports 13 and 14.

The body 34 will be described in more detail below, but it has a lateral projections 35 for engaging in cut-outs in the turned over lips 36 of the track 11. Two pairs of cutouts are provided in the track. The first pair, 37, are located in a position in which the body 34 will prevent the support 13 travelling along the track 11 from left to right as shown in Figure 1. The second pair, 38, are located to retain the body 34 in the position in which it allows the stay to be in a cleaning position, as is described below.

The body 34 is arranged so that the projections 35 are normally urged against the undersides of the lip 36 and therefore will pop into the openings as they become aligned with a pair of openings (37 or 38). Similarly the body can be depressed against spring action allowing for release of the body 34 from a defined position.

Thus if the window is in the egress position illustrated in Figure 1, it can be moved into the cleaning position illustrated in Figure 2 in one of two ways. The first method is simply to depress the body 34 to release it from the openings 37 and to slide the all stay and window assembly along the track from left to right. In some cases this may be too great an effort, due to the weight of the

window, and so would not be suitable, for example, for more elderly users. The alternative approach therefore is to depress the body 34 to release it from the position defined by the cutouts 37; to close partially the window so that the support 14 retreats past the openings 38; to slide the body 34 until the
5 projections 35 engage in the openings 38 and then to reopen the window, whereupon, because the support 14 is now restricted from movement by the body 34, the first support 13 will slide down the track from left to right into the cleaning position.

It will be understood that stays of this type are used in pairs and in either
10 case both bodies will have to be manipulated according to the method being used. The second method will therefore be somewhat longwinded for some users, but it is a great boon for those who are physically not strong enough to slide the whole window unit relative to the track.

When the stay 10 is closed from the cleaning position at Figure 2, the
15 support 14 will return up the track from right to left until it reaches its window closed position. However, the body 34 will apparently remain retained in the openings 38. It cannot therefore be left in that position, or else on next opening the window would open to its cleaning position. Accordingly link 18 carries, on its underside, a moulding which has a downward projection. As the window
20 closes the link 18 begins to sweep over the body 34 and the projection passes through an opening 38 to engage the upper part of the body 34 to depress the projections 35 out of the openings 38. The body 34 is formed with a raised portion, which has an edge that can be cammingly engaged by the projection so that the body 34 is nudged sufficiently right to left up the track 11 that, when the

stay is reopened, the projections 35 will not simply pop back into the openings 38.

On reopening of the stay, the second support 14 will move right to left along the track sweeping the body 34 towards the support 13 until it once more engages in the openings of 37 to ensure that the stay necessarily opens to egress in its fully opened position.

The body is provided with a spring in its underside for engaging the base of the track 11. The spring mechanism could be provided by some integral moulding.

To achieve the functions as described above, it is necessary that the frictional engagement between the support 13 on the track is greater than the frictional engagement between the support 14 and the track, at least when the support 13 is in its egress position. This can be achieved by providing localised enhanced frictional engagement at the support 13's egress position, but most simply the support 14 is of a higher frictional type, for example that described in our co-pending application to 200407882.0 filed on 7th April 2004.

CLAIMS

1 A stay for windows or the like including an arm for supporting a load, a track, a first support located in the track in a fixed position by a releasable mechanism whereby when released the first support can move along the track, a
5 second support located in the track in a further spaced fixed position by a releasable connection whereby when released the second support can move along the track and a linkage for hingingly connecting the arm to the track and including at least one link member connected to the first support and another link member connected to the second support whereby:

10 (a) with the releasable mechanism and the releasable connection engaged, the arm can be moved from a "closed" position overlying the track to a restrained open position;

(b) with the releasable mechanism engaged and the releasable connection released thereto, the arm can move to a egress position in which it is
15 located adjacent one end of the track and at about 90 degrees and

(c) with the releasable mechanism released, the arm can move to a "clean" position in which it is located intermediate the ends of the track and at about 90 degrees thereto.

2. A stay as claimed in claim 1 further including means for preventing
20 movement of the first support, when the stay is in the egress position.

3. A stay as claimed in claim 2 wherein the movement prevention means includes a frictional engagement between an extension of the support and a detent fixed with respect to the track.

4. A stay as claimed in any one of the preceding claims wherein the

releasable connection is constructed by two inter-engaging portions which can be resetably separated when the stay experiences an opening force in a longitudinal direction along the track above a predetermined level.

5 5. A stay as claimed in claim 4 wherein one portion has a projection having an enlarged head and the other portion has an open mounted opening, the mouth being deflectable to allow passage of the head there through when the stay experiences the opening force.

6. A stay as claimed in claim 4 wherein the projection is in the form of an arrow head or a jigsaw puzzle piece limb.

10 7. A stay as claimed in claim 4 wherein one of the inter-engaging portions is in the form of a deflectable hook.

8. A stay as claimed in claim 4 wherein the inter-engaging portions are a longitudinal extending catch mounted on the second support and an end stop in the track over which the catch can cam for engagement and disengagement.

15 9. A stay as claimed in any one of the preceding claims wherein the releasable mechanism includes a catch on the first support for engaging the track and a releasable member is coupled to the support for movement therewith and for relative movement thereto, the release member being arranged to release the catch on movement towards the support and wherein the release member is slidably located within the track.

20 10. A stay as claimed in claim 1 or claims 4 to 9 as dependent on claim 1 wherein the movement prevention means include an independent body slidably disposed in the track between the two supports and releasably automatic engageable with the track in a first position in which it restricts movement of the

first support from its egress position, but which, when released allows movement into a cleaning position.

5 11. A stay as claimed in claim 10 wherein the body is releasably automatically engageable with the track in a second position when it reaches the cleaning position so that it remains substantially therein on closing of the stay.

12. A stay as claimed in claim 11 further including means for releasing the body from its second position on closing or opening of the stay such that the body is returned to its first position by movement of the second support on opening of the stay to its egress position.

10 13. A stay as claimed in any one of claims 10 to 12 wherein the body has one or more projections for engaging in openings in the track.

14. A stay as claimed in claim 13 wherein the body is spring loaded for movement of the or each projection into an opening.

15 15. A stay as claimed in any one of claims 1 to 14 wherein, at least in the egress position, the first support has a greater frictional engagement with the track than the second support.of the stay.



INVESTOR IN PEOPLE

Application No: GB0514335.9

Examiner: Catherine Jones

Claims searched: 1-15

Date of search: 30 September 2005

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,Y	X: 1-4 & 15; Y: 9-14	EP 1362973 A2 (SECURISTYLE) - see particularly paragraphs 0020 - 0030
X,Y	X: 1-3 & 15; Y: 4, 5 & 9-14	GB 2330173 A (TROJAN) - see particularly figures 1 and 2, and line 9 of page 6 to line 14 of page 8
X,Y	X: 1-3 & 9; Y: 4, 5 & 10-14	GB 2363160 A (LAPORTA) - see particularly line 19 or page 10 to line 29 of page 11
Y	4 & 5	GB 2398104 A (JURRAS) - see particularly the figures and line 17 of page 5 to line 18 of page 6
Y	4 & 5	GB 2273526 A (EUROMOND) - see particularly figures 1-5 and line 4 of page 9 to line 4 of page 11
Y	9	GB 2399859 A (COTSWOLD) - see particularly the figures
Y	10-14	GB 2262308 A (SECURISTYLE) - see whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

E2F

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

E05C; E05D



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The following online and other databases have been used in the preparation of this search report

EPODOC, WPI