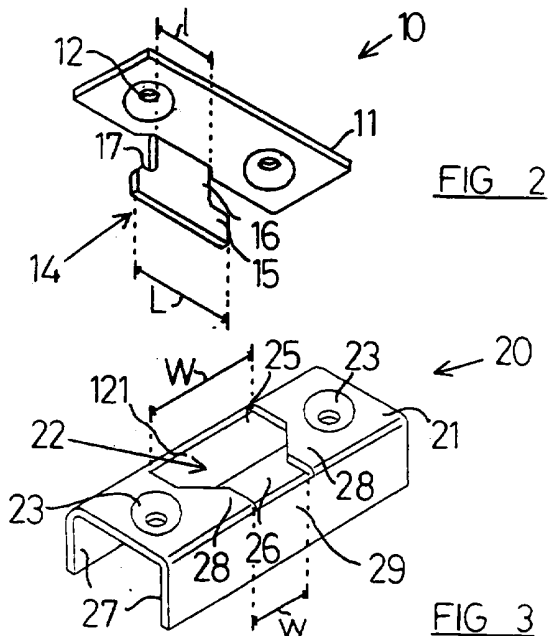
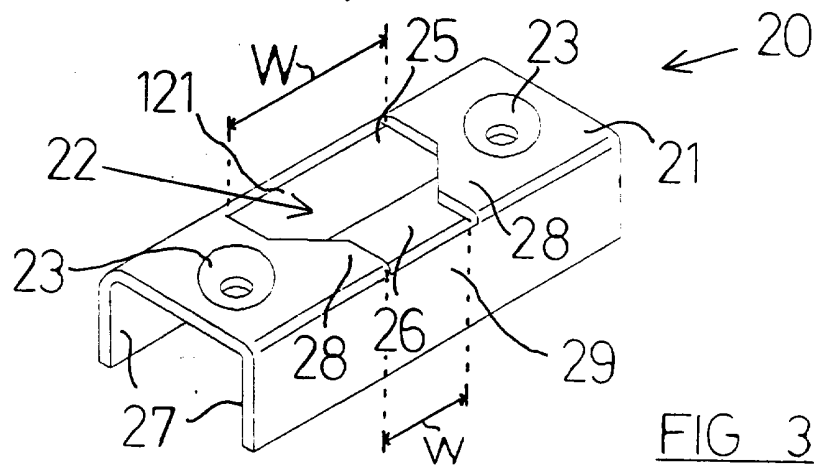
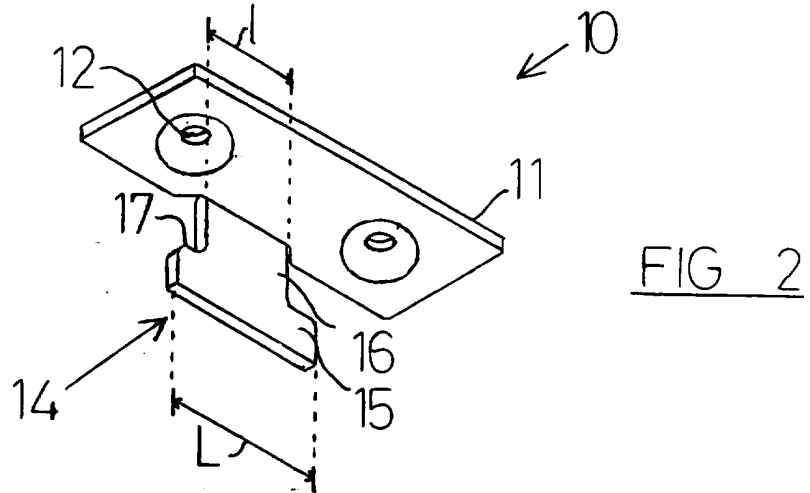
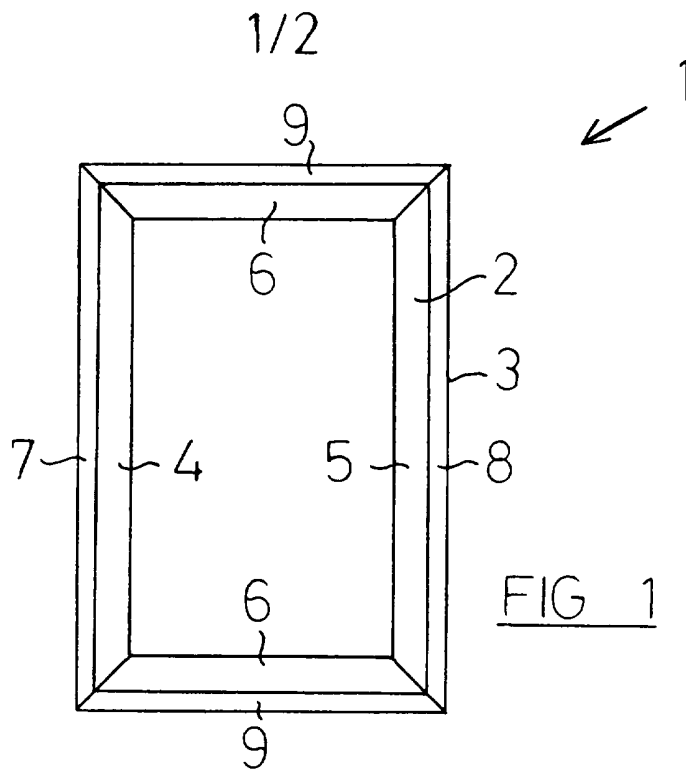


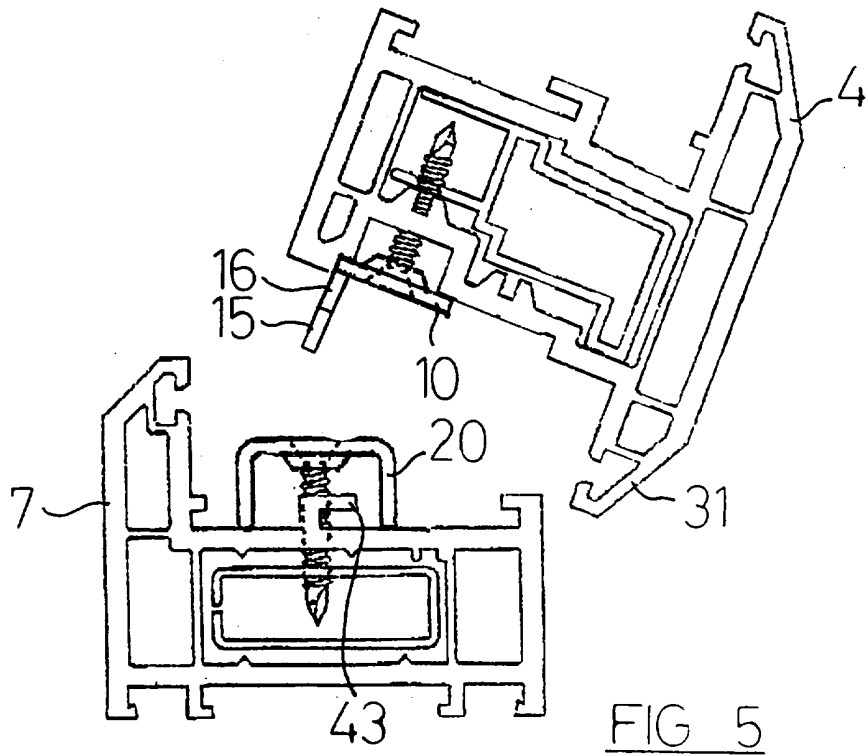
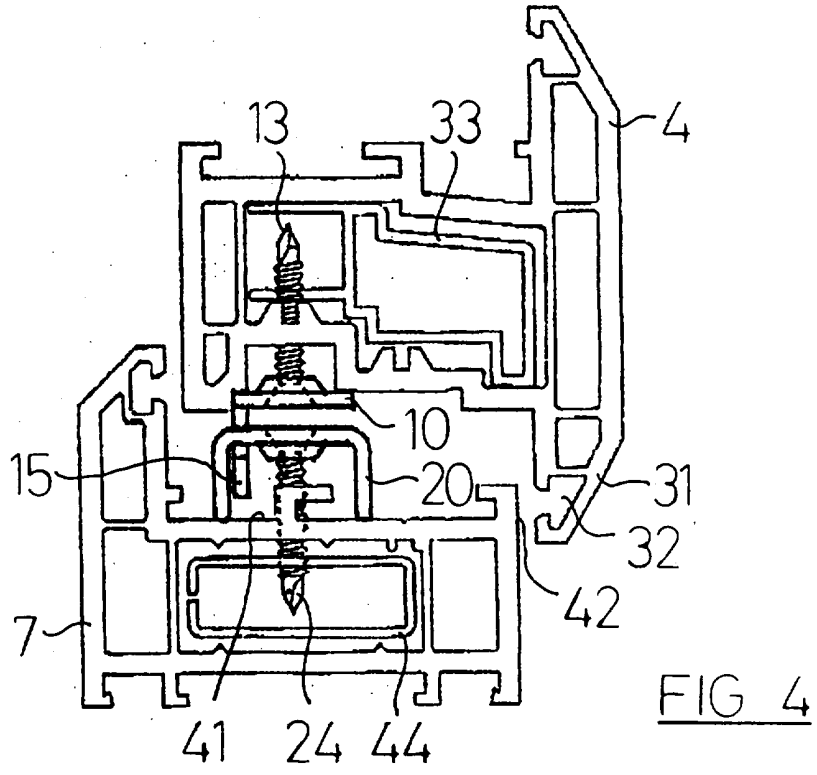
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(54) Abstract Title  
**Security device for a hinged panel**

(57) A security device or an assembly including a security device comprising two parts which are intended to be attached to the hinged edge of a hinged panel. The first part (10) having a projection (14) with a flanged formation (17) on at least one edge, and the second part (20) having a ledge (28) in which is formed a 'key hole' shaped aperture (22) having first (25) and second (26) portions. The second portion (26) being of a smaller diameter than the first (25). When the hinged panel is brought into contact with the frame the projection (14) on the first part (10) is received in the first portion (25) of the 'key hole' shaped aperture (22). Any attempted lateral movement of the wing away from the frame will cause the projection (14) to pass through into the smaller portion (26) of the aperture (22) and cause the two parts (10,20) to combine to resist any further movement.







## SECURITY DEVICE AND FITTED ASSEMBLY

## FIELD OF THE INVENTION

The invention relates to a security device, and in particular to a security device for use with a hinged panel. The invention also relates to an assembly of a frame and a hingedly mounted panel fitted with respective parts of the security device.

The device is likely to find particular utility with panels such as windows which are made from extruded plastics, including for example UPVC. Accordingly, much of the following description will relate to such use; however the use of the device for other applications is not thereby excluded.

## BACKGROUND TO THE INVENTION

Hinged windows are typically located in a fixed frame, and are usually rectangular - comprising a hinge edge and an opposed locking edge joined by two connecting edges. The frame surrounding the window is correspondingly rectangular, and for simplicity its edges will also be referred to as the hinge edge, locking edge and connecting edges respectively.

Many types of hinge are known for interconnecting the hinge edge of a window and the hinge edge of its frame. However, it is a typical feature of windows of extruded plastics that they have a peripheral lip overlying a part of the frame, which lip precludes the use of many of the conventional types of hinge. The lip is provided to carry a seal, which when the window is closed contacts the hinge edge of the frame, the seal helping to ensure adequate weather sealing for this type of window.

Thus, for plastic windows (and other types having a peripheral lip) the action of the hinge is necessarily complex, since the hinge edge of the window must be moved wholly away from the hinge edge of the frame as the window is opened. The increasing popularity of plastic windows as above described has resulted in the development of a particular type of hinging component known as a "stay" or in particular a "four bar linkage stay". Such a stay is shown, for example, in US patent 2,784,459.

Typically, there are two such stays fitted to an opening window, the stays being fitted to the connecting edges of the window and frame rather than the hinge edges. If the window opens about a substantially horizontal hinge axis the stays are fitted to the vertical connecting edges of the window and frame; if the window opens about a substantially vertical hinge axis the stays are fitted to the top and bottom (horizontal) connecting edges of the window and frame.

It has become widely recognised, however, that such stays offer less restraint than conventional hinges against an intruder intent on forcing a gap between the hinge edges of the window and frame; thus, since the action of the stays permit a gap to be created between the hinge edges of the window and frame when the window is opened, the intruder can utilise this additional freedom when seeking unauthorised entry. Usually, the intruder will seek to force a gap between the window and frame sufficient to insert a hand and arm by which to manipulate the opening handle and/or locking device of an adjacent window.

In addition, there has been considerable development and improvement of the locking systems for such windows, rendering an attack on the locking edge less likely to succeed, so that intruders are believed increasingly to be targeting the hinge edge when seeking to gain unauthorised entry.

DESCRIPTION OF THE PRIOR ART

It is possible to restrain forced separation of the window hinge edge away from the frame hinge edge by the provision of a retainer for the sash arm of the stay, such as the retainer disclosed for example in GB patent application 2,284,014. However, not all stays have such a retainer, and in certain cases the retainer is insufficient to prevent more determined forced separation of the window and frame hinge edges. Thus, the force required to "spring" the sash arm from the retainer may be 1.5 kN for example, which is well within the capability of an intruder having a suitable jemmy or forcing tool.

Devices which seek more directly to prevent the forcing of the hinge edge of the window away from the hinge edge of the frame are also known, and a commonly-available device is known as a "dog bolt". In this device, a bracket mounting a steel peg is fixed to the hinge edge of the frame, the peg projecting towards the centre of the frame. A bracket having a hole to receive the peg is fixed to the hinge edge of the window, such that when the window is closed the peg is located within the hole. Attempts to force the hinge edge of the window away from the corresponding frame part are resisted by the peg engaging a side of the hole.

A major disadvantage of the dog bolt is that the hinge edge of the window needs to be drilled to accommodate the peg in the closed window condition. The correct positioning of the hole is critical, and is not always easy to achieve in practice. In addition, it must be ensured that the hole does not breach internal walls of the window extrusion, since such a breach may encourage or facilitate the ingress of damp. Furthermore, whilst the peg is designed to project towards the centre of the frame, there must be sufficient tolerance to accommodate the arcuate movement of the window, and in particular the arcuate movement of the hole as it passes

around the peg as the window is moved to its closed condition. Often, the tolerance required is sufficient to permit an intending intruder to insert a jemmy or other forcing tool between the lip of the window and the frame, which is what the dog bolt was intended to avoid.

It is recognised that once an intending intruder has inserted a jemmy between the lip of the window and the frame, it is often possible to force the window away from the frame along the line of the peg, so that the jemmy is used forcibly to remove the peg of the dog-bolt from its hole. Once this has been achieved, the hinge edge of the window can be forced away from the frame without further resistance from the dog bolt.

It has been suggested to increase the length of the peg to reduce the likelihood that the peg can be forcibly removed from the hole, but such an increase in length exacerbates the above-stated problems of the requirement for the hole to be formed in the window, and the tolerance required to accommodate the arcuate movement of the window.

#### STATEMENT OF THE INVENTION

It is the object of the present invention to seek to provide a security device which avoids or reduces the disadvantages of the dog bolt as above described, and so to provide an improved security device for the hinge edge of a hinged panel.

Thus, according to the invention there is provided a security device for the hinge edge of a hinged panel comprising a first part and a second part, the first part having a flange, the second part having a ledge.

Preferably, the flange is provided between the head and neck of a projection of the first part, the head being of larger dimension than the neck. Preferably also, the ledge is provided by a surface adjacent an opening of the second part. When the security device is in operation, the neck is received into the opening and is retainable thereby by virtue of the ledge overlying the flange.

Usefully, the second part is a female part in which the opening is part of a "keyhole" aperture having a first region and a second region, the second region comprising the opening and being of smaller dimension than the first region. Usefully also, the first part is a male part in which the head of the projection is receivable in the first region, but is retainable by the second region, i.e. the neck is receivable in the second region but the dimension of the head is larger than the corresponding dimension of the second region.

Usefully, the first and second parts are made of metal plate.

Preferably, the first part is adapted to fit to the hinge edge of the panel, whilst the second part is adapted to fit to the hinge edge of the frame. When in the normal closed condition of the window, the flange and ledge will not engage, for example the head and neck of the projection will extend either alongside the opening or through and beyond the first region of the aperture. However, upon jemmying of the panel, i.e. the forcing of the lip of the hinge edge of the panel away from the frame, the ledge will overlie the flange so as to resist the forced separation of the panel from the frame. In the preferred embodiment, upon jemmying the panel the neck will be moved into the opening; subsequent attempted forcing of the hinge edge of the panel towards the centre of the frame (as would have released a dog bolt as above) will be resisted because the neck is retained in the opening.



Accordingly, the inventor has realised that the forcing of the hinge edge of the panel towards the centre of the frame can only be achieved after the attempting intruder has inserted a jemmy or other forcing tool between the panel lip and the frame, and it is arranged that such insertion will cause the flange and ledge to cooperate to resist continued forced separation.

Preferably, the opening is provided in a surface of the second part, the second part including legs to space the surface from the hinge edge to which it is to be mounted; accordingly, there is no requirement to drill or otherwise remove material from the hinge edge extrusion, so saving on fitting time and difficulty, and avoiding the above-described potential problems of drilling into the extrusion.

Usefully, the projection is of "T" shape; alternatively it is of "L" shape, in both cases providing the necessary flange.

The first and second parts may also include fixing means, preferably apertures to receive fixing screws or the like, by which the parts may be secured to the respective panel and frame.

According to the invention there is also provided an assembly comprising a frame and a panel hingedly mounted within the frame, in which one of the first and second parts of a security device as above defined is fitted to the hinge edge of the panel and the other of the first and second parts of the security device is fitted to the hinge edge of the frame, the first part being free to move relative to the second part during hinged (authorised) movement of the panel, whereby following unauthorised separation of the panel from the frame in a certain direction the flange and ledge cooperate to resist the continued separation thereof.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig.1 is a schematic view of a window panel and frame assembly to which the security device of the invention is fitted.

Fig.2 is a perspective view of the first part of the security device according to the invention;

Fig.3 is a perspective view of the second part;

Fig.4 is a sectional view through the window and frame of Fig.1, in the closed window condition; and

Fig.5 is a view as Fig.4, but with the window in the partly-opened condition.

#### DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

The window panel and frame assembly 1 comprises a window 2 and frame 3, both of which are rectangular in front view. Both the panel and frame are formed from four lengths of extruded plastic, mitred and joined at the corners, in known fashion. The panel 2 comprises a hinge edge 4, a locking edge 5 and connecting edges 6. The frame comprises a hinge edge 7, locking edge 8 and connecting edges 9.

The window 2 is a side-hung window, i.e. its hinge edge 4 is substantially vertical. However, the device is equally applicable to top-hung windows in which the hinge edge is substantially horizontal.

The security device comprises a first part 10 (Fig.2) and a second part 20 (Fig.3), which are respectively adapted to be secured to the hinge edge 4 of the window and the corresponding hinge edge 7 of the frame.

The first part 10 comprises a fixing plate 11 having a pair of holes 12 for receiving fixing screws 13 by which the male part can be secured to the window hinge edge 4 (only one of the fixing screws can be seen in Figs.4,5). Connected to the fixing plate is a projection 14 comprising a head 15 and a neck 16. In this embodiment the projection 14 is of "T" shape.

The second part 20 comprises a surface 21 in which is provided an aperture 22 and two fixing holes 23. The holes 23 can receive fixing screws 24 by which the second part can be secured to the frame hinge edge 7 (only one of the fixing screws can be seen in Figs.4,5).

The aperture 22 is of "keyhole" shape, having a first region 25 and a second region 26, the first region being of a larger dimension than the second region. In particular, the width  $W$  of the first region is larger than the width  $w$  of the second region. In addition, the width  $W$  of the first portion is greater than the length  $L$  of the head 15 of the projection 14, so that the head 15 can be accommodated therein as the window 2 is moved from its open condition as represented in Fig.5 to its closed condition as shown in Fig.4.

The legs 27 of the second part 20 serve to space the surface 21 of the second part from the surface 41 of the frame hinge edge 7; accordingly, and as seen in Fig.4, no drilling or other removal of material is required in order to accommodate the head 15 of the first part when the window 2 is in the closed condition.

Neither the glass nor the surrounding brickwork are shown in Figs. 1,4 or 5 since these do not relate to the invention itself; however, the presence of these items in the fitted condition of the window will be understood by those skilled in this art. In addition, whilst Fig.4 shows a internally-beaded window, it will be understood that the invention could alternatively be used with an externally-beaded window, without amendment of the device.

As is typical of windows made of extruded plastics, the edges 4,5,6 of the window 2 have a lip 31 which overlies a part of corresponding edges 7,8,9 of the frame 3. In particular, the lip 31 of the window hinge edge 4 overlies the wall 42 of the frame hinge edge 7. The lip 31 has a recess 32 which in use will carry a seal (not shown) which, in the closed condition of the window as shown in Fig.4, will engage the wall 42 of the frame, to prevent the ingress of dirt and moisture therebetween. It is the presence of the lip 31 which necessitates the complex hinging action, i.e. when the window 2 is opened it is necessary for the whole of the window hinge edge 4 (including the lip 31) to move away from the frame hinge edge 7, as shown in Fig.4.

It is an important feature of this embodiment of the invention that the length  $L$  of the head 15 of the projection 14 is greater than the width  $w$  of the second region 26 of the aperture 22, which width  $w$  is itself greater than the length  $l$  of the neck 16 of the projection 14. Accordingly, when an intending intruder inserts a jemmy or other forcing tool between the wall 42 and the lip 31 (and in particular between the wall 42 and the seal carried by the recess 32), the hinge edge 4 of the window will be moved away from the hinge edge 7 of the frame, i.e. the hinge edge 4 of the window 2 moves to the right as drawn in Fig.4. Such relative movement causes the first part 10 to be moved to the right (as drawn in Fig.4) relative to the second part 20, so that projection 14 is caused to move from the first region 25 of the aperture 22

to the second region 26. Once the projection has been so moved, the head 16 thereof is effectively retained by the second region 26, i.e. the ledges 28 overlies the flanges 17, so that attempted forced separation of the window 2 from the frame 3 (with the window being forced towards the top of the paper as drawn in Fig.4) is resisted.

In addition, the wall 29 of the second part will resist further forced movement of the window 2 towards the right as drawn in Fig.4.

When the jemmy is removed, the resilience of the stays and the window and frame components, will normally result in the projection 14 returning to the first region 25 of the aperture 22, so that authorised hinged opening of the window can be effected.

Thus, the inventor has realised that an intending intruder will typically seek to force the window in two directions, a first direction whilst the jemmy is inserted, and a second direction seeking to separate the hinge edge 4 of the window 2 from the hinge edge 7 of the frame 3. The second direction will typically have a component which is towards the centre of the frame 3 (in the direction A of Fig.4), and the security device resists movement in this direction after the jemmy has been inserted.

It will be understood that the wall 121 of the second part 20 serves only to add rigidity to the second part, i.e. it plays no direct part in the security function; accordingly, this wall could be removed on another embodiment of the invention. In such an embodiment, it would be understood that the aperture would only require its second region. Thus, during authorised hinging movement the first and second parts could pass to the side of each other without engagement or other interaction, the head of the projection entering an opening

in the second part only when forced there by an intending intruder.

In another alternative embodiment, the first part could carry a flange directed towards the ledge, the flange freely passing the ledge during authorised hinged movement of the window, but with the flange being forced underneath the ledge during insertion of the jemmy.

The first 10 and second 20 parts of the security device can be adapted to suit the many different profiles which are available. In particular, the legs 27 of the second part could be made different lengths if the profile requires this, and the fixing plate 11 could be profiled to correspond to the profile of the hinge edge to which it is to be secured.

With the particular profile shown in Figs 4 and 5, the hinge edge 7 of the frame 3 has an upstanding lip 43; it is a feature of use of the security device with this particular frame that when the jemmy is inserted between the wall 42 and the lip 31 that the head 15 of the projection 14 must be forced past or through the lip 43, so increasing the force required to insert the jemmy. The lip will usually be damaged by such forcing, and plays no further part in securing the window, but is nevertheless an advantageous feature of this particular profile.

It will be noted from Figs. 4 and 5 that the window and frame profiles include strenghtening inserts 33 and 44 respectively. As is customary these inserts will be of metal, and provide a secure base to which the first and second parts are respectively affixed.

CLAIMS

1. A security device for the hinge edge of a hinged panel (2) comprising a first part (10) and a second part (20), the first part having a flange (17), the second part having a ledge (28).
2. A security device according to claim 1 in which the flange (17) is provided between the head (15) and neck (16) of a projection (14) of the first part, the head being of larger dimension than the neck.
3. A security device according to claim 1 or claim 2 in which the ledge (28) is provided by a surface adjacent an opening (26) of the second part.
4. A security device according to claim 3 in which the opening (26) is part of a "keyhole" aperture (22) having a first region (25) and a second region (26), the second region comprising the opening and being of smaller dimension than the first region.
5. A security device according to claim 4 in which the head (15) of the projection (14) is receivable in the first region (25), but is retainable by the second region (26).
6. A security device according to any of claims 1-5 in which the first and second parts are made of metal plate.
7. A security device according to any of claims 1-6 in which the first part is adapted to fit to the hinge edge (4) of the panel (2), whilst the second part is adapted to fit to the hinge edge (7) of the frame (3).
8. A security device according to any of claims 1-7 in which the ledge is provided by a surface (21) of the

second part, the second part including legs (27) to space the surface from the hinge edge to which it is to be mounted.

9. A security device according to any of claims 1-8 in which there is a pair of flanges and a pair of ledges.
10. A security device according to any of claims 1-9 in which the first and second parts include fixing means, preferably apertures to receive fixing screws or the like, by which the parts may be secured to the respective panel and frame hinge edges.
11. An assembly (1) comprising a frame (3) and a panel (2) hingedly mounted within the frame, in which one of the first (10) and second (20) parts of a security device according to claim 1 is fitted to the hinge edge (4) of the panel and the other of the first and second parts of the security device is fitted to the hinge edge (7) of the frame, the first part being free to move relative to the second part during hinged (authorised) movement of the panel, whereby following unauthorised separation of the panel from the frame in a certain direction the flange (17) and ledge (28) cooperate to resist the continued separation thereof.
12. An assembly according to claim 11 in which the panel hinge edge has a lip overlying a part of the frame hinge edge, in which the flange (17) is provided between the head (15) and neck (16) of a projection (14) of the first part, the head being of larger dimension than the neck, and in which the ledge (28) is provided by a surface adjacent an opening (26) of the second part, and in which forced movement of the panel lip away from the frame causes the neck (16) to be moved into the opening (26).



13. A security device including a first part constructed and arranged substantially as described with reference to Fig. 2 of the accompanying drawings.
14. A security device including a second part constructed and arranged substantially as described with reference to Fig. 3 of the accompanying drawings.



Application No: GB 9826311.4  
Claims searched: 1 - 14

Examiner: P. Gardiner  
Date of search: 19 March 1999

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK CI (Ed.Q): E1J: JFG  
Int CI (Ed.6): E05C, E05D, E06B  
Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X,Y	GB 2307937 A WMS (UK) LIMITED (e.g. Fig. 1)	1,6,7,10,11
X	GB 2290336 A PLUS PLAN (UK) LIMITED (e.g. Fig's 3-5)	1,3,7,8,10,11
X	GB 2277345 A MILA HARDWARE & MACHINERY (UK) LIMITED (e.g. Fig. 2)	1,7,10,11
X,Y	GB 2172646 A ANGLIAN WINDOWS LIMITED (e.g. Fig. 1)	1,6,7,9,10,11
X	EP 0844348 A1 WAGNER (GB) Ltd. (e.g. Fig's 1&2, in particular part 100 and aperture 20)	1-3,7-9,11
Y	GB 2275080 A HARDWARE & SYSTEMS PATENTS LIMITED (e.g. Fig. 1)	1,6,7,10,11

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.