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(54) **Roof window with a corner bracket**

Dachfenster mit Eckmontagewinkel

Fenêtre pour installation dans un toit avec un dispositif de fixation pour le coin

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## Description

### Technical Field

**[0001]** The present invention relates to a roof window comprising a window frame of a substantially rectangular outline having four longitudinal frame members, wherein at least two adjacent frame members are provided with at least one mounting groove extending along their external surface at least in the neighbourhood of their corner joint, a window sash mounted in the window frame, and at least one corner bracket for mounting said window frame to a roof construction in the area of connection of the adjacent frame members.

### Background of the Invention

**[0002]** Prior art discloses various techniques of fixing roof windows to various roof constructions, in particular to wooden constructions which are in general comprised of rafters and battens perpendicular to each other.

**[0003]** Publication WO 99/35355 for example, discloses a mounting bracket comprising a first leg portion for connection with an associated frame member and a second leg portion which is essentially perpendicular to the first leg portion and is to be fastened to the roof structure, where the first leg portion is designed as two leg sections essentially perpendicular to each other for connection with adjacent frame members at the joint between these.

**[0004]** Polish utility model application No. 117857 discloses a corner bracket having two arms for fixing to a roof construction, which are provided on their internal side with wings formed in the perpendicular plane, wherein each arm is crowned by an area of overpresses comprising projections having a shape of the outline corresponding to the width of a groove of a window frame, projecting outside the plane of the wings at the length of the groove.

**[0005]** European patent application EP 2 055 859 A1 discloses a window mounting bracket comprising a first leg portion for connection with an associated window frame member and a second leg portion essentially perpendicular to the first leg portion for fastening to the roof structure. The first leg portion comprises at least one leg section for connection with a member of the frame at a corner joint. The first leg portion and the second leg portion are interconnected by means of a connecting member in such a way that the second leg portion is essentially within the external limit of the frame in a transport position of the window, while the second leg portion is essentially outside the external limit of the frame in a mounted position of the window. European patent specification EP 1 061 199 B1 discloses a fitting of the insulating frame for interconnection with the installation fitting on the roof window. The installation fittings of the roof window are corner fittings that are connected to adjacent main frame elements through their assembly and are designed for connection to the roof construction. The fittings of the

insulating frame are essentially identical to said corner fittings.

**[0006]** International patent publication WO 88/04348 discloses a roof window with incorporated mounting brackets to be set in the side pieces of the window frame. The legs of the brackets are provided with securing holes for receiving securing means. The roof window has on the outer lateral surfaces of each side piece of the window frame at least one securing groove that receives flat projections formed on the corresponding leg of the mounting bracket and symmetrically spaced in relation to its longitudinal axis.

**[0007]** Patent specification US 4,920,713 discloses a bracket for fixing a prefabricated window to roof boards or sheathing in an inclined roof. The bracket is already secured to the window main frame during the factory assembling of the window. The presecuring of the bracket is effected by a screw inserted through a hole in a positioning member which through a connecting portion consisting of a bridge and a rodlike member is integrally connected with one side edge of a first leg of the bracket. The first leg continues at its lower side into a second leg at right angle to the first leg. Before packaging the window for transportation the first and second legs are swung into abutment on the main frame by turning around the connecting portion. When the window is to be installed in the roof the first and second legs are swung through an angle of 180 until the first leg abuts against the positioning member. In this position mounting screws are through the overlapping holes screwed into the main frame. Then the window is secured to the roof boards by driving screws or nails through the holes in the second leg into the boards.

**[0008]** Though the above-described prior art brackets improve positioning of a window in a roof construction, a need still exists for providing a roof window the installation of which would be easy and which would be provided with a bracket of a simpler, more economical construction, and the production of which would be easy and less material-consuming than a production of known brackets, wherein such a bracket should additionally facilitate an installation of such a window.

### Summary of the Invention

**[0009]** The present invention provides a roof window of the kind mentioned in the outset which is characterized in that the corner bracket has a form of a single-element metal shape, the thickness of which corresponds substantially to the height of the mounting groove in the frame member, and which comprises a first flat element of a concave L-shaped outline for settling in the mounting grooves of the adjacent frame members and for fixing to the roof construction elements perpendicular to the external surfaces of the frame members, and a second flat element bent perpendicularly to the first element, for fixing to the external surface of the frame member, wherein a section of the edge of the perpendicular bend of the

first and the second elements is smaller than the length of an internal edge of the first element and is distanced in parallel from the remaining section of this edge at a distance corresponding substantially to the depth of the mounting groove in the frame member, wherein the first and the second element is provided with throughout openings for mounting screws.

**[0010]** Such a solution significantly simplifies a construction of a roof window and enables for reliable and simple fixing thereof to a roof construction.

**[0011]** Preferably the second element of the mounting bracket is bent in the corner area of the internal edges of the first element.

**[0012]** This feature advantageously improves dimensional tolerance since the mounting grooves of adjacent frame members may be then slightly shifted with relation to each other without affecting fixing reliability of a window frame.

**[0013]** Furthermore, the throughout openings of the first element have preferably a longitudinal cross-section, thus enabling for displacing a frame over a certain range before it is finally fixed.

#### Brief Description of the Drawings

**[0014]** The invention is presented below in exemplary embodiment and in connection with the attached drawings on which:

Fig. 1 is a schematic perspective view of a window frame according to the present invention fixed to a roof construction,

Fig. 2 is an enlarged view of the area A of Fig. 1,

Fig. 3 is a cross-sectional view in the plane perpendicular to the plane of the frame running through the line B-B in Fig. 1,

Fig. 4 is a perspective view of an embodiment of a roof window corner bracket according to the present invention,

Fig. 5 is a top view of an embodiment of a roof window corner bracket according to the present invention, and

Fig. 6 is a side view of an embodiment of a roof window corner bracket according to the present invention.

#### Detailed description of the invention

**[0015]** A window frame 1 of a roof window shown in Fig. 1 is fixed to a roof construction 2 comprised of a number of oblique rafters 21 parallel to each other and a number of horizontal battens 22, 23 parallel to each other and perpendicular to the rafters 21. Rafters 21 are fixedly connected with battens in a typical manner e.g. by means of nails or woodscrews. Each window frame 1 is of a rectangular outline and comprises two side members 11, 12 extending parallel to the rafters 21 and two horizontal members 13, 14 extending parallel to the bat-

tens 22, 23. Each window frame member 11-14 is provided with two mounting grooves 15, each extending circumferentially along the external surface of the window frame 1. The window frame 1 is fixed to the roof construction 2 by means of four corner brackets 3 mounted to the battens 23. A set of brackets for one window frame comprises two symmetrical "left" brackets (located in the bottom left and top right corners of the window frame 1 shown in Fig. 1) and two symmetrical "right" brackets (located in the bottom right and top left corner of the window frame shown in Fig. 1).

**[0016]** As presented in Figs. 2 and 3, each bracket 3 has a form of a single-element metal shape having constant thickness and comprising the first flat element 32 settled in mounting grooves 15 of the adjacent frame members 11 and 14 and fixed to the batten 23 of the roof construction 2, and the second flat element 31 perpendicular to the first element 32 and fixed to the external surface of the frame member 11, which is perpendicular to the surface of the first element 32.

**[0017]** The elements 31, 32 are fixed to the roof construction 2 and to the frame members by means of screws 16 running through throughout openings 311, 321 and 322. Longitudinal openings 322 of the first element 32 of the bracket provide a certain tolerance for a fixation of the window frame 1 to the roof construction thus enabling for a limited displacing thereof, whereas after final positioning of the frame, it is fixed by means of screws running through circular openings 321.

**[0018]** Figs. 4 and 6 present the "right" bracket from Figs. 1, 2 and 3 in axonometric, top and side view, respectively.

**[0019]** The first element 32 of the bracket has a form of a L-shaped flat plate, the thickness (g) of which corresponds to the height (h) of the mounting groove 15 (cf. Fig. 3), wherein the external corners of the plate are slightly chamfered. Furthermore the first element 32 has four throughout openings 321 arranged in pairs in its opposite corners and two throughout openings of a longitudinal cross-section in parallel relative to arms of this element.

**[0020]** From the internal section 3231 of the edge 323, in the area of the corner of the internal edges 323, 324 of the first element, the second element 31 is bent perpendicularly to the first element 32. The second element 31 has a form of a flat plate having a shape of a right-angled triangle, one of the catheti 312 of which is perpendicular to the plane of the first element 32 and the hypotenuse 313 of which adjoins the internal corner of the first element 32.

**[0021]** A section of the edge 3231 of the perpendicular bend of the second element 31 is distanced in parallel from the remaining section of this edge 3232 at a distance (d) substantially corresponding to the depth (b) of the mounting groove 15 formed in the frame member 11 (cf. Fig. 3).

**[0022]** The above described construction has only an illustrative character. The second element 32 of a bracket

according to the present invention may obviously have another shape and may be directed downwards or upwards relative to the plane of a batten 23 of a roof construction 2. In particular a window according to the present invention may be fixed using four identical brackets, the second 31 of which would be directed both downwards and upwards (accordingly diagonally over a the window frame).

## Claims

1. A roof window comprising a window frame of a substantially rectangular outline having four longitudinal frame members, wherein at least two adjacent frame members are provided with at least one mounting groove extending along their external surface at least in the neighbourhood of their corner joint, a window sash mounted in the window frame, and at least one corner bracket for mounting said window frame to a roof construction in the area of connection of the adjacent frame members, wherein the corner bracket (3) has a form of a single-element metal shape, the thickness (g) of which corresponds substantially to the height (h) of the mounting groove (15) in the frame member (11, 12, 13, 14), and which comprises only one first flat element (32) of a concave L-shaped outline for settling in the mounting grooves (15) of the adjacent frame members (11, 12, 13, 14) and for fixing to the elements (23) of the roof construction (2) perpendicular relative to the external surfaces of the frame members (11, 12, 13, 14), and only one second flat element (31) bent perpendicularly relative to the first element (32), for fixing to the external surface of the frame member (11, 12, 13, 14), wherein the first (32) and the second (31) element is provided with throughout openings (311, 321, 322) for mounting screws (16), wherein a section of the edge (3231) of the perpendicular bend of the first (32) and the second (31) elements is smaller than the length of an internal edge (323) of the first element (32) and is distanced in parallel from the remaining section of this edge (3232) at a distance (d) corresponding substantially to the depth (b) of the mounting groove (15) in the frame member (11, 12, 13, 14).
2. The roof window according to claim 1, **characterized in that** the second element (31) of the mounting bracket (3) is bent in the corner area of the internal edges (323, 324) of the first element (32).
3. The roof window according to claim 1 or 2, **characterized in that** the throughout openings (322) of the first element (32) have a longitudinal cross-section.

## Patentansprüche

1. Dachfenster bestehend aus einem grundsätzlich rechteckigen Fensterrahmen, enthaltend vier Längselemente des Fensterrahmens, wobei mindestens zwei benachbarte Fensterrahmenelemente über mindestens ein Montageloch entlang deren Außenfläche mindestens in der Nähe ihres Eckanschlusses, einen am Fensterrahmen montiertes Fensterflügel sowie mindestens einen Wickelträger zur Befestigung des Fensterrahmens an der Dachkonstruktion im Anschlussbereich der benachbarten Fensterrahmenelemente verfügen, wobei der Eckträger (3) die Form eines Metallelementes hat, dessen Stärke (g) ungefähr der Höhe (h) des Montageloches (15) am Fensterrahmenelement (11, 12, 13, 14) entspricht und der nur ein flaches Element des ersten Typs (32) in Form des konkaven Buchstabens "L" zur Befestigung der benachbarten Fensterrahmenelemente (11, 12, 13, 14) in den Montagelöchern (15) sowie zur Befestigung an den Elementen (23) der Dachkonstruktion (2) senkrecht zu Außenflächen der Fensterrahmenelemente (11, 12, 13, 14) sowie nur ein flaches Element des zweiten Typs (31) enthält, das zum ersten Element (32) senkrecht gebogen ist und der Befestigung an der Außenfläche des Fensterrahmenelementes (11, 12, 13, 14) dient, wobei das erste (32) und das zweite (31) Element über durchbohrte Löcher (311, 321, 322) zur Befestigung der Befestigungsschrauben (16) verfügt; Ferner ist der Randteil (3231) der senkrechten Biegung des ersten (32) und des zweiten (31) Elementes kleiner als die Länge des Innenrandes (323) des ersten Elementes (32) und verläuft parallel zum übrigen Teil dieses Randes (3232) in einem Abstand (d), der ungefähr der Tiefe (b) des Montageloches (15) am Fensterrahmenelement (11, 12, 13, 14) entspricht.
2. Dachfenster nach Anspruch 1 **dadurch gekennzeichnet, dass** das zweite Element (31) des Montageträgers (3) im Eckbereich der Innenränder (323, 324) des ersten Elementes (32) gebogen ist.
3. Dachfenster nach Anspruch 1 bzw. 2 **dadurch gekennzeichnet, dass** die durchbohrten Löcher (322) des ersten Elementes (32) einen Längsschnitt aufweisen.

## Revendications

1. Une fenêtre de toit comprenant un cadre de fenêtre avec un contour rectangulaire comportant quatre éléments de châssis longitudinaux, dans lequel au moins deux éléments de châssis adjacents sont pourvus d'au moins une rainure de montage s'étendant le long de leur surface externe au moins au voisinage de leur joint d'angle, un châssis de fenêtre

monté dans le cadre de la fenêtre, et au moins un support de coin pour monter ladite fenêtre de cadre est une construction dans la zone de la connexion des éléments de châssis adjacents, où le support d'angle (3) a une forme de forme métallique à élément unique, l'épaisseur (g) ce qui correspond à la hauteur (h) de la rainure de montage (15) dans l'élément de cadre (11, 12, 13, 14), et qui ne comporte que le premier (32) d'un contour concave en forme de L pour régler dans les rainures de montage (15) des éléments de châssis adjacents (11, 12, 13, 14) et pour fixer aux éléments (23) de la construction de toit (2) la perpendiculaire par rapport aux surfaces externes des éléments de châssis (11, 12, 13, 14), et seul un second élément plat (31) plié perpendiculairement au premier élément (32), pour la fixation sur la surface externe de l'élément de cadre (11, 12, 13, 14), le premier élément (32) et le second (31) étant prévus dans les ouvertures (311, 321, 322) pour les vis de montage (16), dans lequel une section du bord (3231) du virage perpendiculaire des premier (32) et du second (31) éléments est inférieure à la longueur d'un bord interne (323) du premier élément (32) et est distancée parallèlement à la section restante de ce bord (3232) à une distance (d) correspondant aux profondeurs (b) de la rainure de montage (15) dans l'élément de châssis (11, 12, 13, 14).

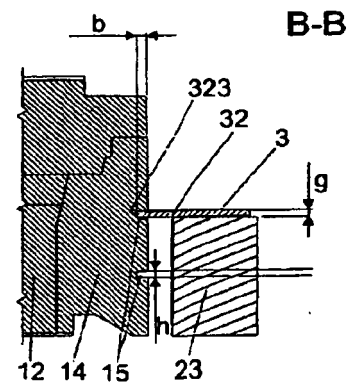
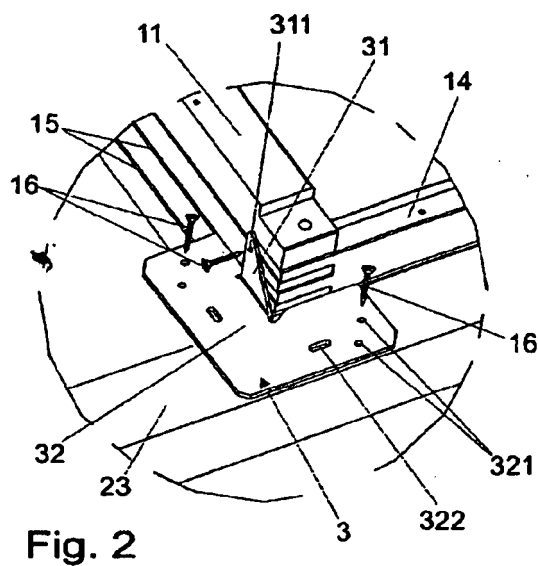
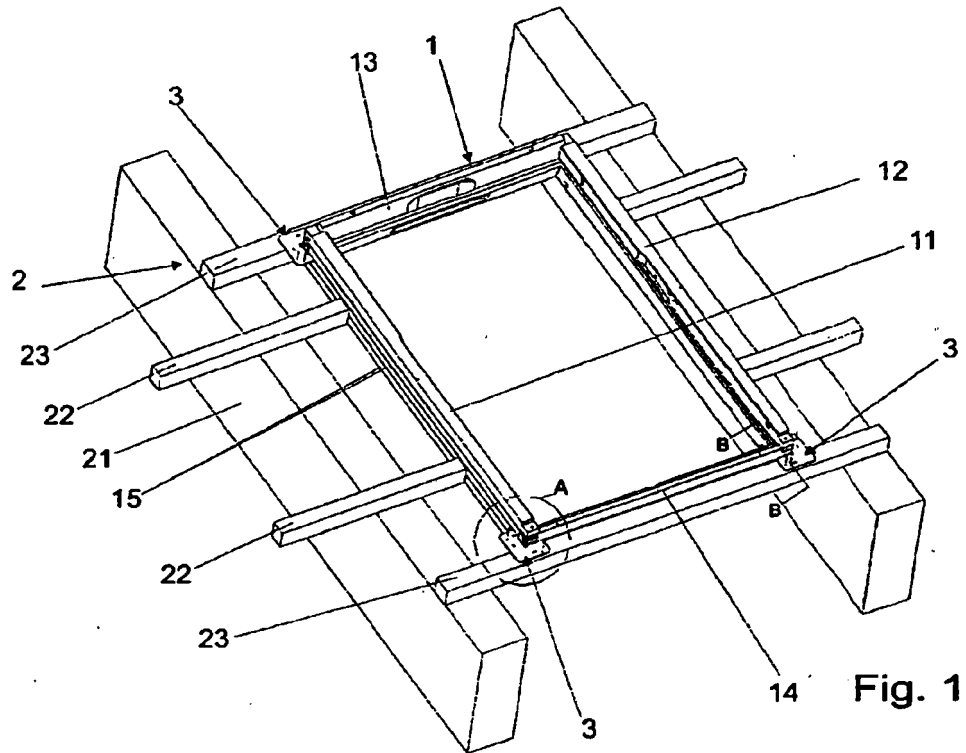
2. La fenêtre de toit selon la revendication 1, **caractérisée en ce que** le deuxième élément (31) de l'étrier de montage (3) est plié dans la zone de collage des premiers bords (323, 324) du premier élément (32).
3. La fenêtre de toiture selon la revendication 1 ou 2, **caractérisée en ce que** les ouvertures traversantes (322) du premier élément (32) ont une section transversale longitudinale.

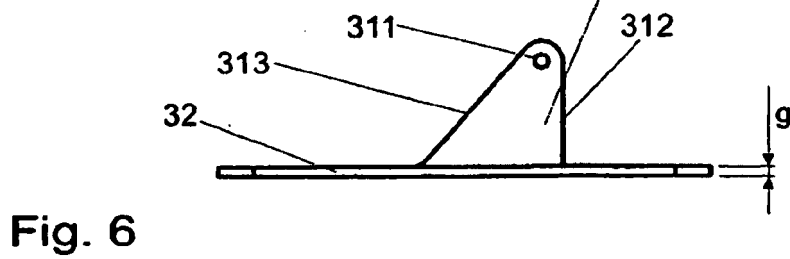
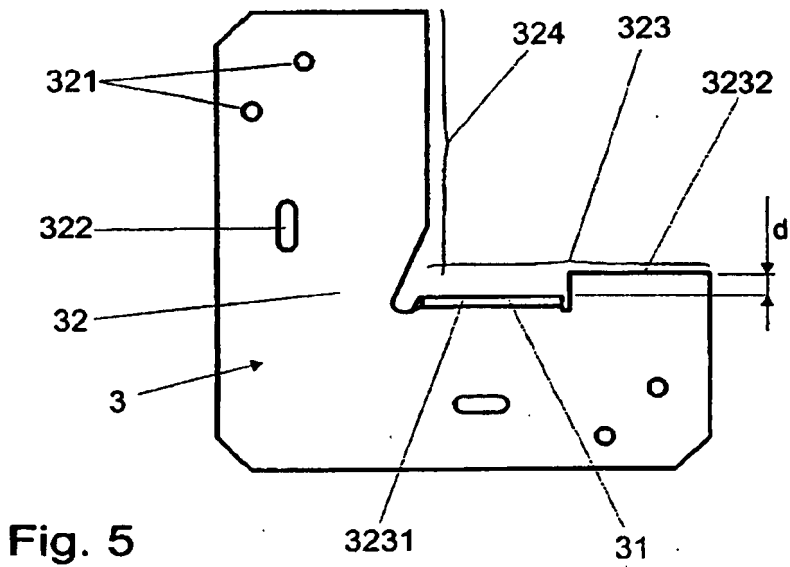
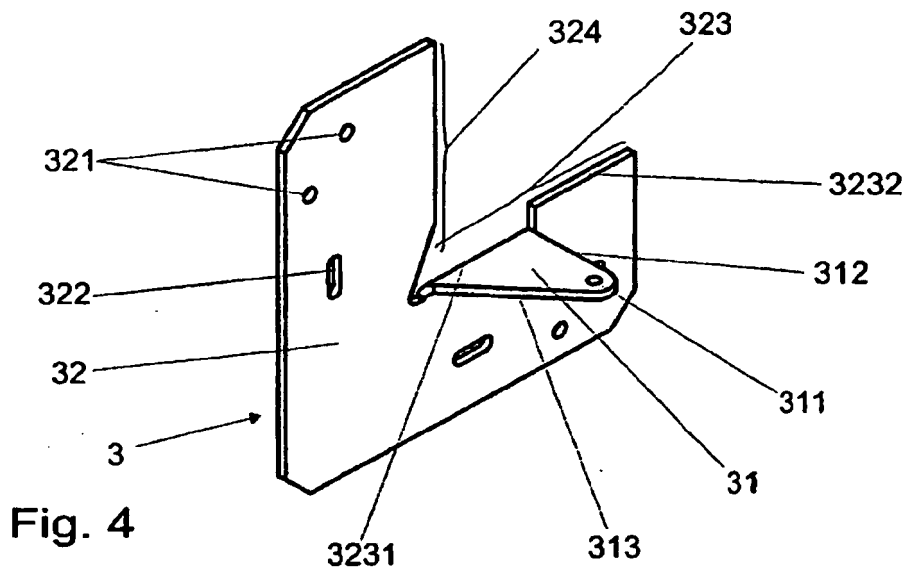
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**REFERENCES CITED IN THE DESCRIPTION**

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