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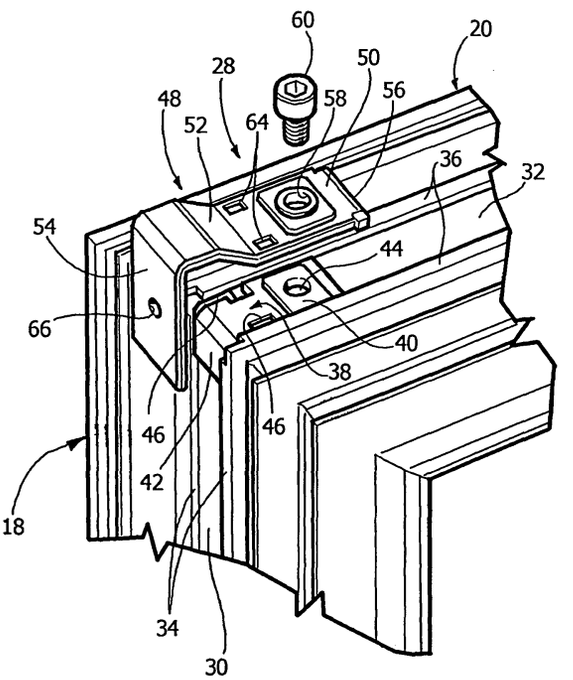
(54) "Device for fastening an upper half-hinge to the frame of a window wing"

(57) Device for fastening an upper half-hinge (22") to a frame of a wing (14) set side by side to a swivel wing (16), comprising an anchoring plate (38) with substantially "L" shape, to be positioned at the vertex between a vertical section bar (18) and a transverse section bar (20), and a half-hinge for fastening element (48) with a base portion (50) fastened by means of at least one screw (60) to the anchoring plate (38). The half-hinge fastening element (48) comprises a base portion (50) provided with a bent edge (56) which in use incises the longitudinal edges (36) of a groove (32) of the transverse section bar (20) of the frame.

FIG. 4



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Description

[0001] The present invention relates to the field of accessories for metallic frames for windows.

[0002] A window is normally provided with a fixed frame bearing one or more openable wings. The wings can be openable solely by rotation around a vertical axis or can be provided with a dual opening motion, selectable by means of a cremone bolt control which, in addition to the normal rotation around a vertical axis, also provides for opening the wing by rotation around a lower horizontal axis.

[0003] In the remainder of the description and in the claims, the term "wing" means a part of window that is openable solely by rotation around a vertical axis and the term "swivel wing" means a part of window that is openable selectively by rotation around a vertical axis or by rotation around a horizontal axis.

[0004] The present invention was specifically developed for application to a window comprising a wing and a swivel wing. The upper hinge of a swivel wing is connected to a scissors arm borne by the upper transverse section bar of the movable frame, whose purpose is to allow the opening motion of the swivel wing around the horizontal axis. The fact that the hinge is connected to the scissors arm causes the hinge to be positioned differently relative to the hinge of a wing which is traditionally fastened directly to the vertical section bar of the wing. Thus, in the case of a window that comprises a wing set side by side to a swivel wing, the upper hinge of the wing is positioned differently from the upper hinge of the swivel wing, which is a drawback from the aesthetic viewpoint.

[0005] The object of the present invention is to provide a device for fastening an upper hinge to a frame of a wing set side by side to a swivel-wing, which allows to overcome the aforesaid drawback.

[0006] According to the present invention, said object is achieved by a device having the characteristics set out in the claims.

[0007] The characteristics and the advantages of the present invention shall become readily apparent in the detailed description that follows, provided purely by way of non limiting example, with reference to the accompanying drawings in which:

- Figure **1** is a front view of a window provided with a device according to the present invention,
- Figure **2** is an enlarged scale section of the part indicated by the arrow II in Figure **1**,
- Figure **3** is a perspective view of the part indicated by the arrow III in Figure **2**,
- Figure **4** is an exploded perspective view of the device illustrated in Figure **3**,
- Figure **5** is a plan view according to the arrow V of Figure **2**,
- Figures **6** and **7** are sections respectively according to the lines VI-VI and VII-VII of Figure 5, and
- Figures **8** and **9** are details in enlarged scale of the parts indicated by the arrows VIII and IX in Figures **6** and **7**.

[0008] With reference to Figure 1, the reference number 10 designates a window comprising a fixed frame 12, a wing 14 and a swivel wing 16. The fixed frame 12 and the frames of the wings 14, 16 are formed by light alloy section bars. Each of the two wings 14, 16 has a frame formed by two vertical section bars 18 and by two transverse section bars 20. The wings 14, 16 are connected to the fixed frame 12 by means of respective hinges 22 each of which comprises a fixed half-hinge 22' and a movable half-hinge 22". The swivel wing 16 comprises a cremone bolt control 24 provided with a handle 26 which is capable of assuming three positions: a closed position, a wing opening position and a swivel wing opening position. The wing 14 is solely capable of the movement or rotation around the vertical axis of the hinge 22.

[0009] With reference to Figures 2 through 4, the section bars 18, 20 which constitute the frame of the wing 14 are standardised aluminium section bars and have respective longitudinal grooves 30, 32 with undercut cross section provided with respective external longitudinal edges 34, 36.

[0010] The reference number 28 designates a device for fastening the movable half-hinge 22" to the frame of the wing 14. The fastening device 28 comprises an anchoring plate 38 having a general "L" shape, with a main portion 40 housed in the groove 32 of the upper transverse section bar 20 and a secondary part 42 housed in the groove 30 of the vertical section bar 18. The main part 40 of the anchoring plate 38 is provided with a threaded hole 44. Preferably, the anchoring plate 38 is also provided with two through openings 46 positioned between the secondary portion 42 and the fastening hole 44. The "L" shape of the anchoring plate 38 allows to obtain a unique positioning of the fastening hole 44 relative to the frame of the wing 14.

[0011] With reference to Figures 2 to 5, the fastening device 28 comprises a hinge fastening element 48, comprising a base portion 50, a segment 52 inclined upwards starting from the base portion 50 and a hinge fastening portion 54 which extends orthogonally relative to the base portion 50.

[0012] The base portion 50 is provided at one of its ends with a bent edge 56 which is able to incise the longitudinal edges 36 of the groove 32 in the manner described hereafter. The base portion 50 further comprises a smooth through hole 58 through which extends a fastening screw 60 which engages the threaded hole 44 of the anchoring plate 38. The base portion 50 is preferably provided on its lower surface with two small projections 62 formed by non-through recesses 64 on the upper surface (see in particular Figures 7 and 8). The projections 62 are positioned laterally between the hole 58 and the inclined portion 52 and, in the mounting position, are po-

sitioned at the inner surfaces of the edges 36. The through openings 46 of the anchoring plate 38 are positioned below the projections 62.

[0013] The tightening of the screw 60 thrusts the base portion of the hinge fastening element 48 against the upper surfaces of the edges 36. The small projections 62 incise the inner surfaces of the edges 36 and guide the approaching movement of the base portion 50 to the anchoring portion 38 during the tightening of the screw 60. As shown in particular detail in Figures 6 and 8, the bent edge 56 of the base portion 50 has inclined edges which end with a width that is slightly larger than the distance between the inner surfaces of the edges 36. When the screw 60 is tightened, the bent edge 56 incises like a wedge the inner surfaces of the edges 36 and is driven with interference between said edges. The material constituting the fastening portion of the hinge 48 has greater hardness than the material constituting the section bars 18, 20. Preferably, the hinge fastening element 48 and the anchoring plate 38 are made of steel.

[0014] The fastening portion of the hinge 54 has a threaded through hole 66 which is engaged by a screw 68 (Figure 2) to fasten the movable half-hinge 22" to the hinge fastening element 48.

[0015] In the assembled position shown in Figure 2, the base portion 50 of the hinge fastening element 48 is pressed against the upper surfaces of the edges 36. The hinge fastening portion 54 extends parallel and at a distance with respective to the outer side of the edges, 34 of the vertical section bar 18.

[0016] The movable half-hinge 22" is fastened to the movable frame in the same position as the movable half-hinge of the swivel wing connected to the frame by means of a scissors arm. The connection of the half-hinge 22" to the frame of the wing is particularly robust and stable expecially thanks to the driving of the bent edge 56 into the edges 36 which produces a much more effective anchorage than a simple tightening by friction.

[0017] Naturally, the construction details and the embodiments may be widely varied from what is described and illustrated herein without thereby departing from the scope of the invention, as defined by the claims that follow.

Claims

1. Device for fastening an upper half-hinge (22") to a frame of a wing (14) set side by side to a swivel wing (16) of a metallic window frame, in which the frame of the wing (14) comprises two vertical section bars (18) connected to each other by two transverse section bars (20), and in which the vertical and transverse section bars (18, 20) are provided with respective longitudinal grooves (30, 32) with undercut section, **characterised in that** the fastening device (28) comprises an anchoring plate (38) with substantially "L" shape, to be positioned within the longitudinal grooves (30, 32) and at the vertex between a vertical section bar (18) and a transverse section bar (20), and

   - a half-hinge fastening element (48) with a base portion (50) fastened by means of at least one screw (60) to the anchoring plate (38), the upper half-hinge fastening element (48) comprising a base portion (50) and a hinge fastening portion (54) positioned orthogonally to the base portion (50), and in which the base portion is provided with a bent edge (56) which in use incises the longitudinal edges (36) of the groove (32) of the transverse section bar (20).

2. Device as claimed in claim 1, **characterised in that** the half-hinge fastening element (48) has an inclined portion (52) which in use extends upwards starting from the base portion (50).

3. Device as claimed in claim 1, **characterised in that** the base portion (50) of the half-hinge fastening element (48) is provided with two projections (62) on one of its lower surfaces, which co-operate in guiding relationship with the longitudinal edges (36) of the groove (32).

FIG. 1

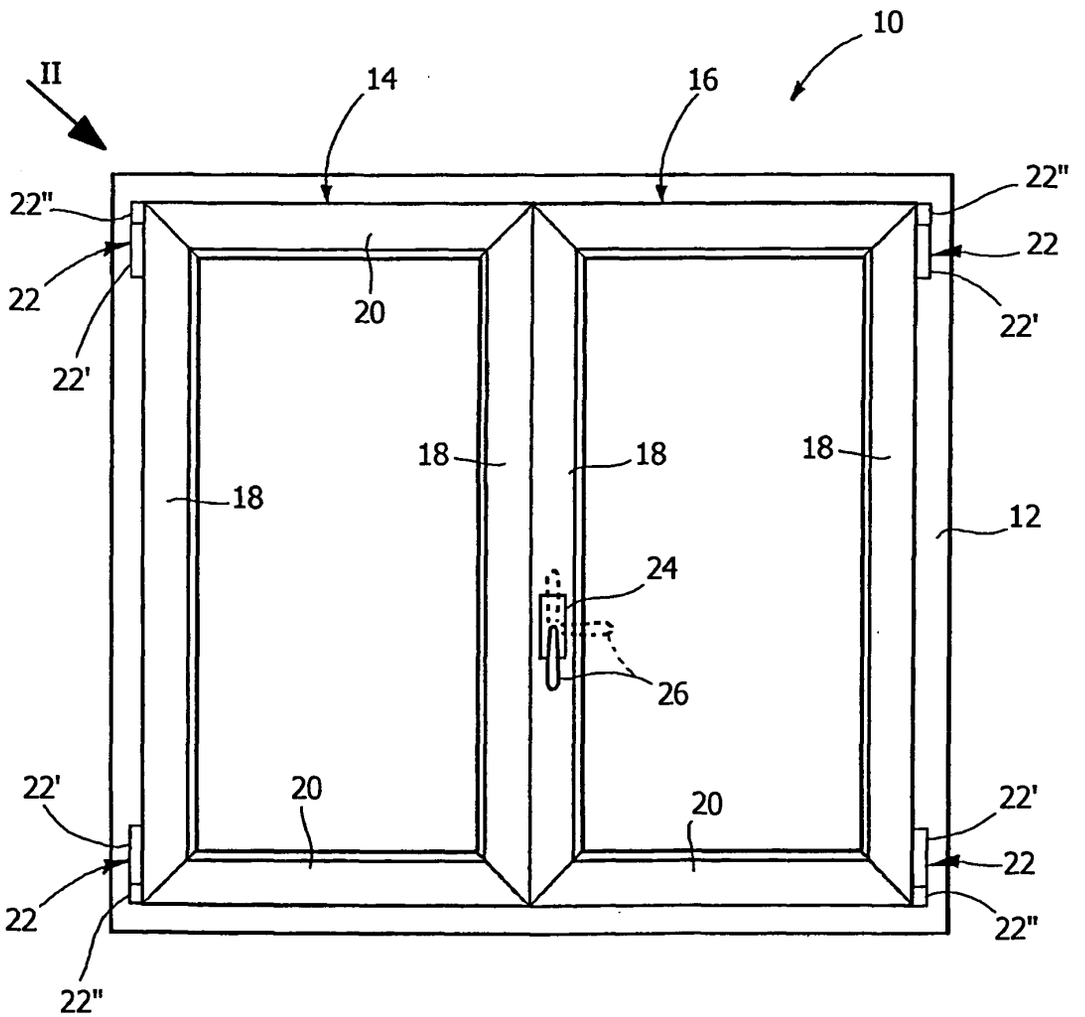

FIG. 2

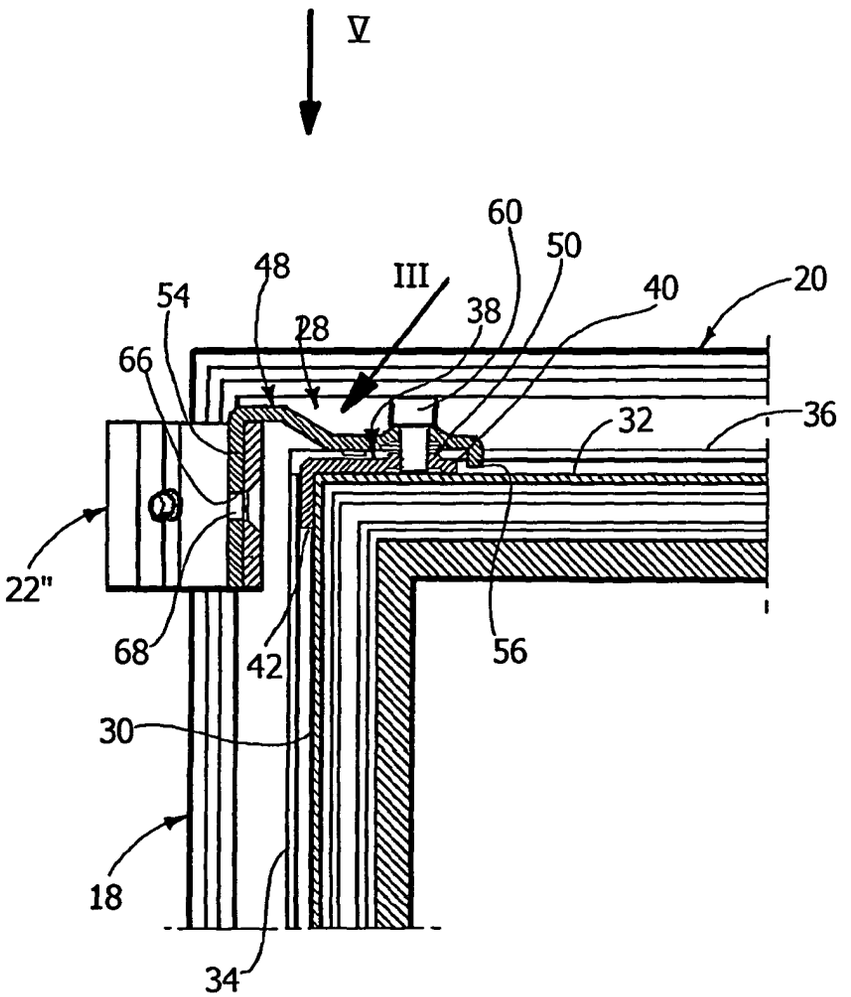

FIG. 3

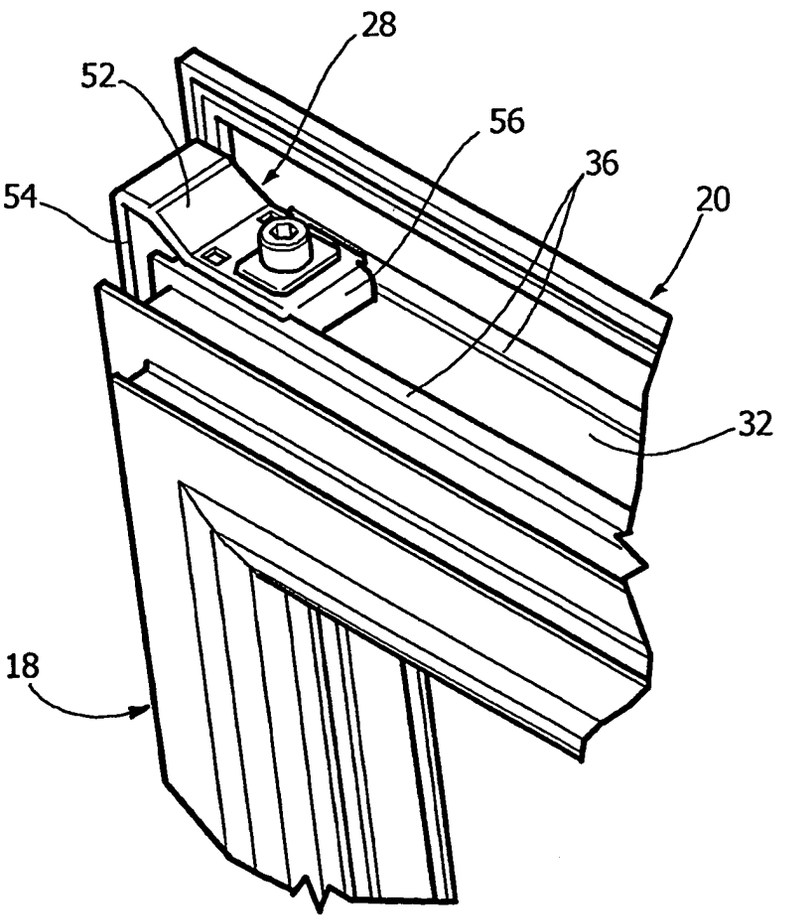

FIG. 4

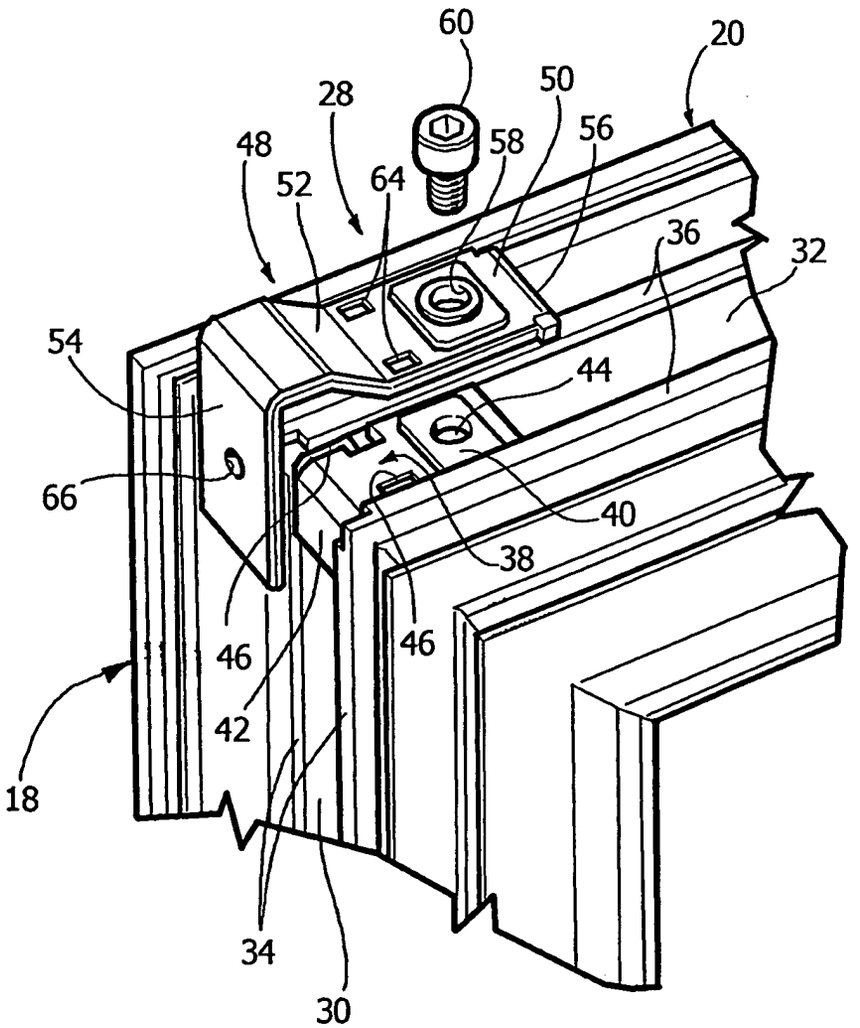

FIG. 5

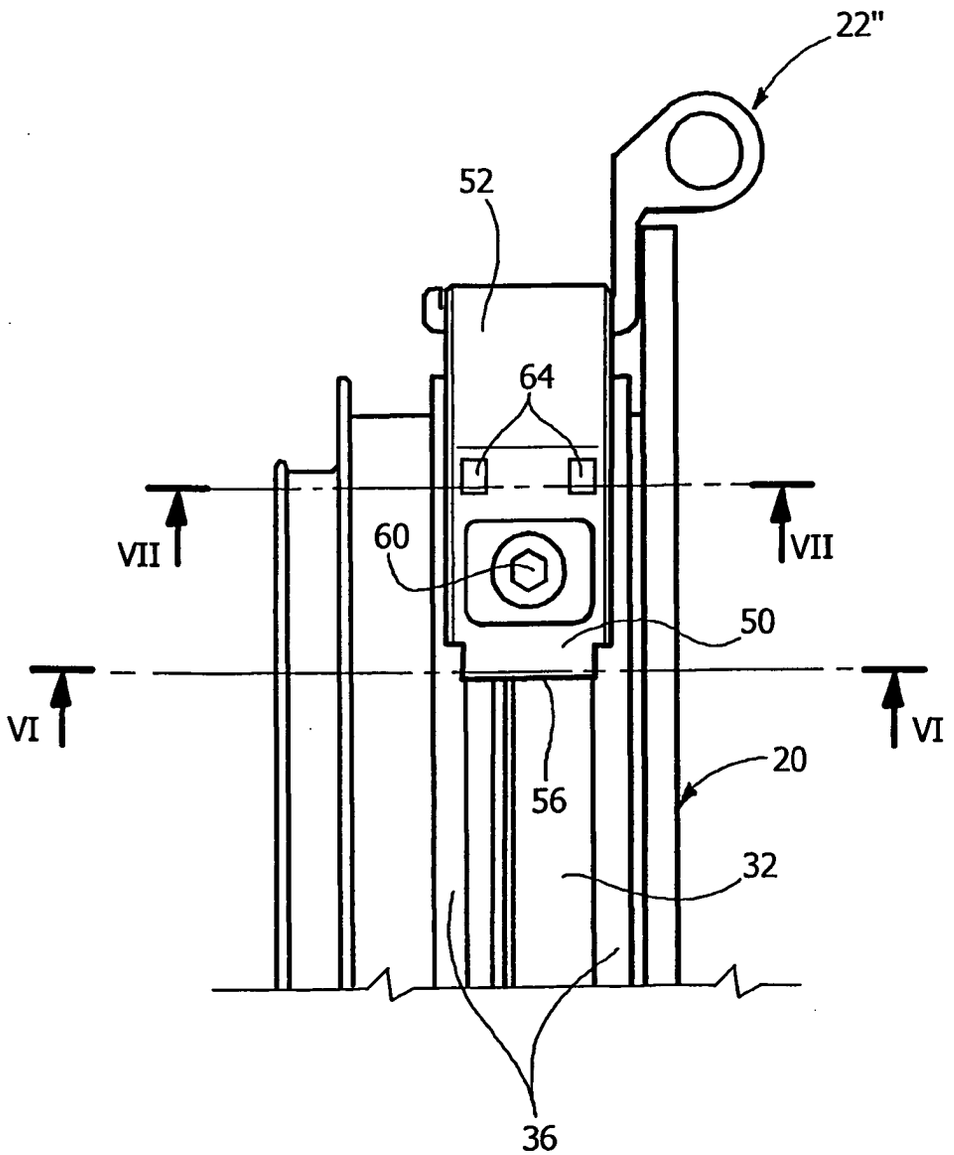

FIG. 6

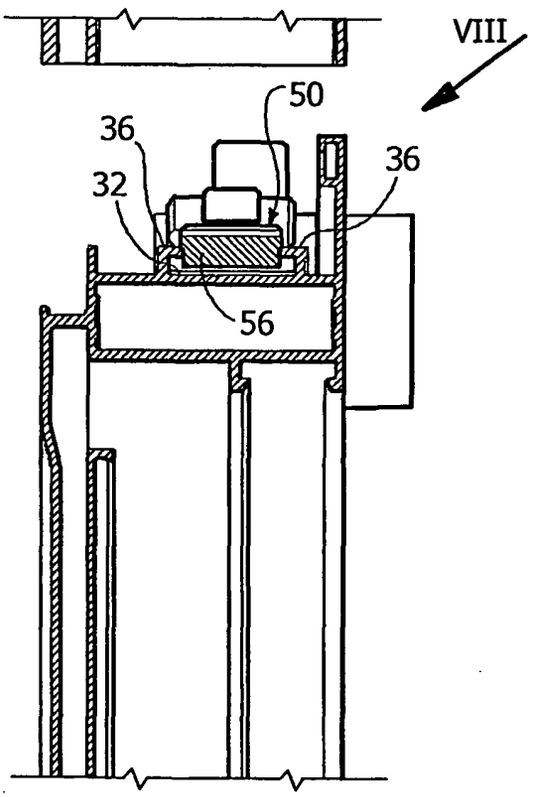

FIG. 8

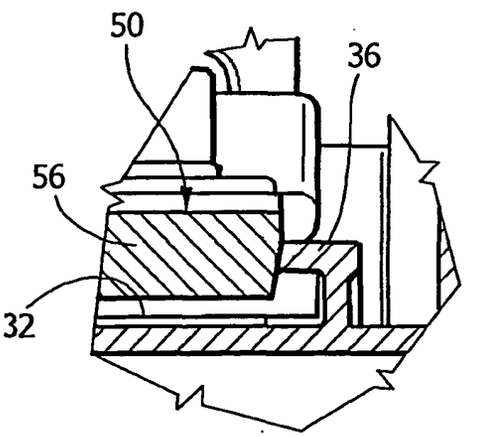

FIG. 7

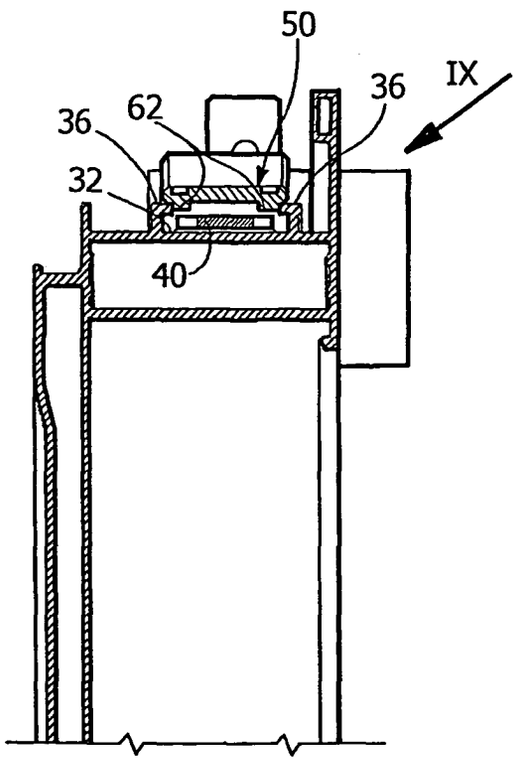

FIG. 9