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(54) **Dormer roof window**

(57) A dormer with side walls (1) and a barrel roof (2), With an obtuse angle (a) between the front side of the dormer and the ridge of the barrel roof The dormer comprises a window on its front side, with an arched top edge, fitted to the dormer roof arch (2), opened by the rotation of its sash (5) around its horizontal axis, where said sash is seated in hinges (6) fixed to the stiles (32) of the sash frame. The design of the window in the dormer is typical for roof windows.

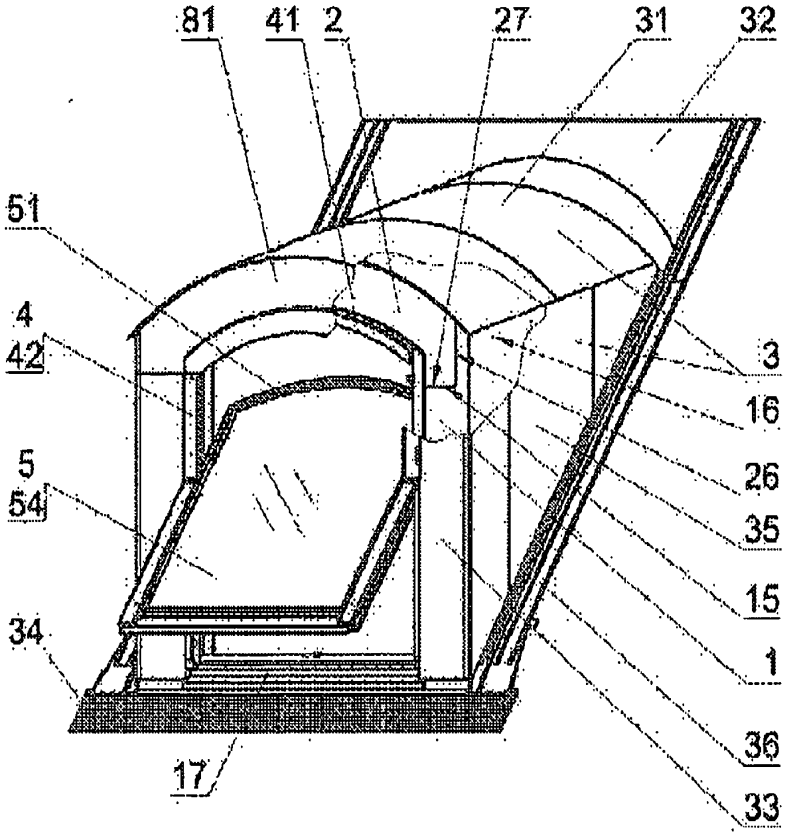

Fig 1

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Description

[0001] This application relates to a dormer with a barrel roof, intended for mounting on the inclined building roof for daylighting and natural ventilation of the attic. Specifically the invention comprises a prefabricated dormer, delivered on site as a set of components for installation on the roof or on site before transporting to the roof. The invention further includes a roof window, specifically intended for installation in the dormer. The window can also be installed directly on the roof or in a building wall.

[0002] Prior art. The dormers mounted on the inclined roof, with the barrel roof are well known. The front side of the dormer is positioned vertically, and the dormer window installed in the dormer has the design specific for wall mounted windows. The dormers are adapted to the roof pitch, and for each pitch a different dormer is used.

DISCLOSURE.

[0003] Dormer with barrel roof with a window installed on its front side, with two side walls and the dormer roof, characterized in that, between the front side of the dormer and the barrel roof there is an obtuse angle, and the window shape at its top edge is similar to the curvature of the barrel roof. An obtuse angle between the dormer front side and the barrel roof ridge does not exceed 130°, and preferably is 100°to 120°. A dormer window, with a design similar to roof windows, opened with pivot action, rotating around its horizontal axis; where the sash is seated in the hinges fixed to the stiles above half of the window height. The bottom edges of the wall and the rear edge of the dormer roof are adapted for installation on the building roof. The dormer roof is arched, at least on the front side thereof, and on the rear side, the roof may be arched as in the front, penetrating the roof surface or transform into a straight structure. An obtuse angle between the front side, the dormer roof ridge and the roof window, makes it possible to change the position of the dormer depending on a specific roof inclination. The extreme dormer inclination is the position where the dormer front side is vertical, and the roof ridge is horizontal, the inclination is lower than the inclination of the roof, on which the dormer is mounted. The other extreme position is, when the dormer front side is out of vertical position, and the roof ridge is horizontal. For the dormer at 110°, at vertical pos ition of the front side, the roof ridge is tilted by 20°from its horizontal position, and at horizontal position of the roof ridge, the dormer front side is tilted by 20°from its ver tical position, which allows installation of the dormer on roofs with inclination which differs by up to 20°. The dormer at 120° angle may be mounted on roofs with inclination which differs by up to 30°. At different roof inclinations, lower than indicated, the dormer is positioned in a way, that its front side is out of vertical position, and the roof ridge is out of horizontal position.

[0004] The dormer walls and roof are individual prefabricates, available in packages and ready to assembly on site, with thermal insulation and waterproofing membrane. The dormer walls and roof have finished inner surfaces, e.g. made of gypsum boards, and preferably have finished outer surfaces, e.g. with a metal sheet. The dormer comprises a metal sheet flange, sealing its joint with roof deck, adapted to a roof deck configuration.

[0005] The window frame installed in the dormer at its front side adheres with its stiles directly to the side walls of the dormer. Preferably, the frame is seated with its stiles in recesses in the front inner corners of the walls. The frame adheres directly to the dormer roof with its top rail, with a curvature concentric to the barrel roof of the dormer. Preferably, the window frame is seated with its top rail in the recess in the front inner corner of the dormer roof.

[0006] In the other embodiment, the dormer comprises a segment of the front wall over the window, finished at the bottom with arched surface, corresponding to the arched shape of the dormer roof, with adhering arched rail of the window frame. The window frame stiles, as in a previous embodiment, adhere directly to the side walls of the dormer, preferably seated in the recesses in the front inner corners of the walls.

[0007] In the dormer window, in each of two hinges, one unit, specifically fastened to the window frame stile comprises a curved guide, and the other, specifically fastened to the sash stile comprises a curved slide cooperating with the guide. The centres of curvature of the sliding surface of the guide and the slide are the points on the theoretical rotation axis of the hinge, positioned on the outer surface of the glazing, which facilitates cooperation of the sealing cover installed at the stiles of the window frame and the sash frame.

[0008] A dormer window with a pair of hinges mounted in the window frame stiles is a single action pivot window, rotating around its horizontal axis in the middle section, above the half of its height.

[0009] The dormer window may also be a dual action window, also an awning window, rotating around its horizontal axis, in the additional hinges in the top section of the sash frame stiles. Preferably, in each of two additional hinges for awning action, one of the units comprises a curved guide, and the other unit comprises a curved slide cooperating with the guide. The centres of curvature of the sliding surface of the guide and the slide are the points on the theoretical rotation axis of the hinge, positioned on the outer surface of the glazing.

[0010] A roof type window specifically for mounting in the dormer comprises a frame, further including a stile, top and bottom rail, characterized in that, at least in the frame, the top rail have at least one arched surface, perpendicular to the surface of the frame. The window further includes hinges, fastened to the sash frame and window frame stiles, above half of the window height. The sash frame comprises a window pane, and the window is fitted with seals, covers and a lock, similar to a roof window. Preferably, both the top window frame rail and the top sash frame rail and the top edge of the glass pane are

arched, and all the arcs are concentric. The flashing providing window integrity is fitted to the arched shape of the rails.

[0011] The window installed directly on the building roof has an additional sealing flange around its frame, fitted to the arched shape of the top rail of the window frame and other straight rails, and to the roof deck. The window installed in the dormer does not have a flange, since it is sealed with a flashing of a dormer front side. Also a window installed in the building wall does not have a flange, since the window frame is sealed with standard means available for wall windows.

[0012] In each of two hinges positioned in the sash frame stiles, one unit of each hinge comprises a curved guide, and the other comprises a curved slide cooperating with the guide. The centres of curvature of the sliding surface of the guide and the slide are the points on the theoretical rotation axis of the hinge, positioned on the outer surface of the glazing, which facilitates cooperation of the sealing cover installed at the stiles of the window frame and the sash frame. The hinge unit with a curved slide is fastened with its mounting plate with a sash frame stile. The curved slide is fixed with a mounting plate with an axis, providing additional rotation of the sash by approx. 180°from the closed position, allo wing positioning of the outer glass pane to the inside, for cleaning purposes.

[0013] In the first embodiment of the window, the hinges are the only pair of hinges, and the units comprise curved guides joined with the mounting plates with window frame stiles. The hinges are installed in the middle of the stile length of the window frame and the sash frame. The window is a single action pivot window. When open, the top rail and the sections of sash frame stiles under the hinges move to the inside of the room, and the sections of stiles below the hinges and the bottom rail of the sash frame moves to the outside of the room.

[0014] In the second embodiment of the window, a dual action window is used, pivot and awning action, rotating around its horizontal axis, with the hinges installed near the top rail of the sash frame. In this embodiment, the hinge units providing a pivot action comprise curved guides joined with mounting plates with additional arms, joined with the window frame stiles with hinges near the top rail of the sash frame. At pivot action, the arms remain inside the frame and only the sash rotates, and at awning action, the arms move with the sash. The hinges providing a pivot action allow movement of top rail of the sash frame inside the room, whereas the stiles and the bottom rail move outside the room. Preferably in each of the two hinges for opening the window in pivot action, one unit comprises a curved guide and the other unit comprises a curved slide in the guide. The centres of curvature of the sliding surface of the guide and the slide are the points on the theoretical rotation axis of the hinge, positioned on the outer surface of the glazing.

[0015] Advantages of the invention. A dormer with a barrel roof, with an obtuse angle between the dormer front side and the roof ridge, allows classification of products, where on dormer type may be installed on roofs with various inclinations. A window, preferably for mounting in the front side of the dormer, with arched top rail is fitted to the dormer shape, and as a roof window provides better integrity, than existing dormer windows.

[0016] Preferred embodiments of the invention. A dormer with a barrel roof, and a window, preferably mounted in the dormer of the present invention shown as embodiments in the following drawings, where the following figures shows:

Fig. 1 - Dormer with partially open window, pivot action - axonometric view.
Fig. 2 - Dormer of fig. 1, with closed window - front view.
Fig. 3 - Cross section of the side wall and the window - line B-B of Fig. 2.
Fig. 4 - Cross section of the dormer - line A-A of Fig. 2.
Fig. 5 - Window with arched top rail, partially open, pivot action - axonometric view.
Fig. 6 - Window of Fig. 5 partially open, side view, with detailed hinge view.
Fig. 7 - Window of Fig. 5 partially open, pivot action, with sealing flange - axonometric view.
Fig. 8 - Sealing flange for window of Fig. 5 and Fig. 6 - axonometric view.

The dormer and the window are presented as the embodiments not shown in the figures, described by indication of common features and differences in relation to shown embodiments.

Embodiment 1. A dormer comprises two side walls 1, flat and obtuse triangle shaped, and a dormer roof 2 barrel type along its length. Flashings 3 protecting dormer components and attic against rain, snow and weather conditions are installed on the surface of a barrel roof 2 and its side walls 1, including the dormer front side. The front side of the dormer comprises a roof type window 4 with arched top rail 41 and window sash 5 with arched top rail 51 and an arched top edge of the glass pane.

Side wall 1 of the dormer comprises an outer panel 11 and an inner panel 12, joined at the front with a face panel 13. The panels: inner 11 and outer 12 are obtuse triangle shaped, and the side wall 1, forming an obtuse angle between the front edge and the top edge, joining the side wall 1 with the dormer roof 2. Between the inner panel 11 and outer panel 12 of the side wall, there is a thermal insulation 14, e.g. mineral wool.

Dormer roof 2 comprises arched outer panel 21 and inner panel 22, with arched frames 23, forming a box structure with panels 21, 22, and providing rigidity. Between the panels 21, 22 and the frames 23 of the dormer roof, there is a thermal insulation 24, e.g. mineral wool. Front edge 25 of the dormer roof is tilted in relation to the ridge of the arched roof surface by an obtuse angle, identical to the side wall.

Dormer roof edges 2 joining the roof with side walls 1 are

flat, with two parallel surfaces, i.e. side surfaces 26 and bottom surfaces 27, resting on the top surfaces 15 of both side walls. Outer panels 11 of the side walls 1 protrude in its top section outside the top surface 15 of the wall and in assembled position adhere from the inside to the side surfaces 28 of the dormer roof2. Through the protruding part of the outer panel 11 of the side wall, the screws 16 are installed, joining the side walls 1 and dormer roof 2, seated in the dormer roof 2, specifically in its rebate 23. The bottom corners of the triangular side walls 1 are joined with transom 17 positioned below the bottom rail 43 of the window frame. The end sections of the transom 17 are seated in the side walls 1 and fixed to the outer panels 11 with screws through the outer panels 11 and seated in the transom 17 at its front side.

Dormer flashings 3 comprise arched flashing 31 of the dormer roof 2, and in the rear dormer section joined with the flat flashing 32 of the building roof. The front sides of the side walls 1 and the front side of a dormer roof 2 comprise flashings 33, and the bottom section comprise a flexible apron 34 positioned on the building roof below the dormer. The dormer has horizontal flashings 35 on the outer panels 11 on both side walls, and the flat flashings 32 are terminated on both sides with profiles 36 along the side wall 1 of the dormer fitted to the roof covering type.

A roof window is installed in the dormer with a window frame 4 with arched top rail 41, straight stiles 42 and a bottom rail 34. The stiles 42 of the window frame are seated in the side walls 11 in the front inner recess 18 of the wall. The inner panel 12 of the side wall 1 protrudes to the front inner recess 18 and in closed position protrudes to the recess in the window frame stile. The top rail 41 of the window frame is seated in the arched front inner recess 28 of the dormer roof 2 corresponding to the shape of the top rail. The bottom rail 43 of the window frame is seated in the transom 17 of the side walls.

The window may be single action, pivot type, shown in Fig. 4 as a cross section of partially opened window, where the sash in a partially open position is marked with symbol5p. The dormer window may also be a dual action window, pivot and awning type, shown in Fig. 4 as a cross section of open window, where the awning action is marked with symbol 5o, and the pivot action is marked with symbol 5p. The detailed description of a roof window installed in the dormer and its actions are shown in the third and fifth embodiment.

Embodiment 2. The dormer comprises two side walls, each of them flat and obtuse triangle shaped and arched roof along its length, and the sealing flashings at the surface of the arched roof, identical to the first embodiment. The dormer front side further includes a roof window with a window frame and arched top rail and a sash with arched top rail and arched top glass pane edge. Over the window is a front side wall, and the window frame does not adhere to the roof but to the front side wall, protruding with its top rail to the recess in the front side bottom edge of the wall. The remaining features of the dormer, including joints of its components, roof window and opening system are identical to the first embodiment.

Embodiment 3. A roof window, intended for mounting in the dormer with barrel roof comprising a window frame 4 with arched top rail 41, straight stiles 42 and a bottom rail 43. The sash 5 comprises a sash frame with arched top rail 51, straight stiles 52 and a bottom rail 53. Insulating glass pane 54 made of two glass panes, where the top edge is arched, corresponding to the shape of the top rail 51 is fitted in the sash frame 5 .The sash 5 is seated in the window frame 4 with pivot hinges 6 joining the stiles 51 of the sash frame with stiles 42 of the window frame, above half of the stile height. A pivot window is used in this embodiment. When opened, the top rail 51 of the sash 5 and the sections of the stiles 52 above the pivot hinges 6 move inside the room, and the bottom rail 53 of the sash with the sections of the stiles 52 below the pivot hinges 5 moves outside the room. A handle 7 with lock 71 in closed position cooperating with a socket 72 located in the bottom rail 43 of the frame 4 on its inner side is rotatably mounted in the bottom rail 53 of the sash 5 from the inside of the room.

Each hinge has two units - one fastened to the window frame and the other fastened to the sash frame. The first unit of the hinge comprises a curved guide 61, immovably fixed to the mounting plate 62 fastened to the stile 42 of the window frame 4 from the inside. The second unit of the hinge comprises a curved slide 63 in a curved guide 61 joined with a mounting plate 64 fastened to the stile52 of the sash frame. The centre of curvature of the curved guide 61 and arched slide 63 is on the theoretical rotation axis on the outside of the glass pane, which facilitate the operation of the sash 82 and the frame 83 covers improving the sealing properties. The curved slide 63 is joined with a mounting plate 64 with the axis 65, which at the maximum slide protrusion provides additional window turn by approx. 180°to the closed position, which allows cleaning of the outer glass pane surface, which in this position is inside the room. In normal operation of a window, closing and opening is within the range of a slide 63 movement inside the guide 61.

The window and sash frame stiles and rails comprise covers 8 made of metal sheets protecting the window and the room against rain and snow. The top rail 41 of the window frame 4 have an arched cover 81 corresponding to the rail shape. In the sash 5 on the bottom section of its stiles 52, mainly below the pivot hinges 6 are the sash covers 82, moving with the sash 5whereas in the frame 4 on the top section of its stiles 42 , mainly above the pivot hinges 6 are fixed window frame covers 83, overlapping the sash covers 82.

Embodiment 4. A roof window, intended for direct mounting in the building roof comprising a window frame 3 with an arched top rail 31, straight stiles 32 and a bottom rail 33. A sash 4 comprises a sash frame with an arched top rail 41, straight stiles 42 and a bottom rail 43. Insulating glass pane 44 made of two glass panes, where the top edge is arched, corresponding to the shape of a top rail

41 is fitted in the sash frame 4.The sash is seated in the window frame with pivot hinges joining the stiles of the sash frame and window frame, above half of the stile height. All window components are as in the third embodiment.

The window intended for mounting directly in the building roof comprising a sealing flange 9 with a top section 91 having an arched surface 92 perpendicular to the roof cooperating with the top rail 41 of the window frame 4 corresponding to the rail shape. The sealing flange including two side sections 93, each with a bend perpendicular to the roof surface, adhering to the stile 32 of the window frame and the bottom section 94 with a bend including a bottom rail 33 and the bottom part of both stiles 32 of the window frame. Sealing flange sections 9 are lap joined in the direction of a rain water flow from the roof.

Embodiment 5. A roof window, intended for dormers with barrel roof comprising a window frame with an arched top rail, two stiles and a bottom rail. Similarly, the sash comprises a sash frame with an arched top rail, two stiles and a bottom rail, where an insulating glass pane made of two glass panes, with arched top edge, corresponding to the shape of a top rail is fitted in the frame. The window in this embodiment is a dual action window, pivot and awning action, as shown in Fig. 4 as a cross section of opened window, where the sash open with awning action is marked with symbol 5o and opened with pivot action is marked with symbol 5p. The sash is seated in the window frame with pivot hinges, above half of the stile height, and with awning hinges at the top section of the stiles. The hinges are joined with arms, which remain in the window frame for pivot action and rotate with the sash for awning action. The hinges for awning action are similar to the hinges of P-383664, with a curved slide in a curved guide.

Claims

1. The dormer with the barrel roof, specifically prefabricated, intended for mounting in the inclined building roofs, with the window installed in its front side, with two side walls and dormer roof, barrel roof type at the front side, where the bottom edges of the wall and the rear edge of the barrel roof are adapted for mounting in the roof where the dormer is installed wherein between the dormer front side and the barrel roof there is an obtuse angle (a) and the arc shaped window similar to the barrel roof curvature (5) is opened by the rotation of its sash (5) around its horizontal axis, said sash is seated in the hinges (6) fixed to the stiles (32) of the sash frame.

2. The dormer of claim 1 wherein the obtuse angle between the dormer front side and the dormer roof ridge (2) does not exceed 130 degrees, preferably 100 to 120 degrees.

3. The dormer of claim 1 or 2 wherein the walls (1) and the dormer roof (2) are individual prefabricates intended for installation on site, with thermal insulation and waterproofing membrane, with finished inner surfaces and preferably outer surfaces, said dormer comprising the flange sealing the joint with building roof covering.

4. The dormer of claim 1, 2 or 3 wherein said window frame (4) adheres directly to the side walls (1) of said dormer, preferably seated with stiles and top rail in the recesses (18, 28) in front inner corners of the walls and said dormer roof.

5. The dormer of claim 1, 2, 3 or 4 wherein comprising flashings (3) on the front side surface of side walls and said dormer roof cooperating with the dormer window flashings.

6. The dormer of claim 1, 2, 3, 4 or 5 wherein said dormer window is opened in pivot action, with the rotation axis above half of the window height, where each of two hinges (6) comprise one unit, preferably fastened to the stile (42) of the window frame with the curved guide (61), and the other unit, preferably fastened to the stile (52) of the sash frame with the curved slide (63) in said guide, where the centres of curvature of sliding surfaces are the points on the theoretical rotation axis of said hinge, on the outside of the glass pane surface.

7. The dormer of claim 6 wherein the window is a dual action window, also with awning action, rotating around its horizontal axis on the hinges near the top rail of said sash frame, preferably in each of two hinges, one unit comprising the curved guide and the other unit comprising the arched slide in said guide, where the centres of curvature of sliding surfaces are the points on the theoretical rotation axis of said hinge, on the outside of the glass pane surface.

8. The roof type window, preferably for the dormer, comprising the frame further including stiles, top and bottom rail and the sash frame further including the stile, top and bottom rail and the glass pane as well as seals and covers, hinges, joining the sash with said window frame and the lock for closed position wherein at least in the window frame (4) the top rail (41) comprises at least one arched surface, perpendicular to the window frame surface, including the rail, and the hinges (6) are fastened to the stiles (52) of said sash frame, above half of the window height.

9. The window of claim 8 wherein the top rails (41, 51) of said window frame (41) and said sash frame (5), and the top edge of said glass pane (5) are arched, and the flashings are fitted to the shape of said rails.

10. The window of claim 8 or 9 wherein said window comprises the sealing flange (9) intended for the window mounted directly in the building roof, with an arched surface (92) adhering to the top rail (41) of said window frame (4), fitted to the roof covering.

11. The window of claim 8, 9 or 10 wherein said window is opened by pivot action, with the rotation axis above half of its height, and each hinge (6) comprising one units with the curved guide (61), and the other unit with the curved slide (63) in said curved guide, where the centres of curvature of sliding surfaces are the points on the theoretical rotation axis of the hinge, on the outside of the glass pane surface.

12. The window of claim 10 wherein said hinge (6) with curved guide (61) joined through the mounting plate thereof (62) with the stiles (42) of said window frame (4), and hinge with curved slide (63) joined through the mounting plate thereof (63) with the stile(52) of said sash frame (5), said curved slide joined through the mounting plate thereof with an axis (65) providing additional sash rotation.

13. The window of claim 8, 9, 10, 11 or 12 wherein said window is a dual action window, with awning action, rotating in its horizontal axis, in the additional hinges near the top rail of said sash.

14. The dormer of claim 13 wherein said hinges for opening window by awning action comprise one unit with the curved guide and the other unit with the arched slide in said guide, where the centres of curvature of sliding surfaces are the points on the theoretical rotation axis of the hinge, on the outside of the glass pane surface.

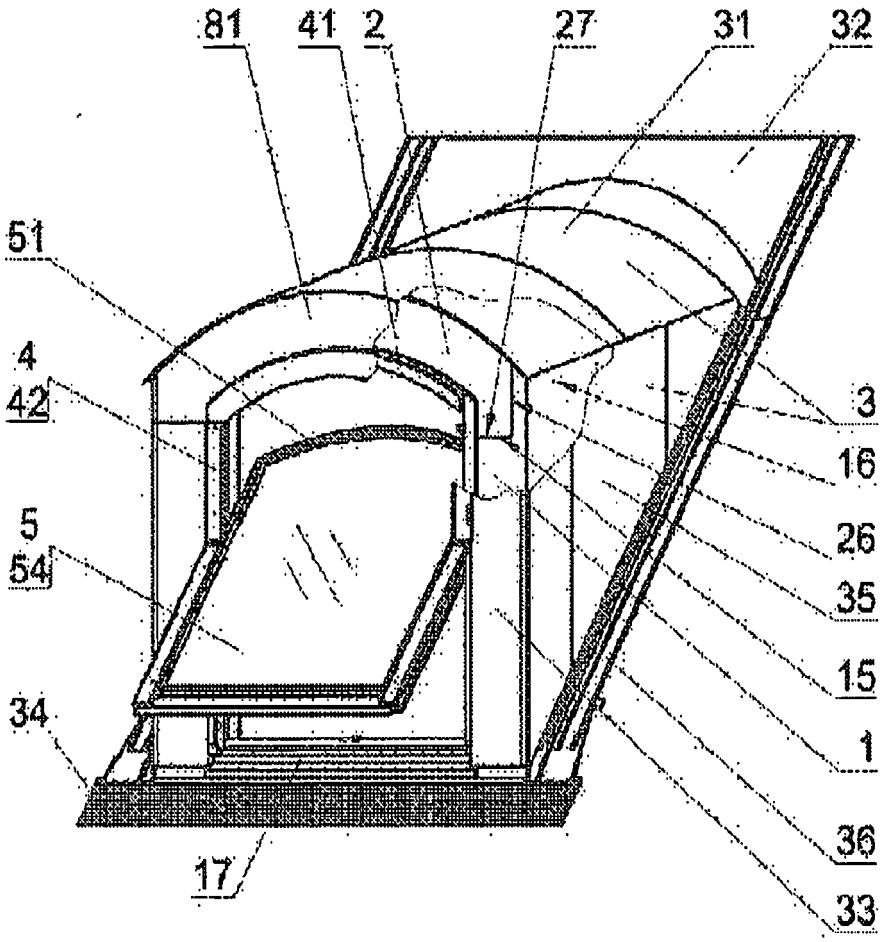

Fig 1

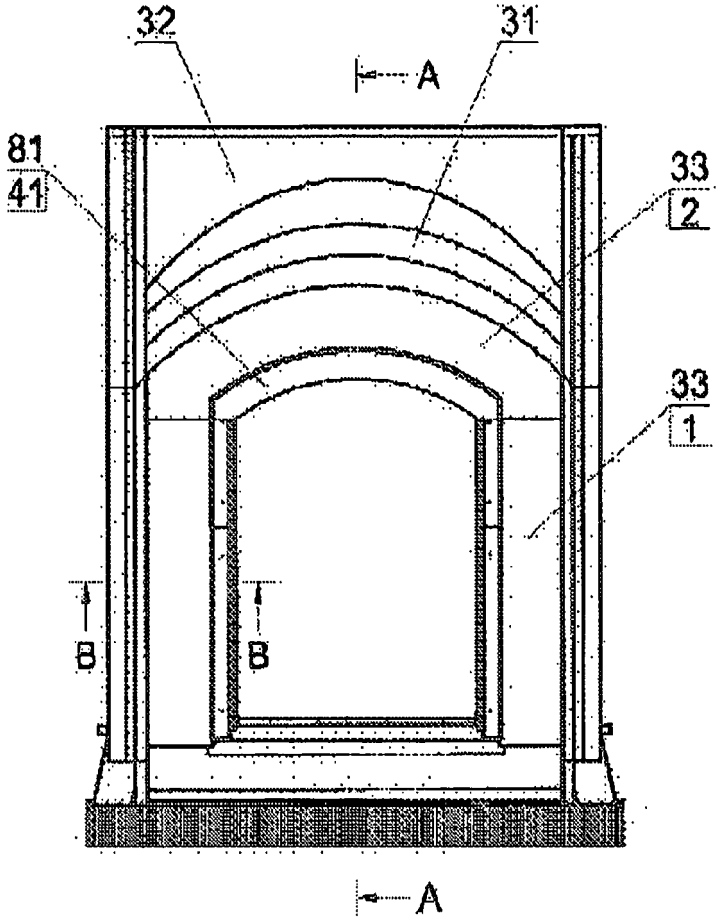

Fig 2

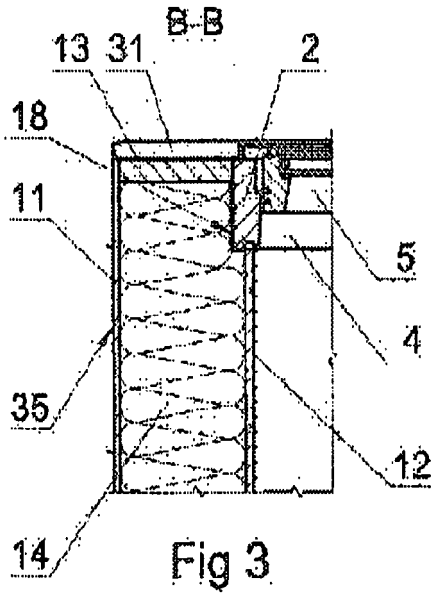

Fig 3

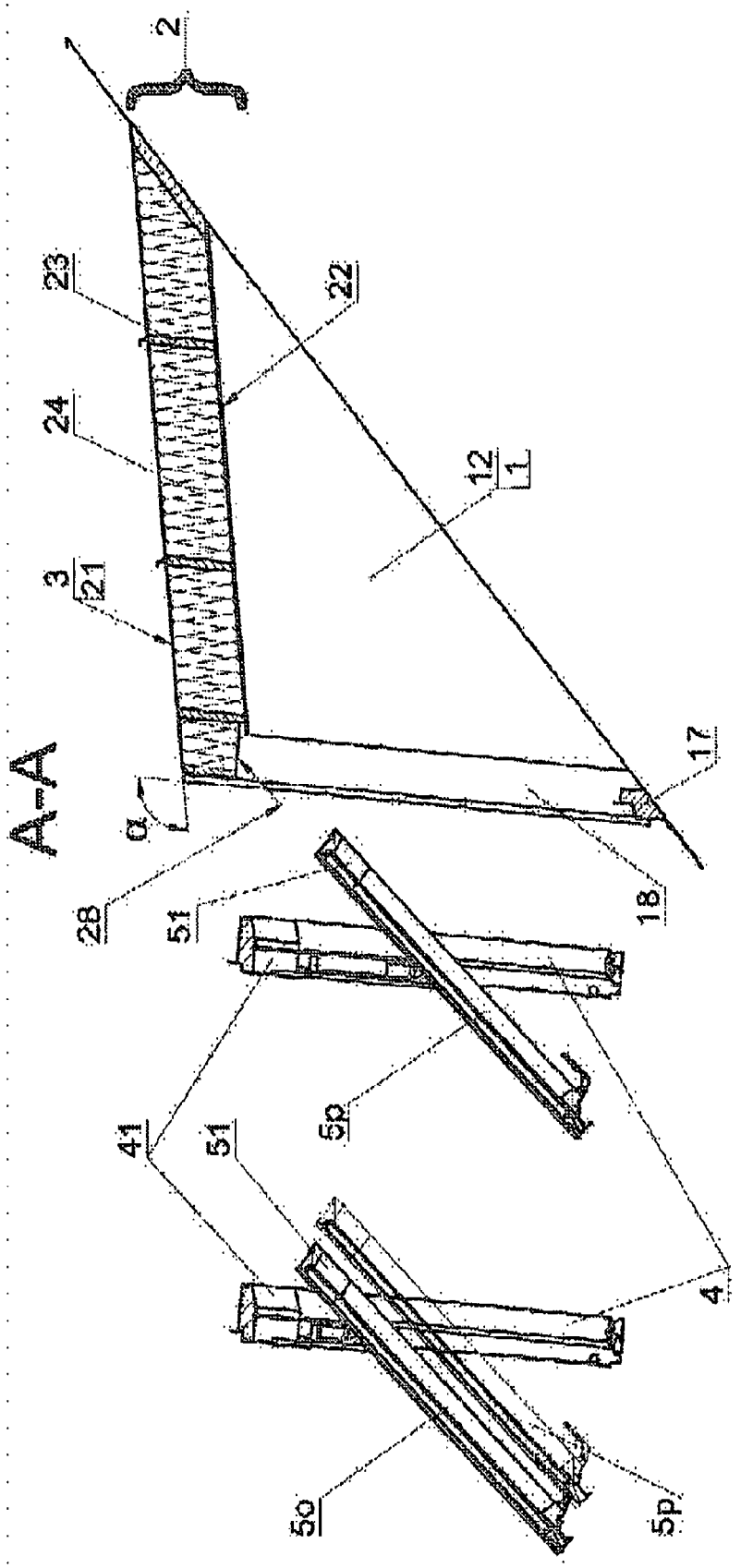

Fig.4

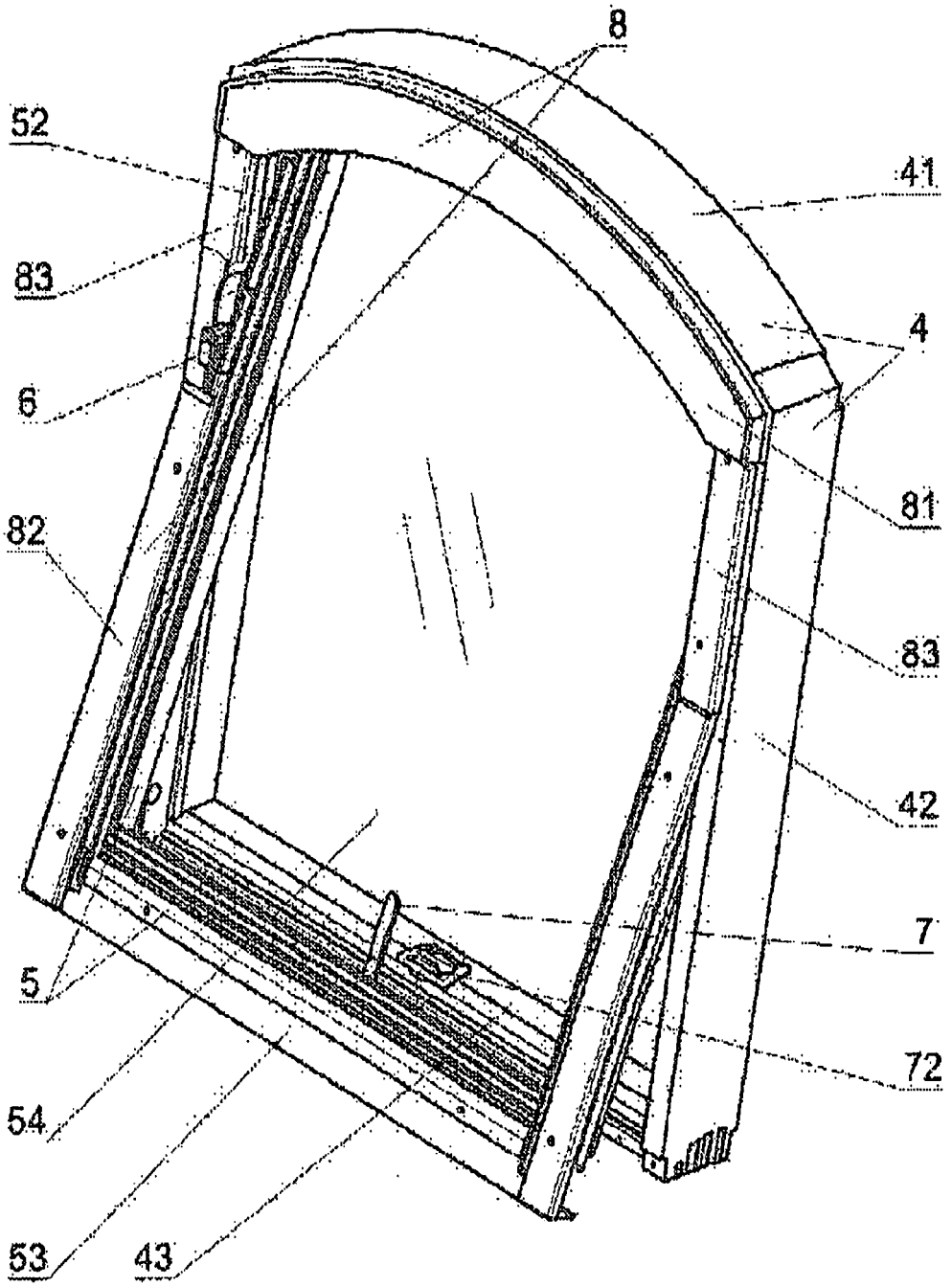

Fig 5

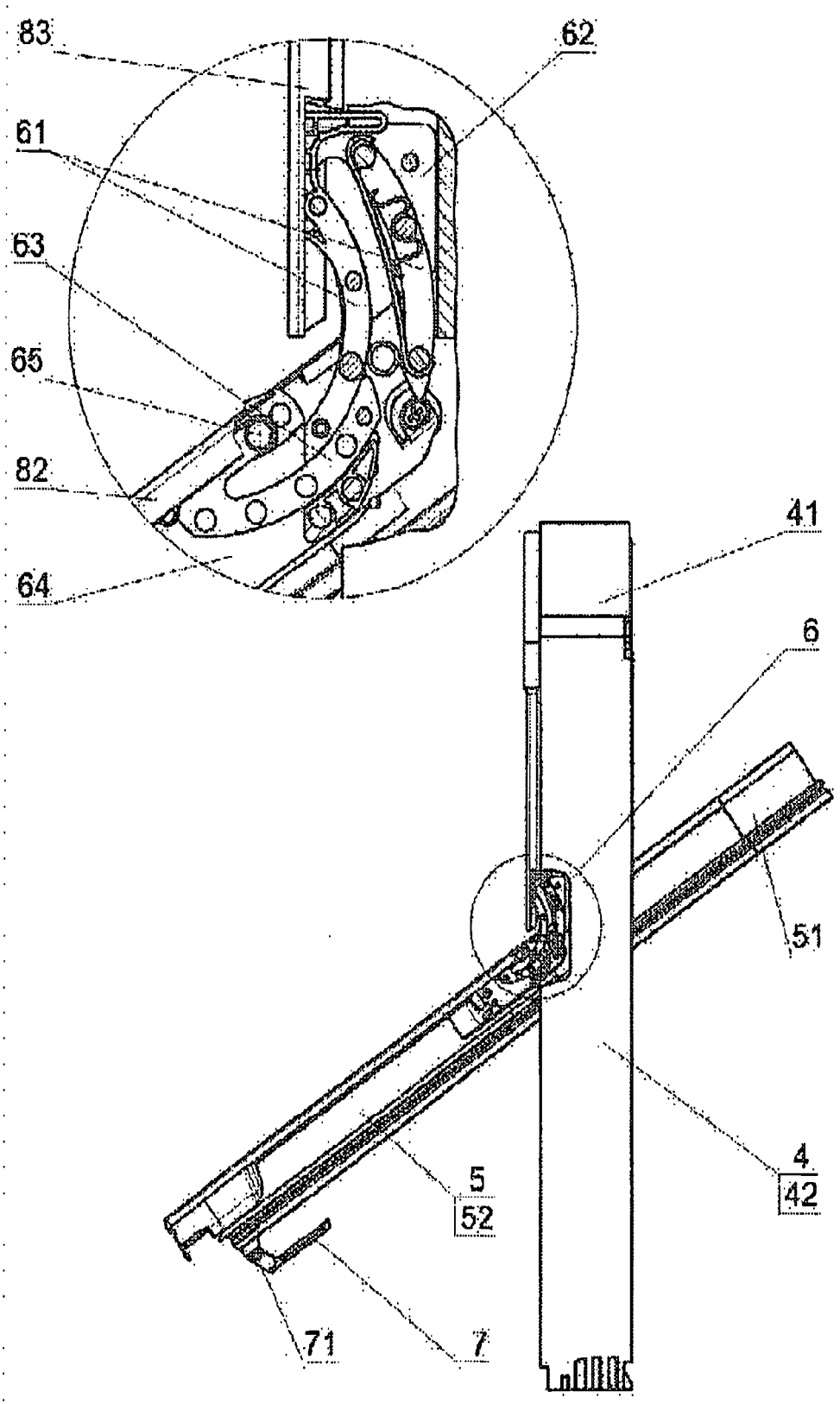

Fig 6

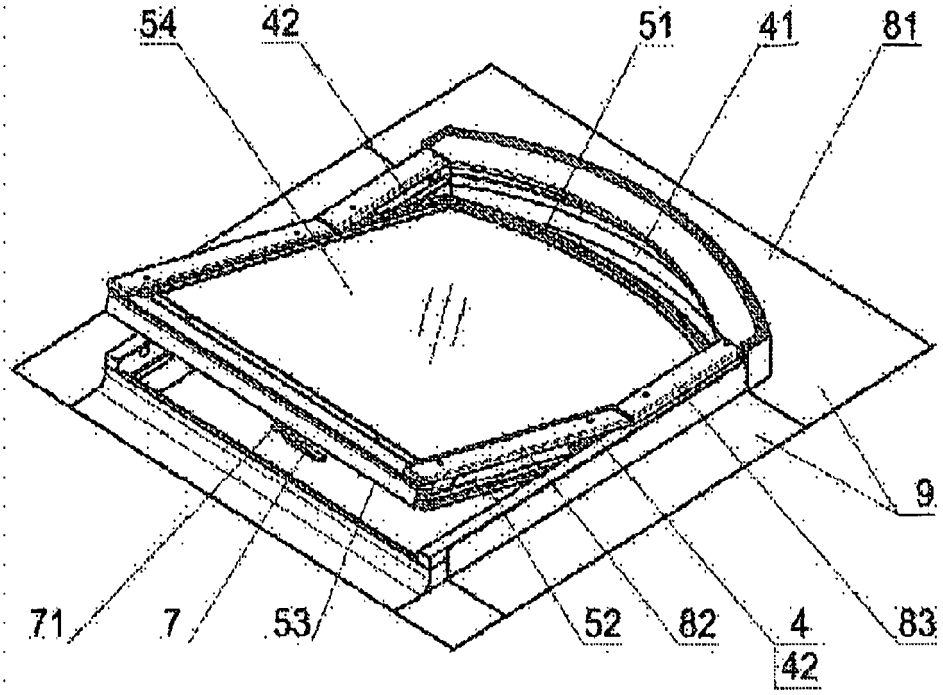

Fig 7

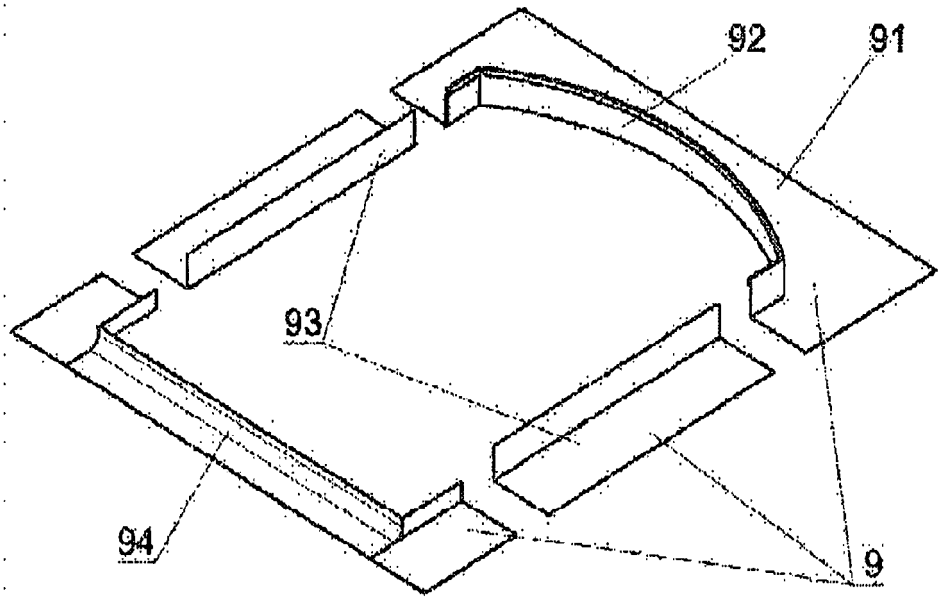

Fig 8