

[54] METAL WINDOW FRAME

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[56] References Cited

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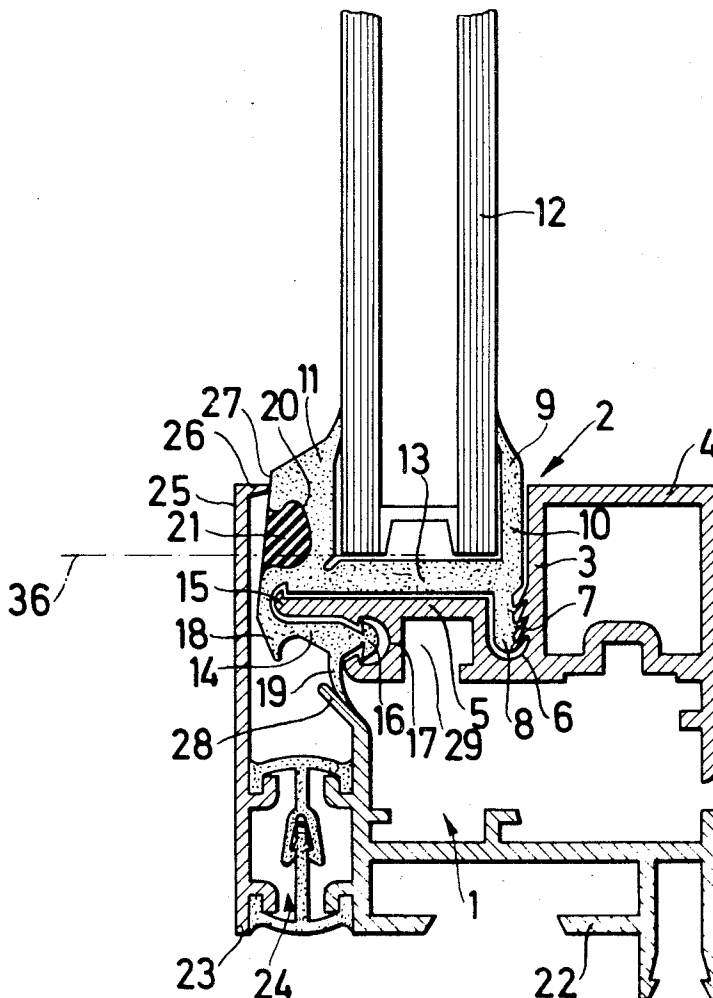
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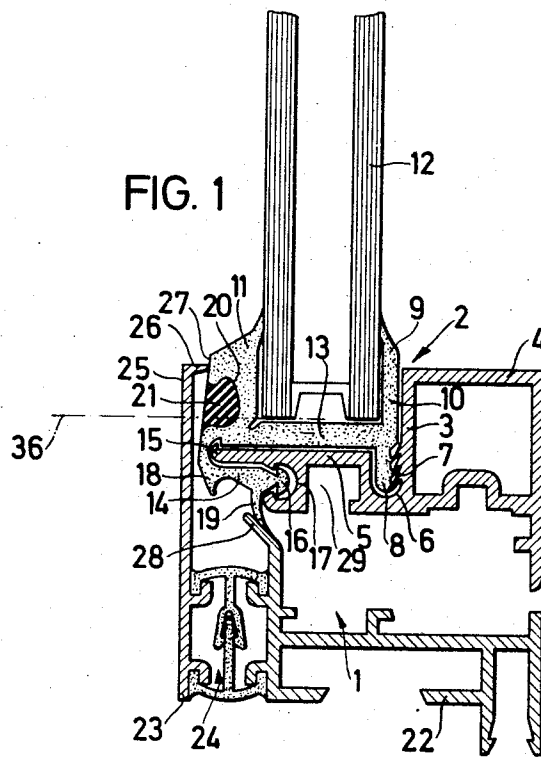
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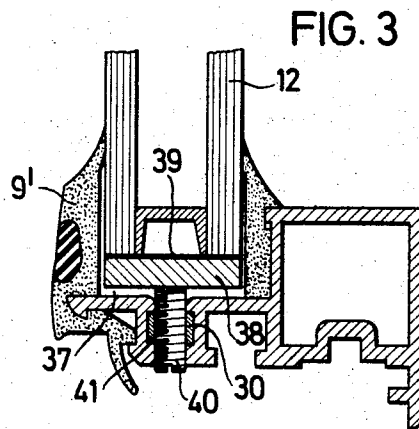
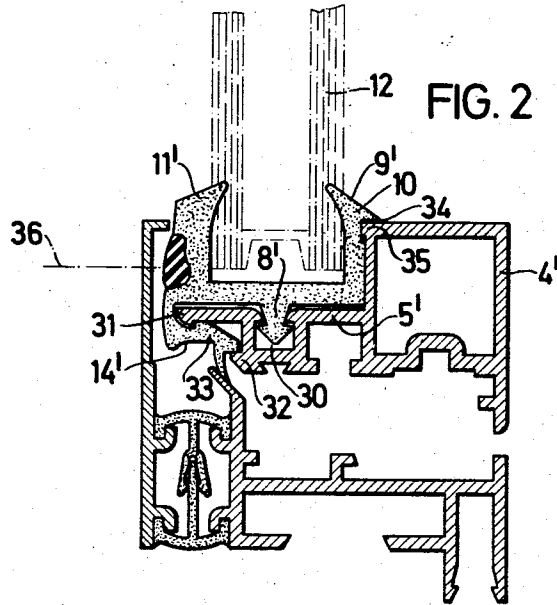
[57] ABSTRACT

A metal window is suggested the casement frame of which exhibits a frame section with a hollow section part, whereby a synthetic rubber glazing section encompassing the pane edge adjoins the said hollow section part at right angles to the plane of the frame, the said glazing section having a sealing face which cooperates with a flange of the window case. It is of importance that the casement frame exhibits within a section part extending transversely from the hollow section part at least one section groove substantially oriented towards the frame aperture, with an anchoring flange of the synthetic rubber glazing section which is substantially parallel to the plane of the frame, engaging the said section groove, the said glazing section having a section leg which can be reinforced by means of an elastic filler bar and can be bent downward for insertion of the panes, the said section leg being the sole pane securing means of the casement frame located in the space in front of the panes.

14 Claims, 3 Drawing Figures







## METAL WINDOW FRAME

### FIELD OF THE INVENTION

The invention relates to window frames. It is concerned with window frames comprising an openable casement frame in which glazing surrounding the edge of a window pane is secured. The glazing may be provided with a sealing face co-operating with a flange of the window case.

### DISCUSSION OF PRIOR ART

With a known metal window of this type the glass is inserted into the window frame together with the synthetic rubber glazing surrounding its edge and is then secured by means of a separate fixing member which in the assembled state forms part of the casement frame, the glazing section and the edge of the pane being simultaneously supported in the casement frame.

With the known metal window construction the fixing member has to be produced jointly with the casement frame in order to ensure the desired fit and operation and in addition the synthetic rubber glazing has to be attached to the edge of the pane before inserting the structural assembly thus formed into the casement frame. It is desirable therefore to achieve a method of assembly which is simpler than that of the known construction described above in such a way that the individual parts of the window casement starting with the casement frame can be assembled one after the other while at the same time the number of structural parts is kept to a minimum.

### SUMMARY OF THE INVENTION

According to the present invention a window frame comprises a casement frame in which glazing surrounding the edge of a window pane is adapted to be secured, the frame having a slot and the glazing having a co-operating anchoring flange adapted to engage in the slot and in which the glazing has a longitudinally extending groove in an outer surface enabling a side edge of the glazing to be bent outwards for insertion of a window pane therein which groove when filled by a filler bar to prevent subsequent bending of the said side edge thereby secures the pane in the casement frame.

In one preferred embodiment the anchoring flange of the glazing juts outwardly away from the glazing in a plane generally parallel to the plane of the window so that when pressure is exerted on the window pane the stress on the flange is primarily in shear. When the window is open the glazing secures the assembly comprising the glass panes and the glazing in an adequate manner so that no additional fixing means is required. When the casement is closed the window panes and their glazing are clamped between a flange on the window case and a support surface in the casement frame so that a similar condition is achieved to pressure glazing.

In windows embodying the invention the transverse distance between one side of the window case and the opposite side of the casement frame can be made very large thus improving the thermal insulation.

The large dimension of the casement frame in a transverse direction to the window pane ensures that the casement frame has a high dimensional stability so that the action of any closing mechanism on the window ensures a uniform pressure of the glazing and the window panes against the window case.

### BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more fully understood reference will now be made to the accompanying drawings in which:

FIG. 1 illustrates in section a window frame embodying the invention, parts not lying in the plane of the section being omitted,

FIG. 2 illustrates in section an alternative embodiment of the invention, and

FIG. 3 illustrates a section through a part of a casement frame in the region of an adjusting device.

### DESCRIPTION OF PREFERRED EMBODIMENTS

The metal window shown in FIG. 1 has a window case 1 and a casement frame 2 consisting of a single metal frame 3. The latter has on its inner side or on the side facing the casement aperture a hollow part 4 the cross-section of which is, in the embodiment illustrated, substantially square. Abutting the hollow part 4 there follows, in the transverse outward direction, a part 5 containing a slot 6 facing the aperture of the frame.

The wall of slot 6 adjoining the hollow part 4 is provided with anchoring recesses 7 which co-operate with barbs of an anchoring flange 8. The anchoring flange 8 juts out away from glazing 9 consisting of synthetic rubber, for example chlorobutadiene and having a Shore hardness of about 70°.

The part of the glazing 9 facing the double window pane 12 has a substantially C-shaped cross-sectional shape which includes an inner leg 10 and an outer leg 11 joined by a transverse web 13. Also, in addition to anchoring flange 8 a part 14 is attached to transverse web 13. Part 14 surrounds the front end of part 5 of the casement frame, which front end has a hook-shaped cross-section 15. The part 14 of the glazing is anchored in a slot or recess 17 on the underside of part 5 of the frame by means of an element 16 which has an arrow or anchor shaped profile.

The part 14 has at its outer end a nose 18 and a sealing lip 19 close to the bar 16 forming part of the window case.

The leg 11 of the glazing 9 has, on its side facing away from the glass pane 12, a groove 20 occupying a considerable part of the cross-section of this leg, whereby the groove when it is not filled enables leg 11 to be easily bent in a counter-clockwise direction with respect to the position shown in FIG. 1, thus enabling the glass pane 12 to be inserted into the glazing after the glazing 9 has been fitted to the casement frame 3. Thereafter groove 20 is filled with an elastic filler bar 21 in a known manner, the filler bar 21 consisting of the same or similar material as glazing 9, it being possible for the filler bar to be made with a Shore hardness of 80° if the glazing 9 has a Shore hardness of 70°.

The window case 1 is composed of two metal sections 22 and 23 which are connected in a manner ensuring thermal insulation between the inner section and the outer section by means of a structure generally designated 24 and consisting of insulating coupling members. The outer section 23 of the window case 1 possesses a flange 25 which extends inwardly of the frame aperture and has an angled end 26 which in the closed condition of the casement abuts against a mating face 27 of leg 11 of the glazing 9 and together with it forms a seal.

The inner section 22 of the window case 1 has at a predetermined distance in the transverse direction from flange 25 an inclined flange 28 which co-operates with sealing lip 19 of the part 14 of the glazing so as to form a further seal.

On the side of part 5 of the casement frame facing away from glazing 9 there is a chamber 29 which is accessible if the casement is opened and can be used for the installation of a device for adjusting the padding of the window frame, so that the metal frame can be readjusted even a considerable time after its installation. The part 5 and the glazing 9 have, to this end, cut-outs for installation of the padding device at appropriate points. This will be discussed in greater detail with reference to FIG. 3.

The embodiment shown in FIG. 2 differs from that in FIG. 1 mainly in the design of the glazing 9'. The anchoring flange 8' which is substantially symmetrical to the centre plane of the twin window panes has, with the embodiment shown in FIG. 2, an anchor-shaped or arrow-shaped cross-section and engages a slot 30 in the part 5' which faces the region occupied by the twin pane 12. The part 5' also possesses, on that side which in FIG. 2 is on the left, hook elements 31 and 32 which substantially face one another and define a recess which surrounds and retains a bar-shaped element 33 of a part 14' of glazing 9'.

The leg 10' of the glazing 9' is provided with a groove 34 and a lug 35 which faces away from the hollow part 4' of the casement frame engages in groove 34 so that improved sealing is brought about between the glazing 9' and the casement frame with a view to preventing the entry of condensation water between these two structural elements.

The position of the anchoring flange 8' in a direction transversely of the window pane has the advantage that after insertion of the panes the anchoring flange 8' is virtually locked in channel 30 and that pressure on the panes at right angles to the plane of the panes appreciably stresses anchoring flange 8' only in shear.

In FIGS. 1 and 2 projection lines in the space directly in front of the panes 12 are designated 36. The leg 11 or 11' of the glazing 9 or 9' which can be reinforced by means of a filler bar 21 constitutes the only securing means pertaining to the casement frame which projects into this space and holds the panes against the casement frame. Owing to the special design of the glazing this securing method is adequate and considerably simplifies assembly of the casement frame.

FIG. 3 shows a sectional view of the casement frame of the metal window shown in FIG. 2 in the region of an adjusting device. Close to the corners the base of the synthetic rubber glazing 9' is recessed for a longitudinal distance of, for instance, about 60 mm to 90 mm. An aluminum pad 38 is inserted into the space 37 in FIG. 3. The aluminum pad 38 supports on the side which faces the glass panes 12 a plastic bearing face 39 the thickness of which amounts to about 1 mm. The aluminium pad 38 can be clamped against the edge of the glass panes 12 by means of one or several threaded pins 40. The threaded pin 40 is screwed through a nut 41 inserted into channel 30. The threaded pin 40 passes through a bore or recess in the base of channel 30.

What is claimed is:

1. A window assembly comprising:  
window casing means, said casing means defining a window opening;

a casement frame, said frame being at least in part movable with respect to said casing means and being received in the opening defined thereby, said frame including:

- 5 a base portion, said base portion being provided with a first longitudinal slot which faces the window opening; and
- a first side portion extending generally outwardly from a first end of said frame base portion;
- 10 flexible glazing means, said glazing means being provided with a base portion and a pair of side portions which define a groove for receiving a window pane, said groove facing the window opening, said glazing means further being provided with a first anchoring flange which cooperates with said first longitudinal slot in said casement frame base portion to secure said glazing means to said frame, said glazing means also including a longitudinally extending slot in a first one of said side portions, said glazing means slot facing in a direction generally transverse to said glazing means pane receiving groove and permitting said one side portion to be flexed outwardly to enable insertion of a window pane in said groove, said glazing means further comprising an extension of said base portion which passes around the second end of said casement frame base portion, said second side portion of said glazing means and said first casement frame side portion cooperating to prevent distortion of the second side portion of said glazing means; and
- a filler bar complementary in shape to said glazing means slot, said bar being adapted to be inserted and engaged by said glazing means slot to prevent flexing of said glazing means first side portion subsequent to insertion of a window pane in said glazing means groove whereby a window pane may be secured in said casement frame for movement therewith.

2. The apparatus of claim 1 wherein said window casing means includes:

a sealing projection, said sealing projection being urged into sealing relationship with said glazing means extension with the window in the closed position.

3. The apparatus of claim 2 wherein said glazing means additionally comprises:

an inclined flange member, said flange member extending from said glazing means base portion extension and cooperating with said casing means projection to define a first window seal.

4. The apparatus of claim 3 further comprising:  
means defining a second window seal between said window casing means and said glazing means, said second seal defining means including a projection on said casing means which contacts said glazing means first side portion with the window in the closed position.

5. The apparatus of claim 4 wherein said frame base portion includes a channel which defines said first slot and wherein said apparatus further comprises:

nut means positioned in said channel;  
pad means, said pad means being vertically movable and being in registration with said nut means and recesses in said glazing means defined groove whereby contact between said pad means and a window pane mounted in said glazing means groove is established; and

threaded pin means, said pin means extending through said nut means and contacting said pad means, said pin means being adjustable from the exterior of said casement frame.

6. The apparatus of claim 1 wherein said window casing means comprises:

an inner casing section, said inner section defining the window opening and being provided with a first projection which cooperates with said glazing means to define a first window seal;

an outer casing section, said outer casing section defining a fixed position side wall of the window assembly; and

insulating means for interconnecting said inner and outer casing sections.

7. The apparatus of claim 1 wherein said frame base portion includes a channel which defines said first slot and wherein said apparatus further comprises:

adjustable window pane support means, said adjustable support means being in registration with recesses in said glazing means defined groove whereby contact between said adjustable means and a window pane mounted in said glazing means groove is established; and

means for varying the position of said adjustable support means from the exterior of said casement frame, said position varying means extending through and being in part positioned in said channel.

8. The apparatus of claim 1 wherein said frame base portion includes a channel which defines said first slot and wherein said apparatus further comprises:

nut means positioned in said channel;

pad means, said pad means being vertically movable and being in registration with said nut means and recesses in said glazing means defined groove whereby contact between said pad means and a window pane mounted in said glazing means groove is established; and

threaded pin means, said pin means extending through said nut means and contacting said pad means, said pin means being adjustable from the exterior of said casement frame.

9. A window assembly comprising:

an inner casing section, said inner section defining the window opening, said inner casing section being provided with a first projection which extends at an angle with respect to the plane of the window opening;

an outer casing sections, said outer casing section defining a fixed position side wall of the window assembly;

means for interconnecting said inner and outer casing sections;

a casement frame, said frame being at least in part movable with respect to said casing sections and being received in the opening defined by said outer casing section, said frame being provided with a first longitudinal slot in a portion thereof which faces the window opening;

flexible glazing means, said glazing means being provided with a base portion and a pair of side portions which define a groove for receiving a window pane, said groove facing the window opening, said glazing means further being provided with a first anchoring flange which cooperates with said frame first slot to secure said glazing means to said frame,

said glazing means also including a longitudinally extending slot in a first one of said side portions, said glazing means slot facing in a direction generally transverse to said glazing means pane receiving groove and permitting said first side portion to be flexed outwardly to enable insertion of a window pane in said groove, said glazing means cooperating with said inner casing section first projection to define a first window seal;

a filler bar complementary in shape to said glazing means slot, said bar being adapted to be inserted in and engaged by said glazing means slot to prevent flexing of said glazing means first side portion subsequent to insertion of a window pane in said glazing means groove whereby a window pane may be secured in said casement frame for movement therewith; and

means defining a second window seal between said outer casing section and said glazing means.

10. The apparatus of claim 9 wherein said means defining said second window seal comprises:

a flange member extending from said glazing means generally in the same direction as said anchoring flange; and

a sealing projection on said outer casing section, said sealing projection being urged into sealing relationship with said glazing means flange member with the window in the closed position.

11. The apparatus of claim 10 wherein said casement frame comprises:

a base portion, said base portion having said first slot formed therein; and

a first side portion extending generally outwardly from a first end of said casement frame base portion, said casement frame first side portion being positioned to prevent distortion of the second side portion of said glazing means.

12. The apparatus of claim 11 wherein said glazing means further comprises:

an extension of said base portion, said extension passing around the second end of said casement frame base portion, said flange member extending from said glazing means base portion extension.

13. The apparatus of claim 12 wherein said means interconnecting said inner and outer window casing sections comprises:

insulating means, said insulating means engaging said casing section to maintain the spatial separation therebetween.

14. A window assembly comprising:

window casing means, said casing means defining a window opening;

a casement frame, said frame being at least in part movable with respect to said casing means and being received in the opening defined thereby, said frame being provided with a first longitudinal slot in a portion thereof which faces the window opening;

flexible glazing means, said glazing means being provided with a base portion and a pair of side portions which define a groove for receiving a window pane, said groove facing the window opening, said glazing means further being provided with a first anchoring flange which cooperates with said frame first slot to secure said glazing means to said frame, said glazing means also including a longitudinally extending slot in a first one of said side portions,

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said glazing means slot facing in a direction generally transverse to said glazing means pane receiving groove and permitting said one side portion to be flexed outwardly to enable insertion of a window pane in said groove;

a filler bar complementary in shape to said glazing means slot, said bar being adapted to be inserted in and engaged by said glazing means slot to prevent flexing of said glazing means first side portion subsequent to insertion of a window pane in said glazing means groove whereby a window pane may be

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secured in said casement frame for movement therewith; and

means for varying the depth of portions of said glazing means defined groove, said groove depth varying means being in registration with recesses in said glazing means whereby contact between said groove depth varying means and a window pane mounted in said glazing means groove is established.

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