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(54) **Multi-walled glazing panel, and method of attaching it to a support structure**

Mehrwandige Verglasungsscheibe und Verfahren zur Befestigung derselben an einem Tragwerk

Panneau de vitrage à parois multiples, et méthode pour attacher ledit panneau à une structure de support

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(73) Proprietor: **Twinwall Fixings (UK) Limited**
Warrington, Cheshire, WA3 6NJ (GB)

(72) Inventor: **Kindon, Rodney**
Warrington, Cheshire WA2 0EL (GB)

(74) Representative: **Thomson, Paul Anthony et al**
Potts, Kerr & Co.,
15, Hamilton Square
Birkenhead, Merseyside CH41 6BR (GB)

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EP 1 055 785 B1

Description

[0001] The present invention relates to a glazing panel. More particularly, the present invention relates to a multi-walled glazing panel suitable for use as a roof light or like structure. The present invention also provides a method of attaching a multi-walled glazing panel to a support structure.

[0002] The provision of roof lighting enables daylight to be effectively transmitted or admitted into buildings.

[0003] One type of roof lighting includes at least one multi-walled glazing panel supported by a support structure, which is locatable on the roof of a building. Such support structures generally comprise a plurality of bar members located at either side of the multi-walled glazing panel and which are adapted to receive such panels. Such bar members are commonly referred to in the industry as glazing bars and come in various shapes and sizes. It is to be understood that such panels can be located on any part of a building or like structure.

[0004] With reference to Figure 1, which is a perspective view of a known multi-walled glazing panel, a known type of multi-walled glazing panel 100 includes a plurality of, or at least two, horizontal sheet members 101, separated from one another by vertical interconnecting walls 102, such walls 102 defining channels 103 running along the length of the multi-walled glazing panel 100. Generally, multi-walled glazing panels 100 of this type are made from the extrusion of a polycarbonate material, and the thickness of such panels can range from 4 millimeters up to approximately 30 millimeters.

[0005] A major advantage of this type of multi-walled glazing panel is that they provide good heat insulation and light transmission and consequently, can assist with savings in energy costs. Moreover, and as such glazing panels are extremely light in weight, less stress is exerted by them on the surrounding structures of the building to which they are attached and consequently, it is believed that they may actually extend the life of a building to which they are attached.

[0006] However, and somewhat surprisingly, such panels may become dislodged from their respective support structures if a heavy object falls on top of same. This is somewhat surprising as polycarbonate has exceptional levels of impact and shock resistance. In this connection, it is believed that due to the flexible nature of multi-walled polycarbonate glazing panels of this type, when a heavy object falls onto same, they flex in an elastic manner such that the sides of same come free from the glazing bars of the support structure supporting same. This has severe safety implications, especially if the heavy object concerned is a person.

[0007] According to an aspect of the present invention there is provided a multi-walled glazing panel (10) attachable at either side thereof to a support structure (20,30,40), the multi-walled glazing panel (10) including a plurality of horizontal sheet members (11) separated from one another by vertical interconnecting walls (12), such vertical interconnecting walls (12) defining channels (13) running along the length of the multi-walled glazing panel (10) characterised in that each side of the multi-walled glazing panel (10) that is attachable to the support structure (20,30,40) is reinforced with at least one reinforcement bar (15) each comprising an elongate bar of rigid material, each reinforcement bar (15) being insertable into at least one of the channels (13) located adjacent the support structure (20,30,40) on each side of the glazing panel, wherein each side of the multi-walled glazing panel (10) is further provided with at least one protruding member (22,50) extending in a direction perpendicular to said horizontal sheet members that can engage with a surface of the adjacent support structure (20,30,40).

[0008] It is believed that the present invention addresses the problem outlined above. In particular, and as the sides of the multi-walled glazing panel of the present invention, which are to be attached to the support structure, are reinforced by reinforcement bars, same is less likely to come free from the support structure when an object falls thereon. Therefore, it is believed that the present invention increases the overall safety of using such multi-walled glazing panels as part of a roof light or like structure. In this connection, it is believed that by reinforcing the sides, same acts as a mechanical restraint and moreover, enhances the inherent rigidity of the multi-walled glazing panel, thereby increasing the resistance to the dislocation of the glazing panel from the support structure. Furthermore, it is believed that both of the above factors result in a high percentage of the energy of the falling object being transferred to, and absorbed by, the support structure, which can safely absorb such energy without the dislodgment of the glazing panel therefrom.

[0009] In a preferred embodiment, the reinforcement means comprises a bar of metal, preferably extruded commercial grade aluminium. It is to be understood that the bar may be of any other suitable material exhibiting the desired rigidity, for example, polycarbonate.

[0010] Preferably, the reinforcement means is sized to fit snugly within a channel provided within the multi-walled glazing panel, but not too snugly so that same is difficult to insert into said channel. This has the advantage in that same is easy to locate within the glazing panel.

[0011] Further preferably, the reinforcement means is of such a size that it is concealed by the portion of the support structure to which it is fixed. This has the advantage in that the reinforcement means cannot be seen from either above or below and hence, does not affect the aesthetic qualities of the glazing panel, nor hinder the transmission of light therethrough.

[0012] In a further aspect of the present invention there is provided a method of attaching the sides of a multi-walled glazing panel (10) as claimed in any preceding claim to a support structure, the method comprising the steps of:

inserting at least one reinforcement bar (15) into at least one channel located at each side of the multi-walled glazing panel (10); and

attaching the multi-walled glazing panel (10) to the support structure (20,30,40) further comprising the step of providing each side of the multi-walled glazing panel (10) with at least one protruding member (22,50) extending in a direction perpendicular to said horizontal sheet members of the glazing panel that can engage with a surface of the support structure (20,30,40).

[0013] The present invention will now be described with reference to Figures 2 to 9, in which:

Figure 2 is a perspective view of a first embodiment of a multi-walled glazing panel in accordance with the present invention;

Figure 3 illustrates the glazing panel of Figure 2 when fixed to a glazing bar of the interlocking type;

Figure 4 is a cross-sectional view of a multi-walled glazing panel of Figure 2 when fixed to the glazing bar of Figure 3;

Figure 5 is a cross-sectional view of a multi-walled glazing panel of Figure 2 when fixed to a "conventional" type glazing bar;

Figure 6 is a cross-sectional view of a multi-walled glazing panel of Figure 2 when attached to a first embodiment of a "conventional" type glazing bar;

Figure 7 is a cross-sectional view of a multi-walled glazing panel of Figure 2 when attached to a second embodiment of a "conventional" type glazing bar;

Figure 8 is a perspective view of a second embodiment of a multi-walled glazing panel in accordance with the present invention; and

Figure 9 is a cross-sectional view of the multi-walled glazing panel of Figure 8 when attached to the glazing bar of Figure 3.

[0014] As illustrated in Figure 2, a multi-walled polycarbonate glazing panel 10 in accordance with the present invention includes a plurality of horizontal sheet members 11, separated from one another by vertical interconnecting walls 12, such walls 12 defining channels 13 running the length of the multi-walled glazing panel 10. Additionally, and in order to reinforce the sides or side portions of the panel 10 which are to be attached or supported by a support structure, such as a glazing bar, same is further provided with reinforcement bars 15 which are insertable into channels 13 located at either side of the panel 10. For illustration purposes, only one of such bars 15 is shown in Figure 2.

[0015] As illustrated in Figures 3 and 4, each side of the panel 10 is locatable between the jaw or clamp portion 21 of a glazing bar 20 of the interlocking type, sold by us under the name "MULTI-LINK-PANEL INTERLOCKING MODULAR GLAZING SYSTEM", which is the subject of our European Patent No. 0473321. As shown, the panel 10 and reinforcement bars 15 are fixed to the glazing bar 20 via fixing means 22, such as a self tapping screw, which passes through an aperture provided in a surface of the jaw 21 into the panel 10 and reinforcement bar 15. As shown in Figure 4, the bar 15 can be located in either of the channels 13 directly adjacent the glazing bar 20. Additionally, the bar 15 is located within the confines of the jaw 21 of the glazing bar 20 and hence, is concealed. Once each side of the glazing panel 10 is fixed to its respective glazing bar 20, via reinforcement bars 15, a U-profile capping member 25 is placed on either end of the glazing panel 10.

[0016] In order to install a multi-walled polycarbonate glazing panel 10 as shown in Figures 2 and 3, a reinforcement bar 15 is inserted into a channel 13 at each side of the panel 10 which are to be fixed to the glazing bars 20 of a support structure. It is preferable that the length of the reinforcement bar 15 is selected such that when located within the glazing panel 10, same protrudes at both ends thereof, preferably by about 4 mm.

[0017] Once the bar 15 is in position, a clearance hole or aperture is provided through the top of each jaw 21 and through the top layer of the glazing panel 10, followed by a tapping hole through the reinforcement bar 15. Such an aperture is preferably provided on both sides of the glazing panel 10 in a central position along the length of each glazing bar 20 and immediately over the center of the reinforcement bar 15. Fixing means 22, such as a self tapping screw, is then driven into the assembly of the glazing bar 20, panel 10 and reinforcement bar 15, until the head of the screw 22 sits on the surface of the glazing bar 20. Preferably, such screw 22 is not tightened to such an extent that free thermal movement of the glazing panel 10 is hindered, that is, when fixed to its respective glazing bar 20.

[0018] If applicable, U-profile capping members 25 are then placed at either end of the glazing panel 10. The protrusion of the reinforcement bar 15 beyond the end of the panel 10 is intended to act as a restraint by contact with the U-profile capping members 25, thus preventing any sideways movement of the reinforcement bar 15.

[0019] As illustrated in Figure 5, a side of the panel 10 is locatable between a jaw or clamp portion 31 provided by a base member 35 and capping bar 34 of a glazing bar 30. As shown, the panel 10 and reinforcement bar 15 are fixed to the glazing bar 30 via fixing means 32, such as a self-tapping screw, which passes through an aperture provided in a surface of a upper seal 36a into the panel 10 and reinforcement bar 15. As shown in Figure 5, the bar 15 is located in the uppermost channel 13 provided within the panel 10, however, it is understood that it can be provided in any of the channels 13. Additionally, the bar 15 is located within the confines of the jaw 31 provided by the base member 35 and capping bar 34 of the glazing bar 30 and hence, is concealed. Although not illustrated, once fixed to the glazing bar 30, each end of the glazing panel 10 can be provided

with a U-profile capping member.

[0020] In order to install a multi-walled polycarbonate glazing panel 10 in accordance with the present invention to a glazing bar 30 as shown in Figure 5, a reinforcement bar 15 is inserted into a channel at each side of the panel 10 which is to be fixed to the glazing bar 30 of a support structure. Preferably, the length of the reinforcement bar 15 is selected such that, when located within the glazing panel 10, same protrudes at both ends thereof, preferably by about 4 mm.

[0021] Once the bar 15 is in position, a clearance hole or aperture is provided through the top of the seal 36a and through the top layer of the glazing panel 10, followed by a tapping hole through the reinforcement bar 15. Such an aperture is preferably provided on both sides of the glazing panel 10 in a central portion along the length of each glazing bar 30 and immediately over the centre of the reinforcement bar 15. Fixing means 32, such as a self-tapping screw, is then driven into the assembly of the seal 36a, panel 10 and reinforcement bar 15.

[0022] If applicable, U-profile capping members are then placed at either end of the glazing panel 10 The protrusion of the reinforcement bar 15 beyond the ends of the panel 10 is intended to act as a restraint by contact with the U-profile capping member, thus preventing any sideway movements of the reinforcement bar 15.

[0023] As illustrated in Figure 6, each side of the panel 10 is locatable between the jaw or clamp portion 31 provided by a base member 35 and a capping bar 34 of a glazing bar 30. As shown, the panel 10 and reinforcement bar 15 are fixed to one another via fixing means 32, such as a self-tapping screw. As illustrated, one end of fixing means 32 protrudes into space 38 provided by base member 35 of the glazing bar 30. In the illustrated embodiment, same passes through a lower seal 36b provided on the base member 35 of the glazing bar 30. As the fixing means 32 protrudes into the space 38, when the glazing panel 10 is hit by an object, this causes the end of the fixing means 32 to engage with a surface of the base member 35 and hence, prevents the glazing panel 10 from being removed or dislodged from the glazing bar 30.

[0024] With reference to Figure 6, although the reinforcement bar is located in the lowermost channel 13, it is to be understood that it can be located in any of the channels 13 adjacent the glazing bar 30. In this connection, it is only the length of the fixing means which must be long enough to engage with a surface of the glazing bar 30. For the avoidance of any doubt, such surface may be provided by the base member 35 or capping bar 34 of glazing bar 30.

[0025] Additionally, the reinforcement bar 15 is located within the confines of the jaw 31 provided by the base member 35 and capping bar 34 of the glazing bar 30 and hence, is concealed. Although not illustrated, once fixed to the glazing bars 30, each end of the glazing panel 10 may be provided with a U-profile capping member.

[0026] In order to attach a multi-walled polycarbonate glazing panel 10 in accordance with the present invention to a glazing bar 30 as shown in Figure 6, a reinforcement bar 15 is inserted into a channel 13 at each side of the panel which are to be attached to the glazing bars 30 of the support structure. It is preferable, that the lengths of the reinforcement bar 15 is selected such that when located within the glazing panel 10, same protrudes at both ends thereof, preferably by about 4 mm.

[0027] Once the bar 15 is in position, a clearance hole or aperture is provided through the top of the glazing panel 10, followed by a tapping hole through the reinforcement bar 15. Such an aperture is preferably provided on both sides of the glazing panel 10 in a central position. Fixing means 32, such as a self-tapping screw, is then driven into a surface of the glazing panel 10 and reinforcement bar 15 until an end of same protrudes through reinforcement bar 15 into space 38 provided by base member 35 of the glazing bar 30.

[0028] If applicable, U-profile capping members can then be placed on either end of the glazing panel 10. The protrusion of the reinforcement bar 15 beyond the end of the panel 10 is intended to act as a restraint by contacting the U-profile capping members, thus preventing any sideways movement of the reinforcement bar 15.

[0029] As illustrated in Figure 7, each side of the panel 10 is locatable between the jaw or clamp portion 41 provided by a base member 45 and a capping bar 44 of a glazing bar 40. As shown, the panel 10 and reinforcement bar 15 are fixed to one another via fixing means 42, such as a self-tapping screw. As illustrated, one end 42a of fixing means 42 protrude into space 48 provided by base member 45 of the glazing bar 40. As the fixing means 42 protrude into the space 48, when the glazing panel 10 is hit by an object, this causes the end 42a of the fixing means 42 to engage with a surface of the base member 45 and hence, prevents the glazing panel 10 from being removed or dislodged from the clamp portion 41 provided by the base member 45 and capping member 44.

[0030] Additionally, the reinforcement bar 15 is located within the confines of the jaw 41 provided by the base member 45 and capping bar 44 of the glazing bar 40 and hence, is concealed. As illustrated , once fixed to the glazing bar 40, each end of the glazing panel 10 can be provided with a U-profile capping member.

[0031] In order to attach a multi-walled polycarbonate glazing panel 10 in accordance with the present invention to a glazing bar 40 as shown in Figure 7, a reinforcement bar 15 is inserted into channels 13 at each side of the panel 10. It is preferable, that the lengths of the reinforcement bar 15 is selected such that when located within the glazing panel 10, same protrudes at both ends thereof, preferably by about 4mm.

[0032] Once the bar 15 is in position , a clearance hole or aperture is provided through the top of the glazing panel 10, followed by a tapping hole through the rein-

forcement bar 15. Such an aperture is preferably provided on both sides of the glazing panel 10 in a central position. Fixing means 42, such as a self-tapping screw, is then driven into a surface of the glazing panel 10 and reinforcement bar 15, until an end of same protrudes through reinforcement bar 15 until same protrudes through the other side of the glazing panel 10. The panel is then located on to the base member 45 such that the lower end 42a of the fixing means 32 is located in the space 48 provided thereby and the capping member 44 of the glazing bar 40 is then placed on top of the panel 10 such that the jaws 41 provided by the glazing bar 40 clamps the panel 10 in position.

[0033] If applicable, U-profile capping members can then be placed at either end of the glazing panel 10. The protrusion of the reinforcement bar 15 beyond the end of the panel 10 is intended to act as a restraint by contacting the U-profile capping members, thus preventing any sideway movements of the reinforcement bar.

[0034] As illustrated in Figure 8, each channel 13 located on either side of the multi-walled glazing panel 10 is provided with a reinforcement bar 15. It will be appreciated that by increasing the number of reinforcement bars 15, the reinforcement of the glazing panel 10 is increased such that same is less likely to become dislodged from the glazing bars 20 to which it is attached, that is, in the event that a heavy object falls onto same. In the illustrated embodiment, the two channels 13 directly adjacent the glazing bar 20 are each provided with a reinforcement bar 15. It is to be understood that the number of reinforcement bars 15 utilized can vary depending on the number of channels 13 provided within the multi-walled glazing panels 10 which are located at either side of the multi-walled glazing panel 10, for example, a multi-walled glazing panel 10 which includes four horizontal sheet members 11 will have three channels 13 at either side thereof and consequently, each side of such a multi-walled glazing panel 10 can be provided with three reinforcement bars 15.

[0035] As illustrated in Figures 8 and 9, the reinforcement bars 15 are not fixed to the glazing bar 20 via fixing means 22, for example, a self tapping screw, but rather are held, or retained, in position by a stop member 50. As illustrated, each side of the multi-walled glazing panel 10 is provided with two stop members 50; however, it is to be understood that the number can vary depending on the length of the multi-walled glazing panel 10 and support required. Preferably, each stop member 50 includes a plurality of downwardly extending legs 51 which, in use, are located adjacent the reinforcement bars 15 (see Figure 9). Depending on the width of the reinforcement bars 15 and the width of the channels 13, it is to be understood that the legs 51 may be inserted into the same channel 13 within which the reinforcement bar 15 is located, or in an adjacent channel 13. Preferably, the legs 51 of the stop member 50 are long enough so that they extend into space 23 provided by glazing panel 20, such that on impact the lower portions of the legs 51 will interact or engage with the glazing bar 20 and hence, assists with preventing the multi-walled glazing panel 10 from being removed or dislodged from the glazing bar 20, that is, in the event that an object falls onto same.

[0036] In order to install a multi-walled polycarbonate glazing panel 10 as shown in Figure 8, a reinforcement bar 15 is inserted into each channel 13 located at either side of the multi-walled glazing panel 10. It is preferable that the length of the reinforcement bar 15 is selected such that when located within the glazing panel 10, same protrudes at both ends thereof, preferably by about 4 mm.

[0037] Once the bars 15 are in position, a plurality of suitably spaced clearance holes or apertures are provided through the top of each jaw 21 and through the glazing panel 10 such that the legs 51 of stop member 50 can be inserted through the jaw 21 of the glazing bar 20 and through the multi-walled glazing panel 10 located therein.

[0038] If applicable, U-profile capping members 25 are then placed at either end of the glazing panel 10. The protrusion of the reinforcement bar 15 beyond the end of the panel 10 is intended to act as a restraint by contact with the U-profile capping members 25, thereby preventing any sideways movement of the reinforcement bars 15.

[0039] Although the present invention has been described by way of example to a multi-walled glazing panel made of polycarbonate it is to be understood that same can be made of any other similar material of like properties.

[0040] It is to be understood that the sides portions, which are attachable to a support structure, of a multi-walled glazing panel in accordance with the present invention can be constructed from a solid material integral with the multi-walled glazing panel. For example, the channels located within the side portion which is attachable to the support structure may be filled with a solid, settable material; the material having the desired rigidity.

[0041] It is to be understood that a multi-walled glazing panel in accordance with the present invention may have more than one reinforcement bar located in adjacent channels in each side portion of the multi-walled glazing panel which is to be attached to, or supported by, a support structure.

[0042] It is to be understood that a multi-walled glazing panel in accordance with the present invention can be located on any part of a building or other structure.

Claims

1. A multi-walled glazing panel (10) attachable at either side thereof to a support structure (20,30,40), the multi-walled glazing panel (10) including a plurality of horizontal sheet members (11) separated

from one another by vertical interconnecting walls (12), such vertical interconnecting walls (12) defining channels (13) running along the length of the multi-walled glazing panel (10) **characterised in that** each side of the multi-walled glazing panel (10) that is attachable to the support structure (20,30,40) is reinforced with at least one reinforcement bar (15) each comprising an elongate bar of rigid material, each reinforcement bar (15) being insertable into at least one of the channels (13) located adjacent the support structure (20,30,40) on each side of the glazing panel, wherein each side of the multi-walled glazing panel (10) is further provided with at least one protruding member (22,50) extending in a direction perpendicular to said horizontal sheet members that can engage with a surface of the adjacent support structure (20,30,40).

2. A multi-walled glazing panel as claimed in claim 1, in which the reinforcement bars (15) are insertable into at least one of the channels (13) located directly adjacent the support structure (20,30,40) on each side of the glazing panel.

3. A multi-walled glazing panel (10) as claimed in claim 2, wherein each channel (13) located directly adjacent the support structure (20,30,40) is provided with a reinforcement bar (15).

4. A multi-walled glazing panel (10) as claimed in any preceding claim, in which the reinforcement bars are made from metal or polycarbonate.

5. A multi-walled glazing panel (10) as claimed in any one of claims 1 to 4, in which the reinforcement bars (15) are sized such that they protrude from either end of the channel (13) within which they are located.

6. A multi-walled glazing panel (10) as claimed in any preceding claim, in which each protruding member comprises of at least one screw (22) protruding from at least one of the respective reinforcement bars (15) of the multi-walled glazing panel (10).

7. A multi-walled glazing panel (10) as claimed in claim 6, in which each protruding member includes at least one stop member (50) which, in use, is locatable adjacent the respective reinforcement bar (15).

8. A multi-walled glazing panel (10) as claimed in claim 7, in which the stop member (50) includes at least two legs (51).

9. A multi-walled glazing panel (10) as claimed in any one of the preceding claims, in which the sides of the multi-walled glazing panel (10) are sized such that they are concealed by a portion of the support structure (20,30,40) to which the multi-walled glazing panel (10) is attached.

10. A method of attaching the sides of a multi-walled glazing panel (10) as claimed in any preceding claim to a support structure, the method comprising the steps of:

inserting at least one reinforcement bar (15) into at least one channel located at each side of the multi-walled glazing panel (10); and
attaching the multi-walled glazing panel (10) to the support structure (20,30,40) further comprising the step of providing each side of the multi-walled glazing panel (10) with at least one protruding member (22,50) extending in a direction perpendicular to said horizontal sheet members of the glazing panel that can engage with a surface of the support structure (20,30,40).

Patentansprüche

1. Mehrwandige Verglasungsscheibe (10), die ihren beiden Seiten an einer Tragstruktur (20, 30, 40) befestigbar ist, wobei die mehrwandige Verglasungsscheibe (10) eine Vielzahl von horizontalen Plattenelementen (11) umfasst, die voneinander durch vertikale Verbindungswände (12) getrennt sind, wobei die vertikalen Verbindungswände (12) Kanäle (13) definieren, die entlang der Länge der mehrwandigen Verglasungsscheibe (10) verlaufen, **dadurch gekennzeichnet, dass** jede Seite der mehrwandigen Verglasungsscheibe (10), die an der Tragstruktur (20, 30, 40) befestigbar ist, mit wenigstens einer Verstärkungstange (15) verstärkt ist, die jeweils eine längliche Stange aus festem oder steifen Material aufweist, wobei jede Verstärkungsstange (15) in wenigstens einen der Kanäle (13) einfügbar ist, die benachbart zur Stützstruktur (20, 30, 40) auf jeder Seite der Verglasungsscheibe angeordnet sind, wobei jede Seite der mehrwandigen Verglasungsscheibe (10) ferner mit wenigstens einem vorstehenden Element (22, 50) versehen ist, das sich in einer Richtung im rechten Winkel zu den horizontalen Plattenelementen erstreckt und das im Eingriff oder in Betätigung mit einer Oberfläche der benachbarten Tragstruktur (20, 30, 40) kommen kann.

2. Mehrwandige Verglasungsscheibe nach Anspruch 1, bei der die Verstärkungsstangen (15) in wenigstens einen der Kanäle (13) einfügbar sind, die unmittelbar benachbart zur Tragstruktur (20, 30, 40) auf jeder Seite der Verglasungsscheibe angeordnet sind.

3. Mehrwandige Verglasungsscheibe (10) nach Anspruch 2, wobei jeder Kanal (13), der unmittelbar benachbart zur Tragstruktur (20, 30, 40) angeordnet ist, mit einer Verstärkungsstange (15) versehen ist.

4. Mehrwandige Verglasungsscheibe (10) nach einem der vorhergehenden Ansprüche, bei der die Verstärkungsstangen aus Metall oder Polykarbonat gemacht sind.

5. Mehrwandige Verglasungsscheibe (10) nach einem der Ansprüche 1 bis 4, in der die Verstärkungsstangen (15) so bemessen sind, dass sie aus beiden Ende des Kanals (13) hervortreten, indem sie angeordnet sind.

6. Mehrwandige Verglasungsscheibe(10) nach einem der vorhergehenden Ansprüche, bei der jedes vorspringende Element wenigstens eine Schraube (22) aufweist, die aus wenigstens einer der jeweiligen Verstärkungsstangen (15) der mehrwandigen Verglasungsscheibe (10) hervortritt.

7. Mehrwandige Verglasungsscheibe nach Anspruch 6, wobei jedes vorspringende Element wenigstens ein Stopelement (50) umfasst, das bei Gebrauch benachbart zur jeweiligen Verstärkungsstange (15) anordenbar ist.

8. Mehrwandige Verglasungsscheibe (10) nach Anspruch 7, bei der das Stopelement (50) wenigstens zwei Beine (51) umfasst.

9. Mehrwandige Verglasungsscheibe (10) nach einem der vorhergehenden Ansprüche, bei der die Seiten der mehrwandigen Verglasungsscheibe (10) so bemessen sind, dass sie von einem Abschnitt der Tragstruktur (20, 30, 40) verdeckt sind, an der die mehrwandige Verglasungsscheibe (10) befestigt ist.

10. Verfahren zur Befestigung der Seiten einer mehrwandigen Verglasungsscheibe (10), wie in einem der vorhergehenden Ansprüche beansprucht, an einer Tragstruktur, wobei das Verfahren die Schritte aufweist:

    Einfügen wenigstens einer Verstärkungsstange (15) in wenigstens einem Kanal, der an jeder Seite der mehrwandige Verglasungsscheibe (10) angeordnet ist; und
    Befestigen der mehrwandige Verglasungsscheibe (10) an der Tragstruktur (20, 30, 40), wobei es ferner den Schritt eines Versehens jeder Seite der mehrwandige Verglasungsscheibe (10) mit wenigstens einem vorspringenden Element (22, 50) aufweist, das sich in einer Richtung im rechten Winkel zu den horizontalen Plattenelementen der Verglasungsscheibe erstreckt und das mit einer Oberfläche der Tragstruktur (20, 30, 40) in Eingriff oder Betätigung kommen kann.

Revendications

1. Panneau vitré à multi-cloisons (10) qui peut être fixé par l'un ou l'autre de ses côtés sur une structure de support (20, 30, 40), le panneau vitré à multi-cloisons (10) comprenant plusieurs éléments en forme de feuilles horizontales (11), séparés les uns des autres par des cloisons qui s'interconnectent (12) lesdites cloisons interconnectées (12) définissant des canaux (13) qui se prolongent sur la longueur du panneau vitré à multi-cloisons (10), **caractérisé par le fait que** chaque côté du panneau vitré à multi-cloisons (10) qui peut être fixé sur la structure de support (20, 30, 40) est renforcé par au moins une barre de renfort (15), chaque barre comprenant une barre allongée fabriquée dans un matériau rigide, chaque barre de renfort (15) pouvant s'insérer dans au moins l'un des canaux (13) adjacents à la structure de support (20, 30, 40), situés de chaque côté du panneau vitré, dans lequel chaque côté du panneau vitré à multi-cloisons (10) comporte également au moins un élément dépassant (22, 50) se prolongeant dans une direction perpendiculaire aux dits éléments des feuilles horizontales pouvant s'engager dans la surface de la structure de support adjacente (20, 30, 40).

2. Panneau vitré à multi-cloisons selon la revendication 1, dans lequel les barres de renfort (15) peuvent s'insérer dans au moins un des canaux (13) directement adjacents à la structure de support (20, 30, 40) de chaque côté du panneau vitré.

3. Panneau vitré à multi-cloisons (10) selon la revendication 2, dans lequel chaque canal (13) directement adjacent à la structure de support (20, 30, 40) comporte une barre de renfort (15).

4. Panneau vitré à multi-cloisons (10) selon l'une des revendications précédentes, dans lequel les barres de renfort sont fabriquées en métal ou en polycarbonate.

5. Panneau vitré à multi-cloisons (10) selon l'une des revendications 1 à 4, dans lequel les barres de renfort (15) sont dimensionnées de façon à dépasser d'une extrémité ou de l'autre du canal (13) dans lequel elles sont placées.

6. Panneau vitré à multi-cloisons (10) selon l'une des revendications précédentes, dans lequel chaque

élément qui dépasse comprend au moins une vis (22) dépassant d'au moins une des barres de renfort respectives (15) du panneau vitré à multi-cloisons (10).

7. Panneau vitré à multi-cloisons (10) selon la revendication 6, dans lequel chaque élément dépassant comporte au moins un élément de blocage (50) qui, dans l'usage, est adjacent à la barre de renfort respective (15).

8. Panneau vitré à multi-cloisons (10) selon la revendication 7, dans lequel l'élément de blocage (50) comprend au moins deux tiges (51).

9. Panneau vitré à multi-cloisons (10) selon l'une des revendications précédentes, dans lequel les côtés du panneau vitré à multi-cloisons (10) sont dimensionnés de façon à être cachés par une partie de la structure de support (20, 30, 40), à laquelle le panneau vitré à multi-cloisons (10) est fixé.

10. Procédé utilisé pour fixer les côtés d'un panneau vitré à multi-cloisons (10) selon l'une des revendications précédentes, à une structure de support, ledit procédé comprenant les étapes suivantes :

L'insertion d'au moins une barre de renfort (15) dans au moins un canal situé de chaque côté du panneau vitré à multi-cloisons (10) ; et
La fixation du panneau vitré à multi-cloisons (10) sur la structure de support (20, 30, 40), comprenant également l'étape qui consiste à équiper chaque côté du panneau vitré à multi-cloisons (10) d'au moins un élément dépassant (22, 50), se prolongeant dans le sens perpendiculaire aux dites feuilles horizontales du panneau vitré, pouvant s'engager dans une surface de la structure de support (20, 30, 40).

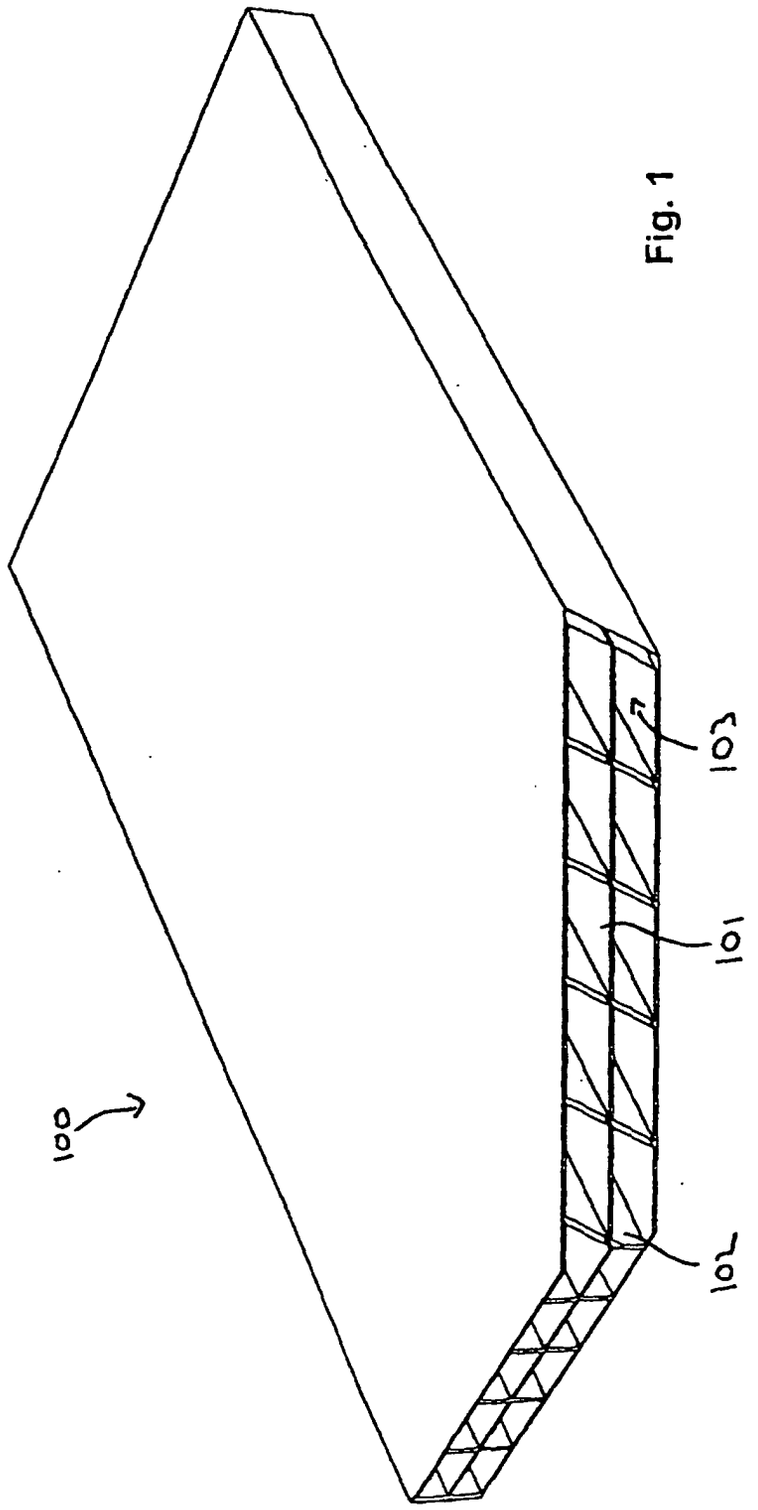


Fig. 1

PRIOR ART

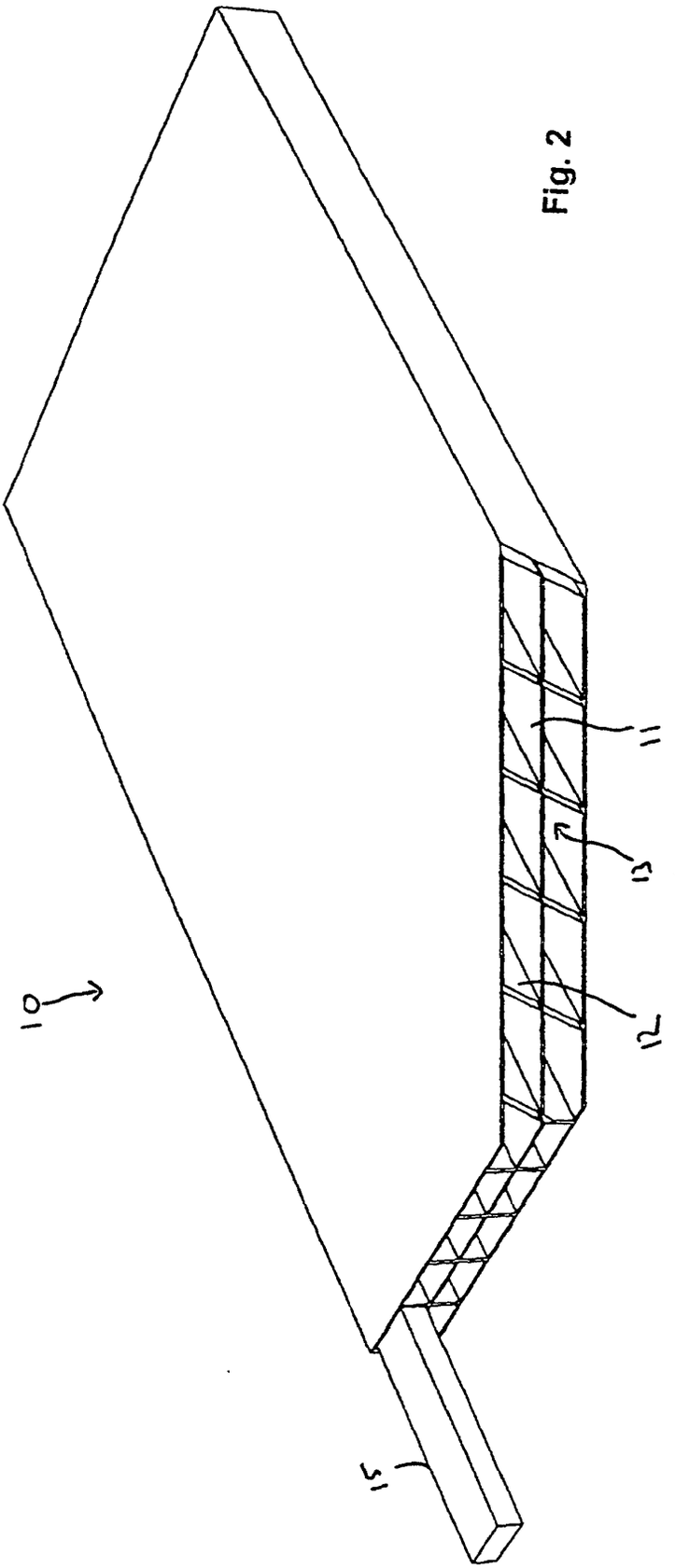


Fig. 2

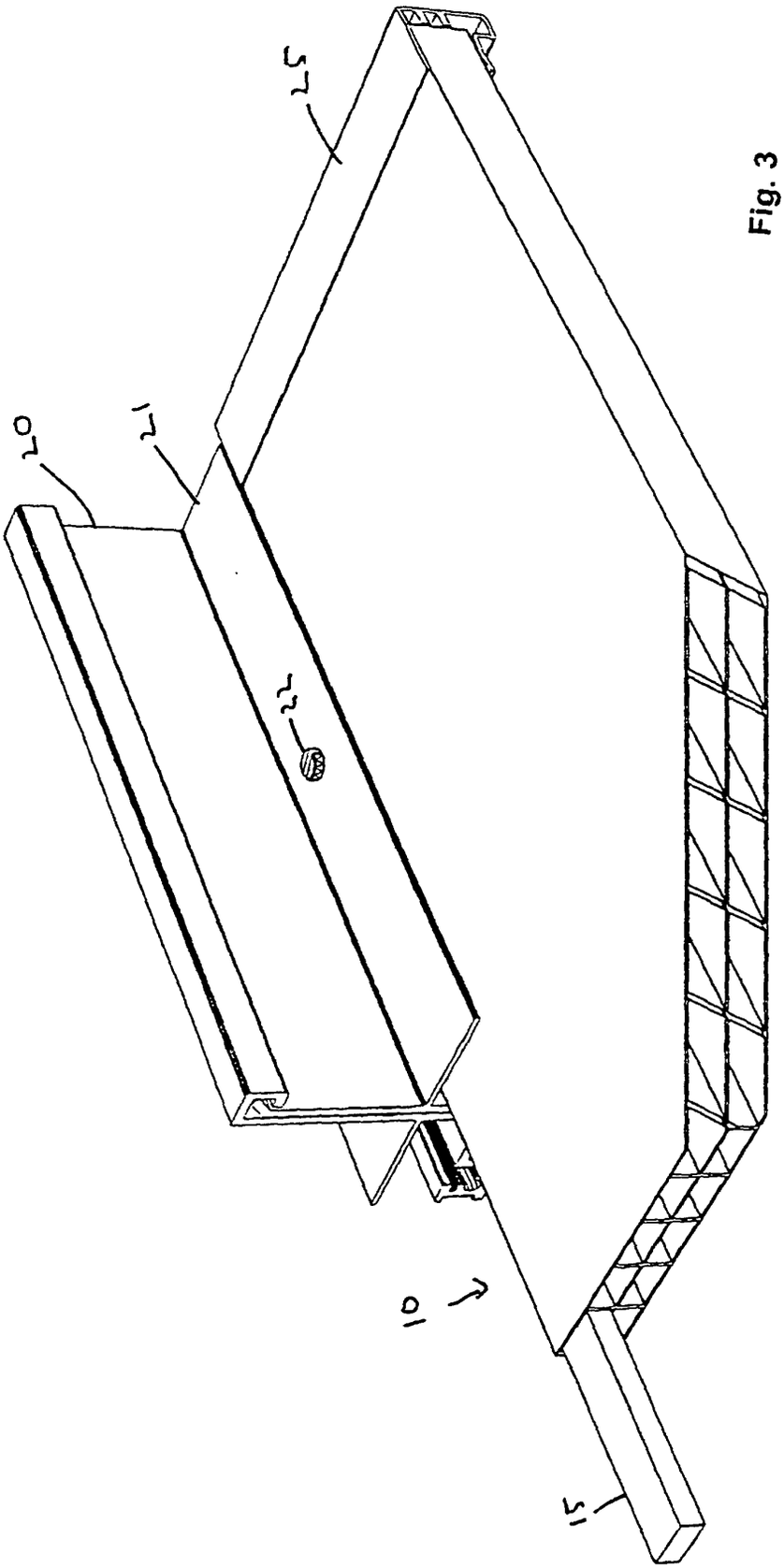


Fig. 3

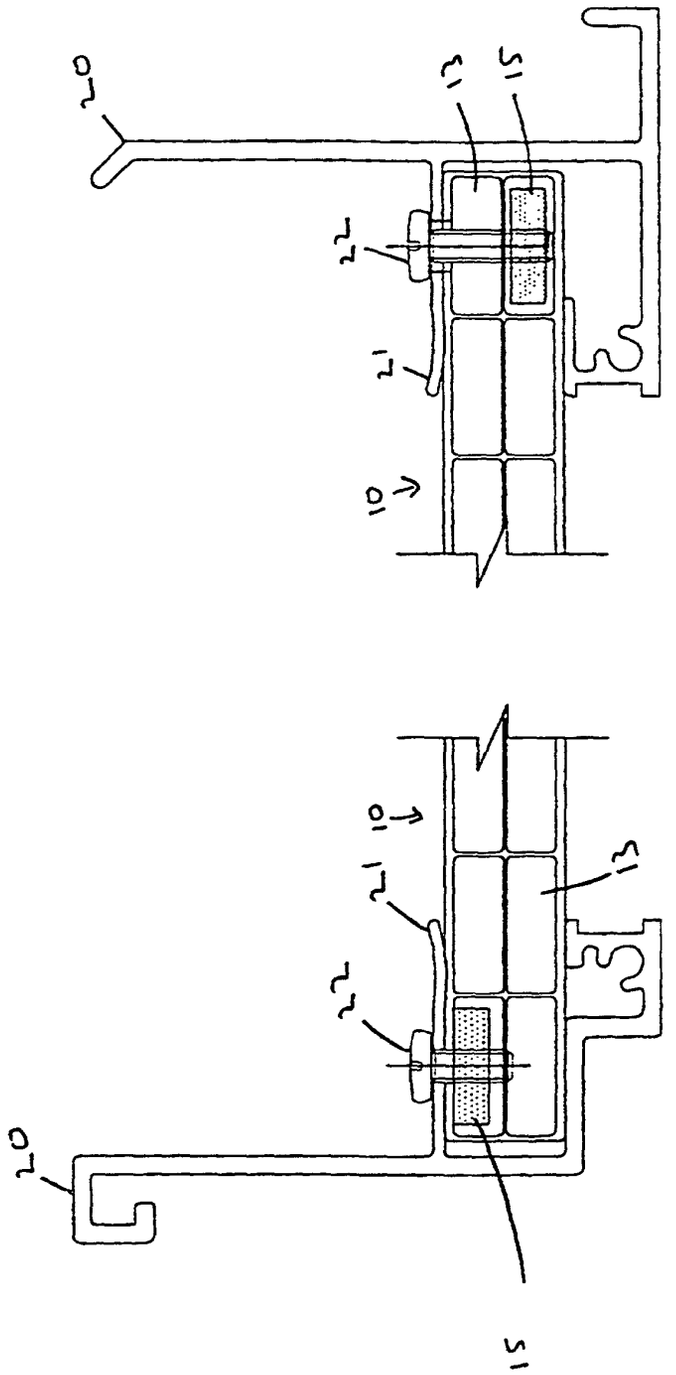


Fig. 4

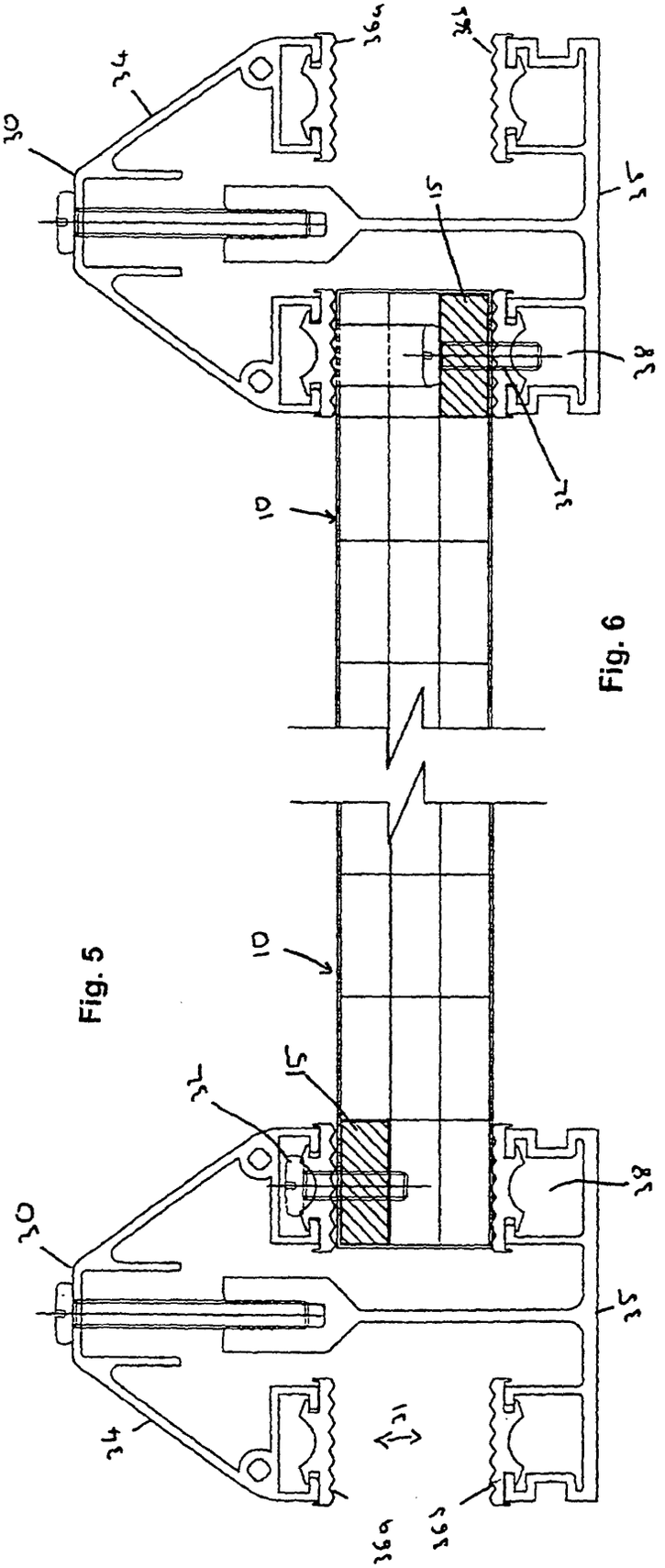
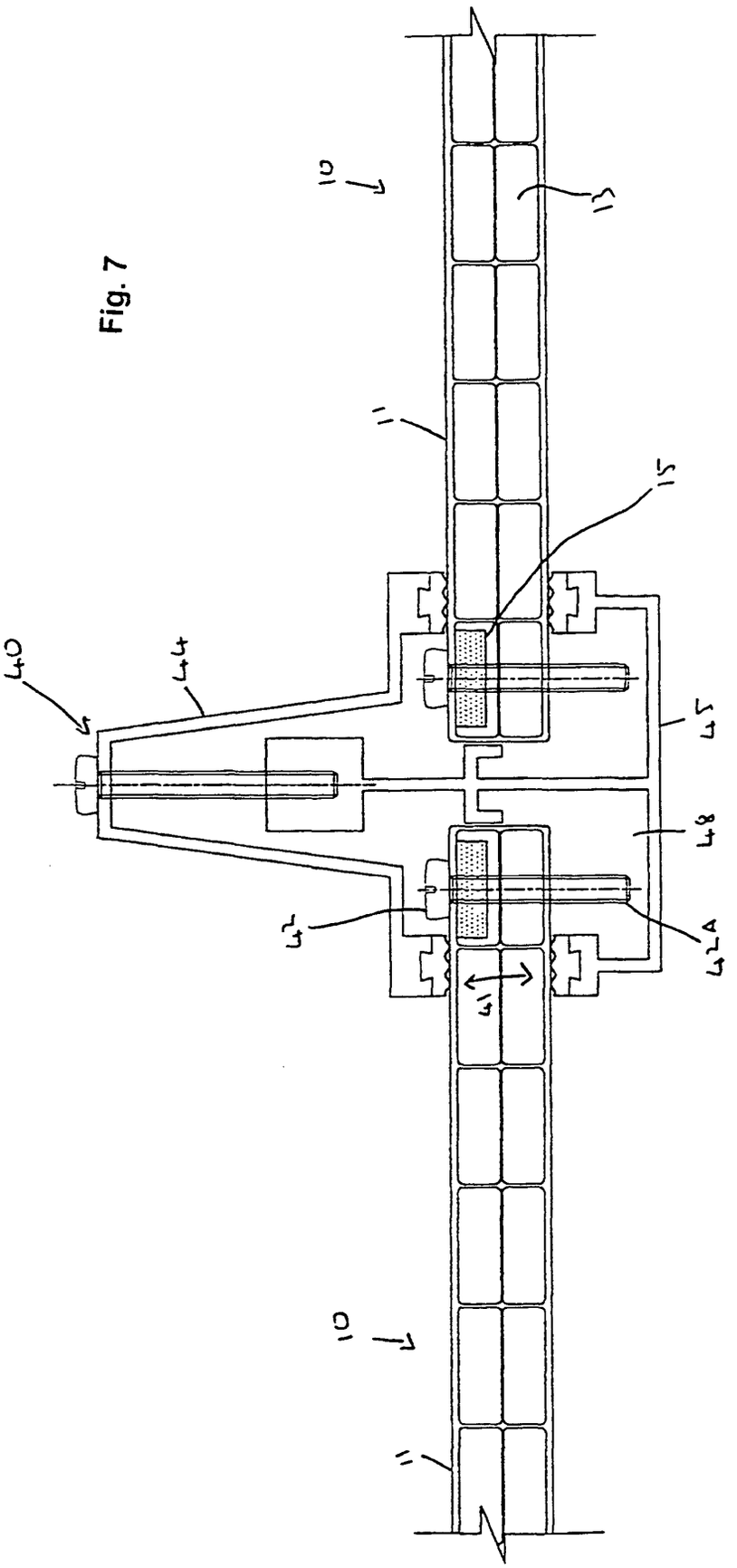


Fig. 5

Fig. 6

Fig. 7



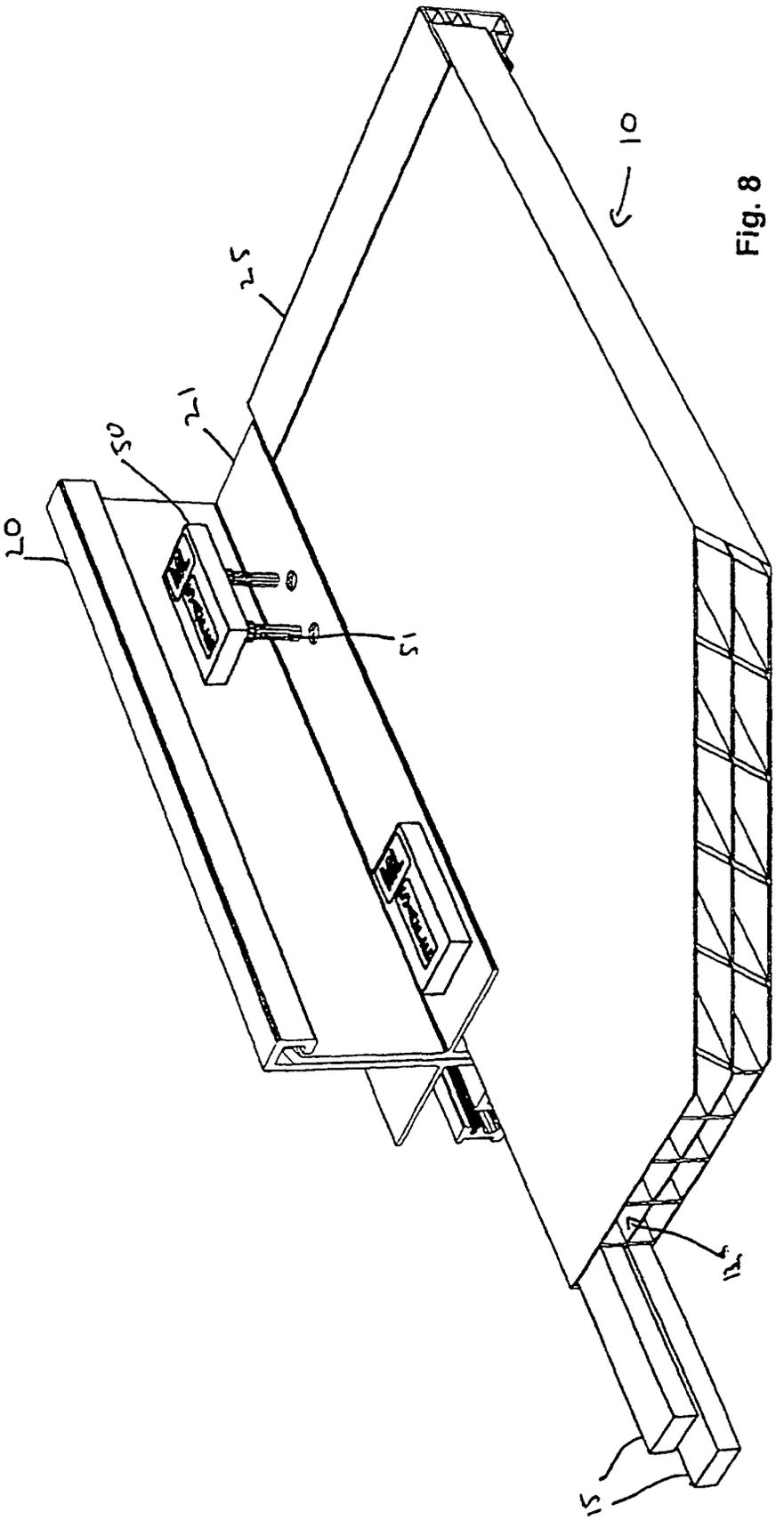


Fig. 8

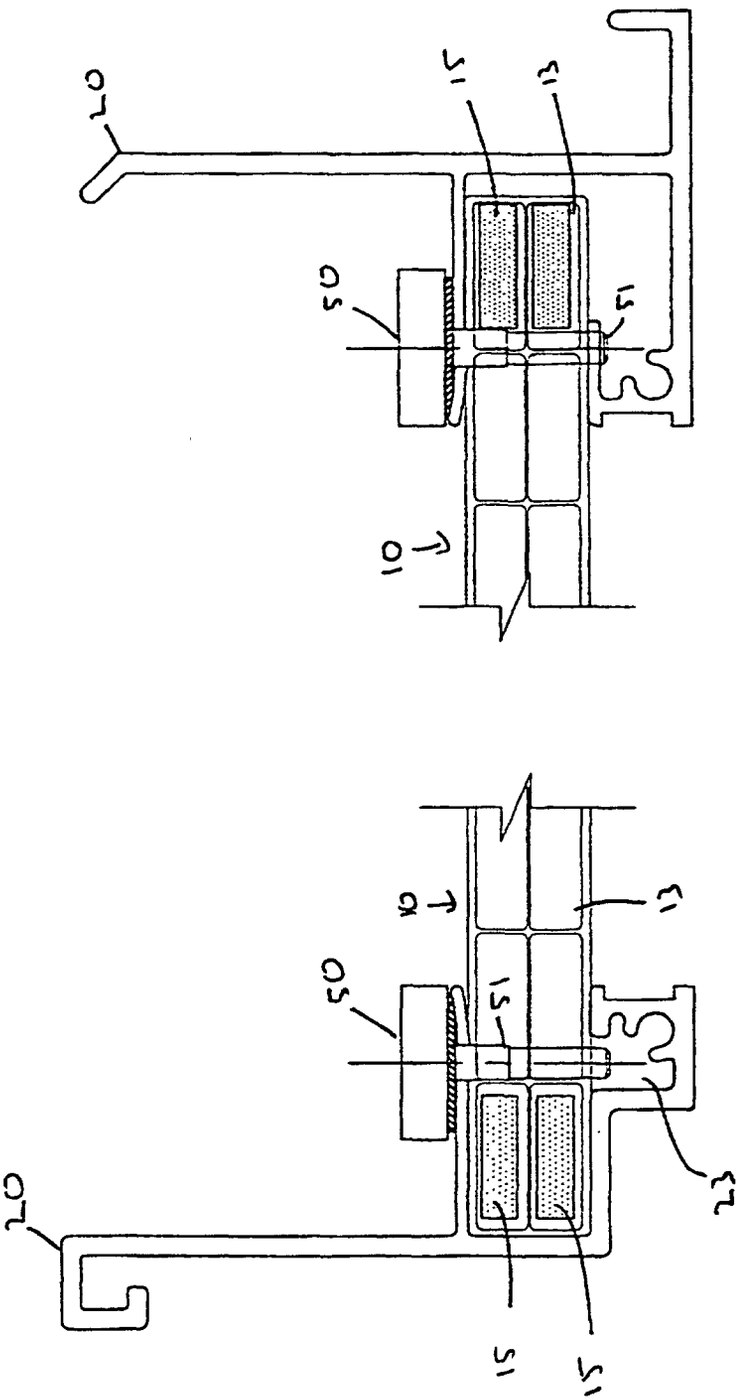


Fig. 9