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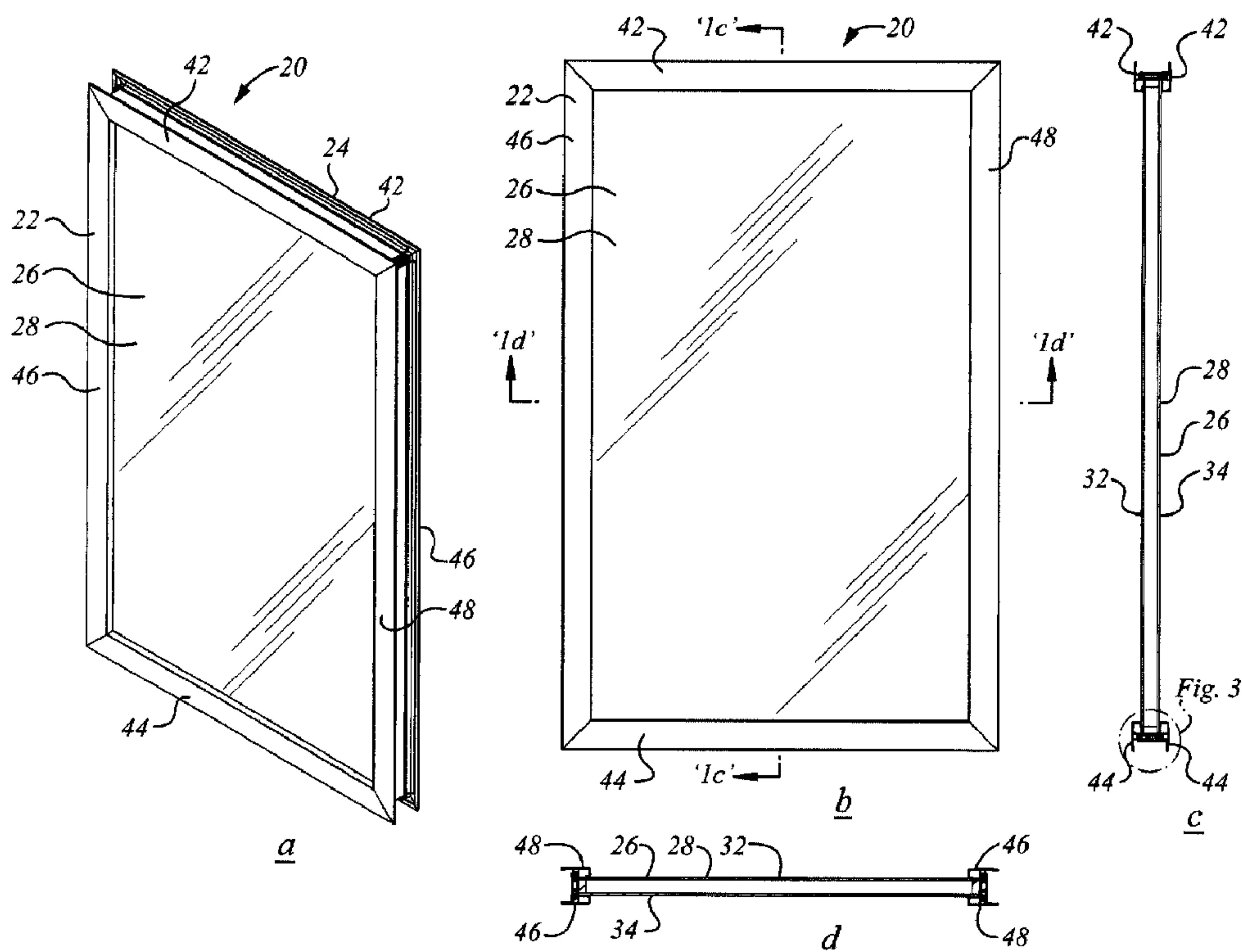
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(54) Titre : FIXATION D'UN ASSEMBLAGE DE FENETRE

(54) Title: WINDOW ASSEMBLY SECUREMENT



(57) Abrégé/Abstract:

A window assembly includes an inside frame, and outside frame, a glazing panel and a set of connectors that serve to seat, or positively locate, the glazing panel relative to one of the frames, and also positively to locate the inside and outside frames relative to



(57) **Abrégé(suite)/Abstract(continued):**

each other. The members of the frames and the connectors may all be extrusions. The connector may have non-releasing, one-way engagement fittings that snap fit together with mating fittings on the frames. The frames may be made of a metal such as aluminum. The connectors may be made of a thermal insulator, such as a plastic or other composite material, that may tend not to form a thermal bridge between the inner and outer frames.

Abstract

A window assembly includes an inside frame, and outside frame, a glazing panel and a set of connectors that serve to seat, or positively locate, the glazing panel relative to one of the frames, and also positively to locate the inside and outside frames relative to each other. The members of the frames and the connectors may all be extrusions. The connector may have non-releasing, one-way engagement fittings that snap fit together with mating fittings on the frames. The frames may be made of a metal such as aluminum. The connectors may be made of a thermal insulator, such as a plastic or other composite material, that may tend not to form a thermal bridge between the inner and outer frames.

WINDOW ASSEMBLY SECUREMENT

Field of the Invention

This invention relates to the field of doors having windows.

Background of the Invention

In window assemblies the inside and outside framing members may be made of aluminum, often in the form of extrusions. It may be that an insulating member is, or insulating members are, mounted between the inner and outer aluminum members, with the object of reducing thermal conduction heat loss through the structure. It may be that such an insulating connector may also facilitate or improve assembly of the window structure, whether in terms of reduction of effort, repeatability, or quality of finished product.

Summary of the Invention

In an aspect of the invention there is a window assembly securement or fitting or connector. It has a connector body having a first end and a second end. The first end has a first frame engagement by which said connector body. The second end has a second frame engagement. The connector body has a first index, the first index defining an abutment against which to locate a glazing panel such as a window pane, or window glass, the index thereby fixing the position of the window pane relative to the second frame.

In a feature of that aspect of the invention, the body has a second index. The second index is mounted to the first end. The second index defines an abutment to seat against supporting structure to which the window assembly is mounted, the second index thereby fixing the position of the window relative to the supporting wall structure and hence also relative to the second frame on assembly. In another feature, the securement is a thermal insulator. In another feature, at least one of the first frame engagement and the second frame engagement is a one-way motion catch. In another feature, the first frame engagement is a one-way catch and the second frame engagement is a one-way catch. In another feature, the securement has a fastener accommodation passing therethrough. In still another feature, the securement is an extrusion. In still another feature, at least one of the first frame engagement and the second frame engagement is a spring biased deflection member. In another feature, the connector is made of a material having a co-efficient of thermal conductivity, k , that is less than 1 W/mK.

In another aspect of the invention, there is a window assembly. It has a first window frame member; a second window frame member; and a connector. The connector has a first end and a second end. The first window frame member has a first fitting, the first fitting being matingly engageable with the first end of the connector. The second window frame member has a second fitting, the second fitting being matingly engageable with the second end of the connector. The connector is made of a thermal insulator material. When assembled the connector is positioned between the first and second frame members, and the first and second frame members bracket a window pane.

In a feature of that aspect of the invention, the first and second window frame members are formed of material that is more highly thermally conductive than the thermal insulator material of the connector. In another feature, at least one of the first and second window frame members is an extrusion. In another feature, at least one of the window frame members is made of aluminum. In still another feature, at least one of the window frame members has a wing that, on installation, conceals a margin of the window pane. In a further feature, the first window frame member and the second window frame member have the same cross-section.

In another feature, the connector has a first index. It defines an abutment against which to seat the window pane. The abutment is opposed to the second window frame member, whereby the window pane is located between the first index and the second window frame member. In yet another feature, the first window frame assembly has a first wing, and the second window frame assembly has a second wing. On assembly the first wing is faced to oppose the second wing, and the window pane is captured between the first and second wings of the first and second frames respectively. In another feature, on assembly, the first wing of the first window frame member and the first index are positioned flush with each other. In still another feature, the connector has a first index. The first index defines an abutment. On assembly, the abutment stands in opposition to the second frame member whereby the first frame member is fixedly located relative to the connector.

In a still further feature, the connector has a second index, the second index defines an abutment; and, on assembly, the abutment of the second index stands in opposition to the second frame member whereby the second frame member is positioned relative to the connector. In still another feature, the window assembly is one in which at least one of (a) the first frame member and the first end of the connector have mutually engaging end fittings, the end fittings being male on one hand, and female on the other, and being one-way spring-biased snap-fit on assembly; (b) the second frame member and the second end of the connector have mutually engaging end fittings, the end

fittings being male on one hand, and female on the other, and being one-way spring-biased snap-fit on assembly. In still yet another further feature, the end fitting of the second window frame connector has flights for engagement of a threaded fastener; and the connector accommodates the passage of a threaded fastener therethrough to engage the flights, such engagement causing the second end fitting of the connector and the end fitting of the second window frame member to bind.

In another aspect of the invention there is any combination of any of the features of any one of embodiments shown or described herein, in combination with the features of any other embodiment, except to the extent those features are mutually exclusive. In another aspect of the invention, there is any apparatus substantially as shown or described herein, in whole or in part.

Brief Description of the Drawings

These aspects and other features of the invention can be understood with the aid of the following illustrations of a number of exemplary, and non-limiting, embodiments of the principles of the invention in which:

Figure **1a** shows a perspective view of a window assembly;

Figure **1b** shows a front view of the window assembly of Figure **1a**;

Figure **1c** shows a vertical section of the window assembly of Figure **1a**;

Figure **1d** shows a horizontal section of the window assembly of Figure **1a**;

Figure **2** is a sectioned perspective view of the window assembly of Figure **1a**;

Figure **3** is a cross-section of the window assembly of Figure **1a**; and

Figure **4** is an enlarged detail, in cross-section of elements of the window assembly of Figure **3**.

Detailed Description

The description that follows, and the embodiments described therein, are provided by way of illustration of an example, or examples, of particular embodiments of the principles of the present invention. These examples are provided for the purposes of explanation, and not of limitation, of those principles and of the invention. In the description, like parts are marked throughout the specification and the drawings with the same respective reference numerals. The drawings may be understood to be to scale and in proportion unless otherwise noted. The wording used herein is intended to include both singular and plural where such would be understood, and to include synonyms or analogous terminology to the terminology used, and to include equivalents thereof in

English or in any language into which this specification may be translated, without being limited to specific words or phrases.

For the purposes of this description, it may be that a Cartesian frame of reference may be employed. In such a frame of reference, the long, or largest, dimension of an object may be considered to extend in the direction of the x-axis, the base of the article, where substantially planar, may be considered to extend in an x-y plane, and the height of the article may be measured in the vertical, or y-direction. Accordingly, the width of the window assembly described herein may be arbitrarily designated as the x-direction; and the height may be arbitrarily designated as the y-direction. The through-thickness is then the z-direction. Unless noted otherwise, the terms “inside” and “outside”, “inwardly” and “outwardly”, refer to location or orientation relative to the window. In this description, when an item, or structure, or wall, is indicated as being insulated, such term is understood to mean that the wall has a layer of insulation. In this specification, The commonly used engineering terms “proud”, “flush” and “shy” may be used to denote items that, respectively, protrude beyond an adjacent element, are level with an adjacent element, or do not extend as far as an adjacent element, the terms corresponding conceptually to the conditions of “greater than”, “equal to” and “less than”.

In this specification a distinction is made between materials that are thermal conductors and thermal insulators. In general, the thermal conductors may be thought of as materials such as metals, such as steel, stainless steel, copper sheathing, mild steel flashing, whether galvanized or otherwise, or aluminum sheeting or aluminum extrusions, painted or otherwise. The insulators may be thought of as materials such as wood, particle board, oriented strand board, composites, whether fiber reinforced or otherwise, and plastics, whether fiber reinforced or otherwise. Plastics may have a thermal conductivity of, typically, 0.2 – 0.25 W/mK; softwood may have a cross-grain thermal conductivity of about 0.15 W/mK. By contrast, mild steel has a thermal conductivity of perhaps 50 W/mK; stainless steel of 12 W/mK; aluminum of up to 210 W/mK. As the difference between insulators and conductors is typically 2 – 3 orders of magnitude, for the purposes of this description, in the unlikely event that a person of ordinary skill in the art would be unable to distinguish conductors from insulators, insulators will arbitrarily be considered to have a thermal conductivity of less than 1 W/mK, and conductors will be considered to be materials having a thermal conductivity of more than 1 W/mK.

Referring to the Figures, and by way of a general overview, a window assembly is indicated generally as **20**. Window assembly **20** may be used as a widow in a wall, or it may be used as a window in a door. Window assembly **20** may include a first, or inside, surround, or bezel, or frame

assembly **22**; a second, or outside, surround, or bezel, or frame assembly **24**; and a panel assembly **26** carried by, and typically bracketed by, or sandwiched by, the inside and outside assemblies **22**, **24**. When the sandwich is formed, the inside frame and the outside frame may be held in place with one or more connectors **30**.

In the most generic sense, panel assembly **26** may be any kind of panel. However, in the context of the present invention, panel assembly **26** may most typically have the form of a planar, or substantially planar sheet, and may most typically be glazing such as may be identified generically as a window pane **28**, whether clear (i.e., transparent) or frosted (translucent); whether single pane or multi-pane; whether sealed or unsealed; whether plain or patterned or coloured or decorative in the form of a stained glass assembly or similar.

While round, or oval, or triangular or trapezoidal planform window shapes are known, for the purposes of this description, and in most common use, window assembly **20** and panel assembly **26** in particular may be taken as being four-sided, most typically rectangular panel elements. Often, though not always, the rectangular form may have a long dimension that is the vertical dimension on installation, corresponding to the **z**-axis or **z**-direction in this description. Window assembly **20** and panel assembly **26** may also have a shorter dimension that may be the width dimension on installation running in the **y**-axis or **y**-direction. The entire assembly may have a through thickness in the **x**-direction. The entire window assembly may be predominantly or substantially planar in the sense that the **y**-direction and **z**-direction extent of the structure may typically be many times the through-thickness dimension in the **x**-direction. The entire assembly may be mounted in surrounding structure, suggested by the intermittent dashed line in Figure 3, such as in a wall (or door), and notionally indicated as **40**.

For the purposes of the present description, panel assembly **26** will be considered to be transparent glazing that includes a first sheet of glazing, identified as first pane **32**, a second pane of glazing identified as second pane **34**, and a third member **36** which may have the form or function of a spacer or standoff, **38**, such as may be located between first pane **32** and second pane **34**. Panes **32** and **34**, and third member **36** may be sealed about their common periphery to form a sealed multi-pane window panel. Although a double pane is shown, the window may also be a triple pane window. The window panel may also be provided with coatings to reduce glare or heat transfer, as may be.

First frame **22** may have top and bottom portions **42**, **44** that run predominantly cross-wise (i.e., in the width-wise or **y**-direction on installation), and left and right hand side portions **46**, **48** that

run predominantly up-and-down (i.e., in the vertical or **z**-direction on installation) and that co-operate to form the generally rectangular shape or frame of window assembly **20** generally. The elements of the assembly, namely portions **42**, **44**, **46** and **48**, may all have the same cross-sectional profile, and may be made as extruded members. It may be that portions **42**, **44**, **46**, and **48** may be made of an extruded material, such as aluminum, or a plastic. The various corner pairs may be mitered to fit together, and may be secured using corner keys, welding, PVC welding, glues, bonding agents or like materials.

Second, or outside, frame assembly **24** may be identical to first, or inside, frame assembly **22**, although this need not necessarily be so in the general case. For the purposes of simplification of this description, in the embodiment shown it will be taken that this is so. As such, a description of the cross-section of bottom portion **42** of first frame **22** may be taken as representative of all of the members of first frame **22** and second frame **24**.

The cross-section of bottom portion **42** is shown in Figure 3. The extrusion is identified generally as **50**. It has a first wall, or member **52** that can be thought of as the facing of the item. That is, the exterior surface **54** of member **52** faces away from the window pane, and provides the presentation surface most visible to persons facing the window. It can be considered, and is, a “trim panel”. Member **52** has a first end, **56**, a second end **58**, and a medial portion **60**.

First end **56** is the bottom end in Figure 3, and, in use is the end most distant from the window pane. It is the end that laps over the adjacent wall or door structure, shown in an intermittent line and indicated notionally as **40**. At the first end **56** member **52** may terminate in a foot **62** that may have the form of a doubling, or flange, or bulbous end, or thickened end **64**, as may be, that is fattened to provide an index, or datum, or stop, or abutment, surface **66** that may bear against, e.g., a wood panel, or drywall, of a door face, of the surrounding structure. On the inward (or wall-facing, or back) face **68** of member **52** there may be a space, or alcove, or chamber, or rebate, or relief, or seat, or accommodation **70**, however it may be termed, that accommodation having a depth equal to or greater than the distance by which thickened end **64** stand inwardly proud of inward surface **68**.

Second end **58** of member **52** is the top end in Figure 3, and it is the end most proximate to the window pane. It may include an arm or leg, or finger, or flange, in the form of a member **72** that extends substantially horizontally from member **52** back toward the window pane, and that forms the visible or cosmetic edge or sill of the window. Member **72** may also have a further portion or flange **74** that is folded downwardly to form a surface facing in planar opposition to panel assembly **26**.

Medial portion **60** extends between first and second end portions **56** and **58**. In an intermediate location, which may be roughly half way between ends **56** and **58**, medial portion **60** has a closed-section member **76** that may be generally square or rectangular. Member **76** has first and second, upper and lower, webs **78**, **82** that stand generally perpendicularly to, and away from, member **52**; and a fourth wall **84**, a closing wall, spaced generally parallel to, and away from, member **52** that completes the closed periphery of the rectangular section. The hollow **80** defined therewithin may be the hollow for receiving a corner key for assembly of four such members into a rectangular frame.

The structure described so far may be considered conceptually as a beam in which the main web is member **52**, member **72** (and finger **74**) define a re-entrant top flange, and foot **62** forms a bottom flange, with predominant resistance to bending in the plane parallel to the main surface of panel assembly **26**. It also describes a beam with non-trivial depth in the through-thickness direction of panel **26**.

It may be noted that a connector engagement member, or structure, or socket, or prong, or connection fitting, identified generally as a connector **90** extends inwardly from closed section member **76** away from member **52**. Connector **90** may be a male connector or a female connector. It may include a pair of legs **92**, **94** that are spaced apart and that extend away from closed section member **76**. Legs **92** and **94** may be symmetrical. That is to say, they may be mirror images of each other such that, together, they form a co-operating pair, and, collectively, form connector **90**.

Each of the legs **92** and **94**, or both legs taken together, may be referred to as a prong or prongs. The two legs may define between them an accommodation **88**. The inside faces of legs **92**, **94**, that is, the sides of legs **92**, **94** that are opposed and therefore facing generally toward each other to define the sides of accommodation **88**, may be provided with ridges, or threads, or asperities, or teeth **96**. The inside faces of legs **92**, **94** may not be quite parallel, but are angled together toward their roots such that accommodation **88** is slightly narrowing toward its closed end. The end face, or tip, of each prong may be rounded or chamfered, as at **98**, such as to provide a lead-in for an approaching engaging member. The outside face of each of legs **92**, **94** may have a stop, or abutment, or barb, or catch **100**, and, in the lee of the catch, a relief **102** for accommodating a mating feature of another member that may engage catch **100**. Legs **92** and **94** may be rooted in the intermediate closed-periphery member **76**.

Connector **30** may also be an extruded member. However, connector **30** may be made of something other than aluminum. That is, a plastic or composite material may be used that is a thermal insulator, such that the thermal conduction path between first frame **22** and second frame **24** is interrupted.

Connector **30** may have a first end, **106**, a second end **108**, and a medial portion **110** extending between the two ends. First end **106** has an engagement fitting (or fittings) **112** for engagement with the corresponding mating fitting, or fittings **92**, **94**, of connector **90** of the respective first frame member, be it **42**, **44**, **46** or **48**. Similarly, second end **108** has an engagement fitting, or fittings, **114** for mating engagement with the corresponding fittings **92**, **94** of the respective second frame member, be it **42**, **44**, **46** or **48**.

Intermediate member or portion **110** may be a hollow form sections having first and second webs **116**, **118** that in this instance extend in a plane parallel to the sealed edge of the window pane. First and second webs **116**, **118** are maintained in spaced-apart parallel relationship by a pair of intermediate webs **120**, **122**. Intermittently, there may be a fastener bore **104** formed through webs **120**, **122**, as appropriate to admit a mechanical threaded fastener such as a screw **138**. The rectangular box or frame defined by the combination of webs **116**, **118**, **120** and **122** may be considered to be the “body” of connector **30**.

The second ends **124**, **126** of webs **116**, **118** extend beyond web **120**. Each has a catch **130** formed thereat. Ends **124** and **126** are more flexible than aluminum, and thus when legs **92**, **94** of second frame **24** are driven into engagement with ends **124**, **126**, those ends may tend to deflect as the tapered or rounded lead-ins of catch **100** and catch **130** ride against each other. Ends **124**, **126** are resilient, and as they spring outward they become resiliently biased back toward their undeflected condition. This continues until the rearward facing abutments of catches **100** and **130** clear the lead-in slopes, and snap together, with the rearward-facing hooks of catches **100** and **130** snapping back into the respective accommodations formed as gullets or reliefs in the lee of those hooks. The engagement is a one-way engagement – once the abutment hooks have passed each other and engaged, the rearward facing tooth of each hook is impeded by the other hook from disengaging. They are now prevented from backing away from each other. In addition, catch **130** of end **124** has a stop **128** that will bottom against the back wall of fourth wall **84** of closed member **76** if pushed too far.

The first ends **134**, **136** of webs **116**, **118** are similar to, and have all of the same features as ends **124**, **126**, and likewise engage the prongs or legs **92**, **94** of connector **90** of first frame **22**.

Further, a wing, or member, or arm, or index, or datum member, or stop, or abutment, or flange **140** that extends upwardly from a root near catch **130** of second end **134**. Flange **140** extends away from catch **130** toward the sealed window pane. On installation, the rearward face of flange **140**, facing toward web **122**, bears against panel assembly **26**, and locates, connector **30** relative to panel assembly **26**. Once so located, mechanical fastener **138** may be driven through webs **122** and **120** of connector **30** and into front frame assembly **24** and tightened, and in so doing works against teeth **96**, causing legs **92**, **94** to bind, and abutments or stops **128** to bottom out against member **84**, thus capturing window panel **26** between flange **140** and finger **74** of frame **24**. Fasteners **138** need not be made of steel. They could be made of a hard plastic or composite material. A composite material may tend not to provide a thermally conductive path. They need not be overly tightened. The threads may be treated with a bonding agent, epoxy, or glue.

Furthermore, connector **30** has another index, or stop, or abutment, or bracket, or arm, or locator member, or extension, or appendage **146**. Appendage **146** may include a member or leg **148** that extends longitudinally from catch **130** of end **136** of web **118** toward medial portion **60**. Appendage **146** may also include a flange **150** that extends transversely from leg **148**. Flange **150** may extend generally parallel to the plane of window pane **28**, and, on assembly, may define a foot that provides a back-stop or buffer for first frame **22** on window pane **28**. That is, flange **150** may seat in accommodation **70**, in opposition to the inside surface **66** of member **52**. As seated, the rearward face of flange **150** may lie flush with face **66** of foot **62**. On installation of window assembly **20** in a wall structure **40**, the back face of flange **150** may then lie against wall structure or door surface **40**. Since each member **42**, **44**, **46** and **48** includes one or more connectors **30**, their respective flanges **150** may define a footprint, or bezel, or surround that positively locates connectors **30**, and therefore pane **28**, at a set depth relative to the inside surface, typically drywall, of the structure. That is, the rear face of flange **150** defines a datum, or index reference point when it seats against the surrounding wall structure, thereby locating the glass element depth, i.e., as per the difference in the x-direction between the first datum and the second datum. That is, the connector defines three relationships: (1) the location of the window pane relative to the first frame; (2) the location of the window pane relative to the supporting wall structure; and (3) the connection of the first and second frames in a single assembly. It may be noted that once the connector is in place, the addition of the inside frame is not structurally necessary, and it is in some sense cosmetic.

Connector **30** may be a continuous extrusion of a length corresponding to, but somewhat less than members **42**, **44**, **46** and **48**, or may be provided in discrete, shorter sections, like cleats, that may be 2" – 4" long, for example.

On assembly, second frame member **24** is placed on a flat horizontal surface, such as a table. A bead of sealant, or a gasket, or O-ring seal, or a double-sided adhesive tape, may be provided to flange **74** of second frame member **24**, as may be appropriate. Window pane assembly **28** is then placed on second frame member **24**, in a generally centered position. Connectors **30** are installed in members **42**, **44**, **46** and **48**. In each case the hooks of catches **130** of fittings **114** of second end **108** engage the respective hooks of catches **100** of connector **90** of the other member. Threaded fasteners **138** are installed and gently tightened until snug. This will trap window pane assembly **28** between the first index, flange **140** of connector **30**, and flange **74** of frame member **24**. The unit may be installed in the window opening in structure **40** in this condition. Finally, first frame member **22** is placed on top. Connectors **90** of member **22** engage fittings **112** of connectors **30**, such that flange **74** of the various members of frame member **22** face, and may lie against, window pane assembly **28**. As before, a seal may be provided between flange **74** and the glazing sheet, **32** of pane assembly **28**. Flange **150** seats in accommodation **70**, flush on the inside face with foot **62**. The window panel is then bracketed by the inside and outside wings, namely ends **56**, of the inside and outside framing extrusions.

The embodiments illustrated and described above illustrate individual non-limiting examples in which the principles of the present invention are employed. It is possible to make other embodiments that employ the principles of the invention and that fall within the following claims. To the extent that the features of those examples are not mutually exclusive of each other, the features of the various embodiments may be mixed-and-matched, i.e., combined, in such manner as may be appropriate, without having to resort to repetitive description of those features in respect of each possible combination or permutation. The invention is not limited to the specific examples or details which are given by way of illustration herein, but only by the claims, as mandated by law. The claims are to be given the benefit of purposive interpretation to include equivalents under the doctrine of equivalents.

As described above, there is a window assembly securement, namely connector **30**. It has, or is, a body or frame, or hollow section, having a first end and a second end. The first end has a first frame engagement, namely fitting, or fittings, **112**. The second end has a second frame engagement, namely fitting or fittings, **114**. There is a first index mounted to the body near the first end, namely index **140**. Index **140** defines an abutment against which to locate a window, such as window pane **28**, such as may be a glass pane or pane, that window then being sandwiched between the first index and the first frame. Index **140** thereby fixes the position of the glass pane, or pane, relative to the outside frame **24**.

The body may also have another index, namely member **146**, which includes flange **150**. This second index is also mounted to the first end of connector **30**. Flange **150** of member **146** defines an abutment against which to seat the window assembly against adjacent structure, such that the window assembly is secured on, or to, the surrounding structure by sandwiching or bracketing the surrounding structure between the second index and the second frame **24**. The securement of either or both of first frame engagement **112** and second frame engagement **114** may include a one-way motion catch in the form of catch **112** or **114** (or a pair of opposed co-operating catches **112**, or **114**, as may be). These catches may have the form of a hook or hooks that engage the mating member, or members, of one of the window frames. Either of frame engagements **112** and **114** may be, or may include, a spring biased deflection member. Connector **30** may have a fastener accommodation passing therethrough, such as bore **104** for receiving fastener **138**.

Connector **30** may be an extrusion. Connector **30** may be a thermal insulator. Connector **30** may be made of a material having a co-efficient of thermal conductivity, **k**, that is less than 1 W/mK, such as a plastic.

In the description, window frame assembly **20** has a first window frame member **22**; a second window frame member **24**; and a connector **30**. Connector **30** has a first end and a second end. First window frame member **22** has a first fitting **90**, that is matingly engageable with the first end of connector **30**. Second window frame member **24** has a second fitting **90**, that is matingly engageable with the second end of connector **30**. Connector **30** is made of a thermal insulator material. When window **20** is assembled, connector **30** is positioned between first and second frame members **22**, **24**, and in which first and second frame members **22**, **24** bracket a window pane **28**. First and second window frame members **22**, **24** are formed of material, such as aluminum, that is more highly thermally conductive than the thermal insulator material of connector **30**. Alternatively one, the other, or both, could be made of PVC. One of all of members **22**, **24** and **30** may be an extrusion. Either or both of member **22**, **24** may be made of aluminum. Either, or both, of members **22**, **24** may have a wing that, on installation, conceals a margin of the window pane. Members **22**, **24** may have the same cross-section.

Connector **30** has a first index **140**. Index **140** defines an abutment against which to seat window pane **28**. The abutment is in opposition to second window frame member **24**, whereby window pane **28** is located between index **140** and first window frame member **22**.

The window frame assembly **20** has a first wing, item **54**, on the first frame assembly **22**, and a second wing, item **54** on the second frame assembly **24**. On assembly the two wings **54** are faced

to oppose each other, and the window panel is captured between the respective wings of the first and second frame members. The connector has a first index, and said first index defines an abutment. On assembly, the abutment stands in opposition to the first frame member whereby the second frame member is fixedly located relative to the connector. The connector has a second index. The second index defines an abutment; and, on assembly, that abutment stands in opposition to the second frame member whereby the second frame member is positioned relative to the connector.

The first frame member and the first end of the connector have mutually engaging end fittings, those fittings being male on one hand, and female on the other, and being one-way spring-biased snap-fit on assembly. The second frame member and second end of the connector have mutually engaging end fittings, being male on one hand, and female on the other, and being one-way spring-biased snap-fit on assembly. The end fitting of the second window frame connector has flights to engage a threaded fastener; and the connector accommodates the passage of a threaded fastener to engage those flights, such engagement causing the second end fitting of the connector and the end fitting of said second window frame member to bind.

Although the various embodiments have been illustrated and described herein, the principles of the present invention are not limited to these specific examples which are given by way of illustration, but only by a purposive reading of the claims.

Claims

I claim:

1. A window assembly securement comprising:
a body having a first end and a second end;
the first end having a first frame engagement by which said body is mounted to a first window frame member;
said second end having a second frame engagement; and
a first index mounted to said body, said first index defining an abutment against which to locate a window pane, said index thereby fixing the position of the window pane relative to the second frame.
2. The securement of claim 1 wherein said body has a second index, said second index being mounted to said first end, said second index defining an abutment to seat against supporting structure to which the window assembly is mounted, said second index thereby functioning as a datum fixing the position of the window relative to the supporting structure.
3. The securement of claim 1 wherein said securement is a thermal insulator.
4. The securement of claim 1 wherein at least one of said first frame engagement and said second frame engagement is a one-way motion catch.
5. The securement of any one of claims 1 to 3 wherein said first frame engagement is a one-way catch and said second frame engagement is a one-way catch.
6. The securement of claim 1 wherein said securement has a fastener accommodation passing therethrough.
7. The securement of any one of claims 1 to 6 wherein said securement is an extrusion.
8. The securement of any one of claims 1 to 7 wherein at least one of said first frame engagement and said second frame engagement is a spring biased deflection member.
9. The securement of any one of claims 1 to 8 wherein said connector is made of a material having a co-efficient of thermal conductivity, k , that is less than 1 W/mK.

10. A window assembly, comprising:
a first window frame member; a second window frame member; and a connector;
said connector having a first end and a second end;
said first window frame member having a first fitting, said first fitting being matingly engageable with said first end of said connector;
said second window frame member having a second fitting, said second fitting being matingly engageable with said second end of said connector;
said connector being made of a thermal insulator material; and
when assembled said connector is positioned between said first and second frame members, and said first and second frame members bracket a window pane.
11. The window assembly of claim 10 wherein said first and second window frame members are formed of material that is more highly thermally conductive than said thermal insulator material of said connector.
12. The window assembly of claim 10, wherein at least one of said first and second window frame members is an extrusion.
13. The window frame assembly of any one of claims 10 to 12 wherein at least one of said window frame members is made of aluminum.
14. The window frame assembly of any one of claims 10 to 13 wherein at least one of said window frame members has a wing that, on installation, conceals a margin of the window pane.
15. The window frame assembly of any one of claims 10 to 14 wherein said first window frame member and said second window frame member have the same cross-section.
16. The window frame assembly of any one of claims 10 to 15 wherein said connector has a first index, said first index defining an abutment against which to seat said window pane, said abutment being opposed to said second window frame member, whereby said window pane is located between said first index and said second window frame member.
17. The window frame assembly of claim 16 wherein said first window frame assembly has a first wing, and said second window frame assembly has a second wing; on assembly said first wing is faced to oppose said second wing, and said window pane is captured between said first and second

wings of the first and second window frames respectively.

18. The window frame assembly of claim 17 wherein, on assembly, said first wing of said first window frame member and said first index are positioned flush with each other.

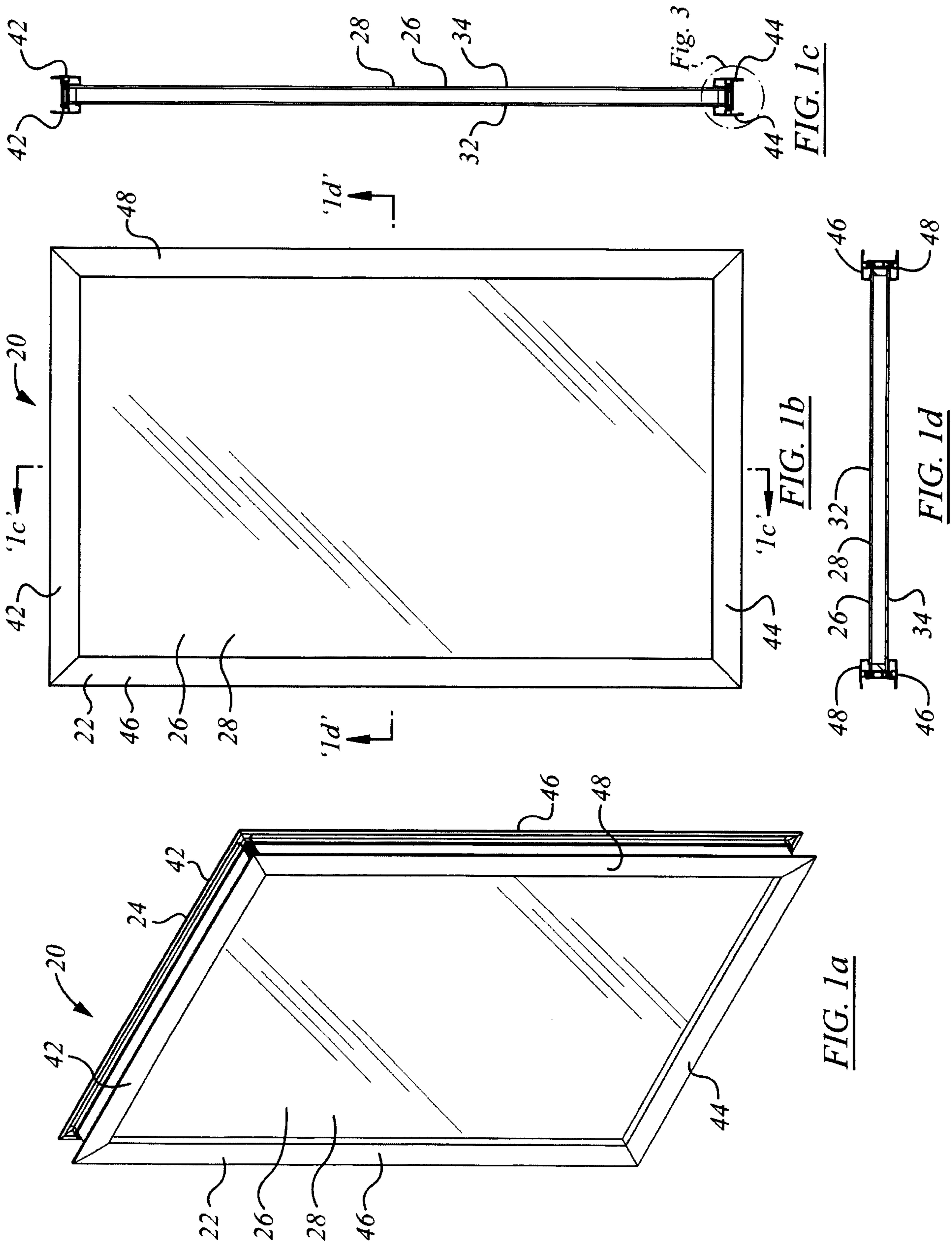
19. The window frame assembly of any one of claims 10 to 15 wherein said connector has a first index, and said first index defining an abutment; and, on assembly, said abutment stands in opposition to said second frame member whereby said first frame member is fixedly located relative to said connector.

20. The window frame assembly of claim 16 wherein said connector has a second index, said second index defining an abutment; and, on assembly, said abutment of said second index stands in opposition to said second frame member whereby said first frame member is positioned relative to said connector.

21. The window frame assembly of any of claims 10 to 20 wherein at least one of:

- (a) said first frame member and said first end of said connector have mutually engaging end fittings, said end fittings being male on one hand, and female on the other, and being one-way spring-biased snap-fit on assembly;
- (b) said second frame member and said second end of said connector have mutually engaging end fittings, said end fittings being male on one hand, and female on the other, and being one-way spring-biased snap-fit on assembly.

22. The window frame assembly of claim 21 wherein said end fitting of said second window frame connector has flights for engagement of a threaded fastener; and said connector accommodates the passage of a threaded fastener therethrough to engage said flights, such engagement causing said second end fitting of said connector and said end fitting of said second window frame member to bind.



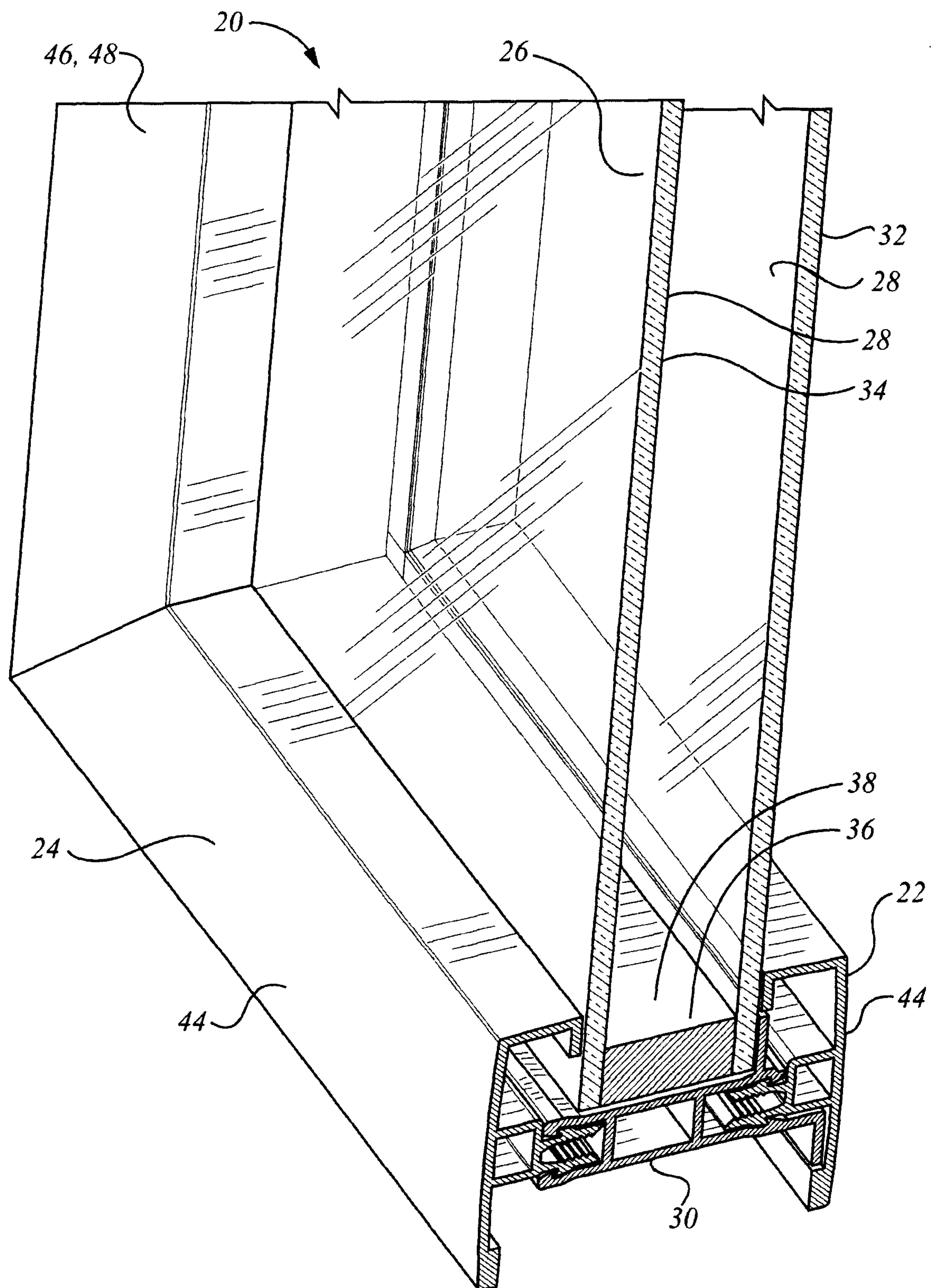


FIG. 2

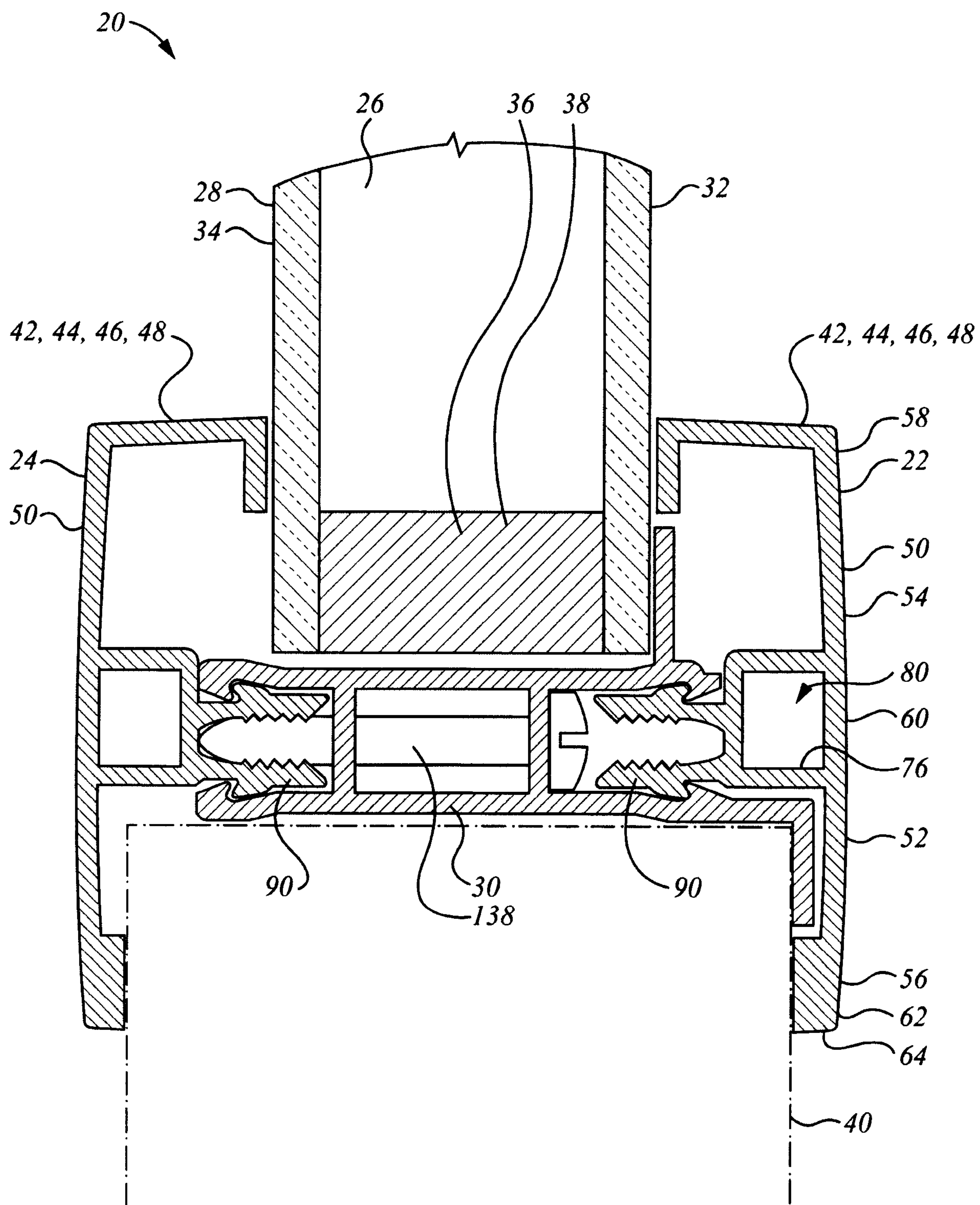


FIG. 3

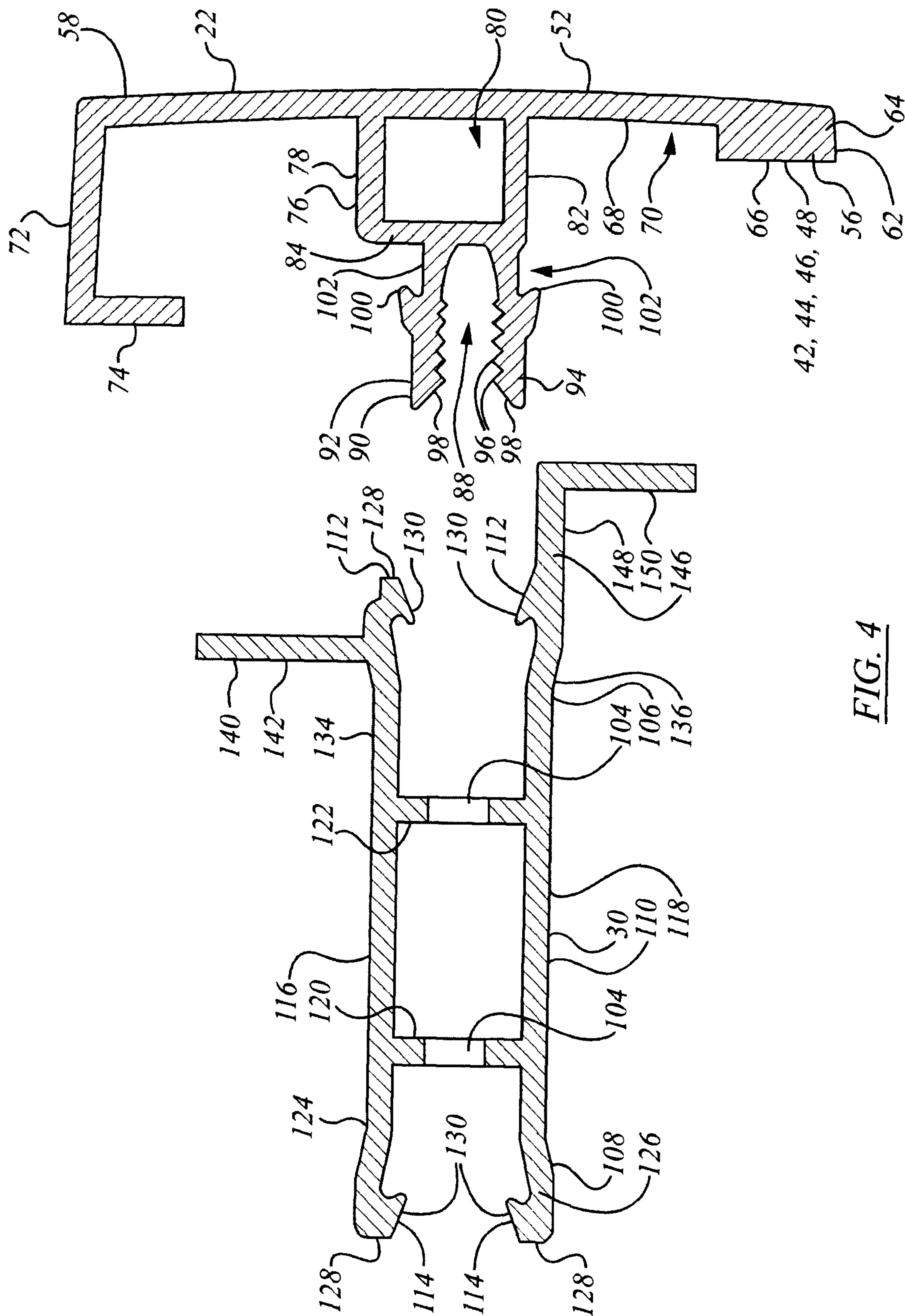


FIG. 4

