Sept. 15, 1964 C. D'AMATO 3,148,479

WINDOW GREENHOUSE AND COMPONENTS THEREFOR

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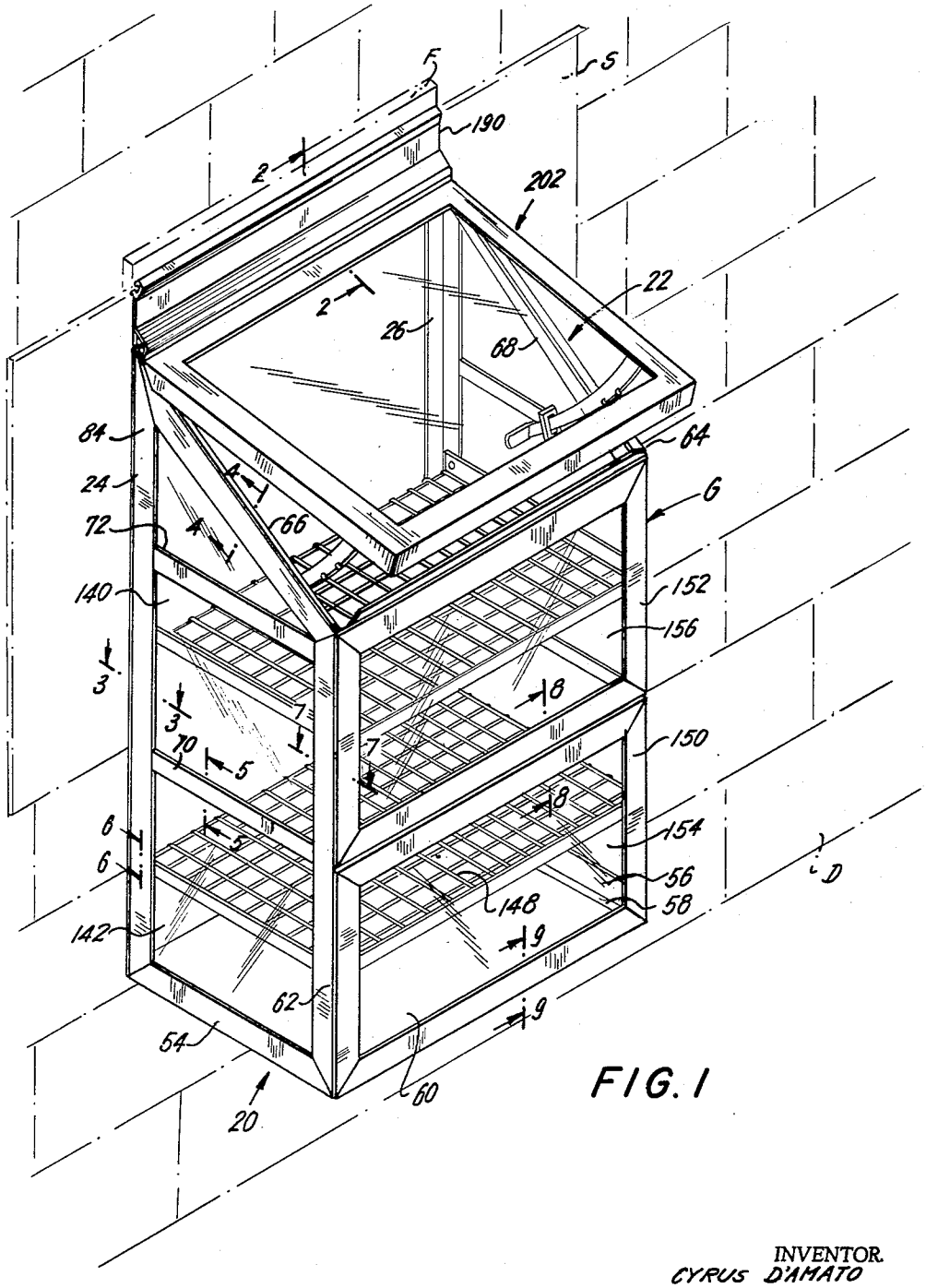


FIG. 1

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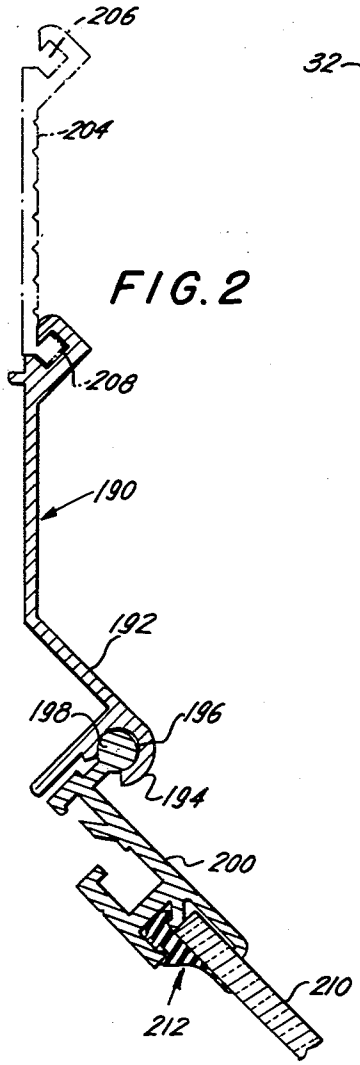


FIG. 2

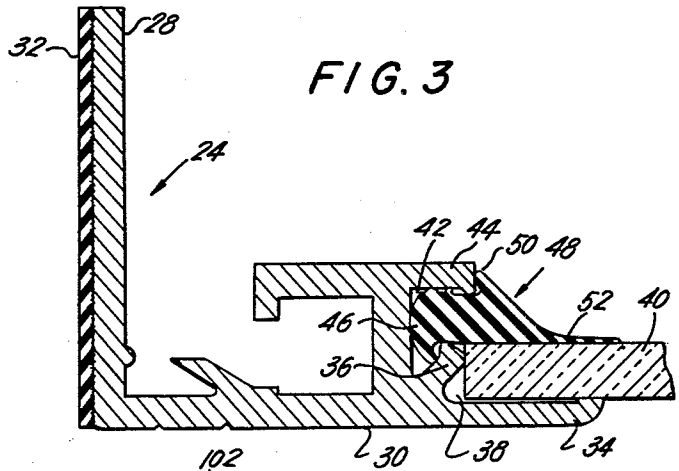


FIG. 3

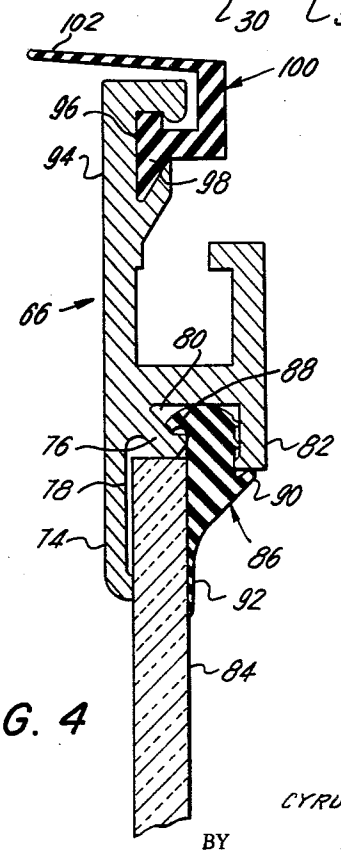


FIG. 4

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FIG. 5

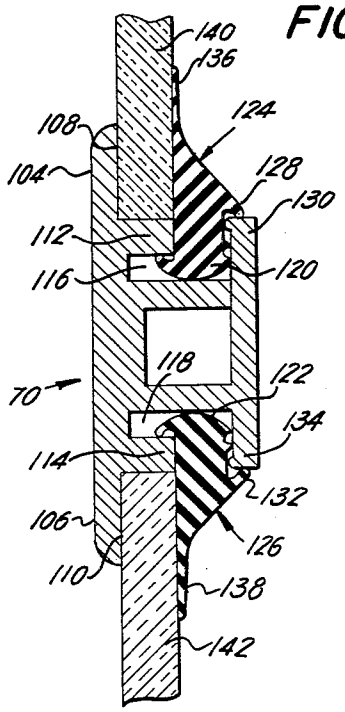


FIG. 6

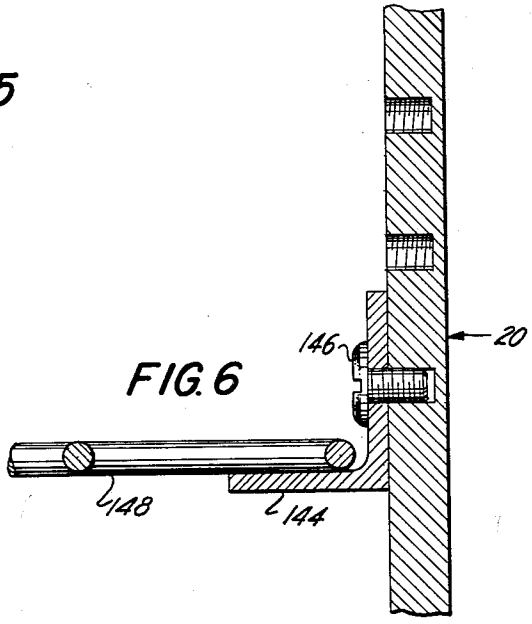
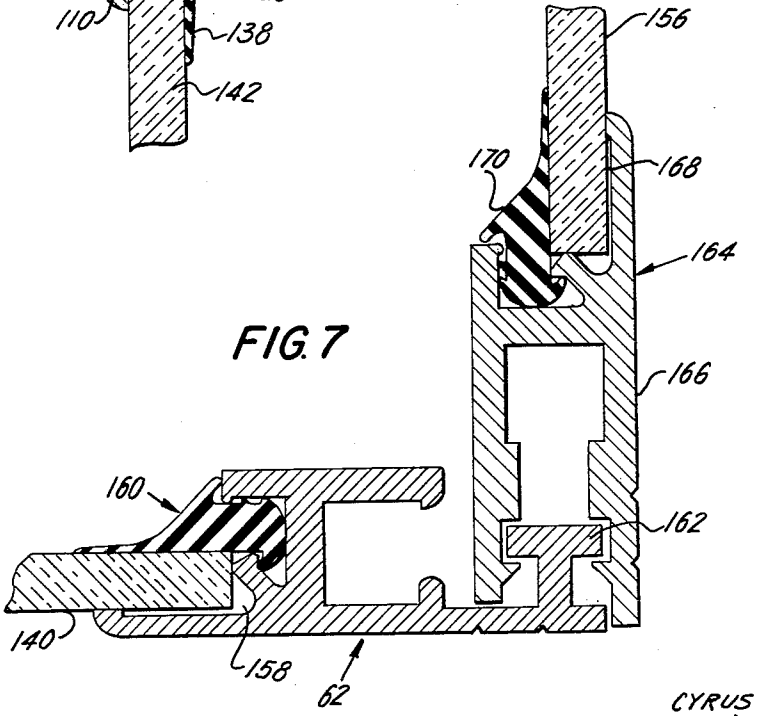


FIG. 7



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FIG. 8

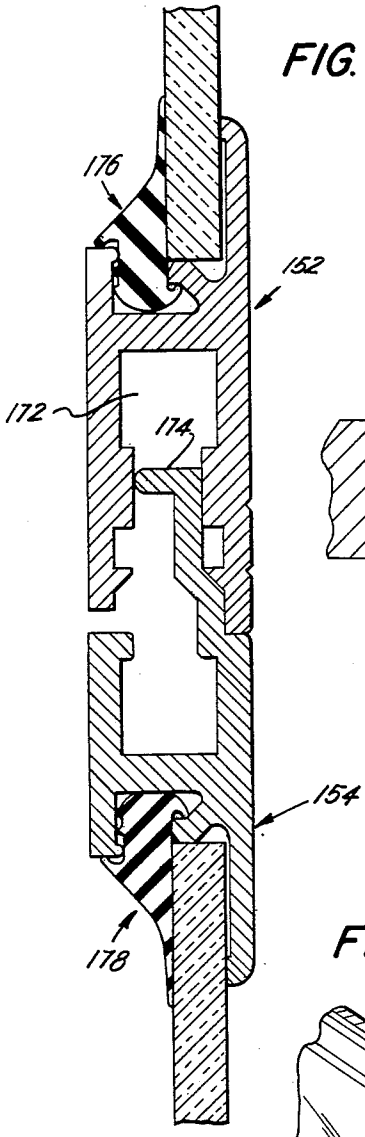


FIG. 9

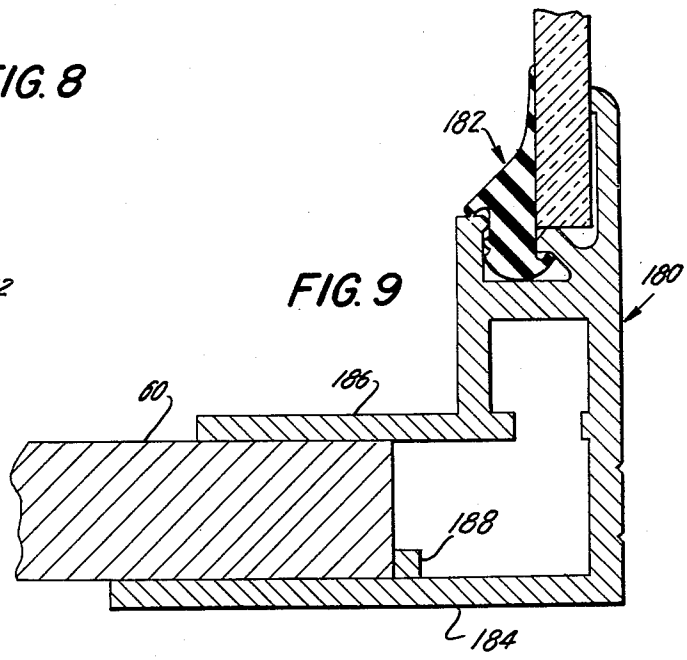


FIG. 10

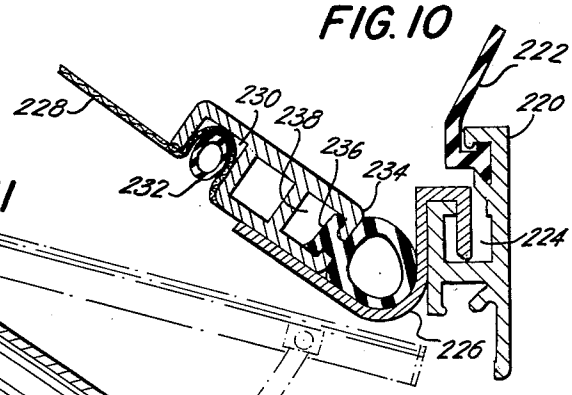
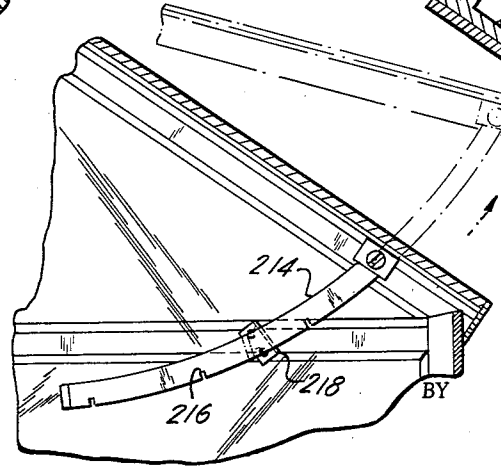


FIG. 11



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3,148,479

WINDOW GREENHOUSE AND COMPONENTS THEREFOR

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Filed Nov. 14, 1962, Ser. No. 237,490
3 Claims. (Cl. 47—40)

This invention relates to window greenhouses and components therefor.

It is an object of the invention to provide an improved window greenhouse structure adapted for fabrication by mass production techniques.

A further object of the invention is to provide an improved greenhouse structure which is readily assembled and disassembled by the user thereof.

Yet another object of the invention is to provide for a greenhouse structure which is readily connected to a dwelling or the like.

Still another object of the invention is to provide an improved greenhouse structure which is readily ventilated and otherwise rendered suitable for the growth and cultivation of botanical life.

Still another object of the invention is to provide an improved greenhouse structure incorporating window panes which are readily mounted and replaced.

Still another object of the invention is to provide an improved frame-type structure whereof the components are readily manufactured, such as, by extrusion.

Another object of the invention is to provide an improved structure including a hingeable cover wherein the hinge structure is readily manufactured and adapted for being employed for purposes of assembly.

Yet another object of the invention is to provide an improved greenhouse structure which is efficiently sealed with respect to ambient weather conditions.

In achieving the above and other of its objectives, the invention contemplates the provision of a greenhouse structure comprising two side panels adapted for being affixed to a dwelling in spaced parallel relationship so as to define an enclosure therebetween. These side panels are preferably provided with bottom flanges adapted for supporting a substantially rigid bottom therebetween and the side panels are, moreover, adapted for slidably receiving two or more front panels which are readily connected and disconnected from one another, as well as in relation to said side panels.

According to a feature of the invention there is provided a hinge member at the top of the aforesaid side panels, said hinge member being provided with an elongated cylindrical opening within which is accommodated a cylinder-like rib on a cover member, the rib and opening being engaged with a sliding movement in axial direction following which the cover is securely and hingedly mounted in position.

According to a further feature of the invention, adjustment means are provided by means of which the aforesaid cover may be firmly held in any one of a number of predetermined positions by means of which ventilation of the aforesaid enclosure is effected.

According to still another feature of the invention, the panels and frames are fabricated of extruded beams, each defining a groove opening inwardly towards the aforesaid enclosure and in a further direction so that a plurality of such beams may define a window-pane receptacle delimited by abutment members incorporated into said beams. Moreover, according to the invention, said beams are provided with socket openings adjacent which are provided stops, there being accommodated in said socket openings the hooked extremities of resilient sealing supports including lips braced against the stops and further

lips braced against the pane accommodated in the associated receptacle.

The aforenoted type of pane structure is also employed in accordance with the invention for accommodating various sealing and cushioning strips of which use is made throughout the greenhouse structure of the invention.

According to still a further feature of the invention, supports are provided in the enclosure upon which may be mounted on one or more screen-type floors which operate to support flower pots and the like without interfering with the ventilation which is effected within the enclosure.

Advantageously, the structure of the invention is readily assembled and disassembled and therefore shipping costs and storage requirements are reduced to a minimum.

As a further advantage of the invention, the various objectives thereof are achieved, as will be seen, by the use of members which are readily adapted to mass production techniques.

Other objects, features and advantages of the invention will be found in the following detailed description of a preferred embodiment of the invention as illustrated in the accompanying drawing in which:

FIGURE 1 is a perspective view of a window frame in a dwelling upon which has been mounted a window greenhouse in accordance with a preferred embodiment of the invention;

FIGURE 2 is a sectional view, taken along line 2—2 of FIG. 1, an additional component being illustrated in phantom lines;

FIGURE 3 is a sectional view taken along line 3—3 of FIG. 1;

FIGURE 4 is a sectional view taken along line 4—4 of FIG. 1;

FIGURE 5 is a view taken in cross-section along line 5—5 of FIGURE 1;

FIGURE 6 is a cross-sectional view referred to line 6—6 of FIG. 1;

FIGURE 7 is a view cross-sectional view taken along line 7—7 of FIG. 1;

FIGURE 8 is a view in cross-section referred to line 8—8 of FIG. 1;

FIGURE 9 is a cross-sectional view taken along line 9—9 of FIG. 1;

FIGURE 10 is a cross-sectional view of a portion of FIG. 1 illustrating an additional component which can be employed in accordance with the invention; and

FIGURE 11 is a partially cross-sectional view of the side panel of the greenhouse of FIG. 1 as seen from the interior thereof.

In FIG. 1 is generally indicated a dwelling D having a window frame F provided with shutters S and upon which is mounted a window greenhouse G in accordance with the invention.

The greenhouse comprises generally two side panels 20 and 22 including rear edge members 24 and 26, a sectional view of which can be seen in FIG. 3.

More particularly, in FIG. 3 is seen a cross-sectional view of rear edge member 24, this member being constituted by an elongated extruded column including a flange 28 connected at right angles to an arm 30, there being a rubber sealing strip 32 bonded to flange 28 and adapted for constituting a seal between this flange and the frame F. Flange 28 may be connected to frame F by means of screws or bolts (not shown).

Arm 30 comprises a flange 34 which, with an abutment 36, defines a groove 38 opening in two directions so as to be able to receive a structural member 40, as will be described in greater detail hereunder.

Arm 30, moreover, is provided with a socket opening 42 adjacent which is provided a stop 44.

In said socket opening 42 is accommodated the hooked end 46 of a resilient sealing support 48 having a lip 50 braced against stop 44 and a lip 52 braced against structural element 40.

Arm 30 and the various components thereof inclusive of the engagement of element 48 with element 40 constitutes a particular feature of the invention as will be described in greater detail hereinafter.

Referring again to FIG. 1, it is seen that the side panels 20 and 22 further comprise bottom edge members 54 and 56, said members including inwardly extending flanges of which only flange 58 is visible. Said flanges cooperatively support a substantially rigid bottom member 60 of imperforate material, said member being fabricated of wood, synthetic material, or the like.

Side panels 20 and 22, moreover, respectively comprise front edge members 62 and 64 and top edge members 66 and 68. These edge members, along with the aforenoted rear and bottom edge members, cooperatively constitute frames, which in turn constitute the side panels.

Extending transversely of said frames and dividing these open frames into a plurality of window openings are transverse beams or members, of which reference is made to beams 70 and 72. These window openings and the inclusion of window panes therein will be discussed in greater detail hereinafter.

In FIG. 4 is shown a cross-sectional view of the top edge member 66. This member includes a flange or extension 74 which, with an abutment 76, defines a groove 78, said groove being open in two directions and being limited on one side by abutment 76 and on the other side by flange 74. Adjacent groove 78 is a socket opening 80 bounded on one side by stop 82.

In FIG. 1, as well as in FIG. 4, is illustrated a window pane 84. This window pane is resiliently and sealingly held in position by means of a resilient sealing support 86 including a hooked end portion 88 accommodated in socket opening 80 and hooked around said abutment 76. Element 86, moreover, is provided with a lip 90 braced against stop 82 and a lip 92 braced against the aforesaid pane 84.

From what has been stated above with reference to the structure of FIG. 3, as well as the structure of FIG. 4, it will be seen that the window panes of the invention are glazed toward the interior of the structure, that the window panes are resiliently and sealingly held in position in a very effective and efficient manner, it being an extremely simple matter to mount and demount such panes as required.

Referring next to the upper arm 94 of the beam 66, it is seen that the same is provided with a groove 96 wherein is accommodated the bulbous extremity 98 of a cushioning strip 100, the upper flange 102 of which rides atop the edge member 66 and provides for cushioning an associated cover member, as will be discussed hereinafter.

Transverse beam 70 is shown in greater detail in the cross-sectional view of FIG. 5 wherein the beam is shown as comprising the upwardly extending flange 104 and downwardly extending flange 106 respectively constituting lateral limits of grooves 108 and 110 otherwise limited by abutments 112 and 114 respectively.

Beam 70 is, according to the above discussed feature of the invention, moreover, provided with socket openings 116 and 118 adapted for accommodating the hooked extremities 120 and 122 of resilient sealing supports 124 and 126 respectively.

Member 124 includes a lip 128 braced against stop 130 mounted on flange 104, and element 106 includes a lip 132 braced against a stop 134 constituting an integral part of beam 70.

Sealing supports 124 and 126 respectively comprise lips 136 and 138 braced against window panes 140 and 142 whereby said panes are firmly, yet detachably, held in position.

FIG. 6 illustrates a cross-section taken along line 6—6

of FIG. 1, there being illustrated in this figure a right-angled beam 144 arranged in horizontal disposition and secured to the side panel 20 by means of a screw 146. Beam 144, the counterpart of which is supported on the other side panel, is adapted along with the corresponding beam on the other side panel, to support a screen-type floor 148, as is also seen in FIG. 1.

The invention contemplates that one or more of such screen floors can be provided for supporting flower pots and the like. The use of this type of flooring minimizes the weight of the greenhouse of the invention for purposes of shipping and storage, but more important, it is directed to improving the effectiveness of ventilating efforts exercised in such greenhouses.

To provide a front for the enclosure of the greenhouse there are employed in the preferred embodiment two front panels 150 and 152 arranged in superposed relationship and each consisting of a frame respectively accommodating beams 154 and 156.

These front panels are slidably and detachably accommodated between the side panels 20 and 22 which support and position the same. The manner in which the front panels are accommodated is best seen in FIG. 7.

In FIG. 7 is illustrated the aforedescribed structure whereby, for example, the front edge member 62 is provided with a groove 158 wherein is accommodated pane 142 held in position by resilient sealing support 160 in a manner which has been described in detail above.

By way of illustration, front edge member 62 includes a T-shaped protrusion 162 which is of elongated construction extending throughout the height of the front of the greenhouse.

Front panel 152, for example, comprises beam 164 comprising female portion 166 adapted for matingly engaging the T-shaped slide 162 constituting the male member of the connection.

Member 162 and its counterpart on side panel 22 constitutes spaced parallel guides by means of which the front panels are slidably received and supported.

In addition, and by way of example, beam 164 may define the aforenoted type of groove, herein indicated by reference 168, in cooperation with which resilient sealing support 170 accommodates the corresponding beam 156.

FIG. 8 illustrates that the front panels 152 and 154 can be matingly engaged by means of the provision of a socket opening receiving the protrusion 174 on the other of said front panels.

It is also seen in FIG. 8 that the respective portions of front panels 152 and 154 are provided with window supporting structures 176 and 178 of the above described type.

The lower of the front panels, that is, front panel 150, has a specifically designed lower beam structure such as is illustrated in the form of beam 180 in FIG. 9. Said beam 180 is provided with the pane supporting structure 182 of the aforenoted type and is moreover provided with a bottom flange 184 and a flange 186 spaced from and parallel to flange 184. Between flanges 184 and 186 is accommodated bottom 60, the extent to which the bottom 60 can extend between said flanges being limited by the stop on abutment 188.

It will be noted that the cantilever arrangement of flange 186 permits a certain displacement of the same to accommodate variations in thickness of said bottom.

At the top of rear edge members 24 and 26 is accommodated a transverse top member 190, as is best seen in FIG. 2.

Said top member 190 constitutes a hinge member and for this purpose is provided with inclined flange 192 having a hooked end portion 194 defining an elongated cylindrical opening 196.

In opening 196 is accommodated cylindrical rib 198 mounted on beam 200, opening 196 and cylindrical element 198 constituting therebetween a hinge structure be-

tween which axial displacement is possible for purposes of mounting the cover panel (FIG. 1).

In FIG. 2 is illustrated in phantom lines an expander **204** provided with an opening **206**, the main portion of the beam **190** being provided with a similar opening **208** adapted for accommodating the expander **204** or a resilient sealing strip (not shown), said opening **206** also being adapted to accommodate a resilient sealing strip for engaging the frame F (FIG. 1) of the structure to which the greenhouse is connected.

In FIG. 2 is illustrated the pane **210** of the cover panel which is accommodated in the beams of the cover panel by means of a connecting structure of which structure **212** is illustrative (this structure having been described above).

As best seen in FIG. 11, the cover panel is provided with one or more arcuate members **214** depending from the cover panel into the enclosure of the greenhouse and provided with a plurality of spaced radial slots **216** adapted for cooperating with a locking structure **218** by means of which the cover panel is held in one of a plurality of predetermined positions, one of which is illustrated in phantom lines in FIG. 11.

A further possible structure provided in accordance with a feature of the invention is illustrated in cross-section in FIG. 10, wherein is illustrated the top edge member **220** of the front panel **152** having connected thereto a cushioning strip **222** and provided with a socket opening **224** wherein is hooked an inclined flange **226**, the purpose of which will be next made apparent.

In order to screen the opening to the enclosure of the greenhouse to permit ventilation while preventing the entry of insects and other pests, there is provided a screen **228** connected to extruded beam **230** by means of elongated insert **232**, beam **230** being provided with a tubular resilient edge **234**, the anchor member **236** of which is accommodated in opening **238**, the latter said element coming to rest against said inclined flange **226**.

Side panels **20** and **22** may be pre-assembled with the components thereof having been welded or otherwise connected together. In assembling the greenhouse of the invention to the frame F, the side panels are arranged in parallel spaced relation and the front panels **152** and **154** are slidingly engaged therewith. The bottom **60** can next be inserted into position followed by an installation of the screen floors. At any stage of the aforesaid operations or subsequent thereto, said side panels may be bonded or screwed to the frame F.

The cover panel may next be slidingly engaged by means of the aforesaid hinge structure which is connected to the side panels by means of bonds, screws or the like and the assembly of the greenhouse structure of the invention is essentially complete.

It will be obvious from the structure of the beams as illustrated in the drawing that the same are readily susceptible of manufacture by mass production techniques such as by extrusion and that these beams are readily made of aluminum or such other materials as have suitable structural strength while being light in weight and attractive.

It will be also readily apparent from what has been described above that the various grooves provided in the different beams are adapted for defining window pane receptacles wherein window panes are readily accommodated and maintained in position by associated resilient sealing supports.

There will now be obvious to those skilled in the art many modifications and variations of the structures and components set forth above. These modifications and variations will not, however, depart from the scope of the invention if defined by the following claims.

What is claimed is:

1. A window greenhouse comprising spaced and parallel side panels defining the sides of an enclosure and each including front and rear edge members, a bottom edge member and a sloping top edge member, said members of each side being connected to constitute an open frame, at least one transverse beam intermediate said top and bottom edge members and connected between said front and rear members to provide in the associated frame a plurality of window openings, the bottom edge members including flanges extending towards each other, a substantially rigid bottom supported on said flanges between said side panels, each of said edge members being provided adjacent the corresponding window opening with a groove opening into said enclosure and further opening towards the corresponding window opening and including an abutment delimiting said groove, said grooves cooperatively constituting window pane receptacles, window panes in said receptacles, each of said edge members including socket openings parallel to and spaced from said grooves and including stops parallel to and adjacent said socket openings, resilient sealing supports in strip form including hooked ends accommodated in said socket openings and including first lips braced against said stops and second lips braced against the corresponding pane, each of said front edge members including a T-shaped member extending normal thereto and toward the other edge member and constituting parallel slides, at least two window pane frames having T-shaped slideways slidably engaging said T-shaped members to provide a front for said enclosure, one of said pane frames being vertically superposed above the other, said pane frames defining pane receptacles, window panes in the latter said receptacles, said pane frames having socket openings adjacent the latter said receptacles, resilient sealing supports in the latter said socket openings and holding the corresponding panes in their receptacles, at least one pair of further horizontal co-planar flanges, one of each pair being on each of said side panels and inside said enclosure, a screen floor supported by said further flanges above said rigid bottom, and a cover panel hingedly engaged with said side panels whereby said enclosure can be opened and closed.

2. A window greenhouse comprising spaced and parallel side panels defining the sides of an enclosure and each including front and rear edge members, a bottom edge member and a sloping top edge member, said members of each side being connected to constitute an open frame, at least one transverse beam intermediate said top and bottom edge members and connected between said front and rear members to provide in the associated frame a plurality of window openings, the bottom edge members including flanges extending towards each other, a substantially rigid bottom supported on said flanges between said side panels, each of said edge members being provided adjacent the corresponding window opening with a groove opening into said enclosure and further opening towards the corresponding window opening and including an abutment delimiting said groove, said grooves cooperatively constituting window pane receptacles, window panes in said receptacles, each of said edge members including socket openings parallel to and spaced from said grooves and including stops parallel to and adjacent said socket openings, resilient sealing supports in strip form including hooked ends accommodated in said socket openings and including first lips braced against said stops and second lips braced against the corresponding pane, each of said front edge members including a T-shaped member extending normal thereto and toward the other edge member and constituting parallel slides, at least two window pane frames having T-shaped slideways slidably engaging said T-shaped members to provide a front for said enclosure, one of said pane frames being vertically superposed above the other, said pane frames defining pane receptacles, window panes in the latter said receptacles, said pane frames having socket openings adjacent the latter said receptacles, resilient sealing supports in the latter said socket openings and holding the corresponding panes in their receptacles, at least one one pair of further horizontal co-planar flanges, one of each pair being on each of said side panels and inside said enclosure, a screen

floor supported by said further flanges above said rigid bottom, the adjacent edge portions of said at least two window pane frames including abutting edge members cooperatively including male and female elements in engaged relation, a hinge strip connected between said rear edge members at the upper extremities thereof, said hinge strips defining a cylindrical hinge opening parallel to said pane frames, and a cover panel including a window pane and a cylindrical rib hingedly engaged in said hinge opening whereby said cover panel can be opened and closed.

3. A window greenhouse comprising spaced and parallel side panels defining the sides of an enclosure and each including front and rear edge members, a bottom edge member and a sloping top edge member, said members of each side being connected to constitute an open frame, at least one transverse beam intermediate said top and bottom edge members and connected between said front and rear members to provide in the associated frame a plurality of window openings, the bottom edge members including flanges extending towards each other, a substantially rigid bottom supported on said flanges between said side panels, each of said edge members being provided adjacent the corresponding window opening with a groove opening into said enclosure and further opening towards the corresponding window opening and including an abutment delimiting said groove, said grooves cooperatively constituting window pane receptacles, window panes in said receptacles, each of said edge members including socket openings parallel to and spaced from said grooves and including stops parallel to and adjacent said socket openings, resilient sealing supports in strip form including hooked ends accommodated in said socket openings and including first lips braced against said stops and second lips braced against the corresponding pane, each of said front edge members including a T-shaped member extending normal thereto and toward the other edge member and constituting parallel slides, at least two window pane frames having T-shaped slideways slidably engaging said T-shaped members to provide a front for said enclosure, one of said pane frames being vertically superposed above the other, said pane frames defining pane receptacles, window panes in the latter said receptacles, said pane frames having socket openings adjacent the latter said receptacles, resilient sealing supports in the latter said socket openings and holding the corresponding panes in their receptacles, at least one pair of further horizontal co-planar flanges, one of each pair being on each of said side panels and inside said enclosure, a screen floor supported by said further flanges above said rigid bottom, the adjacent edge portions of said at least two window pane frames including abutting edge members cooperatively including male and female elements in engaged relation, a hinge strip connected between said rear edge members at the upper extremities thereof, said hinge strips defining a cylindrical hinge opening parallel to said pane frames, a cover panel including a window pane and a cylindrical rib hingedly engaged in said hinge opening whereby said cover panel can be opened and closed, arcuate members depending from said cover panel into said enclosure and each provided with spaced radial slots, lock members on said side panels to engage said radial slots and hold said cover panel in one of a plurality of selected positions, a sealing strip on and atop said hinge strip and adapted for engaging a structure to which said greenhouse is affixed, sealing strips on and atop said sloping top edges and adapted for cushioning said cover panel, and a screen structure to screen said enclosure at the top of the latter and detachably engaging the uppermost of said pane frames at the top of the latter.

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