

E. F. KUROWSKI.
GREENHOUSE CONSTRUCTION.
APPLICATION FILED FEB. 19, 1908.

913,217.

Patented Feb. 23, 1909.

2 SHEETS—SHEET 1.

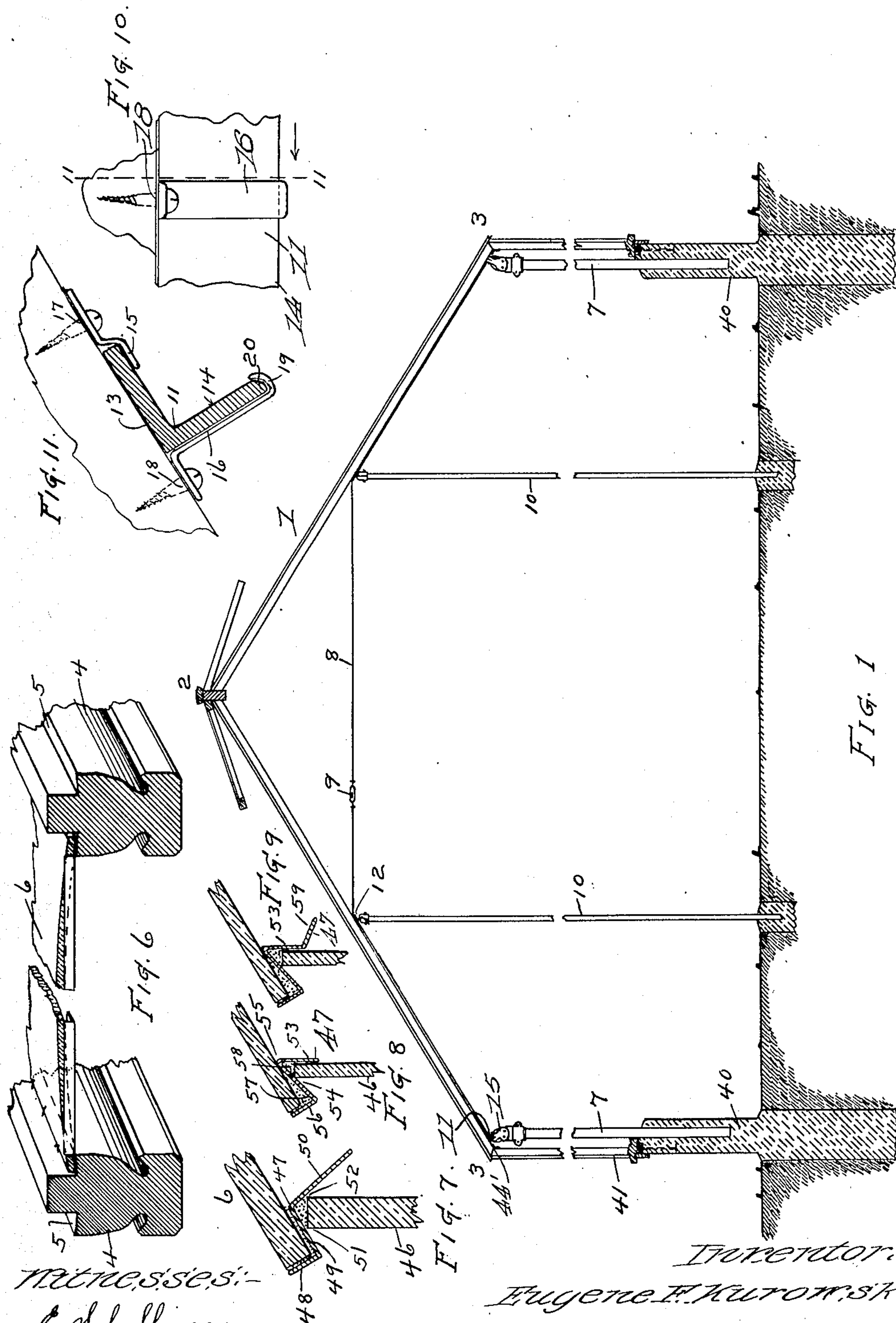


FIG. 1

Witnesses:
C. Schallinger
C. Heymann.

Inventor:
Eugene F. Kurowski
by Carl M. Crawford
Attorney

E. F. KUROWSKI.
GREENHOUSE CONSTRUCTION.
APPLICATION FILED FEB. 19, 1908.

913,217.

Patented Feb. 23, 1909.

2 SHEETS—SHEET 2.

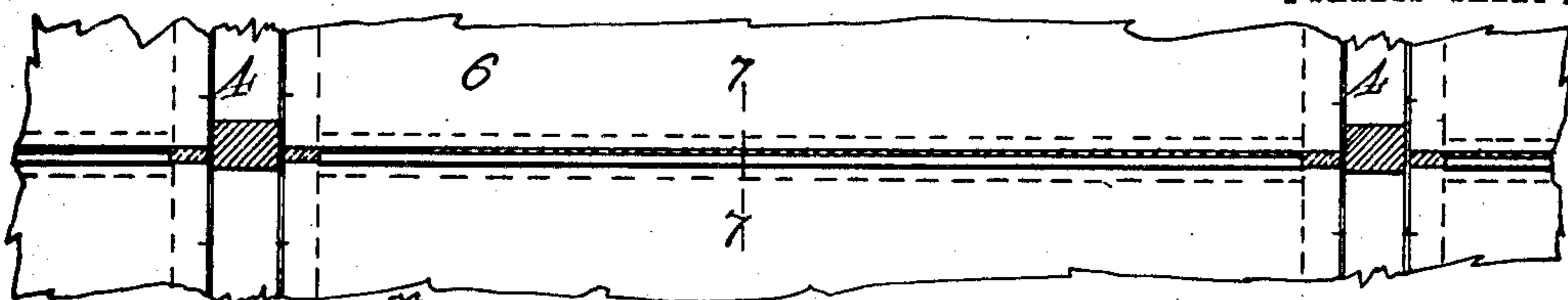


FIG. 5

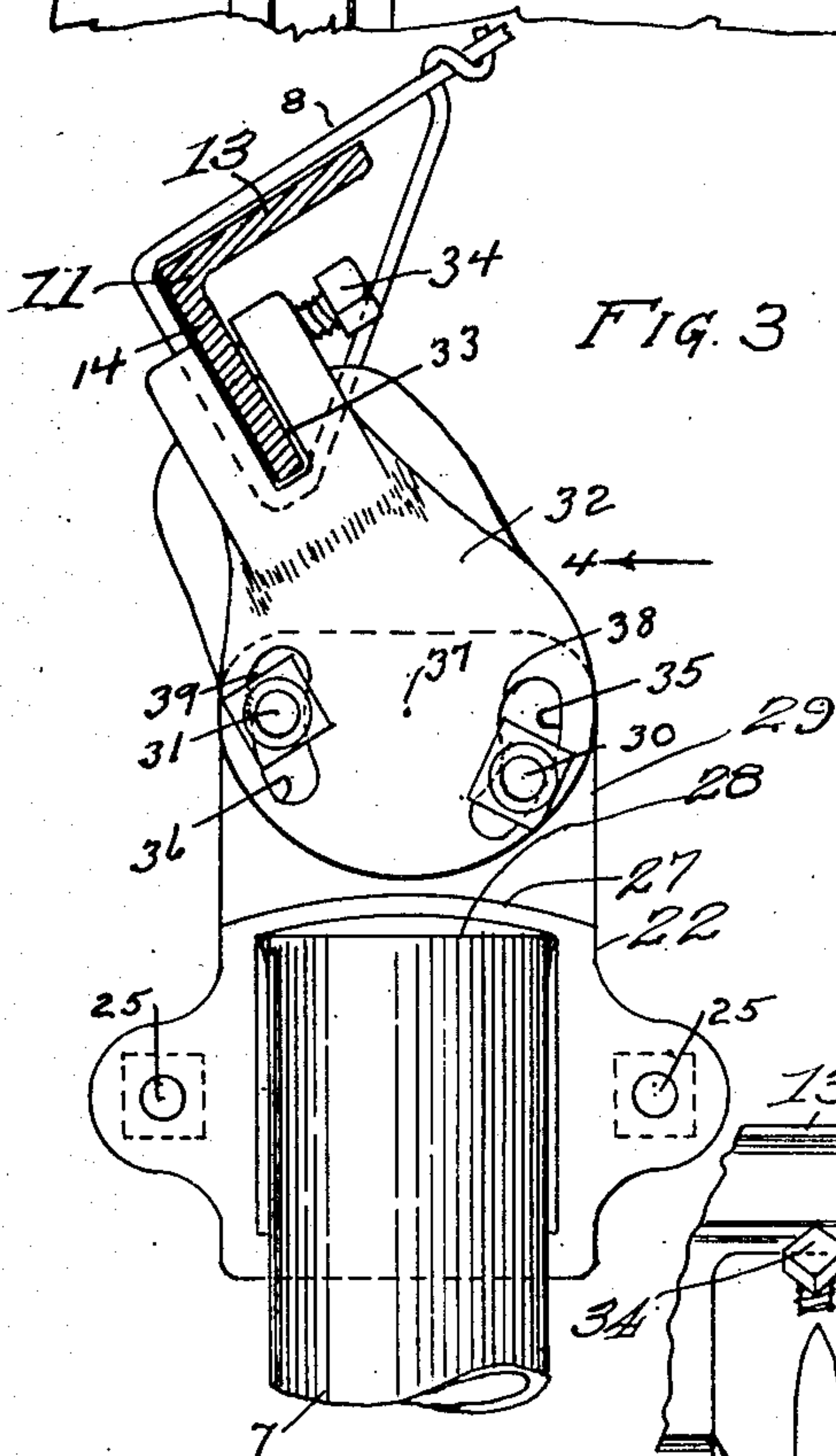


FIG. 3

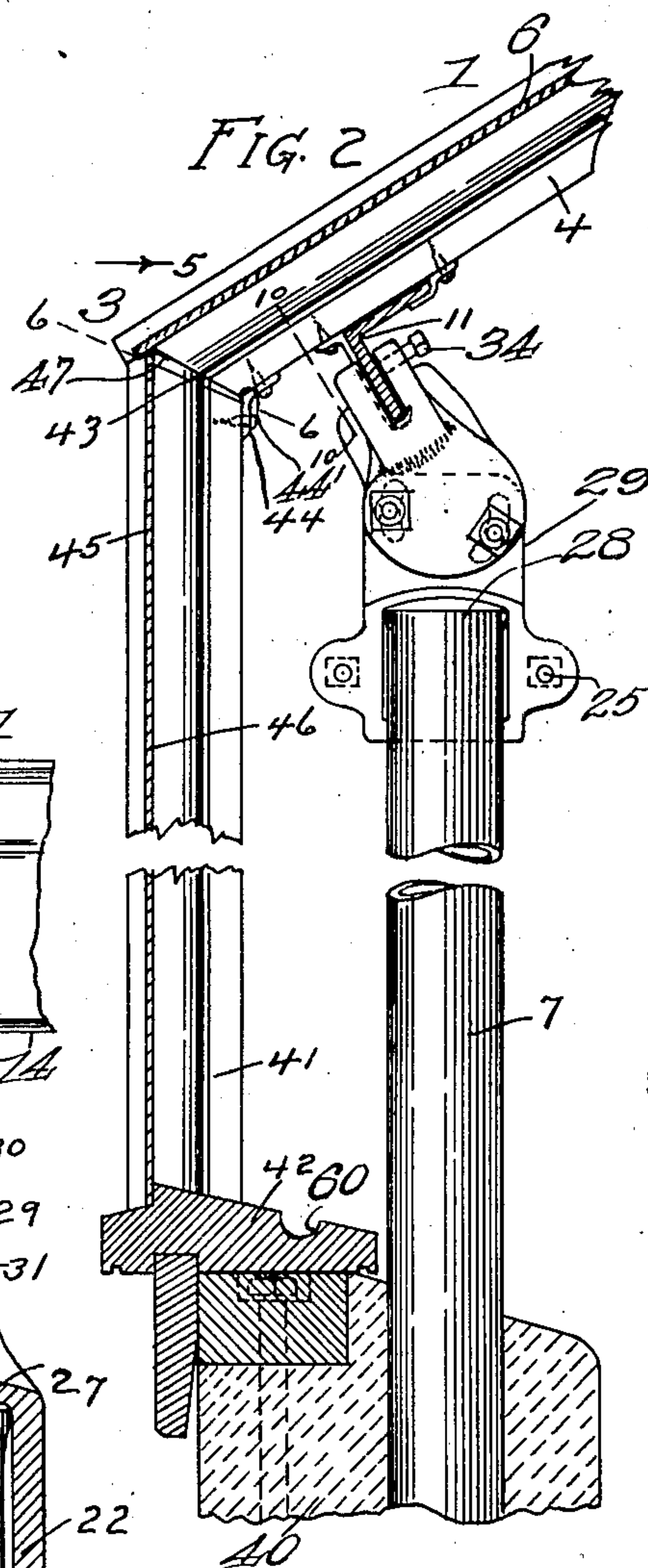


FIG. 2

FIG. 4

Witnesses:
E. Schallinger
C. Hymann

Inventor:-
Eugene F. Kurowski
by Carl M. Crawford
Attorney

UNITED STATES PATENT OFFICE.

EUGENE F. KUROWSKI, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE JOHN C. MONINGER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

GREENHOUSE CONSTRUCTION.

No. 913,217.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed February 19, 1908. Serial No. 416,791.

To all whom it may concern:

Be it known that I, EUGENE F. KUROWSKI, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Greenhouse Construction, of which the following is a specification.

This invention relates to improvements in greenhouse construction and has to do with a novel means for supporting the roof together with post fittings and other structural features in connection therewith.

A further novel feature consists in the provision of a novel glass joint adapted to be disposed at the juncture of the roof and side glass to form a closed joint thereat.

Other features of the invention will be more fully described in connection with the accompanying drawings and will be more particularly pointed out and ascertained in and by the appended claims.

Figure 1 is a transverse sectional view of a greenhouse construction illustrating the main features of my invention. Fig. 2 is an enlarged transverse sectional view of a portion of the structure shown in Fig. 1. Fig. 3 is a detail view, partly in elevation and partly in section, illustrating an improved roof support. Fig. 4 is a view of the part shown in Fig. 3 looking in the direction of the arrow 4 of Fig. 3. Fig. 5 is a view in elevation of the eave portion of the structure looking in the direction of the arrow 5 of Fig. 2. Fig. 6 is a sectional view on line 6—6 of Fig. 2. Fig. 7 is a sectional view on line 7—7 of Fig. 5, showing the improved glass joint. Fig. 8 is a similar view of a modified form of joint. Fig. 9 is a similar view showing a further modification of the joint. Fig. 10 is a sectional view on line 10—10 of Fig. 2 without the roof supporting means. Fig. 11 is a sectional view on line 11—11 of Fig. 10.

Like numerals of reference designate similar parts throughout the different figures of the drawings.

As shown, the roof structure, designated as a whole by 1, is provided with ridge and eave portions 2 and 3 respectively. Said roof structure may conveniently consist of transversely disposed inclined roof bars 4 extending from the ridge to the eave portions in parallel relation and spaced apart from each other as shown in Fig. 6. Suitable glass supporting shoulders are provided

for said bars to receive the roof glass 6 which spans the space between said bars to form a continuous roof surface. Said glass is usually held in place by brads as shown in Fig. 4. Means are provided for supporting said roof structure and as shown said means is located at points inside of the eaves and connections are provided for said means which connections are preferably adjustable. Considered specifically, in connection with the drawings, said means comprises eave or wall roof posts 7 supportingly secured to the roof bars and adjustably connected with each other so as to take up the vertical and angular stress imposed thereon by the weight of the inclined roof. As shown the adjustable connection may consist of a wire or cable 8 transversely disposed and provided with a device for instance as a turn-buckle 9 for taking up the slack and maintaining said wire taut. The primary function of said wire is to prevent the posts 7 from spreading as a result of the lateral stress imposed thereon. In greenhouses, where the roof structure has a span of considerable length, intermediate supporting means may be provided and said means may be in the form of intermediate posts 10. Where intermediate posts are provided the connecting wires 8 are preferably supported by said posts 10 so that they will not form obstructions in the passageways of the greenhouse. If desired said wires 8 may be secured to the intermediate posts 10 in any suitable manner so as to assist in maintaining the roof ends of the post 10 in prescribed relation with respect to the roof.

Roof members are provided which are especially designed for connection with the wall and intermediate supporting posts and securing devices are provided for anchoring said members to said roof to effectively hold them in place so that they will withstand the angular stress imposed by the roof. As shown, said roof members consist of angle irons 11 and 12 which are secured to the bottom faces of the roof bars 4 in alinement with the eave and intermediate posts 7 and 10 respectively. Said angle irons are secured to said roof bars so that one angle portion 13 will lie flat against the same thereby causing the other angle portion 14 to project downwardly from said bars 4 in the manner shown in Fig. 11. Said securing devices preferably comprise clips 15 and 16.

Said clips 15 are secured to the roof bars 4 at 17 and frictionally engage and overlap the angle portions 13 and said clips 16 are secured to the roof bars 4 at 18 and engage the projecting angle portions 14 along their outer faces and are provided with hooked ends 19 which embrace the lower marginal portions 20. It will be seen by reference to Fig. 11 that the clips 16 by means of their hooked ends 19 not only cooperate with the clips 15 to hold the angle portion 13 in engagement with the roof bar but that they also effectively prevent the angle iron 11 from slipping downwardly on the roof bar. In constructing a greenhouse the supporting posts cannot always be located exactly in position with respect to other parts and by means of the foregoing construction it will be seen that the angle irons 11 and 12 and their retaining clips may be readily located or adjusted so as to accommodate such variation. Furthermore in using different widths of roof glass the spacing of the roof bars varies and this form of securing devices can be attached to the angle iron at any point and entirely avoid the necessity of accurate calculation as to the relative position of the bars with respect to the angle irons.

An improved form of fitting is provided to secure the posts 7 and 10 to the angle irons 11 and 12 respectively and said fitting comprise post engaging portions and member engaging portions, which latter are adapted for engaging the angle irons 11 and 12. In view of the fact that the roof structure when in place may incline at an angle slightly at variance with the plans of construction, it is desirable to connect the member engaging portions with the post portions in such a manner as to permit of lateral or rotative adjustment of the former with respect to the latter, and in view of the fact that it is desirable to have a structural end to end engagement between the posts and the post portions, and as the posts cannot always be disposed in a manner so as to bring their ends to the proper height, it is advantageous to be able to adjust the member portions longitudinally as well as laterally with respect to the post portions. As shown, the post portions of said fitting are made in two parts which are designated as 21 and 22, reference being had to Figs. 2, 3 and 4. Ears 23 and 24 are provided on said parts 21 and 22 respectively and bolts 25 extend through said ears whereby the parts 21 and 22 may be clamped upon the posts 7. Said parts 21 and 22 form a socket for the ends of the posts 7 and are provided with overhanging top portions 26 and 27 adapted for engagement with the upper ends 28 of the posts 7 so that the fitting will be supported by a structural engagement with the posts. The bolts 25 will therefore not be required to clamp the parts 21 and 22 on

the posts 7 with sufficient pressure to sustain the load imposed by the roof but will merely be called upon to hold the parts 21 and 22 in engagement with the posts. If desired however the fittings may be adjusted longitudinally of the posts and supported by blocks inserted between the ends of the posts and the parts 26 and 27. One of the parts, preferably 22, is provided with a projection 29 having round apertures through which bolts 30 and 31 project. Member engaging portions 32 are provided and are bifurcated at 33 to receive the projecting portion 14 of the angle iron. A set screw 34 or equivalent means is provided to rigidly secure the angle portion 14 in place. Said member 32 is provided with slots 35 and 36 to receive the bolts 30 and 31 and said bolts are provided with nuts whereby the two parts of the fitting 32 and 29 may be rigidly connected. The slots 35 and 36 have a common center 37 and the member 32 may be rotated or laterally adjusted to bring the bifurcated portion in alinement with the angle iron by turning said member 32 about either bolt 30 or 31 as a pivot or about the center 37. It is desirable to have the lower end of the angle portion 14 in engagement with the base of the bifurcated portion 33 so that the member 32 will structurally support the angle iron, the set screw 34 merely securing the angle iron in place. In order to adjust the member 32 longitudinally when the post 7 is set too high or too low I desirably enlarge the slot 35 at 38 and the slot 36 at 39 to afford such longitudinal adjustment. As shown in Fig. 3 the ends of the wires 8 are bent about the angle irons 11 and secured thereto and if desired these wires may pass above the angle irons 12, in cases where intermediate posts 10 are employed, as clearly shown in Fig. 1.

The supporting means for the roof, hereinbefore described, is designed to support the same independently of the side walls of the greenhouse and by means of this feature the side walls are merely made of sufficient strength to support the wall glass and therefore the heavy supporting construction usually employed in side walls is entirely avoided together with the resultant obstruction of light.

As shown, foundation walls 40 are provided and the same extend upwardly to a point usually equal to the height of the beds. The posts 7, may if desired, be embedded in said walls 40. The side walls proper consist of side bars 41 mounted on said walls 40 by suitable constructions such as indicated at 42, said bars 41 extending upwardly and joining the roof bars 4 at 43. Suitable means such as indicated at 44 may be provided to hold the side bars 41 in engagement with the roof bars 4 and as such means is not called upon to perform any other function

they may as shown be of light construction so as to yield and permit relative movement of the side and roof bars under wind or rain pressure, that is, the roof bars may turn on a fulcrum formed by the inner edges at 44' and the loose or floating joint member 47 between the side and roof glass will permit the roof glass to move with said roof bars. The side bars are designed to receive the side glass 45 and may if desired be provided with shoulders 46 similar to the shoulders 5 of the roof bar 4.

In order to avoid the expense of and also to avoid the obstruction to light incident to the provision of a gutter at the eaves and to provide an effective means of closing the joint between the side and roof glass 46 and 6 respectively the following construction is provided. A glass juncture or joining member 47 is shown in Figs. 2, 5, 6 and 7 and said member is preferably so constructed as to engage the overlapping marginal portions of angularly disposed plates of glass in such a manner that the engagement therewith will not only hold said member itself in place but will also serve as a support for certain of the glass plates. Referring more particularly to Fig. 7, which shows said member 47 in cross-section, 48 designates a portion adapted to engage the lower eave margin of the roof glass 6 and said portion is of sufficient height to make such engagement continuous even where the roof glass is bowed, as shown in Fig. 6. Said member 47 is bent at an angle to form a supporting portion 49 adapted to engage the bottom surface of the roof glass and at 50 another bend is provided to engage the side glass 46. The portions 49 and 50 engage the side glass 46 at 51 and 52 and the weight of the roof glass 6 or the engagement thereof with said member 47 acts upon the portions 48 and 49 to keep the member 47 in a given position, as shown, and also serves to maintain engagement at points 51 and 52. The pin shown in Figs. 5 and 6 hold the roof and side glass upon their supporting shoulders and assist in maintaining the member 47 in place. A suitable filling of putty or the like may be disposed between the glass and the member 47 to provide an air-tight joint. As shown in Fig. 7 the portion 50 extends inwardly with respect to the side glass 46 so as to receive the water of condensation from the lower face of the roof glass and deflect it inwardly with respect to the side glass. A small gutter 60 may be provided to receive the drippings from said part 50. Normally the heat imparted to the portion 50 from the interior of the greenhouse will maintain the parts 48 and 49 at a sufficiently high temperature to prevent the formation of icicles adjacent 48 or in any place about the eaves. Said member 47 is conveniently in the form of a strip and is designed to extend between the roof and side

bars so as to engage the latter with its ends but owing to the improved construction of said member 47 it is not necessary to secure the same at its ends to the roof and side bars or at any point and therefore it constitutes a floating glass joining member.

In Fig. 8 a modified construction is shown wherein the portion 53 lies flat against the side glass 46 and wherein the part 54 engages the roof glass at its rear end 55 and is out of engagement with the roof glass at its intermediate and lower portions. The part 56 is increased in width and the spaces 57 and 58 are filled with putty or the like.

In Fig. 9 a modification is shown which is similar in all respects to the form shown in Fig. 8 with the exception that the part 53 is bent inwardly at 59 to perform the function of the part 50 shown in Fig. 7.

It will be seen that as either the weight of the glass or the brads engaging the same maintains engagement between the member 47 and the side glass so that the said member will be rigidly held in place and owing to the retaining part 48 said member will prevent the eave panes of glass from sliding downwardly. It will be further noted that the connected side and intermediate posts together with the means for loosely connecting the roof and side glass and roof and side bars all cooperate to provide an effective closed structure with light obstructing parts reduced to a minimum.

I claim:—

1. A greenhouse construction comprising in combination, a roof bar, an angle iron secured thereto, a supporting post, and a fitting comprising two separate portions embracing the side and top of said post, means for holding said portions in engagement with said post, one of said portions having a projection, a bifurcated member receiving and provided with means engaging a portion of said angle iron, and bolts securing said bifurcated member to said projection, said member having slots receiving said bolts and formed to permit of rotative and longitudinal adjustment of said member with respect to said projections.

2. A greenhouse construction comprising in combination, vertical side glass, roof glass inclined with respect thereto and overhanging said side glass, and an eaved joint member interposed between the juncture of said side and roof glass and having a portion lying between the lower face of the roof glass and the outer corner of the side glass and an upwardly bent outer extension engaging the outer overhanging margin of the roof glass, said member having a downwardly bent inner extension engaging and extending below the inner corner of the side glass and projecting angularly therefrom to catch and deflect the water of condensation from the roof glass and deflect the same

outwardly from the side glass, and a receiving gutter adjacent the bottom portion of the side glass for receiving said water.

3. In a greenhouse construction, the combination with roof members, of depending members carried thereby, a supporting post and a two-part connection between said supporting post and said depending member, one part of said connection being rotatively and vertically adjustable upon said post, and the other part being swingingly mounted upon said vertically adjustable member.

4. In a greenhouse construction, the combination with roof members, of depending members carried thereby, a supporting post, a two-part connection between said supporting post and said depending member, one part of said connection being rotatively and vertically adjustable upon said post, and the other part being swingingly mounted upon said vertically adjustable member, said last named portion being bifurcated for the reception of said depending member, and means for binding said depending member within said bifurcated portion.

5. In a greenhouse construction, the combination with the roof members, of longitudinally extending depending members upon opposite ends of the greenhouse, supporting posts located upon opposite sides of the greenhouse, rotatively and vertically adjustable members mounted upon the upper ends of the supporting posts, swinging members mounted upon the vertically adjustable

members and adapted to engage the depending members of the roof, a flexible member extending across the greenhouse, the opposite ends of which are connected to the depending members of the roof, and means for adjusting the tension of said flexible member.

6. In a greenhouse construction, the combination with the supporting post, of the roof members, a longitudinally extending angle iron secured to said roof members, one portion of said angle iron lying parallel with the roof members, and the other portion of said angle iron depending therefrom, a two-part casing rotatively and vertically adjustable upon the upper end of the supporting post, means for binding the two parts of said casing together, an upward extension carried by one part of said casing, a transverse binding member carried by said extension, a bifurcated member having an arcuate slot formed therein through which said binding member passes, and means for binding said bifurcated member to the downwardly extending portion of the angle iron substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

EUGENE F. KUROWSKI.

Witnesses:

PHILIP L. MCKEE,

RUDOLPH E. KUROWSKI.